

**EXHIBIT P**  
**FISH AND WILDLIFE HABITATS AND SPECIES**  
 OAR 345-021-0010(1)(p); OAR 345-022-0060

**TABLE OF CONTENTS**

	Page
P.1 INTRODUCTION.....	P-1
P.1.1 Analysis Area.....	P-1
P.1.2 Agency Consultation.....	P-1
P.2 FISH AND WILDLIFE HABITAT MITIGATION GOALS AND STANDARDS.....	P-1
P.2.1 Habitat Category 1.....	P-1
P.2.2 Habitat Category 2.....	P-2
P.2.3 Habitat Category 3.....	P-2
P.2.4 Habitat Category 4.....	P-3
P.2.5 Habitat Category 5.....	P-3
P.2.6 Habitat Category 6.....	P-4
P.3 BIOLOGICAL AND BOTANICAL SURVEYS.....	P-4
P.3.1 Information Review.....	P-4
P.3.2 Field Survey Methods.....	P-9
P.3.2.1 Summary of Field Survey Methods.....	P-9
P.3.2.2 Field Visit.....	P-9
P.3.2.3 Habitat Categorization.....	P-9
P.3.2.4 Wetland Delineation.....	P-10
P.4 FISH AND WILDLIFE HABITAT.....	P-10
P.4.1 Habitat Types.....	P-11
P.4.2 Habitat Categorization.....	P-11
P.4.2.1 Category 2.....	P-12
P.4.2.2 Category 4.....	P-12
P.5 HABITAT LOCATIONS.....	P-13
P.6 IDENTIFICATION OF SENSITIVE SPECIES AND SITE-SPECIFIC ODFW ISSUES.....	P-14
P.6.1 Identification of State Sensitive and Other Nonlisted Special-status Species.....	P-14
P.6.2 Baseline Survey.....	P-14
P.7 DESCRIPTION OF SIGNIFICANT POTENTIAL DISTURBANCES.....	P-15
P.7.1 Potential Habitat Impacts.....	P-15
P.7.2 Potential Wildlife Impacts.....	P-15
P.7.2.1 Potential Impacts on Mammals.....	P-16
P.7.2.2 Potential Impacts on Birds.....	P-16
P.7.2.3 Potential Impacts on Reptiles.....	P-21
P.8 MEASURES TO AVOID, MINIMIZE, OR MITIGATE DISTURBANCES.....	P-21
P.8.1 Avoidance Measures.....	P-21
P.8.2 Minimization Measures.....	P-22
P.8.3 Mitigation Measures.....	P-23

P-9	MONITORING PLAN .....	P-24
P-10	REFERENCES.....	P-24

## TABLES

P-1	State Sensitive and Other Nonlisted Special-status Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon .....	P-6
P-2	Summary of Field Surveys for Boardman Solar Energy Facility .....	P-9
P-3	Oregon Department of Fish and Wildlife Habitat Categories, Characteristics, and Goals for Mitigation.....	P-10
P-4	Habitat Types within the Site Boundary .....	P-11
P-5	Temporary and Permanent Disturbance by Habitat Category and Subtype .....	P-12

## FIGURE

P-1	Fish and Wildlife Habitat
-----	---------------------------

## ATTACHMENTS

P-1	Agency Correspondence Record
P-2	Site Characterization Study
P-3A	Species Occurrence Data from U.S. Fish and Wildlife Service
P-3B	Species Occurrence Data from Oregon Biodiversity Information Center [ <i>Confidential and Not for Public Distribution. Provided Under Separate Cover.</i> ]
P-4	Baseline Survey Protocol
P-5	Habitat Mitigation Plan
P-6	Revegetation and Noxious Weed Control Plan
P-7	Wildlife Monitoring and Adaptive Management Plan
P-8	Raptor Nest Survey
P-9	Sensitive Species Survey

## **P.1 INTRODUCTION**

**OAR 345-021-0010(1)(p)** *requires the following:*

*Information about the fish and wildlife habitat and the fish and wildlife species, other than the species addressed in subsection (q) that could be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0060.*

**OAR 345-022-0060** *requires the following:*

*“[T]he Council must find that the design, construction and operation of the facility, taking into account mitigation, are consistent with the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025 in effect as of September 1, 2000.*

### **P.1.1 Analysis Area**

The analysis area, for purposes of Exhibit P, includes the area within the site boundary and the area within 0.5 mile of the site boundary, in accordance with OAR 345-001-0010(2) and (59).

### **P.1.2 Agency Consultation**

Consultation between Boardman Solar Energy LLC (Applicant), Oregon Department of Fish and Wildlife (ODFW), and U.S. Fish and Wildlife Service (USFWS) personnel regarding fish and wildlife habitat and species that could be affected by the Facility began in May 2016 and is ongoing. The following meetings and correspondence are described in additional detail in Attachment P-1:

- Preliminary discussion regarding several Invenergy projects with ODFW-May 16, 2016
- Preliminary discussion regarding several Invenergy projects with USFWS-May 18, 2016
- Discussion regarding baseline survey protocol with ODFW-July 12, 2016
- Comments received on baseline survey protocol scope from ODFW-September 8, 2016
- Comments received on baseline survey protocol scope from USFWS-November 3, 2016
- Review of species list, habitat categorization, mitigation plan, and monitoring plan with ODFW-November 7, 2016
- Site visit with ODFW-November 21, 2016
- Discussion regarding habitat mitigation plan with ODFW-March 14, 2017
- Discussion regarding Exhibit P documents with ODFW and ODOE-May 12, 2017
- Discussion regarding habitat mitigation plan with ODFW and ODOE-June 28, 2017

## **P.2 FISH AND WILDLIFE HABITAT MITIGATION GOALS AND STANDARDS**

**OAR 635-415-0025** *defines six habitat categories and establishes mitigation goals and implementation standards for each category. For reference, the six habitat categories and corresponding mitigation goals and implementation standards are as follows.*

### **P.2.1 Habitat Category 1**

**OAR 635-415-0025(1)** *Habitat Category 1 is irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic*

*province or site-specific basis, depending on the individual species, population, or unique assemblage.*

- (a) *The mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality.*
- (b) *The Department shall act to protect Category 1 habitats by recommending or requiring:*
  - (A) *Avoidance of impacts through alternatives to the proposed development action;*  
*or*
  - (B) *No authorization of the proposed development action if impacts cannot be avoided.*

### **P.2.2 Habitat Category 2**

**OAR 635-415-0025(2)** *Habitat Category 2 is essential habitat for a fish or wildlife species, population, or unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population or unique assemblage.*

- (a) *The mitigation goal if impacts are unavoidable, is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality.*
- (b) *The Department shall act to achieve the mitigation goal for Category 2 habitat by recommending or requiring:*
  - (A) *Avoidance of impacts through alternatives to the proposed development action;*  
*or*
  - (B) *Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality. In addition, a net benefit of habitat quantity or quality must be provided. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.*
- (c) *If neither 635-415-0025(2)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action. I*

### **P.2.3 Habitat Category 3**

**OAR 635-415-0025(3)** *Habitat Category 3 is essential habitat for fish and wildlife, or important habitat for fish and wildlife that is limited either on a physiographic province or site-specific basis, depending on the individual species or population.*

- (a) *The mitigation goal is no net loss of either habitat quantity or quality.*
- (b) *The Department shall act to achieve the mitigation goal for Category 3 habitat by recommending or requiring:*
  - (A) *Avoidance of impacts through alternatives to the proposed development action;*  
*or*



(B) *Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed prior to or concurrent with the development action.*

(c) *If neither 635-415-0025(3)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.*

#### **P.2.4 Habitat Category 4**

**OAR 635-415-0025(4)** *Habitat Category 4 is important habitat for fish and wildlife species.*

(a) *The mitigation goal is no net loss in either existing habitat quantity or quality.*

(b) *The Department shall act to achieve the mitigation goal for Category 4 habitat by recommending or requiring:*

(A) *Avoidance of impacts through alternatives to the proposed development action; or*

(B) *Mitigation of impacts, if unavoidable, through reliable in-kind or out-of-kind, in-proximity or off-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed prior to or concurrent with the development action.*

(c) *If neither 635-415-0025(4)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.*

#### **P.2.5 Habitat Category 5**

**OAR 635-415-0025(5)** *Habitat Category 5 is habitat for fish and wildlife having high potential to become either essential or important habitat.*

(a) *The mitigation goal, if impacts are unavoidable, is to provide a net benefit in habitat quantity or quality.*

(b) *The Department shall act to achieve the mitigation goal for Category 5 habitat by recommending or requiring:*

(A) *Avoidance of impacts through alternatives to the proposed development action; or*

(B) *Mitigation of impacts, if unavoidable, through actions that contribute to essential or important habitat.*

(c) *If neither 635-415-0025(5)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.*

### **P.2.6 Habitat Category 6**

**OAR 635-415-0025(6)** *Habitat Category 6 is habitat that has low potential to become essential or important habitat for fish and wildlife.*

- (a) *The mitigation goal is to minimize impacts.*
- (b) *The Department shall act to achieve the mitigation goal for Category 6 habitat by recommending or requiring actions that minimize direct habitat loss and avoid impacts to offsite habitat.*

### **P.3 BIOLOGICAL AND BOTANICAL SURVEYS**

**OAR 345-021-0010(1)(p)(A)** *A description of biological and botanical surveys performed that support the information in this exhibit, including a discussion of the timing and scope of each survey.*

**Response:** Sections P.3.1 and P.3.2 summarize the information review and the biological and botanical (habitat, wildlife, rare plants) investigations completed for the Facility.

The information review included the site boundary and a 5-mile buffer for state and federal special-status species within Gilliam and Morrow counties, Oregon. Habitat mapping was done within the site boundary.

#### **P.3.1 Information Review**

A USFWS Information for Planning and Conservation Trust Resources Report was generated for federal special-status species within the site boundary and 5 miles of the Facility (USFWS, 2016). In addition, the Oregon Biodiversity Information Center (ORBIC) database was queried for records of state and federal special-status species within the site boundary and within 5 miles of the Facility (ORBIC, 2016a). The USFWS report is found in Attachment P-3A and the ORBIC database query results (*confidential and not for public distribution*) are found in Attachment P-3B.

Based on results of the USFWS report and the ORBIC database query, six state and federal threatened and endangered species were identified as occurring or potentially occurring within the site boundary or a 5-mile buffer area. These are listed in Table Q-1 and described further in Exhibit Q. Exhibit P focuses on the state sensitive and other nonlisted special-status species in Oregon, and Table P-1 lists these species. Table P-1 and Table Q-1 (Exhibit Q) were used to design the field surveys described in Sections P.3.2 and Q.2.2. If there is no impact potential for the species, it is not addressed further in this Exhibit P.

To help make a determination on whether there is suitable habitat within the site boundary and whether there will be impact potential within the analysis area in Table P-1, additional sources were consulted to supplement the USFWS report and ORBIC database query. The ORBIC database does not represent a comprehensive survey effort and relies on voluntary reporting. These sources provided additional information on species that potentially occur in the analysis area and included critical information such as habitat preferences, morphological characteristics, phonologic development timelines, and species ranges.

- 2011 National Land Cover Database (Homer et al., 2015)
- U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey (NRCS, 2016)

- The National Map (U.S. Geological Survey [USGS], 2016)
- *Morrow County Comprehensive Plan* (Morrow County, 2013)
- Oregon Department of Agriculture [ODA] Plant Conservation Program (ODA, 2016)
- *Columbia Basin Wildlife Areas Management Plan* (ODFW, 2008)
- Deer and Elk Winter Range Maps (ODFW, 2016b)
- *Umatilla and Willow Creek Basin Assessment for Shrub Steppe, Grasslands, and Riparian Wildlife Habitats* (USEPA, 2000)
- *Rare and Endangered Plants of Oregon* (Eastman, 1990)
- *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973)
- *A Field Guide to Pacific States Wildflowers: Washington, Oregon, California, and Adjacent Areas* (Niehaus and Ripper, 1976)
- *Survey of Peregrine Falcon Breeding Area Monitoring in Oregon, 2003-2007: Final Report* (Isaacs, 2008)
- eBird, an online database of bird distribution and abundance (eBird, 2016a)
- The National Audubon Society (Audubon) Important Bird Areas (Audubon, 2016)
- USGS Breeding Bird Survey (BBS; USGS, 2001)
- Golden Eagle Birds of North America Account (Kochert et al., 2002)
- *Golden Eagles (Aquila chrysaetos) Nesting in Oregon, 2011-2014: Final Annual Report* (Isaacs, 2015)
- *Golden Eagle Survey Locations: 2011 - 2015. Metadata: Point and Vector Object Information for the Lake Harney Wind Project* (Oregon Eagle Foundation, 2015)
- *Multi-Species Candidate Conservation Agreement with Assurances* between Threemile Canyon Farms, The Nature Conservancy, Portland General Electric Company, ODFW and USFWS (David Evans and Associates, 2004)
- The Sibley Field Guide to Birds of Western North America (Sibley, 2003)

The following five USGS Breeding Bird Survey routes (Attachment P-2, Figure 8; Pardieck et al., 2015) are the closest ones to the analysis area and were reviewed for species occurrence:

- Bickleton, 10 miles northwest in Washington (approximately 1990-2015)
- Mercer, 10 miles northeast in Washington (approximately 1968-2015)
- Umatilla, 20 miles east in Oregon (approximately 1988-1998)
- Cecil, 10 miles south in Oregon (approximately 1998-2001)
- Montague, 10 miles southwest in Oregon (approximately 1974-2000)

The following reports from nearby wind energy projects were also consulted for species occurrence:

- *Horn Butte Wind Power Project Biological Study Report* (Northwest Wildlife Consultants, Inc., 2010); the Horn Butte Wind Project is approximately 1 mile south of the Facility

- *Record of Decision for the Electrical Interconnection of the Willow Creek Wind Project* (BPA, 2008); the Willow Creek Wind Project is approximately 5 miles south of the Facility, and the Willow Creek Wind Project interconnection is adjacent to the Facility POI line tap

There are no ODA plant protection and conservation programs that apply to the Facility or within the site boundary, nor are wildlife conservation programs in place.

Table P-1. State Sensitive and Other Nonlisted Special-status Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon

Species	Scientific Name	State Status <sup>a,b</sup>	Federal Status <sup>a,b</sup>	Potential Habitat within the Facility Site Boundary	Potential Impact within the 0.5-mile Analysis Area (Yes/No)
<b>Mammals</b>					
California bat	<i>Myotis californicus</i>	SV	--	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Fringed bat	<i>Myotis thysanodes</i>	SV	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Hoary bat	<i>Lasiurus cinereus</i>	SV	--	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Long-eared bat	<i>Myotis evotis</i>	--	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Long-legged bat	<i>Myotis volans</i>	SV	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Pallid bat	<i>Antrozous pallidus</i>	SV	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SV	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Spotted bat	<i>Euderma maculatum</i>	SV	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
Yuma bat	<i>Myotis yumanensis</i>	--	SOC	Yes; foraging habitat in wetlands, no roosting habitat	Yes
White-tailed jackrabbit	<i>Lepus townsendii</i>	SV	--	Yes	Yes
<b>Birds</b>					
Bald eagle	<i>Haliaeetus leucocephalus</i>	--	BGEPA	No	Yes

Table P-1. State Sensitive and Other Nonlisted Special-status Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon

Species	Scientific Name	State Status <sup>a,b</sup>	Federal Status <sup>a,b</sup>	Potential Habitat within the Facility Site Boundary	Potential Impact within the 0.5-mile Analysis Area (Yes/No)
Ferruginous hawk	<i>Buteo regalis</i>	SC	BCC, SOC	Yes	Yes
Golden eagle	<i>Aquila chrysaetos</i>	--	BGEPA	Yes	Yes
Peregrine falcon	<i>Falco peregrinus anatum</i>	SV	BCC	Yes	Yes
Short-eared owl	<i>Asio flammeus</i>	--	BCC <sup>c</sup>	Yes	Yes
Swainson's hawk	<i>Buteo swainsoni</i>	SV	--	Yes	Yes
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	SC	SOC	Yes	Yes
Flammulated owl	<i>Psilosops flammeolus</i>	SV	BCC	No; species occurs in pine forest habitat	No; limited likelihood of occurring in the analysis area
Brewer's sparrow	<i>Spizella breweri</i>	--	BCC	Yes	Yes
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SV	--	Yes	Yes
Green-tailed towhee	<i>Pipilo chlorurus</i>	--	BCC	Yes	Yes
Loggerhead shrike	<i>Lanius ludovicianus</i>	SV	BCC	Yes	Yes
Long-billed curlew	<i>Numenius americanus</i>	SV	BCC	Yes	Yes
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	SC	BCC	Yes	Yes
Sage thrasher	<i>Oreoscoptes montanus</i>	--	BCC	Yes	Yes
Calliope hummingbird	<i>Selasphorus calliope</i>	--	BCC	No	No
Cassin's finch	<i>Haemorhous cassinii</i>	--	BCC	No	No
Eared grebe	<i>Podiceps nigricollis</i>	SC	BCC	No	No
Western grebe	<i>Aechmophorus occidentalis</i>	--	BCC <sup>c</sup>	No	No
Fox sparrow	<i>Passerella iliaca</i>	--	BCC	No	No
Greater sage-grouse	<i>Centocercus urophasianus</i>	SV	BCC	No	No
Rufous hummingbird	<i>Selasphorus rufus</i>	--	BCC	No	No
White-headed woodpecker	<i>Picoides albolarvatus</i>	SC	BCC	No	No
Willow flycatcher	<i>Empidonax traillii</i>	SV	BCC, SOC	No	No

**Reptiles**

**Table P-1. State Sensitive and Other Nonlisted Special-status Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon**

Species	Scientific Name	State Status <sup>a,b</sup>	Federal Status <sup>a,b</sup>	Potential Habitat within the Facility Site Boundary	Potential Impact within the 0.5-mile Analysis Area (Yes/No)
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	SV	SOC	Yes	Yes
<b>Fish</b>					
Pacific lamprey	<i>Entosphenus tridentatus</i>	SV	SOC	No; suitable habitat in Columbia River more than 0.5 mile from site boundary	No
Steelhead—Middle Columbia River ESU, summer run	<i>Oncorhynchus mykiss</i>	SC	T, CH	No; suitable habitat in Columbia River 0.5 mile from site boundary	No
<b>Plants</b>					
Interior rush	<i>Juncus interior</i>	SV, R	--	No; known occurrence on the shores of the Columbia River more than 0.5 mi from site boundary	No
Robinson's onion	<i>Allium robinsonii</i>	--	SOC	No	No--extirpated
<b>Fungus</b>					
Woven-spored lichen	<i>Texosporium sancti-jacobi</i>	R	SOC	No; known occurrence approximately 1.0 mi from site boundary	No

<sup>a</sup> ORBIC, 2016a; ORBIC, 2016b; ODFW, 2015; USFWS, 2016; USFWS, 2008; BGEPA, 1940; ODA, 2016; Harvey et al., 1999.

<sup>b</sup> Status Definitions

-- = No status.

#### **Oregon**

R = Rare; considered rare by the Oregon Natural Heritage Program.

SV = Sensitive-vulnerable; listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring.

SC = Sensitive-critical; listing as threatened or endangered is pending or may be appropriate if immediate conservation actions are not taken.

#### **Federal**

SOC = Species of Concern; being reviewed by USFWS for consideration as candidates for listing.

BCC = USFWS Birds of Conservation Concern.

BGEPA = Protected under the Bald and Golden Eagle Protection Act.

CH = Critical Habitat.

T = Threatened.

Note: All migratory birds are protected by the Migratory Bird Treaty Act.

<sup>c</sup> Short-eared owl and western grebe are listed in the USFWS IPaC report as BCC, but are not designated as BCC for the Great Basin BCR (in which the site boundary is located).

### P.3.2 Field Survey Methods

#### P.3.2.1 Summary of Field Survey Methods

Table P-2 summarizes field surveys that have been conducted, as well as ongoing investigations.

**Table P-2. Summary of Field Surveys for Boardman Solar Energy Facility**

Date	Description
April 26, 2016	Field visit
September 2016	Habitat Categorization; Wetland Delineation
April – May 2017	Raptor Nest Survey
April – May 2017	Sensitive Species Survey
September 2016 – August 2017	Avian Use Survey – Fixed Point
April – June 2017	Breeding Bird Survey

#### P.3.2.2 Field Visit

A field visit was conducted by two biologists on April 26, 2016, to evaluate biological resources as they relate to the Facility. The visit focused on identifying the potential presence of special-status species and potential suitable habitats for wildlife and plants. The area within the site boundary was viewed from vehicle and on foot, with targeting focus on features (e.g., wetlands) and habitats (e.g., soil types or communities with potential to provide suitable habitat for special-status species).

#### P.3.2.3 Habitat Categorization

Biologists with experience identifying and characterizing Columbia Plateau habitat types and wildlife used a combination of deer and elk winter range information (ODFW, 2013), historical land cover data (Homer et al., 2015), color aerial image interpretation (ESRI, 2016), topographic information (USGS, 2016), soil data (NRCS, 2016), and onsite verification to characterize habitat types present within the site boundary from the perspective of wildlife use, both general (for species assemblages [e.g., shrub-steppe obligates]) and specific (for individual taxa [e.g., special-status species]).

On September 14, 2016, a biologist familiar with regional flora and fauna conducted an 8-hour site visit on foot to ground truth habitat occurrence and quality. Specifically, habitat identified in the information review was ground truthed by manually delineating observed habitat boundaries on aerial photographs. During the site visit, the biologist also recorded wildlife observations and documented habitats, land features, and land use practices that indicated the potential for state and federal wildlife species of concern to occur in the site boundary.

Delineated habitat boundaries were then categorized according to the habitat definitions in the ODFW Fish and Habitat Mitigation Policy (ODFW, 2004) using the habitat classification flowchart (Table P-3). Vegetative structure, land form, land use, habitat functionality, and overall ecological condition for wildlife, in particular for special-status species, were all considered during categorization.

Table P-3. Oregon Department of Fish and Wildlife Habitat Categories, Characteristics, and Goals for Mitigation.

Category	Habitat Characteristics	Goal for Mitigation
1	Irreplaceable, essential, and limited	No loss of habitat quantity or quality
2	Essential and limited	No net loss of habitat quantity or quality and to provide a net benefit of habitat quantity or quality
3	Essential, or important and limited	No net loss of habitat quantity or quality
4	Important	No net loss of habitat quantity or quality
5	Having high potential to become either essential or important	Net benefit in habitat quantity or quality
6	Low potential to become essential or important	Minimize impacts

#### P.3.2.4 Wetland Delineation

The wetland delineation is described in Exhibit J.

#### P.3.2.5 Raptor Nest Survey

A biologist conducted ground-based raptor nest surveys on April 6 and May 13, 2017. The objective of this study was to survey for all raptor nests within the Facility boundary and within one mile of the boundary (nest study area). Further details are provided in the Raptor Nest Report found in Attachment P-8.

#### P.3.2.6 Sensitive Species Survey

A biologist conducted field surveys of sensitive species April 5 – 7 and May 12 – 13, 2017. Study objectives were to document the presence/absence and spatial occurrence of plant and animal species of concern within areas of suitable habitat located within the Facility boundary and within 1,000 feet of the boundary (sensitive species study area). Species of concern were defined to include federally threatened or endangered species, Oregon state-listed species (including state conservation strategy, critical, vulnerable, threatened, and endangered, and rare species), or state or federal special-status species, such as bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA; 1940). Further details are provided in the Sensitive Species Report found in Attachment P-9.

#### P.3.2.7 Avian Use and Breeding Bird Surveys

The breeding bird and avian use surveys are on-going and the methods are described in Attachment P-4.

### P.4 FISH AND WILDLIFE HABITAT

**OAR 345-021-0010(1)(p)(B)** *Identification of all fish and wildlife habitat in the analysis area, classified by the habitat categories as set forth in OAR 635-415-0025 and a description of the characteristics and condition of that habitat in the analysis area, including a table of the areas of permanent disturbance and temporary disturbance (in acres) in each habitat category and subtype.*



**Response:** Below are the habitat types and categories that were mapped during the September 14, 2016, field visit. Habitat types and categories will be ground truthed and refined, based on the results of the spring 2017 special-status wildlife surveys.

#### P.4.1 Habitat Types

Habitat types within the site boundary include non-native grassland, shrub-steppe, and wetlands as shown in Table P-4 and Figure P-1.

Table P-4. Habitat Types within the Site Boundary

General Land Cover Type and Codes	Specific Habitat Type ("Subtype") and Mapping Codes	Description	Acres in Site Boundary
Wetland	Herbaceous	Includes various wetland classes such as palustrine emergent, forested and scrub-shrub with no open water. However, no distinction was made here between formal wetland classes (refer to <b>Exhibit J</b> for more detail regarding wetland types). Predominant species found within the wetlands included cattail ( <i>Typha latifolia</i> ), watercress ( <i>Nasturtium officinale</i> ), softstem bulrush ( <i>Schoenoplectus tabernaemontani</i> ), and western goldenrod ( <i>Euthamia occidentalis</i> ).	11.4
	Open Water	Excavated area along west side of Threemile Canyon Road. Dominated by cattail and softstem bulrush.	0.5
Grassland (G) Steppe dominated by native and/or non-native grasses (<20% shrub cover)	Exotic Annual Grassland (GA)	Dominated by two non-native grass species associated with heavy grazing and periodic burning: cheatgrass ( <i>Bromus tectorum</i> ) and bulbous bluegrass ( <i>Poa bulbosa</i> ). Scattered gray rabbitbrush and ( <i>Ericameria nauseosa</i> ) snakeweed ( <i>Gutierrezia sarothrae</i> ) were also present throughout.	664.5
	Native Perennial Grassland (GB)	Predominantly native bunchgrasses such as bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ). Native forb species (e.g., northern buckwheat [ <i>Eriogonum compositum</i> ], arrowleaf balsamroot [ <i>Balsamorhiza sagittata</i> ]) are likely in these areas.	7.3
Shrub-steppe (SS) dominated by native and/or non-native grasses (<20% shrub cover)	Rabbitbrush/ Snakeweed Shrub-steppe (SSB)	Dominated by gray rabbitbrush and snakeweed, with small isolated areas of big sagebrush ( <i>Artemisia tridentata</i> ) also present. Understory was dominated by cheatgrass.	113.9
Total			798

#### P.4.2 Habitat Categorization

The habitats in the Facility boundary were categorized as 2 or 4; none of the habitat was classified as categories 1, 3, 5, or 6. Table P-5 shows the areas of disturbance in each habitat category and subtype. The permanently disturbed acres represent maximum impacts that could occur during operations and the temporarily disturbed acres represent additional maximum impacts during construction, which will be restored following construction.

Table P-5. Temporary and Permanent Disturbance by Habitat Category and Subtype

Habitat Category	Habitat Subtype	Permanently Disturbed	Temporarily Disturbed	Total Disturbed
2	Herbaceous Wetland	0	0	0
	Open Water Wetland	0	0	0
	Subtotal	0	0	0
4	Exotic Annual Grassland	472.45	26.62	499.07
	Native Perennial Grassland	0.05	4.08	4.13
	Rabbitbrush/Snakeweed Shrub-steppe	13.53	28.29	41.82
	Subtotal	486.03	58.99	545.02
<b>Total</b>		<b>486.03</b>	<b>58.99</b>	<b>545.02</b>

#### P.4.2.1 Category 2

Category 2 habitat is essential and limited habitat. Category 2 habitat within the site boundary is limited to wetlands.

##### ***Category 2 Wetlands***

There are two subtypes of wetlands in the site boundary: Herbaceous Wetland and Open Water. Predominant species found within the Herbaceous Wetland subtype included cattail (*Typha latifolia*), watercress (*Nasturtium officinale*), softstem bulrush (*Schoenoplectus tabernaemontani*), and western goldenrod (*Euthemia occidentalis*). Both subtypes include small, isolated, and disturbed wetlands, but given the fact there are not many wetlands in the surrounding area, these areas are considered limited habitat. In addition, although no special-status species have been documented, these wetlands may provide essential or important habitat and are therefore considered Category 2.

#### P.4.2.2 Category 4

Category 4 habitat is important wildlife habitat that is not limited and could include areas that have been moderately to highly grazed or show signs of other disturbance and have moderate structure and forage for wildlife. These areas are usually weedy and contain a high percentage of non-native grasses. Two types of Category 4 habitat occur within the site boundary: grassland and shrub-steppe. While sagebrush-steppe and grasslands would typically be considered important and limited (i.e., Habitat Category 3) in the analysis area, the areas described here are isolated and dominated by non-native plant species. These areas may still provide important habitat for some wildlife, but their relatively poor quality precludes them from being considered limited. Important, but not limited, habitats are, by definition, considered Habitat Category 4.

##### ***Category 4 Grassland***

There are two subtypes of Category 4 grassland in the site boundary: Exotic Annual Grassland and Native Perennial Grassland. Both are bordered by Interstate 84 to the north and agricultural crop circles to the south and have been periodically grazed.

Category 4 Exotic Annual Grassland includes nonnative grasslands with a very high weed component (e.g., cheatgrass [*Bromus tectorum*] and bulbous bluegrass [*Poa bulbosa*]) and disturbed or less nutrient-rich soils. The forb component is composed primarily of nonnative weeds such as Russian thistle (*Salsola* spp.), with occasional patches of native bunchgrass (e.g., bluebunch wheatgrass [*Pseudoroegneria spicata*]) and native forb species (e.g., northern buckwheat [*Eriogonum compositum*], arrowleaf balsamorhiza [*Balsamorhiza sagittata*]). The high weed content is primarily the result of past fires, which burned native shrubs and bunchgrasses and were followed by heavy grazing and wind erosion.

Category 4 Exotic Annual Grassland provides important habitat to common species like horned lark (*Eremophila alpestris*), but the dense weed cover and lack of native grasses limit the ability of most wildlife species to use these areas for forage or cover. With sufficient time and different livestock grazing practices, however, these areas could evolve to provide habitat for some native wildlife species (e.g., grasshopper sparrow [*Ammodramus savannarum*]).

Category 4 Native Perennial Grassland occurs in small patches within the site boundary. Category 4 Native Perennial Grassland is ecologically similar to Category 3 Native Perennial Grassland but is classified as Category 4 when found in small, isolated patches which limit its value to wildlife. Native Perennial Grasslands provide important foraging habitat to a variety of common resident and migratory birds and common mammals. White-tailed jackrabbit (*Lepus townsendii*), burrowing owl (*Athene cunicularia*), and grasshopper sparrow typically use this habitat.

Grasslands are an ODFW conservation strategy habitat in this ecoregion, Columbia Plateau, and five others in Oregon (ODFW, 2016a). Native grasslands are disappearing rapidly in Oregon, primarily due to grazing, invasive plant species, and conversion to agriculture. Conservation approaches include maintaining open grassland structures by using tools such as prescribed burns, controlled grazing, and minimizing spread of cheatgrass and other invasive species. If there are high priority grassland patches, ODFW recommends maintaining these patches and improving connectivity between similar habitat types (ODFW, 2016a).

#### **Category 4 Shrub-steppe**

There is one subtype of Category 4 shrub-steppe within the site boundary: Rabbitbrush/ Snakeweed Shrub-steppe. This habitat is also bordered by Interstate 84 to the north and agricultural crop circles to the south. This habitat subtype is dominated by gray rabbitbrush (*Ericameria nauseosa*) and snakeweed (*Gutierrezia sarothrae*), with small isolated areas of big sagebrush (*Artemisia tridentata*) also present. However, the big sagebrush was not prevalent or contiguous throughout the site boundary and the understory was dominated by cheatgrass. Both the fragmentation of the big sagebrush and the dominance of cheatgrass in the understory resulted in the shrub-steppe habitat being classified as Category 4 rather than Category 3. Category 4 shrub-steppe provides foraging and nesting habitat for Brewer's sparrows (*Spizella breweri*) and white-tailed jackrabbits, as well as common horned larks and western meadowlarks.

## **P.5 HABITAT LOCATIONS**

**OAR 345-021-0010(1)(p)(C)** A map showing the locations of the habitat identified in (B).

**Response:** Figure P-1 is a map showing the habitat locations within the site boundary.

## **P.6 IDENTIFICATION OF SENSITIVE SPECIES AND SITE-SPECIFIC ODFW ISSUES**

**OAR 345-021-0010(1)(p)(D)** *Based on consultation with the Oregon Department of Fish and Wildlife and appropriate field study and literature review, identification of all State Sensitive Species that might be present in the analysis area and a discussion of any site-specific issues of concern to ODFW.*

**OAR 345-021-0010(1)(p)(E)** *A baseline survey of the use of the habitat in the analysis area by species identified in (D) performed according to a protocol approved by the Department and ODFW.*

### **P.6.1 Identification of State Sensitive and Other Nonlisted Special-status Species**

Based on current literature review, the spring 2016 field visit, the fall 2016 habitat categorization effort, the spring 2017 raptor nest and sensitive species surveys and consultation with ODFW, there is suitable habitat in the analysis area for 19 state sensitive and 2 other nonlisted special-status species (see Table P-1).

### **P.6.2 Baseline Survey**

A baseline survey of the use of habitat in the analysis area by sensitive and other special-status species has been completed according to a protocol approved by ODFW (Attachment P-4) and the report is included here as Attachment P-9. This survey protocol includes the information review described in Section P.3.1 and field visit described in Section P.3.2.6. In addition to habitat categorization and wetland delineation described elsewhere, the following survey components have been completed.

#### ***Raptor Nest Survey***

Ten nests were detected within the nest study area during the first survey conducted on April 6, 2017. These included three occupied/active red-tailed hawk nests, one occupied/active common raven (*Corvus corax*) nest, and six unoccupied/inactive raptor stick nests of unknown species. The three occupied/active red-tailed hawk nests and one occupied/active common raven nest were located outside the Facility boundary, but within the nest study area. One of the six raptor unoccupied/inactive stick nests of unknown species was located within the Facility boundary, while the remaining five unoccupied/inactive nests were located outside the Facility boundary, but within the nest study area.

During the second survey conducted on May 13, 2017, nine of the 10 nests were the same status as recorded on April 6, except for one of the red-tailed hawk nests, which was found to be no longer active (i.e., a failed nest attempt) and was recorded as occupied/inactive. No new nests were identified.

No eagle nests or nests of federally or state-listed threatened, endangered or sensitive raptor species were observed during the surveys, and none of the nests found appeared to be previously used by eagles, based on their size and structure.

Further details are provided in the Raptor Nest Report found in Attachment P-8.

#### ***Sensitive Species Survey***

Three sensitive species were recorded during the spring 2017 surveys, including three observations of peregrine falcons (three individuals), 29 groups of long-billed curlews (40

individuals), and three observations of grasshopper sparrows (three individuals). Species totals may reflect repeated observations of the same individuals. Grasshopper sparrows and long-billed curlews were observed within both the Facility boundary and the sensitive species study area; peregrine falcons were observed only in the sensitive species study area, but not within the Facility boundary. All three of these bird species are considered Oregon sensitive-vulnerable species.

Suspected burrows of the Washington ground squirrel were recorded outside of the Facility boundary at the edge of the sensitive species study area. However, no activity or other signs of Washington ground squirrels were observed at or near these burrows during sensitive species surveys nor when checked on April 11, 2016 after conducting fixed-point avian use surveys. These burrows were determined to be from Ord's kangaroo rats (*Dipodomys ordii*) based upon the presence of kangaroo rat droppings found during the second round of sensitive species surveys.

No sensitive plant species were recorded.

Further details are provided in the Sensitive Species Report found in Attachment P-9.

## **P.7 DESCRIPTION OF SIGNIFICANT POTENTIAL DISTURBANCES**

**OAR 345-021-0010(1)(p)(F)** *A description of the nature, extent and duration of potential adverse impacts on the habitat identified in (B) and species identified in (D) that could result from construction, operation and retirement of the proposed facility.*

**Response:** Potential impacts on habitat and sensitive species are described below.

### **P.7.1 Potential Habitat Impacts**

No potential adverse impacts on Habitat Category 2 are expected because this habitat will be completely avoided by the Facility.

Potential impacts on Habitat Category 4 wildlife habitat from construction and operation of the Facility include temporary and permanent habitat loss and disturbance. This section focuses on habitat loss and Section P.7.2 discusses habitat loss/alteration and disturbance.

Approximately 486 acres of Habitat Category 4 will be permanently removed to make way for permanent Facility major components (i.e., module blocks) and related facilities (i.e., collection system, substation, transmission line, line tap, control house, O&M building, access road, service roads. This will result in a loss of habitat until retirement and reclamation of the Facility, when these acres will be restored.

Approximately 59 additional acres of Habitat Category 4 will be cleared for temporary construction areas along the transmission line and in the temporary staging and grading areas. This impact will result in a temporary loss of habitat during construction that will be restored following construction as part of the *Revegetation and Noxious Weed Control Plan* (Attachment P-6).

### **P.7.2 Potential Wildlife Impacts**

Potential impacts are discussed below for the 19 state sensitive species and 2 other nonlisted special-status species. In summary, existing science regarding wildlife impacts from solar energy facilities is fairly limited but suggests that impacts are primarily indirect and are from

disturbance during construction and habitat loss/alteration during construction and operations. Although limited information is currently available, few carcasses that have evidence of collision have been found during post-construction monitoring surveys at photovoltaic solar energy facilities, particularly when compared to fatality rates at reference areas (WEST, 2014). During the few comprehensive fatality studies at photovoltaic facilities to date, fatality rates are not high in relation to other anthropogenic mortality sources (e.g., wind projects; WEST, unpub. data). This exhibit focuses primarily on potential indirect impacts that may result from construction and operations. Risk of potential indirect and direct impacts will be avoided and minimized as described in Section P.8.

#### **P.7.2.1 Potential Impacts on Mammals**

**Bats.** Up to 10 special-status bat species have the potential to use the area (see Table P-1), particularly for foraging habitat in and around the wetlands, however, there is no suitable roosting habitat (e.g., large trees, large cliffs, buildings) in the analysis area. Foraging habitat associated with the water sources within the Facility site boundary will not be adversely impacted, and because construction and retirement activities generally occur during daylight hours when bats are generally absent, the construction and retirement of the Facility is not anticipated to disturb bat foraging activity within the Facility site boundary.

Because the Facility will not be built in foraging habitat, the operation of the Facility is not anticipated to result in the loss or degradation of bat foraging habitat within the Facility site boundary. In addition, no direct impacts are anticipated; the trackers only move during daylight hours and are therefore not expected to be collision risks for bats.

**White-tailed Jackrabbit.** White-tailed jackrabbit, an Oregon sensitive-vulnerable species, may be present in the Facility site boundary, in which case it could be indirectly impacted due to habitat loss/alteration. However, jackrabbits are unlikely to be directly impacted by Facility operations because this species is typically found in high-quality native grassland habitat, which is not present in the analysis area. If present onsite, white-tailed jackrabbits will most likely be transient visitors. Therefore, it is unlikely that the Facility will have any significant impact on this species.

#### **P.7.2.2 Potential Impacts on Birds**

The analysis area is located within the Pacific Flyway (Flyways.us 2016), which is used by migrating waterfowl, waterbirds, shorebirds, songbirds, and raptors. Of these bird types, waterfowl have the greatest potential to migrate through the Facility area because of the wetlands in the analysis area, as well as the proximity of the Columbia River and associated emergent wetlands located north of the analysis area. Other species that could use the Facility area include common ground-nesting birds such as savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), and horned lark (*Eremophila alpestris*). Topographic features such as ridges or mountains that could attract various other migratory birds (Liguori, 2005) are not present in the analysis area.

Construction of the Facility may result in some temporary and permanent habitat loss and alteration. Temporary disturbance to nesting birds could occur if construction occurs during the sensitive breeding season. Permanent habitat loss may permanently displace vulnerable species from the impacted areas. However, given that most of the habitat in the site boundary is degraded, and the abundance of this habitat type in the vicinity, birds using the site could be expected to relocate to other comparable habitat in the general Facility vicinity.

## Passerines

Three state sensitive passerine species may occur in the analysis area, but there were no records of them within a 5-mile area from the ORBIC query (ORBIC, 2016a). Two of these species, loggerhead shrike and sagebrush sparrow, are covered by the Multi-Species Candidate Conservation Agreement with Assurances (MSCCAA) between Threemile Canyon Farms, The Nature Conservancy, Portland General Electric Company, ODFW, and USFWS (David Evans and Associates, 2004). The MSCCAA established the Boardman Conservation Area in 2004 to provide conservation protections for these and two other species (David Evans and Associates, 2004). Although this solar Facility is proposed within the “Covered Area” boundary of the MSCCAA, it will be located in an area classified as Undeveloped Portions of the Farm and outside the designated Conservation Areas in the MSCCAA. Threemile Canyon Farms LLC has a memorandum of understanding (MOU) with ODFW for voluntary conservation measures (David Evans and Associates, 2004), and the measures to avoid, minimize, and mitigate disturbances from this Facility described in Section P.8 complement the MOU measures.

Additional details regarding the three state sensitive passerine species with potential to occur in the analysis area are provided below.

***Grasshopper sparrow.*** Grasshopper sparrow, an Oregon sensitive-vulnerable species, nests in clumps of grasses at or near ground level (Cornell Lab of Ornithology, 2016a). In Oregon, suitable breeding habitat can be found throughout the Columbia Plateau and in the Willamette Valley (eBird, 2016a). Habitat loss, fragmentation, and degradation are believed to be factors in the decline of this species (Vickery, 1996). This species may occur within or near the analysis area during the breeding season, and has been recorded on the five Breeding Bird Survey (BBS) Routes located nearest to the Facility (Pardieck et al., 2015) as well as during surveys at the Willow Creek Wind Project (BPA, 2008) and three were recorded during the spring 2017 sensitive species survey (see Section P.6.2). If present, grasshopper sparrows may be permanently displaced from areas where grassland habitat is lost or degraded due to construction of the Facility.

***Loggerhead shrike.*** Loggerhead shrike, an Oregon sensitive-vulnerable species, is a year-round resident of Oregon. This species prefers grasslands, pastures, shrublands, and other open areas where they nest in thick brush, shrubs, or small trees (Yosef, 1996). The diet of the loggerhead shrike is composed of insects, small mammals, birds, and reptiles (Yosef, 1996). This species has been recorded on the Bickleton, Mercer, and Montague BBS Routes located near the Facility (Pardieck et al., 2015), within the MSCCAA Conservation Area (David Evans and Associates, 2004), and during avian use and special-status wildlife surveys for the Horn Butte Wind Power Project (NWC, 2010). However, no suitable loggerhead shrike habitat was identified within the Project area during the MSCCAA assessment (David Evans and Associates, 2004), and, based on the site-specific habitat mapping described in Section P.4, suitable habitat for this species is very limited within the analysis area. If present, nesting loggerhead shrikes may be permanently displaced from areas where shrub/scrub habitat is lost or degraded due to construction of the Facility. Foraging activity for this species may also be impacted by loss of grassland habitat resulting from construction of the Facility.

***Sagebrush sparrow.*** Sagebrush sparrow, an Oregon sensitive-critical species, prefers shrubland, grassland, and desert habitats in the western U.S. during the breeding season (Hansley and Beauvais, 2004). This species needs extensive sagebrush shrub habitat to support breeding populations and, although small tracts of shrub habitat are present, suitable nesting areas within the analysis area is limited. This species has been recorded on the Bickleton and Mercer

BBS Routes located near the Facility (Pardieck et al., 2015) and within the MSCCAA Conservation Area (David Evans and Associates, 2004). However, no suitable sagebrush sparrow habitat was identified within the analysis area during the MSCCAA assessment (David Evans and Associates, 2004), and suitable habitat for this species is very limited within the analysis area. If present, sagebrush sparrows may be permanently displaced from areas where shrub/scrub habitat is lost or degraded due to construction of the Facility.

### **Raptors**

Raptor nesting could occur in trees along ephemeral drainages (e.g., Threemile Canyon), wetlands, and grasslands in the analysis area and in streams nearby (e.g., Columbia River, Willow Creek). Nesting could also occur on manmade structures, such as the existing Portland General Electric transmission line power poles. If present, nesting raptor species may be temporarily impacted by construction activities during the breeding season, and permanently impacted by the loss of nesting substrate (e.g., trees, grassland) or foraging habitat near nest locations. However, based on the limited suitable nesting habitat within the analysis area, it is unlikely there are high densities of nesting raptors.

During migration, raptors could rest and forage in the analysis area, depending on weather and prey availability. Several factors influence the migratory patterns of raptors, the most significant of which is geography (Liguori, 2005). Two geographical features are primarily used by raptors during migration: ridgelines and the shorelines of large bodies of water (Liguori, 2005). Updrafts formed as wind hits ridges and thermals created over land, not water, make for energy-efficient travel for raptors over long distances (Liguori, 2005). It is for this reason that raptors tend to follow prominent ridges with defined edges during migration. The analysis area is generally flat topography that lacks defined topographical ridges or other defined features typically used by migrating raptors. Raptor species are more likely to travel along north-south orientated large water bodies during migration (Liguori, 2005) as well. The Columbia River lies north of the Facility in an east-west direction and is not likely to have substantial raptor migration along it.

Raptor foraging is influenced by prey availability. Small- and medium-sized mammals comprise the primary prey base for many raptor species, although small- and medium-sized birds, reptiles, and insects also make up the diet for several raptor species. Rodents may be most concentrated along roads (Preston, 1990; Rosenzweig, 1989), while passerines and insects likely occur in most of the analysis area. Reptiles most typically occur in exposed rocky habitats and on paved roadsides. Waterfowl and waterbirds, also potential prey for large raptors, will mostly likely be attracted to the perennial and ephemeral water sources in and near the analysis area. Although foraging raptors may be permanently displaced from the Facility site, similar habitats are abundant throughout the immediate vicinity and the loss of small areas of degraded habitat is not anticipated to be significant.

None of the sensitive or nonlisted special-status raptor species with potential to be impacted were observed during the 2017 spring raptor nest survey. However, as part of the avoidance and minimization measures, the Applicant will contract with a qualified biologist to flag and monitor any such raptor nests that may be observed in subsequent surveys, as further described in Section P.8.2.

Additional details regarding the four state sensitive raptor species and two other nonlisted special-status species with potential to be impacted within the 0.5-mile analysis area are provided below.



***Ferruginous Hawk.*** Ferruginous hawk, an Oregon sensitive-critical species, is a summer resident in the lowland desert terrain of Oregon that typically nests at the edge of pinyon-juniper (*Pinus* spp.-*Juniperus* spp.) and shrub-steppe habitats. However, they can be found in any arid and semi-arid grassland region (Bechard and Schmutz, 1995). The diet of the ferruginous hawk varies geographically, but mammals generally compose the vast majority of their prey (Cornell Lab of Ornithology, 2016b). This species has been documented along the BBC Montague route near the analysis area (Pardieck et al., 2015), nesting within the far southern portion of the MSCCA area (nearest nest roughly 5.1 miles from the southern tip of the proposed transmission line; David Evans and Associates, 2004), and during surveys for the Willow Creek Wind Project (BPA, 2008) and the Horn Butte Wind Power Project (NWC, 2010). If small mammals are present, particularly jackrabbits, there is potential for ferruginous hawks to forage within the analysis area from late spring through early fall. Permanent loss or degradation of foraging habitat resulting from Facility construction may negatively influence prey availability within the site boundary, potentially causing the permanent displacement of this species from the impacted habitat.

***Peregrine Falcon.*** Peregrine falcon, an Oregon sensitive-vulnerable species, are aerial hunters that breed in a variety of habitats; nests are normally built on cliff edges or on tall human-made structures (White et al., 2002). No suitable nest substrate is present within the analysis area, but the species has the potential to occur as a transient during migratory and wintering periods. One peregrine falcon was observed during avian use surveys at the Horn Butte Wind Power Project (NWC, 2010) and three were recorded during the spring 2017 sensitive species survey (see Section P.6.2). However, no observations of peregrine falcons have been documented along the five BBS routes closest to the Facility area (i.e., Bickleton, Cecil, Montague, Mercer, Umatilla; Pardieck et al., 2015) or during surveys for the Willow Creek Wind Project (BPA, 2008). If present, peregrine falcons will likely be migrating through the area or hunting along the Columbia River and other major waterways in the region, and no indirect impacts are anticipated for this species.

***Swainson's Hawk.*** Swainson's hawk, an Oregon sensitive-vulnerable species, spends the breeding season in grassland, shrub, and agricultural areas where scattered trees offer nesting opportunities (Cornell Lab of Ornithology, 2016c). Small mammals (e.g., mice, voles) make up the bulk of their diet during the breeding season. This species has been documented along the BBS Montague route near the analysis area (Pardieck et al., 2015), and nests for this species were found during surveys at both the Willow Creek Wind Project (BPA, 2008) and Horn Butte Wind Power Project (NWC, 2010). If present, nesting Swainson's hawks may be temporarily impacted by construction activities during the breeding season, and permanently impacted by the loss of nesting substrate. Permanent loss or degradation of foraging habitat resulting from Facility construction may negatively influence prey availability within the site boundary, potentially causing the permanent displacement of Swainson's hawks from the impacted habitat.

***Western Burrowing Owl.*** Burrowing owl, an Oregon sensitive-critical species, can be found in open grassland and shrub habitats throughout eastern Oregon (ODFW, 2016). They nest in earthen burrows excavated by other species, such as American badgers (*Taxidea taxus*) or ground squirrels. Soil depths and stability within the analysis area are generally unsuitable for nest burrows; however, small areas with suitable soils and foraging habitat may be present. Burrowing owl have been documented along the Bickleton, Mercer, Montague, and Umatilla BBS routes near the site boundary (Pardieck et al., 2015), and during surveys at the Willow Creek Wind Project (BPA, 2008). This species may be indirectly impacted due to habitat loss resulting from construction of the Facility, but does appear to be somewhat tolerant of

nondestructive disturbance as nests are often located in highly disturbed areas (Poulin et al., 2011).

**Bald Eagle.** Bald eagles, protected by the BGEPA, are known to occur along the Columbia River, located approximately 0.5 mile north of the site boundary (eBird, 2016a). The Facility site boundary is also located 0.5 mile east of Willow Creek, which may attract bald eagles. However, no observations of bald eagles have been documented along the five Breeding Bird Survey (BBS) routes closest to the site boundary (Pardieck et al., 2015), and there were no records within a 5-mile area from the ORBIC database query (ORBIC, 2016a).

Bald eagles typically nest in forested areas or mature trees adjacent (within 1.2 miles) to waterbodies large enough to provide foraging opportunities (Buehler, 2000). No suitable nest substrate for bald eagles is located within the Facility site boundary; however, there is potential for bald eagles to nest within 5 miles and to forage along Willow Creek, the Columbia River or Carty Reservoir. Therefore, the species may fly over the Facility year-round but is not expected to be impacted.

**Golden Eagle.** Golden eagles, protected by the BGEPA, are year-round residents of Oregon and Washington (Kochert et al., 2002) and there are at least 30 known golden eagle territories in Morrow and Gilliam counties (Issacs, 2015). However, no suitable nest substrate for golden eagles is located within the site boundary. The nearest known golden eagle nest is 3.7 miles to the south of the Facility site boundary (Figure 7 in Attachment P-2); at least one adult golden eagle was occupying the territory associated with this nest in 2015 (Oregon Eagle Foundation, 2015).

Golden eagles' prey species, including ground squirrels (Goetzman, 2014), rabbits, and other small and medium-sized prey (Kochert et al., 2002), may use shrub-steppe and grasslands within the site boundary. No observations of golden eagles have been documented along the five BBS routes closest to the site boundary (Pardieck et al., 2015). However, incidental observations of golden eagles have been reported in Morrow and Gilliam counties as reported by eBird (eBird, 2016b). This species was recorded during avian use surveys and nesting within the boundary of the Horn Butte Wind Power Project (NWC, 2010). In summary, golden eagle use within the Facility area is likely low, but could occur during any part of the year.

Permanent disturbances to golden eagles may include loss of foraging habitat. The new transmission line will be built consistent with the Avian Power Line Interaction Committee (APLIC) guidelines, and thus no direct impacts are anticipated from the line. Increased noise and human presence could temporarily deter foraging eagles from using adjacent habitat during construction. Although foraging golden eagles could be permanently displaced from the Facility site, similar habitats are abundant throughout the immediate vicinity and the loss of this habitat is not considered significant.

### **Shorebirds**

**Long-billed curlew.** Long-billed curlew, an Oregon sensitive-vulnerable species, breeds in the grasslands and agricultural fields of the Great Basin and Great Plains and they migrate in the winter to the coasts or south to Mexico (Cornell Lab of Ornithology, 2016d). Long-billed curlews have been documented along all five BBS routes nearest to the analysis area (Pardieck et al., 2015). They were also observed during surveys at the Horn Butte Wind Power Project (NWC 2010), and nesting within the Willow Creek Wind Project (BPA, 2008). The Facility is approximately one mile east of the nearest parcel of the U.S. Department of Interior, Bureau of

Land Management (BLM) Horn Butte Area of Critical Environmental Concern (Horn Butte Curlew ACEC) established for nesting long-billed curlews (see Figure T-1 in Exhibit T). The Horn Butte Curlew ACEC is approximately 6,000 acres in area, contains curlew nesting habitat (some of which is being restored or enhanced), and is located 5 miles east of Arlington (BLM, 1986). Twenty-nine groups of long-billed curlews were recorded during the spring 2017 sensitive species survey. Long-billed curlews will likely be impacted by human activity and habitat loss resulting from construction of the Facility, but there is similar suitable habitat nearby that can be utilized by long-billed curlews.

### P.7.2.3 Potential Impacts on Reptiles

**Northern Sagebrush Lizard.** Northern sagebrush lizard, an Oregon sensitive-vulnerable species, is found in sagebrush and other types of shrublands throughout Great Basin deserts (California Herps, 2016). They typically occur in scattered low bushes with lots of sun, and are active from spring through fall (California Herps, 2016). This species was observed during surveys for the Willow Creek Wind Project (BPA, 2008) and Horn Butte Wind Power Project (NWC, 2010). Limited suitable habitat is present within the analysis area, and none have been observed during field surveys.

If present, individuals of this species may be directly or indirectly impacted by construction and operation of the Facility. However, due the limited habitat available, the potential losses of individuals and their habitat resulting from the Facility are not anticipated to have population-level effects on this species.

## P.8 MEASURES TO AVOID, MINIMIZE, OR MITIGATE DISTURBANCES

**OAR 345-021-0010(1)(p)(G)** *A description of any measures proposed by the applicant to avoid, reduce, or mitigate the potential adverse impacts described in (F) in accordance with the ODFW mitigation goals described in OAR 635-415-0025 and a discussion of how the proposed measures would achieve those goals.*

**Response:** In coordination with ODFW and the landowner, the Applicant has implemented or will implement measures to avoid or reduce adverse impacts for nonlisted special-status wildlife and habitat. These are in addition to the measures for threatened and endangered species described in Exhibit Q, Section Q.4.

### P.8.1 Avoidance Measures

As the Applicant has gathered additional information about the analysis area and its habitat and environmental attributes, the following adjustments to the Facility layout have been made:

- Wetlands—Major components and related facilities have been specifically aligned to avoid (Category 2) wetlands, as described in Exhibit J.
- Habitat—The Facility was intentionally sited on Category 4 disturbed grassland and shrub-steppe habitat to avoid higher-quality (Category 2) habitat.
- Roads—During construction and operation, vehicles and construction equipment will use existing roads to the maximum extent possible.
- Transmission line—The proposed transmission line will be constructed consistent with the recommendations of the APLIC guidelines for raptor protection on power lines (including minimum conductor spacing and the use of antiperch guards) and will also be constructed

and operated in a way that avoids impacts on any occupied or potentially suitable Washington ground squirrel habitat.

### **P.8.2 Minimization Measures**

The Applicant will work to minimize (reduce) the impact of construction on the environment by employing the following methods to ensure compliance with federal, state, and local regulations and industry best practices:

- Seasonal Avoidance—construction activities will not occur within proximity of occupied raptor nests as follows:
  - Ferruginous hawk: ¼ mile (between March 15–August 15)
  - Swainson’s hawk: ¼ mile (between April 1–August 15)
  - Western burrowing owl: ¼ mile (between April 1–August 15)
  - Golden eagle: ½ mile (between January 1–July 15)
  - Bald eagle: ½ mile (between January 1–August 31)
- Environmental Training—A qualified biologist will develop and implement an environmental training course for site workers, which will require reporting any injured or dead wildlife on the site, adherence to site speed limits, trash control, and other subjects.
- Exclusion Flagging—A qualified biologist will mark wetlands and streams near the site boundary, and approved buffers around any occupied Washington ground squirrel colonies and raptor nests.
- Clearing limits—Construction boundaries will be identified and visibly marked before construction activities take place. These boundaries are deliberately constrained as much as reasonably possible, and any activity or traffic outside these limits must be deemed necessary and approved by the Applicant or its construction contractor. During design and construction, contractor shall not remove existing trees and vegetation beyond approved construction corridors.
- Vegetation Clearing—Tree or native vegetation clearing, if any, will occur between September 1 and March 1 to the greatest extent feasible to avoid impacts on wildlife. Any tree or native vegetation clearing outside of this period will be conducted only following a biological survey, performed no more than 7 days prior to clearing of the area to be cleared to ensure that no birds or bats are roosting in the area to be cleared. If birds are discovered, no clearing will occur until the birds have left the nest for the season. If a bat roost is discovered, ODFW will be contacted for guidance.
- Best management practices (BMPs)—The Applicant will develop an erosion and sediment control plan in accordance with the Facility’s 1200-C Construction Stormwater National Pollutant Discharge Elimination System (NPDES) Permit. The Applicant and its construction contractors will use best management practices to reduce potential impacts on areas immediately surrounding the construction site. Straw wattles, silt fence, rock check dams, or ditching will be installed to control erosion and avoid contamination of discharged stormwater. Water will be sprayed in high-traffic areas to prevent fugitive dust from blowing offsite. The Facility Field Contact Representative and biological monitor will conduct periodic inspections of BMPs to ensure all measures are maintained and in compliance with the NPDES permit. Dust control measures will be deployed throughout the Facility where construction is active.

- **Hazardous material containment**—Any hazardous materials generated by construction will be collected and disposed of properly. Concrete trucks will be required to wash out in designated plastic lined collection pits to prevent alkaline runoff. Equipment maintenance and fueling will be performed over drip pans and equipment is inspected for leaks regularly. Waste oil and contaminated earth from minor spills or drips will be collected for disposal. Spills will be reported in accordance with the NPDES permit requirements.
- **Restoration**—A period of restoration occurs at the conclusion of every Invenergy project. The restoration will include clearing any remaining debris from construction and installing any water dispersion pads required to ensure proper stormwater flow. Any remaining disturbed ground will be prepared and sown with an appropriate native seed mix in accordance with the *Revegetation and Noxious Weed Control Plan* to ensure rapid growth and erosion prevention.
- **Noxious weeds** – Weeds will be controlled using both mechanical and chemical methods in all surface-disturbed areas in accordance with the *Revegetation and Noxious Weed Control Plan*. All herbicide and pesticide mixing and applications will be conducted in accordance with all federal, state, and local laws and regulations and the specific product's label. Herbicide and pesticide application will be directly applied to a localized spot and will not be applied by broadcasting techniques.
- **Lighting during Operation and Construction**—Motion detectors or timers and hoods that minimize skyward light will be installed on exterior lights on the O&M building, collector station, and substation. Construction will be directed to extinguish nighttime exterior lights at the O&M building, substation, and any temporary construction work site, equipment and laydown yard, if any, when not in use.
- **Traffic**—All personnel will be required to adhere to a reduced speed limit of 20 mph while driving in the Facility area and will be required to adhere to posted speed limits on public roads. If there are no posted speed limits, contractor will operate vehicles in a manner consistent with typical public traffic on public roads. Travel will be restricted to designated roads where possible; no off-road travel will be allowed except in case of emergency. In addition, all construction personnel will be instructed to observe caution when driving through the Facility area and to maintain reasonable driving speeds so as not to harass or accidentally strike wildlife. Speed limits will be posted throughout the Facility construction area.
- **Housekeeping**—Trenches will not be left open overnight, but will be filled or covered in a way that prevents animals from entering. If trenches cannot be fully covered, a wildlife escape ramp, such as a 2-by-4, will be installed to ensure no wildlife are trapped in the excavation. No burning or burying of waste materials will occur at the Facility site. The contractor will be responsible for the removal of all waste materials from the construction area. All contaminated soil and construction debris will be disposed of in approved landfills in accordance with appropriate environmental regulations. Garbage will be disposed of in appropriate covered waste bins. Contractor and Invenergy personnel will use good-housekeeping practices to remove any waste.

### **P.8.3 Mitigation Measures**

For the impacts that cannot be avoided or minimized, mitigation will be developed by means of reliable methods and in compliance with ODFW habitat mitigation rules. The Applicant has developed a Habitat Mitigation Plan in consultation with ODFW. The mitigation plan identifies actions that contribute to enhanced habitat quality near the site boundary (see Attachment P-5). ODFW instructed in a letter to ODOE on February 22, 2017 that the mitigation should be in-

kind or out-of-kind, in-proximity or off-proximity, in order to achieve no net loss in either pre-development habitat quantity or quality. The Applicant is currently evaluating a conservation easement with a third party on a parcel equivalent to Category 4 habitat or higher that supports similar species as those that may be impacted by the Facility. The terms of the easement will include a binding obligation on the part of the third party to maintain the quality of the habitat for the life of the Facility. The proposed location of the conservation easement has been agreed to by ODFW and ODOE as part of the habitat mitigation plan.

## P.9 MONITORING PLAN

(H) A description of the applicant's proposed monitoring plans to evaluate the success of the measures described in (G).

**Response:** The Applicant will work with ODFW to develop a monitoring plan to evaluate the success of mitigation measures to address impacts on special-status and other species.

A Wildlife Monitoring and Adaptive Management Plan (WMAMP) has been developed in coordination with ODFW and is included here as Attachment P-7. The WMAMP will be implemented for the operational phase of the Facility to evaluate impacts of the Facility on wildlife and habitat. Aspects and objectives of the WMAMP will include avian and bat standardized casualty searches, training of Facility personnel on emergency response procedures for discovered injured animals, tracking and reporting of incidental finds (whether reported by Facility employees or qualified biologists), searcher efficiency trials, and carcass removal trials. Post-construction monitoring of any occupied Washington ground squirrel habitat will also be conducted.

## P.10 REFERENCES

- Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 *United States Code* (U.S.C.) § 668-668d. Bald Eagle Protection Act of 1940, June 8, 1940, Chapter 278, Section (§) 2, 54 Statute (Stat.) 251; Expanded to include the related species of the golden eagle October 24, 1962, Public Law (PL) 87-884, 76 Stat. 1246. As amended: October 23, 1972, PL 92-535, § 2, 86 Stat. 1065; November 8, 1978, PL 95-616, § 9, 92 Stat. 3114.
- Bechard, M.J. and J.K. Schmutz. 1995. "Ferruginous Hawk (*Buteo regalis*).". A. Poole, ed. *The Birds of North America Online*. Cornell Lab of Ornithology. Ithaca, New York. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/172>.
- Bonneville Power Administration (BPA). 2008. *Record of Decision for the Electrical Interconnection of the Willow Creek Wind Project*. [https://www.bpa.gov/news/pubs/PastRecordsofDecision/2008/Willow\\_Creek\\_Wind\\_ROD.pdf](https://www.bpa.gov/news/pubs/PastRecordsofDecision/2008/Willow_Creek_Wind_ROD.pdf).
- Buehler, D.A. 2000. "Bald Eagle (*Haliaeetus leucocephalus*).". A. Poole, ed. *The Birds of North America Online*. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/506>.
- Bureau of Land Management (BLM). 1986. Two Rivers Resource Management Plan. Record of Decision, Rangeland Program Summary (RPS). Prineville District Office, BLM, U.S. Department of the Interior. June 6, 1986. [https://www.blm.gov/or/districts/prineville/plans/files/pdo\\_tworivers\\_06\\_1986.pdf](https://www.blm.gov/or/districts/prineville/plans/files/pdo_tworivers_06_1986.pdf).

- California Herps. 2016. *Sclerophorus graciosus* - Northern Sagebrush Lizard. Accessed November 2016. <http://www.californiaherps.com/lizards/pages/s.g.graciosus.html>.
- Cornell Lab of Ornithology. 2016a. *All About Birds Guide: Grasshopper Sparrow*. Accessed December 13, 2016. [https://www.allaboutbirds.org/guide/Grasshopper\\_Sparrow/id](https://www.allaboutbirds.org/guide/Grasshopper_Sparrow/id).
- Cornell Lab of Ornithology. 2016b. *All About Birds Guide: Ferruginous Hawk*. Accessed December 13, 2016. [https://www.allaboutbirds.org/guide/Ferruginous\\_Hawk/id](https://www.allaboutbirds.org/guide/Ferruginous_Hawk/id).
- Cornell Lab of Ornithology. 2016c. *All About Birds Guide: Swainson's Hawk*. Accessed December 13, 2016. [https://www.allaboutbirds.org/guide/Swainsons\\_Hawk/id](https://www.allaboutbirds.org/guide/Swainsons_Hawk/id).
- Cornell Lab of Ornithology. 2016d. *All About Birds Guide: Long-billed Curlew*. Accessed December 13, 2016. [https://www.allaboutbirds.org/guide/Long-billed\\_Curlew/id](https://www.allaboutbirds.org/guide/Long-billed_Curlew/id).
- David Evans and Associates. 2004. *Multi-Species Candidate Conservation Agreement with Assurances*. Signatories include Threemile Canyon Farms, The Nature Conservancy, Portland General Electric Company, USFWS, ODFW.
- Dugger, B.D., and K.M. Dugger. 2002. "Long-billed Curlew (*Numenius americanus*).” In *The Birds of North America*. No. 628. A. Poole and F. Gill, eds. *The Birds of North America, Inc.* Philadelphia, PA.
- Eastman, D.C. 1990. *Rare and Endangered Plants of Oregon*. Beautiful America Publishing Company. 194 pp.
- eBird. 2016a. *eBird: An online database of bird distribution and abundance* [web application]. eBird, Ithaca, New York. Accessed November 2016. <http://ebird.org>.
- eBird. 2016b. Golden Eagle Sightings in Oregon. *eBird: An online database of bird distribution and abundance* [web application]. eBird, Ithaca, New York. Accessed October 2016. <http://ebird.org>.
- ESRI. 2016. *World Street Map and Aerial Photos: World Imagery*. ArcGIS Resource Center. ESRI, producers of ArcGIS software, Redlands, California. Data accessed September and October 2016.
- Goetzman, K. 2014. *Our Golden Eagles*. Minnesota Conservation Volunteer January-February 2014: 8-21.
- Hansley, P. L. and G. P. Beauvais. 2004. "Species Assessment for Sage Sparrow (*Amphispiza belli*) in Wyoming." Prepared for the Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming.
- Harvey, M. J., J. S. Altenbach, and T. L. Best. 1999. *Bats of the United States*. Arkansas Game and Fish Commission and U.S. Fish and Wildlife Service, Arkansas.
- Hitchcock, C. L. and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle and London.
- Homer, C. G., J. A. Dewitz, L. Yang, S. Jin, P. Danielson, G. Xian, J. Coulston, N. D. Herold, J. D. Wickham, and K. Megown. 2015. *Completion of the 2011 National Land Cover Database*

*for the Conterminous United States-Representing a Decade of Land Cover Change Information*. Photogrammetric Engineering and Remote Sensing 81(5): 345-354.  
<http://www.mrlc.gov/nlcd2011.php>.

Isaacs, F. B. 2008. *Results of Peregrine Falcon Breeding Area Monitoring in Oregon, 2003-2007: Final Report*. Oregon Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon.

Isaacs, F. B. 2015. Golden Eagles (*Aquila chrysaetos*) Nesting in Oregon, 2011-2014: Final Annual Report. Oregon Eagle Foundation, Inc., Klamath Falls, Oregon. February 10.

Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. "Golden Eagle (*Aquila chrysaetos*).” A. Poole, ed. *The Birds of North America Online*. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/684>; doi: 10.2173/bna.684

Liguori, J. 2005. *Hawks from Every Angle: How to Identify Raptors in Flight*. Princeton University Press, Princeton, New Jersey.

Morrow County. 2013. *Morrow County Comprehensive Plan - Review and Revision*. Revision date: October 1, 2013. Comprehensive Plan. <http://morrowcountyoregon.com/planning-department/comprehensive-plan/>. Review and Revision: <http://morrowcountyoregon.com/planning/19.pdf>.

National Audubon Society (Audubon). 2016. *The Important Bird Areas*. Data accessed May 2016. Important Bird Areas by State: <http://www.audubon.org/bird/iba>.

Niehaus, T. F. and C. L. Ripper. 1976. *A Field Guide to Pacific States Wildflowers: Washington, Oregon, California, and Adjacent Areas*. Houghton Mifflin, Boston, Massachusetts.

Northwest Wildlife Consultants, Inc. 2010. *Horn Butte Wind Power Project Biological Study Report*. Prepared for Horn Butte Wind, LLC.

Oregon Biodiversity Information Center (ORBIC). 2016a. Letter from Biodiversity Data Manager Lindsey Wise to WEST, Inc., Carisa Stanbury regarding data system search. November 10.

Oregon Biodiversity Information Center (ORBIC). 2016b. *Rare, Threatened and Endangered Species of Oregon*. Institute for Natural Resources. Portland State University. <http://inr.oregonstate.edu/orbic/rare-species/rare-species-oregon-publications>.

Oregon Department of Agriculture (ODA). 2016. Oregon Listed Plants by County. Plant Conservation, ODA, Salem, Oregon. Accessed October 2016.  
<http://www.oregon.gov/ODA/programs/PlantConservation/Pages/ListedPlants.aspx>.

Oregon Department of Fish and Wildlife (ODFW). 2004. Division 415: Fish and Wildlife Habitat Mitigation Policy. Oregon Administrative Rules (OAR), ODFW. OAR 635-415-0000 to OAR 635-415-0025. November 26, 2004. <http://www.dfw.state.or.us/OARs/415.pdf>.

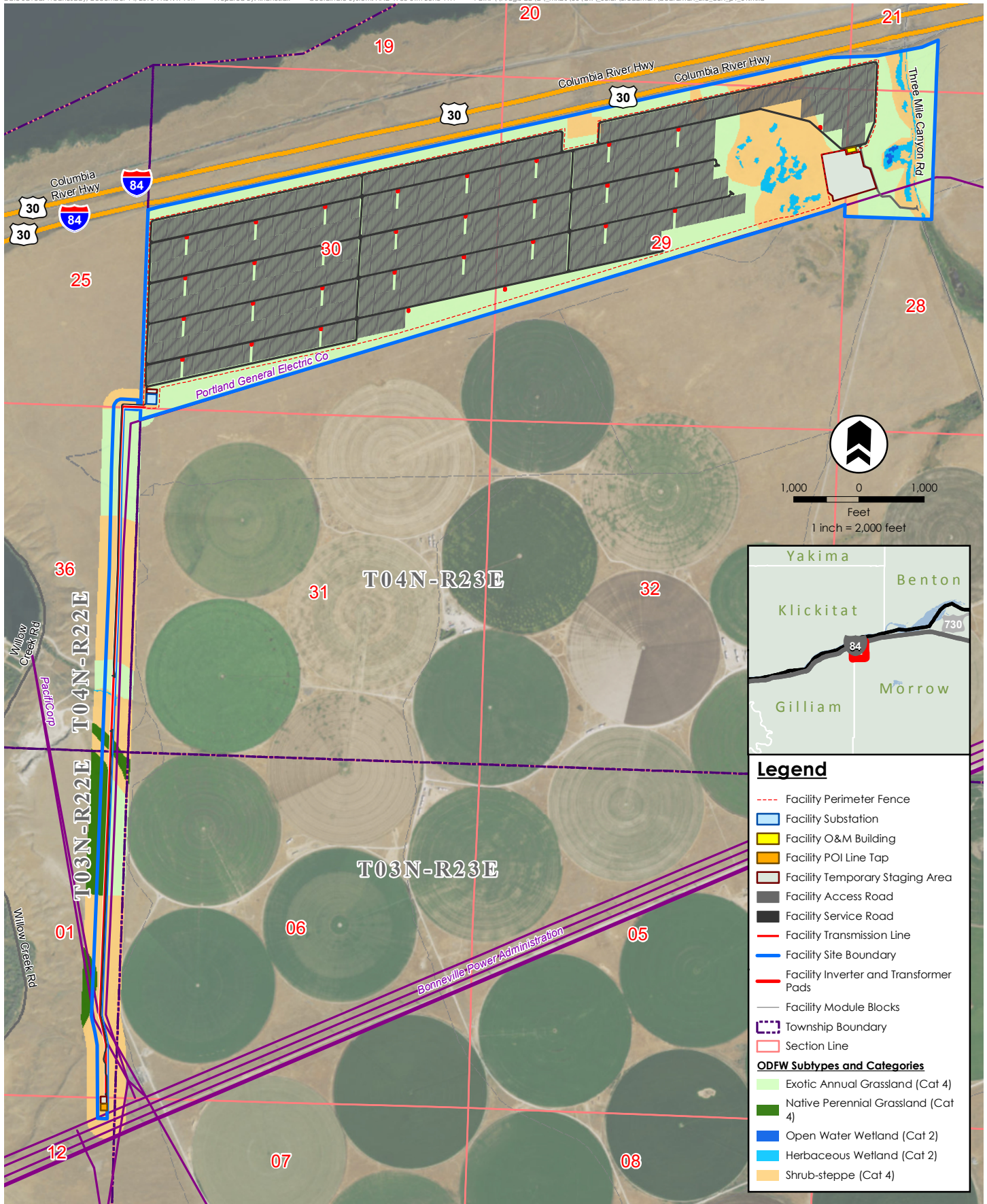
Oregon Department of Fish and Wildlife (ODFW). 2008. *Columbia Basin Wildlife Areas Management Plan*. ODFW, Salem, Oregon. October. [http://www.dfw.state.or.us/wildlife/management\\_plans/wildlife\\_areas/docs/columbia\\_basin.pdf](http://www.dfw.state.or.us/wildlife/management_plans/wildlife_areas/docs/columbia_basin.pdf)



- Oregon Department of Fish and Wildlife (ODFW). 2013. ODFW's data clearinghouse: ODFW winter range for eastern Oregon.  
<http://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&XMLname=885.xml>
- Oregon Department of Fish and Wildlife (ODFW). 2015. *Threatened, Endangered, and Candidate Fish and Wildlife Species*. ODFW, Salem, Oregon. Updated November.  
[http://www.dfw.state.or.us/wildlife/diversity/species/threatened\\_endangered\\_candidate\\_list.asp](http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp)
- Oregon Department of Fish and Wildlife (ODFW). 2016a. *Conservation Strategy Habitat for Grasslands*. ODFW, Salem, Oregon. Accessed December 12, 2016.  
<http://oregonconservationstrategy.org/strategy-habitat/grasslands/>
- Oregon Department of Fish and Wildlife (ODFW). 2016b. *Deer and Elk Winter Range Maps*. Accessed October 19, 2016. <http://www.dfw.state.or.us/maps/>.
- Oregon Eagle Foundation. 2015. *Golden Eagle Survey Locations: 2011 - 2015. Metadata: Point and Vector Object Information for the Lake Harney Wind Project*. 47 pp. Oregon Eagle Foundation, Klamath Falls, Oregon. August.
- Pardieck, K.L., D.J. Ziolkowski, Jr., M.A.R. Hudson, and K. Campbell. 2015. *North American Breeding Bird Survey Dataset 1966 - 2015, Version 2015.0*. U.S. Geological Survey, Patuxent Wildlife Research Center. [www.pwrc.usgs.gov/BBS/RawData/](http://www.pwrc.usgs.gov/BBS/RawData/).
- Poulin, R., L.D. Todd, E. A. Haug, B. A. Millsap and M. S. Martell. 2011. "Burrowing Owl (*Athene cunicularia*).". In *The Birds of North America Online*. No. 061. A. Poole, ed. Cornell Lab of Ornithology, Ithaca, New York.
- Preston, C. R. 1990. "Distribution of Raptor Foraging in Relation to Prey Biomass and Habitat Structure." *Condor* 92: 107-112.
- Rosenzweig, M. L. 1989. "Habitat Selection, Community Organization, and Small Mammal Studies." pp. 5-21. In: *Patterns in the Structure of Mammalian Communities*. D. W. Morris, Z. Abramsky, B. J. Fox, and M. R. Willig, eds. Texas Tech University Press, Lubbock, Texas.
- Sibley, D. 2003. *The Sibley Field Guide to Birds of Western North America*. New York: Alfred A. Knopf.
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2000. Long-billed curlew (*Numenius americanus*). Fish and Wildlife Habitat Management Leaflet. Number 7. January. Accessed December 19, 2016.  
[https://webcache.googleusercontent.com/search?q=cache:NVLvMHjxCNEJ:https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs144p2\\_054095.pdf+&cd=4&hl=en&ct=clnk&gl=us](https://webcache.googleusercontent.com/search?q=cache:NVLvMHjxCNEJ:https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_054095.pdf+&cd=4&hl=en&ct=clnk&gl=us)
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2016. SSURGO Soils Data. Soil Survey Geographic (SSURGO) Database, USDA Soil Survey Staff, NRCS. SSURGO Database for Morrow County and Gilliam County, Oregon. Accessed November 2016. <http://websoilsurvey.nrcs.usda.gov/>.

- U.S. Environmental Protection Agency (USEPA). 2000. *Umatilla and Willow Creek Basin Assessment for Shrub Steppe, Grasslands, and Riparian Wildlife Habitats*. EPA Regional Geographic Initiative: Final Report September.
- U.S. Fish and Wildlife Service (USFWS). 2008. *Birds of Conservation Concern 2008*. December 2008. Division of Migratory Bird Management. Arlington, Virginia.  
<http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf>.
- U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC). 2016. Resources for Project in Gilliam County and Morrow County, Oregon. Initial Project Scoping: IPaC, Environmental Conservation Online System (ECOS), USFWS. Accessed October and November 2016. IPaC: <http://ecos.fws.gov/ipac/>; IPaC Initial Project Scoping: <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action>; Gilliam County-specific resources: <https://ecos.fws.gov/ipac/project/3LDKUN5MJVEODIBEBLYREZ6PXE/overview>; Morrow County-specific resources: <https://ecos.fws.gov/ipac/project/7PWSFNQIXNDG3ASRQO4HVE7FDA/overview>.
- U.S. Geological Survey (USGS). 2001. *North American BBS Methodology Training*. Accessed October 2016. USGS Breeding Bird Surveys (BBS), Patuxent Wildlife Research Center, Laurel, Maryland. Methodology Training: <http://www.pwrc.usgs.gov/BBS/participate/training/>; Description and Methods: <http://www.pwrc.usgs.gov/BBS/participate/training/1.html>.
- U.S. Geological Survey (USGS). 2016. *The National Map/US Topo*. Last updated January 2016. <http://nationalmap.gov/ustopo/index.html>.
- Vickery, P. D. 1996. "Grasshopper Sparrow (*Ammodramus savannarum*).". In *The Birds of North America*. No. 239. A. Poole and F. Gill, eds. The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists Union, Washington, D.C.
- Western EcoSystems Technology, Inc. (WEST). 2014. *Sources of Avian Mortality and Risk Factors Based on Empirical Data from Three Photovoltaic Solar Facilities*. Prepared by WEST, Cheyenne, Wyoming. June 17.
- White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt. 2002. "Peregrine Falcon (*Falco peregrinus*).". A. Poole, ed. *The Birds of North America Online*. Cornell Lab of Ornithology, Ithaca. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/660>; doi: 10.2173/bna.660.
- Yosef, R. 1996. "Loggerhead Shrike (*Lanius ludovicianus*).". In *The Birds of North America*. No. 231. A. Poole, ed. Cornell Lab of Ornithology, Ithaca, New York

Figure



**Figure P-1. Fish and Wildlife Habitat**

Boardman Solar Energy Facility, Morrow and Gilliam Counties, Oregon

Rev. 01  
December 14, 2016



Attachment P-1  
Agency Correspondence Record

## Boardman Solar Energy Facility Agency Correspondence Record

Consultation with Oregon Department of Fish and Wildlife (ODFW) and US Fish and Wildlife Service (USFWS) personnel regarding fish and wildlife habitat and species that could be affected by the Boardman Solar Energy Facility (Facility) began in May 2016 and is on-going. The following is a description of the consultation.

1. Preliminary discussion regarding several Invenergy projects with ODFW staff; the items relevant to the Boardman Solar Energy Facility are described here.

**Agency:** Oregon Department of Fish & Wildlife

**Address:** 4034 Fairview Industrial Drive SE, Salem, OR 97302

**Date:** May 16, 2016

**ODFW Staff:**

Sarah Reif, Energy Coordinator

Jon Germond, Habitat Resources Program Manager

Melody Henderson, Heppner District Office Assistant Wildlife Biologist (by phone)

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Laura Miner, Sr. Manager, Project Development

Erin Lieberman, Director of Environmental and Wildlife Permitting (by phone)

Invenergy provided an overview of the Boardman Solar Energy Facility and findings to-date. ODFW provided the following feedback, specifically regarding two species.

Washington Ground Squirrel (WGS)

- Invenergy's internal critical issues analysis (CIA) noted that there could be some habitat for WGS along the transmission line and point of interconnect (BPA).
- Soils are generally not conducive to WGS and a little rocky, although some use is possible.
- ODFW recommended consulting soil layer data and the Nature Conservancy layers.
- ODFW also noted the Irrigation District may be putting in a pipeline off that area near Willow Creek and may be also evaluating or mitigating for WGS habitat. ODFW recommended following up with Joel Watts at ODFW.
- Steps to take depending on findings of WGS surveys:
  - Category 1: If we find burrows, we must follow a rule of avoidance and operate a 785-foot buffer around any active burrow. This category is considered non-mitigatable.
  - Category 2: suitable but unoccupied habitat. This category can be mitigated but avoidance is preferred.
- WGS are active February-May so this is the best time for surveys. However, ODFW would work with Invenergy outside the survey season if absolutely necessary.
- Spanning is not considered an impact unless we're digging in that area.
- ODFW recommended following up with TNC (Leslie Nelson). They have done a lot of mapping for known colonies and Jodie Delavan (FWS) to review WGS survey protocols.
- Dept. of Agriculture would be the agency to engage with on sensitive plants.





Grasshopper Sparrows

- ODFW noted Invenergy should potentially survey for this avian species. Some presence on a TNC conservation area nearby.
- Invenergy would need to avoid when constructing.

2. Preliminary discussion regarding several Invenergy projects with USFWS; the items relevant to the Boardman Solar Energy Facility are described here.

**Agency:** US Fish & Wildlife Service (FWS), Bend Field Office

**Address:** 63095 Deschutes Market Road, Bend, OR 97701

**Date:** May 18, 2016

**FWS Staff:**

Jerry Cordova, Bend Office

Suzanne Anderson, LaGrande office (by phone)

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Laura Miner, Sr. Manager, Project Development

Erin Lieberman, Director of Environmental and Wildlife Permitting (by phone)

Invenergy provided an overview of the Boardman Solar Energy Facility and findings to-date. USFWS provided the following feedback.

- FWS noted this was already disturbed habitat and a good selection for a solar project.
- Recommended Invenergy clear outside of nesting season to eliminate need for surveys. MBTA requires protecting birds, active nests, and eggs, so clearing outside of nesting season eliminates the potential for impacts to active nests.
- Eagles may nest earlier, but should be able to rely on USFWS nest data. There may be a construction seasonal restriction if a nest is active.
- Follow-up: send Jerry and Jodie and Suzanne the protocol for WGS for review and comment

3. Discussion regarding baseline survey protocol with ODFW

**Agency:** Oregon Department of Fish & Wildlife

**Address:** 54173 Highway 74, Heppner, OR 97836

**Date:** July 12, 2016

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

**Invenergy Employees:**

Laura Miner, Sr. Manager, Project Development

Invenergy provided information on progress of Boardman Solar Energy Facility and ODFW agreed to review baseline survey protocol.

4. ODFW comments on baseline survey protocol (attached)

5. USFWS comments on baseline survey protocol (attached)
6. Review of draft species list, habitat categorization, mitigation plan and monitoring plan with ODFW

**Agency:** Oregon Department of Fish & Wildlife

**Address:** N/A, conference call

**Date:** November 7, 2016

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

**Invenenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Laura Miner, Sr. Manager, Project Development

**Invenenergy Consultants:**

Elaine Albrich, Stoel Rives LLP

Eric Hallingstad, WEST, Inc. Research Biologist

Invenenergy provided an overview of species lists, habitat categorization, mitigation plan and monitoring plan. Invenenergy noted that it had conducted a site characterization similar in scope to the Tier 1 and 2 analysis of the Wind Energy Guidelines, as well as habitat mapping to identify any resources in the project area. Fixed point avian use surveys were underway, and a breeding bird survey will be conducted in the spring. Raptor nest surveys and any special status species surveys will also be conducted in the spring of 2017.

The results of the habitat assessment included the following:

**Grassland**

- Dominated by two non-native grass species associated with heavy grazing and periodic burning: cheatgrass and bulbous bluegrass
- Scattered gray rabbitbrush and snakeweed also present throughout

**Shrub/Scrub**

- Dominated by gray rabbitbrush and snakeweed, with small isolated areas of big sagebrush
- Understory dominated by cheatgrass

Both show signs of heavy grazing and periodic fires (estimate fire occurred within last 10 years) and were considered restorable. Due to the prevalence of non-native grasses, indications of recurring disturbances related to grazing and fire, the preliminary conclusion for the shrub/scrub in the project area was a Category 5, or “having high potential to become either essential or important.”

The assessment of the wetlands in the project area identified the following characteristics:

- Predominant species included cattail, watercress, softstem bulrush, and western goldenrod
- isolated and degraded state
- Other similar wetlands nearby



ODFW noted that it would prefer to conduct a site visit with Invenergy to assess habitat in the field. In this region, grassland and shrub/scrub is likely to be considered Category 4 even when it is degraded by grazing or burning. Steve noted that wetlands are usually considered to be a Category 1, 2, or 3 because there are not many wetlands in the basin. Invenergy explained that the layout of the project would avoid wetlands almost entirely, which would eliminate the need for mitigation due to wetland disturbance. In addition, WEST's evaluation of the wetlands reflected that they are somewhat degraded from grazing and non-native vegetation.

Sarah noted that improvement to the wetlands through removal of non-native vegetation or prevention of grazing could serve as a possible mitigation offset for other disturbance. Steve asked about vegetation control long-term. Invenergy will reseed any areas of temporary disturbance and will manage weeds under the solar panels and near other infrastructure.

## 7. ODFW site visit

**Agency:** Oregon Department of Fish & Wildlife

**Address:** Boardman Solar Energy Facility

**Date:** November 21, 2016

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Laura Miner, Sr. Manager, Project Development

**Invenergy Consultants:**

Jerry Baker, WEST, Inc. Biologist

Invenergy explained its approach to widening the access road from Threemile Canyon Road may be to expand it to the south, resulting in the removal of some Russian olive trees to provide a larger setback to the wetland to the north. ODFW noted that such an approach would be favorable because Russian olive is an invasive species, so the removal would be preferred. The wetland to the north was probably a Category 2 because it was non-pristine, contained a lot of invasive vegetation, and in general not a high quality wetland. However, this type of habitat is still limited, thus its Category 2 status. If Invenergy avoids the wetlands, Invenergy will not have to conduct mitigation for disturbance to the wetlands.

ODFW explained that habitat categorizations are dependent on the availability of habitat in the region. For example, even though this sage brush shrub steppe habitat is degraded relative to habitat in other parts of the state, because it is a diminishing habitat across the basin, even degraded sage brush steppe is considered Category 4 by ODFW. And for reference, ODFW typically considers wheat fields Category 5 because there is potential to restore them to quality habitat. An example of a Category 6 is a parking lot. ODFW noted that the grasslands are degraded, grazed and do not have much native species. However, because they provide more habitat than wheat fields, ODFW considers them Category 4 habitat.

Consistent with discussions November 7, 2016, and because Invenergy is designing the Facility to avoid the Category 2 wetland habitat in the site boundary, ODFW suggested mitigation for Category 4 habitat could include restoring wetlands in and/or near the site boundary. The wetlands in the site boundary could be fenced to exclude livestock grazing, dredged to create opportunities for deeper water and cleared of vegetation such as Russian olive trees. If needed, Invenergy could also contribute to ongoing wetland habitat restoration in the nearby Willow Creek Wildlife Area. ODFW does wetland restoration on their own projects, including the Willow Creek Wildlife Area, but recommended using a third party like Ducks Unlimited for wetland restoration on private land.

ODFW suggested restoration of temporary impacts areas should focus on grass rather than forbs so that weed killers can be used without worrying about inhibiting forb growth. Steve recommended seed bed prep and frequent monitoring during the first year. Invenergy should spray or mow Russian thistle for the first year or it will take over. Invenergy should utilize a contractor for vegetation monitoring and maintenance that is familiar with the vegetation in the area and can respond quickly. ODFW can help with additional guidance on restoration and revegetation.

Invenergy noted that it would survey for WGS in the spring. ODFW noted that WGS require deep and loamy soil types, but there are not specific soil types and so surveys are the way to determine presence/absence. WGS survey data is then valid for three years. ODFW noted that previous surveys in the area had not yielded presence of WGS in the past, but that WGS may still be present.

8. Updated baseline survey protocol incorporating comments sent to ODFW and USFWS November 23, 2016 and additional comments were received from ODFW and incorporated December 7, 2016.
9. Sent wildlife monitoring and adaptive mitigation plan to ODFW for comments March 1, 2017.
10. Discussion of habitat mitigation plan with ODFW

**Agency:** Oregon Department of Fish & Wildlife

**Address:** N/A, conference call

**Date:** March 14, 2017

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

Sarah Reif, Energy Coordinator

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Erin Lieberman, Director of Environmental and Wildlife Permitting

Laura Miner, Sr. Manager, Project Development

ODFW noted that they are unable to make onsite Category 2 wetland mitigation work within the mitigation policy for this project given that we are trying to mitigate for Category 4 habitat. ODFW and Invenergy agreed that Invenergy would take the lead on identifying a parcel for mitigation. ODFW noted the appropriate ratio for mitigation of Category 4 habitat is



1:1. Revegetation and fire control are measures recommended for restoring disturbed areas, but do not result in mitigation credit. The lands used for mitigation need to be covered by a legal framework that protects the land and maintains the habitat quality for the duration of the impact, which must include the reclamation and restoration period. Invenergy has initiated conversations with a third party that owns potential mitigation land option. ODFW agreed to follow up if they determine a target area for mitigation.

11. Updated Exhibit P documents incorporating comments and sent to ODFW and ODOE April 26, 2017.

12. Discussion of updated Exhibit P documents with ODFW and ODOE

**Agency:** Oregon Department of Fish & Wildlife

**Address:** N/A, conference call

**Date:** May 12, 2017

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

Sarah Reif, Energy Coordinator

**ODOE Staff:**

Katie Clifford, Energy Facility Siting Council

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Erin Lieberman, Director of Environmental and Wildlife Permitting

Laura Miner, Sr. Manager, Project Development

**Invenergy Consultants:**

Sarah Stauffer Curtiss, Stoel Rives LLP

ODFW requested additional information on several items including the following:

- Habitat mitigation area with map and mitigation actions
- Habitat mitigation for life of project
- Revegetation plan monitoring and reference sites
- Wildlife monitoring and adaptive mitigation plan carcass removal program
- Wildlife monitoring and adaptive mitigation plan thresholds due to lack of data

ODOE requested spring 2017 survey data be incorporated into Exhibits P and Q, and that language be added throughout the plans regarding on-going roles of ODFW and ODOE.

13. Updated revegetation plan incorporating comments and sent to ODOE May 26, 2017 and June 27, 2017.

14. Updated wildlife monitoring and adaptive mitigation plan and sent to ODOE June 5 and 15, 2017.

15. Updated habitat mitigation plan incorporating comments and sent to ODFW and ODOE June 9, 2017.

16. Sent spring 2017 survey reports to ODOE June 26, 2017.



**17. Discussion of habitat mitigation plan with ODFW and ODOE**

**Agency:** Oregon Department of Fish & Wildlife

**Address:** N/A, conference call

**Date:** June 28, 2017

**ODFW Staff:**

Steve Cherry, Heppner District Office Wildlife Biologist

Melody Henderson, Heppner District Office Assistant Wildlife Biologist

Sarah Reif, Energy Coordinator

**ODOE Staff:**

Katie Clifford, Energy Facility Siting Council

**Invenergy Employees:**

Erin Delawalla, Environmental & Wildlife Permitting Manager

Laura Miner, Sr. Manager, Project Development

**Invenergy Consultants:**

Sarah Stauffer Curtiss, Stoel Rives LLP

ODFW requested additional information or revision on several items including the following:

- Frequency of noxious weed monitoring and treatment
- Define success by maintaining habitat quality, not implementing measures
- Reinstate section on monitoring success of revegetation efforts
- Remove references to “events beyond applicant’s control”
- Revise annual monitoring requirement to be by “qualified” but (not necessarily independent) biologist

ODOE requested that language be added regarding their role if an alternate habitat mitigation area is chosen.

**18. Updated habitat mitigation plan incorporating comments and sent to ODFW and ODOE June 29, 2017.**



# Oregon

Kate Brown, Governor

## Department of Fish and Wildlife

Heppner District Office

P.O. Box 363

54173 Highway 74

Heppner, Oregon 97836

541-676-5230

Fax: 541-676-9075

[www.dfw.state.or.us/](http://www.dfw.state.or.us/)

September 8, 2016

Laura Miner, Senior Business Development Manager

Invenergy LLC

[lminer@invenergyllc.com](mailto:lminer@invenergyllc.com)

503-964-8900 (Office)



RE: Morrow County renewable development, draft Boardman wildlife survey protocol

Dear Laura:

This letter is in regards to the draft survey protocol for the proposed solar project located near Boardman, Oregon. The draft protocol is unclear on the frequency and survey area for the Washington ground squirrel (WGS) surveys. Oregon Department of Fish and Wildlife (ODFW) recommends 2 rounds of WGS surveys be completed in suitable WGS habitat, between the months of March through June within 1,000 feet of ground disturbing activities. ODFW also recommends that no ground disturbing activity occur within 785 feet of any active WGS colonies. The remaining protocol appears to be acceptable in obtaining baseline datasets to help ODFW and the Applicant minimize impacts and determine the appropriate mitigation for the proposed project.

I appreciate the opportunity to comment on this proposed project and look forward to working with you in the future. Please feel free to contact me if you have any questions regarding my comments.

Respectfully,

Melody Henderson

Assistant District Wildlife Biologist

Email: [Melody.B.Henderson@state.or.us](mailto:Melody.B.Henderson@state.or.us)

Phone: 541-676-5230



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

La Grande Field Office

3502 Highway 30

La Grande, Oregon 97850

Phone: (541) 962-8584 FAX: (541) 962-8581

Reply To: 01EOFW00-2017-CPA-0002

File Name: Boardman Solar Project

TS Number: 17-54

TAILS: 01EOFW00-2017-CPA-0002

Doc Type: Final

NOV 3 2016

Laura Miner  
Senior Business Development Manager  
Invenergy LLC  
1001 SE Division Street, Suite 3  
Portland, OR 97202

Subject: Comments Regarding Invenergy's Wildlife Resource Survey Protocol for the Proposed Boardman Solar Energy Project, Morrow and Gilliam Counties, Oregon (01EOFW-2017-CPA-0002)

Dear Ms. Miner

The Fish and Wildlife Service (Service) has reviewed the draft Boardman Wildlife Survey Protocol, received on September 6, 2016. The protocol will be used for the proposed Boardman Solar Energy Project (Project) in Morrow and Gilliam counties, Oregon. The Project consists of a photovoltaic (PV) facility with a projected generating capacity of up to 75 megawatts, situated within approximately 600 acres that runs proximate to the Columbia River and mouth of the John Day River. In addition, the Project includes a 2-mile long, transmission line between the PV footprint and the existing transmission system. The majority of the proposed transmission line extends out of Morrow County and into Gilliam County, before interconnecting to an existing line in Gilliam County.

The Service's primary concerns for the Project are: (1) disturbance to nesting birds, both large and small; and (2) the loss of foraging habitat for eagles and other raptors. The bird survey protocol you have provided is adequate as it stands. However, in addition, the Service recommends paying close attention to eagles foraging versus those that might be migrating through the area. The John Day River is used by eagles and an increase in numbers, as birds migrate down from Alaska this fall/winter, would be expected.

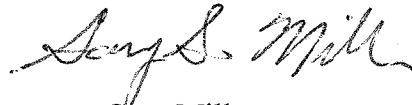
In addition, surveys for Washington ground squirrels (WGS) appear to be necessary and the Service supports the comments provided by Oregon Department of Fish and Wildlife (ODFW) on September 8, 2016, as follows:

- Provide the frequency and survey area for the WGS surveys, as recommended by ODFW

- ODFW's recommendations are 2 rounds of WGS surveys be completed in suitable WGS habitat, between the months of March through June within 1,000 feet of ground disturbing activities, and
- No ground disturbing activity should occur within 785 feet of any active WGS colonies.

We appreciate the opportunity to provide comments on this Project. The Service wants to continue to assist Invenergy in the review, development, mitigation, and monitoring of the Project. We would like to work with you to further the balancing of developing solar energy and protecting fish, wildlife and plant resources within the project area. If you have any questions regarding the Service's comments or desire to meet with us to discuss these issues further, please contact Suzanne Anderson or me at (541) 962-8584.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gary S. Miller".

Gary Miller  
Field Supervisor

cc:

Melody Henderson, Oregon Department of Fish and Wildlife, Heppner, Oregon  
Steve Cherry, Oregon Department of Fish and Wildlife, Heppner, Oregon  
Mike Green, US Fish and Wildlife Service, Migratory Birds, Portland, Oregon  
Matthew Stuber, Pacific Region Eagle Coordinator, US Fish and Wildlife Service, Corvallis, Oregon  
Jerry Cordova, US Fish and Wildlife Service, Bend Oregon

Attachment P-2  
Site Characterization Study



**Site Characterization Study  
for the Boardman Solar Energy Facility  
Morrow and Gilliam Counties, Oregon**

---



**Prepared for:**

**Invenergy Solar Development LLC**

One South Wacker Drive, Suite 1800  
Chicago, Illinois 60606

---

**Prepared by:**

**Troy Rintz and Eric Hallingstad**

Western EcoSystems Technology, Inc.  
456 SW Monroe Avenue, Suite 106  
Corvallis, Oregon 97333

**December 16, 2016**



## **STUDY PARTICIPANTS**

### **Western EcoSystems Technology**

Todd Mattson	Senior Manager
Eric Hallingstad	Project Manager
Cara Meinke	Senior Review
Carmen Boyd	Data and Report Manager
Troy Rintz	Report Writer
Carisa Stansbury	Report Compiler
Jon Cicarelli	GIS Analyst
Andrea Palochak	Technical Editor

## **REPORT REFERENCE**

Rintz, T. and E. Hallingstad. 2016. Site Characterization Study Report for the Boardman Solar Energy Facility, Morrow and Gilliam Counties, Oregon. Prepared for Invenergy Solar Development LLC, Chicago, Illinois. Prepared by Western EcoSystems Technology, Inc. (WEST), Corvallis, Oregon. 35 pages + appendices.

## **TABLE OF CONTENTS**

1	INTRODUCTION.....	1
2	PROJECT AREA.....	1
3	METHODS .....	4
3.1	Desktop Review.....	4
3.2	Field Visit.....	5
3.2.1	ODFW Fish and Wildlife Habitat Categories .....	6
4	HABITATS .....	7
4.1	Land Cover.....	7
4.2	Shrub/Scrub and Grassland.....	9
4.3	Wetlands and Riparian Areas .....	11
5	FEDERALLY AND STATE-LISTED SPECIES.....	13
5.1	Federally Listed Species.....	13
5.1.1	Federally Listed Animals.....	13
5.1.2	Federally Listed Plants.....	14
5.2	State Species of Concern .....	17
5.2.1	State-listed Animals .....	17
5.2.2	State-listed Plants.....	17
5.2.3	State Special Status Species .....	19
5.3	Eagles .....	22
5.3.1	Bald Eagle .....	22
5.3.2	Golden Eagle.....	22
6	GENERAL WILDLIFE.....	24
6.1	Birds .....	24
6.1.1	Bird Migration .....	24
6.1.2	Important Bird Areas.....	24
6.1.3	U.S. Fish and Wildlife Service Birds of Conservation Concern.....	24
6.1.4	U.S. Geological Survey Breeding Bird Survey.....	24
6.1.5	Raptors.....	28
6.1.6	Big Game Winter Range/Other Concentration Areas .....	28
6.2	Bats .....	28
6.3	Other Sensitive Species with Potential to Occur .....	29
6.4	Species Observed during the Site Visit.....	29

7	REFERENCES.....	30
7.1	Literature .....	30
7.2	Laws, Acts, and Regulations.....	35

## **LIST OF TABLES**

Table 1.	Oregon Department of Fish and Wildlife habitat categories and goals for mitigation.....	6
Table 2.	2011 National Land Cover Database land cover types within the Boardman Solar Energy Facility boundary. ....	7
Table 3.	State- and federally listed (threatened or endangered) species and federal candidate species with known or potential for occurrence within an 8.0-kilometer (5.0-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.....	15
Table 4.	State special status species with known occurrence within an 8.0-kilometer (5.0-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.....	20
Table 5.	State sensitive and other non-listed special status species with known or potential occurrence within an 0.8-kilometer (0.5-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.....	26
Table 6.	Bat species with the potential to occur at the Boardman Solar Energy Facility. ....	29
Table 7.	Avian and mammal species observed at the Boardman Solar Energy Facility during a site visit on September 14, 2016.....	30

## **LIST OF FIGURES**

Figure 1.	Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	2
Figure 2.	Digital elevation map of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	3
Figure 3.	National Land Cover Database land cover types within and adjacent to the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	8
Figure 4.	Habitat categorization within the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	10
Figure 5.	National Wetland Inventory wetland types within and adjacent to the Boardman Solar Energy Facility and proposed transmission line route in Morrow and Gilliam counties, Oregon.....	12
Figure 6.	State- and federally listed species with documented occurrence within 8.0 kilometers (5.0 miles) of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. Chinook salmon were not included in the ORBIC records of occurrence. ....	18

Figure 7. State status species with documented occurrence within 8.0 kilometers (5.0 miles)  
of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.....21

Figure 8. Breeding Bird Survey (BBS) routes closest to the Boardman Solar Energy Facility  
in Morrow and Gilliam counties, Oregon.....23

## **LIST OF APPENDICES**

Appendix A. U.S. Fish and Wildlife Service (USFWS) Information for Planning and  
Conservation (IPaC) Correspondence

Appendix B. Great Basin Birds of Conservation Concern (BCC)

## **1 INTRODUCTION**

Invenergy Solar Development LLC (Invenergy) is considering the development of the Boardman Solar Energy Facility (Project or Facility) in Morrow and Gilliam counties, Oregon (Figure 1). The Project consists of the proposed solar development area and an associated transmission line. The proposed solar development area is in Morrow County, and the proposed transmission line between the solar development area and the existing transmission system is approximately 3.2 kilometers (km; 2.0 miles [mi]) long and is in Gilliam County. To support development of the Project, Invenergy requested that Western EcoSystems Technology, Inc. (WEST) conduct a biological site characterization study (SCS).

The primary purpose of the SCS was to identify biological resources present within and surrounding the proposed Project area in accordance with a Tier 1 and Tier 2 site characterization set forth in the United States Fish and Wildlife Service's (USFWS) *Land-based Wind Energy Guidelines* (USFWS 2012), as no guidelines specific to solar energy development are currently available. The specific objectives of the SCS were to determine if the following resources were present in the Project area and vicinity: 1) species of concern (e.g., state- and federally listed species); 2) designated or critical habitat for species of concern; 3) plant communities of concern; and 4) known concentration areas for species of concern (e.g., winter ranges, bat roosts). Additional objectives were to identify: 1) potential adverse impacts to species of concern resulting from Project development; and 2) species likely to be impacted by Project development. A final objective was to categorize habitat within the Project area following Oregon Department of Fish and Wildlife (ODFW) policy. The following report describes the results of the SCS study.

## **2 PROJECT AREA**

The Project area encompasses the 306-hectare (ha; 758-acre [ac]) solar development area and the 3.2-km (2.0-mi) transmission line (Figure 1; Project area). Resources were evaluated within and around the Project area; the extent of each assessment (i.e., the buffer size) varied in scale, based on the resources queried and/or species of interest to characterize both the Project area and surrounding region.

The Project occurs in the Columbia Plateau Ecoregion (United States [U.S.] Environmental Protection Agency [USEPA] 2016), characterized by a flood basalt plateau. Much of the region is dominated by arid sagebrush- (*Artemisia* spp.) steppe and grasslands and encompassed by mountain ranges. A few creeks are present in and adjacent to the Project area, including a stream that runs through Threemile Canyon in the northeast, Willow Creek just west of the Project, and the Columbia River to the north (Figure 1). The elevation in the Project area ranges from approximately 115 – 165 meters (m; 380 – 541 feet [ft]; Figure 2). Topography in the Project area is generally flat (Figure 2).



**Figure 1. Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.**



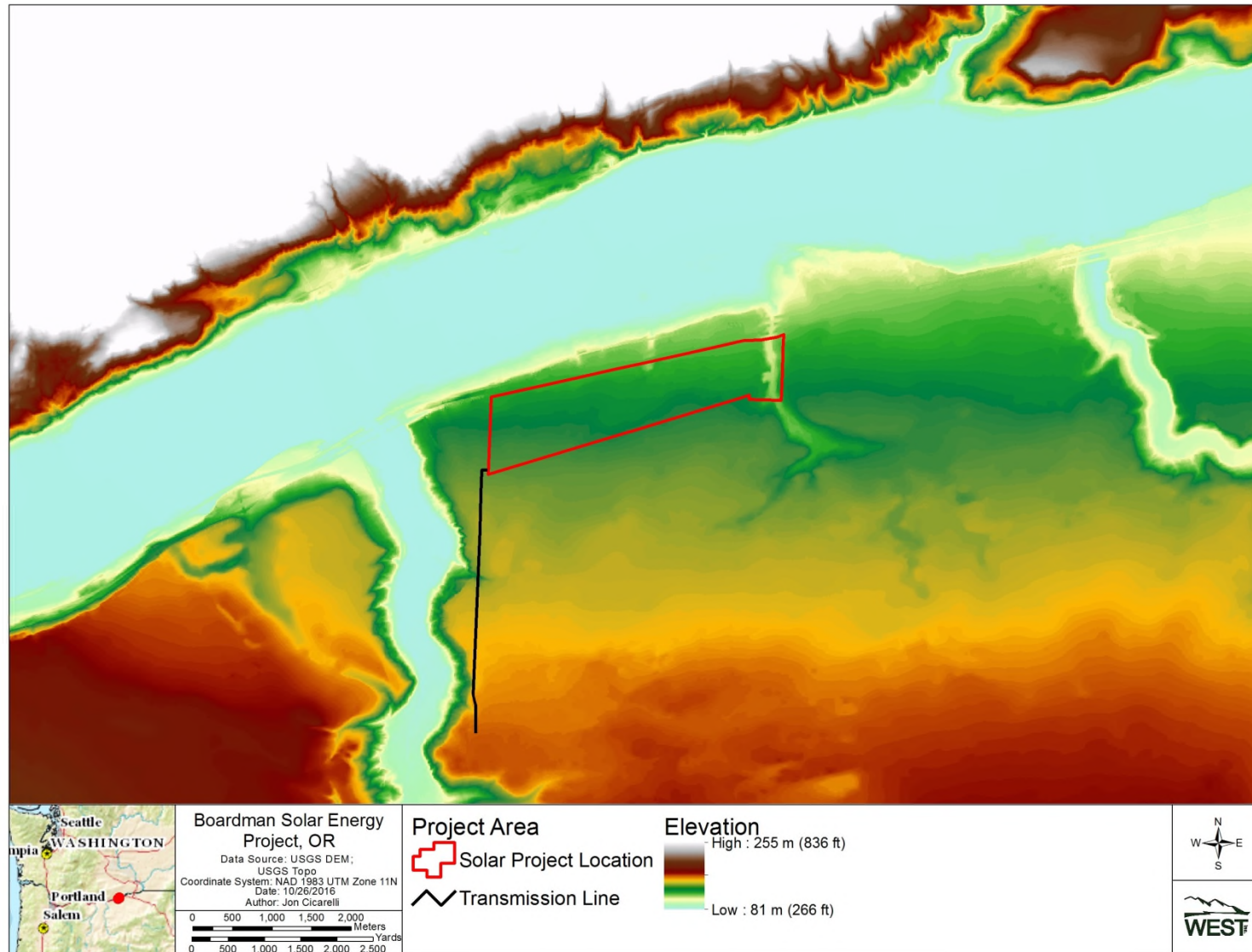


Figure 2. Digital elevation map of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.



### **3 METHODS**

#### **3.1 Desktop Review**

A comprehensive desktop review of existing biological data was completed for the Project area and an 8.0 km (5.0 mi) buffer. Several sources of available data were reviewed to evaluate the potential use of the Project area by wildlife and plant species and their habitat associations, including the following:

- 2011 National Land Cover Database (Homer et al. 2015)
- US Department of Agriculture Natural Resource Conservation Service Soil Survey (NRCS 2016)
- The National Map (U.S. Geological Survey [USGS] 2016)
- *Abundance and Habitat Associations of Washington Ground Squirrels in North-Central Oregon* (Greene 1999)
- Gray Wolf General Information and Life History (USFWS 2016a)
- Yellow-billed Cuckoo General Information and Life History (USFWS 2016b)
- Bull Trout General Information and Life History (USFWS 2016c)
- Bull Trout Final Rule Determining Threatened Status (USFWS 1998)
- *Morrow County Comprehensive Plan* (Morrow County 2013)
- Oregon Department of Agriculture [ODA] Plant Conservation Program (ODA 2016)
- ODA Species Profile for Lawrence's milkvetch (ODA 2014)
- *Columbia Basin Wildlife Areas Management Plan* (Oregon Department of Fish and Wildlife [ODFW] 2008)
- Deer and Elk Winter Range Maps (ODFW 2016)
- *Umatilla and Willow Creek Basin Assessment for Shrub Steppe, Grasslands, and Riparian Wildlife Habitats* (USEPA 2000)
- *Rare and Endangered Plants of Oregon* (Eastman 1990)
- *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973)
- *Threatened and Endangered Vascular Plants of Oregon: An Illustrated Guide* (Meinke 1982)
- *A Field Guide to Pacific States Wildflowers: Washington, Oregon, California, and Adjacent Areas* (Niehaus and Ripper 1976)

- Geographic Distribution and Habitat Preferences of Washington Ground Squirrels (*Spermophilus<sup>1</sup> washingtoni*) (Betts 1990)
- Current Status of Washington Ground Squirrels (WGS) in Oregon and Washington (Betts 1999)
- *Status and Habitat Use of the Washington Ground Squirrel (Spermophilus washingtoni) on State of Oregon Lands, South Boeving, Oregon, in 1999* (Morgan and Nugent 1999)
- *Dispersal Patterns of Washington Ground Squirrels in Oregon* (Klein 2005)
- *Home Range, Movement, and Foraging Behavior of Adult Washington Ground Squirrels (Spermophilus washingtoni)*; Delavan 2005)
- *Survey of Peregrine Falcon Breeding Area Monitoring in Oregon, 2003-2007: Final Report* (Isaacs 2008)
- Bald and golden eagle nest locations (Isaacs 2015, Oregon Eagle Foundation 2015)
- Golden eagle general information and life history (Goetzman 2014, Kochert et al. 2002)
- eBird, An online database of bird distribution and abundance (eBird 2016a)
- USFWS Information for Planning and Conservation (IPaC; USFWS IPaC 2016)
- The National Audubon Society (Audubon) Important Bird Areas (IBA; Audubon 2016)
- USGS Breeding Bird Survey (BBS; USGS 2001, Pardieck et al. 2015)
- USFWS Birds of Conservation Concern (USFWS 2008)
- Bat Conservation International species profiles (BCI 2016)
- The Sibley Field Guide to Birds of Western North America (Sibley 2003)

Additionally, a formal data request to the Oregon Biodiversity Information Center (ORBIC) database was made on November 1, 2016 to identify records of special-status plant and wildlife species within 8.0 km (5.0 mi) of the Project area. The response to this data request is presented throughout this SCS.

### **3.2 Field Visit**

A site reconnaissance visit was conducted by a biologist on September 14, 2016 to investigate biological resources identified in the desktop assessment and to investigate the potential presence of other biological resources in the Project area. Specifically, potential habitat for any federally listed and state-listed species identified during the desktop review was evaluated during the site visit. Habitat layers used in the desktop review were ground-truthed by delineating observed habitat boundaries by hand on aerial photographs. During the site visit, the biologist also recorded all wildlife species observed and documented any habitats, land

---

<sup>1</sup> Note that the genus for WGS has since been changed to *Urocitellus*.

features, and land use practices that would indicate the potential for eagles, bat species, and other bird species to occur in the Project area.

### **3.2.1 ODFW Fish and Wildlife Habitat Categories**

The ODFW has established fish and wildlife habitat categories and mitigation strategies for habitat types in the state of Oregon in its Fish and Habitat Mitigation Policy (Oregon Administrative Rules [OAR] 635-415-0000 through OAR 635-415-0025 [ODFW 2004]) (Table 1). During the site visit, a biologist familiar with Columbia Plateau habitat types and wildlife evaluated habitat in the Project area and a 91.5-m (300.0-ft) buffer along the proposed transmission line to allow micro-siting of the line (encompassing a total of 370 ha [916 ac]) according to the ODFW habitat definitions. Habitat boundaries were delineated based on differences in vegetation, land form, and land use. This information was then used to determine the appropriate ODFW habitat category for each type of habitat present, and the potential for federally or state-listed species as well as other species of concern to occur in the Project area. Habitat categorizations were discussed during a site visit with ODFW personnel on November 21, 2016.

**Table 1. Oregon Department of Fish and Wildlife habitat categories and goals for mitigation.**

<b>Category</b>	<b>Habitat Characteristics</b>	<b>Goal for Mitigation</b>
1	Irreplaceable, essential, and limited	No loss of habitat quantity or quality
2	Essential and limited	No net loss of habitat quantity or quality and to provide a net benefit of habitat quantity or quality
3	Essential, or important and limited	No net loss of habitat quantity or quality
4	Important	No net loss of habitat quantity or quality
5	Having high potential to become either essential or important	Net benefit in habitat quantity or quality
6	Low potential to become essential or important	Minimize impacts

## **4 HABITATS**

### **4.1 Land Cover**

Habitat types and quality are generally consistent with those found in the surrounding landscape, and general wildlife species common in the region may use the Project area.

According to the 2011 National Land Cover Database (NLCD; Homer et al. 2015), the majority (99.5%) of the Project area consists of shrub/scrub (i.e., arid sagebrush-steppe community) and developed areas (Table 2, Figure 3). The remaining land cover types each compose less than 0.3% of the Project area.

**Table 2. 2011 National Land Cover Database land cover types within the Boardman Solar Energy Facility boundary.**

<b>Cover Type</b>	<b>Hectares</b>	<b>Acres</b>	<b>Percent (%)</b>
Shrub/Scrub	291.7	720.9	95.0
Developed, Open Space	12.9	32.1	4.3
Grasslands	1.1	2.6	0.3
Open Water	0.7	1.8	0.2
Developed, Low Intensity	0.6	1.5	0.2
<b>Total</b>	<b>307.0</b>	<b>758.9</b>	<b>100.0</b>

The site visit confirmed the presence of three primary habitat types: shrub/scrub, grassland and wetlands. In addition, the site visit determined that the dominant habitat in the Project area was grasslands, with shrub/scrub making up a much smaller portion than indicated by the NLCD.

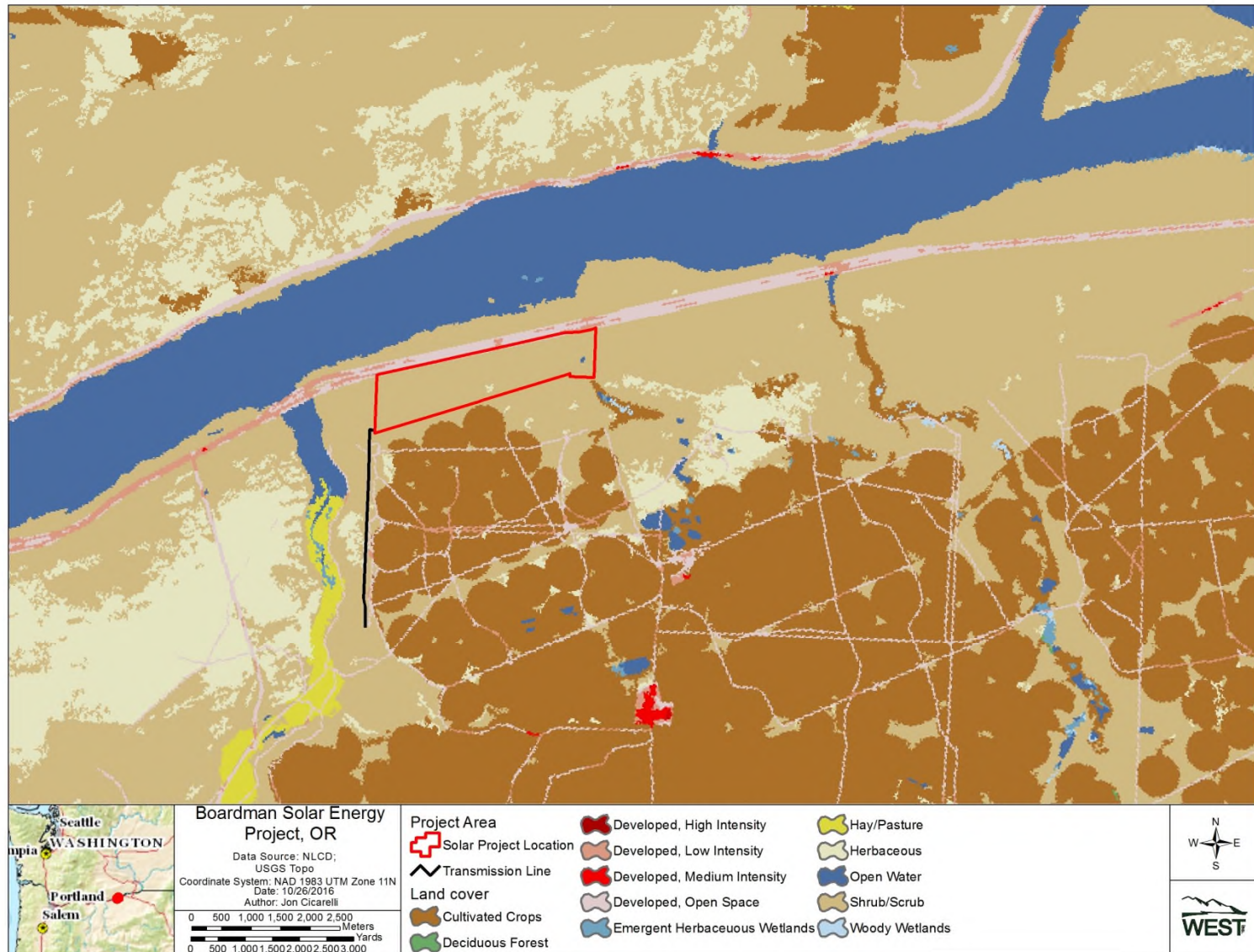


Figure 3. National Land Cover Database land cover types within and adjacent to the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.

## **4.2 Shrub/Scrub and Grassland**

Shrub/scrub and grassland habitats showed signs of heavy grazing and periodic fires (fire estimated to have occurred within last 10 years). The shrub/scrub habitat type was dominated by gray rabbitbrush (*Ericameria nauseosa*) and snakeweed (*Gutierrezia sarothrae*), with small isolated areas of big sagebrush (*Artemisia tridentata*) also present. The big sagebrush was not prevalent or contiguous in the Project area. Understory in the shrub/scrub habitat type was dominated by cheatgrass (*Bromus tectorum*). There are two subtypes of grassland in the Project area: exotic annual grassland and native perennial grassland. The exotic annual grassland subtype includes predominantly nonnative grasses (primarily cheatgrass and bulbous bluegrass [*Poa bulbosa*]) with a very high weed component and disturbed or less nutrient-rich soils. The forb component of the exotic annual grassland subtype is composed primarily of nonnative weeds, such as Russian thistle (*Salsola* spp.). The native perennial grassland subtype occurred in smaller patches within the Project area; these patches were comprised of native bunchgrasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*), and native forb species (e.g., northern buckwheat [*Eriogonum compositum*], arrowleaf balsamorhiza [*Balsamorhiza sagittata*]) are more likely in these areas. Scattered gray rabbitbrush and snakeweed were present throughout the both grassland subtypes.

Due to the prevalence of non-native grasses, existing habitat fragmentation on the surrounding landscape (e.g., transmission lines; agricultural lands; Interstate 84 and other existing roads), and indications of recurring disturbances related to land use, all shrub/scrub and grassland habitats in the Project area were classified as Category 4, “important habitat.” According to the ODFW, the mitigation goal for Habitat Category 4 is “no net loss of habitat quantity or quality” (ODFW 2004).



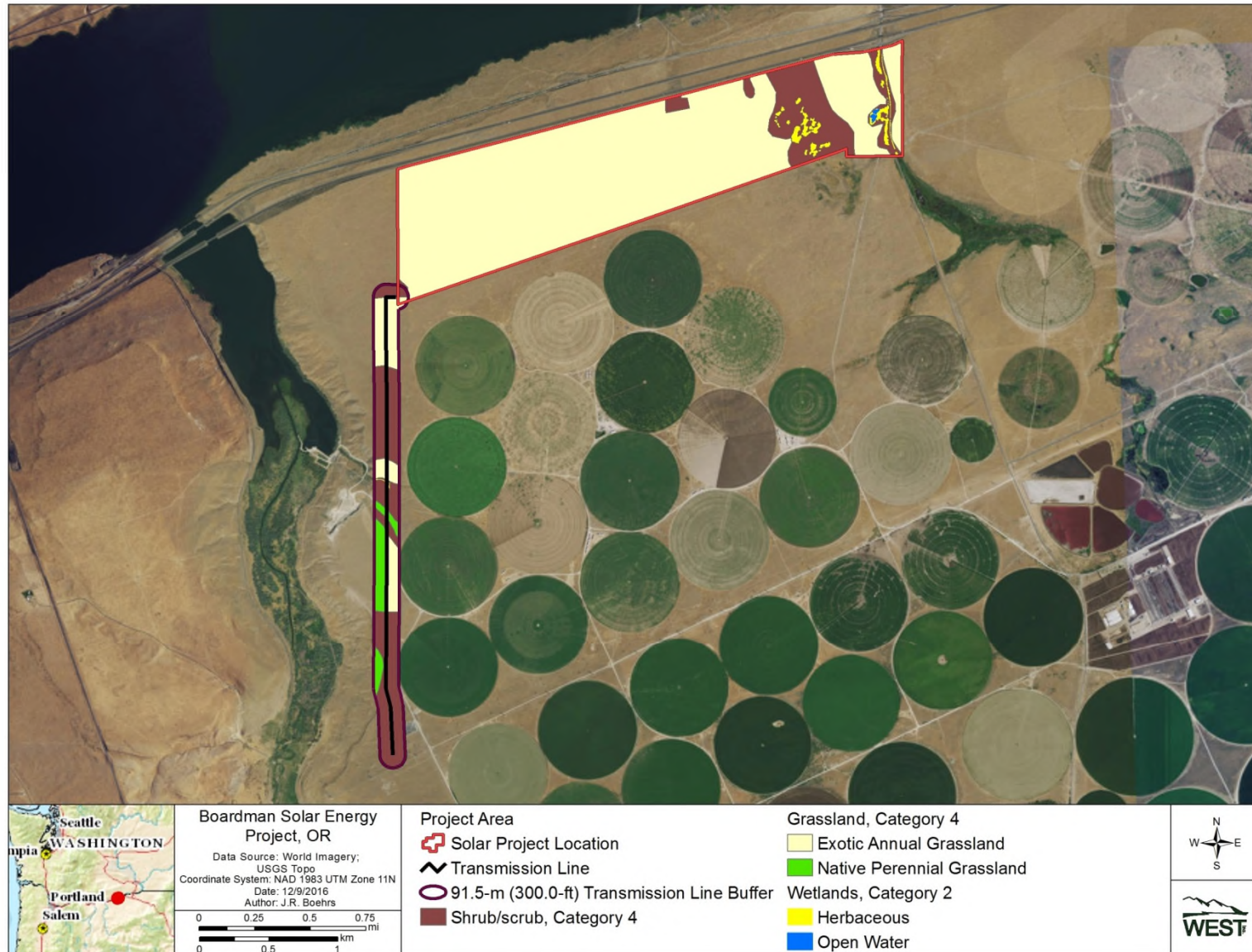


Figure 4. Habitat categorization within the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.

Formal special-status species surveys in the Project area are planned for spring 2017, the results of which could result in modification of the current ODFW habitat category designations. For example, presence of WGS (*Urocyon washingtoni*), a state-listed species (see Section 5.3.1 below), would initiate a delineation of the suitable WGS habitat. Delineated suitable WGS habitat and a 785-ft (239-m) buffer around the WGS habitat would be designated Category 1. The Category 1 designation would preclude development of those areas per the mitigation goals outlined in OAR 635-415-0025 (Table 1).

#### **4.3 Wetlands and Riparian Areas**

National Wetlands Inventory (NWI) data (USFWS NWI 2014) showed a very small amount of open water within the Project area (Table 2, Figure 5), and onsite habitat mapping documented several small degraded and isolated wetland areas within the Project area (Figure 4). These wetlands were comprised of two wetland subtypes: herbaceous and open water (Figure 4). Predominant species found within the herbaceous wetlands included cattail (*Typha latifolia*), watercress (*Nasturtium officinale*), softstem bulrush (*Schoenoplectus tabernaemontani*), and western goldenrod (*Euthemia occidentalis*).

Wetlands can sustain fish and wildlife populations over time and are considered important habitat. Wetlands of similar or higher quality can be found throughout this area of the Columbia Plateau, particularly given the Project's proximity to the Columbia River; however, the wetlands present within the Project area were considered essential and limited. For these reasons, all wetlands within the Project area were designated as Category 2. According to ODFW, the mitigation goal for Habitat Category 2 is "no net loss of habitat quantity or quality and to provide a net benefit of habitat quantity or quality" (Table 1). A detailed wetland assessment was completed for the Project, and additional detail on wetland and riparian habitats present within the Project area will be provided in the Project's Wetland Report (WEST, in prep).



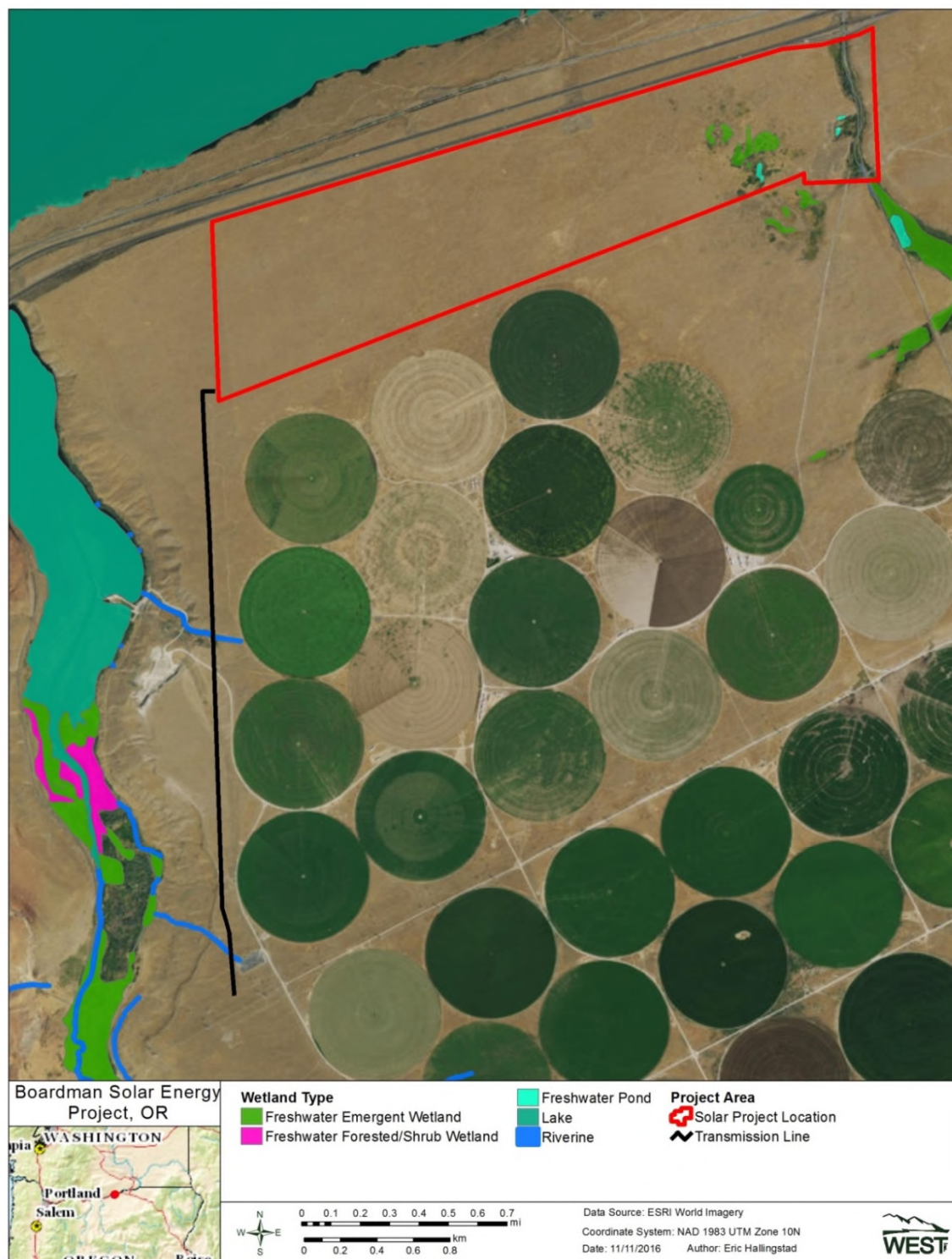


Figure 5. National Wetland Inventory wetland types<sup>2</sup> within and adjacent to the Boardman Solar Energy Facility and proposed transmission line route in Morrow and Gilliam counties, Oregon.

<sup>2</sup> Note that NWI classifies dammed rivers as lakes.

## **5 FEDERALLY AND STATE-LISTED SPECIES**

### **5.1 Federally Listed Species**

#### *5.1.1 Federally Listed Animals*

Based on queries of the USFWS's IPaC tool (USFWS 2016d; USFWS IPaC 2016; Appendix A), six species listed as endangered, threatened, or candidates for listing under the Endangered Species Act (ESA 1973) were identified as having potential to occur within an 8.0-km (5.0-mi) buffer of the Project area (Table 3). These species and the potential for them and/or their habitat to occur in the Project area and buffer are described below and summarized in Table 3.

Bull trout (*Salvelinus confluentus*) is federally listed as threatened. This species is distributed throughout Idaho, Montana, Nevada, Oregon, and Washington (USFWS 2016c). Bull trout inhabit cold water streams or creeks with stream channels that are stable and that can be also used for spawning and rearing of young (USFWS 2016c). The Columbia River, approximately 0.8 km (0.5 mi) to the north of the Project, is designated as critical habitat for bull trout. However, no habitat for this species is present within the Project area.

Two additional federally listed species had designated critical habitat in the 8.0-km (5.0-mi) buffer of the Project area: the Snake River Evolutionarily Significant Unit (ESU) of the fall and spring/summer run Chinook salmon (threatened; *Oncorhynchus tshawytscha*) (Table 3) and the Middle Columbia River ESU of summer and winter run Steelhead (threatened; *Oncorhynchus mykiss*) (Table 3; Figure 6). Chinook salmon is also a state-threatened species, while Steelhead is also a State Critical species (ORBIC 2016). Project development will not affect critical habitat for these species, as it is restricted to the Columbia River, located 0.8 km (0.5 mi) to the north.

The USFWS IPaC tool showed two additional federally listed species, the yellow-billed cuckoo (threatened; *Coccyzus americanus*) and the gray wolf (endangered; *Canis lupus*) as occurring on the Washington side of the Columbia River, but not in Morrow or Gilliam counties. The yellow-billed cuckoo is distributed across Washington and western Oregon (USFWS 2016b, 2016d, 2016e). The yellow-billed cuckoo is known to use wooded habitat with dense cover (USFWS 2016e), which does not occur in the Project area. The gray wolf is federally endangered, but is currently proposed for delisting (USFWS 2016a). The gray wolf can use a variety of habitats within mountainous areas such as tundra, forest areas, and grasslands (USFWS 2016a).

Similar to the yellow-billed cuckoo and the gray wolf, the North American wolverine (*Gulo gulo*), proposed for listing as threatened, showed occurrence limited to the Washington side of the Columbia River (USFWS 2016f). This species uses areas that maintain deep snow late into the spring and summer, typically at high elevations (USFWS 2016f). Therefore, no suitable habitat for this species is present within the Project area.

The WGS was formerly a federal candidate species (i.e., a species for which the USFWS has enough information to propose them as threatened or endangered, but their listing is precluded

by higher priority listing actions), but its candidate status was removed on September 16, 2016 (USFWS 2016g). The WGS is listed as state endangered and is discussed further in Section 5.3.1.

#### **5.1.2 Federally Listed Plants**

No federally listed plant species have been documented in the 8.0-km (5.0-mi) buffer area, nor were any federally listed plant species observed during the site visit. However, suitable habitat for the federal candidate species Lawrence's milkvetch (*Astragalus collinus* var. *laurentii*) occurs in the Project area. Lawrence's milkvetch is endemic to the Columbia Plateau and prefers sandy or rocky soils overlying basalt (ODA 2016). The ORBIC did not identify any occurrence of Lawrence's milkvetch within 8.0 km (5.0 mi) of the Project area, and the Project's elevation is outside of the typical elevation range of 600 – 1,040 m (2,000 – 3400 ft; ODA 2014). However, habitat and soil types throughout the Project area may support this species. Surveys for this species should be conducted when the plants are flowering, typically from May to August (ODA 2014).

**Table 3. State- and federally listed (threatened or endangered) species and federal candidate species with known or potential for occurrence within an 8.0-kilometer (5.0-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.**

Species	Scientific Name	State Status <sup>1</sup>	Federal Status <sup>1</sup>	Potential Habitat within the Project Area and 8.0-km (5.0-mi) Buffer	Likelihood of Occurrence within the Project Area and 8.0-km (5.0-mi) Buffer
<b>Birds</b>					
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC	Threatened	No	None; no suitable habitat, no known records in Morrow or Gilliam counties
<b>Mammals</b>					
Gray wolf	<i>Canis lupus</i>	CS	Endangered	Yes	Low; no known records in Morrow or Gilliam counties
Washington ground squirrel	<i>Urocitellus washingtoni</i>	Endangered	None (candidate status removed Sept. 16, 2016)	Yes; limited to western side of the transmission line corridor	Moderate; species may occur within the Project area, particularly in areas of Native Perennial Grassland with deep soils; known occurrence approximately 8.0 km (5.0 mi) from the Project area
Wolverine	<i>Gulo gulo</i>	Threatened, CS	Candidate	No	None; no suitable habitat, not believed to occur in Morrow or Gilliam counties
<b>Fish</b>					
Bull trout	<i>Salvelinus confluentus</i>	None	Threatened	No; Columbia River is designated critical habitat	Low; not known to currently occur within buffer
Chinook salmon Snake River Evolutionarily Significant Unit (ESU), fall run	<i>Oncorhynchus tshawytscha</i>	Threatened, CS	Threatened; Critical Habitat	Yes	High; limited to Columbia River
Chinook salmon Snake River Evolutionarily Significant Unit (ESU), spring/summer run	<i>Oncorhynchus tshawytscha</i>	Threatened, CS	Threatened; Critical Habitat	Yes	High; limited to Columbia River

**Table 3. State- and federally listed (threatened or endangered) species and federal candidate species with known or potential for occurrence within an 8.0-kilometer (5.0-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.**

Species	Scientific Name	State Status <sup>1</sup>	Federal Status <sup>1</sup>	Potential Habitat within the Project Area and 8.0-km (5.0-mi) Buffer	Likelihood of Occurrence within the Project Area and 8.0-km (5.0-mi) Buffer
Steelhead Middle Columbia River Evolutionarily Significant Unit (ESU), summer run	<i>Oncorhynchus tshawytscha</i>	Threatened, CS	Threatened; Critical Habitat	Yes	High; limited to Columbia River
Steelhead Middle Columbia River ESU, winter run	<i>Oncorhynchus mykiss</i>	None	Threatened; Critical Habitat	Yes	High; limited to Columbia River
<b>Plants</b>					
Lawrence's milkvetch	<i>Astragalus collinus</i> var. <i>laurentii</i>	Threatened	SOC	Yes	Moderate; species may occur within the Project area, but no known occurrence within buffer

Sources: ORBIC 2016; USFWS 2016d; USFWS IPaC 2016a, 2016b.

<sup>1</sup> CS: Conservation Strategy species. SC: State Critical species. SV: State Vulnerable species. SOC: Taxa which the USFWS is reviewing for consideration as Candidates for listing under the ESA.

## **5.2 State Species of Concern**

### ***5.2.1 State-listed Animals***

One state-listed fish and one state-listed mammal animal species have the potential to occur within the 8.0-km (5.0-mi) Project area buffer: the Snake River ESU of fall and spring/summer run Chinook salmon (state threatened; ORBIC 2016; Table 3), and the WGS (state endangered; ODFW 2015; Table 3, Figure 6). Project development will not affect the fish species, as its occurrence is restricted to the Columbia River, located 0.8 km (0.5 mi) to the north, which will not be affected by Project development.

WGS are known to occur within the Boardman Grasslands, which are 8.0 km (5.0 mi) east of the Project area (Figure 6). The typical habitats occupied by WGS are grasslands and shrub/scrub habitat, both present within the Project area. This species requires sandy or silt-loam texture soils that are deep and supportive enough to accommodate burrows (Betts 1990, Yensen and Sherman 2003).

Soil suitability within the Project area for burrowing species is generally low due to high sand composition. However, suitable habitat and soil types may be present along the proposed transmission line, particularly in the western half of the 91.5-m survey buffer on slopes where soil depth may support burrow complexes. While the habitat along the transmission line corridor is fragmented and degraded (including a recent burn), native grasses (e.g., bluebunch wheatgrass [*Pseudoroegneria spicata*]) were abundant in this area. Approximately 50% (the western half, or about 32 ha [79 ac]) of the transmission line corridor has supportive soil and habitat quality that may be suitable for WGS. However, biologists spent 3 hours surveying the transmission line route during habitat and wetland mapping efforts and did not see any burrows or other sign that would indicate WGS are present.

Surveys for this and other special-status species will be conducted in spring 2017 when adults have emerged from hibernation (USFWS 2016h) and WGS activity is easiest to document.

### ***5.2.2 State-listed Plants***

The Lawrence's milkvetch, a state threatened plant, has not been documented in the 8.0-km (5.0-mi) buffer area. Refer to Section 5.1.2 for a discussion of this plant's potential to occur in the Project area.



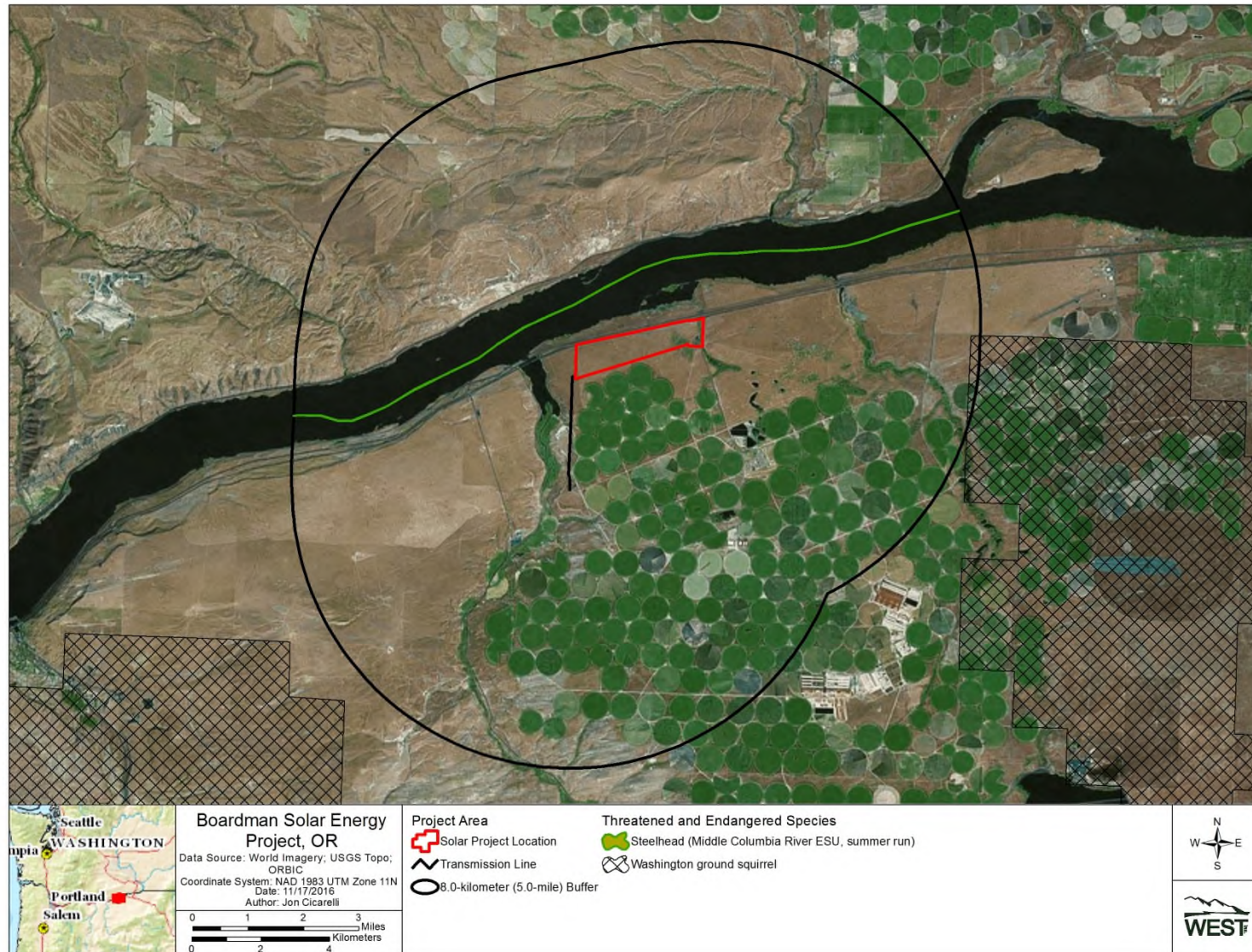


Figure 6. State- and federally listed species with documented occurrence within 8.0 kilometers (5.0 miles) of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. Chinook salmon were not included in the ORBIC records of occurrence.

### 5.2.3 State Special Status Species

The ORBIC database was queried to document animal and plant species with state status (i.e., Extirpated, Rare, State Critical, or State Vulnerable) within 8.0 km (5.0 mi) of the Project area (Table 4). Two fish, two plants, and one fungus with state status have ORBIC records of occurrence within the 8.0-km (5.0-mi) buffer. One plant, Robinson's onion (*Allium robinsonii*), is considered extirpated.

The two fish species, Pacific lamprey (*Entosphenus tridentatus*; State Vulnerable) and the Middle Columbia River ESU steelhead (State Critical), are limited to the Columbia River (Figure 7), do not have suitable habitat in the Project area, and will not be affected by Project development. Limited suitable habitat is present within the Project area for interior rush (*Juncus interior*); a species typically found in moist areas within meadows and spring prairies. There is one known occurrence of interior rush are within approximately 1.0 km (0.6 mi) of the Project area (Figure 7). No suitable habitat is present within the Project area for woven spore-lichen (*Texosporium sancti-jacobi*). Both the interior rush and woven-spore lichen are also considered rare species by the Oregon Natural Heritage Program (ORBIC 2016).



**Table 4. State special status species with known occurrence within an 8.0-kilometer (5.0-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.**

Species	Scientific Name	State Status <sup>1</sup>	Suitable Habitat	Potential Habitat within the Project Area and 8.0-km (5.0-mi) Buffer	Likelihood of Occurrence within the Project Area and 8.0-km (5.0-mi) Buffer
<b>Fish</b>					
Pacific lamprey	<i>Entosphenus tridentatus</i>	SV	Freshwater rivers and ocean	Yes	High; limited to Columbia River
Steelhead Middle Columbia River Evolutionarily Significant Unit (ESU), summer run	<i>Oncorhynchus mykiss</i>	SC	Freshwater rivers and ocean	Yes	High; limited to Columbia River
<b>Plants</b>					
Robinson's onion	<i>Allium robinsonii</i>	EX	Unknown	Yes	None, extirpated
Interior rush	<i>Juncus interior</i>	R	Found in moist areas within meadows and spring prairies	Yes	High; known populations occur on the shores of the Columbia River approximately 1.0 km (0.6 mi) from the Project area
<b>Fungus</b>					
Woven-spored lichen	<i>Texosporium sancti-jacobi</i>	R	Found in undisturbed arid landscapes with predominately native plant species; prone to elimination by fire	Yes	High; known occurrence approximately 1.6 km (1.0 mi) from the Project area.

Source: ODA 2016, ODFW 2015

<sup>1</sup> EX: Extirpated; R: rare species; SC: state critical species; SE: state endangered species; ST = state threatened species; SV=state vulnerable species

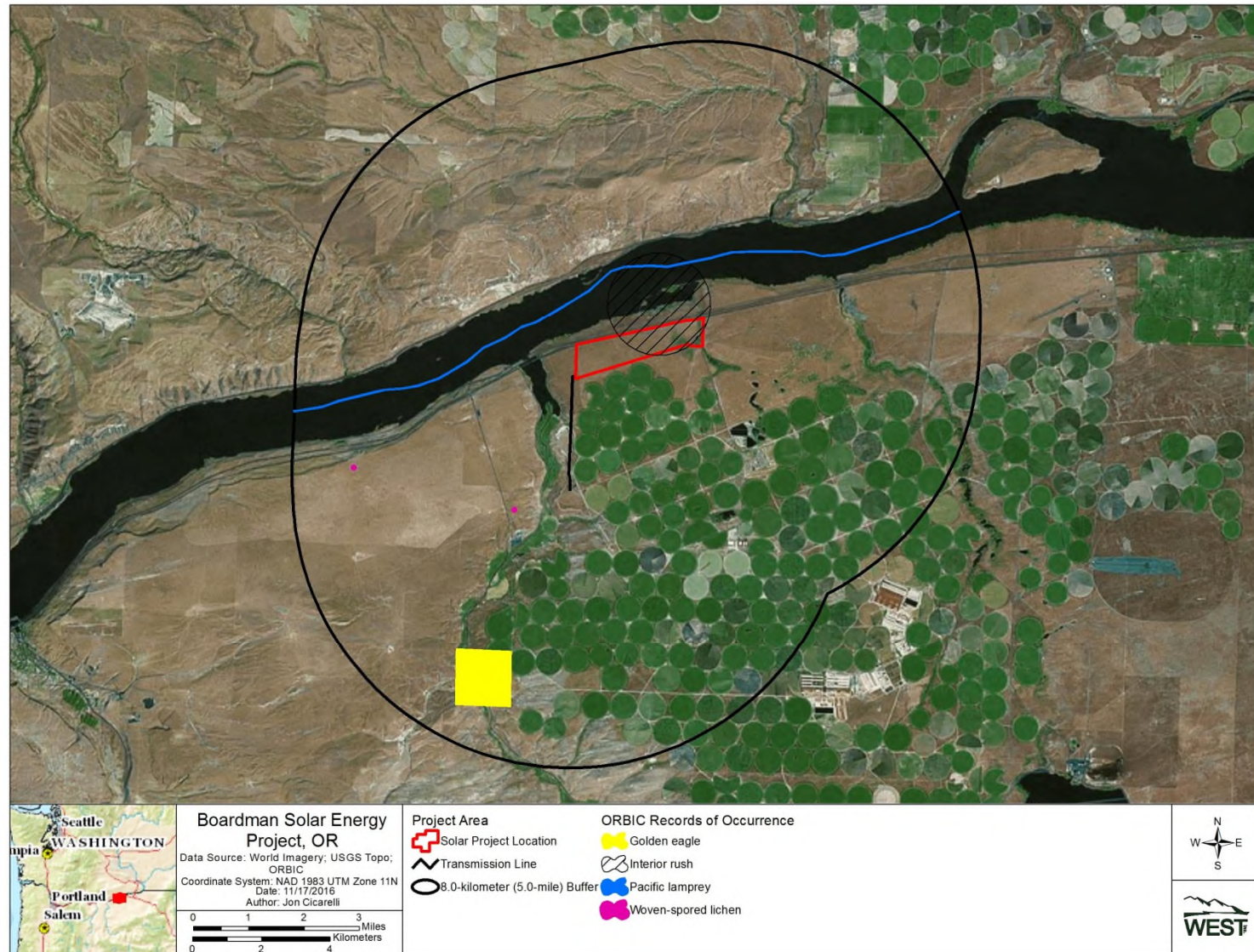


Figure 7. State status species with documented occurrence within 8.0 kilometers (5.0 miles) of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.

### **5.3 Eagles**

Bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are not federally listed, state-listed, or state-sensitive species, but are protected under the federal Bald and Golden Eagle Protection Act (1940).

#### **5.3.1 Bald Eagle**

Bald eagles are known to occur along the Columbia River (eBird 2016a), located 0.8 km (0.5 mi) to the north. The Project area is also located 0.8 km (0.5 mi) east of Willow Creek, which may attract foraging bald eagles. However, no observations of bald eagles have been documented along the five BBS routes closest to the Project area (i.e., Bickleton, Cecil, Montague, Mercer, Umatilla; Figure 8; Pardieck et al. 2015). There have been observations of bald eagles made incidentally in Morrow and Gilliam counties as reported by eBird (2016b).

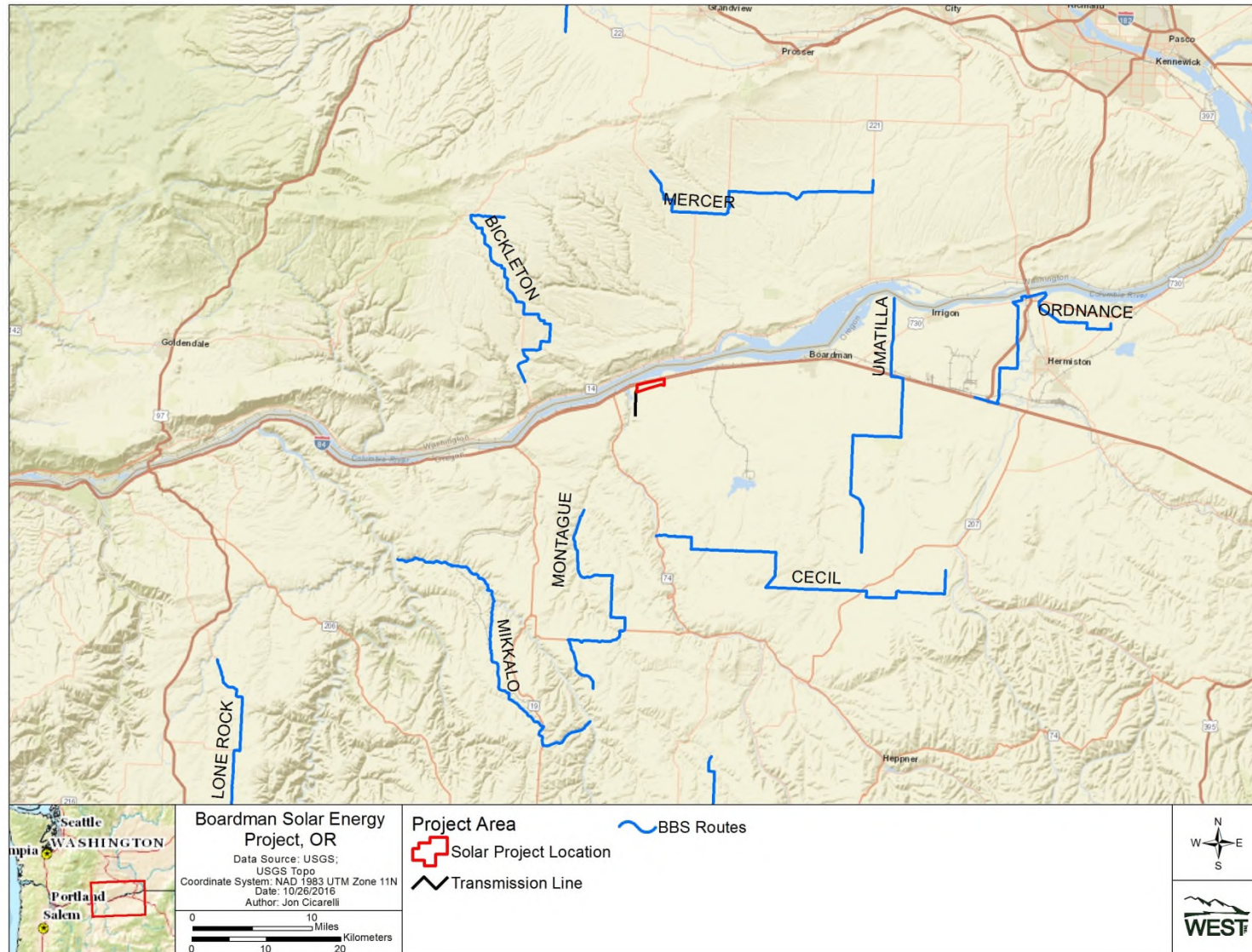
Bald eagles may potentially occur in the Project area during the winter, migration, and breeding/nesting seasons. Bald eagles typically nest in forested areas or mature trees adjacent (within 1.9 km [1.2 mi]) to waterbodies large enough to provide foraging opportunities (Buehler 2000). No suitable nest substrate for bald eagles is located within the Project area and only marginal opportunities for nesting (e.g., transmission line towers) are present in the Project vicinity; no bald eagle nests are known to occur within 8.0 km (5.0 mi) of the Project area (Isaacs 2015).

#### **5.3.2 Golden Eagle**

Golden eagles are year-round residents of Oregon and Washington (Kochert et al. 2002) and there are at least 30 known golden eagle territories in Morrow and Gilliam counties (Isaacs 2015). However, no suitable nest substrate for golden eagles is located within the Project area. The nearest known golden eagle nest is 6.0 km (3.7 mi) to the south of the Project area (Figure 6); at least one adult golden eagle was occupying the territory associated with this nest in 2015 (Oregon Eagle Foundation 2015).

Golden eagles' prey species, including ground squirrels (Goetzman 2014), rabbits, and other small and medium-sized prey (Kochert et al. 2002), may use sagebrush-steppe and grasslands within the Project area. No observations of golden eagles have been documented along the five BBS routes closest to the Project area (Figure 8; Pardieck et al. 2015). There have been observations of golden eagles made incidentally in Morrow and Gilliam counties as reported by eBird (2016c). In summary, golden eagle use within the Project area is likely low, but could occur during any part of the year.





## **6 GENERAL WILDLIFE**

### **6.1 Birds**

#### *6.1.1 Bird Migration*

The Project area is located within the Pacific Flyway (Flyways.us 2016), which is used by migrating waterfowl, waterbirds, shorebirds, songbirds, and raptors. Of these bird types, waterfowl have the greatest potential to migrate through the Project area. Based on USFWS NWI data, the Project area only contains 0.7 ha (1.8 ac) of NWI-mapped wetlands and open water, but there is potential for migrating waterfowl to use these areas. Additionally, the Columbia River and associated emergent wetlands located north of the Project area have the potential to increase waterfowl use in the Project area. Topographic features such as ridges or mountains that attract other migrant birds (Liguori 2005) are not present in the vicinity of the Project.

#### *6.1.2 Important Bird Areas*

Audubon-identified IBAs are described as providing essential habitat for one or more bird species (Audubon 2016). The closest registered IBA to the Project area is the Boardman Grasslands IBA, which is located approximately 8.0 km (5.0 mi) to the east. The Boardman Grasslands IBA encompasses 27,923 ha (69,000 ac) of native shrub/scrub and grassland habitat.

#### *6.1.3 U.S. Fish and Wildlife Service Birds of Conservation Concern*

The USFWS lists 28 species as birds of conservation concern (BCC) within the Great Basin Bird Conservation Region (BCR) where the Project is located (USFWS 2008). These species have been identified as vulnerable to population declines by the USFWS (2002). Although some of these species may use habitats in the Project area during migration or nesting (e.g., wetlands and ponds), the majority of the Project area encompasses shrub/scrub communities, so use by these BCC species would likely be limited to the scattered native habitats in and near the Project area.

The BCC that have been observed on USGS BBS routes near the Project area are discussed in Section 6.1.4. Based on habitat availability and quality, two BCC species have not been observed on nearby BBS routes but do have potential to occur within the Project area based on habitat availability and quality: peregrine falcon (*Falco peregrinus*; State Vulnerable) and green-tailed towhee (*Pipilo chlorurus*) (Table 5). Nine BCC species included in the IPaC response do not have suitable habitat present within the 0.8-km (0.5-mi) buffer (Table 5). A full BCC list for the Great Basin BCR is provided in Appendix B.

#### *6.1.4 U.S. Geological Survey Breeding Bird Survey*

The two closest USGS BBS routes to the Project area include the Bickleton Route, running north/south and located 14.5 km (9.0 mi) to the north, and the Montague Route, running north/south and located 17.7 km (11.0 mi) to the southwest (Figure 8; Pardieck et al. 2015). The

BBS routes are each 39.4 km (24.5 mi) long and consist of 50 3-minute counts along the length of each route (USGS 2001). Information gathered from the BBS routes provide an indication of what bird species have the potential to occur in the Project area.

A total of 64 bird species have been documented along the Bickleton Route, including seven raptor or owl species (red-tailed hawk [*Buteo jamaicensis*], Swainson's hawk [*Buteo swainsoni*; State Vulnerable; Table 5], northern harrier [*Circus cyaneus*]), prairie falcon [*Falco mexicanus*], burrowing owl (*Athene cunicularia*; State Critical; Table 5), short-eared owl [*Asio flammeus*], and great horned owl [*Bubo virginianus*]). The most common passerine (i.e., songbird) species recorded were horned lark (*Eremophila alpestris*) and western meadowlark (*Sturnella neglecta*). Five species designated by the USFWS as BCC within the Great Basin BCR (USFWS 2008) also have been documented along the Bickleton Route: loggerhead shrike (*Lanius ludovicianus*; State Vulnerable), Brewer's sparrow (*Spizella breweri*), sagebrush sparrow (*Artemisiospiza nevadensis*; State Critical), long-billed curlew (*Numenius americanus*; State Vulnerable), and sage thrasher (*Oreoscoptes montanus*; Pardeik et al. 2015; Table 5); however, there are no documented occurrences of these species within 8.0 km (5 mi) of the Project area.

A total of 53 bird species have been documented along the Montague Route, including nine raptor or owl species (American kestrel [*Falco sparverius*], red-tailed hawk, northern harrier, Swainson's hawk, ferruginous hawk (*Buteo regalis*; BCC and State Critical), merlin (*F. columbarius*), burrowing owl, short-eared owl, and great horned owl). The most common songbird species recorded were western meadowlark and horned lark. Five species designated by the USFWS as BCC within the Great Basin BCR (USFWS 2008; Table 5) have been observed along the route: ferruginous hawk, long-billed curlew, Brewer's sparrow, sage thrasher, and loggerhead shrike (Pardieck et al. 2015). However, there are no documented occurrences of these BCC species within 8.0 km (5 mi) of the Project area.

Table 5. State sensitive and other non-listed special status species with known or potential occurrence within an 0.8-kilometer (0.5-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.

Species	Scientific Name	State Status <sup>1</sup>	Federal Status <sup>2</sup>	Potential Habitat within the Project area and 0.8-km (0.5-mi) Buffer	Likelihood of Occurrence within Project area and 0.8-km (0.5-mi) Buffer
<b>Mammals</b>					
California bat	<i>Myotis californicus</i>	SV, CS	--	Yes, primarily wetlands	Moderate
Fringed bat	<i>Myotis thysanodes</i>	SV, CS	SOC	Yes, primarily wetlands	Moderate
Hoary bat	<i>Lasiurus cinereus</i>	SV, CS	--	Yes, primarily wetlands	Moderate
Long-eared bat	<i>Myotis evotis</i>	--	SOC	Yes, primarily wetlands	Moderate
Long-legged bat	<i>Myotis volans</i>	SV, CS	SOC	Yes, primarily wetlands	Moderate
Pallid bat	<i>Antrozous pallidus</i>	SV, CS	SOC	Yes, primarily wetlands	Moderate
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SV, CS	SOC	Yes, primarily wetlands	Moderate
Spotted bat	<i>Euderma maculatum</i>	SV, CS	SOC	Yes, primarily wetlands	Moderate
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC, CS	SOC	Yes, primarily wetlands	Moderate
White-tailed jackrabbit	<i>Lepus townsendii</i>	SV, CS	--	Yes	Moderate
Yuma bat	<i>Myotis yumanensis</i>	--	SOC	Yes, primarily wetlands	Moderate
<b>Birds</b>					
Bald eagle	<i>Haliaeetus leucocephalus</i>	None	Protected under Bald and Golden Eagle Protection Act (BGEPA)	Yes, primarily open water	Moderate
Brewer's sparrow	<i>Spizella breweri</i>	--	BCC	Yes	Moderate
Calliope hummingbird	<i>Selasphorus calliope</i>	--	BCC	No	None
Cassin's finch	<i>Haemorhous cassinii</i>	--	BCC	No	None
Eared grebe	<i>Podiceps nigricollis</i>	SC	BCC	No	None
Ferruginous hawk	<i>Buteo regalis</i>	SC, CS	BCC, SOC	Yes	Moderate
Flammulated owl	<i>Psilosops flammeolus</i>	SV	BCC	No	None
Fox sparrow	<i>Passerella iliaca</i>	--	BCC	No	None
Golden eagle	<i>Aquila chrysaetos</i>	None	Protected under BGEPA	Yes	Moderate
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SV, CS	--	Yes	Moderate
Greater sage-grouse	<i>Centrocercus urophasianus</i>	SV	BCC	No	None
Green-tailed towhee	<i>Pipilo chlorurus</i>	--	BCC	Yes	Low
Loggerhead shrike	<i>Lanius ludovicianus</i>	SV, CS	BCC	Yes	Low
Long-billed curlew	<i>Numenius americanus</i>	SV, CS	BCC	Yes	Moderate
Peregrine falcon	<i>Falco peregrinus anatum</i>	SV, CS	BCC	Yes	Low
Rufous hummingbird	<i>Selasphorus rufus</i>	--	BCC	No	None
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	SC, CS	BCC	Yes	Low
Sage thrasher	<i>Oreoscoptes montanus</i>	--	BCC	Yes	Low

Table 5. State sensitive and other non-listed special status species with known or potential occurrence within an 0.8-kilometer (0.5-mile) buffer of the Boardman Solar Energy Facility and potential for Project impacts.

Species	Scientific Name	State Status <sup>1</sup>	Federal Status <sup>2</sup>	Potential Habitat within the Project area and 0.8-km (0.5-mi) Buffer	Likelihood of Occurrence within Project area and 0.8-km (0.5-mi) Buffer
Short-eared owl	<i>Asio flammeus</i>	--	BCC <sup>3</sup>	Yes	Moderate
Swainson's hawk	<i>Buteo swainsoni</i>	SV, CS	--	Yes	Moderate
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	SC, CS	SOC	Yes	Moderate
Western grebe	<i>Aechmophorus occidentalis</i>	--	BCC <sup>3</sup>	No	None
White-headed woodpecker	<i>Picoides albolarvatus</i>	SC	BCC	No	None
Willow flycatcher	<i>Empidonax traillii</i>	SV	BCC, SOC	No	None
<b>Reptiles</b>					
Northern sagebrush lizard	<i>Sceloporus graciosus graciosus</i>	SV, CS	SOC	Yes	Moderate
<b>Fish</b>					
Pacific lamprey	<i>Entosphenus tridentatus</i>	SV, CS	SOC	No	None
<b>Plants</b>					
Interior rush	<i>Juncus interior</i>	R	--	Yes; known occurrence approximately 1.0 km (0.6 mi) from the Project area	Moderate
Robinson's onion	<i>Allium robinsonii</i>	--	SOC	Yes	None; extirpated
<b>Fungus</b>					
Woven-spored lichen	<i>Texosporium sancti-jacobi</i>	R	SOC	No	None

Sources: BGEPA 1940, USFWS 2008, ODA 2016, ORBIC 2016

<sup>1</sup> CS: Conservation Strategy species; SC: State Critical species; SV: State Vulnerable species<sup>2</sup> SOC: Taxa which the USFWS is reviewing for consideration as Candidates for listing under the ESA; BCC: Birds of Conservation Concern<sup>3</sup> Short-eared owl and western grebe are listed in the USFWS IPaC report as BCC, but are not designated as BCC for the Great Basin BCR (in which the Site Boundary is located).



### **6.1.5     *Raptors***

Raptor nesting could occur (predominantly in trees) along ephemeral drainages (e.g., Threemile Canyon), wetlands, and grasslands in and adjacent to the Project area. Nesting could occur on manmade structures, such as the power poles near southern edge of the solar development area and along the transmission line route. Based on the limited suitable nesting habitat, it is unlikely the Project area supports high densities of nesting raptors.

During migration, raptors could rest and forage in the Project area, depending on weather and prey availability. Several factors influence the migratory patterns of raptors, the most significant of which is geography (Liguori 2005). Two geographical features are primarily used by raptors during migration: ridgelines and the shorelines of large bodies of water (Liguori 2005). Updrafts formed as wind hits ridges and thermals created over land, not water, make for energy-efficient travel for raptors over long distances (Liguori 2005). It is for this reason that raptors tend to follow prominent ridges with defined edges during migration. The Project area is located on flat topography that generally lack defined topographical ridges or other defined features typically used by migrating raptors (Figures 1 and 2). Raptor species are more likely to travel along north-south orientated large water bodies during migration (Liguori 2005) as well. The Columbia River lies north of the Project in an east-west direction and is not likely to have substantial raptor migration along it.

Raptor foraging is influenced by prey availability. Small- and medium-sized mammals comprise the primary prey base for many raptor species, although small- and medium-sized birds and insects also make up the diet for several raptor species. Rodents may be most concentrated along roads (Preston 1990, Rosenzweig 1989), while songbirds and insects likely occur in most of the Project area. Waterfowl and waterbirds, also potential prey for eagles and other large raptors, would mostly likely be attracted to the perennial and ephemeral water sources in and near the Project area.

### **6.1.6     *Big Game Winter Range/Other Concentration Areas***

The Project does not fall within ODFW-designated big game winter ranges (ODFW 2016). No concentration areas for other wildlife species are known to exist within the Project area.

## **6.2     *Bats***

Sixteen bat species occur in Oregon, all of which have ranges that overlap the Project area (Table 6; Harvey et al. 1999, Bat Conservation International 2016) and have the potential to use the Project area during the spring, summer, and fall. Based on the habitat assessment, the Project area has no roosting habitat for bats (e.g., large trees, cliffs, buildings). There is approximately 0.7 ha (1.8 ac) of open water present for bat foraging and drinking. No special-status bat species have been documented within the Project area by the ORBIC.

Table 6. Bat species with the potential to occur at the Boardman Solar Energy Facility.

Common Name	Scientific Name
Pallid bat <sup>1, 3</sup>	<i>Antrozous pallidus</i>
Townsend's big-eared bat <sup>2, 3</sup>	<i>Corynorhinus townsendii</i>
Western red bat	<i>Lasiurus blossevillei</i>
Spotted bat <sup>1, 3</sup>	<i>Euderma maculatum</i>
Little brown bat	<i>Myotis lucifugus</i>
California bat <sup>1</sup>	<i>Myotis californicus</i>
Long-eared bat <sup>3</sup>	<i>Myotis evotis</i>
Big brown bat	<i>Eptesicus fuscus</i>
Silver-haired bat <sup>1, 3</sup>	<i>Lasionycteris noctivagans</i>
Hoary bat <sup>1</sup>	<i>Lasiurus cinereus</i>
Dark-nosed small footed bat	<i>Myotis melanorhinus</i>
Fringed bat <sup>1, 3</sup>	<i>Myotis thysanodes</i>
Long-legged bat <sup>1, 3</sup>	<i>Myotis volans</i>
Yuma bat <sup>3</sup>	<i>Myotis yumanensis</i>
Canyon bat	<i>Parastrellus hesperus</i>
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>

<sup>1</sup> State Vulnerable species<sup>2</sup> State Critical species<sup>3</sup> Federal species of concern

### 6.3 Other Sensitive Species with Potential to Occur

Two other Oregon sensitive species have potential to occur within the Project area based on range maps and habitat availability: the northern sagebrush lizard (*Sceloporus graciosus*; State Vulnerable and federal species of concern) and the white-tailed jackrabbit (*Lepus townsendii*; State Vulnerable). The northern sagebrush lizard prefers open areas with low sagebrush (California Herps 2016). The white-tailed jackrabbit also prefers open areas and depends upon grasses, forbs, and shrubs for forage (Smith and Johnston 2008).

### 6.4 Species Observed during the Site Visit

Table 7 includes avian and mammal species observed during the site visit; no federally or state-listed species were observed.

Table 7. Avian and mammal species observed at the Boardman Solar Energy Facility during a site visit on September 14, 2016.

Common Name	Scientific Name
<b>Birds</b>	
Black-billed magpie	<i>Pica hudsonia</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Western meadowlark	<i>Sturnella neglecta</i>
American kestrel	<i>Falco sparverius</i>
Common raven	<i>Corvus corax</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Mallard	<i>Anas platyrhynchos</i>
Pacific wren	<i>Troglodytes pacificus</i>
Virginia rail	<i>Rallus limicola</i>
California quail	<i>Callipepla californica</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Northern flicker	<i>Colaptes auratus</i>
Song sparrow	<i>Melospiza melodia</i>
Barn owl	<i>Tyto alba</i>
Osprey	<i>Pandion haliaetus</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
European starling	<i>Sturnus vulgaris</i>
<b>Mammals</b>	
Mule deer	<i>Odocoileus hemionus</i>
Coyote	<i>Canis latrans</i>

## 7 REFERENCES

### 7.1 Literature

- Bat Conservation International. 2016. Bat Species: US Bats. BCI, Inc., Austin, Texas. Accessed October 2016. Homepage: <http://www.batcon.org>; Species profiles available online at: <http://www.batcon.org/resources/media-education/species-profiles>, species ranges from 2003-2016 data.
- Betts, B.J. 1990. Geographic Distribution and Habitat Preferences of Washington Ground Squirrels (*Spermophilus washingtoni*). Northwestern Naturalist 71:27-37.
- Betts, B.J. 1999. Current status of Washington ground squirrels in Oregon and Washington. Northwestern Naturalist 80:35-38.
- Buehler, D. A. 2000. Bald Eagle (*Haliaeetus leucocephalus*). A. Poole, ed. The Birds of North America Online. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/506>
- California Herps. 2016. *Sclerophorus graciosus graciosus* - Northern Sagebrush Lizard. Accessed November 2016. Available online at: <http://www.californiaherps.com/lizards/pages/s.g.graciosus.html>
- Delavan, J. L. 2005. Home Range, Movement, and Foraging Behavior of Adult Washington Ground Squirrels (*Spermophilus washingtoni*). La Grande Fish and Wildlife Office, La Grande, Oregon. 20 pp.

- Eastman, D. C. 1990. Rare and Endangered Plants of Oregon. Beautiful America Publishing Company. 194 pp.
- eBird. 2016a. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Accessed November 2016. Information available online at: <http://ebird.org>
- eBird. 2016b. Bald Eagle Sightings in Oregon. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Accessed October 2016. Information available online at: <http://ebird.org>
- eBird. 2016c. Golden Eagle Sightings in Oregon. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Accessed October 2016. Information available online at: <http://ebird.org>
- ESRI. 2016. World Street Map and Aerial Photos: World Imagery. ArcGIS Resource Center. ESRI, producers of ArcGIS software, Redlands, California. Data accessed September and October 2016.
- Flyways.us. 2016. Pacific Flyway. A collaborative effort of waterfowl managers across the continent. U.S. Fish and Wildlife Service (USFWS). Accessed October 2016. Information available online at: <http://flyways.us/flyways/info>
- Goetzman, K. 2014. Our Golden Eagles. Minnesota Conservation Volunteer January-February 2014: 8-21.
- Greene, E. 1999. Abundance and Habitat Associations of Washington Ground Squirrels in North-Central Oregon. Thesis. Oregon State University.
- Harvey, M. J., J. S. Altenbach, and T. L. Best. 1999. Bats of the United States. Arkansas Game and Fish Commission and US Fish and Wildlife Service, Arkansas.
- Hitchcock, C. L. and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle and London.
- Homer, C. G., J. A. Dewitz, L. Yang, S. Jin, P. Danielson, G. Xian, J. Coulston, N. D. Herold, J. D. Wickham, and K. Megown. 2015. Completion of the 2011 National Land Cover Database for the Conterminous United States-Representing a Decade of Land Cover Change Information. Photogrammetric Engineering and Remote Sensing 81(5): 345-354. Available online from: <http://www.mrlc.gov/nlcd2011.php>
- Isaacs, F. B. 2008. Results of Peregrine Falcon Breeding Area Monitoring in Oregon, 2003-2007: Final Report. Oregon Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon.
- Isaacs, F. B. 2015. Golden Eagles (*Aquila chrysaetos*) Nesting in Oregon, 2011-2014: Final Annual Report. Oregon Eagle Foundation, Inc., Klamath Falls, Oregon. February 10, 2015.
- Klein, K. J. 2005. Dispersal Patterns of Washington Ground Squirrels in Oregon. Thesis. Oregon State University, Corvallis, Oregon.
- Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). A. Poole, ed. The Birds of North America Online. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/684>; doi: 10.2173/bna.684
- Liguori, J. 2005. Hawks from Every Angle: How to Identify Raptors in Flight. Princeton University Press, Princeton, New Jersey.

- Meinke, R. 1982. Threatened & Endangered Vascular Plants of Oregon: An Illustrated Guide. USFWS Office of Endangered Species, Region 1, Portland, Oregon, with Assistance from US Forest Service Region 6, Bonneville Power Administration, Bureau of Land Management Oregon State Office, and Corps of Engineers. 352 pp. Available online at: <http://cascadiaprairieoak.org/wp-content/uploads/2014/04/Meinke-R.J.-1982.-Threatened-and-endangered-vascular-plants-of-Oregon-An-illustrated-guide.pdf>
- Morgan, R. L. and M. Nugent. 1999. Status and Habitat Use of the Washington Ground Squirrel (*Spermophilus washingtoni*) on State of Oregon Lands, South Boeing, Oregon, in 1999. Oregon Department of Fish and Wildlife (ODFW), Salem, Oregon.
- Morrow County. 2013. Morrow County Comprehensive Plan - Review and Revision. Revision date: October 1, 2013. Comprehensive Plan available online at: <http://morrowcountyoregon.com/planning-department/comprehensive-plan/>; Review and Revision available online at: <http://morrowcountyoregon.com/planning/19.pdf>
- National Audubon Society (Audubon). 2016. The Important Bird Areas. Data accessed May 2016. IBAs by state available online at: <http://www.audubon.org/bird/iba>
- Niehaus, T. F. and C. L. Ripper. 1976. A Field Guide to Pacific States Wildflowers: Washington, Oregon, California, and Adjacent Areas. Houghton Mifflin, Boston, Massachusetts.
- Oregon Biodiversity Information Center (ORBIC). 2016. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources. Portland State University. Available online at: <http://inr.oregonstate.edu/orbic/rare-species/rare-species-oregon-publications>
- Oregon Department of Agriculture (ODA). 2014. Lawrence's Milkvetch (*Astragalus collinus* var. *laurentii*). ODA, Salem, Oregon. Accessed November 2, 2016. Available online at: <https://www.oregon.gov/ODA/shared/Documents/Publications/PlantConservation/AstragalusCollinusLaurentiiProfile.pdf>
- Oregon Department of Agriculture (ODA). 2016. Oregon Listed Plants by County. Plant Conservation, ODA, Salem, Oregon. Accessed October 2016. Information available online from: <http://www.oregon.gov/ODA/programs/PlantConservation/Pages/ListedPlants.aspx>
- Oregon Department of Fish and Wildlife (ODFW). 2004. Division 415: Fish and Wildlife Habitat Mitigation Policy. Oregon Administrative Rules (OAR), ODFW. OAR 635-415-0000 to OAR 635-415-0025. November 26, 2004. Available online at: <http://www.dfw.state.or.us/OARs/415.pdf>
- Oregon Department of Fish and Wildlife (ODFW). 2008. Columbia Basin Wildlife Areas Management Plan. ODFW, Salem, Oregon. October 2008. Available online at: [http://www.dfw.state.or.us/wildlife/management\\_plans/wildlife\\_areas/docs/columbia\\_basin.pdf](http://www.dfw.state.or.us/wildlife/management_plans/wildlife_areas/docs/columbia_basin.pdf)
- Oregon Department of Fish and Wildlife (ODFW). 2015. Threatened, Endangered, and Candidate Fish and Wildlife Species. ODFW, Salem, Oregon. Updated November 2015. Available online at: [http://www.dfw.state.or.us/wildlife/diversity/species/threatened\\_endangered\\_candidate\\_list.asp](http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp)
- Oregon Department of Fish and Wildlife (ODFW). 2016. Deer and Elk Winter Range Maps. Accessed on October 19, 2016. Information available online at: <http://www.dfw.state.or.us/maps/>
- Oregon Eagle Foundation. 2015. Golden Eagle Survey Locations: 2011 - 2015. Metadata: Point and Vector Object Information for the Lake Harney Wind Project. 47 pp. Oregon Eagle Foundation, Klamath Falls, Oregon. August 2015.
- Pardieck, K. L., D. J. Ziolkowski, Jr., M. A. R. Hudson, and K. Campbell. 2015. North American Breeding Bird Survey Dataset 1966 - 2015, Version 2015.0. US Geological Survey, Patuxent Wildlife Research Center. Information available online at: [www.pwrc.usgs.gov/BBS/RawData/](http://www.pwrc.usgs.gov/BBS/RawData/)

- Preston, C. R. 1990. Distribution of Raptor Foraging in Relation to Prey Biomass and Habitat Structure. *Condor* 92: 107-112.
- Rosenzweig, M. L. 1989. Habitat Selection, Community Organization, and Small Mammal Studies. Pp. 5-21. *In*: D. W. Morris, Z. Abramsky, B. J. Fox, and M. R. Willig, eds. *Patterns in the Structure of Mammalian Communities*. Texas Tech University Press, Lubbock, Texas.
- Sibley, D. (2003). *The Sibley Field Guide to Birds of Western North America*. New York: Alfred A. Knopf.
- Smith, A. T. and C. H. Johnston. 2008. *Lepus townsendii*. The International Union for Conservation of Nature Red List of Threatened Species 2008: e.T41288A10413649. Accessed November 2016. Available online at: <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41288A10413649.en>
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2016. SSURGO Soils Data. Soil Survey Geographic (SSURGO) Database, USDA Soil Survey Staff, NRCS. SSURGO Database for Morrow County and Gilliam County, Oregon. Accessed November 2016. Web Soil Survey available online at: <http://websoilsurvey.nrcs.usda.gov/>
- U.S. Environmental Protection Agency (USEPA). 2000. Umatilla and Willow Creek Basin Assessment for Shrub Steppe, Grasslands, and Riparian Wildlife Habitats. EPA Regional Geographic Initiative: Final Report September 2000.
- U.S. Environmental Protection Agency (USEPA). 2016. Level III and Level IV Ecoregions of the Continental United States. Information available online at: <https://www.epa.gov/ecoresearch/level-iii-and-iv-ecoregions-continental-united-states>
- U.S. Fish and Wildlife Service (USFWS). 1998. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout; Final Rule. Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17. 63 Federal Register (FR) 111: 31647-31674. June 10, 1998.
- U.S. Fish and Wildlife Service (USFWS). 2002. Migratory Bird Mortality: Many Human-Caused Threats Afflict Our Bird Populations. USFWS Division of Migratory Bird Management, Arlington, Virginia. January 2002.
- U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. December 2008. Division of Migratory Bird Management, Arlington, Virginia. Available online at: <http://www.fws.gov/migratorybirds/pdf/management/BCC2008.pdf>
- U.S. Fish and Wildlife Service (USFWS). 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online at: [http://www.fws.gov/cno/pdf/Energy/2012\\_Wind\\_Energy\\_Guidelines\\_final.pdf](http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf)
- U.S. Fish and Wildlife Service (USFWS). 2016a. Gray Wolf (*Canis lupus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Gray wolf species profile available online at: <http://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=A00D>
- U.S. Fish and Wildlife Service (USFWS). 2016b. Yellow-Billed Cuckoo (*Coccyzus americanus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Yellow-billed cuckoo species profile available online at: <http://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=B06R>

- U.S. Fish and Wildlife Service (USFWS). 2016c. Bull Trout (*Salvelinus confluentus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed October 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Bull trout species profile available online at: <http://ecos.fws.gov/ecp0/profile/speciesProfile?slid=8212>
- U.S. Fish and Wildlife Service (USFWS). 2016d. Species by County Report. Environmental Conservation Online System (ECOS), USFWS. Accessed October 2016. Gilliam County report available online at: <http://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41021>; Morrow County report available online at: <http://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41049>
- U.S. Fish and Wildlife Service (USFWS). 2016e. County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species: Yellow Billed Cuckoo in Oregon. Environmental Conservation Online System (ECOS), USFWS. Accessed October 2016. Information available online from: <http://ecos.fws.gov/ecp0/profile/countiesByState?entityId=6901&state=Oregon>
- US Fish and Wildlife Service (USFWS). 2016f. North American Wolverine (*Gulo gulo luscus*). USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Species profile available online at: <http://ecos.fws.gov/ecp0/profile/speciesProfile.action?scode=A0FA>
- U.S. Fish and Wildlife Service (USFWS). 2016g. Washington Ground Squirrel (*Uroditellus washingtoni*). USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Species profile available online at: <https://ecos.fws.gov/ecp0/profile/speciesProfile.action?scode=A0HE>
- US Fish and Wildlife Service (USFWS). 2016h. Species Sheet: Washington Ground Squirrel. Oregon Fish and Wildlife Office, USFWS. Accessed October and November 2016. Available online at: <https://www.fws.gov/oregonfwo/articles.cfm?id=149489415>
- U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC). 2016. Resources for Project in Gilliam County and Morrow County, Oregon. Initial Project Scoping: IPaC, Environmental Conservation Online System (ECOS), USFWS. Accessed October and November 2016. IPaC: <http://ecos.fws.gov/ipac/>; IPaC Initial Project Scoping: <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action>; Gilliam County-specific resources available online at: <https://ecos.fws.gov/ipac/project/3LDKUN5MJVEODIBEBLYREZ6PXE/overview>; Morrow County-specific resources available online at: <https://ecos.fws.gov/ipac/project/7PWSFNQIXNDG3ASRQO4HVE7FDA/overview>
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). 2014. Seamless Wetlands Data by State: Oregon. USFWS NWI Data Mapper. USFWS NWI, Fort Snelling, Minnesota. Updated November 2014. Geodatabase and Shapefile data available online at: <http://www.fws.gov/wetlands/data/State-Downloads.html>
- U.S. Geological Survey (USGS). 2001. North American BBS Methodology Training. Accessed October 2016. USGS Breeding Bird Surveys (BBS), Patuxent Wildlife Research Center, Laurel, Maryland. Methodology Training available online at: <http://www.pwrc.usgs.gov/BBS/participate/training/>; Description and Methods available online at: <http://www.pwrc.usgs.gov/BBS/participate/training/1.html>
- U.S. Geological Survey (USGS). 2016. The National Map/US Topo. Last updated January 2016. Homepage available at: <http://nationalmap.gov/ustopo/index.html>
- U.S. Geological Survey (USGS) Digital Elevation Model (DEM). 2011. Digital Elevation Model (DEM) Imagery.



- US Geological Survey (USGS) National Land Cover Database (NLCD). 2011. National Land Cover Database 2011 (NLCD 2011). Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database (NLCD). USGS Earth Resources Observation and Science (EROS) Center, Sioux Falls, South Dakota. Information available online at: <http://www.mrlc.gov/nlcd2011.php>; Legend information available at: [http://www.mrlc.gov/nlcd11\\_leg.php](http://www.mrlc.gov/nlcd11_leg.php)
- Western EcoSystems Technologies, Inc. (WEST). In prep. Aquatic Resources Inventory and Wetland Delineation for the Boardman Solar Energy Facility in Morrow and Gilliam Counties, Oregon.
- Yensen, E. and P.W. Sherman. 2003. Ground-Dwelling Squirrels of the Pacific Northwest. US Fish and Wildlife Service (USFWS) Snake River Fish and Wildlife Office, Bureau of Land Management (BLM), Spokane District Office, and BLM, Oregon State Office. 28 pp. + maps. Available online at: <https://idfg.idaho.gov/sites/default/files/ground-squirrels-of-the-pacific-northwest-yensen-shermann-by-permission.pdf>

## **7.2 Laws, Acts, and Regulations**

- Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 United States Code (USC) § 668-668d. Bald Eagle Protection Act of 1940, June 8, 1940, Chapter 278, Section (§) 2, 54 Statute (Stat.) 251; Expanded to include the related species of the golden eagle October 24, 1962, Public Law (PL) 87-884, 76 Stat. 1246. As amended: October 23, 1972, PL 92-535, § 2, 86 Stat. 1065; November 8, 1978, PL 95-616, § 9, 92 Stat. 3114.
- Endangered Species Act (ESA). 1973. 16 United States Code (USC) §§ 1531-1544, Public Law (PL) 93-205, December 28, 1973, as amended, PL 100-478 [16 USC 1531 *et seq.*]; 50 Code of Federal Regulations (CFR) 402.
- Fish and Wildlife Habitat Mitigation Policy. Oregon Administrative Rules (OAR). Oregon Department of Fish and Wildlife; Division 415 - Fish and Wildlife Habitat Mitigation Policy; Sections (§§) 635-415-0000 to Oar 635-415-0025. Available online at: <http://www.dfw.state.or.us/OARs/415.pdf>



**Appendix A. U.S. Fish and Wildlife Service (USFWS) Information for Planning and  
Conservation (IPaC) Correspondence**

# *IPaC Trust Resources Report*

Generated November 01, 2016 05:07 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



# Table of Contents

IPaC Trust Resources Report .....	<a href="#"><u>1</u></a>
Project Description .....	<a href="#"><u>1</u></a>
Endangered Species .....	<a href="#"><u>2</u></a>
Migratory Birds .....	<a href="#"><u>4</u></a>
Refuges & Hatcheries .....	<a href="#"><u>7</u></a>
Wetlands .....	<a href="#"><u>8</u></a>

U.S. Fish & Wildlife Service

# IPaC Trust Resources Report

---

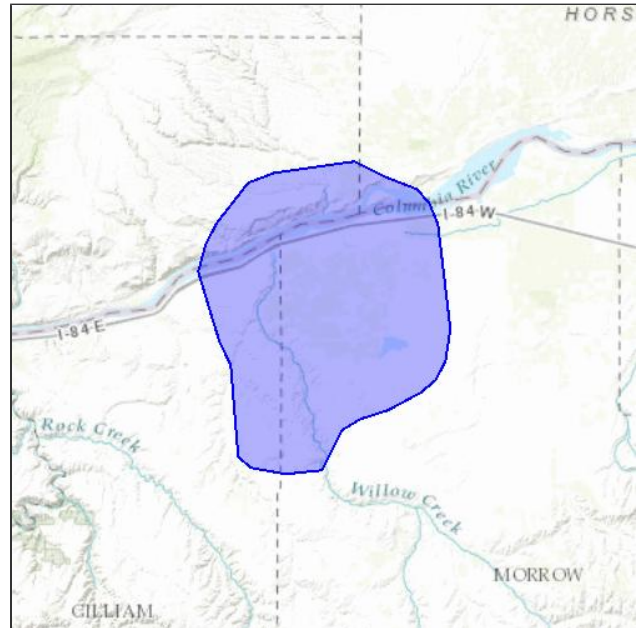


## LOCATION

Oregon and Washington

## IPAC LINK

<https://ecos.fws.gov/ipac/project/X474E-FJCPJ-EVDFJ-EPAEO-XZTDSQ>



## U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

### **Washington Fish And Wildlife Office**

510 Desmond Drive Se, Suite 102  
Lacey, WA 98503-1263  
(360) 753-9440

### **Oregon Fish And Wildlife Office**

2600 Southeast 98th Avenue, Suite 100  
Portland, OR 97266-1398  
(503) 231-6179

## Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

**This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.**

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

**A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.**

The list of species below are those that may occur or could potentially be affected by activities in this location:

### Birds

**Yellow-billed Cuckoo** *Coccyzus americanus*

Threatened

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

There is **proposed** critical habitat designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06R](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R)

### Fishes

**Bull Trout** *Salvelinus confluentus*

Threatened

MANAGED BY

Oregon Fish And Wildlife Office

Washington Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E065](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E065)

## Mammals

### **Gray Wolf** *Canis lupus*

Endangered

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=A00D](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A00D)

### **North American Wolverine** *Gulo gulo luscus*

Proposed Threatened

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=A0FA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0FA)

## Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

### **Bull Trout** *Salvelinus confluentus*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E065#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E065#crithab)

### **Chinook Salmon** *Oncorhynchus* (=Salmo) *tshawytscha*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E06D#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E06D#crithab)

### **Steelhead** *Oncorhynchus* (=Salmo) *mykiss*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E08D#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E08D#crithab)

# Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.<sup>[1]</sup> There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

---

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern  
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds  
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data  
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

**Bald Eagle** *Haliaeetus leucocephalus*

Bird of conservation concern

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B008](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008)

**Brewer's Sparrow** *Spizella breweri*

Bird of conservation concern

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0HA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA)

**Calliope Hummingbird** *Stellula calliope*

Bird of conservation concern

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0K3](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0K3)

**Cassin's Finch** *Carpodacus cassinii*

Bird of conservation concern

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0J6](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J6)

**Eared Grebe** *Podiceps nigricollis*

Season: Breeding

Bird of conservation concern

**Ferruginous Hawk** *Buteo regalis*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06X](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06X)

**Flammulated Owl** *Otus flammeolus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0DK](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DK)

**Fox Sparrow** *Passerella iliaca*

Season: Breeding

Bird of conservation concern

**Greater Sage-grouse** *Centrocercus urophasianus*

Season: Year-round

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06W](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06W)

**Green-tailed Towhee** *Pipilo chlorurus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0IO](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IO)

**Loggerhead Shrike** *Lanius ludovicianus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0FY](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY)

**Long-billed Curlew** *Numenius americanus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06S](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S)

**Peregrine Falcon** *Falco peregrinus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0FU](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU)

**Rufous Hummingbird** *selasphorus rufus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0E1](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0E1)

**Sage Thrasher** *Oreoscoptes montanus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0ID](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ID)

**Short-eared Owl** *Asio flammeus*

Season: Year-round

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0HD](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD)

**Swainson's Hawk** *Buteo swainsoni*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B070](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070)



**Western Grebe** *aechmophorus occidentalis*

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0EA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0EA)

Bird of conservation concern

**White Headed Woodpecker** *Picoides albolarvatus*

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0HU](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HU)

Bird of conservation concern

**Willow Flycatcher** *Empidonax traillii*

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0F6](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6)

Bird of conservation concern

## Wildlife refuges and fish hatcheries

**There are no refuges or fish hatcheries in this location**

# Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

## DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

## DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

## DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

## Freshwater Emergent Wetland

[PEM/SS1C](#)

[PEM/SS1CH](#)

[PEM1/UBF](#)

[PEM1/USCH](#)

[PEM1A](#)

[PEM1Ah](#)

[PEM1C](#)

[PEM1Ch](#)

[PEM1F](#)

[PEM1Fh](#)

## Freshwater Forested/shrub Wetland

[PFO/EM1CH](#)

[PFO1A](#)

[PFO1C](#)

[PFO1Ch](#)

[PSS/EM1Ch](#)

[PSS1/USCH](#)

[PSS1A](#)

[PSS1C](#)

[PSS1Ch](#)

## Freshwater Pond

[PAB4H](#)

[PUB/EM1C](#)

[PUB/EM1F](#)

[PUB/EM1Fx](#)

[PUBF](#)

[PUBFh](#)

[PUBFx](#)

[PUBH](#)

[PUBHh](#)

[PUBHx](#)

## Lake

[L1UBH](#)

[L1UBHh](#)

[L2UBFH](#)

[L2USCFH](#)

[L2USCh](#)

## Riverine

[R3UBH](#)

## **R4SBC**

A full description for each wetland code can be found at the National Wetlands Inventory website: <http://107.20.228.18/decoders/wetlands.aspx>

## **Appendix B. Great Basin Birds of Conservation Concern (BCC)**

**Appendix B. Birds of Conservation Concern in the Great Basin Bird Conservation Region.**

Common Name	Scientific Name
greater sage-grouse <sup>1</sup> (Columbia Basin Distinct Population Segment [DPS])	<i>Centrocercus urophasianus</i>
healed grebe <sup>2</sup>	<i>Podiceps nigricollis</i>
bald eagle <sup>3</sup>	<i>Haliaeetus leucocephalus</i>
ferruginous hawk	<i>Buteo regalis</i>
golden eagle	<i>Aquila chrysaetos</i>
peregrine falcon <sup>3</sup>	<i>Falco peregrinus</i>
yellow rail	<i>Coturnicops noveboracensis</i>
snowy plover <sup>4</sup>	<i>Charadrius nivosus</i>
long-billed curlew	<i>Numerius americanus</i>
marbled godwit <sup>2</sup>	<i>Limosa fedoa</i>
yellow-billed cuckoo <sup>1</sup> (western U.S. DPS)	<i>Coccyzus americanus</i>
flamulated owl	<i>Psiloscoops flammeolus</i>
black swift	<i>Cypseloides niger</i>
calliope hummingbird	<i>Selasphorus calliope</i>
Lewis's woodpecker	<i>Melanerpes lewis</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
white-headed woodpecker	<i>Picoides albolarvatus</i>
willow flycatcher <sup>4</sup>	<i>Empidonax traillii</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
pinyon jay	<i>Gymnorhinus cyanocephalus</i>
sage thrasher	<i>Oreoscoptes montanus</i>
Virginia's warbler	<i>Leiothlypis virginiae</i>
green-tailed towhee	<i>Leiothlypis virginiae</i>
Brewer's sparrow	<i>Leiothlypis virginiae</i>
black-chinned sparrow	<i>Spizella atrogularis</i>
sage sparrow	<i>Artemisiospiza nevadensis</i>
tricolored blackbird	<i>Agelaius tricolor</i>
black rosy-finch	<i>Leucosticte atrata</i>

Source: USFWS 2008

<sup>1</sup> ESA candidate<sup>2</sup> non-breeding in this Bird Conservation Region<sup>3</sup> ESA delisted<sup>4</sup> non-listed subspecies or population of threatened or endangered species

Attachment P-3A  
Species Occurrence Data from U.S.  
Fish and Wildlife Service



# *IPaC Trust Resources Report*

Generated November 01, 2016 05:07 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



# Table of Contents

IPaC Trust Resources Report .....	<a href="#"><u>1</u></a>
Project Description .....	<a href="#"><u>1</u></a>
Endangered Species .....	<a href="#"><u>2</u></a>
Migratory Birds .....	<a href="#"><u>4</u></a>
Refuges & Hatcheries .....	<a href="#"><u>7</u></a>
Wetlands .....	<a href="#"><u>8</u></a>

U.S. Fish & Wildlife Service

# IPaC Trust Resources Report

---

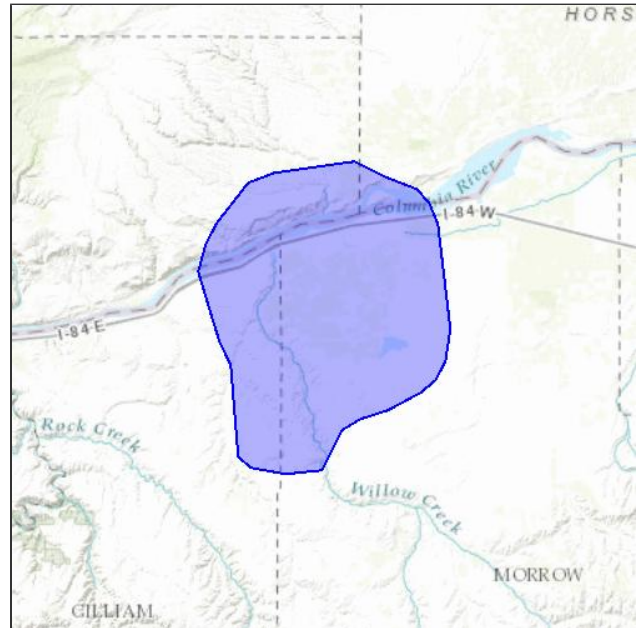


## LOCATION

Oregon and Washington

## IPAC LINK

<https://ecos.fws.gov/ipac/project/X474E-FJCPJ-EVDFJ-EPAEO-XZTDSQ>



## U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

### **Washington Fish And Wildlife Office**

510 Desmond Drive Se, Suite 102  
Lacey, WA 98503-1263  
(360) 753-9440

### **Oregon Fish And Wildlife Office**

2600 Southeast 98th Avenue, Suite 100  
Portland, OR 97266-1398  
(503) 231-6179

## Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

**This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.**

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

**A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.**

The list of species below are those that may occur or could potentially be affected by activities in this location:

### Birds

**Yellow-billed Cuckoo** *Coccyzus americanus*

Threatened

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

There is **proposed** critical habitat designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06R](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R)

### Fishes

**Bull Trout** *Salvelinus confluentus*

Threatened

MANAGED BY

Oregon Fish And Wildlife Office

Washington Fish And Wildlife Office

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E065](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E065)

## Mammals

### **Gray Wolf** *Canis lupus*

Endangered

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=A00D](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A00D)

### **North American Wolverine** *Gulo gulo luscus*

Proposed Threatened

MANAGED BY

Washington Fish And Wildlife Office

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=A0FA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0FA)

## Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

### **Bull Trout** *Salvelinus confluentus*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E065#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E065#crithab)

### **Chinook Salmon** *Oncorhynchus* (=Salmo) *tshawytscha*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E06D#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E06D#crithab)

### **Steelhead** *Oncorhynchus* (=Salmo) *mykiss*

Final designated critical habitat

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=E08D#crithab](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E08D#crithab)

# Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.<sup>[1]</sup> There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

---

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern  
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds  
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data  
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

**Bald Eagle** *Haliaeetus leucocephalus*

Bird of conservation concern

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B008](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008)

**Brewer's Sparrow** *Spizella breweri*

Bird of conservation concern

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0HA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA)

**Calliope Hummingbird** *Stellula calliope*

Bird of conservation concern

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0K3](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0K3)

**Cassin's Finch** *Carpodacus cassinii*

Bird of conservation concern

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0J6](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J6)

**Eared Grebe** *Podiceps nigricollis*

Season: Breeding

Bird of conservation concern

**Ferruginous Hawk** *Buteo regalis*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06X](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06X)

**Flammulated Owl** *Otus flammeolus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0DK](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DK)

**Fox Sparrow** *Passerella iliaca*

Season: Breeding

Bird of conservation concern

**Greater Sage-grouse** *Centrocercus urophasianus*

Season: Year-round

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06W](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06W)

**Green-tailed Towhee** *Pipilo chlorurus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0IO](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IO)

**Loggerhead Shrike** *Lanius ludovicianus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0FY](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY)

**Long-billed Curlew** *Numenius americanus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B06S](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S)

**Peregrine Falcon** *Falco peregrinus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0FU](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU)

**Rufous Hummingbird** *selasphorus rufus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0E1](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0E1)

**Sage Thrasher** *Oreoscoptes montanus*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0ID](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ID)

**Short-eared Owl** *Asio flammeus*

Season: Year-round

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B0HD](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD)

**Swainson's Hawk** *Buteo swainsoni*

Season: Breeding

Bird of conservation concern

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?spcode=B070](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070)

**Western Grebe** *aechmophorus occidentalis*

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0EA](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0EA)

Bird of conservation concern

**White Headed Woodpecker** *Picoides albolarvatus*

Season: Year-round

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0HU](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HU)

Bird of conservation concern

**Willow Flycatcher** *Empidonax traillii*

Season: Breeding

[http://ecos.fws.gov/tess\\_public/profile/speciesProfile.action?sPCODE=B0F6](http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6)

Bird of conservation concern



## Wildlife refuges and fish hatcheries

**There are no refuges or fish hatcheries in this location**

# Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

## DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

## DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

## DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

## Freshwater Emergent Wetland

[PEM/SS1C](#)

[PEM/SS1CH](#)

[PEM1/UBF](#)

[PEM1/USCH](#)

[PEM1A](#)

[PEM1Ah](#)

[PEM1C](#)

[PEM1Ch](#)

[PEM1F](#)

[PEM1Fh](#)

## Freshwater Forested/shrub Wetland

[PFO/EM1CH](#)

[PFO1A](#)

[PFO1C](#)

[PFO1Ch](#)

[PSS/EM1Ch](#)

[PSS1/USCH](#)

[PSS1A](#)

[PSS1C](#)

[PSS1Ch](#)

## Freshwater Pond

[PAB4H](#)

[PUB/EM1C](#)

[PUB/EM1F](#)

[PUB/EM1Fx](#)

[PUBF](#)

[PUBFh](#)

[PUBFx](#)

[PUBH](#)

[PUBHh](#)

[PUBHx](#)

## Lake

[L1UBH](#)

[L1UBHh](#)

[L2UBFH](#)

[L2USCFH](#)

[L2USCh](#)

## Riverine

[R3UBH](#)

## **R4SBC**

A full description for each wetland code can be found at the National Wetlands Inventory website: <http://107.20.228.18/decoders/wetlands.aspx>

Attachment P-3B  
Species Occurrence Data from Oregon  
Biodiversity Information Center  
*[Confidential and Not for Public Distribution.  
Provided Under Separate Cover.]*

Attachment P-4  
Baseline Survey Protocol

**BASELINE SURVEY PROTOCOL**  
**Boardman Solar Energy Facility**  
**Morrow and Gilliam Counties, Oregon**

---



**Prepared for:**

**Invenergy Solar Development LLC**

One South Wacker Drive, Suite 1800  
Chicago, Illinois 60606

---

**Prepared by:**

**Western EcoSystems Technology, Inc.**

415 W 17<sup>th</sup> St, Suite 200  
Cheyenne, Wyoming 82001

**September 6, 2016, rev. November 23, 2016**



## **BASELINE SURVEY PROTOCOL PREPARERS**

	<b>Western EcoSystems Technology</b>	
Eric Hallingstad		Project Manager
Cara Meinke		Senior Review
Andrea Palochak		Technical Editor

## **REPORT REFERENCE**

Western EcoSystems Technology, Inc. (WEST). 2016. Baseline Survey Protocol, Boardman Solar Energy Facility, Morrow and Gilliam Counties, Oregon. Prepared for Invenergy Solar Development LLC, Chicago, Illinois. Prepared by WEST, Cheyenne, Wyoming. 10 pp. + appendix and figures.



## **TABLE OF CONTENTS**

1	INTRODUCTION.....	1
2	TIERS 1 & 2 SITE CHARACTERIZATION .....	1
3	TIER 3 FIELD SURVEYS.....	2
3.1	Avian Use Surveys .....	2
3.1.1	Breeding Bird Surveys .....	2
3.1.2	Fixed-Point Small Bird Use Surveys and Reporting .....	3
3.1.3	Fixed-Point Large Bird Use Surveys .....	4
3.2	Raptor Nest Search .....	5
3.3	Detailed Habitat Mapping .....	5
3.4	Sensitive Species Surveys .....	6
3.5	Wetland Delineation .....	7
4	DATA ANALYSIS AND REPORTING.....	8
5	REFERENCES.....	9

## **LIST OF TABLES**

Table 1. Schedule for the Boardman Solar Energy Facility Baseline Survey Protocol. ....	9
---	---

## **LIST OF APPENDICES**

### Appendix A. Example Datasheets

BBS Survey Datasheet

Small Bird Fixed-Point Survey Datasheet

Large Bird Fixed Point Survey Datasheet

Incidental Observations Datasheet

Raptor Nest Location Datasheet

Threatened, Endangered, and Sensitive Species Data

## **LIST OF FIGURES**

Figure 1. Location of the proposed Boardman Solar Energy Facility and the proposed transmission line route.

Figure 2. Point and transect locations for avian use surveys at the Boardman Solar Energy Facility.

Figure 3. Raptor nest survey area for the proposed Boardman Solar Energy Facility.

Figure 4. National Wetland Inventory data for the Boardman Solar Energy Facility.

## **1 INTRODUCTION**

Western Ecosystems Technology, Inc. (WEST) has prepared the following Baseline Survey Protocol (Plan) for pre-construction studies at the Boardman Solar Energy Facility (Facility or Project) in Morrow and Gilliam counties, Oregon (Figure 1). While the US Fish and Wildlife Service (USFWS) does not have guidelines for solar development, the survey protocols and tiered study approach described in the Land-Based Wind Energy Guidelines (WEG; USFWS 2012) and Eagle Conservation Plan Guidance (ECPG; USFWS 2013) were considered when designing the Tier 1, 2, and 3 survey protocols described below. The Plan also addresses Oregon Department of Fish and Wildlife (ODFW) Mitigation Plan Policy. Comments received to-date from Invenergy, ODFW, and USFWS have been incorporated into this Plan.

## **2 TIERS 1 & 2 SITE CHARACTERIZATION**

WEST will prepare a Site Characterization Study (SCS) that follows the Tier 1 and 2 recommendations in the WEG. The SCS will include both a desktop analysis and a site visit conducted by an experienced biologist. The desktop analysis will involve compilation of available data on environmental conditions and natural resources within and near the proposed Project area. Examples of such data include spatial datasets with information about topography, elevation, land use/land cover, wetlands, and wildlife distributions in Oregon. Data sources include the USFWS Information for Planning and Conservation (IPaC) database, ODFW databases, US Geological Survey (USGS) Breeding Bird Surveys (BBS), National Audubon Society's (Audubon) Christmas Bird Counts (CBC), eBird online database, checklists from counties and wildlife areas, the USGS National Land Cover Database (NLCD), USFWS National Wetlands Inventory (NWI), and publicly available data from other energy facilities in the region.

At the direction of Invenergy, WEST may contact USFWS, ODFW, and Oregon Biodiversity Information Center (ORBIC) personnel directly to solicit information about species and natural communities of concern in the Project area.

Following the desktop analysis, a biologist experienced in evaluating biological resources as they relate to solar energy development will conduct a reconnaissance-level site visit. During the site visit, the biologist will evaluate the proposed Project area and surrounding land by driving and/or walking the proposed Project area using public roads. Site-specific characteristics and conditions of the Project area will be documented, such as vegetative, hydrologic, topographic, and biological features including land use, available wildlife habitat, wetlands, and species present. This information will be used to verify findings from the desktop assessment and tailor the findings to site-specific conditions. The biologist also will record the presence of any potential habitat for sensitive species.

A list of all species observed will be maintained and photographs of representative habitats in the Project area will be taken. Findings and observations during the site visit will be described in the SCS report, consistent with previous SCS information submitted to the Oregon Energy Facility Siting Council.

Based on findings from the desktop analysis, site visit, and agency communications, data gaps and potential impacts to biological resources will be identified and described in terms of potential permitting and monitoring requirements, as well as effects to Project development. Findings from relevant studies at renewable energy projects in the region and across the U.S. will be summarized. Results of Task 2 efforts will lead to the review of proposed field survey protocols to document the presence/absence and habitat suitability for certain wildlife and plant species, in particular the Washington ground squirrel (WGS; *Urocitellus washingtoni*), Lawrence's milkvetch (*Astragalus collinus* var. *laurentii*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), and grasshopper sparrow (*Ammodramus savannarum*).

### **3 TIER 3 FIELD SURVEYS**

The Tier 3 field survey protocols described below will provide adequate information to understand wildlife use of the Project area and potential impacts to wildlife and sensitive avian species from Project development. Data quality assurance/quality control (QA/QC) and reporting details for all Tier 3 surveys are outlined under Data Analysis and Reporting and example datasheets are provided in Appendix A.

#### **3.1 Avian Use Surveys**

Standardized avian use surveys proposed for the Project include: 1) breeding bird surveys, 2) fixed-point small bird surveys, and 3) fixed-point large bird surveys. While traveling onsite, biologists will also record observations of diurnal raptors (i.e., kites, accipiters, hawks, eagles, falcons, northern harriers [*Circus cyaneus*], and osprey [*Pandion haliaetus*]), other large birds, any species of concern, large flocks, and bird species not previously observed in the Project area. These data will be coded as incidental observations. These species of interest may also be detected outside of the survey plots while biologists are conducting surveys; these will also be recorded as incidental observations.

##### **3.1.1 Breeding Bird Surveys**

Breeding bird surveys (BBS) will be conducted during the spring breeding season to document use of the Project area by migratory songbirds. It is anticipated that three survey transects (Figure 2), consisting of five to seven points each, depending on transect length, will be surveyed once each month during the peak nesting season (i.e., April, May, June).

Points will be established at approximately 250-meter (m; 820-foot [ft]) intervals along three transect lines oriented in a general east-west direction to provide thorough coverage of the Project area. Transects will be spaced roughly 400 m (1,312 ft) apart. Surveys will be focused on identifying all small birds within a 100-m (328-ft) radius survey plot centered on the survey point. Each point will be surveyed for five minutes (min) and all birds seen or heard will be recorded. Surveys will be conducted from one-half hour before sunrise to no later than four hours after sunrise. In addition to collecting data on bird use, incidental observations of other wildlife (e.g., sensitive species, raptor prey species) will be recorded while walking transects.

BBS data will be reported as the number of birds observed/5-min survey. Species composition, species diversity, abundance (total, by bird type, and by species), relative abundance, and frequency of observations per bird type and species will also be calculated. Potential patterns in flight heights, behaviors, habitat selection, and detection type for all observations will be investigated. Weather information recorded for each survey point will include temperature, wind speed and direction, and cloud cover.

### *3.1.2 Fixed-Point Small Bird Use Surveys and Reporting*

Fixed-point small bird use surveys will be conducted at five survey points spread throughout the Project area (Figure 2) to assess the year-round temporal and spatial use of the of Project area by small birds. Point locations will be selected to provide coverage of all habitats present within the Project area. All points will be surveyed for ten minutes each once per month (one visit to site per month) from September 2016 to August 2017. The surveys will be conducted in the morning, when passerines are typically most active. Whereas the BBS will target breeding season use by migratory songbirds, the fixed point surveys will provide information on use of the Project area by small birds throughout all seasons.

Survey plots will be defined as 100-m (328-ft) radius circular plots centered on the survey point. While the focus of this survey will be on small birds (passerines, some cuckoos, swifts, hummingbirds, kingfishers, and woodpeckers), observations of other species of interest (e.g., raptor species) within the 100-m (328-ft) survey plots will also be recorded. Estimated distance to each bird observed will be recorded with the assistance of a laser rangefinder. The date, start, and end time of each observation period, species or best possible identification, number of individuals, sex and age class, distance from plot center when first observed, closest distance to plot center with the assistance of a laser rangefinder, flight height, activity, detection method (visual or auditory), and habitat will also be recorded. Perch locations and flight paths for species of interest (e.g., raptors, special-status species) will be mapped on USGS 1:24,000-scale topographic maps or aerial imagery. Weather information recorded for each survey point will include temperature, wind speed, wind direction, and cloud cover.

Small bird data will be reported as the number of small bird observations/10-minute survey/100-m survey plot. Species composition, species diversity, abundance (total, by bird type, and by species), relative abundance, and frequency of observations per bird type and species will also be calculated.

### **3.1.3 Fixed-Point Large Bird Use Surveys**

Fixed-point large bird use surveys will be conducted at two survey points within the Project area to assess the year-round temporal and spatial use of the Project area by large birds. To be consistent with methodologies used at many other renewable energy facilities and recommendations made in the USFWS's Eagle Conservation Plan Guidance (USFWS 2013), large bird use surveys will be conducted for 60 min. Both points will be surveyed once per month (one visit to site per month) from September 2016 to August 2017, for a total of 24 survey hours. Surveys will be spread throughout the daylight hours. Whereas the BBS and fixed-point small bird surveys will target use by migratory songbirds, the fixed point surveys will provide information on use of the Project area by large birds, and raptors in particular.

Survey plots will be defined as 800-m (2,625-ft) radius circular plots centered on the survey point. Survey point locations will be selected such that their associated survey plots provide nearly 100% coverage of the Project area. Large bird types recorded during surveys included diurnal raptors, vultures, doves/pigeons, large corvids (e.g., ravens, magpies, and crows), and goatsuckers (i.e., nighthawks). While the focus this survey will be on large birds, observations of other species of interest (e.g., sensitive species) within the survey plots will also be recorded. Estimated distance to each bird observed will be recorded with the assistance of a laser rangefinder and/or aerial imagery. The date, start, and end time of each observation period, species or best possible identification, number of individuals, sex and age class, distance from plot center when first observed, closest distance to plot center, flight height, activity, and habitat will also be recorded. Perch locations and flight paths for all large birds and other species of interest (e.g., sensitive species) will be mapped on USGS 1:24,000-scale topographic maps or aerial imagery. Weather information recorded for each survey point will include temperature, wind speed, wind direction, and cloud cover.

Large bird data will be reported as the number of large bird observations/60-min survey/800-m survey plot. Species composition, species diversity, abundance (total, by bird type, and by species), relative abundance, and frequency of observations per bird type and species will also be calculated. Potential patterns in flight heights, behaviors, habitat selection, and time of day for all observations will be investigated.

Eagle observations will be recorded to the standards recommended by the USFWS in the ECPG. Observers will record detailed notes at 1-min intervals to describe the activities of eagles and the behavior prevalent during each 1-min interval (USFWS 2013). Eagle minutes will be calculated as total eagle flight minutes within 800-m (2,625-ft) survey plots up to 200 m in height. Although this data will not be appropriate for use in modeling analyses, it will allow for comparison of eagle use at the Project to other renewable energy facilities in the region. Per USFWS recommendation for this Project, WEST biologists will pay particularly close attention to behaviors (e.g., migration, foraging) exhibited by eagles observed in the Project area. These behaviors may indicate the potential for impacts of Project development on eagle foraging habitat.

### 3.2 Raptor Nest Search

This task includes surveys for all raptor nests within 1.6 kilometers (km; 1.0 mile [mi]) of the Project boundary and proposed transmission line route (Figure 3). The objective is documenting the number and distribution of all raptor nests within the survey area. According to the USFWS (2008), this distance is the largest recommended construction setback to avoid disturbance of active raptor nests.

The survey will be conducted from the ground by experienced field personnel. The survey will target likely raptor nesting habitat (e.g., rocky outcrops, wooded areas, human structures such as power poles and wind mills). The initial raptor nest survey is proposed to be conducted in late March or early April of 2017, prior to trees leafing out (which makes nests difficult to detect). Species such as red-tailed hawks (*Buteo jamaicensis*), great-horned owls (*Bubo virginianus*), and eagles will have established nests by early April; however, the initial survey likely will occur before Swainson's hawks (*Buteo swainsoni*) begin nesting. Up to two additional rounds of survey will be conducted in May and June, as needed. These visits will focus on determining nest status and productivity outcomes for all nests documented during the first survey visit. Furthermore, all observations of Swainson's hawks during these later visits will result in a thorough search for late season nest initiation typical of this species.

Prior to surveys, WEST will request existing data from USFWS, ODFW, and the Oregon Eagle Foundation (OEF) about any known raptor nest or roost locations within 1.6 km of the Project. This area of the Columbia Plateau has been extensively surveyed in recent years both for existing/proposed energy facilities as well as for state-wide efforts to record eagle nest locations. All previously documented nest locations will be visited.

For all raptor nest structures detected, biologists will record nest location coordinates with a hand-held Global Positioning System (GPS) device, species present (if any), condition of the nest, presence of eggs or young (if present and visible), substrate of the nest (e.g., tree, power pole, rock outcrop), and height and aspect of the nest. Nest status information to be recorded includes: 1) Unoccupied - a nest with no evidence of recent use, or attendance by adult raptors; 2) Occupied - a nest site exhibiting recent refurbishing (e.g., greenery, recent egg cup), and/or is represented by one or more adults on or immediately adjacent to nest structure(s).

### 3.3 Detailed Habitat Mapping

The objectives of habitat mapping are to quantify habitat types found in and near the Project area, delineate areas needed to be surveyed for species of concern (see below), and to aid in characterizing habitat types, mapping codes, and categorization according to the habitat definitions as per ODFW's Fish and Wildlife Habitat Mitigation Policy (ODFW 2004), which are utilized as a foundation for their mitigation standards. The habitat mapping will include a qualitative determination regarding a habitat's potential to be used by general wildlife as well as species of concern as defined by the USFWS and ODFW. Land cover and potential sensitive species habitat, including any ground squirrel colonies detected, will be mapped.

Over one to two days (~8-12 hours), a field biologist will drive around the site to visually assess land cover and topographic conditions from publically-accessible roads. The biologist will access remote areas on foot. Land cover and potential habitat for sensitive species will be identified and delineated on hardcopy maps with recent aerial imagery (USDA National Agriculture Imagery Program) as the background. The mapped information will be digitized in a Geographic Information System (GIS) so that it is available to view with proposed facility infrastructure and other Project information. Habitats will be assigned a preliminary ODFW categorization value pending wildlife survey results (i.e., sensitive species presence/absence survey results may influence categorization).

### **3.4 Sensitive Species Surveys**

The objective of the sensitive species surveys is to document presence/absence and spatial occurrence of plant and animal species of concern such as Oregon listed and special-status species or federally threatened or endangered species in and near the Project area. Since the proposed Project is a solar development, no state guidance for such developments is available. Therefore, these surveys follow recommendations in Oregon's Wind Energy Siting and Permitting Guidelines (Oregon Columbia Plateau Ecoregion Wind Energy Taskforce 2008).

In general, the sensitive species surveys will occur in areas of native habitat that are proposed for facilities construction and a buffer around these areas once the proposed Project layout has been determined. At a minimum, a 305-m (1,000-ft) survey buffer of all proposed ground disturbance activities will be surveyed, if suitable habitat for target species is present. No ground disturbing activity will occur within 239-m (785-ft) of any active WGS colonies.

The surveys include a two-phased approach that includes: (1) a desktop and field evaluation of habitat suitability for sensitive species (via the SCS, as well as habitat mapping) and; (2) field surveys. During the first phase, information on species distribution and occurrence from the ODFW, ORBIC, and USFWS will be used to identify species potentially occurring in the study area. A final list of target plant and animal species for sensitive species surveys will be developed from sensitive species occurrence and range information presented in the SCS, as well as the availability of suitable habitat for potential target species (as identified during habitat mapping). Secondly, suitable areas will be surveyed for the presence/absence of the target special-status species. Two survey rounds will be conducted during the appropriate survey window for target species (March to mid-June).

The primary survey technique for Washington ground squirrels (WGS) and other target species will be pedestrian transects; protocols will be based on the standard WGS detection survey protocol developed by the ODFW (Morgan and Nugent, 1999). The standard WGS survey protocol will be modified as follows:

- surveys may be conducted as early as March if/when weather conditions are favorable for detecting active adult squirrels,
- surveys may be conducted beyond noon if/when weather conditions allow, and



- surveys may continue when moderate winds occur if/when surveyors have determined that squirrels can still be detected with relative certainty

Observers will systematically search the survey areas for WGS and other target species by walking parallel lines 50 meters apart. The date, time of observation, species, number of individuals, detection method (auditory and/or visual), sex and age class, location, flight height (if applicable), activity, and habitat will also be recorded for all target species observations. WGS detections will be confirmed using squirrel droppings (scat) associated with a burrow hole, positive auditory observation, and/or positive visual observation of squirrels. The order in which the detection components occurred will be tracked to facilitate future analysis of that data. When a suspected target species detection occurs, surveyors may stray from the transect to look for evidence of presence. Surveys will document WGS detection numbers and approximate sizes of activity locations, and be comparable with transect survey efforts for WGS in other portions of the species' range in the Columbia Plateau in Oregon. All individuals will be familiar with WGS detection by sight and sound, as well as other target species. The surveys will include detailed GPS data of areas surveyed and all target species detections. All GPS data will be provided in an editable GIS format.

### **3.5 Wetland Delineation**

WEST will conduct a two-part analysis to document potential wetlands and waters of the U.S. (WUS) within the Project area and along the proposed transmission line route. The first part will be a desktop analysis to identify potential wetland and WUS and applicable permitting. The second part will include field surveys to delineate wetlands and identify WUS. WEST will conduct the desktop analysis in September 2016 that will cover the entire survey area. The wetlands/WUS field survey will take place starting late September 2016.

WEST will review publicly available data on potential wetland and WUS resources in the Project area, including data from the USFWS NWI, USGS National Hydrography Dataset, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), topographic maps, and aerial imagery (see Figure 4). Aerial imagery will be reviewed to help inform potential inundation/saturation intervals at visible features. All data obtained during the data gathering exercise will be plotted on maps.

WEST will evaluate the gathered data and identify any feature(s) that may be considered jurisdictional by the U.S. Army Corps of Engineers (Corps or USACE) and describe permitting options and recommendations based on the features present and the Project development plan, specifically regarding the access road into the Project area from Three Mile Canyon Road. Details specifically related to Nationwide Permit 12 (Utility Line), 14 (Linear Transportation), and 51 (Land-Based Renewable Energy Facilities) will be discussed.

WEST assumes that the field survey will cover the 2.4-square km (km<sup>2</sup>; 0.9-square mile [mi<sup>2</sup>]) Project area and the proposed 3.2-km (2.0-mi) transmission line route with a 91-m (300-ft) buffer on each side (Figure 4). To complete the field survey, WEST scoped a 2-day effort for one survey team of two individuals. One team member will be designated the Team Lead, who will be an

experienced wetland specialist. One focal area of the field survey will be along the access road into the Project area from Three Mile Canyon Road. Some areas may not be visited if no potential wetland or WUS features are indicated, so the work effort may vary depending on the extent of wetland/WUS present; this will be more refined as Project details become available.

Wetlands will be delineated in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* (1987 Manual; Environmental Laboratory 1987) and additional information provided within the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) and Oregon Administrative Rules (OAR) for Wetland Delineations 141-090-0005 through 141-090-0055 (Oregon Department of State Lands [ODSL] 2001). The 1987 Manual emphasizes a three-parameter approach to identify wetlands that may be federally regulated, including the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. These criteria will be applied to establish the presence and extent of wetlands. The delineated wetlands will be classified according to methodologies set forth in *Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

All drainage features within the survey area will be reviewed to determine if they are potential WUS. The determination if all or portions of a drainage meet the WUS criteria will focus on the presence of a definable bed and bank, ordinary high water mark (OHWM), surface connection to waters designated navigable, evidence of flow, and/or presence of areas that meet the Corps' criteria for wetlands. If present, the OHWM will be recorded with a sub-meter accurate GPS unit. Wetland and upland sample points will be documented with the approved Corps regional datasheets and photographs. All features and sample points will be recorded with a sub-meter accurate GPS unit, as required by the Oregon Department of State Lands.

## **4 DATA ANALYSIS AND REPORTING**

Data analysis and reporting includes data entry, QA/QC, data storage, data analysis, and report compilation. WEST will analyze data in a similar fashion to other accepted baseline studies. Data from the field surveys will be entered into a relational database (e.g., ACCESS) and checked thoroughly for data entry errors and missing data. Reports will be prepared for tasks as outlined in the table below; all reports will be presented in standard scientific format using guidelines and metrics outlined by Invenergy.

For avian use surveys, the number of avian species seen during each point count survey will be standardized to a unit area and unit time searched. Mapped raptor flight paths and behaviors will be qualitatively compared to study area characteristics (e.g., topographic features). Mapped raptor nest locations and occupancy status will be included in reports. If consistent use patterns or concentrations are evident, further information may be presented in terms of avian use in relation to vegetation and/or topographic variables (e.g., vegetation transition zones, distance to ridge edge, distance to water, etc.).

WEST will prepare a wetland and waters report that will include general site descriptions, survey methods, descriptions of wetlands and WUS identified in the survey area, wetland datasheets,

wetland and WUS photographs, and figures displaying wetland locations (on aerial backgrounds). The report will be suitable for submission to the Oregon Department of State Lands (DSL) and the Corps.

Observations of sensitive species will be mapped and potential relationships between observation locations, habitat, and species behavior will be assessed. If review of the maps indicates consistent use patterns or concentrations, further information may be presented in terms of avian use in relation to vegetation and/or topographic variables (e.g., vegetation transition zones, distance to water, etc.).

The schedule below provides Invenergy's targeted dates for surveys, as well as draft and final reports (Table 1). Factors outside the control of WEST and Invenergy may influence the schedule.

**Table 1. Schedule for the Boardman Solar Energy Facility Baseline Survey Protocol.**

<b>Task</b>	<b>Due Date</b>
Avian Use Survey—BBS Surveys	April 2017-June 2017
Avian Use Survey—Fixed Point Surveys	September 2016-August 2017
Draft BBS and Avian Use Report Due	Sept. 30, 2017
Final BBS Avian Use Report Due	Oct. 31, or one week after comments
Raptor Nest Survey	March - May or June 2017
Draft Raptor Nest Survey Report Due	May 31, 2017 or one week after last survey
Final Raptor Nest Survey Report Due	July 1, 2017, or one week after comments
Draft Site Characterization/Habitat Mapping Report Due	October 26, 2016
Final Site Characterization/Habitat Mapping Report Due	December 2, 2016, or one week after final comments
Draft Wetlands Report Due	November 9, 2016
Final Wetlands Report Due	November 16, 2016, or one week after comments
Sensitive Species Survey	March – mid-June 2017
Draft Sensitive Species Survey Report Due	June 2, 2017
Final Sensitive Species Survey Report Due	June 9, 2017, or one week after comments

## **5 REFERENCES**

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. US Department of the Interior (USDOI) Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Environmental Laboratory. 1987. 1987 Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Final report prepared by Environmental Laboratory. January 1987. US Army Corps of Engineers (USACOE), Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi, Vicksburg, Mississippi. Available online at: <http://el.ercd.usace.army.mil/elpubs/pdf/wlman87.pdf>

ESRI. 2016. World Imagery and Aerial Photos. ArcGIS Resource Center. ESRI, producers of ArcGIS software. Redlands, California.

- Morgan, R. L. and M. Nugent. 1999. Status and Habitat Use of the Washington Ground Squirrel *Spermophilus washingtoni* on State of Oregon Lands, South Boeig, Oregon in 1999. Oregon Department of Fish and Wildlife (ODFW), Salem, Oregon.
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- Oregon Columbia Plateau Ecoregion Wind Energy Taskforce. 2008. Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines. Oregon Department of Fish and Wildlife, USFWS, and Oregon Department of Energy, Portland, Oregon.
- Oregon Department of Fish and Wildlife (ODFW). 2004. Division 415: Fish and Wildlife Habitat Mitigation Policy. Oregon Administrative Rules (OAR), ODFW. OAR 635-415-0000 to OAR 635-415-0025. November 26, 2004. Available online at: <http://www.dfw.state.or.us/OARs/415.pdf>
- Oregon Department of State Lands (ODSL). 2001. Guidebook for Hydrogeomorphic (HGM)-Based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles. ODSL, Salem, Oregon.
- US Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. J. S. Wakeley, R. W. Lichvar, and C. V. Noble, eds. Wetlands Regulatory Assistance Program Technical Report ERDC/EL TR-08-28. US Army Engineer Research and Development Center (ERDC), Vicksburg, Mississippi. September 2008. Available online at: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1046489.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046489.pdf)
- US Department of Agriculture (USDA). 2016. Imagery Programs - National Agriculture Imagery Program (NAIP). USDA - Farm Service Agency (FSA). Aerial Photography Field Office (APFO), Salt Lake City, Utah. Data accessed May 2016. Information available online at: <http://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/index>
- US Fish and Wildlife Service (USFWS). 2008. Guidelines for Raptor Conservation in the Western United States Draft. USFWS, Region 9, Division of Migratory Bird Management, Washington D.C. February 2008. Accessed July 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands\\_and\\_minerals/oil\\_and\\_gas/february\\_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands_and_minerals/oil_and_gas/february_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf)
- US Fish and Wildlife Service (USFWS). 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online at: [http://www.fws.gov/cno/pdf/Energy/2012\\_Wind\\_Energy\\_Guidelines\\_final.pdf](http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf)
- US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. Executive Summary and frontmatter + 103 pp. Available online at: <https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>
- US Geological Survey (USGS). 2015. The National Map/US Topo. Last updated January 2015. Homepage available at: <http://nationalmap.gov/ustopo/index.html>
- USA Topo. 2016. USA Topo Maps. US Geological Survey (USGS) topographical maps for the United States. ArcGIS. ESRI, producers of ArcGIS software. Redlands, California.

## **Appendix A. Example Datasheets**

Start time \_\_\_\_\_ End time \_\_\_\_\_ Visibility (circle one) G F P MaxVis \_\_\_\_\_ ft or mi Cloud cover \_\_\_\_\_ % Temp \_\_\_\_\_ F  
WEATHER: Time \_\_\_\_\_ WindDir \_\_\_\_\_ Speed \_\_\_\_\_ mph Gusts: Low \_\_\_\_\_ mph High \_\_\_\_\_ mph Precip \_\_\_\_\_ PlotSz 100m  
Survey Length \_\_\_\_\_ min Dominant Habitat (For Entire Plot) (>50%) \_\_\_\_\_ Secondary Habitat (For Entire Plot) \_\_\_\_\_.

[illegible]

**Activity Codes:** SO - soaring; FL - flapping-gliding; PE - perched; MOB - being mobbed; TER - undulating/territorial flight; AUD - auditory; OT-other (specify) ; HU - hunting, kiting/hovering; ST - stooping/diving at prey; AG - stooping or diving agonistically with other birds; CO-courtship display; OC-other call; NA – nesting activity; AC – alarm/warning call; SI - singing

**Habitat Codes:** SB-shrub; CR-cropland; GR-grassland; FR-forest/woodlot; RI-riparian; RO-rocky outcrop; WA-open water; OT-other (specify)

**Sex:** Male Female Mixed Unknown      **Age:** A-adult SA-sub-adult I-immature J-juvenile M-mix U-unknown

**Wind Dir:** N,NE,E,SE,S,SW,W,NW    **Visibility:** Good- Fair- Poor    **Precipitation:** None, Light Rain, Rain, Light Snow, Snow, Sleet, Hail, Other

(field tech) Page \_\_\_\_ of \_\_\_\_

**For office use only:**

**Data Entry Date/ Initials**

--	--

Page #

--	--

Survey Length \_\_\_\_\_ min Dominant Habitat (For Entire Plot) (>50%) \_\_\_\_\_ Secondary Habitat (For Entire Plot) \_\_\_\_\_.

[illegible]

Comments:

**Activity Codes:** SO - soaring; FL - flapping-gliding; PE - perched; MOB - being mobbed; TER - undulating/territorial flight; AUD - auditory; OT-other (specify) ; HU - hunting, kiting/hovering; ST - stooping/diving at prey; AG - stooping or diving agonistically with other birds; CO-courtship display; OC-other call; NA - nesting activity; AC - alarm/warning call; SI - singing

**Habitat Codes:** SB-shrub; CR-cropland; GR-grassland; FR-forest/woodlot; RI-riparian; RO-rocky outcrop; WA-open water; OT-other (specify)

**Sex:** Male Female Mixed Unknown      **Age:** A-adult SA-sub-adult I-immature J-juvenile M-mix U-unknown

**Wind Dir:** N,NE,E,SE,S,SW,W,NW    **Visibility:** Good- Fair- Poor    **Precipitation:** None, Light Rain, Rain, Light Snow, Snow, Sleet, Hail, Other

Survey being conducted when observed: \_\_\_\_\_

DATE of first observation on this pg.: \_\_\_\_\_ DATE of last observation on this pg.: \_\_\_\_\_

Obs. No.	Date	Time	Observer	Species	Sex	Age	# Of Ind.	Dom Habitat (1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> ...)	Dist. from observer (m)	LOCATION			Notes
										UTM Datum	UTM coord. for sensitive species		
											Northing (7 #'s)	Easting (6 #'s)	
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			
										NAD1983			

**Activity Codes:** SO - soaring; FL - flapping-gliding; PE - perched; MOB - being mobbed; TER - undulating/territorial flight; AUD - auditory; OT-other (specify) ; HU - hunting, kiting/hovering; ST - stooping/diving at prey; AG - stooping or diving agonistically with other birds CO-courtship display; OC-other call; NA - nesting activity; AC - alarm/warning call; SI - singing

**Habitat Codes:** SB-shrub; CR-cropland; GR-grassland; FR-forest/woodlot; RI-riparian; RO-rocky outcrop; WA-open water; OT-other (specify)

**Sex:** Male Female Mixed Unknown **Age:** A-adult SA-sub-adult I-immature J-juvenile M-mix U-unknown

**Wind Dir:** N,NE,E,SE,S,SW,W,NW **Visibility:** Good- Fair- Poor **Precipitation:** None, Light Rain, Rain, Light Snow, Snow, Sleet, Hail, Other

(field tech) Page \_\_\_\_ of \_\_\_\_

For office use only:

Data Entry Date/ Initials

Page #

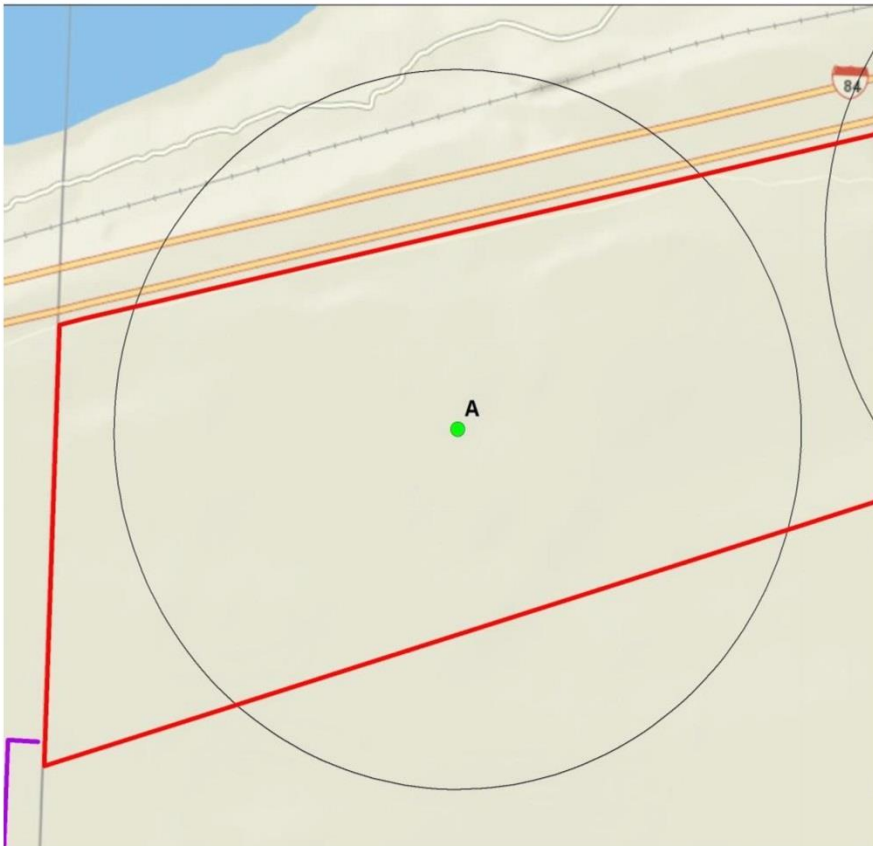


Date \_\_\_\_\_ Observer \_\_\_\_\_ Start time \_\_\_\_\_ End time \_\_\_\_\_ Visibility G F P MaxVis \_\_\_\_\_ mi or ft Cloud cover \_\_\_\_\_ %

Temp \_\_\_\_\_ F WEATHER Time: \_\_\_\_\_ WindDir \_\_\_\_\_ Speed: \_\_\_\_\_ mph Gusts: Low \_\_\_\_\_ mph High \_\_\_\_\_ mph Precip \_\_\_\_\_

[illegible]

<b>Activity Codes:</b> SO - soaring; FL - flapping-gliding; PE - perched; MOB - being mobbed; TER - undulating/territorial flight; AUD - auditory; OT-other (specify); HU - hunting, kiting/hovering; ST - stooping/diving at prey; AG - stooping or diving agonistically with other birds; CO-courtship display; OC-other call; NE - nesting activity; AC - alarm/warning call; SI - singing; SW-swimming			
<b>Habitat Codes:</b> SB-sagebrush; SS-shrub/steppe; CR-cropland; GR-grassland; FR-forest/woodlot; RI-riparian; RO-rocky outcrop; OW-open water; OT-other (specify) <b>**check with PM for a full list, or the back of this datasheet.</b>			
<b>Sex:</b> M-male; F-female; MIXed; U-unknown		<b>Age:</b> A-adult; SA-sub-adult; I-immature; J-juvenile; M-mix; U-unknown	
<b>Wind Dir:</b> N,NE,E,SE,S,SW,W,NW	<b>Visibility:</b> Good- Fair- Poor	<b>Precipitation:</b> None, Light Rain, Rain, Light Snow, Snow, Sleet, Hail, Other	

[illegible]

**For office use only:** Digitizing Date/ Initials  Data Entry Date/ Initials  Page #

## Raptor Nest Location Datasheet

Project Name : Boardman Solar

Date first observed: \_\_\_\_\_

Is this a follow-up visit? \_\_\_\_\_

Observer: \_\_\_\_\_

Aerial or ground survey? \_\_\_\_\_

Raptor Nest ID: \_\_\_\_\_

Map/photo: taken? Location?: \_\_\_\_\_

Species: \_\_\_\_\_

Location: Township \_\_\_\_\_ N / S Range \_\_\_\_\_ E / W

Section \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4

UTM Zone \_\_\_\_\_

GEO Datum (circle one) NAD 27 NAD 83

Northing \_\_\_\_\_ Easting \_\_\_\_\_

Ownership : (circle one) P S FS BLM Unk Other: \_\_\_\_\_

USGS Quad Name: \_\_\_\_\_

BLM Quad Name / Map name: \_\_\_\_\_

County: \_\_\_\_\_

Vegetation type: \_\_\_\_\_

Nest: Nest site elevation: \_\_\_\_\_

Nest status: \_\_\_\_\_

Nest condition: \_\_\_\_\_

Nest Exposure: \_\_\_\_\_

Number of eggs: \_\_\_\_\_

Young: \_\_\_\_\_

Nest substrate: \_\_\_\_\_

Hght of substrate: \_\_\_\_\_

Nest hght on/in substrate  
(ft.): \_\_\_\_\_

**Nest substrate codes** : ANS = artificial nesting structure; LOW = low ridge/hillside; BUR = burrow; MMS = manmade structures; CLF = cliff; ROC = rock cavity; CON = conifer; ROK = rock outcrop; DEC = deciduous tree; TRC = tree cavity; ERR = erosion remnant (badland); UNK = unknown; GND = ground; OTH = other (indicate in comments)

**Vegetation type**: Coniferous forest, deciduous forest, juniper woodlands, basin-prairie shrub steppe, mountain-foothill shrub steppe, riparian shrub-shrub steppe, grasslands, wetlands, croplands/agricultural lands, disturbed areas, other (specify in comments)

**Nest status** : OCCU = Occupied/active; INAC = inactive; PRED = predated; GONE = nest was gone; DNLW = did not locate; UNK = Unknown

**Nest condition codes** = Good = nest is able to be used with little or no maintenance; Fair = Nest is not dilapidated, but needs some repair to be used; Dilapidated = Nest is dilapidated, in need of major repair in order to be used; Gone = there may or may not be evidence of where the nest was; Unknown = nest is obviously present (i.e., a tree cavity) but because of its location, a determination of its condition cannot be made.

**Remarks/Comments: (Physical relationship to other nests, proximity to potential disturbances, etc.)**

---

---

---

---

---

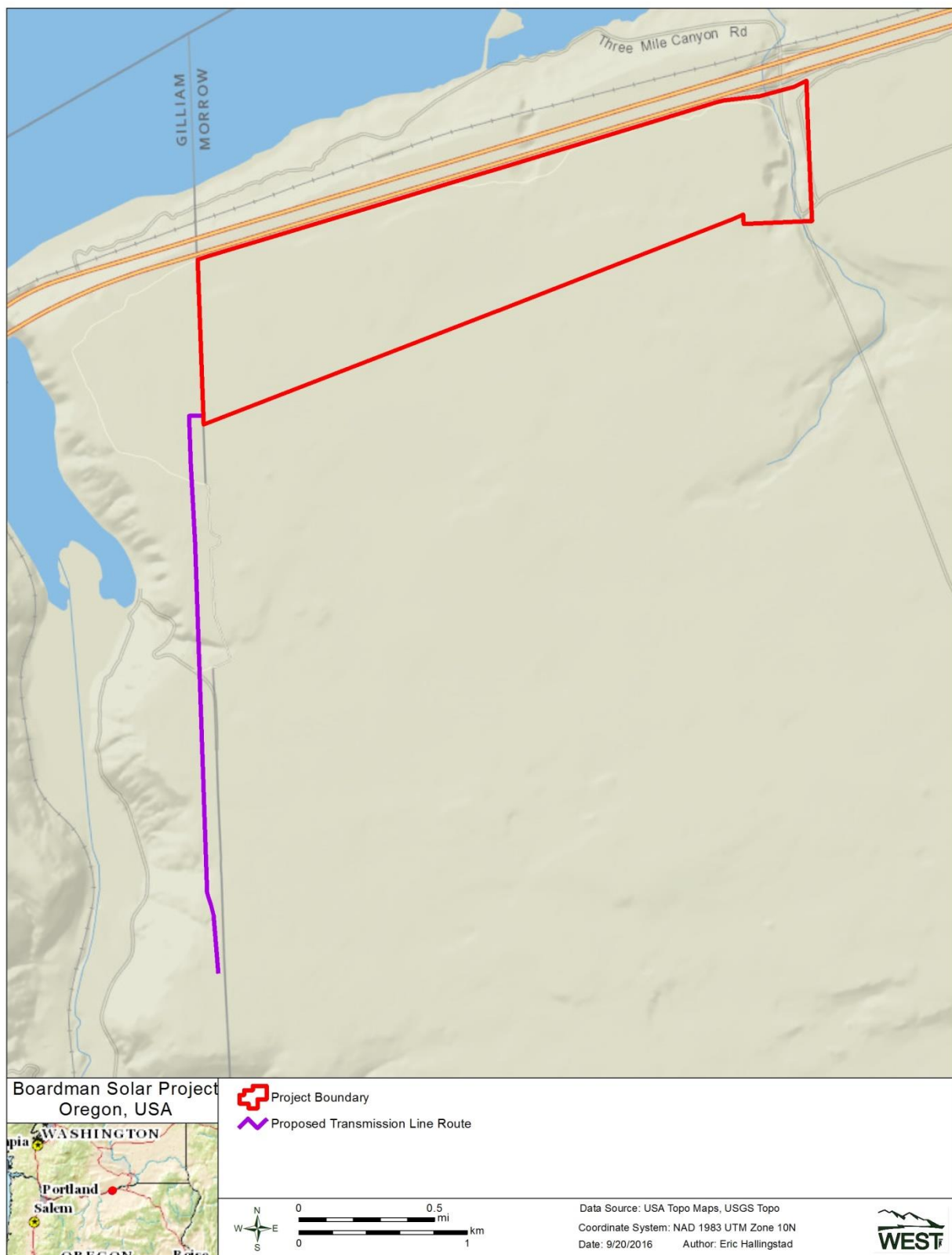
Page \_\_\_\_\_ of \_\_\_\_\_

TIME END: \_\_\_\_\_ hrs %Cloud Cover: \_\_\_\_\_ Temp: \_\_\_\_\_ F / C Wind Dir: \_\_\_\_\_ Ave. Wind Speed: \_\_\_\_\_

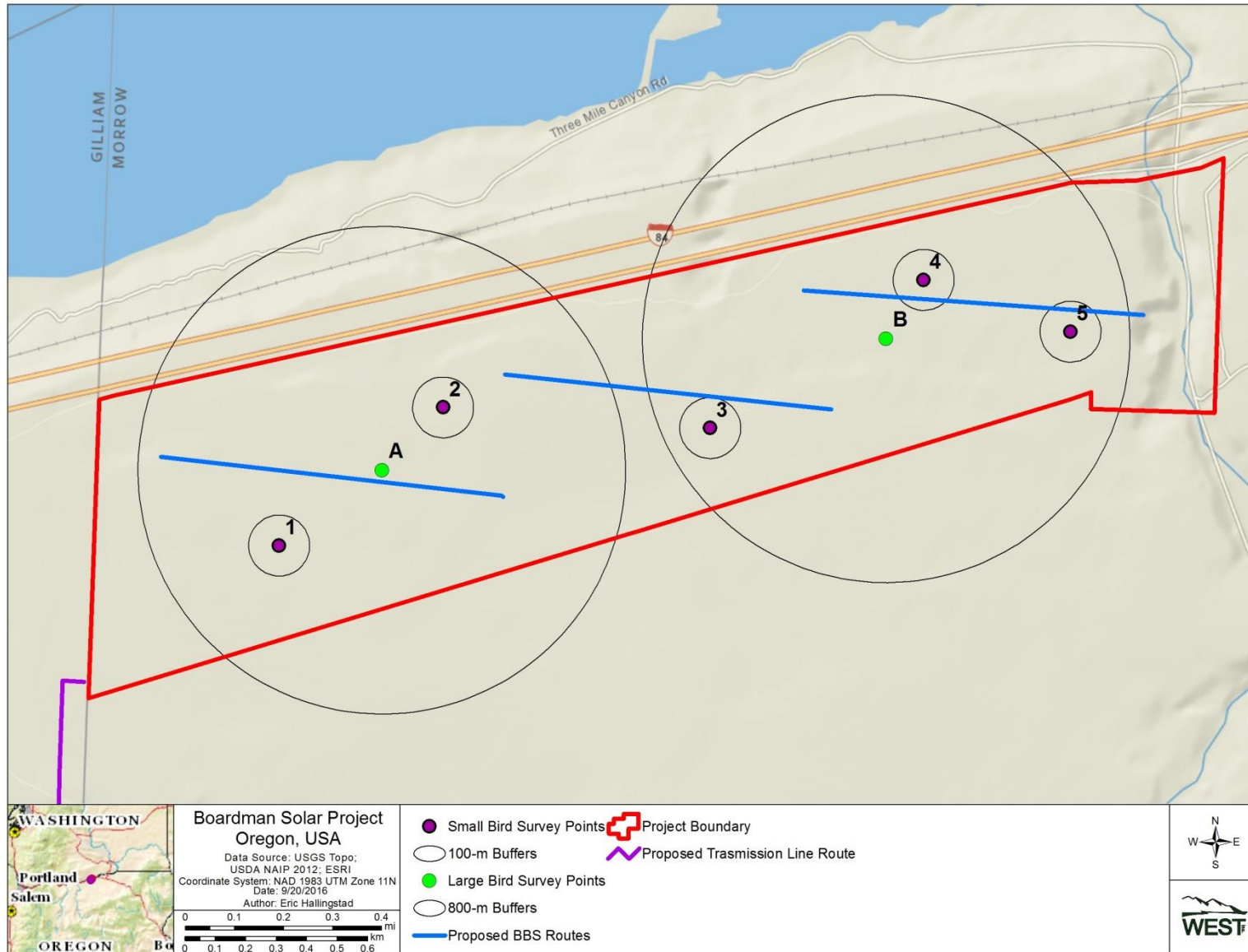
[illegible]

**COMMENTS:**

## Figures

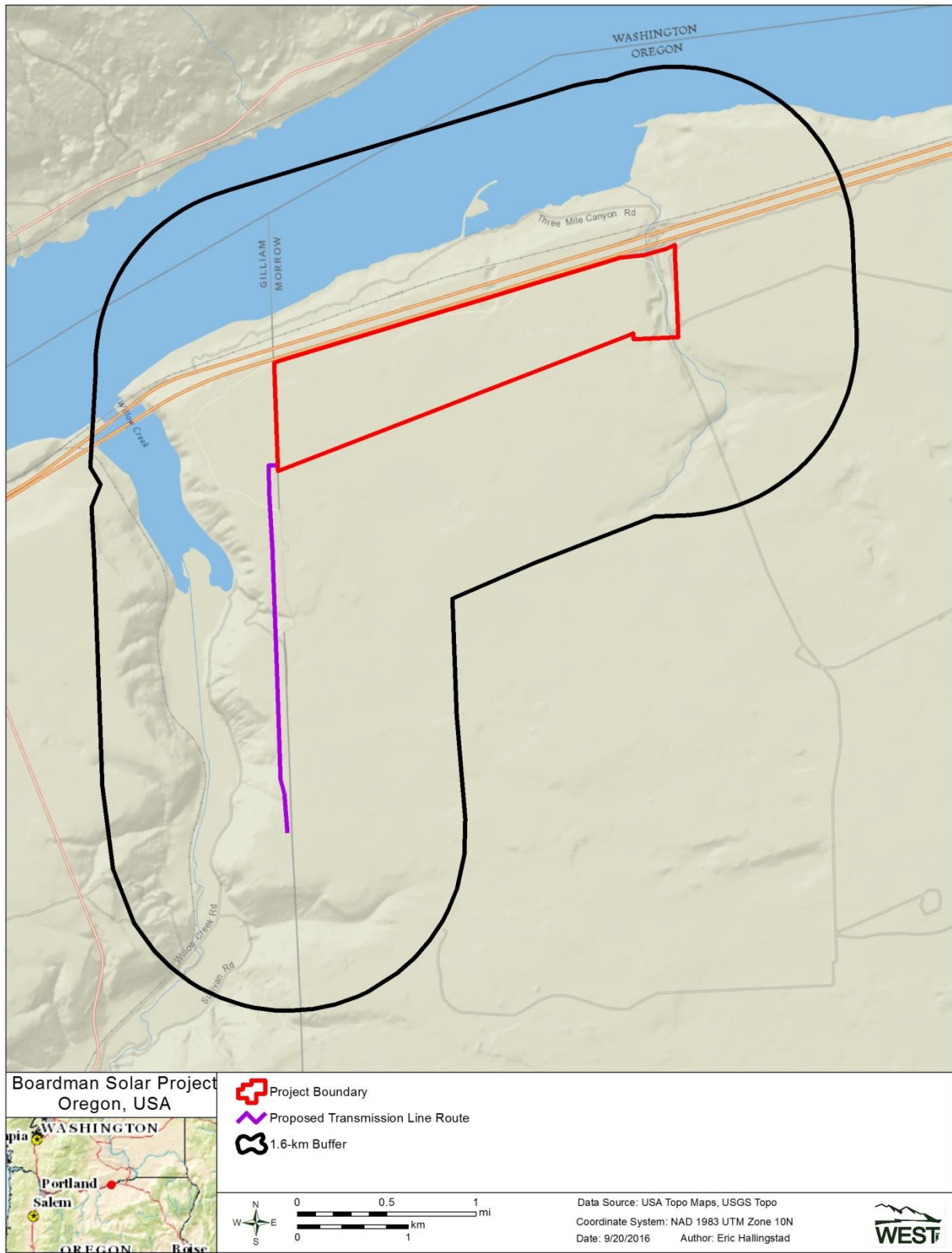


**Figure 1. Location of the proposed Boardman Solar Energy Facility and the proposed transmission line route.**



**Figure 2. Point and transect locations for avian use surveys at the Boardman Solar Energy Facility.**





**Figure 3. Raptor nest survey area for the proposed Boardman Solar Energy Facility.**



**Figure 4. National Wetland Inventory data for the Boardman Solar Energy Facility.**



Attachment P-5  
Habitat Mitigation Plan

## **1.0 INTRODUCTION**

---

Boardman Solar Energy LLC (Applicant or Certificate Holder) has prepared this document for the Boardman Solar Energy Facility (Facility or BSEF) Application for Site Certificate (ASC) submitted to the Oregon Department of Energy (ODOE). This draft Habitat Mitigation Plan (HMP) provides a preliminary strategy for effectively mitigating impacts to habitat. The habitat categorizations and concepts for mitigation have been discussed with personnel from the Oregon Department of Fish and Wildlife (ODFW).

The Facility is located in Gilliam and Morrow counties, Oregon. Western EcoSystems Technology, Inc. (WEST) completed habitat mapping and categorization of the site in the fall of 2016, and avian use surveys, special status wildlife species surveys, and raptor nest surveys in 2017. Details on habitat types, subtypes, and categories can be found in the ASC Exhibit P and in the Site Characterization Study (ASC Exhibit P Attachment P-2). Details on potential impacts to habitat and special-status species from construction and operation can be found in the ASC Exhibits P and Q, as can avoidance and minimization measures. The Applicant is committed to mitigate impacts to Category 4 grassland and shrub-steppe habitat that cannot be avoided or minimized with in-kind or out-of-kind habitat mitigation measures in-proximity or off-proximity to the Facility site boundary with input from ODFW.

## **2.0 DESCRIPTION OF FACILITY IMPACTS ADDRESSED BY THE PLAN**

---

The Facility will be constructed within an approximately 798 acre-site boundary of privately owned land and will have a generating capacity of approximately 75 megawatts and a 2.1-mile-long overhead 115-kilovolt transmission line. The types of habitat present within the site boundary are identified in Table 1.

Table 1. Habitat Types within the Site Boundary

General Land Cover Type and Codes	Specific Habitat Type ("Subtype") and Mapping Codes	Description	Acres in Site Boundary
Wetland	Herbaceous	Includes various wetland classes such as palustrine emergent, forested and scrub-shrub with no open water. However, no distinction was made here between formal wetland classes (refer to <b>Exhibit J</b> for more detail regarding wetland types). Predominant species found within the wetlands included cattail ( <i>Typha latifolia</i> ), watercress ( <i>Nasturtium officinale</i> ), softstem bulrush ( <i>Schoenoplectus tabernaemontani</i> ), and western goldenrod ( <i>Euthamia occidentalis</i> ).	11.4
	Open Water	Excavated area along west side of Threemile Canyon Road. Dominated by cattail and softstem bulrush.	0.5
Grassland (G) Steppe dominated by native and/or non-native grasses (<20% shrub cover)	Exotic Annual Grassland (GA)	Dominated by two non-native grass species associated with heavy grazing and periodic burning: cheatgrass ( <i>Bromus tectorum</i> ) and bulbous bluegrass ( <i>Poa bulbosa</i> ). Scattered gray rabbitbrush and ( <i>Ericameria nauseosa</i> ) snakeweed ( <i>Gutierrezia sarothrae</i> ) were also present throughout.	664.5
	Native Perennial Grassland (GB)	Predominantly native bunchgrasses such as bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ). Native forb species (e.g., northern buckwheat [ <i>Eriogonum compositum</i> ], arrowleaf balsomroot [ <i>Balsamorhiza sagittata</i> ]) are likely in these areas.	7.3
Shrub-steppe (SS) dominated by native and/or non-native grasses (<20% shrub cover)	Rabbitbrush/ Snakeweed Shrub-steppe (SSB)	Dominated by gray rabbitbrush and snakeweed, with small isolated areas of big sagebrush ( <i>Artemisia tridentata</i> ) also present. Understory was dominated by cheatgrass.	113.9
Total			798

Acreages of disturbance within the site boundary are the current estimate of the maximum affected area (the permanent [facility footprint] and temporary [construction] impacts) (Table 2). The actual areas of disturbance will be determined based on the final design layout of the Facility. The final design layout of the Facility will be provided to ODOE and ODFW, along with the associated permanent and temporary impact acreages prior to the beginning of construction.

Table 2. Temporary and Permanent Disturbance by Habitat Category and Subtype.

Habitat Category	Habitat Subtype	Permanently Disturbed	Temporarily Disturbed	Total Disturbed
2	Herbaceous Wetland	0	0	0
	Open Water Wetland	0	0	0
	Subtotal	0	0	0
4	Exotic Annual Grassland	472.45	26.62	499.07
	Native Perennial Grassland	0.05	4.08	4.13
	Rabbitbrush/Snakeweed Shrub-steppe	13.53	28.29	41.82
	Subtotal	486.03	58.99	545.02
<b>Total</b>		<b>486.03</b>	<b>58.99</b>	<b>545.02</b>

Oregon Administrative Rule (OAR) 635-415-0025, the Wildlife Habitat Mitigation Policy, defines habitats based on type, quality, availability, and usefulness/importance to wildlife, and establishes mitigation goals and implementation standards for each.

Category 1 habitat is defined by OAR 635-415-0025 as irreplaceable, essential, and limited. As further described in the ASC Exhibit P, the Facility may have suitable habitat for Washington ground squirrel (WGS) along the transmission line. If WGS colonies are present, the WGS colonies and a 785-foot buffer around those colonies would be considered Category 1 habitat. The Facility was designed and micrositied to avoid all Category 1 habitat, and thus Facility components and activities are not expected to impact such habitat. WGS protocol surveys will be conducted in the spring of 2017 to confirm no WGS will be impacted.

Category 2 habitat is defined by OAR 635-415-0025 as essential and limited. Approximately 11.892 acres of wetlands were identified within the Facility site boundary. Based on the “essential and limited” criteria, discussion with ODFW during the November 21 site visit, and the value of such wetlands to wildlife generally and, in particular, to species of special state or federal status, the wetlands were determined to be Category 2 habitat. The Facility was designed and micrositied to avoid all Category 2 habitat and a significant portion of the surrounding area (see ASC Exhibit P Figure P-1).

Category 4 habitat is defined by OAR 635-415-0025 as important. The remainder of the Facility’s 486.03-acre footprint (area to be covered by permanent facilities) will occupy predominantly exotic annual grassland, with smaller portions of shrub-steppe and native perennial grassland (see ASC Exhibit P Figure P-1). All three habitat types have been classified as Category 4 habitat based on discussion with ODFW onsite on November 21, 2016.

In addition to the permanent impacts mentioned above, construction will entail temporary impacts to 58.99 acres of Category 4 habitat (exotic annual grassland, shrub-steppe, and native perennial grassland). There will be no disturbance to Category 1 or 2 habitats.

### 3.0 HABITAT MITIGATION AREA

The exact permanent and temporary disturbance areas cannot be determined until the final design layout of the Facility is known. Before beginning construction of the facility, the Certificate Holder shall provide to the Oregon Department of Energy (ODOE) and the Oregon Department of Fish and Wildlife (ODFW) a map showing the final design configuration of the Facility and an updated Table 2 showing the estimated areas of permanent impacts and temporary impacts on habitat (by category, habitat types and habitat subtypes). The Certificate Holder shall calculate the size of the habitat mitigation area (HMA), as illustrated below, based on the final design configuration of the Facility. The Certificate Holder shall implement the habitat enhancement actions described in this plan, after ODOE has approved the size of the HMA.

The HMA must be large enough and have the characteristics to meet the standards set in OAR 635-415-0025. The standards for Category 1 mitigation is “no loss of either habitat quantity or quality.” The mitigation goal for Category 2, if impacts are unavoidable, is “no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality” (ODFW Wildlife Habitat Mitigation Policy). The standards for Category 4 mitigation require “no net loss of either habitat quantity or quality.”

The Applicant has designed the Facility to completely avoid Habitat Categories 1 and 2. For the permanent impacts to Category 4 habitat, and to satisfy the ODFW “no net loss” goal, the HMA must include one acre for every acre of impact (a 1:1 ratio). To address the temporal loss of habitat quality during the recovery of Category 4 habitat temporarily disturbed during construction of the Facility, the HMA must include ½ acre for every Category 4 habitat affected (a 0.5:1 ratio). The total HMA is calculated as shown in Table 3, and will be updated once the final design configuration is complete.

**Table 3. Habitat Mitigation Area by Habitat Category and Subtype.**

Habitat Category	Habitat Subtype	1:1 Ratio	0.5:1 Ratio	Total
2	Herbaceous Wetland	0	0	0
	Open Water Wetland	0	0	0
	Subtotal	0	0	0
4	Exotic Annual Grassland	472.45	13.31	485.76
	Native Perennial Grassland	0.05	2.04	2.09
	Rabbitbrush/Snakeweed Shrub-steppe	13.53	14.15	27.68
	Subtotal	486.03	29.50	515.53
<b>Total</b>		<b>486.03</b>	<b>29.50</b>	<b>515.53</b>

For unavoidable permanent and temporary impacts of Category 4 habitat, the Applicant will use in-kind or out-of-kind habitat mitigation measures in-proximity or off-proximity to the Facility to effectively offset impacts in consultation with ODFW and consistent with ODFW Habitat Mitigation Policy (OAR 635-415-0005) which are defined as follows:

*"In-kind Habitat Mitigation" means habitat mitigation measures which recreate similar habitat structure and function to that existing prior to the development action.*

*"Out-of-kind Habitat Mitigation" means habitat mitigation measures which result in different habitat structure and function that may benefit fish and wildlife species other than those existing at the site prior to the development action.*

*"In-proximity Habitat Mitigation" means habitat mitigation measures undertaken within or in proximity to areas affected by a development action. For the purposes of this policy, "in proximity to" means within the same home range, or watershed (depending on the species or population being considered) whichever will have the highest likelihood of benefiting fish and wildlife populations directly affected by the development.*

*"Off-proximity Habitat Mitigation" means habitat mitigation measures undertaken outside the area that would constitute "in-proximity mitigation" but within the same physiographic province as the development action.*

The Certificate Holder shall therefore select a 515.53 acre HMA either in the same home range or physiographic province of the Facility and either lease or purchase the area to benefit similar or different habitat than those at the Facility.

The Applicant has identified a 515.53 acre parcel that would benefit similar habitat within the same home range of the Facility (BSEF Olex HMA). It is located in the Olex Conservation Opportunity Area (Olex COA) in Gilliam County managed by the onsite owners (see Figure 1). The Olex COA is a 2,100 acre area where the Willow Creek Wind Project conservation easement is located along with other long-term habitat protection measures and conservation areas in place (see Figure 2). Collectively, the long-term conservation easements provide value for wildlife habitat functionality within and adjacent to the proposed BSEF HMA. The BSEF Olex HMA habitat includes a mosaic of exotic annual grassland, rabbitbrush/buckwheat shrub-steppe, sagebrush shrub-steppe, perennial grassland, and native perennial grassland; these are displayed as general land cover types in Figure 2. There are 833 acres available, and the 515.53 BSEF HMA will be located at the south end within 645 acres illustrated on Figure 2 that is near other protected habitat. The habitat is of varying quality but could all be classified as Categories 2, 3 and 4. The Olex COA also has Category 1 (Washington ground squirrel) habitat. The BSEF Olex HMA will be protected through a conservation easement.

In the future, the Certificate Holder may, in consultation with ODFW and ODOE, select a HMA parcel other than the BSEF Olex HMA as long as it still meets the concepts outlined in this HMP, subject to ODOE approval.

## **4.0 HABITAT MITIGATION ACTIONS & SUCCESS CRITERIA**

---

The Certificate Holder shall restrict uses of the HMA during the life of the Facility that are inconsistent with the goal of no net loss to Category 4 habitat. Specific habitat quality maintenance actions that will preserve the HMA habitat at minimum Category 4 quality and quantity will include the following:

- Restricting development of buildings or other structures;
- Restricting livestock grazing practices to those that benefit wildlife;
- Inspecting for and then removing or chemically treating noxious weeds in the spring prior to the growing season to benefit vegetative structure and complexity for wildlife;

- Revegetating with native vegetation (by seeding) in bare ground areas created by weed control; and
- Preparing a wildfire response plan that takes into account the arid nature of the region and addresses risks on a seasonal basis.

The conservation of the HMA will be completed as compensation for the 545 acres of unavoidable temporary and permanent disturbance of Category 4 grassland and shrub-steppe habitat. This plan does not include additional avoidance and minimization measures discussed in ASC Exhibits P and Q and the BSEF Wildlife Monitoring and Adaptive Management Plan.

Mitigation of the permanent and temporal habitat impacts of the Facility may be considered successful if the Certificate Holder protects sufficient habitat within the HMA to meet the ODFW goal of no net loss of habitat in Category 4. The Certificate Holder must protect the quantity and quality of habitat within the HMA for the life of the Facility. The mitigation goals are successfully achieved when the HMA contains a sufficient quantity of habitat to meet the mitigation area requirements calculated under Section 3. The Certificate Holder may count habitat of higher value toward meeting the acreage requirements for Category 4 habitat. The Certificate Holder shall determine the actual mitigation area requirements, subject to ODOE approval, before beginning construction of the Facility. The Certificate Holder may demonstrate success based on evidence that the habitat quality at the HMA is maintained as Category 4 or higher.

If the revegetation success criteria are not met in the affected areas of temporarily disturbed Category 4 habitat in the Site Boundary, as determined under the Revegetation and Noxious Weed Control Plan (Exhibit P, Appendix P-6), then ODOE may require the Certificate Holder to provide additional mitigation.

If the quality of the HMA habitat has degraded to worse than Category 4, and as determined during the regularly scheduled monitoring program or at any time the Certificate Holder becomes aware of degradation, the Certificate Holder shall describe if/why the maintenance actions were not effective and then propose and implement remedial action. Details and monitoring for success will be prepared at that time, with input from the ODOE and ODFW. In addition to improving maintenance actions, if possible, some enhancement actions could include the following:

- planting native grasses and shrubs;
- removing old barbed wire fencing;
- installing artificial burrowing owl nest burrows; and/or
- installing wildlife watering guzzlers.

## 5.0 MONITORING

The Certificate Holder will hire a qualified investigator (a botanist, wildlife biologist or vegetation specialist) to conduct an annual site visit of the HMA to ensure that the quality of the habitat is maintained at a Category 4 or higher. Monitoring for habitat maintenance actions will include describing if any development has occurred, recording signs and extent of livestock grazing, assessing for noxious weeds, describing if any wildfires occurred and any response measures, recording incidental wildlife observations, including special status plants and animals, and documenting habitat quality category/categories. Monitoring methods for enhancement actions, including success criteria, will be established if/when they are employed. All methods and results of monitoring will be reported to ODOE and ODFW.

In addition, as part of the wildfire response plan, onsite owners will notify the Certificate Holder of any wildfire when it occurs.

## **6.0 PLAN AMENDMENT**

---

This Habitat Mitigation Plan may be amended by written agreement of the holder of the Site Certificate and the Oregon Energy Facility Siting Council. Amendments to this Plan will not require an amendment of the Site Certificate.



Figure 1. Olex Conservation Opportunity Area (OCO) relative to the Boardman Solar Energy Facility (BSEF)

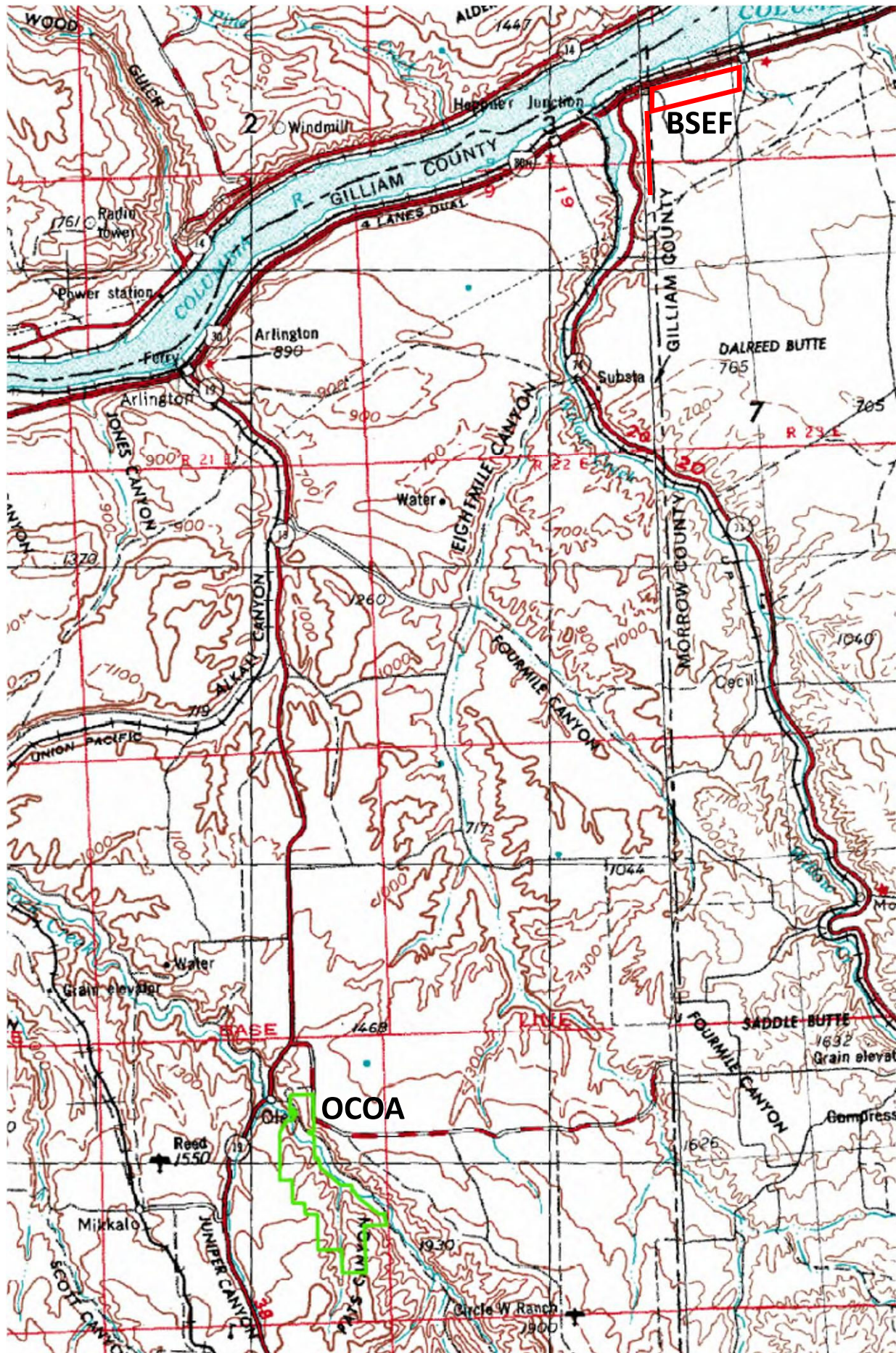
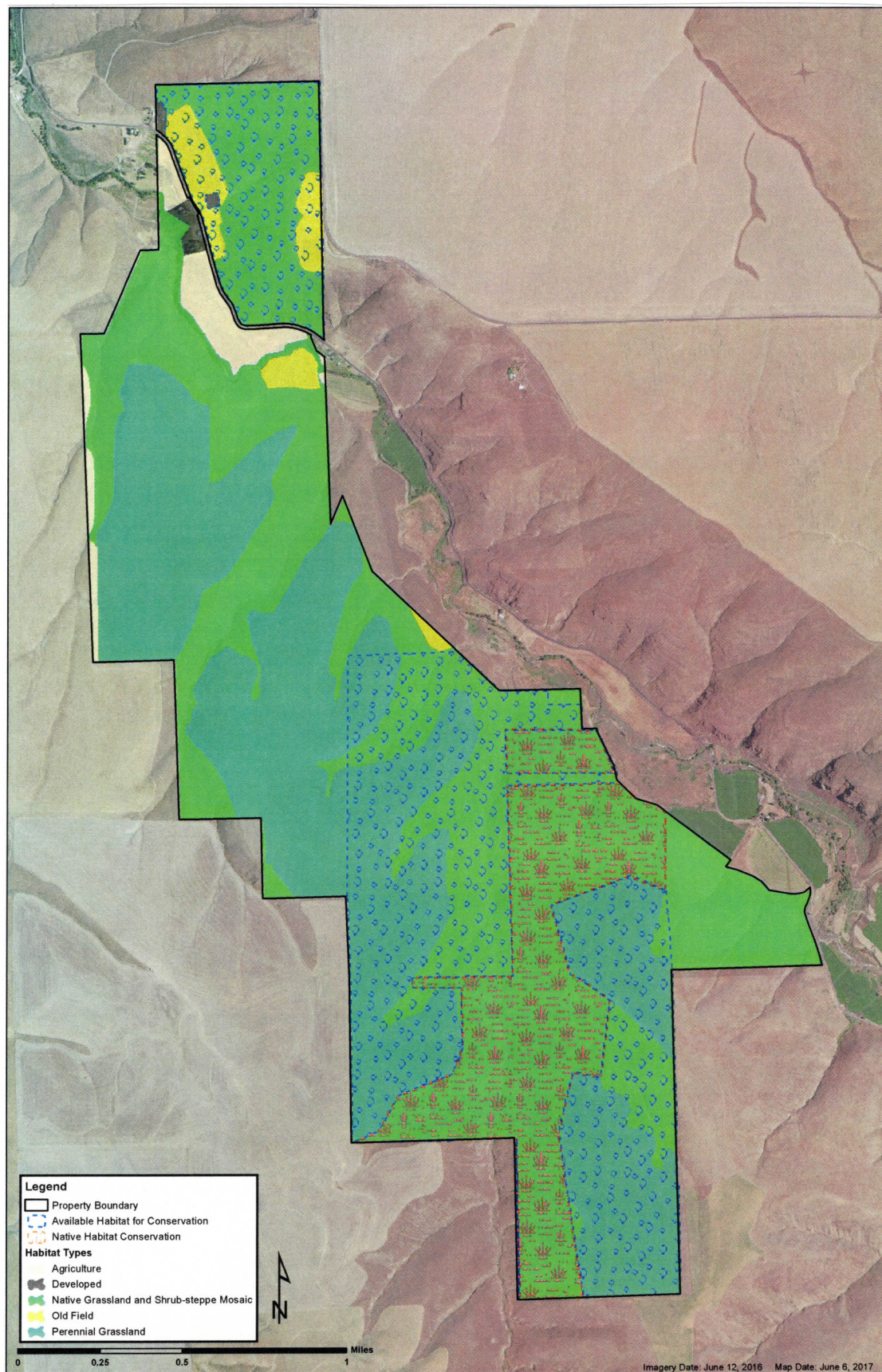




Figure 2. Olex Conservation Opportunity Area habitat types available for conservation.  
 179 acres available at north end, 515+ acres (645 ac. shown) available at south end around habitat in  
 long term conservation.



Attachment P-6  
Revegetation and Noxious Weed  
Control Plan

## **1.0 INTRODUCTION**

---

Boardman Solar Energy LLC (Applicant or Certificate holder) has prepared this document for the Boardman Solar Energy Facility (Facility or BSEF) Application for Site Certificate (ASC) submitted to the Oregon Department of Energy (ODOE). This draft Revegetation and Noxious Weed Control Plan (RNWCP) provides primary concepts for effective revegetation and noxious weed control. These concepts have been discussed with personnel from the Oregon Department of Fish and Wildlife (ODFW) and with Morrow County Weedmaster Dave Pranger. The Applicant will continue to consult with ODFW, Morrow County Weedmaster, and also with Gilliam County Weedmaster Don Farrar. This RNWCP also provides concepts for effective vegetation management to limit potential for wildfire to spread in to or from the Facility area.

The Facility is located in Gilliam and Morrow counties, Oregon. Western EcoSystems Technology, Inc. (WEST) completed habitat mapping and categorization of the site in the fall of 2016, and avian use surveys, special status wildlife species surveys, and raptor nest surveys in 2017. Details on habitat types, subtypes, and categories can be found in the ASC Exhibit P and in the Site Characterization Study (WEST, 2016). Details on potential impacts to habitat and special status species from construction and operations can be found in the ASC Exhibits P and Q, as can avoidance and minimization measures. The Applicant is committed to minimizing impacts to Category 4 grassland and shrub-steppe habitat that cannot be avoided.

## **2.0 DESCRIPTION OF FACILITY IMPACTS ADDRESSED BY THE PLAN**

---

The Facility will be constructed within an approximately 798-acre site boundary of privately owned land and will have a generating capacity of approximately 75 megawatts and a 2.1-mile overhead 115-kilovolt transmission line. The types of habitat present within the site boundary are identified in Table 1.

Table 1. Habitat Types within the Site Boundary

General Land Cover Type and Codes	Specific Habitat Type ("Subtype") and Mapping Codes	Description	Acres in Site Boundary
Wetland	Herbaceous	Includes various wetland classes such as palustrine emergent, forested and scrub-shrub with no open water. However, no distinction was made here between formal wetland classes (refer to <b>Exhibit J</b> for more detail regarding wetland types). Predominant species found within the wetlands included cattail ( <i>Typha latifolia</i> ), watercress ( <i>Nasturtium officinale</i> ), softstem bulrush ( <i>Schoenoplectus tabernaemontani</i> ), and western goldenrod ( <i>Euthamia occidentalis</i> ).	11.4
	Open Water	Excavated area along west side of Threemile Canyon Road. Dominated by cattail and softstem bulrush.	0.5
Grassland (G) Steppe dominated by native and/or non-native grasses (<20% shrub cover)	Exotic Annual Grassland (GA)	Dominated by two non-native grass species associated with heavy grazing and periodic burning: cheatgrass ( <i>Bromus tectorum</i> ) and bulbous bluegrass ( <i>Poa bulbosa</i> ). Scattered gray rabbitbrush and ( <i>Ericameria nauseosa</i> ) snakeweed ( <i>Gutierrezia sarothrae</i> ) were also present throughout.	664.5
	Native Perennial Grassland (GB)	Predominantly native bunchgrasses such as bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> ). Native forb species (e.g., northern buckwheat [ <i>Eriogonum compositum</i> ], arrowleaf balsomroot [ <i>Balsamorhiza sagittata</i> ]) are likely in these areas.	7.3
Shrub-steppe (SS) dominated by native and/or non-native grasses (<20% shrub cover)	Rabbitbrush/ Snakeweed Shrub-steppe (SSB)	Dominated by gray rabbitbrush and snakeweed, with small isolated areas of big sagebrush ( <i>Artemisia tridentata</i> ) also present. Understory was dominated by cheatgrass.	113.9
Total			798

Acres of impact are the current estimate of the maximum affected area (the permanent [facility footprint] and temporary [construction] impacts) (Table 2). The actual areas of disturbance will be determined based on the final design layout of the Facility. The final design layout of the Facility will be provided to ODOE and ODFW, along with the associated permanent and temporary impact acreages prior to the beginning of construction.



Table 2. Temporary and Permanent Disturbance by Habitat Category and Subtype

Habitat Category	Habitat Subtype	Permanently Disturbed	Temporarily Disturbed	Total Disturbed
2	Herbaceous Wetland	0	0	0
	Open Water Wetland	0	0	0
	Subtotal	0	0	0
4	Exotic Annual Grassland	472.45	26.62	499.07
	Native Perennial Grassland	0.05	4.08	4.13
	Rabbitbrush/Snakeweed Shrub-steppe	13.53	28.29	41.82
	Subtotal	486.03	58.99	545.02
<b>Total</b>		<b>486.03</b>	<b>58.99</b>	<b>545.02</b>

### 3.0 WEED MANAGEMENT PLAN

As described in Section 2.0, Facility impacts will primarily be in exotic annual grassland and some in native perennial grassland and shrub-steppe. In addition to the invasive species cheatgrass (*Bromus tectorum* L.), per Morrow County Weedmaster Dave Pranger, there are known occurrences of diffuse knapweed (*Centaurea diffusa*; Morrow County weed of economic importance) and potential occurrences of rush skeletonweed (*Chondrilla juncea* L.; Morrow County noxious weed) and yellow star-thistle (*Centaurea solstitialis* L.; Morrow County noxious weed). Weed lists are maintained by Morrow County in Section 9 Weed Control of the County Code Enforcement Ordinance. This RNWCP also serves as the Weed Management Plan required by the Morrow County Code Enforcement Ordinance Section 9.300(B).

Prior to construction, a weed survey will occur in all areas to be impacted by Facility construction to get a baseline of conditions. The location of all noxious species and weeds of economic importance will be maps and flagged for treatment. They will be treated because, even though much of the Facility area will be cleared of vegetation, treatment will help prevent reemergence after construction as well as limit introduction of noxious weeds to other locations.

All flagged noxious species and weeds of economic importance will be promptly (i.e. within 30 days or prior to viable seed production, whichever comes first) treated and/or removed. Occurrences will be treated via mechanical or chemical means in order to reduce the spread of noxious weed seed or plant parts. Plant material and topsoil at treatment areas will be removed and disposed of in a landfill. Vehicles or equipment used to remove noxious weeds or contaminated topsoil will be cleaned before proceeding with other work. After construction and revegetation, weeds will continue to be treated and/or removed in the same manner. In addition, heavy construction vehicles will be cleaned before entering the site so as to limit introduction of noxious weeds from other locations.

## **4.0 REVEGETATION METHODS**

---

Revegetation will begin as soon as feasible after completion of construction for temporary impacts, and demolition for permanent impacts as part of final restoration, and seeding and planting will be done in a timely manner and in the appropriate season. Soil preparation will involve standard, commonly-used methods, and will take into account all relevant site-specific factors, including slope, size of area, and erosion potential. Topsoil will be restored to the preconstruction condition or better. Mulching and other erosion control measures will be used throughout construction and during revegetation efforts.

Preconstruction land use, soil, and vegetation type will help determine the seed mix used for each area to be restored. All disturbed grassland and shrub-steppe habitat will be reseeded with a mix of native or native-like grasses, forbs, and shrubs. Seed mix and application rates will be determined in consultation with the landowner and ODFW, and will take into consideration soil types, erosion potential, and growing conditions. ODFW has suggested between 0 and 10 percent forbs and shrubs for grassland habitat restoration. Seeds will be obtained from a reputable supplier in compliance with the Oregon Seed Law.

Methods and timing of planting will be appropriate to the seed mix, weather conditions, and site conditions (including area size, slope, soil depth and composition, and erosion potential). Preparation of disturbed ground may include replacing lost topsoil and/or chemical or mechanical weed control. Two common application methods are described below.

### **a) Broadcasting**

In this method, which may be used successfully in areas with shallow and rocky soils, the seed mix will be broadcast at specified application rates. Broadcasting should not be utilized when winds exceed five miles per hour. If feasible, half of the seed mix will be broadcast in one direction, with the other half broadcast perpendicular to the first half. A tracking dye may be added to facilitate uniform application. Certified weed-free straw will be applied at a rate of two tons per acre immediately after seeding; straw may either be crimped into the ground or applied with a tackifier.

### **b) Drilling**

In this method, which is more successful in areas with deeper soils, seed will be planted using an agricultural or range seed drill according to application rates recommended by the seed supplier.

In order to encourage revegetation success, grazing and other activities will be restricted until revegetation is determined successful in accordance with Section 6. This will be done after completion of construction for temporary impacts, and demolition for permanent impacts as part of the land agreement.

## **5.0 VEGETATION MANAGEMENT**

---

During construction, most of the vegetation will be removed from the 545 acre area with grubbing and grading equipment. Any vegetation that grows back in the 486 acre area of permanent disturbance will be managed in order to limit potential for wildlife to spread to or from the Facility area. Management will be via mechanical and/or chemical means. Mechanical methods will include use of gravel or other noncombustible base (in accordance with the fire prevention plan as described in ASC Exhibit B Section

B.1.5) and/or physical removal. Chemical methods could include an annual emergent and/or spot spraying. The intent will be to eliminate fuel for wildfire to spread in to or out of the Facility.

## **6.0 MONITORING**

---

Monitoring of the revegetation and weed management effort will be conducted by an independent botanist or revegetation specialist; this monitoring will be done during the first growing season after planting and continuing until there is sufficient evidence of progress for ODOE to conclude that additional revegetation or weed management efforts in the area are not necessary. Thereafter, the monitor shall perform qualitative assessments of the restored areas at five-year intervals for the life of the Facility. The monitor will also train Operations and Maintenance (O&M) personnel on how to identify and treat weeds in the interim to improve likelihood of on-going revegetation success.

Nearby reference sites (approximating preconstruction conditions) will be selected as targets toward which revegetation will aim. Reference sites will be chosen with consideration to land use patterns, soil types, terrain, and presence of noxious weeds. At present, these reference sites occur to the west of the Facility across the County line and to the east of the Facility across Threemile Canyon Road. New reference sites may be chosen if land use changes, wildfire, or other disturbance makes a chosen reference site no longer representative of target conditions.

The specialist will assess extent of bare soil, weed growth and success of revegetation and weed control measures. Assessments will address whether each revegetation area is trending toward meeting the success criteria described below. During each assessment, revegetated areas will be compared to ensure they meet or exceed reference site conditions with regard to the following:

- Extent of bare soil
- Presence and density of weeds
- Degree of erosion
- Vegetative density
- Proportion of desirable vegetation
- Species diversity and structural stage of desirable vegetation

Records will also be kept by the holder of the Site Certificate of revegetation efforts that will include the following:

- Date construction was completed
- Description of the affected area
- Date revegetation was initiated
- Description of the revegetation effort

Revegetation efforts and monitoring reports will be reported to ODOE and ODFW each year in which monitoring is conducted until there is sufficient evidence of progress for ODOE to conclude that additional revegetation or weed management efforts in the area are not necessary, and thereafter, at five-year intervals for the life of the Facility. Each report will involve an assessment of the progress toward revegetation objectives. The overarching metric for success is when the habitat quality (erosion, desirable



vegetation density, and diversity) is equal to or better than the quality at the relevant reference site according to the conditions described above and is restored to pre-construction (or better) ODFW habitat category.

Remedial action options will be identified in cases where success criteria are not met, whether due to wildfire subsequent to construction or because of lower than expected rates of germination or survival. Remedial actions may include reseeding or other measures. The specialist will make recommendations for remedial actions after each monitoring visit, and the holder of the Site Certificate will take appropriate measures to meet the restoration objectives. The holder of the Site Certificate will include in its annual report the specialist's recommendations for remedial actions and the measures taken. For the qualitative assessments performed at five-year intervals (after ODOE concludes that additional revegetation or weed management efforts in the area are not necessary), the investigator shall assess the general condition of the revegetated areas, check for erosion or weed control problems, and report on any damage to revegetated areas that may be attributed to off-road vehicle use. The investigator will include in the report any remedial actions recommended. The Certificate Holder shall submit the qualitative assessment reports to ODOE as part of the facility annual report for the years in which assessments are done.

Based on the assessment and report at the end of the fifth year or at the time that success criteria has been substantially achieved, whichever is earlier, the holder of the Site Certificate will consult with ODOE and ODFW to design an action plan for subsequent years during operations. The holder of the Site Certificate may propose remedial actions and/or additional monitoring for areas that have not met the success criteria. Alternatively, revegetation efforts may in some cases be deemed to have failed, and mitigation may be proposed in such cases to compensate for the permanent habitat loss.

In all cases, ODOE, in consultation with ODFW, will review the Applicant's proposed remedial actions, and may recommend or require one or more of those actions and/or additional remedial actions.

## **7.0 PLAN AMENDMENT**

---

This Revegetation and Noxious Weed Control Plan may be amended by written agreement of the holder of the Site Certificate and the Oregon Energy Facility Siting Council. Amendments to this Plan will not require an amendment of the Site Certificate.

Attachment P-7  
Wildlife Monitoring and Adaptive  
Management Plan

## **1.0 BACKGROUND AND GOALS**

---

Boardman Solar Energy LLC (Certificate Holder) has prepared a Wildlife Monitoring and Adaptive Management Plan (WMAMP) for the Boardman Solar Energy Facility (BSEF or Facility) Application for Site Certificate (ASC) submitted to the Oregon Department of Energy (ODOE) (Application). The WMAMP provides a detailed plan for post-construction wildlife monitoring and adaptive management, to be finalized with input from Oregon Department of Fish and Wildlife (ODFW). Preliminary concepts associated with this proposed plan have been discussed with ODFW staff.

The specific goals of the WMAMP are to

- 1) describe a post-construction monitoring protocol designed to determine the estimated bird and bat fatality rates at the BSEF during four seasons of operation;
- 2) assess effectiveness of avoidance and minimization measures with respect to birds and bats as outlined in Exhibits P and Q to the Application and implemented during design, construction, operation, maintenance, and decommissioning; and
- 3) identify adaptive management procedures to guide management actions for the life of the BSEF.

## **2.0 MONITORING PLAN**

---

### **2.1 Monitoring Goals**

The WMAMP will involve surveys designed to estimate bird and bat fatality rates at the BSEF. Post-construction monitoring results will be evaluated through adaptive management, which could include more extensive monitoring (as described in Section 3 in this WMAMP). Certificate Holder will analyze bird and bat carcass monitoring data to accomplish the following goals:

- detect carcasses and estimate bird and bat fatality rates for the BSEF;
- estimate fatality rates for species of concern, if practicable; and
- determine whether additional conservation measures are needed to reduce impacts to birds and bats at the BSEF.

### **2.2 Monitoring Methods**

#### **2.2.1 Study Design**

This proposed WMAMP is designed to maximize the accuracy of the fatality estimates and to correct for the following sources of field-sampling error: (1) carcasses that occur on a highly periodic basis, (2) carcass removal by scavengers, (3) searcher efficiency, and (4) carcasses or injured birds or bats that may land or move to areas not included in the search transects (Kunz et al. 2007). Post-construction monitoring at the BSEF will involve standardized distance-sampling based carcass searches, searcher efficiency trials, and carcass persistence trials, consistent with recommendations from Huso et.al (2016b) and accepted monitoring designs at other utility-scale solar facilities (WEST 2016a-c).

Surveys of the PV panel area will be conducted using a distance-sampling based methodology. The layout of PV facilities is often well-suited to a distance-sampling approach. Distance sampling involves searching a transect line and assumes that searcher efficiency decreases (possibly dramatically) as a function of distance from the observer, and is ideally suited to situations in which animals (or carcasses) are sparsely distributed across a landscape (Buckland et al. 1993). As the landscape at the BSEF is flat and relatively clear of vegetation, a distance sampling design is well supported, as demonstrated at other PV solar facilities (WEST 2016a; Huso et. al 2016b).

Distance sampling adjusts carcass counts for variable searcher efficiency by calculating the *effective* searcher efficiency along a transect. Effective searcher efficiency is the average probability of detection in the searched area, derived from the detection function. As a highly simplified example, if a searcher walks a 10-m (33-ft) long transect line and detects 90% of all carcasses within 10-m of the line, and 60% of carcasses that are 10 to 30 m (33 to 99 ft) from the line, then the effective searcher efficiency between zero and 10 m would be 0.9 and the effective searcher efficiency between 10 and 30 m would be 0.6. For the total 10 by 30-m area, the effective searcher efficiency would be  $\frac{0.9 + 0.6}{100\text{ m}^2 + 200\text{ m}^2} = 0.5$ .

In practice, searcher efficiency is modeled as a continuous function of distance, and the detection function is estimated from bias trial data. An advantage to the use of data from bias trials is that the assumption that carcasses are randomly distributed within the search area (typical of most distance sampling designs) becomes unnecessary. Furthermore, having a sufficient sample size to fit the detection function is no longer dependent on what is observed, as in most distance sampling studies, and trials can be placed to measure potential covariates such as carcass size and ground cover. The fitted detection function is used to determine the overall probability of detection as well as to inform the approximate effective view shed of non-zero detection probability for observers.

Assuming that vegetation will be well controlled during the monitoring period, searchers will be able to visually scan the full length of the PV array rows (90 m or 295 ft; Figure 1). This will allow observers to walk or drive using ATVs along the Facility's access roads, perpendicular to panel rows, and search 90 meters (295 ft). Surveys will include a 50% sample of the blocks in the PV panel area.

#### 2.2.2 Search Interval and Search Period

Surveys will be conducted once every three weeks November through February, and once every two weeks from March through October in the year following construction; this period includes spring and fall migration and summer nesting/maternity seasons for birds and bats, respectively. Carcass persistence trials will be conducted concurrently with carcasses searches, and if documented scavenger rates indicate that shorter or longer search intervals are needed, the search intervals may be modified to improve carcass detection rates. Guidance from Huso et. al (2016b) suggests determining search intervals such that the average probability a carcass is available to be found is at least 50%. Since carcass persistence may vary by carcass size, search intervals should be determined based on the size or sizes of principal species of interest; for example, if impacts to water-associated birds are a focus, then search intervals can be adjusted based on persistence times for large and medium-sized birds, such as grebes, ducks, and loons.

#### 2.2.3 Searcher Qualifications

Searchers will be trained to conduct carcass searches and will be familiar with and able to accurately identify bird and bat species likely to be found in the BSEF area. Any unknown birds and bats or suspected state or ESA-listed species discovered during carcass searches will be reported to a qualified biologist for positive identification.

#### 2.2.4 Data Collection

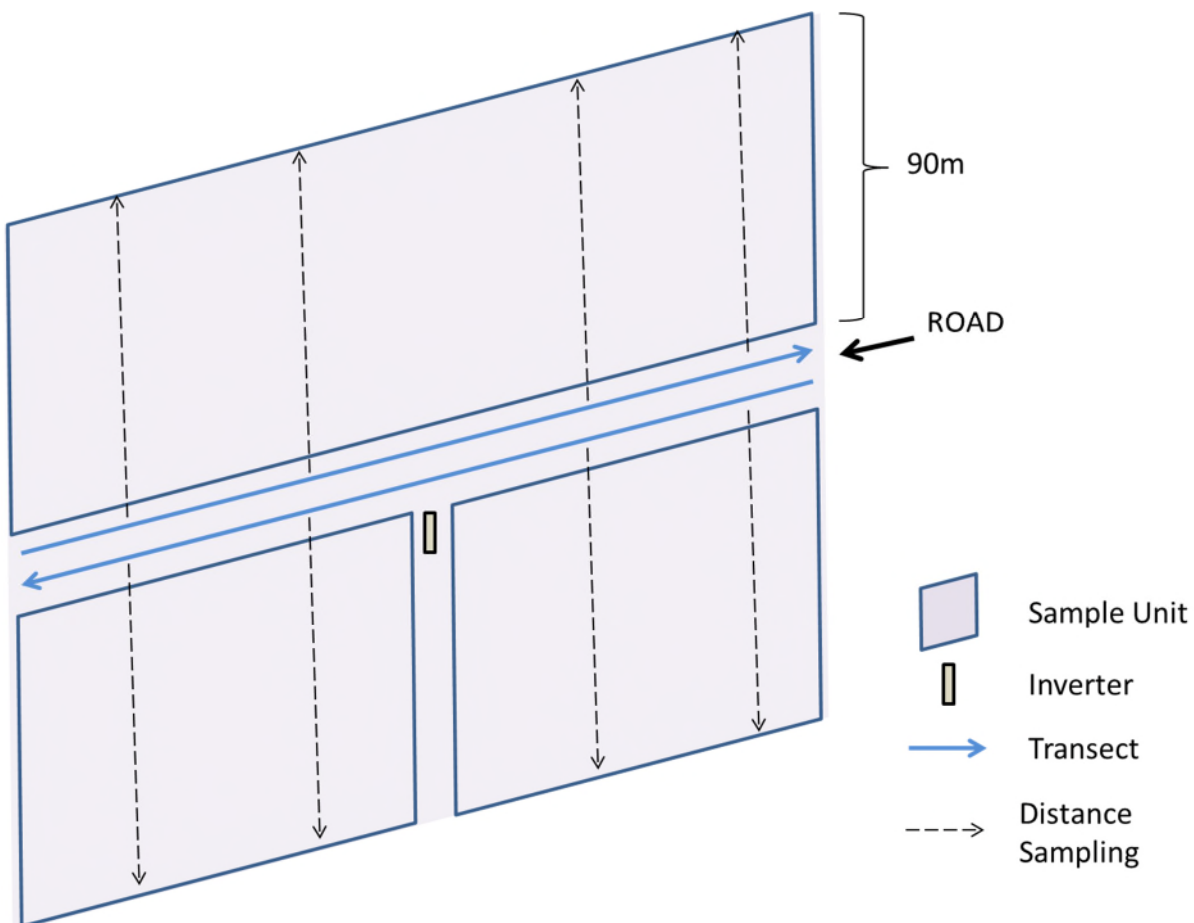
For each carcass found, data recorded will include the following:

- Photos of the carcass from different angles and including a size-referencing object
- Date and time
- Initial species identification
- Sex, age, and reproductive condition (when possible)
- GPS location
- Nearest BSEF component (PV array, control house/storage facility, equipment, or other)
- Distance from observer when carcass first observed Distance to nearest PV panel
- Substrate/ground cover conditions

- Condition of specimen
  - Alive, no sign of physical trauma
  - Dead and intact
  - Dismembered
  - Feather spot (at least two or more primary feathers, five or more tail feathers, or ten or more feathers)
  - Injured
- Carcass condition (fresh/dry, intact/scavenged)

Bird and bat carcasses found in non-search areas (i.e., outside of the sampled areas described in Section 2.2.1) will be coded as incidental finds and documented in a similar fashion to those found during standard searches. Incidental finds will be included in the raw survey summary totals but will not be included in the estimated fatality calculations.

Searchers will not collect or handle carcasses, and therefore neither state nor federal collecting/salvaging permits will be acquired for this study. Searchers will mark the carcasses with spray paint to prevent recounting.



**Figure 1. Example illustration of generic PV sampling unit with travel routes and searches using distance sampling ('observation perspectives').**

#### 2.2.4.1 Searcher Efficiency and Carcass Persistence Trials

Searcher efficiency and carcass persistence trials will be conducted in conjunction with standard carcass surveys. Searcher efficiency trials will be placed throughout each season on scheduled search days to ensure trials are representative of search conditions throughout each season. Trials will be placed on at least five different days throughout each season. Searcher efficiency trials will be used to estimate the percentage of bird and bat carcasses that are detected during the carcass searches. Using the detection function fit from searcher efficiency trial data, the average probability of detecting a carcass over the 90m (295 ft) length of panel rows can be calculated and used to adjust discovered carcasses for detection bias. Similarly, carcass persistence trials will be used to estimate the percentage of bird and bat carcasses that persist (i.e. are not removed by scavengers) long enough to be located by searchers. When considered together, the results of searcher efficiency and carcass persistence trials will inform the likelihood that a bird or bat carcass that falls within the searched area will be recorded. These correction factors will be incorporated into a fatality estimate model to estimate fatality rates.

The bias-trial sample sizes required to produce precise, adjusted fatality estimates are not well established, in part because needs may vary substantially depending on actual project-specific searcher efficiency, carcass persistence, and fatality rates. However, using searcher-efficiency trials to help evaluate the efficacy of the distance-sampling approach used in this investigation will require larger sample sizes to produce a sampling design that effectively accounts for distance as a key covariate of interest. A minimum of 25 carcass samples per small size class, 15 for medium, and 10 for large is anticipated within the solar array, per season. Searcher efficiency will be summarized for each individual searcher, but to avoid needlessly inflating the variance of the estimate, individual searcher effects will not be included in the fatality estimation model.

**Table 1. Approximate Searcher efficiency trial sample sizes per season.**

Project component	Size	sample size
Solar arrays	Small	25
	Medium	15
	Large	10
<b>Totals</b>		<b>50</b>

Carcasses from non-listed bird and bat species recovered during the study may be re-used in the searcher efficiency trials, as carcass condition allows. Species such as house sparrows (*Passer domesticus*) and European starlings (*Sturnus vulgaris*) may be used to represent small-sized birds; rock doves (*Columba livia*) and commercially raised hen mallards (*Anas platyrhynchos*) or hen pheasants (*Phasianus colchicus*) may be used to represent medium to large-sized birds. If visibility classes are established, to account for differences in vegetation, trial carcasses will be placed in a variety of vegetation types so that searcher efficiency rates can be determined for each visibility class. The number of carcasses used will be limited to ensure that a scavenger swamping does not occur.

Searcher efficiency trials will be conducted blindly; the searchers will not know when trials are occurring, within which transects the trial carcasses are placed, or where trial carcasses are located within the BSEF. The number and location of trial carcasses found by searchers will be recorded and compared to the total number placed in the transects. Searchers will be instructed prior to the initial search effort to leave carcasses, once discovered to be trial carcasses, in place (these carcasses will also be used to calculate carcass persistence). The number of trial carcasses available for detection (non-scavenged) will be

determined immediately after the conclusion of the trial. Searcher efficiency of the surveyors will generate the estimate of searcher bias for input into the fatality estimate models (Section 2.2.4.4).

Carcass persistence trials will be conducted concurrently with searcher efficiency trials and, to the extent possible, using the same carcasses from the searcher efficiency trials. In total, 30 small, 20 medium, and 10 large carcasses will be randomly placed and monitored within the solar arrays, each season. Carcass persistence trials in the solar arrays will be monitored, using motion-triggered, digital trail cameras (e.g., see Smallwood et al. 2010). The status of each trial carcass (e.g. gone/present, fresh/desiccated, whole/partial) will be recorded throughout the trial. The length of time carcasses persist on the ground will be used to generate the estimate of carcass persistence for input into of the fatality estimate models (Section 2.2.4.4).

Table 2. Approximate carcass persistence trial sample sizes per season.

Project component	Size	sample size
Solar arrays/fence	Small	30
	Medium	20
	Large	10
<b>Totals</b>		<b>60</b>

Fake cameras or cameras without bias trial carcasses may also be placed to avoid training ravens to recognize cameras as “feeding stations”. Periodic ground-based checking of carcasses also will occur to guard against misleading indicators of carcass removal, such as wind blowing the carcass out of the camera’s field of view. To minimize potential bias caused by scavenger swamping (Smallwood 2007, Smallwood et al. 2010), carcass-persistence specimens will be distributed across the entire Facility, not just in areas subject to standard surveys, and new specimens will be placed every two to three weeks in small numbers.

#### 2.2.4.2 Data Analysis and Modeling

Because the detectability of carcasses during field surveys can be imperfect, raw carcass counts generally underestimate actual mortality. Therefore, the Huso fatality estimator (Huso 2011; Huso et al. 2012, Huso et. al 2016a), modified to account for distance sampling (WEST 2016a, Huso et. al 2016b), will be applied to generate corrected fatality rate estimates for the BSEF.

The Huso fatality estimator (Huso 2011; Huso et al. 2012) allows the user to model categorical covariates that may affect searcher efficiency and carcass persistence. AICc scores are used to evaluate the effectiveness of candidate models before generating final fatality estimates. Because the underlying assumption that searchers have a single opportunity to discover a carcass, only those carcasses determined to have occurred within the previous search interval will be used to generate adjusted fatality estimates. In addition, the model does not produce reliable estimates when there are few carcasses included in analysis. When fewer than five carcasses belonging to a group of interest (e.g. small birds) are found and included in analysis, estimates will not be provided.

Corrected fatality estimates will be reported for the solar Facility (PV panel area). Estimated mortalities will be expressed in terms of carcasses/MW/season and in other metrics appropriate for a solar facility to facilitate comparison with other studies.

Analysis of data collected during the post-construction study will include seasonal fatality estimates for all birds and bats to the taxonomic level where fatality estimates can be calculated. Fatality estimates and confidence intervals will be compared to determine if differences in fatality estimates between taxa or group

(e.g. birds compared to bats, large birds compared to small birds), or season. Because representative fatality estimates are more challenging to develop for small (i.e. <5) numbers of carcasses, appropriate taxonomic-level fatality estimates will only be calculated if the number of carcasses is sufficient.

## **2.3 Reporting**

The Certificate Holder will document the results of the monitoring in a summary report following the completion of the post-construction monitoring. The certificate holder may include the reporting of wildlife monitoring data and analysis in the annual report required under OAR 345-026-0080 or submit this information as a separate document at the same time the annual report is submitted.

The summary report will include fatality estimates and data summaries. The report will include all data analyses, including correlation analyses and overall fatality estimates, and a discussion of monitoring results and their implications. The Certificate Holder shall notify the appropriate agency as outlined in Section 3.2 immediately upon the discovery of a carcass of any state-listed, ESA-listed species or eagle on the Facility site.

## **2.4 Amendment**

This WMAMP may be amended by written agreement of the Certificate Holder and the Oregon Energy Facility Siting Council. Amendments to this WMAMP will not require an amendment of the Site Certificate.

# **3.0 ADAPTIVE MANAGEMENT**

---

## **3.1 Adaptive Management Goals**

The goals of the adaptive management process for this Facility are to enable the incorporation of relevant new information into the BSEF's avoidance and minimization measures as outlined in Exhibits P and Q to the Application. Additional avoidance and minimization measures may be incorporated at any time by Certificate Holder. However, certain trigger events and subsequent changes to avoidance and minimization measures have been defined as a part of the adaptive management process. Adaptive management will allow Certificate Holder to meet the BSEF's goals of avoiding and minimizing impacts to birds and bats. After the end of the first year of post-construction monitoring, if the fatality rates do not exceed any thresholds of concern identified in Section 3.2, no additional monitoring will be conducted. However, if the fatality rates do exceed any of the thresholds of concern in Section 3.2, ODOE, in consultation with ODFW and the Certificate Holder, will determine if additional monitoring is warranted, based on the number of observed carcasses and estimated fatality rates, and consideration of any other significant information available at the time.

## **3.2 Adaptive Management Process**

To enable new information, including the results of post-construction monitoring, to influence and improve the avoidance and minimization measures of the BSEF, certain trigger events and the subsequent changes or actions have been established.

The events that would trigger changes to avoidance and minimization measures presented herein would be:

- Discovery of an eagle carcass
- New ESA-listing of a bird or bat species



- Discovery of an ESA-listed species carcass
- New state-listing of a bird or bat species
- Discovery of a state-listed species carcass
- The total number of observed bird and bat mortalities is higher than expected and likely to be significant, as defined in Section 3.2.6.

### 3.2.1 Discovery of an Eagle Carcass

If an eagle carcass is discovered at the BSEF, the following actions will be taken:

- Certificate Holder will, working with a qualified wildlife biologist, promptly identify and secure the carcass at the place of its discovery in the field until USFWS personnel can be reached and provide the further instruction for the storage of the carcass.
- Certificate Holder will notify USFWS, ODFW, and ODOE within one business day after discovery and positive identification of the carcass.
- Certificate Holder will work with the USFWS to evaluate available data concerning the find and, as appropriate, identify and implement avoidance and minimization measures to reduce the risk of future carcasses. Potential adaptive management approaches are presented in Section 3.2.7 below.
- Certificate Holder will assess the need to obtain additional authorizations in view of the new information.

### 3.2.2 New ESA-listing of a Bird or Bat Species

If a bird or bat species, known to occur or that has a high likelihood to occur within the BSEF area, becomes listed under the ESA during the life of the BSEF, Certificate Holder will coordinate with USFWS. If this trigger is met, Certificate Holder will work with USFWS to assess the potential for the BSEF to impact the species and subsequently to determine the appropriate action(s) for the BSEF, if any.

### 3.2.3 Discovery of an ESA-listed Species Carcass

If a carcass of an ESA-listed species is discovered at the BSEF, the following actions will be taken:

- Certificate Holder will, working with a qualified wildlife biologist, promptly identify and secure the carcass at the place of its discovery in the field until USFWS personnel can be reached and provide the further instruction for the storage of the carcass.
- Certificate Holder will notify USFWS, ODFW, and ODOE within one business day after the discovery and positive identification of the carcass.
- Certificate Holder will work with the USFWS to evaluate available data concerning the discovery and, as appropriate, identify and implement avoidance and minimization measures to reduce the risk of future mortalities.
- Certificate Holder will assess the need to obtain additional authorizations in view of the new information.

### 3.2.4 New State-listing of a New Bird or Bat Species

If a bird or bat species, known to occur or that has a high likelihood to occur within the BSEF area, becomes listed by ODFW during the life of the BSEF, Certificate Holder will coordinate with ODFW and ODOE. If this trigger is met, Certificate Holder will work with ODFW and ODOE to assess the potential for the BSEF to impact the species and subsequently to determine the appropriate action(s) for the BSEF, if any.

### 3.2.5 Discovery of a State-listed Species Carcass

- Certificate Holder will, working with a qualified wildlife biologist, promptly identify and secure the carcass at the place of its discovery in the field until ODFW personnel can be reached and provide the further instruction for the storage of the carcass.
- Certificate Holder will notify ODFW and ODOE within one business day after the discovery and positive identification of the carcass.
- Certificate Holder will work with the ODFW and ODOE to evaluate available data concerning the discovery and, as appropriate, identify and implement avoidance and minimization measures to reduce the risk of future mortalities.
- Certificate Holder will assess the need to obtain additional authorizations in view of the new information.

### 3.2.6 Total Number of Observed Bird and Bat Mortalities is Higher than Expected and Likely to be Significant

Avian use and species richness are expected to be low during pre-construction avian surveys. Similarly, bat use of the area is expected to be limited to foraging and also expected to be low. Thus, mortalities to birds and bats during operations are expected to be low. Significance of the levels of mortality of any bird or bat species would be determined in coordination with USFWS, ODFW and ODOE in a separate document, which shall be incorporated herein by reference at that time and would be based on the best available information, including the most recent data on species' population sizes and trends and fatality rates at technologically and geographically similar facilities if available. At the time of this permit application, there is no publicly available avian fatality data at PV facilities in Oregon but there may be in the future. This approach recognizes that higher levels of mortality of common species may not be significant. Conversely, lower levels of mortalities of less common species may be of more concern, particularly if these species appear to be at risk (e.g., Oregon sensitive-critical species). Given the assessment and prediction that impacts are likely to be low, the following actions are suggested in response to monitoring outcomes:

1. If documented fatalities are lower or not different than predicted and are not significant, no mitigation will be conducted.
2. If fatalities are greater than predicted and are likely to be significant, Certificate Holder will meet and confer with the ODFW and ODOE and the applicable actions presented below will be carried out. If a particular cause can be identified, Certificate Holder will develop specific mitigation measures in consultation with ODFW and ODOE to address the occurrence.

### 3.2.7 Potential Adaptive Management Approaches

Circumstances that trigger the need for adaptive management will be investigated such that the Certificate Holder can, in consultation with ODFW and ODOE, implement avoidance, minimization, and mitigation measures designed and implemented to reduce impacts to birds and/or bats while maintaining Facility viability. If ODOE determines that additional avoidance, minimization or mitigation measures are appropriate based on analysis of the data, consultation with ODFW, and consideration of other significant information available at the time, the Certificate Holder, in consultation with ODOE and ODFW shall propose and implement measures to address the concern, subject to the approval of ODOE.

Avoidance, minimization, and mitigation actions that may be taken under adaptive management include, but are not limited to, the following:

- 1) Remove or modify any identified sources of bird or bat attraction to the extent practicable.
- 2) If more than one eagle carcass is discovered in a 5-year time period, Certificate Holder will develop and implement a roadkill removal program on roads within or near the BSEF, as appropriate, to offset BSEF impacts to eagles.

- 3) Implement technological solutions. If bird and/or bat carcass discoveries exceed the above-defined adaptive management triggers and new techniques or technology become available, the Certificate Holder, ODOE, and/or ODFW shall propose new approaches, techniques or technology designed to avoid and/or minimize impacts to the affected species, taking into consideration factors including but not limited to cost effectiveness and feasibility to implement, subject to the approval of ODOE. At the time of this permit application, there are no technological solutions available.

If ODOE determines that additional monitoring is appropriate based on analysis of the data, consultation with ODFW and Certificate Holder, and consideration of any other significant information available at the time, the Certificate Holder shall conduct additional specific, targeted monitoring to determine if adaptive management measures are effective.

## 4.0 LITERATURE CITED

---

- Buckland, S. T., D. R. Anderson, K. P. Burnham, and J. L. Laake. 1993. Distance Sampling: Estimating Abundance of Biological Populations. Chapman & Hall, London, United Kingdom.
- Huso, M. 2011. An estimator of wildlife fatality from observed carcasses. *Environmetrics*, n/a. doi: 10.1002/env.1052.
- Huso, M., N. Som, and L. Ladd. 2012. Fatality estimator user's guide. U.S. Geological Survey Data Series 729. Available at: <http://pubs.usgs.gov/ds/729/pdf/ds729.pdf>.
- Huso, M., D. H. Dalthorp, T. Miller, and D. Bruns. 2016a. Wind Energy Development- Methods for Assessing Post-Construction Bird and Bat Mortality. *Human-Wildlife Interactions* 10(1): 62-70.
- Huso, M., T. Dietsch, and C. Nicolai. 2016b. Mortality Monitoring Design for Utility-Scale Solar Power Facilities. US Geological Survey (USGS) Open-File Report 2016-1087. 44 pp.
- Kagan, R.A., Viner T.C., Pepper W. T. and Espinoza E.O. 2014. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. National Fish and Wildlife Forensics Laboratory
- Western Ecosystems Technology, Inc. (WEST). 2016a. Avian and Bat Monitoring at the Desert Sunlight Solar Farm Project Riverside County, California, 2015 - 2016 Annual Report [Draft]. Prepared for Desert Sunlight 250, LLC and Desert Sunlight 300, LLC, Juno Beach, Florida. Prepared by WEST, Cheyenne Wyoming.
- Western EcoSystems Technology, Inc. (WEST). 2016b. Bird and Bat Conservation Strategy, Blythe Solar Energy Project, Riverside County, California. 57 pp.
- Western EcoSystems Technology, Inc. (WEST). 2016c. Bird and Bat Conservation Strategy, McCoy Solar Energy Project, Riverside County, California. 57 pp.

Attachment P-8  
Raptor Nest Survey

**Raptor Nest Survey**  
**Boardman Solar Energy Facility**  
**Morrow and Gilliam Counties, Oregon**

---

**Final Report**  
**Spring 2017**



**Prepared for:**  
**Invenergy Solar Development, LLC**  
One South Wacker Drive, Suite 1800  
Chicago, Illinois 60606

---

**Prepared by:**  
**Michael Gerringer**  
Western EcoSystems Technology, Inc.  
415 West 17<sup>th</sup> Street, Suite 200  
Cheyenne, Wyoming 82001

**June 16, 2017**



## **STUDY PARTICIPANTS**

### **Western EcoSystems Technology**

Michael Gerringer	Project Manager, Wildlife Biologist
Carmen Boyd	Data Manager
Fawn Hornsby	Statistician
Jon Cicarelli	GIS Technician
Michael Gerringer	Report Compiler
Lori Nielsen	Senior Reviewer
Jeanette Haddock	Independent Reviewer
Wendy Bruso	Technical Report Manager
Katie Michaels	Technical Editor
Carissa Goodman	Technical Editor
Jerry Baker	Field Technician
Jeremy Krumlauf	Field Technician

## **REPORT REFERENCE**

Gerringer, M. 2017. Raptor Nest Survey, Boardman Solar Energy Facility, Morrow and Gilliam Counties, Oregon. Final Report: Spring 2017. Prepared for Invenergy Solar Development LLC, Chicago, Illinois. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. 9 pages.

**TABLE OF CONTENTS**

1	INTRODUCTION.....	1
2	STUDY AREA .....	1
3	METHODS .....	4
4	RESULTS.....	5
5	LITERATURE CITED .....	9

**LIST OF TABLES**

Table 4.1. Nests identified during the ground-based raptor nest surveys conducted at the Boardman Solar Energy Facility Study Area on April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon. ....	8
---	---

**LIST OF FIGURES**

Figure 1.1. Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	2
Figure 2.1. Location of the Boardman Solar Energy Facility Study Area for the ground-based raptor nest surveys conducted April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon. ....	3
Figure 4.1. Location of raptor nests documented within the Boardman Solar Energy Facility Study Area during the ground-based raptor nest surveys conducted April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon. ....	7

## 1 INTRODUCTION

Invenergy Solar Development, LLC (Invenergy) has proposed development of the Boardman Solar Energy Facility (Project) in Morrow and Gilliam counties, Oregon (Figure 1.1). Invenergy requested Western EcoSystems Technology, Inc. (WEST) conduct ground-based raptor nest surveys for the Project. The objective of this study was to survey for all raptor nests, including the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), in the Project area and within a 1.6-kilometer (km; 1.0-mile [mi]) buffer (Study Area). This buffer is the most conservative distance established by the U.S. Fish and Wildlife Service (USFWS 2008) for potential disturbances caused by construction projects. This report provides the results of the ground-based raptor nest surveys conducted for the Project.

## 2 STUDY AREA

The 323-hectare (ha; 798-acre [ac]) Project area includes the proposed solar project location and the associated transmission line (46-meter [m; 150-feet (ft)] right-of-way). The Project is located in Morrow and Gilliam counties, approximately 1.6 km (1.0 mi) south of the Columbia River, 19.2 km (12.0 mi) west of the town of Boardman and the Boardman Bombing Range, and 17.6 km (11.0 mi) east of the town of Arlington. The Project area is bordered by Interstate 84 to the north, agricultural crop circles to the south, and open land to the east and west. The solar project location is in Morrow County and the transmission line is in Gilliam County (Figure 2.1). The Study Area encompasses the Project area and a 1.6-km (1.0-mi) buffer around the Project area (Figure 2.1).

The Study Area is located in the Columbia Plateau Ecoregion (U.S. Environmental Protection Agency 2016), characterized by a flood basalt plateau. Much of the region is dominated by arid sagebrush steppe (*Artemisia* spp.) and grasslands. A few water features are present in and adjacent to the Study Area, including a stream running through Threemile Canyon within the eastern boundary of the Project, Willow Creek west of the Project, and the Columbia River to the north (Figure 2.1). Elevations in the Study Area range from 81 to 176 m (266 to 577 ft). Topography in the Study Area is generally flat, except for the eastern portion, which lies within Threemile Canyon.



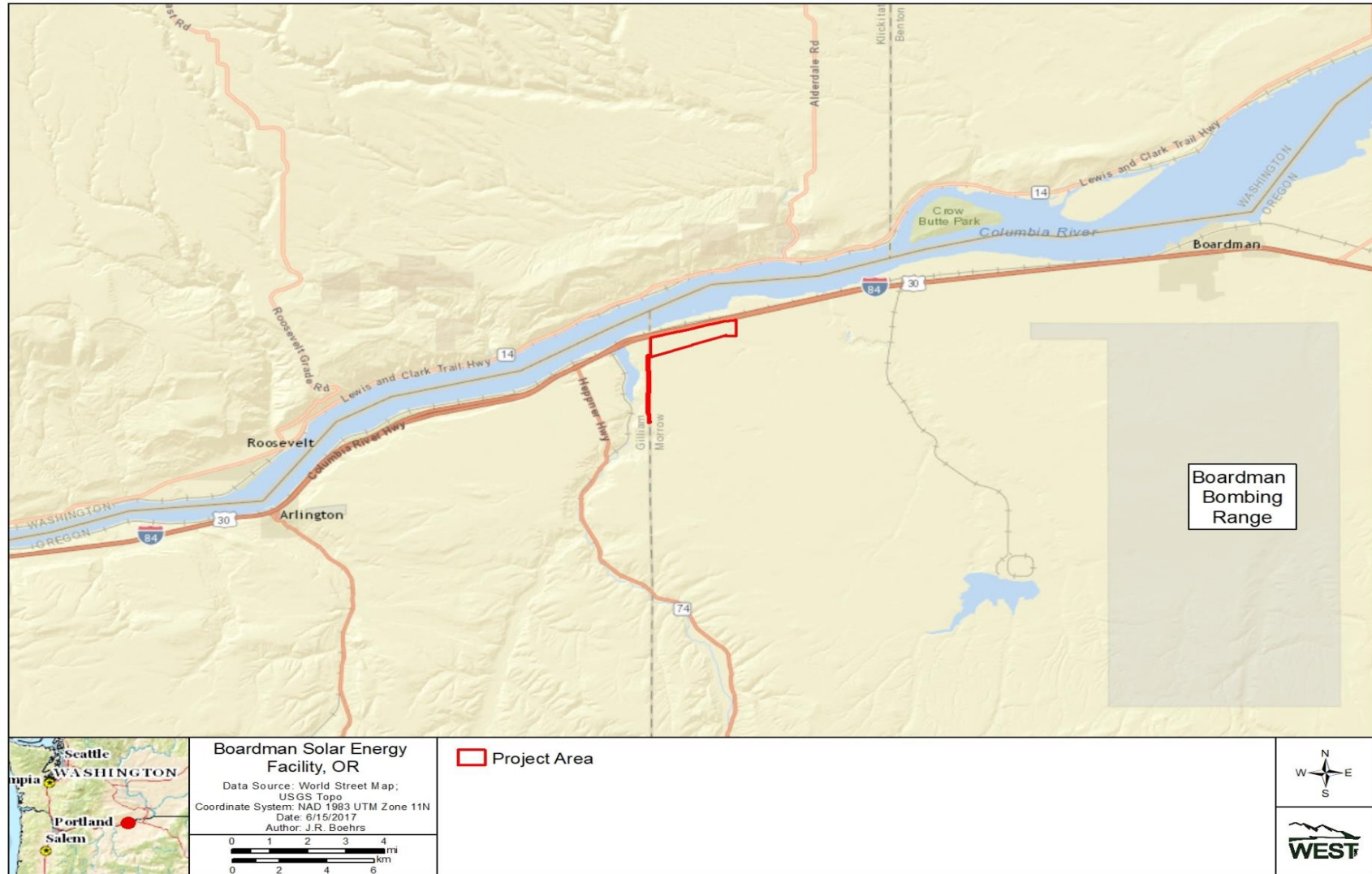


Figure 1.1. Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.

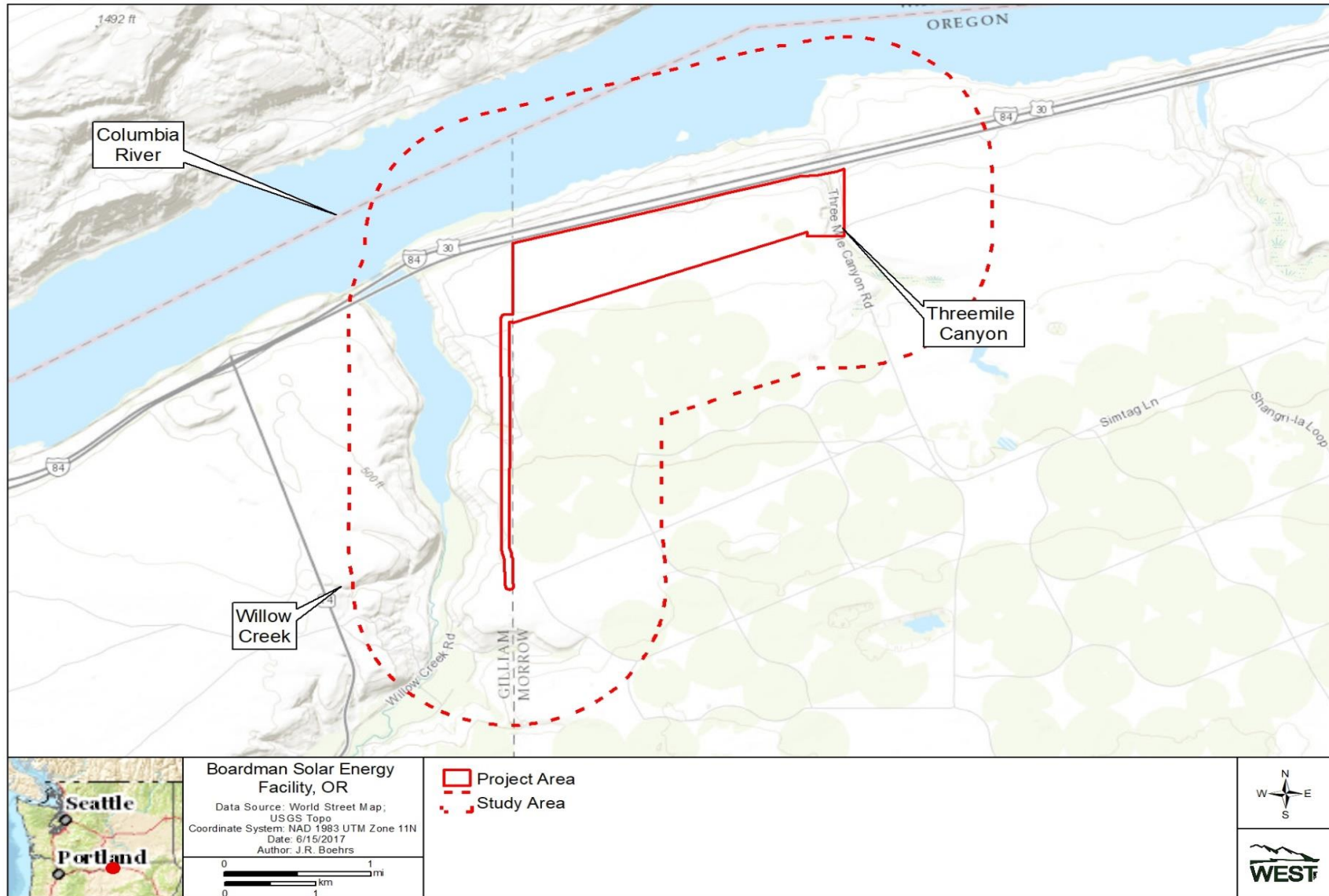


Figure 2.1. Location of the Boardman Solar Energy Facility Study Area for the ground-based raptor nest surveys conducted April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon.

### 3 METHODS

Prior to conducting the ground-based raptor nest surveys, existing data were requested from the USFWS, Oregon Department of Fish and Wildlife, and Oregon Eagle Foundation for any known raptor nest locations within the Study Area. According to these agencies, no records of existing raptor nests were documented within or near the Study Area.

Two raptor nest surveys were conducted from the ground by experienced field biologists. The initial raptor nest survey occurred on April 6, 2017, prior to tree leaf out. During the surveys, suitable raptor nesting habitat (e.g., rocky outcrops, trees, man-made structures such as power poles) was targeted. Biologists used binoculars, when necessary, to identify nesting raptor species and potential nests.

Species such as red-tailed hawks (*Buteo jamaicensis*), great-horned owls (*Bubo virginianus*), and eagles often establish nests by early April; however, other species, such as Swainson's hawks (*Buteo swainsoni*), may not begin nesting until later in April. Therefore, a second ground survey was conducted on May 13, 2017, to search for any new nests and to document the nest status and productivity for nests documented during the first survey. Surveys were conducted between 0800 hours and 1700 hours for both survey periods.

Data recorded for each observed nest site included:

- Nest identification
- Species occupying the nest
- Nest status (i.e., occupied or unoccupied, active or inactive, number of adults and young present)
- Nest condition (i.e., poor, fair, good, excellent)
- Nest substrate
- Nest location (marked with a hand-held GPS unit)

The following are descriptions of terms used during the nest recording and documentation (see Section 4, *Results*).

*Nest identification (ID)* - A unique nest identification number was assigned for each nest documented.

*Species* - A species was assigned to each nest when possible; otherwise, it was classified as an unknown raptor nest. Nests documented as unknown raptor species were defined

as any stick nest that did not have an occupant associated with it at the time of the survey. Nests often become abandoned or are no longer used, and over time, may become a historic nest site. Unknown raptor nests, including old nests or nests that could become suitable for raptors, were documented to populate a nest database to ensure future surveys include all potentially suitable nest sites.

*Nest status* - Basic nest use was recorded for each nest observed. Nests were classified as occupied if any of the following were observed at the nest structure: 1) an adult in an incubating position; 2) eggs; 3) nestlings or fledglings; 4) occurrence of a pair of adults or sub-adults; 5) occurrence of sub-adults; 6) a newly constructed or refurbished stick nest; or 7) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. Occupied nests were further classified as active if an egg or eggs had been laid or nestlings were observed, or inactive if no eggs or chicks were present. A nest that did not meet the above criteria for occupied was classified as unoccupied.

*Nest condition* - Nest condition was categorized using descriptions ranging from poor to excellent. Although the determination of nest condition can be subjective and may vary between observers, it provides a general sense of when a nest or nest site may have last been used. Nests in poor condition are typically dilapidated (e.g., in disrepair, sloughing, or sagging heavily) and require major repair in order to be suitable for successful nesting. A nest in fair condition is not dilapidated, but needs significant repair in order to be used. Nests in good condition only need minor attention to be suitable for nesting. Nests in excellent condition were those that appeared to have been well maintained, had a well-defined bowl shape, were not sagging or sloughing, and were deemed suitable for nesting.

*Nest substrate* - The substrate in which each nest was observed was recorded. Common substrates used by raptors may include deciduous and coniferous trees, rocky outcrops or cliffs, and man-made structures (e.g., power line poles, nest platforms).

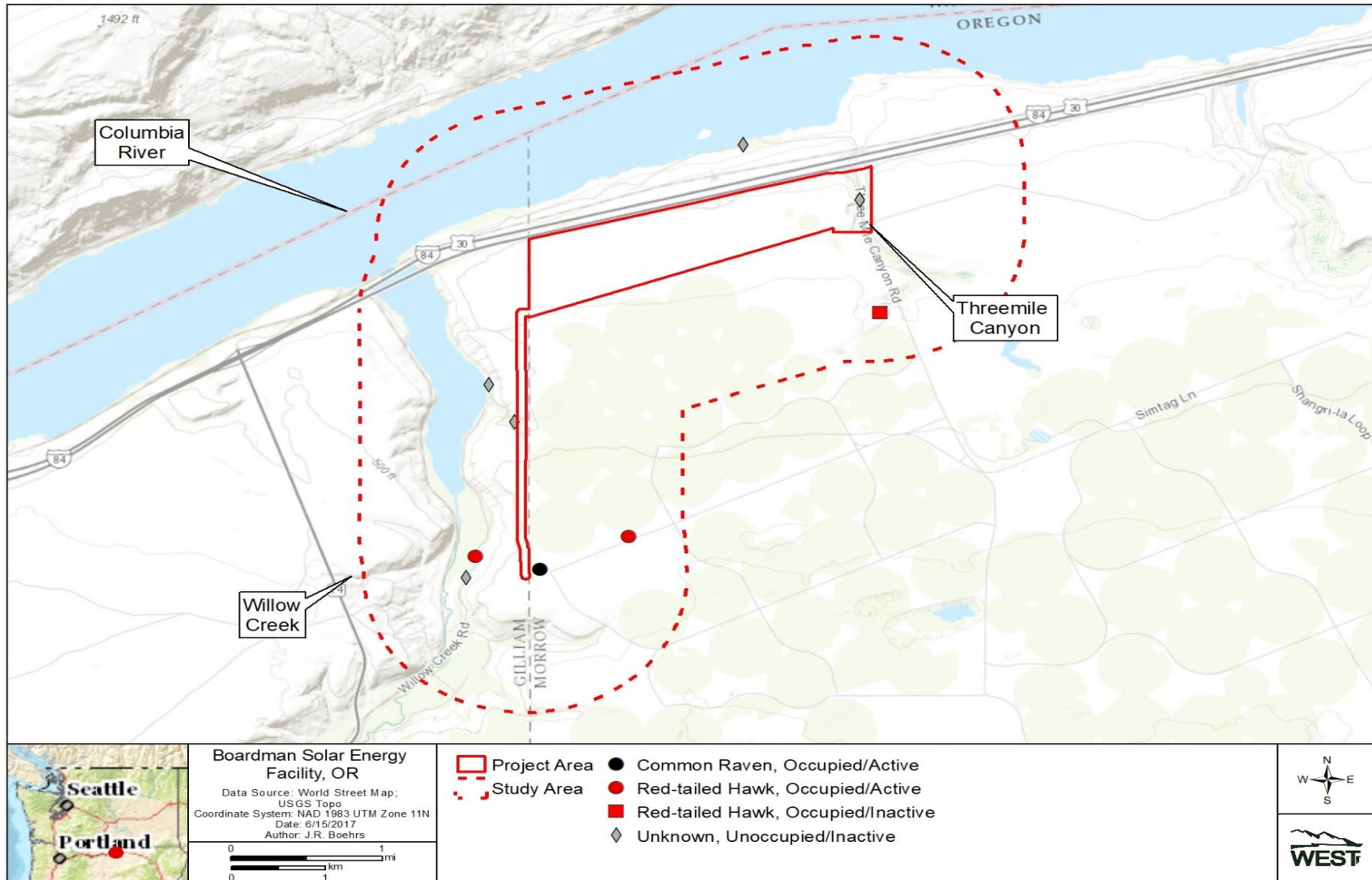
*Nest location* – Using a hand-held GPS, each nest location was recorded, listing both the easting and northing.

## **4 RESULTS**

Ten nests were detected within the Study Area during the first survey conducted on April 6, 2017 (Figure 4.1, Table 4.1). These included three occupied/active red-tailed hawk nests, one occupied/active common raven (*Corvus corax*) nest, and six unoccupied/inactive raptor stick nests of unknown species. The three occupied/active red-tailed hawk nests and one occupied/active common raven nest were located outside the Project area, but within the Study Area. One of the six raptor unoccupied/inactive stick nests of unknown species was located within the Project area, while the remaining five unoccupied/inactive nests were located outside the Project area, but within the Study Area (Figure 4.1, Table 4.1).

During the subsequent survey conducted on May 13, 2017, nine of the 10 nests were the same status as recorded on April 6, except for one of the red-tailed hawk nests, which was found to be no longer active (i.e., a failed nest attempt) and was recorded as occupied/inactive (Figure 4.1; Table 4.1). No new nests were identified. No eagle nests or nests of federally or state-listed threatened or endangered raptor species were observed during the surveys, and none of the nests found appeared to be previously used by eagles, based on their size and structure.





**Figure 4.1. Location of raptor nests documented within the Boardman Solar Energy Facility Study Area during the ground-based raptor nest surveys conducted April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon.**  
 (Note that two nests were in the same tree and appear as one nest; see Table 4.1)

Table 4.1. Nests identified during the ground-based raptor nest surveys conducted at the Boardman Solar Energy Facility Study Area on April 6 and May 13, 2017 in Morrow and Gilliam counties, Oregon.

Nest ID	Species <sup>1</sup>	Nest Status	Nest Condition	Substrate <sup>2</sup>	Easting	Northing	Comments
B1	RTHA	Occupied/Inactive	Good	DEC	5075170	270630	Adult on nest April 6; during second survey May 13, nest no longer active; stick nest in deciduous tree
B2	RTHA	Occupied/Active	Good	DEC	5072210	732752	Adult incubating; stick nest in black cottonwood ( <i>Populus trichocarpa</i> )
B3	UNKN	Unoccupied/Inactive	Good	DEC	5071943	732658	Stick nest in black locust ( <i>Robinia pseudoacacia</i> )
B4	UNKN	Unoccupied/Inactive	Dilapidated	DEC	5076601	270466	Stick nest in Russian olive ( <i>Eleagnus angustifolia</i> )
B5	UNKN	Unoccupied/Inactive	Dilapidated	DEC	5074386	732810	Stick nest in lombardi poplar ( <i>Populus nigra</i> )
B6	UNKN	Unoccupied/Inactive	Good	DEC	5073927	733105	Stick nest in deciduous tree
B7	RTHA	Occupied/Active	Good	MMS	5072442	267841	Adult on nest; newly constructed nest on existing transmission line structure
B8 <sup>3</sup>	UNKN	Unoccupied/Inactive	Good	DEC	5077342	269248	Stick nest in willow ( <i>Salix</i> sp.) tree at 3-meter (10-foot) height
B9 <sup>3</sup>	UNKN	Unoccupied/Inactive	Good	DEC	5077342	269248	Second stick nest in same willow tree at 5-meter (16-foot) height
B10	CORA	Occupied/Active	Good	MMS	5072059	266880	Adult on nest; nest on transmission line structure

<sup>1</sup> RTHA = red-tailed hawk; CORA = common raven; UNKN = unknown raptor

<sup>2</sup> DEC = deciduous tree; MMS = man-made structure

<sup>3</sup> Nests B8 and B9 occur in the same tree north of the Project area; therefore, one location point represents both nests in Figure 4.1

## **5 LITERATURE CITED**

- ESRI. 2017. World Imagery and Aerial Photos. ArcGIS Resource Center. ESRI, producers of ArcGIS software. Redlands, California. Information available online from: <http://www.arcgis.com/home/webmap/viewer.html?useExisting=1>
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- U.S. Environmental Protection Agency (USEPA). 2016. Level III and Level IV Ecoregions of the Continental United States. Available online at: <http://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>
- U.S. Fish and Wildlife Service (USFWS). 2008. Guidelines for Raptor Conservation in the Western United States Draft. USFWS, Region 9, Division of Migratory Bird Management, Washington D.C. February 2008. Accessed July 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands\\_and\\_minerals/oil\\_and\\_gas/february\\_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands_and_minerals/oil_and_gas/february_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf)
- U.S. Geological Survey (USGS). 2017. USGS Topographic Maps. Last updated January 17, 2017. Homepage available at: <https://nationalmap.gov/ustopo/index.html>



Attachment P-9  
Sensitive Species Survey

**Sensitive Species Survey  
Boardman Solar Energy Facility  
Gilliam and Morrow Counties, Oregon**

---

**Final Report  
Spring 2017**



**Prepared for:**  
**Invenergy Solar Development, LLC**  
One South Wacker Drive, Suite 1800  
Chicago, Illinois 60606

---

**Prepared by:**  
**Michael Gerringer**  
Western EcoSystems Technology, Inc.  
415 West 17th Street, Suite 200  
Cheyenne, Wyoming 82001

**June 16, 2017**



## **STUDY PARTICIPANTS**

### **Western EcoSystems Technology**

Michael Gerringer	Project Manager, Wildlife Biologist
Carmen Boyd	Data and Report Manager
Fawn Hornsby	Statistician
Jon Cicarelli	GIS Technician
Greg Johnson	Report Compiler
Lori Nielsen	Senior Reviewer
Jeanette Haddock	Independent Reviewer
Wendy Bruso	Technical Report Manager
Katie Michaels	Technical Editor
Carissa Goodman	Technical Editor
Jerry Baker	Field Technician
Jeremy Krumlauf	Field Technician

## **REPORT REFERENCE**

Gerringer, M. 2017. Sensitive Species Survey. Boardman Solar Energy Facility, Morrow and Gilliam counties, Oregon. Final Report: Spring 2017. Prepared for Invenergy Solar Development, LLC, Chicago, Illinois. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. 10 pages + appendix.

## **TABLE OF CONTENTS**

1	INTRODUCTION.....	1
2	STUDY AREA .....	1
3	METHODS .....	4
3.1	Desktop Assessment.....	4
3.2	Sensitive Species Field Surveys.....	4
4	RESULTS.....	5
4.1	Desktop Assessment.....	5
4.2	Sensitive Species Field Surveys.....	7
5	REFERENCES.....	9

## **LIST OF TABLES**

Table 4.1. List of sensitive species with the potential to occur in the Boardman Solar Energy Facility Study Area in Morrow and Gilliam counties, Oregon.....	6
Table 4.2. Sensitive species observed at the Boardman Solar Energy Facility Study Area on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon. ....	7

## **LIST OF FIGURES**

Figure 1.1. Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon. ....	2
Figure 2.1. Location of the Boardman Solar Energy Facility Study Area surveyed for sensitive species on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon. ....	3
Figure 4.1. Locations of sensitive species documented during surveys at the Boardman Solar Energy Facility Study Area on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon. ....	8

## **LIST OF APPENDICES**

Appendix A. Wildlife Observed during Sensitive Species Surveys at the Boardman Solar Energy Facility Study Area April 5 – 7 and May 12 – 13, 2017	
---	--

## **1 INTRODUCTION**

Invenergy Solar Development, LLC (Invenergy) has proposed development of the Boardman Solar Energy Facility (Project) in Morrow and Gilliam counties, Oregon (Figure 1.1). Invenergy requested Western EcoSystems Technology, Inc. (WEST) conduct pre-construction baseline desktop and field surveys of sensitive species in areas of suitable habitat located within the Project area and within a 305-meter (m; 1,000-foot [ft]) buffer (Study Area). The field surveys were conducted April 5 – 7 and May 12 – 13, 2017. Study objectives were to identify species of concern with the potential to occur in the Study Area and to document the presence/absence and spatial occurrence of plant and animal species of concern. Species of concern were defined to include federally threatened or endangered species, Oregon state-listed species (including state conservation strategy, critical, vulnerable, threatened, and endangered, and rare species), or state or federal special-status species, such as bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA; 1940). This report provides the results of the sensitive species surveys conducted for the Project.

## **2 STUDY AREA**

The 323-hectare (ha; 798-acre [ac]) Project area, includes the proposed solar project location and the associated transmission line (in a 46-m [150-ft] right-of-way). The Project is located in Morrow and Gilliam counties, approximately 1.6 kilometer (km; 1.0 mile [mi]) south of the Columbia River, 19.2 km (12.0 mi) west of the town of Boardman and the Boardman Bombing Range, and 17.6 km (11.0 mi) east of the town of Arlington (Figure 1.1). The Project area is bordered by Interstate 84 to the north, agricultural crop circles to the south, and open land to the east and west. The solar project location is in Morrow County and the transmission line is in Gilliam County (Figure 2.1). The Study Area encompasses the Project area and a 305-m (1,000-ft) buffer around the Project area (Figure 2.1).

The Study Area is located in the Columbia Plateau Ecoregion (U.S. Environmental Protection Agency 2016), characterized by a flood basalt plateau. Much of the region is dominated by arid sagebrush steppe (*Artemisia* spp.) and grasslands. A few water features are present in and adjacent to the Study Area, including a stream running through Threemile Canyon within the eastern boundary of the Project, Willow Creek west of the Project, and the Columbia River to the north (Figure 2.1). Elevations in the Study Area range from 81 to 169 m (266 to 555 ft). Topography in the Study Area is generally flat, except for the eastern portion, which lies within Threemile Canyon.

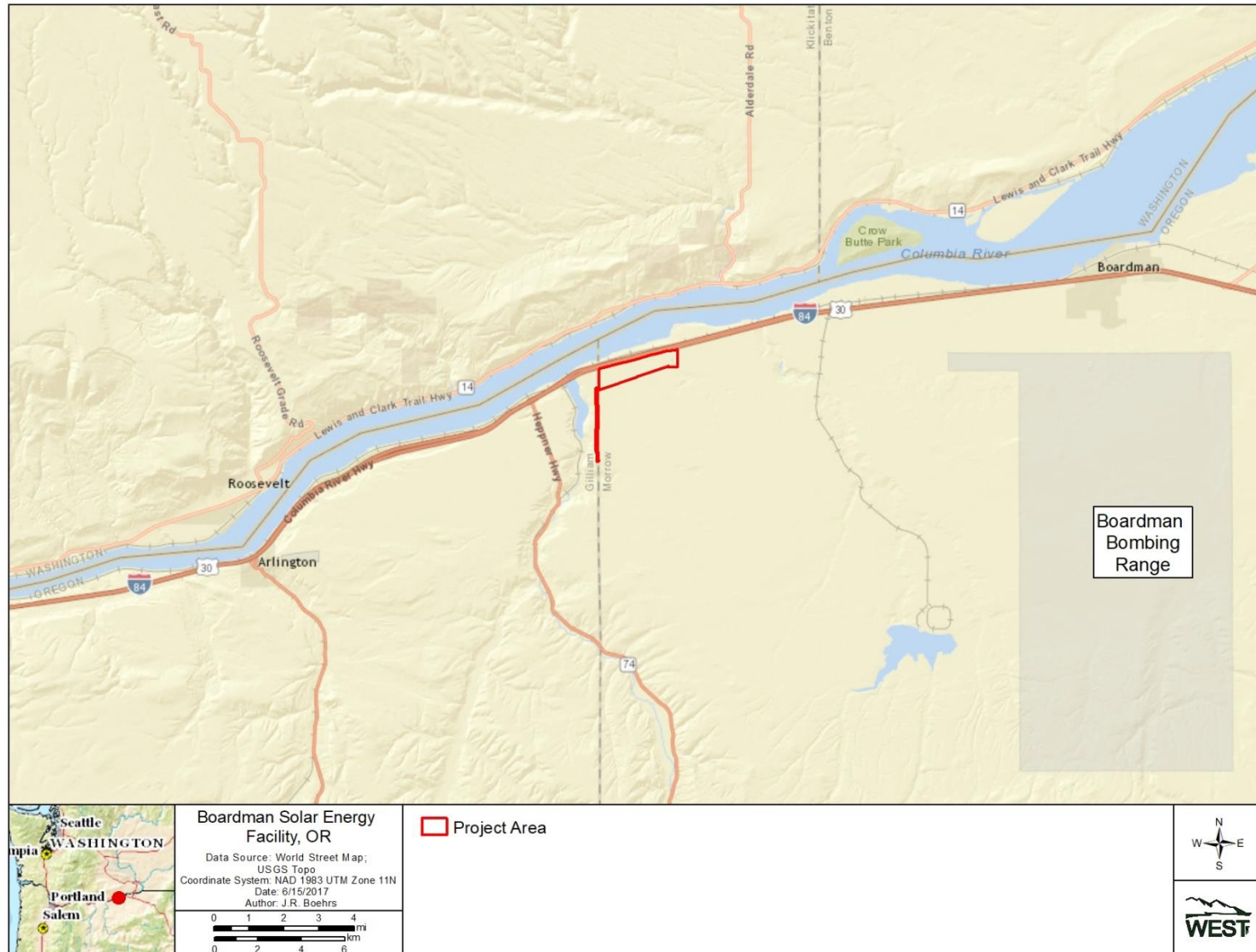


Figure 1.1. Location of the Boardman Solar Energy Facility in Morrow and Gilliam counties, Oregon.

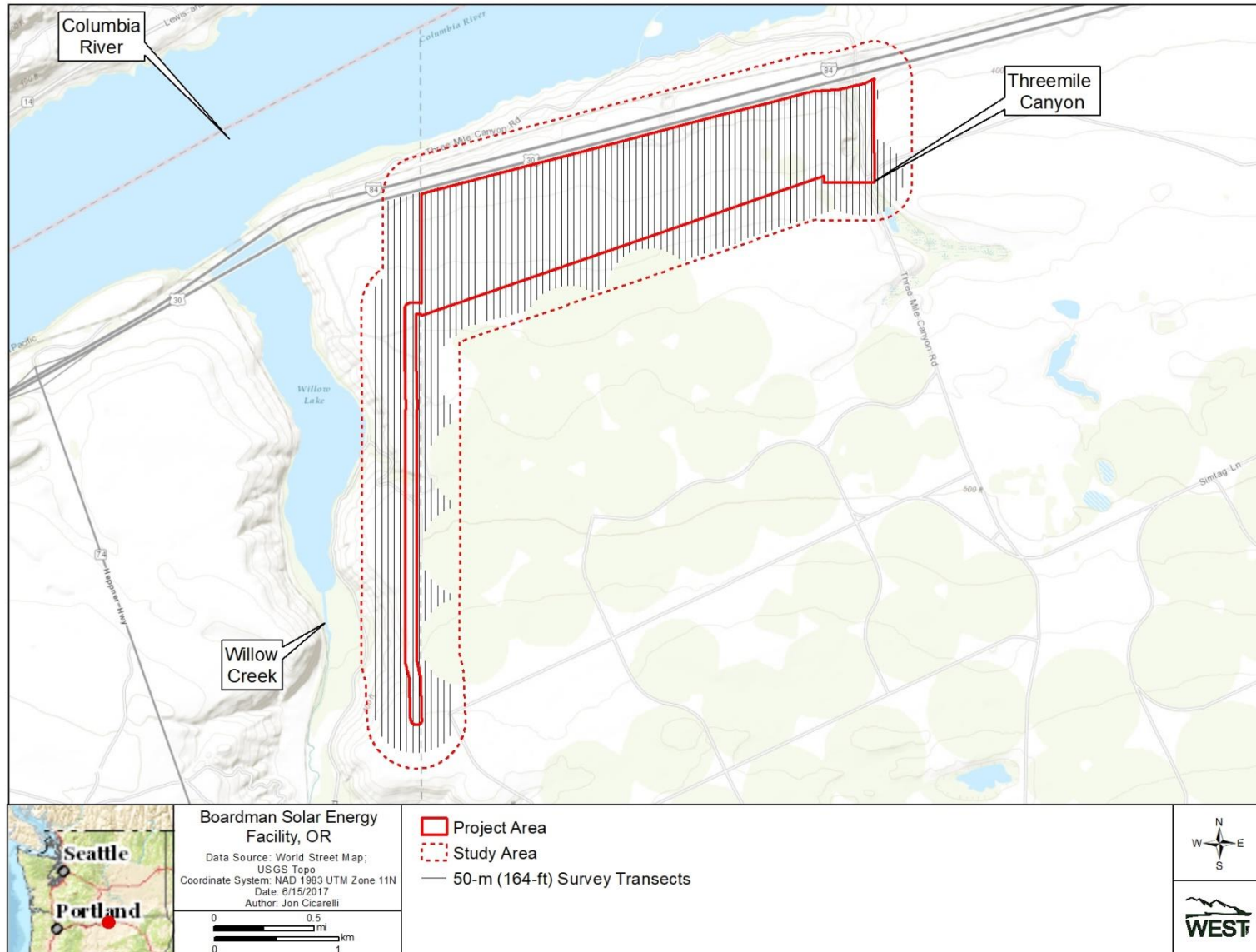


Figure 2.1. Location of the Boardman Solar Energy Facility Study Area surveyed for sensitive species on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon.

### **3 METHODS**

Prior to the sensitive species surveys, land cover in the Study Area was evaluated and mapped, based on the habitat categories provided in the Oregon Department of Fish and Wildlife (ODFW) Fish and Habitat Mitigation Policy (Oregon Administrative Rules [OAR] 635415-0000 through OAR 635-415-0025 [ODFW 2004 (Revised 2016)]). Habitat boundaries were delineated based on differences in vegetation, land form, and land use (Rintz and Hallingstad 2016). Since no state guidance protocol exists for solar development projects in Oregon, these surveys followed recommendations from Oregon's Wind Energy Siting and Permitting Guidelines (Oregon Columbia Plateau Ecoregion Wind Energy Taskforce 2008) and received during agency consultation. The sensitive species survey included a two-phased approach: (1) a desktop and field evaluation of habitat suitability for sensitive species via the Site Characterization Study (Rintz and Hallingstad 2016), as well as Habitat Categorization Study (WEST 2016) and (2) sensitive species field surveys.

#### **3.1 Desktop Assessment**

For the desktop assessment, data from the ODFW, Oregon Biodiversity Information Center (ORBIC), and U.S. Fish and Wildlife Service (USFWS) were reviewed to determine known sensitive species distribution and occurrence in and near the Study Area. Based on these data and the information compiled for the *Boardman Site Characterization Survey Report* (Rintz and Hallingstad 2016), a list of 18 sensitive plant and animal species and areas of potentially suitable habitat was created.

#### **3.2 Sensitive Species Field Surveys**

The survey protocols were developed based on these 18 sensitive species identified with the potential to occur in the Study Area. Surveys were conducted by experienced field biologists during two survey windows appropriate for the relevant sensitive species (April 5 – 7 and May 12 – 13, 2017). All field biologists had experience detecting Washington ground squirrels (*Urocitellus washingtoni*), as well as the other relevant sensitive species, by sight and sound. Areas of suitable habitat within the Study Area were surveyed (Figure 2.1), and unsuitable habitats were excluded (e.g., irrigated crop circles and Interstate 84).

The primary survey techniques for Washington ground squirrels and other sensitive species were based on the standard Washington ground squirrel detection survey protocol developed by the ODFW (Morgan and Nugent 1999). Parallel transects spaced 50 m (164 ft) apart were systematically searched by walking at a slow pace. Transect searches were conducted during daylight hours and as weather conditions permitted. When a suspected sensitive species detection occurred, surveyors departed from the transect in an attempt to confirm presence.



Date, time of observation, species, number of individuals, detection method (auditory and/or visual), sex and age class, flight height (if applicable), activity, and habitat were recorded for all sensitive species observations. Location was recorded using a hand held global positioning system (GPS). To confirm Washington ground squirrel detections, squirrel droppings (scat) associated with a burrow hole, positive identification by call, and/or positive visual observation of squirrels were required.

## **4 RESULTS**

### **4.1 Desktop Assessment**

Based upon the desktop assessment, a list of sensitive plant and animal species was created. Thirteen bird species, two mammal species, one reptile species, and two plant species were identified to have the potential to occur in the Study Area (Table 4.1). While interior rush is not considered a sensitive species, it is included in this list because it is a potential sensitive species for which more information is needed before a status can be determined. Based on the habitat evaluation and mapping effort, two major habitat types were identified in the Study Area: shrub/scrub and grassland. Additionally, small areas of wetlands and open water also were identified.

Gray rabbitbrush (*Ericameria nauseosa*) and snakeweed (*Gutierrezia sarothrae*) were the dominate shrubs in shrub/scrub habitat with small isolated areas of big sagebrush (*Artemisia tridentata*). The understory was dominated by cheatgrass (*Bromus tectorum*). Cheatgrass and bulbous bluegrass (*Poa bulbosa*) were the dominant grasses of the grassland habitat with scattered gray rabbitbrush and snakeweed also present. Predominant wetland species included broadleaf cattail (*Typha latifolia*), watercress (*Nasturtium officinale*), softstem bulrush (*Schoenoplectus tabernaemontani*), and western goldenrod (*Euthamia occidentalis*).

Table 4.1. List of sensitive species with the potential to occur in the Boardman Solar Energy Facility Study Area in Morrow and Gilliam counties, Oregon.

Species	Scientific Name	State Status <sup>1</sup>	Federal Status <sup>2</sup>	Preferred Habitat/Substrate	Potential Habitat within Study Area?
Ferruginous hawk	<i>Buteo regalis</i>	SC*	BCC, SOC	Grassland	Yes
Golden eagle	<i>Aquila chrysaetos</i>	None	Protected under BGEPA	Open water	Yes
Peregrine falcon	<i>Falco peregrinus</i>	SV*	BCC	Grassland	Yes
Short-eared owl	<i>Asio flammeus</i>	None*	BCC	Grassland	Yes
Swainson's hawk	<i>Buteo swainsoni</i>	SV*	None	Grassland	Yes
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	SC*	SOC	Grassland	Yes
Brewer's sparrow	<i>Spizella breweri</i>	None*	BCC	Grassland	Yes
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SV*	None	Grassland	Yes
Green-tailed towhee	<i>Pipilo chlorurus</i>	None	BCC	Shrub/Scrub	Yes
Loggerhead shrike	<i>Lanius ludovicianus</i>	SV*	BCC	Grassland	Yes
Long-billed curlew	<i>Numenius americanus</i>	SV*	BCC	Grassland	Yes
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	SC*	BCC	Grassland	Yes
Sage thrasher	<i>Oreoscoptes montanus</i>	None	BCC	Shrub/Scrub	Yes
<b>Bird Subtotal</b>	<b>13 species</b>				
Washington ground squirrel	<i>Urocitellus washingtoni</i>	SE*	None	Grassland	Yes
White-tailed jackrabbit	<i>Lepus townsendii</i>	SV*	None	Grassland	Yes
<b>Mammal Subtotal</b>	<b>2 species</b>				
Northern sagebrush lizard	<i>Sceloporus graciosus graciosus</i>	SV*	SOC	Shrub/Scrub	Yes
<b>Reptile Subtotal</b>	<b>1 species</b>				
Lawrence's milkvetch	<i>Astragalus collinus var. laurentii</i>	ST*	SOC	Sandy/Rocky Soil	Yes
Interior rush	<i>Juncus interior</i>	SNR*	None	Moist Areas	Yes
<b>Plant Subtotal</b>	<b>2 species</b>				

Sources: Bald and Golden Eagle Protection Act (BGEPA) 1940, USFWS 2008, Oregon Department of Agriculture (ODA) 2016, Oregon Biodiversity Information Center (ORBIC) 2016, Oregon Natural Heritage Information Center (ORNHIC) 2007

<sup>1</sup>SC: State Critical species; SV: State Vulnerable species; SE: State Endangered species; ST: State Threatened species; SNR: State Not yet Ranked species

<sup>2</sup>SOC: Taxa which the USFWS is reviewing for consideration as Candidates for listing under the Endangered Species Act (ESA); BCC: Birds of Conservation Concern

\* Indicates Oregon Conservation Strategy Species

## 4.2 Sensitive Species Field Surveys

Forty-seven bird species, four mammal species, and one reptile species were observed during the field surveys (Appendix A). Of these species, only three sensitive species were recorded, including three observations of peregrine falcons (*Falco peregrinus*; three individuals), 29 groups of long-billed curlews (*Numenius americanus*; 40 individuals), and three observations of grasshopper sparrows (*Ammodramus savannarum*; three individuals; (Table 4.1, Figure 4.2). Species totals may reflect repeated observations of the same individuals. Grasshopper sparrows and long-billed curlews were observed within both the Project area and Study Area; peregrine falcons were observed only in the Study Area, but not within the Project area (Figure 4.1).

**Table 4.2. Sensitive species observed at the Boardman Solar Energy Facility Study Area on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon.**

Species	Scientific Name	Status <sup>1</sup>	# of grps	# of obs
Peregrine falcon	<i>Falco peregrinus</i>	SV*	3	3
Long-billed curlew	<i>Numenius americanus</i>	SV*	29	40
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SV*	3	3
<b>Total</b>			<b>35</b>	<b>46</b>

grps = groups; obs = observations

<sup>1</sup> SV - State Vulnerable

\* Indicates Oregon Conservation Strategy Species

Suspected burrows of the Washington ground squirrel were recorded at the edge of the Study Area; however, no activity or other signs of Washington ground squirrels were observed at or near these burrows during either sensitive species surveys nor when checked on April 11, 2016 after conducting fixed-point avian use surveys. These burrows were determined to be from Ord's kangaroo rats (*Dipodomys ordii*) based upon the presence of kangaroo rat droppings found during the second round of sensitive species surveys.

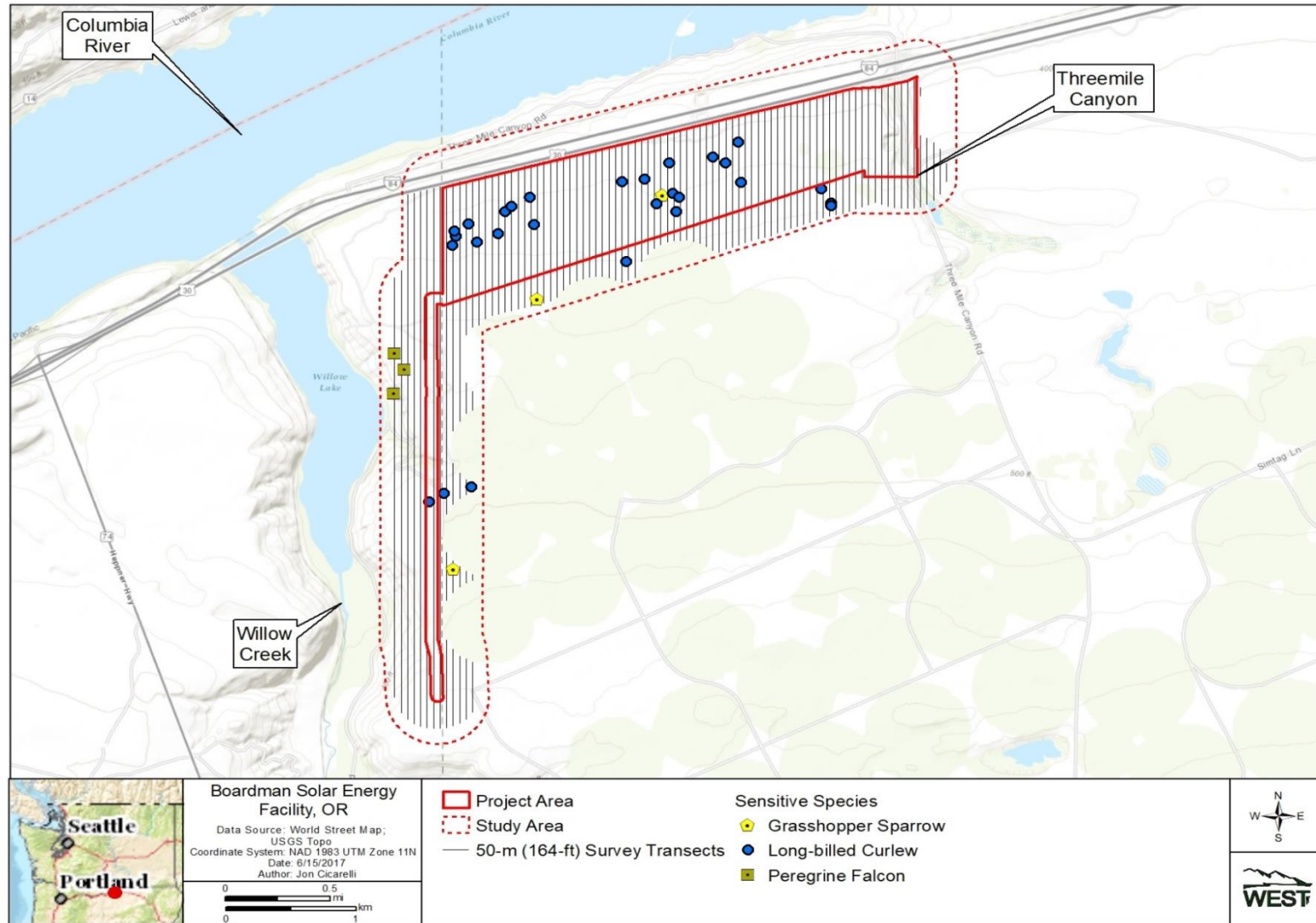


Figure 4.1. Locations of sensitive species documented during surveys at the Boardman Solar Energy Facility Study Area on April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon.

## **5 REFERENCES**

- Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 United States Code (USC) § 668-668d. Bald Eagle Protection Act of 1940, June 8, 1940, Chapter 278, Section (§) 2, 54 Statute (Stat.) 251; Expanded to include the related species of the golden eagle October 24, 1962, Public Law (PL) 87-884, 76 Stat. 1246. As amended: October 23, 1972, PL 92-535, § 2, 86 Stat. 1065; November 8, 1978, PL 95-616, § 9, 92 Stat. 3114.
- ESRI. 2017. World Imagery and Aerial Photos. ArcGIS Resource Center. ESRI, producers of ArcGIS software. Redlands, California. Information available online from: <http://www.arcgis.com/home/webmap/viewer.html?useExisting=1>
- Morgan, R. L. and M. Nugent. 1999. Status and Habitat Use of the Washington Ground Squirrel (*Spermophilus Washingtoni*) on State of Oregon Lands, South Boeig, Oregon, in 1999. Oregon Department of Fish and Wildlife (ODFW), Salem, Oregon.
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- Oregon Biodiversity Information Center (ORBIC). 2016. Rare, Threatened and Endangered Plant and Animal Records for the Proposed Wagon Tire Wind Resource Area. L. Wise, Biodiversity Data Manager, Institute for Natural Resources, ORBIC, Portland State University, Portland, Oregon. April 4, 2016.
- Oregon Columbia Plateau Ecoregion Wind Energy Taskforce. 2008. Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines. Oregon Department of Fish and Wildlife, USFWS, and Oregon Department of Energy, Portland, Oregon.
- Oregon Department of Agriculture (ODA). 2016. Oregon Listed Plants by County. Plant Conservation, ODA, Salem, Oregon. Accessed October 2016. Information available online from: <http://www.oregon.gov/ODA/programs/PlantConservation/Pages/ListedPlants.aspx>
- Oregon Department of Fish and Wildlife (ODFW). 2004. Division 415: Fish and Wildlife Habitat Mitigation Policy. Oregon Administrative Rules (OAR), ODFW. OAR 635-415-0000 to OAR 635-415-0025. November 26, 2004. Available online at: <http://www.dfw.state.or.us/OARs/415.pdf>
- Oregon Natural Heritage Information Center (ORNHC). 2007. Rare, Threatened and Endangered Species of Oregon. ORNHC, Institute for Natural Resources, Oregon State University (OSU), Portland, Oregon. March 2007. 100 pp. Available online at: [http://oregonstate.edu/ornhc/documents/2007\\_t&e\\_book.pdf](http://oregonstate.edu/ornhc/documents/2007_t&e_book.pdf)
- Rintz, T. and E. Hallingstad. 2016. Site Characterization Study for the Boardman Solar Energy Facility September 14, 2016. Prepared for Invenergy Solar Development, LLC, Chicago, Illinois. Prepared by Western EcoSystems Technology, Inc., (WEST) Corvallis, Oregon.
- U.S. Environmental Protection Agency (USEPA). 2016. Level III and Level IV Ecoregions of the Continental United States. Available online at: <https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>
- U.S. Fish and Wildlife Service (USFWS). 2008. Guidelines for Raptor Conservation in the Western United States Draft. USFWS, Region 9, Division of Migratory Bird Management, Washington D.C. February 2008. Accessed July 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands\\_and\\_minerals/oil\\_and\\_gas/february\\_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands_and_minerals/oil_and_gas/february_20120.Par.52166.File.dat/FWSRaptorGuidelines.pdf)

U.S. Geological Survey (USGS). 2017. USGS Topographic Maps. Last updated January 17, 2017. Homepage available at: <https://nationalmap.gov/ustopo/index.html>

Western EcoSystems Technology, Inc., (WEST). 2016. Wildlife Habitat Mapping and Categorization for the Boardman Solar Energy Project, November 30, 2016. Prepared for Invenergy Solar Development, LLC, Chicago, Illinois. Prepared by Western EcoSystems, Inc., (WEST). Corvallis Oregon.

**Appendix A. Wildlife Observed during Sensitive Species Surveys at the Boardman Solar  
Energy Facility Study Area April 5 – 7 and May 12 – 13, 2017**

**Appendix A. Wildlife observed during sensitive species surveys at the Boardman Solar Energy Facility Study Area conducted April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon.**

<b>Common Name</b>	<b>Scientific Name</b>
<b>Birds</b>	
American coot	<i>Fulica americana</i>
American goldfinch	<i>Spinus tristis</i>
American kestrel	<i>Falco sparverius</i>
American robin	<i>Turdus migratorius</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
Barn swallow	<i>Hirundo rustica</i>
Black-billed magpie	<i>Pica hudsonia</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Canada goose	<i>Branta canadensis</i>
California quail	<i>Callipepla californica</i>
Caspian tern	<i>Hydroprogne caspia</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Common raven	<i>Corvus corax</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Eurasian collared-dove	<i>Streptopelia decaocto</i>
European starling	<i>Sturnus vulgaris</i>
Great blue heron	<i>Ardea herodias</i>
Great horned owl	<i>Bubo virginianus</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Green-winged teal	<i>Anas crecca</i>
Horned lark	<i>Eremophila alpestris</i>
Killdeer	<i>Charadrius vociferus</i>
Lark sparrow	<i>Chondestes grammacus</i>
Long-billed curlew	<i>Numerius americanus</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida macroura</i>
Northern flicker	<i>Colaptes auratus</i>
Northern harrier	<i>Circus cyaneus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Rock pigeon	<i>Columba livia</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Turkey vulture	<i>Cathartes aura</i>
Unidentified gull	
Unidentified shorebird	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western meadowlark	<i>Sturnella neglecta</i>
Wilson's snipe	<i>Gallinago delicata</i>
Wilson's warbler	<i>Cardellina pusilla</i>
Western wood-pewee	<i>Contopus sordidulus</i>
Yellow warbler	<i>Setophaga petechia</i>



**Appendix A (*continued*). Wildlife observed during sensitive species surveys at the Boardman Solar Energy Facility Study Area conducted April 5 – 7 and May 12 – 13, 2017 in Morrow and Gilliam counties, Oregon.**

<b>Common Name</b>	<b>Scientific Name</b>
<b>Mammals</b>	
Coyote	<i>Canis latrans</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Mule deer	<i>Odocoileus hemionus</i>
Yellow-bellied marmot	<i>Marmota flaviventris</i>
<b>Reptiles</b>	
Gopher snake	<i>Pituophis catenifer</i>

**EXHIBIT Q**  
**THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES**  
 OAR 345-021-0010(1)(q) and OAR 345-022-0070

**TABLE OF CONTENTS**

	<b>Page</b>
Q.1 INTRODUCTION .....	Q-1
Q.1.1 Analysis Area .....	Q-1
Q.1.2 Agency Consultation .....	Q-1
Q.2 THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES .....	Q-2
Q.2.1 Information Review .....	Q-2
Q.2.2 Field Surveys .....	Q-4
Q.2.2.1 Summary of Field Survey Methods.....	Q-4
Q.2.2.2 Field Visit .....	Q-4
Q.2.2.3 Habitat Categorization.....	Q-5
Q.3 NATURE, EXTENT, AND TIMING OF SPECIES OCCURRENCE IN ANALYSIS AREA .....	Q-5
Q.3.1 Gray Wolf .....	Q-6
Q.3.2 Washington Ground Squirrel .....	Q-7
Q.3.3 Bull trout .....	Q-7
Q.3.4 Chinook Salmon .....	Q-8
Q.3.5 Steelhead .....	Q-8
Q.3.6 Lawrence’s milkvetch.....	Q-9
Q.4 THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES .....	Q-9
Q.5 PLANT DISTURBANCES .....	Q-9
Q.5.1 Plant Species with an ODA Protection and Conservation Program.....	Q-9
Q.5.2 Plant species without an ODA Protection and Conservation Program.....	Q-10
Q.6 ANIMAL DISTURBANCES .....	Q-10
Q.7 MONITORING PROGRAM.....	Q-10
Q.8 REFERENCES.....	Q-10

**TABLES**

Q-1 Federal and State Threatened and Endangered Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon .....	Q-3
Q-2 Summary of Field Surveys for Boardman Solar Energy Facility .....	Q-4

**FIGURE**

Q-1 Threatened and Endangered Species Analysis Area	
---	--

## Q.1 INTRODUCTION

**OAR 345-021-0010(1)(q)** requires the following:

*Information about threatened and endangered plant and animal species that may be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0070.*

**OAR 345-022-0070** requires the following:

*“[T]he Council, after consultation with appropriate state agencies, must find that:*

*(1) For plant species that the Oregon Department of Agriculture has listed as threatened or endangered under ORS 564.105(2), the design, construction and operation of the proposed facility, taking into account mitigation:*

*(a) Are consistent with the protection and conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3); or*

*(b) If the Oregon Department of Agriculture has not adopted a protection and conservation program, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species; and*

*(2) For wildlife species that the Oregon Fish and Wildlife Commission has listed as threatened or endangered under ORS 496.172(2), the design, construction and operation of the proposed facility, taking into account mitigation, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species.”*

### Q.1.1 Analysis Area

The analysis area, for purposes of Exhibit Q, includes the area within the Boardman Solar Energy Facility (Facility) site boundary and the area within 5 miles of the site boundary per OAR 345-001-0010(2) and (59), as shown on Figure Q-1.

### Q.1.2 Agency Consultation

Boardman Solar Energy LLC (Applicant) consultation with Oregon Department of Fish and Wildlife (ODFW) and U.S. Fish and Wildlife Service (USFWS) personnel regarding fish and wildlife habitat and species that could be affected by the Facility began in May 2016 and is ongoing. The following meetings and correspondence are described in additional detail in Exhibit P, Attachment P-1:

- Preliminary discussion regarding several Invenergy projects with ODFW-May 16, 2016
- Preliminary discussion regarding several Invenergy projects with USFWS-May 18, 2016
- Discussion regarding baseline survey protocol with ODFW-July 12, 2016
- Comments received on baseline survey protocol scope from ODFW-September 8, 2016
- Comments received on baseline survey protocol scope from USFWS-November 3, 2016
- Review of species list, habitat categorization, mitigation plan and monitoring plan with ODFW-November 7, 2016
- Site visit with ODFW-November 21, 2016

- Discussion regarding habitat mitigation plan with ODFW-March 14, 2017
- Discussion regarding Exhibit P documents with ODFW and ODOE-May 12, 2017
- Discussion regarding habitat mitigation plan with ODFW and ODOE-June 28, 2017

## **Q.2 THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES**

**OAR 345-021-0010(1)(q)(A)** *Based on appropriate literature and field study, identification of all threatened or endangered species listed under ORS 496.172(2), ORS 564.105(2) or 16 USC Sec. 1533 that may be affected by the proposed facility.*

**Response:** Sections Q.2.1 and Q.2.2 summarize the information review and field study completed to identify threatened or endangered species that may be affected by the proposed Facility.

The information review included the site boundary and a 5-mile buffer for state and federal special-status species within Gilliam and Morrow counties, Oregon.

### **Q.2.1 Information Review**

A USFWS Information for Planning and Conservation (IPaC) Trust Resources Report was generated for federal special-status species within the site boundary and 5 miles of the Facility (USFWS, 2016a). In addition, the Oregon Biodiversity Information Center (ORBIC) database was queried for records of state and federal special-status species within the site boundary and within 5 miles of the Facility (ORBIC, 2016a). These are also included in Exhibit P as Attachment P-3.

Based on results of the USFWS report and ORBIC database query, six state and federal threatened and endangered species were identified as occurring or potentially occurring within the site boundary or the 5-mile buffer area. These species are listed in Table Q-1 and described further in this Exhibit. State sensitive and federal species of concern, are addressed in Exhibit P. Table P-1 (Exhibit P) and Table Q-1 were used to design the field surveys described in Sections P.3.2 and Q.2.2.

To help make a determination on whether there is suitable habitat within the site boundary and potential for impacts within the analysis area for species identified in Table Q-1, additional sources were consulted to supplement the USFWS report and ORBIC database query. ORBIC does not represent a comprehensive survey effort and relies on voluntary reporting. The following sources provided additional information on species that potentially occur in the analysis area and include critical information such as habitat preferences, morphological characteristics, phonologic development timelines, and species ranges:

- 2011 National Land Cover Database (Homer et al., 2015)
- U.S. Department of Agriculture Natural Resource Conservation Service Soil Survey (2016)
- The National Map (U.S. Geological Survey [USGS], 2016)
- Gray Wolf General Information and Life History (USFWS, 2016b)
- Yellow-billed Cuckoo General Information and Life History (USFWS, 2016c)
- Bull Trout General Information and Life History (USFWS, 2016d, 2016e)
- Bull Trout Revised Critical Habitat Designation (USFWS, 2010)

- Bull Trout Final Rule Determining Threatened Status (USFWS, 1998)
- *Morrow County Comprehensive Plan* (Morrow County, 2013)
- Oregon Department of Agriculture [ODA] Plant Conservation Program (ODA, 2016)
- ODA Species Profile for Lawrence's milkvetch (ODA, 2014)
- *Threatened and Endangered Vascular Plants of Oregon: An Illustrated Guide* (Meinke, 1982)
- *Abundance and Habitat Associations of Washington Ground Squirrels in North-Central Oregon* (Greene, 1999)
- Geographic Distribution and Habitat Preferences of Washington Ground Squirrels (*Spermophilus washingtoni*) (Betts, 1990)
- Current Status of Washington Ground Squirrels (WGS) in Oregon and Washington (Betts, 1999)
- *Status and Habitat Use of the Washington Ground Squirrel (Spermophilus washingtoni) on State of Oregon Lands, South Boeig, Oregon, in 1999* (Morgan and Nugent, 1999)
- *Dispersal Patterns of Washington Ground Squirrels in Oregon* (Klein, 2005)
- *Home Range, Movement, and Foraging Behavior of Adult Washington Ground Squirrels (Spermophilus washingtoni)*; Delavan, 2005)

Table Q-1. Federal and State Threatened and Endangered Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon

Species	Scientific Name	State Status <sup>a,b</sup>	Federal Status <sup>a,b</sup>	Potential Habitat within the Facility Site Boundary	Potential Impact within the 5-mile Analysis Area
<b>Mammals</b>					
Gray wolf	<i>Canis lupus</i>	--	E	Suitable habitat; no known occurrence within 5.0 mi of site boundary	Yes
Washington ground squirrel	<i>Urocitellus washingtoni</i>	E	--	Suitable habitat; known populations occur approximately 5.0 mi from the site boundary	Yes
<b>Fish</b>					
Bull trout	<i>Salvelinus confluentus</i>	--	T	No suitable habitat; nearest habitat is Columbia River located 0.5 mi from the site boundary	Yes
Chinook salmon—Snake River, fall run	<i>Oncorhynchus tshawytscha</i>	T	T, CH	No suitable habitat; nearest habitat is Columbia River located 0.5 mi from the site boundary	Yes
Chinook salmon—Snake River, spring/summer run	<i>Oncorhynchus tshawytscha</i>	T	T, CH	No suitable habitat; nearest habitat is Columbia River located 0.5 mi from the site boundary	Yes
Steelhead—Middle Columbia	<i>Oncorhynchus mykiss</i>	SC	T, CH	No suitable habitat; nearest habitat is	Yes

**Table Q-1. Federal and State Threatened and Endangered Species with Potential to Occur within 5 Miles of the Facility Site Boundary – State of Oregon**

Species	Scientific Name	State Status <sup>a,b</sup>	Federal Status <sup>a,b</sup>	Potential Habitat within the Facility Site Boundary	Potential Impact within the 5-mile Analysis Area
River ESU, summer run				Columbia River located 0.5 mi from the site boundary	
Steelhead—Middle Columbia River ESU, winter run	<i>Oncorhynchus mykiss</i>	--	T, CH	No suitable habitat; nearest habitat is Columbia River located 0.5 mi from the site boundary	Yes
<b>Plants</b>					
Lawrence's milkvetch	<i>Astragalus collinus</i> var. <i>Laurentii</i>	T	--	Suitable habitat; no known occurrence within 5.0 mi of site boundary	Yes

<sup>a</sup> ORBIC, 2016a; ORBIC, 2016b; ODFW, 2015; USFWS, 2016a; USFWS, 2016b; USFWS, 2016c; USFWS, 2016h.

<sup>b</sup> Status Definitions

--	=	No status.
E	=	Endangered.
T	=	Threatened.
SC	=	Oregon state sensitive-critical; listing as threatened or endangered is pending or may be appropriate if immediate conservation actions are not taken.
CH	=	Federal dedicated critical habitat.

## Q.2.2 Field Surveys

### Q.2.2.1 Summary of Field Survey Methods

Table Q-2 summarizes field surveys that have been conducted, as well as ongoing investigations.

**Table Q-2. Summary of Field Surveys for Boardman Solar Energy Facility**

Date	Description
April 26, 2016	Field visit
September 2016	Habitat Categorization; Wetland Delineation
April - May 2017	Raptor Nest Survey
April – May 2017	Sensitive Species Survey
September 2016 – August 2017	Avian Use Survey – Fixed Point
April – June 2017	Breeding Bird Survey

### Q.2.2.2 Field Visit

A field visit was conducted by two biologists on April 26, 2016, to evaluate biological resources as they relate to the Facility. The visit focused on identifying the potential presence of special-status species and potential suitable habitats for fish, wildlife, and plants. The area within the site boundary was viewed from vehicle and on foot, with targeting focus on features (e.g.,

wetlands) and habitats (e.g., soil types or communities with potential to provide suitable habitat for special-status species).

#### **Q.2.2.3 Habitat Categorization**

Biologists familiar with Columbia Plateau habitat types and wildlife used a combination of deer and elk winter range information (ODFW, 2016a), historical land cover data (Homer et al., 2015), color aerial image interpretation (ESRI, 2016), topographic information (USGS, 2016), soil data (NRCS, 2016), and onsite verification to characterize habitat types present within the site boundary from the perspective of wildlife use, both general (for species assemblages [e.g., shrub-steppe obligates]) and specific (for individual taxa [e.g., special-status species]).

On September 14, 2016, a biologist familiar with regional flora and fauna conducted a site visit to ground truth habitat occurrence and quality. During the visit, habitat boundaries were then delineated and distinct habitats were categorized according to the habitat definitions in ODFW's Fish and Habitat Mitigation Policy, based on a combination of vegetative structure, habitat functionality, and overall ecological condition for wildlife, in particular for special-status species.

#### **Q.2.2.4 Wetland Delineation**

The wetland delineation is described in Exhibit J.

#### **Q.2.2.5 Raptor Nest Survey**

A biologist conducted ground-based raptor nest surveys on April 6 and May 13, 2017. The objective of this study was to survey for all raptor nests within the Facility boundary and within one mile of the boundary (nest study area). Further details are provided in the Raptor Nest Report found in Attachment P-8.

#### **Q.2.2.6 Sensitive Species Survey**

A biologist conducted field surveys of sensitive species April 5 – 7 and May 12 – 13, 2017. Study objectives were to document the presence/absence and spatial occurrence of plant and animal species of concern within areas of suitable habitat located within the Facility boundary and within 1,000 feet of the boundary (sensitive species study area). Species of concern were defined to include federally threatened or endangered species, Oregon state-listed species (including state conservation strategy, critical, vulnerable, threatened, and endangered, and rare species), or state or federal special-status species, such as bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA; 1940). Further details are provided in the Sensitive Species Report found in Attachment P-9.

#### **Q.2.2.7 Avian Use and Breeding Bird Surveys**

The breeding bird and avian use surveys are on-going and the methods are described in Attachment P-4.

### **Q.3 NATURE, EXTENT, AND TIMING OF SPECIES OCCURRENCE IN ANALYSIS AREA**

**OAR 345-021-0010(1)(q)(B)** *For each species identified under (A), a description of the nature, extent, locations and timing of its occurrence in the analysis area and how the facility might adversely affect it.*

**Response:** The literature review identified a total of six threatened or endangered species that could occur within 5 miles of the site boundary in Oregon (listed in Table Q-1). Based on the

presence of potentially suitable habitat, three listed species have the potential to occur within the Facility site boundary: Gray wolf (*Canis lupus*), Washington ground squirrel (*Uroditellus washingtoni*), and Lawrence's milkvetch (*Astragalus collinus* var. *laurentii*). There is no potentially suitable habitat within the site boundary for fish, but there is designated critical habitat for bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*), and steelhead (*Oncorhynchus mykiss*) within 5 miles. Accordingly, these three species are discussed in this section.

The USFWS report showed one additional federally listed species, the yellow-billed cuckoo (threatened; *Coccyzus americanus*) as occurring on the Washington side of the Columbia River, but not in Oregon where the Facility is located; therefore, this species is not included in Table Q-1). The yellow-billed cuckoo is distributed across Washington and western Oregon (USFWS, 2016c). The yellow-billed cuckoo is known to use large (50 acres or greater) patches of wooded habitat with dense cover (USFWS, 2016c), which does not occur within the site boundary or 5-mile analysis area in Oregon, and there have been no recordings of the species during field surveys. Accordingly, this species is not likely to occur in or near the Facility site boundary. Because there are no impacts expected to this species, it is not addressed further in this Exhibit.

Similar to the yellow-billed cuckoo, the North American wolverine (*Gulo gulo*), proposed for listing as threatened, showed occurrence limited to the Washington side of the Columbia River (USFWS, 2016i). This species uses large, contiguous areas of open forest that maintain deep snow late into the spring and summer, typically at high elevations (USFWS, 2016i). Therefore, no suitable habitat for this species is present within the site boundary and the species is not likely to occur in or near the Facility site boundary. Because no impacts are expected to this species, it is not addressed further in this Exhibit.

Additional wildlife and plant surveys were conducted during the peak activity period for Washington ground squirrel and optimal bloom times for Lawrence's milkvetch in 2017. The following sections provide further information about the threatened or endangered species that have some potential to occur in the Facility site boundary, or be impacted by the Facility, including their habitat requirements, records of occurrence within the analysis area, presence or absence of suitable habitat within the Facility site boundary, and potential for adverse effect from the proposed Facility.

### **Q.3.1 Gray Wolf**

The gray wolf is federally endangered, but is currently proposed for delisting (USFWS, 2016b). It has been delisted from the state of Oregon, but is protected by the Oregon Wolf Conservation and Management Plan (ODFW, 2016b). The gray wolf uses a variety of habitats such as temperate forests, mountains, tundra and grasslands (USFWS, 2016b). USFWS is currently monitoring the population in western Oregon west of Highways 78 and 395 north of Burns Junction and west of Highway 95 south of Burns Junction (USFWS, 2016b). This area includes all of Morrow and Gilliam counties. The ODFW November 2015 biological status review for the gray wolf showed the nearest potential range more than 50 miles from the Facility (ODFW, 2016b), the ORBIC database had no record of the species within the 5-mile analysis area (ORBIC, 2016a), and there have been no recordings of the species during field surveys. Given the lack of gray wolf records in the analysis area and the abundance of suitable habitat in the general area, no adverse impacts to the species are anticipated from construction or operation of the Facility.



### Q.3.2 Washington Ground Squirrel

Washington ground squirrel (WGS) is a state endangered species found in Gilliam, Morrow, and Umatilla counties in Oregon and also in Washington. The species was a candidate for federal protection until September 21, 2016, when USFWS determined listing is not warranted at this time. WGS spends much of their time underground; adults emerge from hibernation between January and early March, depending on elevation and microhabitat conditions (USFWS, 2016g). Their active time is spent in reproduction and fattening for their 6-month or longer dormancy. Adults return to their burrows by late May to early June, and juveniles return about a month later.

The typical habitats occupied by this species are grasslands and shrub-steppe, which are both present within the site boundary. However, the species requires sandy or silt loam texture soils that are deep and supportive enough to accommodate burrows (Betts, 1990; Yensen and Sherman, 2003). There are slopes where soil depth may support burrow complexes along the western half of the transmission line corridor. While the habitat along the transmission line corridor is fragmented and degraded (including a recent wildfire), native grasses (e.g., bluebunch wheatgrass [*Pseudoroegneria spicata*]) are relatively abundant in this area. Biologists have not yet seen any WGS evidence, nor were there any ORBIC database records, in the site boundary.

The species' largest and most densely occupied habitat occurs on U.S. Navy land in Morrow County and the adjacent Boardman Conservation Area, both managed by the Nature Conservancy (USFWS, 2016g). The ORBIC database query showed occurrence of the species a little less than 5 miles to the east of the Facility site boundary (ORBIC, 2016a). The Boardman Conservation Area was established by a Multi-Species Candidate Conservation Agreement with Assurances (MSCCAA) in 2004 to provide conservation protections for WGS and three avian species (David Evans and Associates, 2004). Although this solar Facility is proposed within the "Covered Area" boundary of the MSCCAA, it will be located in an area classified as Undeveloped Portions of the Farm and outside the designated Conservation Areas in the MSCCAA. Threemile Canyon Farms, LLC, has a memorandum of understanding (MOU) with ODFW for voluntary conservation measures (David Evans and Associates, 2004), and the avoidance measures described in Section Q.4.1 complement the MOU measure for WGS.

As noted above, surveys were conducted to see whether there are any WGS colonies in the Facility area or a 1,000-foot buffer. These surveys were completed as part of the Baseline Survey Protocol in spring 2017 (see Exhibit P Attachments P-4 and P-9) and did not identify any colonies. If any evidence of WGS colonies is found prior to or during construction, they have the potential to be impacted during construction of the Facility, so these impacts will be avoided as described in Section Q.4.

### Q.3.3 Bull trout

Bull trout is a federal threatened species. Final critical habitat for bull trout was designated by USFWS in 2010 (USFWS, 2010). Additionally, a recovery plan was published in 2015 (USFWS, 2015). Although the Facility site boundary is not located within the designated critical habitat, the analysis area includes a portion of the Columbia River that is included in Unit 22 – Mainstem Upper Columbia River critical habitat.

Bull trout requirements include streams with cold, unpolluted water, clean gravel and cobble substrate, and gentle stream slopes. Many spawning areas are associated with cold water springs or areas where stream flow is influenced by groundwater. Bull trout are considered a

char and are closely related to Dolly Varden, eastern brook trout, and lake trout. In Oregon, bull trout have a variety of life history strategies that include highly migratory and nonmigratory populations. Spawning occurs in the fall when water temperatures drop below 50 degrees Fahrenheit. Usually, juvenile bull trout feed on insects until they are large enough to transition their diet to fish. Adult bull trout primarily feed on fish (USFWS, 2007).

The ORBIC database had no record of bull trout within 5 miles of the Facility (ORBIC, 2016a). And as stated above, the Facility site boundary does not include the Columbia River. The Facility will obtain a 1200-C Construction Stormwater National Pollution Discharge Elimination System (NPDES) Permit (Exhibit I, Attachment I-1). With erosion and sediment control measures in place, no adverse impacts are anticipated from construction to the Columbia River and associated species. Therefore, the Facility is not expected to affect bull trout.

#### **Q.3.4 Chinook Salmon**

The spring/summer and fall runs of the Snake River population of Chinook salmon are listed as state and federal threatened species. Final critical habitat for these populations was designated in 2010 (NOAA, 2010). Additionally, a recovery plan for the species is in development for the upstream Snake River area (NOAA, 2016). Although the Facility site boundary is not located within the designated critical habitat for Chinook salmon, the analysis area includes a portion of the Columbia River, the entire length of which is designated as critical habitat (NOAA, 2010).

Juvenile Chinook spend from 3 months to 2 years in freshwater before migrating to estuarine areas and then into the ocean to feed and mature. Then they return to natal freshwater streams and rivers to mate. Chinook salmon spawn only once and then die. They feed on terrestrial and aquatic insects, amphipods, and other crustaceans while young, and primarily on other fishes when older (NOAA, 2016).

ORBIC had no record of Chinook salmon within the 5-mile analysis area (ORBIC 2016a). And as stated above, the Facility site boundary does not include the Columbia River. The Facility will obtain a 1200-C Construction Stormwater NPDES Permit (Exhibit I, Attachment I-1). With erosion and sediment control measures in place, no adverse impacts are anticipated from construction to the Columbia River and associated species. Therefore, the Facility is not expected to affect Chinook salmon.

#### **Q.3.5 Steelhead**

The Middle Columbia River population of steelhead is a federal threatened species, and the summer run is considered state sensitive-critical. Final critical habitat for this population was designated in 2005 (NOAA, 2005). Additionally, a recovery plan was published in 2009 (NOAA, 2009). Although the Facility site boundary is not located within the designated critical habitat, the analysis area includes portions of the Columbia River that are included in the Middle Columbia – Lake Wallula Subbasin critical habitat area (NOAA, 2005), and the ORBIC database did have record of the summer run steelhead within the 5-mile analysis area (ORBIC, 2016a).

Steelhead belong to the family Salmonidae, which includes all salmon, trout, and char. Steelhead are born in freshwater streams, where they spend their first 1 to 3 years of life. They then migrate to the ocean where most of their growth occurs. After spending between one to four growing seasons in the ocean, steelhead return to their native freshwater stream to spawn. Steelhead do not necessarily die after spawning and are able to spawn more than once (USFWS, 2016f).

As stated above, the Facility site boundary does not include the Columbia River. The Facility will obtain a 1200-C Construction Stormwater NPDES Permit (Exhibit I, Attachment I-1). With erosion and sediment control measures in place, no adverse impacts are anticipated from construction to the Columbia River and associated species. Therefore, the Facility is not expected to affect steelhead.

### Q.3.6 Lawrence's milkvetch

Lawrence's milkvetch is a state threatened species. This species is endemic to the Columbia Plateau and typically occupies sandy or rocky soils overlying basalt (ODA, 2016). The ORBIC database does not include any occurrence of Lawrence's milkvetch within the 5-mile analysis area; however, potential habitat for this species was observed within the site boundary during the field visit and habitat categorization.

As noted above, surveys were conducted to see whether there is Lawrence's milkvetch in the Facility area or a 1,000-foot buffer. These surveys were completed as part of the Baseline Survey Protocol in spring 2017 (see Exhibit P Attachments P-4 and P-9) and did not identify any of this plant species. If any evidence of Lawrence's milkvetch is found prior to or during construction, it has the potential to be impacted during construction of the Facility, so these impacts will be avoided as described in Section Q.4.

## Q.4 THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

**OAR 345-021-0010(1)(q)(C)** *For each species identified under (A), a description of measures proposed by the applicant, if any, to avoid or reduce adverse impact.*

**Response:** The Applicant has implemented or will implement measures to avoid or reduce adverse impacts on threatened and endangered species. These are in addition to the measures provided for nonlisted special-status wildlife and habitat in Exhibit P, Section P.8. The proposed measures are designed to avoid impacts on special-status species, riparian areas, and high-quality habitat, as described in Exhibit P, Section P.8. Measures to avoid impacts on threatened and endangered species, in particular, are noted as follows:

- Facility components will be microsituated to avoid any occupied Washington ground squirrel habitat that may be found during subsequent surveys. If occupied WGS habitat is identified along the transmission line route, poles will be located at least 785-feet away from active burrows so as not to impact habitat. This measure supports a voluntary conservation measure in the Threemile Canyon Farms, LLC, and ODFW MOU, specifically to maintain suitable WGS habitat within the Undeveloped Portions of the Farm.
- Facility components will be microsituated to avoid any Lawrence's milkvetch or other listed plants that may be found during subsequent surveys.
- Before beginning construction, a qualified biologist will survey the site boundary for listed species, including Washington ground squirrel and Lawrence's milkvetch, and will flag any existing or new locations and associated buffers. A map showing these locations and the Applicant's avoidance plan will be provided to the Oregon Department of Energy.

## Q.5 PLANT DISTURBANCES

### Q.5.1 Plant Species with an ODA Protection and Conservation Program

**OAR 345-021-0010(1)(q)(D)** *For each plant species identified under (A), a description of how the proposed facility, including any mitigation measures, complies with the protection and*

*conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3).*

**Response:** Protection and Conservation Programs are prepared by ODA for selected plant species listed as threatened or endangered under the Oregon Endangered Species Act and selected locations within the state. There is no plant protection and conservation program applicable to the site. Therefore, no additional information is required under this provision and OAR 345-022-0070(1)(a) does not apply.

#### **Q.5.2 Plant species without an ODA Protection and Conservation Program**

**OAR 345-021-0010(1)(q)(E)** *For each plant species identified under paragraph (A), if the Oregon Department of Agriculture has not adopted a protection and conservation program under ORS 564.105(3), a description of significant potential impacts of the proposed facility on the continued existence of the species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species.*

**Response:** ODA has not adopted a protection and conservation program for Lawrence's milkvetch. Given that this plant species is expected to be scarce or absent from the site boundary, and avoidance measures will be employed as described in Section Q.4, the Facility is not likely to cause a significant reduction in the likelihood of survival or recovery of the species.

#### **Q.6 ANIMAL DISTURBANCES**

**OAR 345-021-0010(1)(q)(F)** *For each animal species identified under (A), a description of significant potential impacts of the proposed facility on the continued existence of such species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species.*

**Response:** Given that the five listed animal species in the analysis area are expected to be scarce or absent from the site boundary, as explained in Section Q.3, and avoidance measures will be employed as described in Section Q.4, the Facility is not likely to cause a significant reduction in the likelihood of survival or recovery of any listed animal species.

#### **Q.7 MONITORING PROGRAM**

*(G) The applicant's proposed monitoring program, if any, for impacts to threatened and endangered species.*

**Response:** The Applicant will work with ODFW to develop a monitoring plan to evaluate the success of measures for addressing impacts to threatened and endangered species. This plan is addressed further in Exhibit P, Section P.9.

#### **Q.8 REFERENCES**

Betts, B.J. 1990. "Geographic Distribution and Habitat Preferences of Washington Ground Squirrels (*Spermophilus washingtoni*).*" Northwestern Naturalist 71:27-37.*

Betts, B.J. 1999. "Current status of Washington ground squirrels in Oregon and Washington." *Northwestern Naturalist 80:35-38.*

- David Evans and Associates. 2004. *Multi-Species Candidate Conservation Agreement with Assurances*. Signatories include Threemile Canyon Farms, The Nature Conservancy, Portland General Electric Company, USFWS, ODFW.
- Delavan, J. L. 2005. "Home Range, Movement, and Foraging Behavior of Adult Washington Ground Squirrels (*Spermophilus washingtoni*).” La Grande Fish and Wildlife Office, La Grande, Oregon. 20 pp.
- ESRI. 2016. *World Street Map and Aerial Photos: World Imagery*. ArcGIS Resource Center. ESRI, producers of ArcGIS software, Redlands, California. Data accessed September and October 2016.
- Greene, E. 1999. Abundance and Habitat Associations of Washington Ground Squirrels in North-Central Oregon. Thesis. Oregon State University.
- Homer, C. G., J. A. Dewitz, L. Yang, S. Jin, P. Danielson, G. Xian, J. Coulston, N. D. Herold, J. D. Wickham, and K. Megown. 2015. *Completion of the 2011 National Land Cover Database for the Conterminous United States-Representing a Decade of Land Cover Change Information*. Photogrammetric Engineering and Remote Sensing 81(5): 345-354. <http://www.mrlc.gov/nlcd2011.php>.
- Klein, K. J. 2005. Dispersal Patterns of Washington Ground Squirrels in Oregon. Thesis. Oregon State University, Corvallis, Oregon.
- Meinke, R. 1982. *Threatened & Endangered Vascular Plants of Oregon: An Illustrated Guide*. USFWS Office of Endangered Species, Region 1, Portland, Oregon, with Assistance from U.S. Forest Service Region 6, Bonneville Power Administration, Bureau of Land Management Oregon State Office, and Corps of Engineers. 352 pp. <http://cascadiaprairieoak.org/wp-content/uploads/2014/04/Meinke-R.J.-1982.-Threatened-and-endangered-vascular-plants-of-Oregon-An-illustrated-guide.pdf>.
- Morgan, R. L. and M. Nugent. 1999. "Status and Habitat Use of the Washington Ground Squirrel (*Spermophilus washingtoni*) on State of Oregon Lands, South Boeig, Oregon, in 1999." Oregon Department of Fish and Wildlife (ODFW), Salem, Oregon.
- Morrow County. 2013. *Morrow County Comprehensive Plan - Review and Revision*. Revision date: October 1, 2013. Comprehensive Plan: <http://morrowcountyoregon.com/planning-department/comprehensive-plan/>; Review and Revision: <http://morrowcountyoregon.com/planning/19.pdf>.
- National Oceanic and Atmospheric Administration (NOAA). 2005. *Middle Columbia River Steelhead ESU. NOAA Fisheries, West Coast Region*. Accessed December 12, 2016. <http://www.westcoast.fisheries.noaa.gov/publications/frn/2005/70fr52808.pdf>.
- National Oceanic and Atmospheric Administration (NOAA). 2009. *Middle Columbia Steelhead Recovery Plan*. NOAA Fisheries, West Coast Region. Accessed December 12, 2016. [http://www.westcoast.fisheries.noaa.gov/protected\\_species/salmon\\_steelhead/recovery\\_planning\\_and\\_implementation/middle\\_columbia/middle\\_columbia\\_river\\_steelhead\\_recovery\\_plan.html](http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/middle_columbia/middle_columbia_river_steelhead_recovery_plan.html).

- National Oceanic and Atmospheric Administration (NOAA). 2010. Designated Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho and California; Final Rule. *Federal Register* 65(32): 7764-7787. February 16.
- National Oceanic and Atmospheric Administration (NOAA). 2016. *Chinook salmon species description*. NOAA Fisheries. Accessed December 12, 2016.  
<http://www.nmfs.noaa.gov/pr/species/fish/chinook-salmon.html>.
- Oregon Biodiversity Information Center (ORBIC). 2016a. Letter from Biodiversity Data Manager Lindsey Wise to WEST, Inc. Carisa Stanbury regarding data system search. November 10.
- Oregon Biodiversity Information Center (ORBIC). 2016b. *Rare, Threatened and Endangered Species of Oregon*. Institute for Natural Resources. Portland State University.  
<http://inr.oregonstate.edu/orbic/rare-species/rare-species-oregon-publications>.
- Oregon Department of Agriculture (ODA). 2014. "Lawrence's Milkvetch (*Astragalus collinus* var. *laurentii*).” ODA, Salem, Oregon. Accessed November 2, 2016.  
<https://www.oregon.gov/ODA/shared/Documents/Publications/PlantConservation/AstragalusCollinusLaurentiiProfile.pdf>.
- Oregon Department of Agriculture (ODA). 2016. *Oregon Listed Plants by County*. Plant Conservation, ODA, Salem, Oregon. Accessed October 2016.  
<http://www.oregon.gov/ODA/programs/PlantConservation/Pages/ListedPlants.aspx>.
- Oregon Department of Fish and Wildlife (ODFW). 2015. *Threatened, Endangered, and Candidate Fish and Wildlife Species*. ODFW, Salem, Oregon. Updated November 2015.  
[http://www.dfw.state.or.us/wildlife/diversity/species/threatened\\_endangered\\_candidate\\_list.asp](http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp).
- Oregon Department of Fish and Wildlife (ODFW). 2016a. *Deer and Elk Winter Range Maps*. Accessed on October 19, 2016. <http://www.dfw.state.or.us/maps/>.
- Oregon Department of Fish and Wildlife (ODFW). 2016b. *Wolf Management Plan*. ODFW, Salem, Oregon. Accessed December 12, 2016.  
[http://www.dfw.state.or.us/agency/commission/minutes/15/11\\_november/Exhibit%20B\\_Attachment%203\\_Appx%20A.pdf](http://www.dfw.state.or.us/agency/commission/minutes/15/11_november/Exhibit%20B_Attachment%203_Appx%20A.pdf).
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2016. *SSURGO Soils Data*. Soil Survey Geographic (SSURGO) Database, USDA Soil Survey Staff, NRCS. SSURGO Database for Morrow County and Gilliam County, Oregon. Accessed November 2016. Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/>.
- U.S. Fish and Wildlife Service (USFWS). 1998. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout; Final Rule. Department of the Interior, Fish and Wildlife Service, 50 *Code of Federal Regulations* Part 17. 63 *Federal Register* 111: 31647-31674. June 10.
- U.S. Fish and Wildlife Service (USFWS). 2007. *Bull Trout Facts*. Accessed December 13, 2016.  
<https://www.fws.gov/pacific/news/1997/btfacts.htm>.

- U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule. *Federal Register* 75(200): 63898-64070. October 18.
- U.S. Fish and Wildlife Service (USFWS). 2015. "Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*)." Portland, Oregon.
- U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC). 2016a. Resources for Project in Gilliam County and Morrow County, Oregon. Initial Project Scoping: IPaC, Environmental Conservation Online System (ECOS), USFWS. Accessed October and November 2016. IPaC: <http://ecos.fws.gov/ipac/>; IPaC Initial Project Scoping: <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action>; Gilliam County-specific resources: <https://ecos.fws.gov/ipac/project/3LDKUN5MJVEODIBEBLYREZ6PXE/overview>; Morrow County-specific resources: <https://ecos.fws.gov/ipac/project/7PWSFNQIXNDG3ASRQ04HVE7FDA/overview>.
- U.S. Fish and Wildlife Service (USFWS). 2016b. Gray Wolf (*Canis lupus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Gray wolf species profile: <http://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=A00D>.
- U.S. Fish and Wildlife Service (USFWS). 2016c. Yellow-Billed Cuckoo (*Coccyzus americanus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS: <http://ecos.fws.gov/ecos/indexPublic.do>; Yellow-billed cuckoo species profile: <http://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=B06R>.
- U.S. Fish and Wildlife Service (USFWS). 2016d. Bull Trout (*Salvelinus confluentus*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed October 2016. ECOS: <http://ecos.fws.gov/ecos/indexPublic.do>; Bull trout species profile: <http://ecos.fws.gov/ecp0/profile/speciesProfile?slid=8212>.
- U.S. Fish and Wildlife Service (USFWS). 2016e. Bull trout critical habitat map for Unit 22 Mainstem Upper Columbia River. Accessed December 12, 2016. <https://www.fws.gov/pacific/bulltrout/crithab/washington/22%20Mainstem%20Lower%20Columbia%20River2Wa300.pdf>.
- U.S. Fish and Wildlife Service (USFWS). 2016f. Steelhead (*Oncorhynchus mykiss*). General Information and Life History. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed December 12, 2016. ECOS: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E08D>.
- U.S. Fish and Wildlife Service (USFWS). 2016g. Washington Ground Squirrel. General Information and Life History. USFWS Oregon Fish and Wildlife Office. Accessed December 12, 2016. ECOS: <https://www.fws.gov/oregonfwo/articles.cfm?id=149489415>.
- U.S. Fish and Wildlife Service (USFWS). 2016h. Species by County Report. Environmental Conservation Online System (ECOS), USFWS. Accessed October 2016. Gilliam County report: <http://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41021>;

Morrow County report: <http://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41049>.

U.S. Fish and Wildlife Service (USFWS). 2016i. North American Wolverine. USFWS Environmental Conservation Online System (ECOS) Species Profile. Accessed November 2016. ECOS: <http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0FA>.

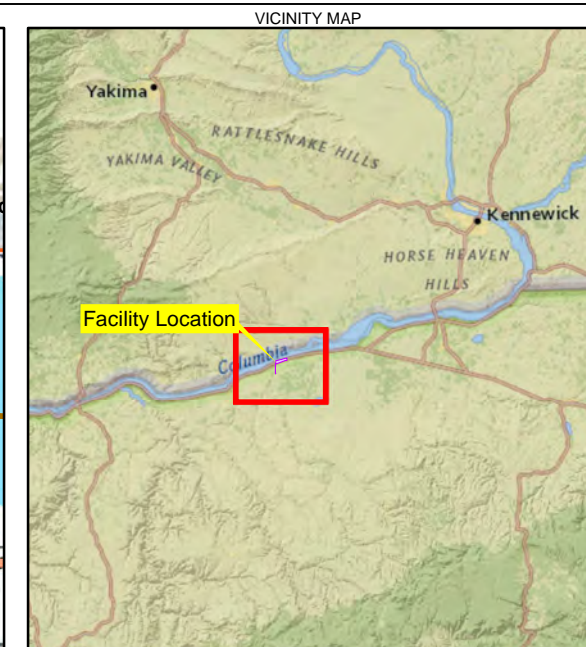
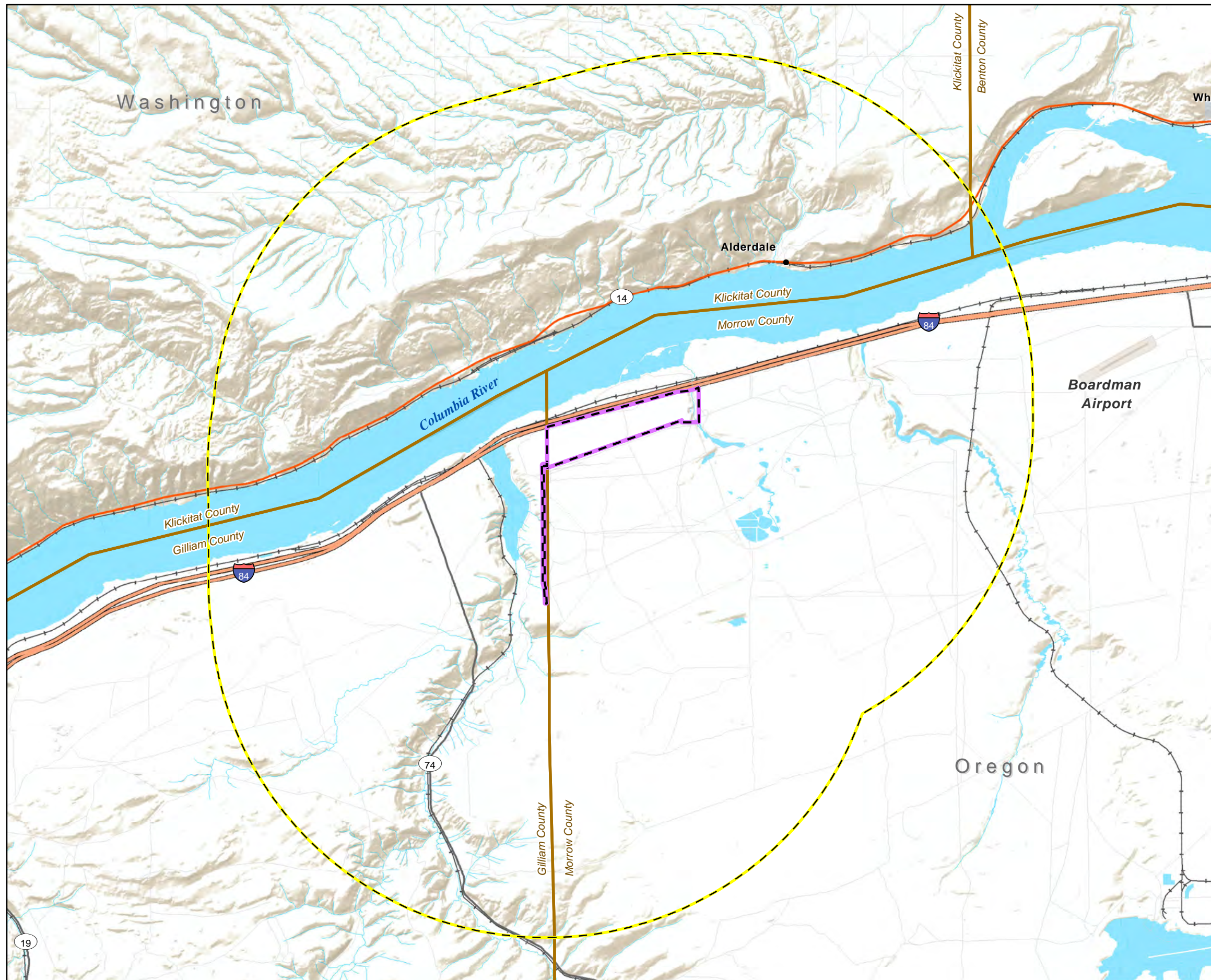
U.S. Geological Survey (USGS). 2016. *The National Map/U.S. Topo*. Last updated January 2016. <http://nationalmap.gov/ustopo/index.html>.

Yensen, E. and P.W. Sherman. 2003. *Ground-Dwelling Squirrels of the Pacific Northwest*. U.S. Fish and Wildlife Service (USFWS) Snake River Fish and Wildlife Office, Bureau of Land Management (BLM), Spokane District Office, and BLM, Oregon State Office. 28 pp. + maps. <https://idfg.idaho.gov/sites/default/files/ground-squirrels-of-the-pacific-northwest-yensen-shermann-by-permission.pdf>



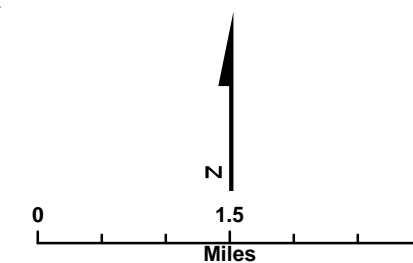
Figure





- LEGEND**
- Facility Site Boundary
  - 5-mile Threatened and Endangered Species Analysis Area
  - State Boundary
  - County Boundary
  - Water
  - Major Highway
  - Highway
  - Major Road
  - Local Road

Service Layer Credits: Sources: Esri, USGS, NOAA  
 Content may not reflect National Geographic's current map policy.  
 Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



**FIGURE Q-1**  
**Threatened and Endangered Species Analysis Area**

*Boardman Solar Energy Facility  
 Application for Site Certificate  
 Morrow and Gilliam Counties, Oregon*



**EXHIBIT R**  
**SCENIC RESOURCES**  
OAR 345-021-0010(1)(r)

**TABLE OF CONTENTS**

	<b>Page</b>
R.1 SITE CONTEXT.....	R-1
R.2 METHODOLOGY .....	R-2
R.2.1 Define Analysis Area .....	R-2
R.2.2 Review Applicable Plans .....	R-2
R.2.3 Conduct Visual Impact Analysis .....	R-2
R.3 LOCAL, STATE, TRIBAL, AND FEDERAL PLANS .....	R-4
R.4 SCENIC RESOURCES IDENTIFIED AS SIGNIFICANT OR IMPORTANT .....	R-5
R.4.1 Local Land Use Plans .....	R-6
R.4.2 State Land Management Plans .....	R-7
R.4.3 Federal Land Management Plans .....	R-9
R.4.4 Summary of Scenic Resources Identified in Local, State, and Federal Land Use and Management Plans .....	R-11
R.5 SIGNIFICANT POTENTIAL ADVERSE IMPACTS .....	R-11
R.5.1 Overview .....	R-12
R.5.2 Loss of Vegetation.....	R-13
R.5.3 Alteration of Landscape .....	R-14
R.5.4 Visual Impacts .....	R-14
R.5.5 Glare Impacts.....	R-17
R.5.6 Conclusion.....	R-18
R.6 MITIGATION .....	R-18
R.7 MAP OF SCENIC RESOURCES.....	R-18
R.8 MONITORING .....	R-18
R.9 SUMMARY .....	R-19
R.10 REFERENCES.....	R-19

**TABLES**

R-1 Identification of Applicable Local, State, and Federal Land Use and Management Plans that Pertain to Lands within 10 Miles of the Facility Site Boundary .....	R-5
R-2 Scenic Resources Identified in Applicable Local, State, and Federal Land Use and Management Plans that Pertain to Lands within 10 Miles of the Facility Site Boundary .....	R-12

**FIGURES**

R-1 Significant and Important Scenic Resources within 10 miles of the Facility Site Boundary	
R-2 Photo Survey Points within 10 miles of the Facility Site Boundary	

**ATTACHMENTS**

- R-1 Existing Conditions Photographs
- R-2 Land Use Management Plan Excerpts

This Exhibit provides an assessment of potential impacts on scenic resources within 10 miles of the Boardman Solar Energy Facility (Facility) site boundary that are identified as significant or important in applicable federal, tribal, state, and local land use and management plans. No significant scenic resources are located within the Facility site boundary.

## R.1 SITE CONTEXT

The Facility site is located directly south of Interstate 84 (I-84) and directly east of the Morrow County and Gilliam County border. Boardman Solar Energy LLC (Applicant) proposes to site the Facility's major components, structures, and systems in Morrow County. These include the solar modules, inverters, and transformers. The related or supporting facilities proposed in Gilliam County include the approximately 2.1-mile-long, 115-kilovolt (kV) transmission line and the point of interconnection (POI) where the transmission line interconnects with the existing electrical grid.

Morrow and Gilliam counties have zoned the entire area encompassed by the Facility site boundary for farm use. The Facility site, and the vast majority of the adjacent land to the north, east, south, and west of the Facility site boundary are owned by Threemile Canyon Farms, LLC (Threemile Canyon Farms). The area within the Facility site boundary is not actively farmed, having historically been used only for winter and spring cattle grazing, and consists of vacant grassland with scattered shrubs. The site is almost entirely devoid of trees, with the exception of non-native Russian olive trees located within and directly adjacent to wetlands in the southeastern corner.

As shown on Figure K-1 and described in Exhibit K, adjacent land uses within approximately 1 mile of the Facility site boundary generally include the following:

- **North** – I-84, Union Pacific Railroad rail-line, vacant land owned by the federal government, and the Columbia River
- **East** – Vacant grassland/rangeland owned by Threemile Canyon Farms, underlying owner of the area within the Facility site boundary
- **South** – Existing Portland General Electric transmission line, vacant grassland/rangeland, and agricultural crop circles owned by Threemile Canyon Farms, underlying owner of the area within the Facility site boundary
- **West** – Vacant grassland/rangeland and other habitat owned immediately to the west by Threemile Canyon Farms and then the federal government, as well as other private parties; Willow Lake, Willow Creek, and associated habitats are also located within 1 mile to the west

The landscape is dominated by the Columbia River and steep bluffs along the Washington state border to the north; vacant grasslands crossed by a mixture of existing transmission line infrastructure to the east and the south; and existing wind power generation turbines associated with wind farms such as Leaning Juniper A and B, Pebble Springs, Shepherds Flat (North, Central, and South), Threemile Canyon, and Willow Creek, located west and southwest of the Facility site boundary. Figure C-3 in Exhibit 3 shows the location of permitted and operational wind energy generation facilities in relation to the Facility site. The turbines associated with the wind farms listed above are a dominant feature of the landscape and are a focal point of the viewshed from areas farther east of the Facility site boundary.

For the purpose of this analysis, designated scenic resources refer to those scenic resources formally inventoried or designated as significant, important, or valued in a local, state, tribal, or federal land management plan.

**Oregon Administrative Rules (OAR) 345-021-0010(1)(r)** *An analysis of significant potential impacts of the proposed facility, if any, on scenic resources identified as significant or important in local land use plans, tribal land management plans and federal land management plans for any lands located within the analysis area, providing evidence to support a finding by the Council as required by OAR 345-022-0080, including:*

## **R.2 METHODOLOGY**

**Response:** An analysis of the potential effects of the proposed Facility on scenic resources was undertaken in response to OAR requirements. The analysis methodology consisted of a series of steps designed to respond to OAR requirements for evaluating impacts on scenic resources. These steps are outlined below.

### **R.2.1 Define Analysis Area**

The scenic resources analysis area is defined as all areas within the Facility site boundary and the area within 10 miles of the Facility site boundary as outlined in OAR 345-001-0010(2) and (57)(b). The 10-mile scenic resources analysis area for Exhibit R is depicted on Figure R-1.

### **R.2.2 Review Applicable Plans**

Applicable local, state, and federal land use and management plans that pertain to lands within the 10-mile scenic resources analysis area were reviewed to identify specific scenic resources designated as significant or important in the plans. No tribal lands were identified within the 10-mile scenic resources analysis area and no tribal land management plans are known to mention any scenic resources within the scenic resources analysis area, including plans of the two closest tribes – the Confederated Tribes of the Warm Springs and the Confederated Tribes of the Umatilla. Therefore, no lands identified in tribal land management plans are included in this Exhibit. Applicable local, state, and federal land use and management plans reviewed for this analysis are listed in Table R-1 (located in Section R.3).

### **R.2.3 Conduct Visual Impact Analysis**

Analysis was conducted to determine the likelihood that Facility components will potentially be seen from scenic resources identified as significant or important in the applicable local, state, and federal land use and management plans. The Applicant's visual impact analysis considered the Facility components described in Exhibit B.

#### **R.2.3.1 Use ArcGIS to Develop Scenic Resources Map**

Environmental Systems Research Institute ArcGIS software was used to develop a scenic resources map that includes the locations of significant or important scenic resources within the scenic resources analysis area identified during the review of applicable local, state, and federal land use and management plans (see Figure R-1). Review of this map made it possible to determine whether potential scenic resources identified in the applicable land use plans will potentially be visible and to determine where further analysis was required, as described directly below.

#### **R.2.3.2 Conduct Site Visit, Select Viewpoints, and Prepare Visual Analysis**

After developing the scenic resources map, the Applicant's visual resource specialist conducted a field visit throughout the Facility's 10-mile scenic resources analysis area on November 16 and 17, 2016. The field visit focused on assessing and documenting with photographs the potential views of Facility components from scenic resources identified and designated as significant or important in local, state, and federal land use and management plans, as well as other potentially sensitive areas.

The field visit focused on assessing and documenting with photographs the potential views of Facility components from scenic resources identified and designated as significant or important. The visual resource specialists relied on field observations, review of aerial photography, and professional expertise to assess the extent to which the Facility will be visible including an evaluation of screening potential of existing development, topography, and vegetation. Attention to topographic features, elevation change, as well as the type, density, and height of vegetation were considered when making assessments about screening. Another major factor used by the visual resource specialist to assess the level of Facility visibility from the applicable scenic resource was the distance between the two areas.

To document the existing views from sensitive viewing areas, photographs were taken using a high-resolution 35-millimeter (mm) single-lens reflex digital camera. The camera was set to take photos equivalent to those taken with a 35-mm camera with a 50-mm focal length at a height of approximately 5 feet, to create an image that simulates the view of the human eye. The location of each photo viewpoint was recorded using a global positioning system device.

Attachment R-1 contains a set of photographs that present the existing view for each viewpoint toward the Facility site. As explained in Section R.5.5, it is important to note that the Applicant will implement glare reduction technology as part of the Facility's design. This technology will minimize reflectivity and glare that may be visible within the scenic resources analysis area.

### **R.2.3.3 Follow Standard Visual Assessment Methods**

The Federal Highway Administration (FHWA) methodology is one of three widely used methodologies used to conduct visual analysis. The other two methodologies are the U.S. Department of the Interior Bureau of Land Management (BLM) Visual Resource Management (VRM) and the U.S. Forest Service (USFS) Scenery Management System (SMS). The FHWA, VRM, and SMS methodologies all use similar processes to establish existing visual conditions and assess impacts on those existing conditions resulting from a proposed development. While these three methodologies are similar in their analysis approach, they differ in that they were designed for use in different contexts. For example, the VRM and SMS methodologies are more appropriate and more commonly used for evaluation of the kinds of projects likely to occur on the generally undeveloped federal lands managed by the BLM and the USFS. Given that the Facility is proposed outside of the National Scenic Area and not on federal lands, and lacking the linkage to federal land management plans for development of federally managed lands, the VRM and SMS methodologies are inapplicable.

In contrast, the FHWA methodology has broader applicability. Its evaluation system is well suited to projects of varying scale and type. As well, it can work in a broad range of landscapes – from undeveloped to highly developed. In addition, because it produces results that are not linked to a specific agency's land management framework, it is well suited to the evaluation of the visual impacts of projects located on private lands. Accordingly, the visual analysis conducted for the Facility was based on the FHWA Visual Impact Assessment methodology, which is defined in *Visual Impact Assessment for Highway Projects* (FHWA, 2015).

The FHWA methodology consists of the following six steps:

1. Establish the project's visual limits (viewshed)
2. Determine who has views of the project (viewers)
3. Describe and assess the landscape that exists before project construction (site context)
4. Determine and evaluate views of and from the project for before and after project construction (using site visit photos provided in Attachment R-1)

5. Describe the potential visible changes to the project area and its surroundings that would result from the proposed project (using site visit photos provided in Attachment R-1)
6. Assess the response of viewers looking at and from the project, before and after project construction (using site visit photos provided in Attachment R-1)

The first three steps described above are used to establish the baseline conditions of the existing landscape and to determine how much of the Facility is visible from within the scenic resources analysis area. The existing landscape of the Facility site, or site context, is described in Section R.1. For the purpose of this analysis, the Facility's visual limits are defined as the scenic resources analysis area described in Section R.2.1. Significant or important scenic resources within the scenic resources analysis area are identified in Section R.3 and described in Section R.4. Potential viewers of the Facility from identified scenic resource locations are also described in Section R.4.

The Applicant's visual resource specialist relied on field observations, a review of aerial photography, and professional expertise to address the last three steps described above. This approach to the analysis is consistent with OAR 345-021-0010(1)(r) in order to determine whether significant adverse visual impacts will result from the Facility. As described in Section R.5, features of the existing environment (including vegetation and topography) screen potential views of the Facility from the majority of scenic resources identified within the 10-mile scenic resources analysis area. The distance of a scenic resource from the Facility site boundary and the relationship of the elevation of the scenic resource to the elevation of the Facility site were also considered in this analysis. The few scenic resources that were determined to have direct, unobstructed views of the Facility were also evaluated under the last three steps described above.

Based on the considerations described above, the FHWA methodology is the appropriate methodology to form the basis of the analysis contained in this Exhibit. It provides a systematic method that is well adapted to developing a clear understanding of the potential visual effects of project types like the proposed Facility that are located on privately owned lands in an area that already has a substantial degree of development.

Using the framework of the FHWA methodology, the visual analysis was also designed to demonstrate compliance with OAR 345-022-0080(1), which requires the following:

*[T]he Council must find the design, construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to scenic resources and values identified as significant or important in local land use plans, tribal land management plans and federal land management plans for any lands located within the analysis area described in the project order.*

The analysis provided below presents the information necessary for the Council to make findings under OAR 345-022-0080(1).

### **R.3 LOCAL, STATE, TRIBAL, AND FEDERAL PLANS**

**OAR 345-021-0010(1)(r)(A)** *A list of the local, tribal and federal plans that address lands within the analysis area.*

**Response:** The applicable local, state, and federal land use and management plans that pertain to areas within the 10-mile scenic resources analysis area are listed in Table R-1. Some portion of the Facility may be visible from these land management areas within the scenic resources analysis area.



**Table R-1. Identification of Applicable Local, State, and Federal Land Use and Management Plans that Pertain to Lands within 10 Miles of the Facility Site Boundary**

<b>Jurisdiction<sup>a</sup></b>	<b>Plan Titles</b>
<b>Federal Lands</b>	
Bureau of Land Management (BLM), Central Oregon Resource Area	<i>Oregon Trail Management Plan</i> (1993) <i>Two Rivers Resource Management Plan Record of Decision Rangeland Program Summary</i> (RPS) (1986)
U.S. National Park Service (NPS)	<i>Lewis and Clark National Historic Trail Comprehensive Plan for Management and Use</i> (1982) <i>Oregon Trail Comprehensive Management and Use Plan</i> (1999)
<b>State<sup>b</sup></b>	
Oregon Department of Fish and Wildlife (ODFW)	<i>Columbia Basin Wildlife Areas Management Plan</i> (2008)
Oregon Department of Transportation (ODOT)	<i>1999 Oregon Highway Plan: Including Amendments November 1999 through May 2015</i> (1999)
Washington State Department of Transportation (WSDOT)	<i>Washington State Scenic and Recreational Highways Strategic Plan (2010-2030)</i> (2010)
<b>Counties</b>	
Gilliam County, Oregon	<i>Gilliam County Comprehensive Plan</i> (2011)
Morrow County, Oregon	<i>Morrow County Comprehensive Plan</i> (1986)
Benton County, Washington	<i>Benton County Comprehensive Plan</i> . (2006)
Klickitat County, Washington	Klickitat County Energy Overlay: Final Environmental Impact Statement (2004)
<b>Cities</b>	
City of Arlington, Gilliam County, Oregon	<i>City of Arlington Comprehensive Plan</i> (1978)

**Notes:**

<sup>a</sup> Identified scenic resources are located partially or entirely within the State of Washington. Although the Applicant has studied potential impacts on all scenic resources within the 10-mile scenic resources analysis area under OAR 345-021-0010(1)(r)(B), the Applicant reserves the right to take the position that applicable Oregon law does not require analysis of scenic resources outside of Oregon.

<sup>b</sup> Three of the 12 management plans reviewed for this Exhibit are state land use and management plans. Although the Applicant has studied potential impacts on scenic resources identified in state land use and management plans within the scenic resources analysis area, the Applicant reserves the right to take the position that OAR 345-022-0080 does not require analysis of state land use and management plans with respect to scenic resources.

#### **R.4 SCENIC RESOURCES IDENTIFIED AS SIGNIFICANT OR IMPORTANT**

**OAR 345-021-0010(1)(r)(B)** *Identification and description of the scenic resources identified as significant or important in the plans listed in (A), including a copy of the portion of the management plan that identifies the resource as significant or important.*

**Response:** The following describes the significant or important scenic and aesthetic resources that were identified in the plans listed in Table R-1. Following this discussion, Table R-2 in Section R.5 summarizes the significant or important resources identified in the applicable land use management plans. Copies of the portions of the management plans that identify each resource as significant or important are included in Attachment R-2. The locally adopted comprehensive plans in both Oregon and Washington are intended to guide future development within each of the local jurisdictions. The plans are implemented through zoning regulations and other land development controls, applicable only to land uses proposed *within*

the respective city or county. No city or county has the authority to extend its land use controls beyond its jurisdictional boundaries, and none of the plans discussed herein purport to do so.

#### **R.4.1 Local Land Use Plans**

This section includes analysis of the local land use plans that exist within the scenic resources analysis area, as listed in Table R-1.

##### **R.4.1.1 *Morrow County Comprehensive Land Use Plan (Morrow County, Oregon, 1986)***

The Facility, with the exception of the transmission line, is located entirely within Morrow County (see Figure R-1). Land use planning in Morrow County is guided by the *Morrow County Comprehensive Plan* (MCCP; Morrow County, 1986). The MCCP provides an inventory of Goal 5 resources that includes natural resources, scenic and historic areas, and open spaces. The inventory was updated in 2013 and does not include any sites designated as scenic resources with high scenic value. Specifically, the MCCP (as updated in 2013) states:

*Morrow County contains a variety of landscapes, many of which may be considered to be scenic. The County has not, however, designated any sites or areas as being particularly high in scenic-resource value.*

The MCCP does not contain goals or policies requiring the conservation or protection of specific identified scenic resources. Morrow County does not contain potential or approved federal or state wild or scenic waterways (U.S. Fish and Wildlife Service [USFWS], 2016), and the county does not contain potential or approved recreation trails with specifically identified scenic values (Morrow County, 1986). Thus, no specific scenic resources are identified and no goals or policies are included to protect specific scenic resources.

##### **R.4.1.2 *Gilliam County Comprehensive Plan (Gilliam County, Oregon, 2011)***

The Facility's transmission line will be located in Gilliam County along the western border of Morrow County. Land use planning in Gilliam County is guided by the *Gilliam County Comprehensive Plan* (GCCP; Gilliam County, 2011). The Goal 5 chapter of the GCCP includes an inventory of scenic resources and provides policies to conserve and protect those resources (Gilliam County, 2011). Finding 3 in Goal 5 of the GCCP states that "rock outcroppings marking the rim and walls of steep canyon slopes are an important characteristic of the County's landscape" (Gilliam County, 2011). The GCCP does not specifically identify the location of designated "rock outcroppings" and does not provide specific policies for the protection or conservation of rock outcroppings. Nonetheless, in Section R.5 this analysis reviews potential visual impacts from a group of rock outcroppings located near Fourmile Road and approximately 8 miles southwest from the Facility site boundary, as shown on Figure R-1. The Applicant's visual resource specialist reviewed aerial maps and photography to determine that the group of rock outcroppings identified on Figure R-1 are the only prominent rock outcroppings along "the rim and walls of steep canyon slopes" within the scenic resources analysis area.

The John Day River crosses Gilliam County and is designated as a National Wild and Scenic River under the Omnibus Oregon Wild and Scenic Rivers Act of 1988. As such, Finding 9 in Goal 5 of the GCCP regards the John Day River as a scenic resource (Gilliam County, 2011). However, the John Day River is located outside of the scenic resources analysis area and is not discussed further in this analysis.

Finding 12 in Goal 5 of the GCCP addresses the Horn Butte Wildlife Management Area (WMA) (located approximately 4.6 miles south of the Facility site) as a significant natural resource site for vegetation resources only and does not assign visual significance to the site. No inventoried Wilderness Areas or approved Oregon Recreation Trails are located in Gilliam County (Gilliam County, 2011).

#### **R.4.1.3 *Klickitat County Energy Overlay: Final Environmental Impact Statement (Klickitat County, Washington, 2004)***

Klickitat County is located north of the Facility site boundary on the north side of the Columbia River in the State of Washington. Land use planning in Klickitat County is guided by the *Klickitat County Comprehensive Plan* (KCCP; Klickitat County, 1977). While the KCCP does not identify any specific scenic resources or views, the *Klickitat County Energy Overlay: Final Environmental Impact Statement* (Klickitat County, 2004), designates the Columbia River Gorge National Scenic Area (CRGNSA) and state-designated Scenic Byways as scenic areas. The CRGNSA is located approximately 45 miles east of the Facility site boundary, is not within the scenic resources analysis area, and is not discussed further in this Exhibit. A portion of State Route 14 (SR 14) located within the scenic resources analysis area (Figure R-1) is designated as the Lewis and Clark Trail Scenic Byway and is further analyzed as a scenic resource under Section R.5.

#### **R.4.1.4 *Benton County Comprehensive Plan (Benton County, Washington, 2006)***

Benton County is located approximately 4.6 miles northeast of the proposed Facility site boundary in the State of Washington. The *Benton County Comprehensive Plan* (BCCP) is the applicable local land use plan (Benton County, 2006). The BCCP does not identify specific designated scenic resources in the county. Goal 40-1 of the BCCP aims to preserve “visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape” (Benton County, 2006). As shown on Figure R-1, the Facility site boundary is located approximately 4.6 miles from the border of Benton County. The portion of Benton County within the scenic resources analysis area consists predominately of agricultural lands, crop circles, and gradual slopes down to the bank of the Columbia River, not the visually prominent steep slopes described in the BCCP.

However, the landscape of Crow Butte State Park located approximately 5.5 miles northeast from the Facility site boundary within the scenic resources analysis area in Benton County consists of an elevated bluff with vegetated slopes on an island within the Columbia basin. The 275-acre park is open seasonally to recreationists (such as campers, hikers, fishers, and boaters) from March 15 through October 31. Benton County does not list Crow Butte State Park as a scenic resource and no other land use management plans identify significant scenic resources within the park boundary. Thus, to the extent that this landscape is consistent with BCCP Goal 40-1 described above, Section R.5 provides further analysis of views from Crow Butte State Park toward the Facility.

#### **R.4.1.5 *City of Arlington Comprehensive Plan (City of Arlington, Oregon, 1978)***

The eastern hills of the City of Arlington, Oregon, are located approximately 9.5 miles southwest of the Facility site boundary and within the scenic resources analysis area. Land use planning in the City of Arlington is guided by the *City of Arlington Comprehensive Plan* (CACP; City of Arlington, 1978). Policy 5 related to public and semi-public land uses in the CACP recognizes “the importance of the scenic quality of the east and west slopes.” The preface to the CACP notes that the slopes provide open space of “considerable scenic quality.” A portion of the City of Arlington’s east slopes are located just within the western boundary of the scenic resources analysis area. Views toward the east slopes from the portion of the City of Arlington within the scenic resources analysis area are further analyzed as a scenic resource under Section R.5.

### **R.4.2 State Land Management Plans**

This section includes analysis of state land management plans that exist within the scenic resources analysis area, as listed in Table R-1.

#### **R.4.2.1 *Columbia Basin Wildlife Areas Management Plan (Oregon Department of Fish and Wildlife, 2008)***

Located south of I-84, the Willow Creek Wildlife Area, is within 0.5 mile west of the Facility site boundary. The Willow Creek Wildlife Area extends approximately 2.5 miles south from the confluence of Willow Creek and the Columbia River. The Willow Creek Wildlife Area is owned by the U.S. Army Corps of Engineers and managed by the Oregon Department of Fish and Wildlife (ODFW) in accordance with the *Columbia Basin Wildlife Areas Management Plan* (ODFW, 2008). This management plan does not identify important scenic resources or values within the scenic resources analysis area but notes that wildlife viewing has increased with the popularity of bird watching among local residents (ODFW, 2008). Although the Willow Creek Wildlife Area is not identified as a scenic resource, it is identified and analyzed as a Protected Area in Exhibit L.

#### **R.4.2.2 *1999 Oregon Highway Plan (Oregon Department of Transportation, 1999)***

The *Oregon Highway Plan*, which was adopted in 1999, establishes long-range policies and investment strategies for the State Highway System. State Route 74 (SR 74) is designated as a state scenic byway (referred to herein as the Blue Mountain Scenic Byway) under the *1999 Oregon Highway Plan* (ODOT, 1999). Recreational uses associated with the byway are described in greater detail in Exhibit T. The Blue Mountain Scenic Byway crosses the scenic resources analysis area between I-84 and Cecil, Oregon. At its nearest point, the Blue Mountain Scenic Byway is located approximately 1.2 miles west of the Facility site boundary (Figure R-1). Scenic Byways are addressed in Policy 1D of the *1999 Oregon Highway Plan*, which states:

*It is the policy of the State of Oregon to preserve and enhance designated Scenic Byways, and to consider aesthetic and design elements along with safety and performance considerations on designated Byways.*

Action 1D.3 of Policy 1D states “Consider impacts to the scenic qualities of Scenic Byways when designing plans and projects” (ODOT, 1999). Accordingly, potential impacts on views from the Blue Mountain Scenic Byway toward the Facility are further analyzed under Section R.5.

#### **R.4.2.3 *Washington State Scenic and Recreational Highways Strategic Plan (2010-2030) (Washington State Department of Transportation, 2010)***

Washington’s Scenic and Recreational Highway Act of 1967 designates SR 14 as a part of the scenic and recreational highway system. As shown on Figure R-1, SR 14 (referred to herein as the Lewis and Clark Trail Scenic Byway) is located adjacent to the Columbia River and crosses the scenic resources analysis area. Recreational uses associated with the byway are described in greater detail in Exhibit T.

At its nearest point, the Lewis and Clark Trail Scenic Byway is approximately 1.3 miles north of the Facility site boundary. Scenic Byways are regulated by WSDOT in accordance with Chapter 47.39 of the *Revised Code of Washington* (RCW). The RCW primarily regulates billboards, signage, marking, scenic observation facilities, and roadside landscaping, restoration, and aesthetic enhancement within delineated highway corridors and viewpoints (RCW 47.39.050). No designated scenic viewpoints are located along the portion of the Lewis and Clark Trail Scenic Byway within the scenic resources analysis area.

The *Washington State Scenic and Recreational Highways Strategic Plan (2010-2030)* (WSDOT, 2010) establishes goals and performance measures to ensure that Washington’s scenic and recreational highways are consistent with the State’s transportation policy goals (RCW 47.04.280). The plan also identifies locations of “highest scenic value” and “highest potential for protecting, preserving, and enhancing resources associated with Washington scenic and recreational highways” (WSDOT, 2010). Figures 3 and 5 of the *Washington State*

*Scenic and Recreational Highways Strategic Plan* (WSDOT, 2010) show that the “highest scenic value” and “highest potential” areas described above are not located along the portion of the Lewis and Clark Trail Scenic Byway within the scenic resources analysis area. While not identified as having the “highest” scenic value, the portion of the Lewis and Clark Trail Scenic Byway within the scenic resources analysis area remains a designated scenic byway under RCW 47.39 and is analyzed further in Section R.5 and Attachment R-1.

### **R.4.3 Federal Land Management Plans**

This section includes analysis of federal land management plans that exist within the scenic resources analysis area, as listed in Table R-1.

#### **R.4.3.1 *Two Rivers Resource Management Plan Record of Decision Rangeland Program Summary (RPS)* (U.S. Bureau of Land Management—Prineville District, Oregon, 1986)**

The *Two Rivers Resource Management Plan Record of Decision Rangeland Program Summary (RPS)* (BLM, 1986) (Two Rivers RMP) documents decisions reached by the BLM for resource management of public lands within the BLM’s Prineville District, which encompasses Gilliam County. The Two Rivers RMP specifically identifies the John Day River as a scenic resource (BLM, 1986). At its nearest point, the John Day River is approximately 13 miles outside of the scenic resources analysis area and the Facility will not be visible at this distance. Therefore, no further analysis of the John Day River is provided in this Exhibit.

The Horn Butte WMA, which is located approximately 4.6 miles south of the Facility site boundary within the scenic resources analysis area, is also managed by BLM in accordance with the Two Rivers RMP (BLM, 1986). However, the Two Rivers RMP does not identify the Horn Butte WMA as an important scenic resource and no further analysis of this area is needed. The Horn Butte WMA is analyzed as a Protected Area in Exhibit L, and recreational uses associated with this WMA are described in greater detail in Exhibit T.

In addition, the Two Rivers RMP identifies the Oregon National Historic Trail (ONHT) Historic Site at Fourmile Canyon as a Special Management Area where the unusual qualities of the site “will be maintained and protected” (BLM, 1986). However, the Fourmile Canyon trail site is not specifically identified as a scenic resource in the Two Rivers RMP. A more thorough review of this trail site is included in Sections R.4.3.2 and R.4.3.3. It is important to note that the Two Rivers RMP does not apply to lands within the Facility site boundary and that the Facility will not result in the development or improvement of any BLM lands.

#### **R.4.3.2 *Oregon Trail Comprehensive Management and Use Plan* (U.S. National Park Service, 1999)**

The ONHT crosses the scenic resources analysis area south of the Facility site boundary, as shown on Figure R-1. The ONHT received federal designation as a “historic trail” under the National Trails System Act (NTSA) in 1978. The NTSA only applies to portions of the ONHT located on federal lands and indicates that specific locations along the ONHT can be identified as “high-potential” sites. The *Comprehensive Management and Use Plan* (CMP) adopted by the U.S. National Park Service (NPS) in 1999 is the federal land management plan for the ONHT (NPS, 1999). As described in the CMP, portions of the ONHT are designated as “high-potential” when they include historic significance, visible presence of historic remnants, and scenic quality (NPS, 1999). The Fourmile Canyon site is the only “high-potential” site located within the scenic resources analysis area. The site is approximately 9.9 miles southwest of the nearest portion of the Facility (see Figure R-1).

The scenic value connected with the Fourmile Canyon site is focused on the view of visible trail remnants and ruts, along with the immediate surroundings, that “commemorate the westward movement of emigrants to the Oregon country as an important chapter of our national

heritage” (NPS, 1999). Visitors to the site view the visible ruts of the ONHT by looking in a southwest direction from an interpretive wayside located on public land managed by BLM. The visual qualities of the Fourmile Canyon site are protected by a ¼-mile corridor buffer on either side of the trail ruts (NPS, 1999). The Applicant provides further analysis in Section R.5.

#### **R.4.3.3 *Oregon Trail Management Plan (U.S. Bureau of Land Management–Prineville District, Oregon, 1993)***

The 1993 Oregon Trail Management Plan was prepared by the BLM Prineville District to meet the objectives of the Two Rivers RMP, which directs the District to provide proper management of the ONHT segment occurring at Fourmile Canyon. To meet the specific goal of land use compatibility, the plan proposes a “protective corridor extending ¼-mile either side of the main trail ruts” to protect the visual qualities of the Fourmile Canyon site. The Applicant provides further analysis in Section R.5.

#### **R.4.3.4 *Lewis and Clark National Historic Trail Comprehensive Plan for Management and Use (U.S. National Park Service, 1982)***

The Lewis and Clark National Historic Trail (LCNHT) received federal designation as a “historic trail” under the NTSA in 1978. The purpose of the NTSA, as described above in Section R.4.3.2, is to protect the route as a historic resource. The focus of the NTSA is on historic preservation and not the management of scenic resources. The LCNHT is also not defined as a Protected Area under OAR 345-022-0040. Nonetheless, the Applicant addresses the LCNHT below to demonstrate that the LCNHT is not a scenic resource identified as significant or important under applicable land use plans..

In 1982, the NPS prepared the *Lewis and Clark National Historic Trail Comprehensive Plan for Management and Use* (CPMU) to guide development and use of the trail. Locations of the LCNHT within the scenic resources analysis area were determined from mapping on sheet 40 of the CPMU (NPS, 1982). The CPMU includes mapping to identify the location of the LCNHT in the Columbia River segment of the LCNHT as identified in the CPMU. However, the CPMU does not identify specific scenic resources or views related to the LCNHT within the scenic resources analysis area.

The LCNHT segments within the Facility scenic resources analysis area are shown on Figures R-1 and R-2. The LCNHT includes a “water trail” along the Columbia River, which identifies the route used by the expedition to move from east to west in 1804. The LCNHT also includes a “motor route” along Washington’s SR 14, which is in the approximate route of the expedition’s return trip from the Pacific Ocean along the north shore of the Columbia River in 1806. Within the scenic resources analysis area, the LCNHT motor route is identical to the Lewis and Clark Trail Scenic Byway described above in Section R.4.2.3. At its nearest point, the LCNHT water trail is approximately 0.3 mile north of the Facility site boundary and the LCNHT motor route is approximately 1.3 miles north of the Facility site boundary.

Neither the LCNHT water trail nor the motor route are specifically identified in the CPMU as a scenic resource.

Therefore, because the focus of the NTSA is on historic preservation and not management of scenic resources; and because the portion of the LCNHT within the scenic resources analysis area does not include any designated significant or important scenic resources;; the LCNHT is not included in Table R-2 as a significant scenic resource in the analysis area and no further analysis is required.

#### **R.4.4 Summary of Scenic Resources Identified in Local, State, and Federal Land Use and Management Plans**

This section provides a summary of the significant or important scenic resources identified in local, state, and federal land use and management plans that exist within the scenic resources analysis area, as listed in Table R-1.

##### **R.4.4.1 Local Land Use Plans**

Morrow County does not identify significant or important scenic resources in the County (Morrow County, 1986). In addition, no potential or approved federal or state wild or scenic waterways (USFWS, 2016) or approved Oregon Recreation Trails are located within the scenic resources analysis area. The CRGNSA is located approximately 45 miles east of the Facility site boundary and is not within the scenic resources analysis area. Therefore, the Facility will not affect scenic resources within Morrow County.

The GCCP identifies “rock outcroppings marking the rim and walls of steep canyon slopes” as important characteristics of the county’s landscape (Gilliam County, 2011). Identified rock outcroppings in the analysis area are analyzed further in Section R.5. The GCCP does not identify other significant or important scenic resources within the scenic resources analysis area.

Klickitat County identifies State-designated Scenic Byways as scenic areas (Klickitat County, 2004). As discussed in Section R.4.2.3, a portion of the Lewis and Clark Trail Scenic Byway that crosses Klickitat County is located in the scenic resources analysis area and it is analyzed further in Section R.5.

In Benton County, portions of the landscape of Crow Butte State Park may be consistent with the landscape described in Goal 40-1 of the BCCP, which aims to preserve “visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape” (Benton County, 2006). Therefore, Section R.5 provides further analysis of views from Crow Butte State Park toward the Facility. The BCCP does not identify other significant or important scenic resources in Benton County.

The City of Arlington recognizes “the importance of the scenic quality of the east and west slopes” surrounding the City (City of Arlington, 1978). Therefore, views toward the east slopes from the portion of the City of Arlington within the scenic resources analysis area are further analyzed in Section R.5.

##### **R.4.4.2 State Land Management Plans**

The scenic resources analysis area includes two State-designated scenic byways. In Oregon, the Blue Mountain Scenic Byway is located approximately 1.2 miles west of the Facility site boundary. The Blue Mountain Scenic Byway begins at Heppner Junction off I-84 on SR 74 and continues south along Willow Creek. In Washington, the Lewis and Clark Trail Scenic Byway is located 1.3 miles north of the Facility site boundary. Views from portions of these scenic byways located within the scenic resources analysis area are analyzed further in Section R.5.

##### **R.4.4.3 Federal Land Management Plans**

The Oregon Trail Fourmile Canyon site is the only “high-potential” site located on the ONHT within the scenic resources analysis area (NPS, 1999). The site is approximately 9.9 miles outside of the Facility site boundary. The Applicant provides further analysis of this site in Section R.5.

#### **R.5 SIGNIFICANT POTENTIAL ADVERSE IMPACTS**

This section describes significant potential adverse impacts on scenic resources identified in the applicable local, state, and federal land management plans discussed in Section R.4 and listed in

Table R-2. Table R-2 also indicates whether each scenic resource may potentially have views of the Facility and the subsequent degree of visual impact.

**OAR 345-021-0010(1)(r)(C)** *A description of significant potential adverse impacts to the scenic resources identified in (B), including, but not limited to, impacts such as:*

- (i) *Loss of vegetation or alteration of the landscape as a result of construction or operation; and*

**Response:** Although construction and operation of the Facility will result in the conversion of mixed grassland dominated by non-native grass species and scrub shrub habitat within the Facility site boundary, the Facility's footprint will not directly affect significant or important scenic resources identified in Table R-2. As demonstrated throughout this Application for Site Certificate, the Facility has been sited specifically to avoid, minimize, and mitigate for potential adverse visual impacts resulting from the loss of existing vegetation and necessary alteration of landscape.

### R.5.1 Overview

As described in Exhibit B, the Facility's major components, structures, and systems are proposed in Morrow County. These include the solar modules, inverters, and transformers. The related or supporting facilities proposed within Morrow County include the underground collection cables, a generator step-up transformer and substation, a control house, an operations and maintenance (O&M) building, internal service roads, a main access road, and additional temporary construction areas such as staging areas and a temporary batch plant. The O&M building will vary in height from approximately 10 to 20 feet, and the maximum height of the solar modules and inverters will be approximately 10 feet tall.

The related or supporting facilities proposed in Gilliam County include the approximately 2.1-mile-long, 115-kV transmission line and the POI where the transmission line interconnects with the existing electrical grid. The overhead transmission line will be supported by steel monopoles. The monopoles will range in height from 70 to 135 feet and will be spaced approximately 400 feet apart, depending on site conditions.

Table R-2. Scenic Resources Identified in Applicable Local, State, and Federal Land Use and Management Plans that Pertain to Lands within 10 Miles of the Facility Site Boundary

Scenic Resource <sup>a</sup>	County	Plan Where Scenic Resource is Identified	Approximate Distance (Miles) and Direction from Facility Site Boundary	Is Facility Potentially Visible	Degree of Impact (i.e., "Substantial" or "Not Substantial")
Crow Butte State Park	Benton County	<i>Benton County Comprehensive Plan</i> (Benton County, 2006)	5.5 – Northeast	No	Not Substantial
Rock Outcroppings Near Fourmile Canyon	Gilliam County	<i>Gilliam County Comprehensive Plan</i> (Gilliam County, 2011)	8.0 – Southwest	No	Not Substantial
Oregon Trail Fourmile Canyon High-Potential Site	Gilliam County	<i>Oregon Trail Comprehensive Management and Use Plan</i> (NPS, 1999) <i>Oregon Trail Management Plan</i> (NPS, 1993) <i>Two Rivers Resource Management Plan Record of Decision Rangeland Program Summary (RPS)</i> (USFWS, 1986)	9.9 – Southwest	No	Not Substantial



Table R-2. Scenic Resources Identified in Applicable Local, State, and Federal Land Use and Management Plans that Pertain to Lands within 10 Miles of the Facility Site Boundary

Scenic Resource <sup>a</sup>	County	Plan Where Scenic Resource is Identified	Approximate Distance (Miles) and Direction from Facility Site Boundary	Is Facility Potentially Visible	Degree of Impact (i.e., “Substantial” or “Not Substantial”)
City of Arlington East Slopes	Gilliam County	<i>City of Arlington Comprehensive Plan</i> (City of Arlington, 1978)	9.5 – Southwest	No	Not Substantial
Blue Mountain Scenic Byway	Gilliam County	<i>1999 Oregon Highway Plan: Including Amendments November 1999 through May 2015</i> (ODOT, 1999)	1.2 – West	Yes – minimally and only intermittently from one approximately 1.0-mile section of SR 74	Not Substantial
Lewis and Clark Trail Scenic Byway	Klickitat County	<i>Klickitat County Energy Overlay: Final Environmental Impact Statement</i> (Klickitat County, 2004)  <i>Washington State Scenic and Recreational Highways Strategic Plan (2010-2030)</i> (WSDOT, 2010)	Nearest point: 1.3 – North	Yes – minimally and only from intermittent sections along SR 14	Not Substantial

**Notes**

<sup>a</sup> In accordance with OAR 345-021-0010(1)(r)(B), only resources identified in local, tribal, and federal management plans as significant or important based on their scenic qualities are analyzed in this Exhibit.

<sup>b</sup> Approximate distances provided are measured from the Facility site boundary to the nearest point of the scenic resource located within the jurisdiction that identifies the resource in its local, state, or federal land use or management plan.

<sup>c</sup> Potential visibility is determined through viewshed analysis, as outlined in Section R.2. Visibility of a specific scenic resource is only analyzed within the jurisdiction that lists that resource in its local, state, or federal land use or management plan.

**R.5.2 Loss of Vegetation**

The area within the Facility site boundary consists of mixed grassland dominated by non-native grass species with scattered scrub shrub habitat. It is almost entirely devoid of trees, with the exception of non-native Russian olive trees located within and directly adjacent to wetlands in the southeastern corner in the Facility site boundary. Although Exhibit P notes that the wetlands in the Facility site boundary are characterized as being isolated and degraded, the Facility layout has been specifically oriented to avoid these wetlands and the associated vegetation (see Figures C-1 and C-2 in Exhibit C). Impacts on existing vegetation will be almost exclusively on non-native grasses. Construction of the new and improved internal service roads and access road, underground collection system, and the pole structures and internal service road associated with the transmission line, will require some ground preparation and limited grading. The temporary disturbance areas will be revegetated in accordance with the *Revegetation and Noxious Weed Control Plan* (Attachment P-6 in Exhibit P). The construction and operation of the Facility will not result in removal of aesthetically important natural vegetation. Therefore, to the extent that the predominantly non-native grass vegetation within the Facility site boundary is visible from surrounding viewsheds, significant adverse impacts on scenic resources associated with the loss of existing vegetation will not occur as a result of the Facility.

### R.5.3 Alteration of Landscape

Construction and operation of the Facility will not alter the existing landscape in a way that will adversely affect views toward the Facility from the identified scenic resources listed in Table R-2. As discussed below, the Facility will add photovoltaic (PV) solar power generation infrastructure to the landscape that will be visible along intermittent portions of the Lewis and Clark Trail Scenic Byway and the Blue Mountain Scenic Byway. However, the Facility elements described in Exhibit B and summarized in Section R.5.1 will not dominate the viewed landscape. Furthermore, the Facility's presence will not detract from the existing landscape setting described in Section R.1.

Views of the landscape in the vicinity of the Facility area are dominated by the Columbia River and steep bluffs along the Washington state boarder to the north; vacant grasslands crossed by a mixture of existing transmission line infrastructure to the east and the south; and existing wind power generation turbines associated with wind farms such as Shepherds Flat (North, Central, and South), Pebble Springs, Leaning Juniper, Willow Creek, and Threemile Canyon located west and southwest of the Facility site boundary. The size and scale of the Facility will be minimal in comparison with these other existing features.

Existing screening in the form of varying topography adjacent to the surrounding highways, vegetation, and structures, blocks many views of the Facility except in certain locations directly adjacent to the Facility site boundary. For example, vegetated bluffs and elevated contours along the shoulder of the Blue Mountain Scenic Byway intermittently screen east-facing views toward the Facility from passing motorists. The Burlington Northern Santa Fe railroad line is located south of and adjacent to the Lewis and Clark Trail Scenic Byway. Portions of the railroad line are elevated above the byway and periodically screen or obstruct views toward the Facility from passing motorists.

In addition, the Facility component with the tallest features, the transmission line, has been routed directly adjacent to an existing transmission line. Thus, the new transmission line poles will be next to existing poles that are similar in scale and appearance. Although certain portions of the Facility may be visible within the existing landscape, the Facility will not result in significant alteration to the landscape. Furthermore, the Facility will not detract from the settings of the scenic resources listed in Table R-2. Therefore, significant adverse impacts on scenic resources associated with the alteration of landscape will not occur as a result of the Facility.

### R.5.4 Visual Impacts

#### (ii) *Visual impacts of facility structures or plumes.*

**Response:** This section provides analysis of potential adverse impacts that may result from construction and operation of the Facility on scenic resources shown on Figure R-1 and listed in Table R-2. Figure R-2 shows the locations where photographs were taken from the identified significant or important scenic resources toward the Facility site boundary. Attachment R-1 contains photographs taken from the locations shown on Figure R-2. Each photograph includes a descriptive caption of the viewshed shown. This analysis concludes that construction and operation of the Facility will not result in significant adverse impacts on the scenic resources listed in Table R-2.

#### R.5.4.1 Crow Butte State Park

Benton County does not list Crow Butte State Park as a scenic resource and no other land use management plans identify significant scenic resources within the park boundary. However, the landscape of Crow Butte State Park may be considered consistent with Goal 40-1 of the BCCP,

which aims to preserve “visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape” (Benton County, 2006). Accordingly, views from Crow Butte State Park toward the Facility site boundary are analyzed.

Photograph 1 in Attachment R-1 shows that views toward the Facility from the marina at Crow Butte State Park are blocked by the elevation and topography of the hills and bluffs north of and adjacent to the Columbia River. In the absence of these features, distance will also preclude views of the Facility from Crow Butte State Park. Therefore, the Facility will not affect the scenic qualities of views from Crow Butte State Park and the Facility will not alter visually prominent slopes associated with the landscape in Benton County. Neither monitoring nor mitigation is proposed.

#### **R.5.4.2 Rock Outcroppings near Fourmile Canyon**

The location of a typical rock outcrop is shown on Figure R-1. The scenic value of this rock outcropping is best experienced from the floor of the canyon within the scenic resources analysis area, as the majority of adjacent uplands are privately owned and do not offer a public vantage point. The rock outcrops of Fourmile Canyon, for most of the canyon’s length, are now backed by the turbines and transmission structures of existing wind facilities.

Photograph 2 in Attachment R-1 shows that when standing at the intersection of Fourmile Road and Eightmile Canyon Road, the Facility will not be visible from views facing northeast directly toward the Facility site boundary. Views of the Facility from this photo survey point are blocked by distance, topography, and vegetative screening. The Facility is not located adjacent to rock outcroppings and the Facility will not change the visual experience of the typical rock outcroppings located near Fourmile Road (Figure R-1). Neither mitigation nor monitoring is proposed.

#### **R.5.4.3 Oregon Trail Fourmile Canyon High-Potential Site**

The Fourmile Canyon site is the only “high-potential” site located on the ONHT within the scenic resources analysis area (NPS, 1999). The site’s primary use is for sightseeing of a historic landmark. As described in Section R.4.3.2, visitors typically begin the viewing experience at an interpretive wayside that aims viewers in a southwest direction toward remnant wagon ruts on adjacent hills (see Photograph 3A in Attachment R-1). The southwest-facing direction of the wayside is opposite the direction from the Facility site boundary. The Facility will not be visible from this main focal point. Furthermore, Photograph 3B in Attachment R-1 shows that distance, elevation, and vegetative screening preclude the Facility from views facing northeast from the interpretive wayside, directly toward the Facility site boundary. Thus, the Facility will not change the visual experience at the Fourmile Canyon interpretive wayside located on public land managed by BLM. Neither mitigation nor monitoring is proposed.

#### **R.5.4.4 City of Arlington East Slopes**

A small portion of the City of Arlington, Oregon, is located within the scenic resources analysis area approximately 9.5 miles southwest of the Facility site boundary. This area includes hill slopes located along the eastern boundary of the City. As described in Section R.4.1.5, the City of Arlington’s east slopes are documented as an important scenic resource. The Facility will not affect views toward the east slopes from the portion of the City within the analysis area. Photograph 4 in Attachment R-1 shows that views toward the Facility from State Route 19, which runs through the center of the City, are blocked by the elevation and topography of the eastern hill slopes. No Facility components are proposed on the east slopes of the City of Arlington. Because the City is located in a canyon floor below the grade of the east slopes, the Facility is not visible from easterly-facing views from the City. Therefore, the Facility will not

affect the scenic qualities of the east slopes of the City of Arlington. Neither monitoring nor mitigation is proposed.

#### **R.5.4.5 Blue Mountain Scenic Byway**

The nearest portion of the Blue Mountain Scenic Byway is located approximately 1.2 miles west of the Facility site boundary (Figure R-1). The Applicant's visual resource specialist drove the portion of the Blue Mountain Scenic Byway within the scenic resources analysis area during the visual resources site visit and verified that the Facility may only be visible from intermittent locations along the first approximately 2.0 miles of the byway. Areas where the Facility may potentially be visible from east-facing views along the highway begin at the interchange of SR 74 and I-84 and end at an elevated grade approximately near the intersection of SR 74 and Rhea Road. Portions of the byway south of Rhea Road follow a grade down to the basin of Willow Creek. Varying topography, vegetation, and structures adjacent to the byway will block the Facility from the view of motorists driving along any portion of the byway below the grade at Rhea Road.

Attachment R-1 provides three photos showing east-facing views from the portion of the byway where there will potentially be views toward the Facility. The locations where these photographs were taken are shown on Figure R-2. Photograph 5 in Attachment R-1 shows a view toward the Facility from the interchange of SR 74 and I-84. This viewpoint was selected because the location marks the beginning of the Blue Mountain Scenic Byway and offers the most unobstructed view toward the Facility site. Photographs 6 and 7 in Attachment R-1 show views toward the Facility from intermittent locations along the approximately 2.0-mile portion of the byway where motorists will likely also have unobstructed views toward the Facility.

As shown on Photographs 5 through 7 in Attachment R-1, the canyon walls along the east side of the Willow Creek Wildlife Area will likely block views of the solar module arrays. In the event that the solar module arrays are visible, their appearance will be similar to a dark line on the horizon. In addition, the Facility component with the tallest features, the transmission line, has been routed directly adjacent to an existing transmission line. The new transmission line poles will be next to existing poles that are similar in scale and appearance, thus minimizing visual impacts that may be associated with the transmission line. From these viewpoints, the Facility may be discernible but will not be a substantial or prominent feature within the viewshed.

Furthermore, given the direction of traffic in relation to the Facility location and the speed limit on SR 74 in this area (55 miles per hour [mph]), any potential views of the Facility will be brief in duration and will only occur while looking east toward the Facility site boundary from intermittent locations along an approximately 2.0-mile section of the byway (such as those documented in Photographs 6 and 7 in Attachment R-1). Wind turbines located within approximately 0.4 mile west of the byway are, and will remain, the dominant man-made feature in views from SR 74. Therefore, while certain portions of the Facility may be visible, the Facility will not result in significant impacts on views from the Blue Mountain Scenic Byway. Neither mitigation nor monitoring is proposed.

#### **R.5.4.6 Lewis and Clark Trail Scenic Byway**

The nearest portion of the Lewis and Clark Trail Scenic Byway is located approximately 1.3 miles north of the Facility site boundary (Figure R-1). The Applicant's visual resource specialist drove the portion of the Lewis and Clark Trail Scenic Byway within the scenic resources analysis area during the visual resources site visit and verified that the Facility may be visible from intermittent locations along the byway.

Existing screening in the form of varying topography, vegetation, and railroad structures adjacent to the byway block many views toward the Facility site boundary. For example, rocky

bluffs and elevated contours covered predominately in shrub-scrub vegetation intermittently rise above the shoulder of the southern corridor of the byway and screen views toward the Facility from passing motorists. Within the scenic resources analysis area, the Burlington Northern Santa Fe railroad line is located south of and adjacent to the byway. Portions of the railroad line are elevated above the byway, which also periodically screen or obstruct views toward the Facility from passing motorists.

Furthermore, Photographs 8 through 11 in Attachment R-1 show views toward the Facility from intermittent locations along portions of the byway where motorists will likely have unobstructed views toward the Facility. In the event that the solar module arrays are visible, their appearance will be similar to a dark line on the horizon. As described above, the transmission line poles, which are the tallest features of the Facility, are routed directly adjacent to existing transmission line poles and will range in height from 70 to 135 feet, thus minimizing visual impacts that may be associated with the transmission line. From these viewpoints, the Facility may be discernible but will not be a substantial or prominent feature within the viewshed.

Given the direction of traffic in relation to the Facility location and the speed limit on SR 14 in this area (55 mph), any potential views of the Facility will be brief in duration and will only occur while looking south toward the Facility site boundary from intermittent locations such as those documented in Photographs 8 through 11 in Attachment R-1. The Columbia River and associated shoreline, steep canyon bluffs along the Washington border, and wind turbines located within approximately 1.6 miles west and southwest of the Facility site boundary are, and will remain, the dominant features in views from SR 14.

Although certain portions of the Facility may be visible, the Facility will not result in significant impacts on views from the Lewis and Clark Trail Scenic Byway. Neither mitigation nor monitoring is proposed.

### **R.5.5 Glare Impacts**

The Facility is designed to generate power through the absorption of sunlight, resulting in limited reflectivity (glare) that may be visible within the scenic resources analysis area. Viewed collectively from a distance at similar elevations, the limited reflectivity of the solar modules contributes to an overall appearance of a dark line on the horizon. In closer-in views, modules will be discernible but they are unlikely to be substantial sources of glint or glare. The solar modules are tracking, which means that they will rotate as the sun's angle changes. This, combined with the solar module's antireflective (AR) coating, will result in minimized glare. As shown in Attachment L-2, top-tier modern photovoltaic solar modules use a sophisticated AR coating to nearly eliminate the reflection of sunlight off the module face. A typical human eye reacts to light wavelengths from 390 to 700 nanometers (nm) and in that spectrum, the AR-coated glass on the Jinko module (which is typical of other modules) will have a high-level transmittance of at least 93.3 percent. Transmittance is the percent of radiation (light) that travels through a surface. Such a high level of transmittance is valuable because it means that more light is traveling through the glass and onto the photovoltaic cells, rather than reflecting off the surface. With transmittance values higher than a body of water or a glass window without an AR coating, the potential for glare is lower for modules compared to these other surfaces, such as the Columbia River, which is visible within the scenic resources analysis area.

Other Facility components, such as the O&M building and inverter boxes, will be located south of the solar module arrays away from I-84 and treated to reduce potential visibility and reflectivity.

As a result of the Facility's location adjacent to I-84, the Applicant initiated communication with ODOT to determine whether ODOT may have concerns about potential glare and adjacent

motorists. In an email response dated August 5, 2016, ODOT raised no concerns related to glare or safety (Hamilton, 2016, personal communication). The Applicant is willing to continue coordination with ODOT on this issue to ensure the safety of nearby motorists.

The Applicant has also secured No Hazard Determinations from the Federal Aviation Administration documenting the agency's position that operation of the Facility will not result in glare that will adversely affect aircraft. The No Hazard Determinations are provided in Attachment E-1 to Exhibit E.

#### **R.5.6 Conclusion**

The Facility structures and associated transmission line may be potentially visible from intermittent locations along the Blue Mountain Scenic Byway and the Lewis and Clark Trail Scenic Byway, which are identified as scenic resources in Table R-2. The Facility will not be visible from other scenic resources listed in Table R-2. Both the Blue Mountain Scenic Byway and the Lewis and Clark Trail Scenic Byway are located more than 1 mile away from the Facility site boundary. Given this distance, the nature of the topography of the existing landscape, and the Facility's limited visibility from the byways, the proposed Facility will not result in significant adverse impacts on scenic resources.

#### **R.6 MITIGATION**

**OAR 345-021-0010(1)(r)(D)** *The measures the applicant proposes to avoid, reduce or otherwise mitigate any significant adverse impacts.*

**Response:** No significant adverse impacts on designated significant or important scenic resource areas will result from Facility design, construction, and operation. Therefore, no measures are proposed to avoid, reduce, or otherwise mitigate Facility impacts.

#### **R.7 MAP OF SCENIC RESOURCES**

**OAR 345-021-0010(1)(r)(E)** *A map or maps showing the location of the scenic resources described under (B).*

**Response:** The scenic resources analysis area consists of the area in the Facility site boundary and the area within 10 miles of the Facility site boundary. The following figures are provided:

- Figure R-1 shows the significant or important scenic resources within the scenic resources analysis area as identified on applicable local, state, and federal land use management plans.
- Figure R-2 shows the locations where photographs were taken from the identified significant or important scenic resources toward the Facility site boundary.

Attachment R-1 contains photographs taken from the locations shown on Figure R-2 toward the Facility site boundary. Each photograph includes a descriptive caption of the viewshed shown on each photograph.

#### **R.8 MONITORING**

**OAR 345-021-0010(1)(r)(F)** *The applicant's proposed monitoring program, if any, for impacts to scenic resources.*

**Response:** Because the Facility will not result in significant adverse impacts on scenic and aesthetic values within the scenic resources analysis area, the Applicant does not propose an active monitoring program specific to impacts on scenic and aesthetic values. With respect to the Applicant's efforts to incorporate design measures intended to minimize potential glare and reflectivity from the Facility's solar arrays, no ongoing monitoring is proposed.

## R.9 SUMMARY

The Facility will comply with the applicable regulatory guidelines concerning scenic and aesthetic resources as discussed in the foregoing responses to the criteria contained in OAR 345-021-0010(1)(r)(A) through (F). Based on the foregoing information, the Applicant has satisfied the requirements of OAR 345-021-0010(1)(r) and demonstrated that the design, construction, and operation of the Facility will not result in significant adverse impacts on scenic resources and values within the scenic resources analysis area. Accordingly, the Council may find that the standards contained in OAR 345-022-0080 have been satisfied.

## R.10 REFERENCES

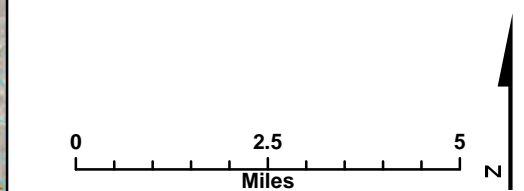
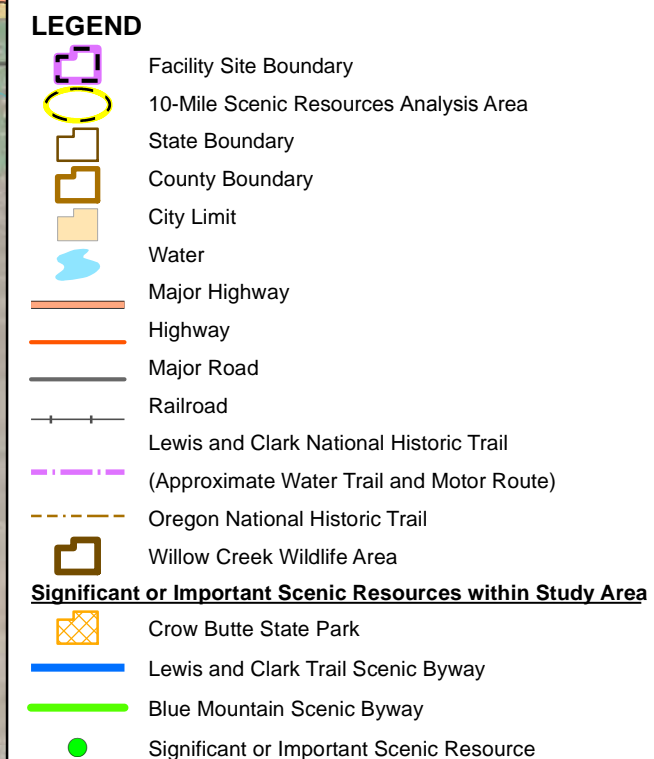
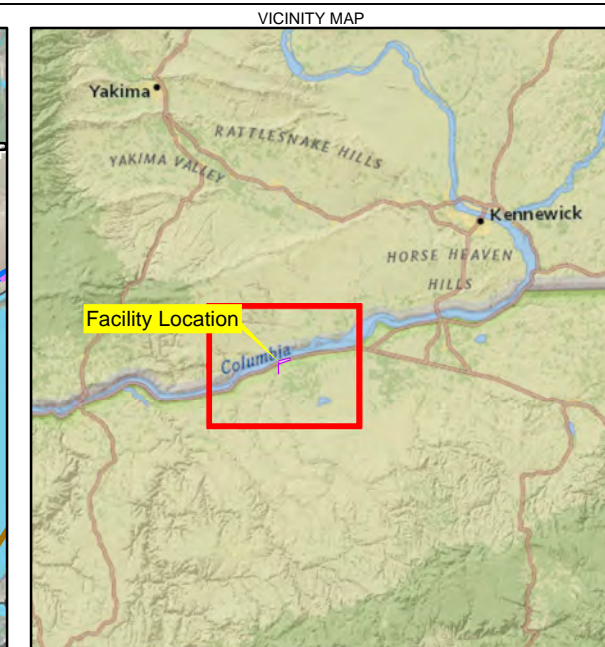
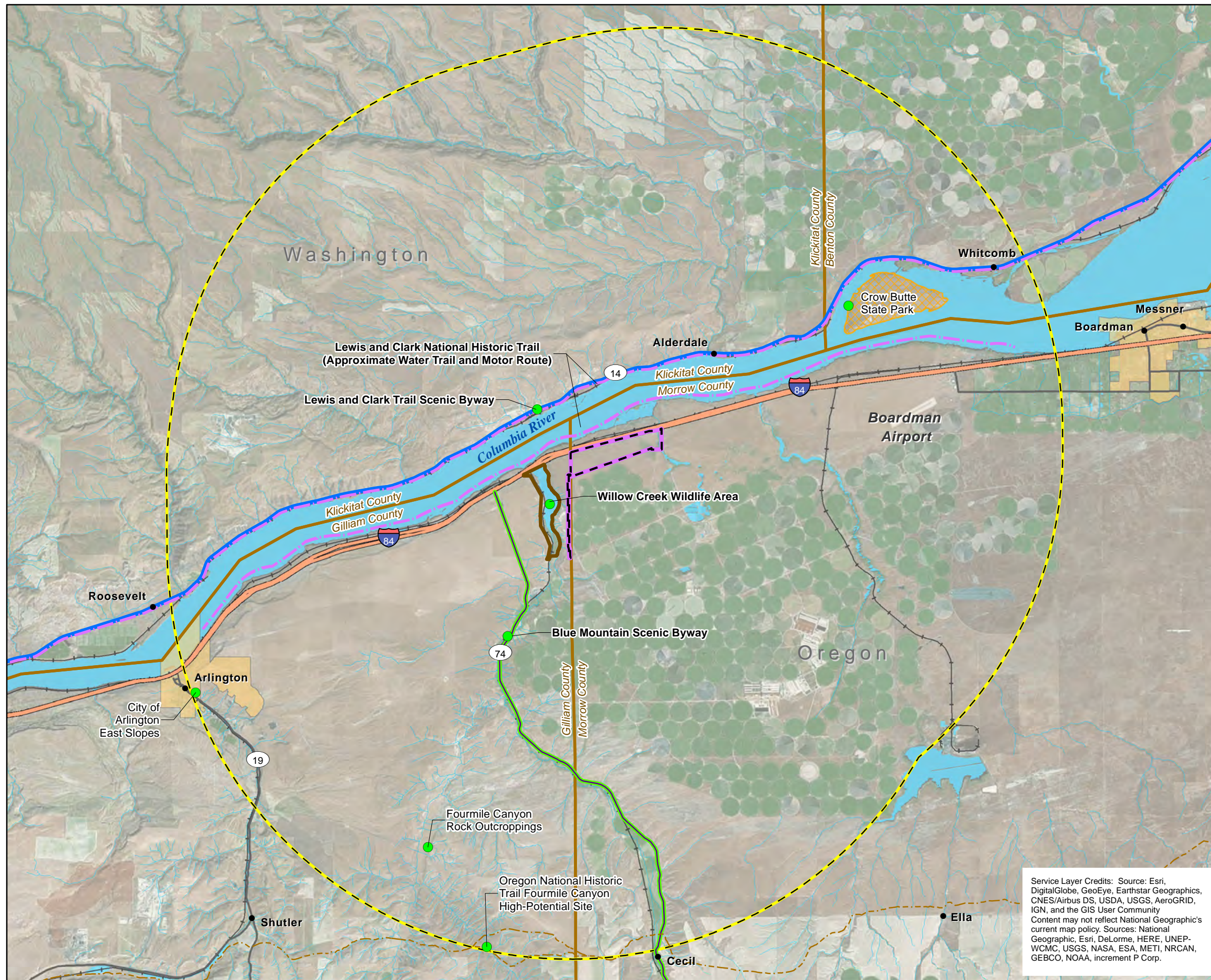
- Benton County. 2006. *Benton County Comprehensive Plan*. Updates through 2015. Accessed April 28, 2016. <http://www.co.benton.wa.us/pview.aspx?id=1450&catID=45>.
- Bureau of Land Management (BLM). 1986. *Two Rivers Resource Management Plan Record of Decision Rangeland Program Summary (RPS)*. June. Accessed April 28, 2016. [http://www.blm.gov/or/districts/prineville/plans/files/pdo\\_tworivers\\_06\\_1986.pdf](http://www.blm.gov/or/districts/prineville/plans/files/pdo_tworivers_06_1986.pdf).
- Bureau of Land Management (BLM). 1993. *Oregon Trail Management Plan*. Prineville District, U.S. Department of the Interior. September.
- City of Arlington. 1978. *City of Arlington Comprehensive Plan*. September 21. Accessed November 18, 2016. <https://scholarsbank.uoregon.edu/xmlui/handle/1794/9141>.
- Federal Highway Administration (FHWA). 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. January. Accessed November 18, 2016. [https://www.environment.fhwa.dot.gov/guidebook/documents/VIA\\_Guidelines\\_for\\_Highway\\_Projects.asp](https://www.environment.fhwa.dot.gov/guidebook/documents/VIA_Guidelines_for_Highway_Projects.asp).
- Gilliam County. 2011. *Gilliam County Comprehensive Plan: Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces*. Adopted October 19, 2011. Accessed April 28, 2016. [http://www.co.gilliam.or.us/gilliam/GOAL\\_5\\_Natural\\_Resources\\_etc.pdf](http://www.co.gilliam.or.us/gilliam/GOAL_5_Natural_Resources_etc.pdf).
- Hamilton, Allison, Oregon Department of Transportation (ODOT). 2016. Personal communication (by email) with Laura Miner, Boardman Solar Energy LLC. August 5.
- Klickitat County. 1977. *Klickitat County Comprehensive Plan*. August.
- Klickitat County. 2004. *Klickitat County Energy Overlay: Final Environmental Impact Statement*. September. Accessed April 28, 2016. <http://www.klickitatcounty.org/DocumentCenter/Home/View/367>.
- Morrow County. 1986. *Morrow County Comprehensive Plan*. Updated in 2013 (MC OR-1-2013). <http://morrowcountyyoregon.com/planning/6.pdf>.
- Oregon Department of Fish and Wildlife (ODFW). 2008. *Columbia Basin Wildlife Areas Management Plan*. October. Accessed April 28, 2016. [http://www.dfw.state.or.us/wildlife/management\\_plans/wildlife\\_areas/docs/columbia\\_basin.pdf](http://www.dfw.state.or.us/wildlife/management_plans/wildlife_areas/docs/columbia_basin.pdf).
- Oregon Department of Transportation (ODOT). 1999. *1999 Oregon Highway Plan: Including Amendments November 1999 through May 2015*. Accessed November 16, 2016. [https://www.oregon.gov/ODOT/TD/TP/docs/OHP/1999\\_OHP.pdf](https://www.oregon.gov/ODOT/TD/TP/docs/OHP/1999_OHP.pdf).
- U.S. Fish and Wildlife Service (USFWS). 2016. *National Wild and Scenic Rivers System: Oregon*. Accessed April 28, 2016. <https://www.rivers.gov/oregon.php>.

- U.S. National Park Service (NPS). 1982. *Lewis and Clark National Historic Trail Comprehensive Plan for Management and Use*. January. Accessed November 17, 2016.  
<https://www.nps.gov/lecl/learn/management/upload/Comprehensive-Plan-Orig.pdf>.
- U.S. National Park Service (NPS). 1999. *Comprehensive Management and Use Plan*. Accessed April 28, 2016. <https://www.nps.gov/cali/learn/management/upload/CMP.pdf>.
- Washington State Department of Transportation (WSDOT). 2010. *Washington State Scenic and Recreational Highways Strategic Plan (2010-2030)*. Accessed November 21, 2016.  
[https://www.wsdot.wa.gov/NR/rdonlyres/815CB0FF-12A1-485B-8D2B-4924DDB458B4/0/WashingtonStateScenicandRecreationalHighwayPlan\\_2010.pdf](https://www.wsdot.wa.gov/NR/rdonlyres/815CB0FF-12A1-485B-8D2B-4924DDB458B4/0/WashingtonStateScenicandRecreationalHighwayPlan_2010.pdf).



Figures

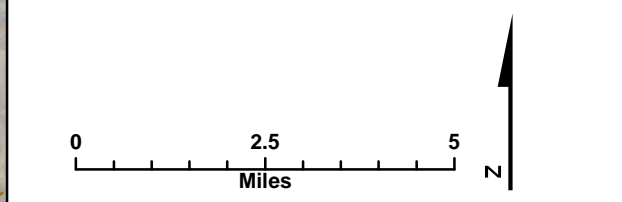
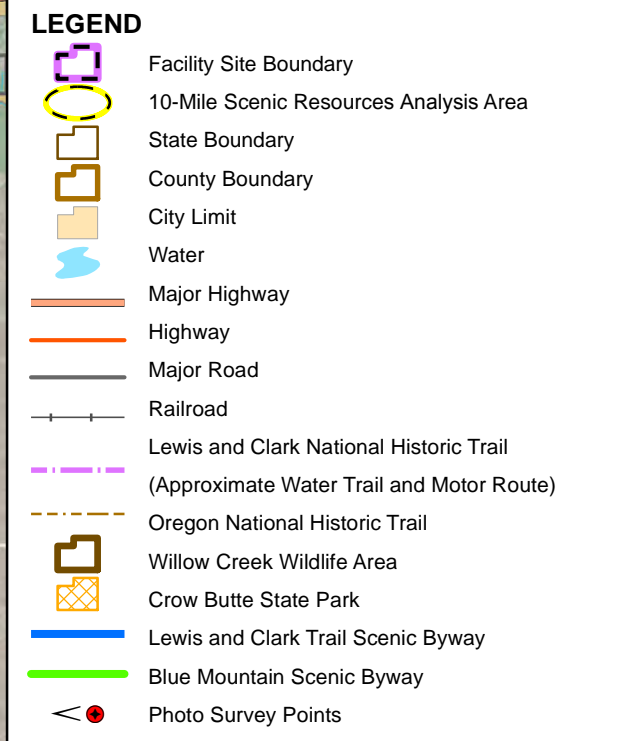
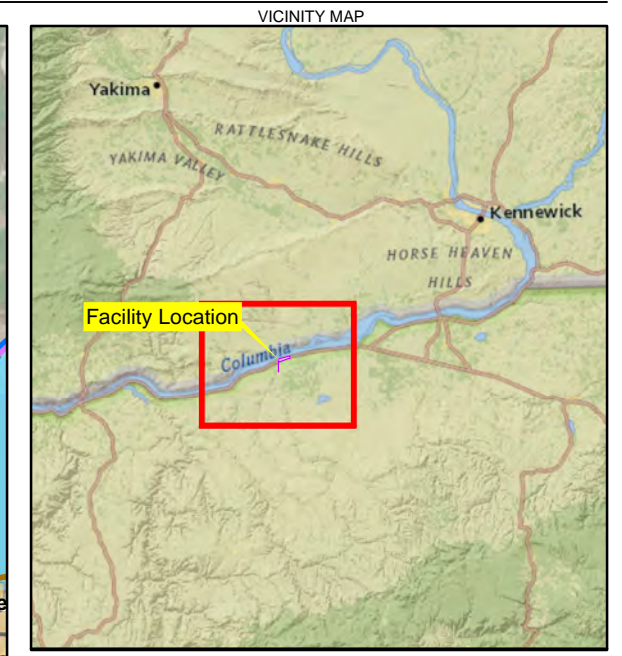
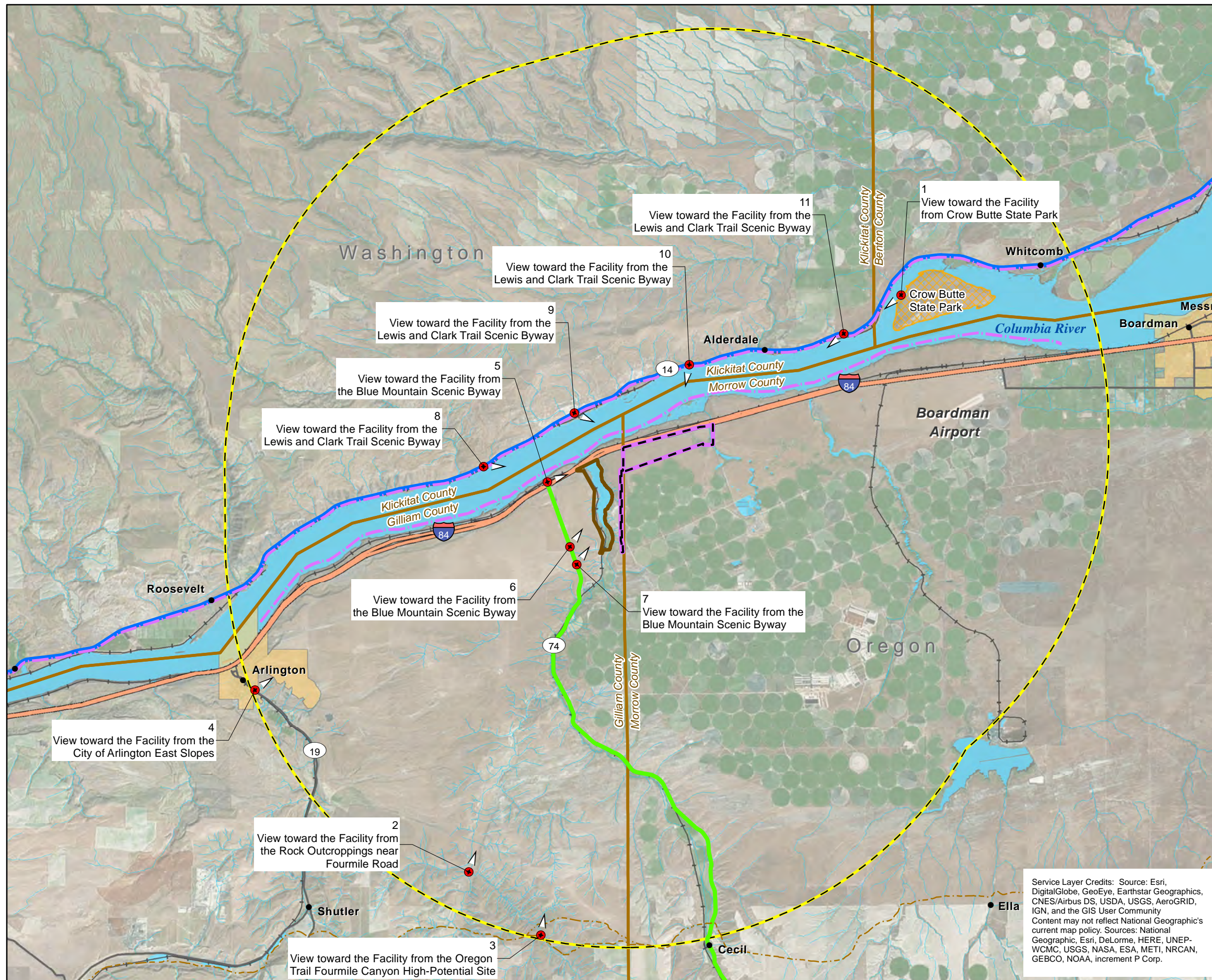




**FIGURE R-1**  
**Significant and Important Scenic Resources within 10 miles of the Facility Site Boundary**  
 Boardman Solar Energy Facility  
 Application for Site Certificate  
 Morrow and Gilliam Counties, Oregon

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.





Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

**FIGURE R-2**  
**Photo Survey Points within 10 miles of the Facility Site Boundary**  
 Boardman Solar Energy Facility  
 Application for Site Certificate  
 Morrow and Gilliam Counties, Oregon





Attachment R-1  
Existing Conditions Photographs



**Photograph 1 – From Photo Survey Point 1 on Figure R-2.**

View from the marina at Crow Butte State Park facing southwest toward the Facility site boundary. (The red arrow indicates the approximate location of the Facility site.)



**Photograph 2 – From Photo Survey Point 2 on Figure R-2.**

View of the rock outcroppings near the intersection of Fourmile Canyon and Eightmile Canyon Road facing northeast toward the Facility site boundary. (The red arrow indicates the approximate location of the Facility site.)





**Photograph 3A – From Photo Survey Point 3 on Figure R-2.**

View of the historic wagon ruts from the interpretive wayside at the Oregon National Historic Trail Fourmile Canyon “high-potential” site that faces southwest and is opposite the direction of the Facility site boundary.



**Photograph 3B – From Photo Survey Point 3 on Figure R-2.**

View from the interpretive wayside at the Oregon National Historic Trail Fourmile Canyon “high-potential” site facing northeast toward the Facility site boundary. (The red arrow indicates the approximate location of the Facility site.)





**Photograph 4 – From Photo Survey Point 4 on Figure R-2.**

View of the City of Arlington's east slopes from a location on State Route (SR) 19 within the city boundary and the scenic resources analysis area and facing northeast toward the Facility site boundary. (The red arrow indicates the approximate location of the Facility site.)



**Photograph 5 – From Photo Survey Point 5 on Figure R-2.**

View facing east toward the Facility site boundary from the beginning of the Blue Mountain Scenic Byway at the interchange of Interstate-84 (I-84) and SR 74. (The red arrow indicates the approximate location of the Facility site in the midground center and above the highway.)





**Photograph 6 – From Photo Survey Point 6 on Figure R-2.**

View facing northeast toward the Facility site boundary from the Blue Mountain Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground left of center above the fence line.)



**Photograph 7 – From Photo Survey Point 7 on Figure R-2.**

View facing northeast toward the Facility site boundary from the Blue Mountain Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground left of center along the horizon above the fence line.)





**Photograph 8 – From Photo Survey Point 8 on Figure R-2.**

View facing southeast toward the Facility site boundary from the Lewis and Clark Trail Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground right of center above the highway overpass over Willow Creek Lake.)



**Photograph 9 – From Photo Survey Point 1 on Figure R-2.**

View facing south toward the Facility site boundary from the Lewis and Clark Trail Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground center along the top of the bluff.)



**Photograph 10 – From Photo Survey Point 10 on Figure R-2.**

View facing southwest toward the Facility site boundary from the Lewis and Clark Trail Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground left of center along the top of the bluff.)



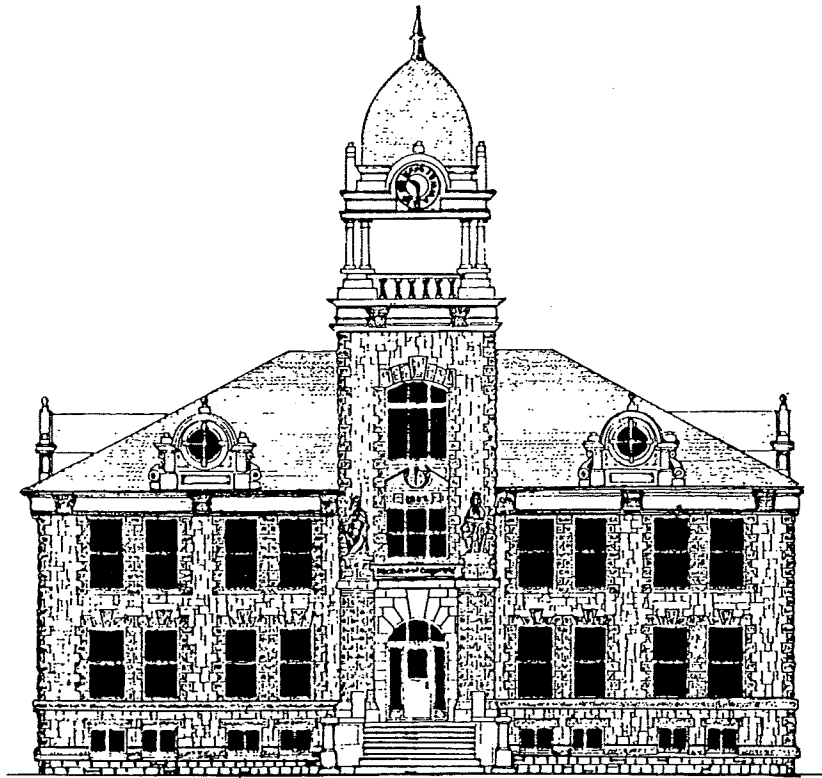
**Photograph 11 – From Photo Survey Point 11 on Figure R-2.**

View facing southwest toward the Facility site boundary from the Lewis and Clark Trail Scenic Byway. (The red arrow indicates the approximate location of the Facility site in the midground center along the top of the bluff.)

Attachment R-2  
Land Use Management Plan Excerpts



# MORROW COUNTY, OREGON



## COMPREHENSIVE PLAN

Acknowledged by the LCDC

January 30, 1986

Cecil General Store	Private property.	3C
Hardman Townsite	Additional information needed.	1B
Cultural Areas	Morrow County does not contain unique cultural area.	N/A
Potential/Approved Recreation Trails	Morrow County does not contain potential or approved recreation trails.	N/A
Potential/Approved Federal Wild and Scenic Waterways; State Scenic Waterways	Morrow County does not contain potential or approved state/federal wild or scenic waterways.	N/A

## Boardman Bombing Range - 2A

References: County resource maps.

Location; Quality/Quantity: The 73 square mile Boardman Bombing Range is unique in several respects: (1) The range contains relict grassland communities (i.e., native grasses undisturbed by agricultural practices); (2) The range contains the only known colony of Washington Ground Squirrels in Oregon; and (3) The range contains a portion of the Oregon Trail and an historic cemetery. The US Navy administers the range; part is used for bombing practice, part leased for grazing and part (3 separated parcels; A, B and C) managed as a Natural Research Area (NRA).

Goal 5 Designation: The Boardman Bombing Range is administered by the federal government. It has been accorded a 2A designation (no conflicting use).

## Federal/State Wildlife Areas - 2A

References: Plan, p. 76; Map of Wildlife Resources; Map of Identified Natural Areas (The Nature Conservancy); Morrow County Natural Resources (The Nature Conservancy). Applicable plan policies: (General Policies) pp. 79-80; (Fish and Wildlife) pp. 82-83.

Location; Quality/Quantity: There are three protected wildlife areas in Morrow County: Umatilla National Wildlife Refuge, Coyote Springs WMA and Irrigon WMA. Coyote Springs and Irrigon wildlife management areas are owned by the federal government but leased to the Oregon State Department of Fish and Wildlife. All three areas provide a habitat for waterfowl. In addition, the Umatilla National Wildlife Refuge contains a Great Blue Heron rookery and a variety of raptors, including bald and golden eagles.

Goal 5 Designation: The three wildlife areas are administered by federal or state government. They have been accorded a 2A designation (no conflicting use).

**Scenic Views and Sites - 1B:** Morrow County contains a variety of landscapes, many of which may be considered to be scenic. The County has not, however, designated any sites or areas as being particularly high in scenic-resource value.

## Water Resources (General)

Morrow County's water resources include groundwater (3C), streams (3C), and ponds (2A). These resources are utilized for domestic, industrial, and agricultural purposes. In addition, streams and ponds are fish and wildlife habitats. Water requirements often result in conflicts. Problems which must be addressed by governing bodies include quality and quantity. Efforts to resolve or alleviate the problems are usually approached in the form of a project. Two projects would enhance the county's water resources: Snipe Creek and Stanfield-Westland.

The Snipe Creek and Stanfield-Westland projects are proposals to augment water resources in specific areas of Morrow and Umatilla counties. The Snipe Creek project would transmit water from John Day basin streams to the Butter Creek critical groundwater area. Stanfield-Westland is comprised of several projects designed to replenish water now

## **GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES**

***Goal: To conserve open space and protect natural and scenic resources.***

Statewide planning Goal 5 requires the county to inventory the following resources:

1. Riparian corridors, including water and riparian areas and fish habitat;
2. Wetlands;
3. Wildlife Habitat (including bird sites);
4. Federal Wild and Scenic Rivers;
5. State Scenic Waterways;
6. Groundwater resources;
7. Approved Oregon Recreation Trails;
8. Natural Areas;
9. Wilderness Areas;
10. Mineral and Aggregate Resources;
11. Energy sources;
12. Cultural areas.

Counties are also encouraged to maintain current inventories of historic resources, open space, and scenic views and sites.

The policies adopted in this Comprehensive Plan focus on issues related to the conservation of open space and natural and scenic resources. They are intended to comply with statewide planning goals and guidelines concerning Open Spaces, Scenic and Historic Areas, and Natural Resources (Goal 5).

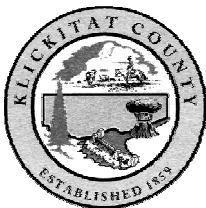
### **FINDINGS**

1. Open space is characteristic of Gilliam County, and no effort exclusively directed toward acquisition of additional open space is necessary. As provided in this Comprehensive Plan, stream beds, drainage ways and proven landslide areas generally will be maintained in a open state as a matter of prudent development practice.
2. 1985 Atlas of Oregon Lakes: No Lakes are identified in Gilliam County
3. The rock outcroppings marking the rim and walls of steep canyon slopes are an important characteristic of the County's landscape.
4. The entire Columbia River waterfront, including related fish and wildlife habitat, is within the jurisdiction of the United States Army Corps of Engineers; the Corps has prepared and adopted a plan for the development of the river shore land, which plan encompasses

September 2004

# Klickitat County Energy Overlay

## Final Environmental Impact Statement





lines run through the County. Areas around Dallesport, White Salmon, and Goldendale are zoned urban or industrial.

Scenic areas within the County include the Columbia River Gorge National Scenic area and state designated scenic byways.

### 3.8.1 Study Methodology

Although a detailed visual impact analysis was not completed as part of this EIS, a general qualitative evaluation identifying the sensitivity of viewers who would see the project sites was completed. Figure 3-7, Visual Impact Analysis, illustrates a line-of-site evaluation along Highway 97, Highway 14, Highway 141, Highway 142, and Interstate 84 in Oregon. The GIS-based visual analysis used a topographic digital elevation model of the terrain and assumed an elevation of 100 feet for towers. Shaded areas on the figure represent areas visible from each of the identified highways; however, it does not mean that the entire shaded area is visible from every point on the highway. Several conditional use permits for energy projects within the County were reviewed. Common mitigation measures implemented for these projects have been incorporated in the following sections.

### 3.8.2 Affected Environment

Potential visual impacts of any energy generation project would include temporary visual changes introduced by construction of the project and permanent visual changes resulting from the operations and maintenance of the project. Activities and facilities for the energy types discussed in this EIS would be visible to residents, recreationists, motorists, and workers.

### 3.8.3 Regulatory Framework

Development within in the Columbia River Gorge National Scenic area is regulated by the Columbia River Gorge Commission (CRGC). The CRGC has developed a body of rules governing development in the National Scenic Areas. The rules can be found in OAR 350, Division 20, and in the Management Plan for the Columbia River Gorge National Scenic Area, which can be found on the Internet at:

[http://www.co.multnomah.or.us/dscd/landuse/CRGNSAPlan/Home/NSAMP\\_Home.html](http://www.co.multnomah.or.us/dscd/landuse/CRGNSAPlan/Home/NSAMP_Home.html).

These rules do not apply to existing Urban Areas located within the Scenic Area.

Scenic Byways are regulated by Washington State Department of Transportation (WDOT) Rules regarding scenic byways are found in Chapter 47.39 RCW implementing the Scenic and Recreational Highway Act of 1967. The code principally regulates billboards and development directly adjacent to the highways.

The current Klickitat County zoning ordinance has an Illumination Control area incorporating all of Townships 3, 4, and 5 within Ranges 15, 16, and 17. Township 3, Range 16 and 17 are limited to those areas north of the crest of the Columbia Hills.



**BENTON COUNTY  
COMPREHENSIVE  
LAND USE PLAN  
2006 UPDATE\***

**BOARD OF COUNTY COMMISSIONERS**

Shon Small, Chairman

Jerome Delvin

James Beaver

**BENTON COUNTY PLANNING COMMISSION**

Martin Sheeran, Chairman

Rick Giberson

James Wetzel

James Willard

Lloyd Coughlin

Mark Reis

Darwin Crosby

**BENTON COUNTY PLANNING STAFF**

Michael Shuttleworth, Planning Manager

Susan M. Walker, Senior Planner

Valerie Smith, AICP, Associate Planner

The Benton County Planning Staff would like to extend their thanks and appreciation to the Residents of Benton County for their contribution and countless hours of dedication they provided throughout the development of this plan. Special thanks to members of the five Rural Planning Advisory Committees: Finley-Kennewick, Prosser-Whitstran, Benton City-Kiona, Paterson-Plymouth and Richland-West Richland. The Rural Planning Advisory Committee Members are referenced by name in the appendices of this plan.

\*GMA 2006 Comprehensive Plan Update Resolution #07-160 adopted March 12, 2007, and as amended thereafter by Resolution numbers 07-655, 07-656, 07-767, 07-905, 09-142, 09-144, 09-145, 09-726, 09-730 & 09-731, 11-523, 11-524, 11-525, 12-526, 12-527, 12-528; Rev. 3/13, Res. 2013-266; Rev. 3/31/15, Res. 2015-256; Rev. 7/21/15, Res. 2015-516, 517, 518, 519, 520 and 521 and Res. 2016-492.

**POLICIES:**

- A. That public acquisition of critical fish and wildlife habitats and lands essential to the protection of the functions and values of those resources shall be encouraged as the action preferable to applying regulations onerous to private use of property.
- B. Using Best Available Science the functions and values (Table 2.0) of designated Fish and Wildlife conservation areas shall be protected for the public health, safety and welfare.
- C. Unless specifically prohibited by state law, or County ordinance for reasons of public safety, the activities of hunting and fishing for game species during legal seasons and consistent with State and Federal game laws, are historic cultural activities that are protected on lands where such are allowed by any of the following: permission, public designation, public right of access, ownership, contract (e.g., conservation easement), treaty rights.

**PARKS, RECREATION, OPEN SPACE, AND HISTORIC PRESERVATION**

**GOAL 39**

To develop and maintain a park system for Benton County residents and visitors which provides a variety of recreational opportunities including: regional and local parks and trail systems for bicycle, hiking and equestrian use.

**GOAL 40**

Jointly, with cities and agencies owning public property, adopt the Tapteal Greenway concept Plan, and prepare and facilitate the realization of a Greenway along the riverine corridor of the lower Yakima River from just west of Benton City and extending downstream to Columbia Point and including Bateman Island.

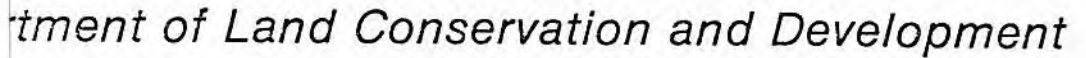
**GOAL 40-1**

To conserve as undeveloped and unmarked for posterity, the visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice Age Floods.

**POLICIES:**

- A. That the Benton County Comprehensive Parks and Recreation Plan shall be the Plan for developing and maintaining a regional park and trail system integrated with city recreational resources.
- B. That the development of a system of bicycling, hiking and equestrian trails in the County shall be encouraged and coordinated with existing and/or proposed city systems.
- C. That developers of low density, large lot subdivisions and plats shall be encouraged to provide access easements for bicycle and horse riding both within the development and between contiguous developments, connecting where possible to regional trails, and to establish a means of maintaining such

Union Oak 100 ✓



September 21, 1978

Dear Mayor Odum:

The Acknowledgment signifies a historic step for the City's land use planning program. Arlington is one of the first of Oregon's cities to be in compliance with the Statewide Goals. By effectively planning ahead for the wise use of your valuable land, you have set an excellent example for others to follow.

I would like to commend the city officials, staff, and citizens of your community for their hard work and foresight in the field of land use planning.

W. J. Kvarsten  
Director

Enclosure

cc: Judge Leo Barnett  
Marlene Davison, County Coordinator  
Jim Kennedy, LCDC Field Representative  
Wayne Schwandt, ECOAC



approval in order to protect adjacent or surrounding properties from any adverse effects of such a development.

2. The city will endeavor to achieve and maintain the standards established by the National Recreation Association for playlots and playgrounds.

3. The city may require developers of residential subdivisions or apartment complexes to provide outdoor recreation facilities of a type and in an amount appropriate to the size and expected occupancy characteristics of the development proposed.

4. In presently developed areas, the city will encourage and assist in the development of areas suitable for childrens' unorganized play.

5. The city recognizes the importance of the scenic quality of the east and west slopes, and will require that development occurring on those slopes be designed in such a way as to not detract from that quality.

6. The city encourages the school district to enter into discussions relative to making available on a regular basis the existing recreational facilities at the school grounds. It is recognized that this discussion must include consideration of methods for assuming liability in connection with such use.

7. Special attention should be given to continued development of water-related recreation, especially on the northern edges of the inlet. The area below the freeway bridge, unsuitable for most activities, could provide for boat trailer parking if the Port's marina facilities are expanded to encourage the sport fishery. The city will cooperate with the Port Commission in exploring such possibilities for increased water-oriented recreation activities.

\*8. See Page 25(a) (1)

#### Opportunity Area

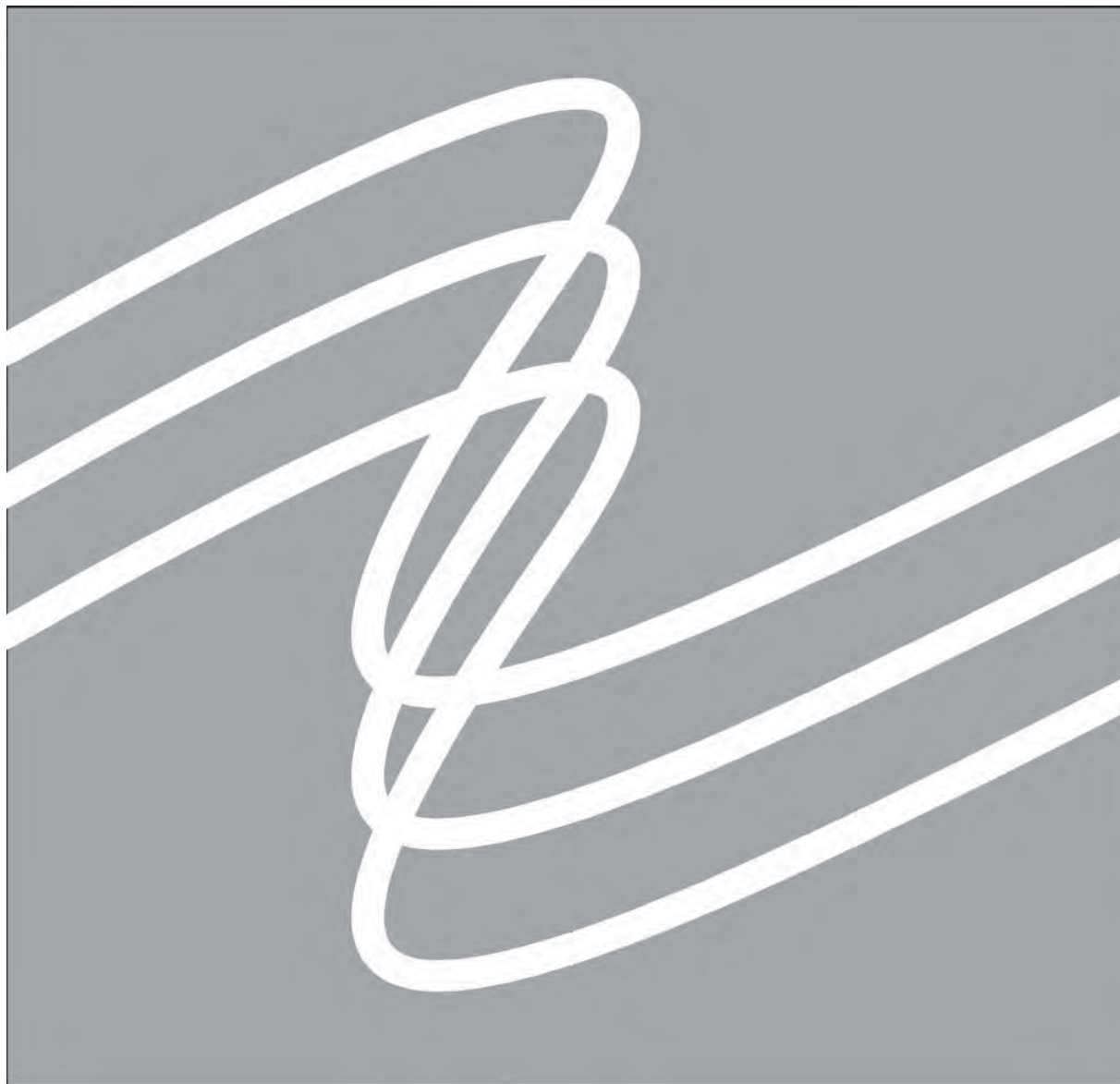
The plan also identifies an opportunity area on the west slope of the city, adjacent to the northernmost reservoir.

The west slope presents a difficult problem in development, and the city should remain receptive to suggestions as to how that land might be improved. In this area, the type of development is not as important to the city as the way in which it is developed. Proposals for development should take into account the limited access to the area as well as the steepness of the slope.

In the absence of any proposal for private development of this area, the city may wish to consider acquiring the property (or at least its development rights) and maintaining it in the open space reserve. Some limited trails, picnic facilities and viewpoints could be developed as part of this area. In any event, it is important to protect the scenic quality of the hillside, and development of it should be as unobtrusive as possible.

\*\* See Page 25(a) (2)

**1999**  
**OREGON HIGHWAY PLAN**  
Including amendments November 1999 through May 2015



*An Element of the Oregon Transportation Plan*

**T** THE OREGON DEPARTMENT OF TRANSPORTATION

## SCENIC BYWAYS

### Background

While every state highway has certain scenic attributes (see Policy 5B), the Oregon Transportation Commission has designated Scenic Byways throughout the state on federal, state, and local roads which have exceptional scenic value (see map, Figure 11). In 1998, the federal government designated two of these routes as All- American Roads and four as National Scenic Byways. The Oregon Transportation Commission may designate additional state byways. To protect the scenic assets of its Scenic Byways, ODOT will develop guidelines for aesthetic and design elements within the public right-of-way that are appropriate to Scenic Byways. The Scenic Byways Policy recognizes that safety and performance issues may cause the need for physical improvements to Scenic Byways, and seeks to balance these needs with the preservation of scenic values.

### Policy 1D: Scenic Byways

It is the policy of the State of Oregon to preserve and enhance designated Scenic Byways, and to consider aesthetic and design elements along with safety and performance considerations on designated Byways.

#### *Action 1D.1*

Develop and apply guidelines for appropriate aesthetic and design elements within the public right-of-way on Scenic Byways. The purpose of these guidelines is to preserve and enhance the scenic value while accommodating critical safety and performance needs. The elements should include guidelines for turnouts, overlooks, signage, and visual treatment of the highway infrastructure.



*The Historic Columbia River Highway is both a State Scenic Byway and an All American Road*

#### *Action 1D.2*

With guidelines in place, develop management priorities for Scenic Byways in management plans and corridor plans.



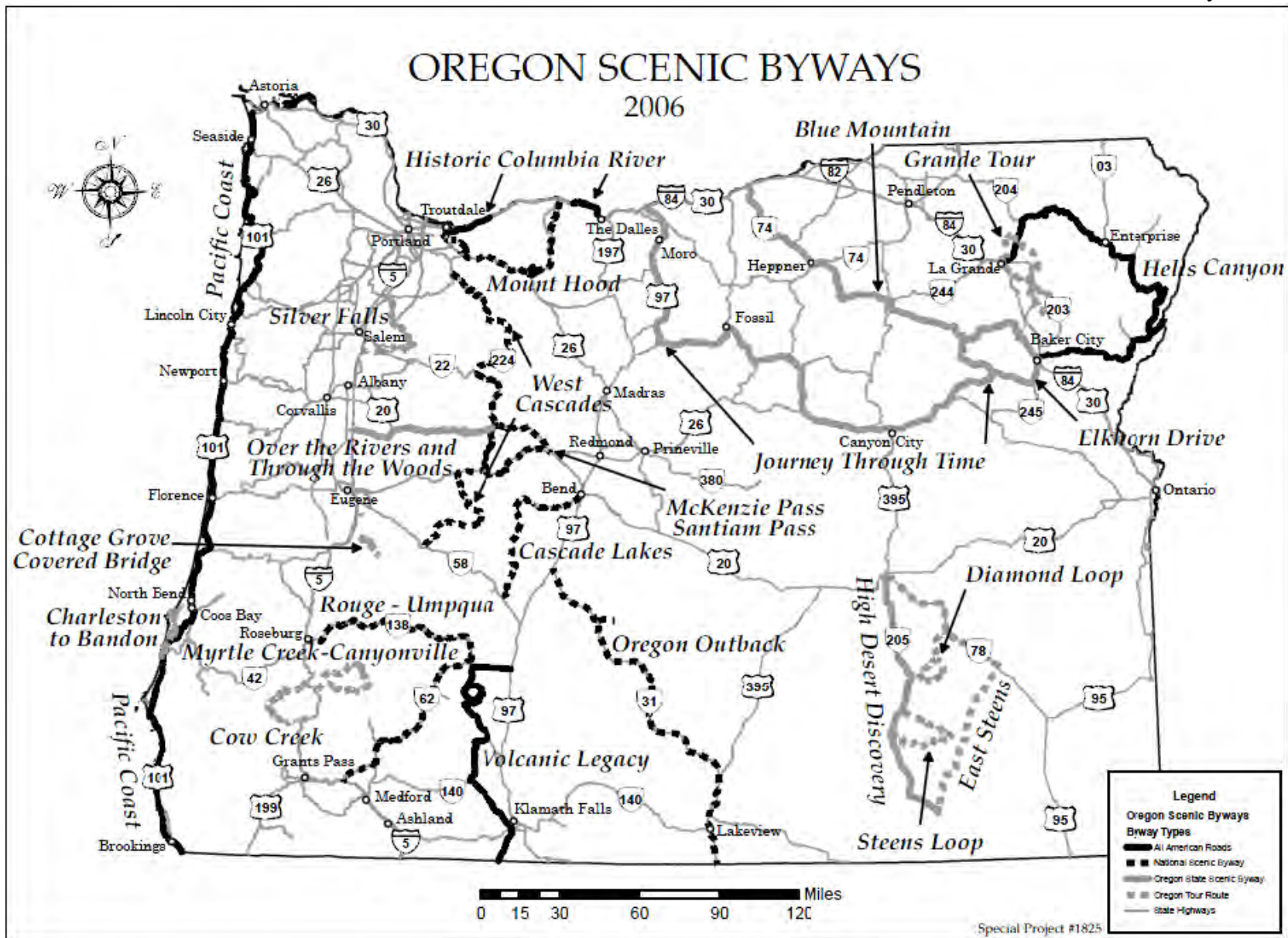


Figure 11: Designated Scenic Byways



***Action 1D.3***

Consider impacts to the scenic qualities of Scenic Byways when designing plans and projects.

***Action 1D.4***

Develop resource management plans and maps that describe ODOT's maintenance actions for roads which are designated Oregon Scenic Byways, including restricted activity zones, property to be used for disposal of slide debris and other material, and unsold state properties to be considered for ODOT retention. Identify scenic resources and existing vista opportunity locations on the maps. Include guidelines for maintenance activities where scenic resources are a factor. Ensure that ODOT highway maintenance activities are compatible with Scenic Byway management plans.

**LIFELINE ROUTES****Background**

Earthquakes, flooding, landslides, wild fires, and other natural and man-made disasters may destroy or block key access routes to emergency facilities and create episodic demand for highway routes into and out of a stricken area. ODOT's investment strategy should recognize the critical role that some highway facilities, particularly bridges, play in emergency response and evacuation. In some cases, the most cost-effective solution to maintaining security in these lifeline routes involves investment in roads or bridges owned by local jurisdictions. To the extent feasible, investments should be made without regard to roadway jurisdiction in order to provide the greatest degree of lifeline security for the available resources. ODOT will work with local governments to further define and map a network of lifeline routes. The lifeline network will focus on serving those communities which are particularly susceptible to isolation by virtue of their limited highway access.

**Policy 1E: Lifeline Routes**

It is the policy of the State of Oregon to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response and to support rapid economic recovery after a disaster.

***Action 1E.1***

Define the criteria for lifeline routes to respond to short and long-term needs and, working with local jurisdictions, agencies, and emergency service providers, designate the lifeline network for the State of Oregon.

# Washington State Scenic and Recreational Highways Strategic Plan



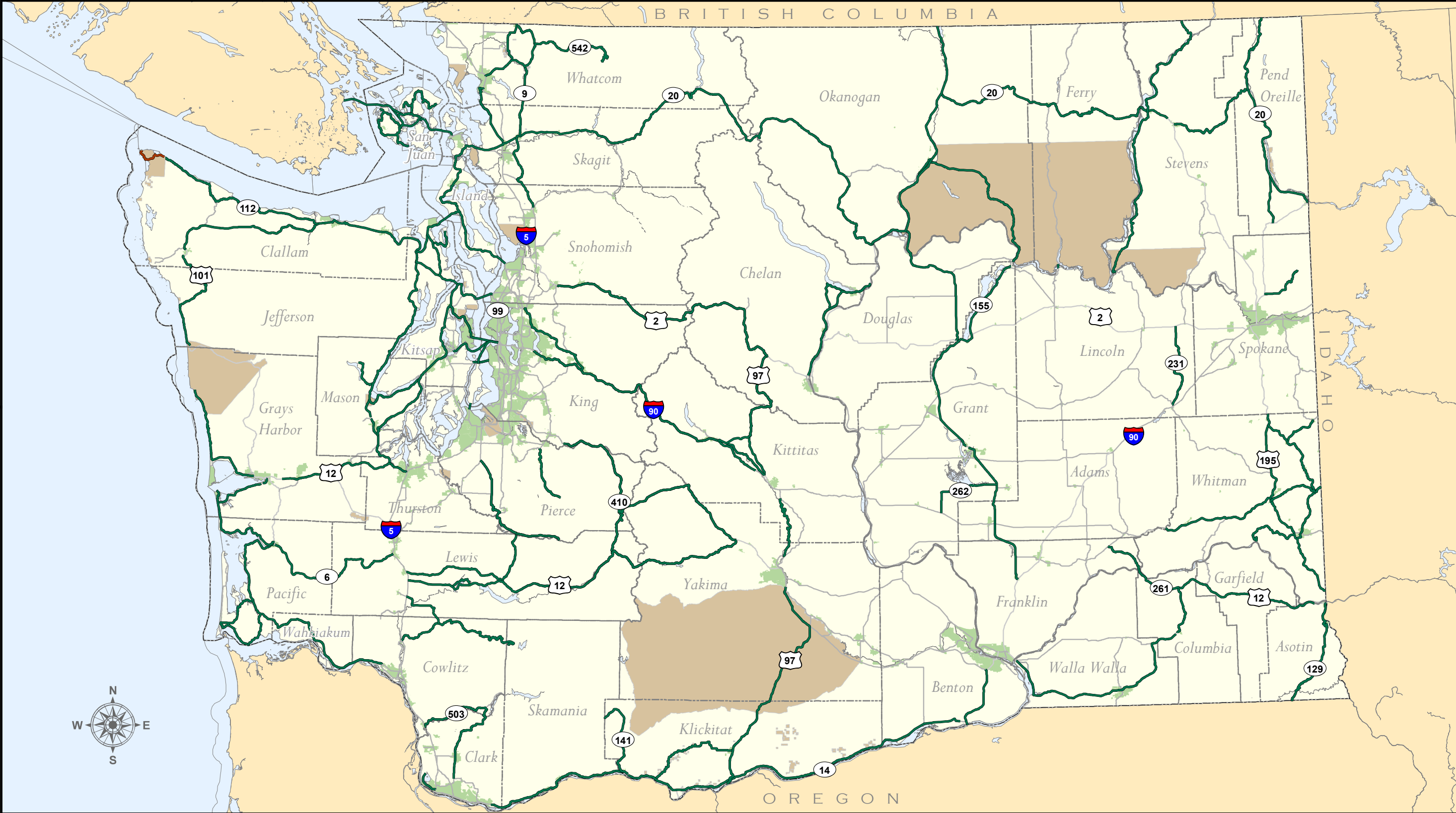
2010-2030



**Washington State  
Department of Transportation**

Highways and Local Programs Division

Figure 1. Washington State's Scenic and Recreational Highways



0 15 30 60 Miles



Washington State  
Department of Transportation



Tribal Lands\*



City Limits



Scenic and Recreational Highways (Per RCW 47.39 and 47.42)



Indian Tribe Byways (Not in state law)

Scenic and Recreational Highways  
Indian Tribe Byways

Source: Revised Code of Washington 47.39 and 47.42

\* Tribal lands data source: Census 2000, Federally Recognized American Indian Reservations and Trust Lands.

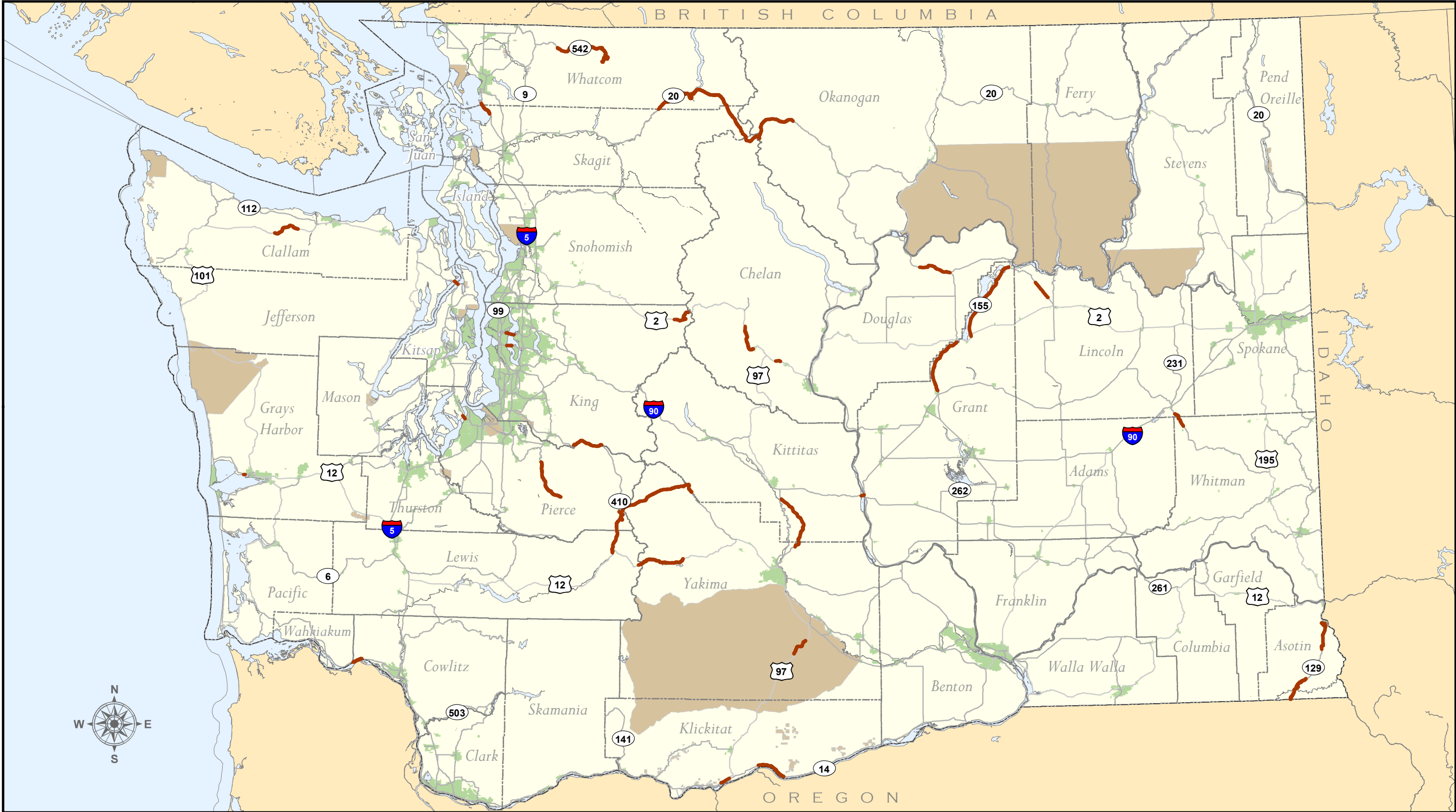


---

## APPENDIX A: LOCATIONS OF HIGHEST SCENIC VALUE AND HIGHEST POTENTIAL FOR PRESERVING AND PROTECTING RESOURCES – BENCHMARKS



Figure 3. Locations of Highest Scenic Value



0 15 30 60 Miles



Washington State  
Department of Transportation



Tribal Lands\*



City Limits



Locations of Highest Scenic Value

### Locations of Highest Scenic Value

As Identified through studies conducted by  
WSDOT between 1960 and 1990

\* Tribal lands data source: Census 2000, Federally Recognized  
American Indian Reservations and Trust Lands.

U.S. Department of the Interior  
Bureau of Land Management

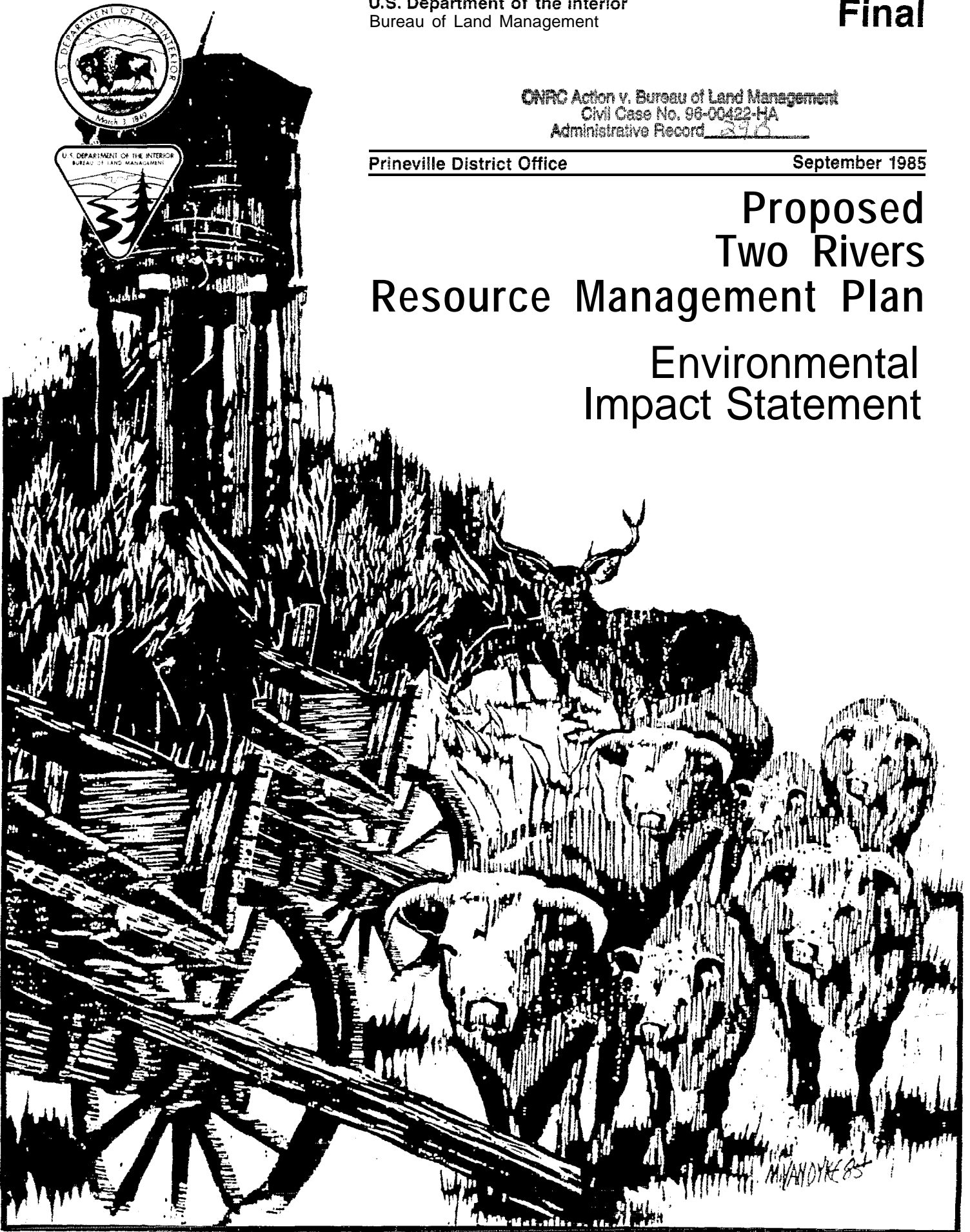
**Final**

CNRC Action v. Bureau of Land Management  
Civil Case No. 96-00422-HA  
Administrative Record 270

Prineville District Office

September 1985

# Proposed Two Rivers Resource Management Plan Environmental Impact Statement



## Historic Spanish Gulch Mining District

The 335 acre Spanish Gulch Mining District will be designated as an Area of Critical Environmental Concern to protect and maintain significant historical values.

This mining district is an important historic gold mining area dating back to the mid 1800s. Remnants of early mining activities include an old stamp mill, mineshafts and several old cabins.

## The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archaeological Site.

The unusual qualities of these sites will be maintained and protected, Intensive management plans, as well as public information and interpretive plans will be developed for these areas.

## Implementation

Designation of the five special management areas as areas of critical environmental concern with three areas being managed as either a research natural area, or an outstanding natural area will be completed upon filing of the record of decision and publication of the designation order in the Federal Register. Additional survey work will be initiated on Sutton Mountain and on the Sherars Bridge Road to determine if the areas meet the criteria for one of the above designations. Any areas which are nominated and found to meet the criteria for classification as an Area of Critical Environmental Concern in the future will receive interim protective management until formal designation occurs.

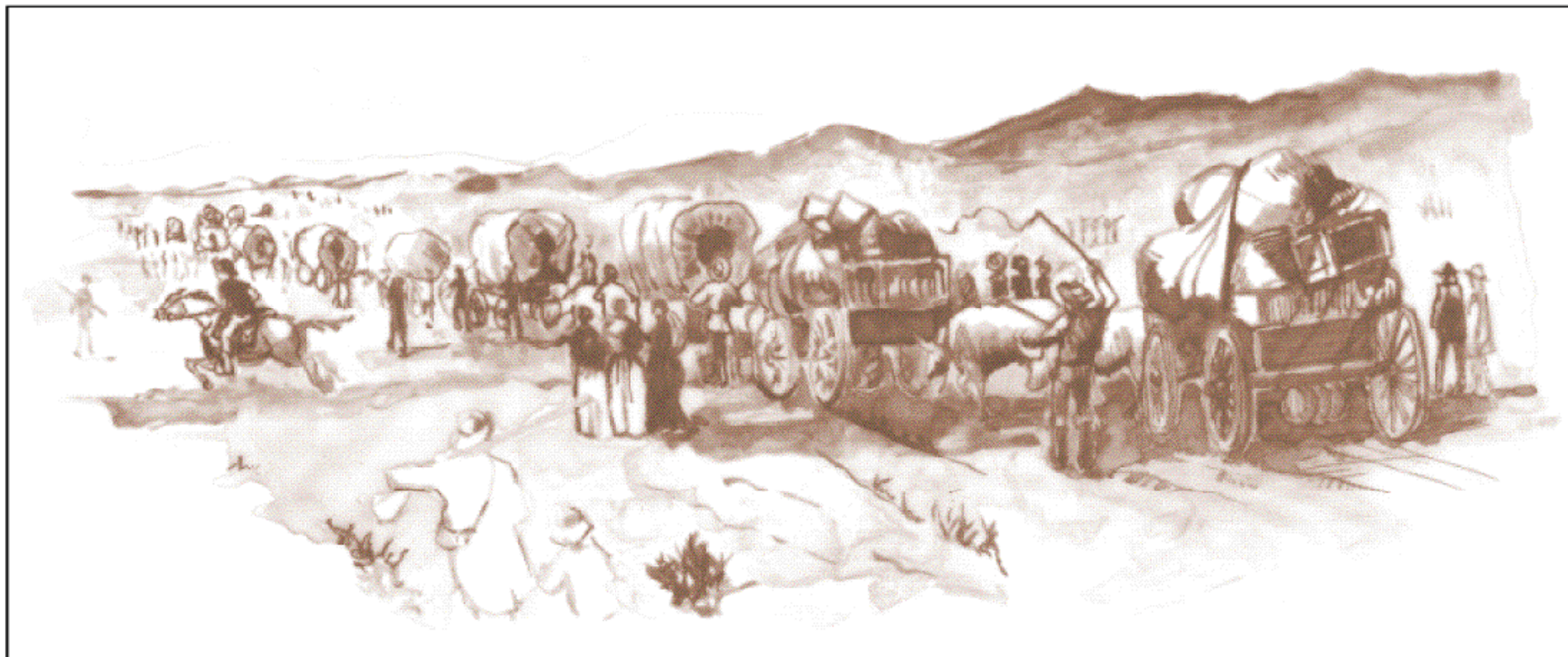


The Island in The Cove Palisades State Park



Comprehensive Management and Use Plan  
Final Environmental Impact Statement  
**California National Historic Trail**  
**Pony Express National Historic Trail**

Management and Use Plan Update  
Final Environmental Impact Statement  
**Oregon National Historic Trail**  
**Mormon Pioneer National Historic Trail**



OREGON • CALIFORNIA • MORMON PIONEER • PONY EXPRESS  
**NATIONAL HISTORIC TRAILS**

United States Department of the Interior • National Park Service

ownership jurisdiction. They include planning and developing trail segments or specific sites, site interpretation, site stabilization and protection, and managing visitor use.

In 1995 the National Park Service established the Long Distance Trails Office in Salt Lake City, Utah, to improve interstate and inter-regional coordination. This office is responsible for implementing this plan, but it does not manage trail resources. Specific responsibilities of the trails office include coordinating and supporting the protection of trail resources, marking and interpreting the trails, designating and marking an auto-tour route, and identifying and certifying high-potential sites.

The availability of the Draft Environmental Impact Statement for a 60-day public review was announced in the Federal Register on August 18, 1998. Close to 1,000 copies were sent out for review. Public meetings were held in late September and early October at nine locations throughout the West and were attended by approximately 180 people. Written comments were received from 32 federal, state, and local agencies, 1 Indian tribe, and about 105 organizations and individuals. This Comprehensive Management and Use Plan / Final Environmental Impact Statement has been revised in response to substantive comments on the draft document. Substantive comments, as defined by the Council on Environmental Quality, are those that (1) question the accuracy of information, (2) question the adequacy of the environmental analysis, (3) present reasonable alternatives to those presented in the plan, and (4) cause changes or revision in the proposal. In accordance with the National Environmental Policy Act, all written responses from public agencies are reprinted in this document. Substantive comments from individuals have been summarized and responded to in table 20.

This Comprehensive Management and Use Plan / Final Environmental Impact Statement

- describes the purpose and significance of each trail
- addresses the planning requirements outlined in section 5 of the National Trails System Act
- addresses issues and concerns related to resource protection
- addresses issues and concerns related to interpretation and visitor use
- establishes the long-term objectives for the administration of the four trails
- presents a proposed plan for the comprehensive administration of the trails, as well as a no-action alternative that would continue existing administrative programs
- assesses the impacts of implementing the proposed plan and the no-action alternative
- provides general maps of the national historic trails

The proposed plan provides a framework for federal, state, and local governments, as well as private organizations and individuals, to cooperatively maintain, protect, and manage the resources associated with the trails. In addition, this plan guides the development of an interpretive program and outlines a range of activities for visitor experience and use.

This document fulfills the legislative requirement for comprehensive management and use plans for the California and Pony Express National Historic Trails, and it updates earlier plans for the Oregon and the Mormon Pioneer National Historic Trails. These two plans were developed independently from each other and make no provision for the overlapping nature of these routes.

Only the 1,400-mile original wagon route that Brigham Young and the Pioneer Party followed in 1846–47, between Nauvoo, Illinois, and Salt Lake City, Utah, has been authorized by legislation as the Mormon Pioneer National Historic Trail. Only the primary route of the Oregon Trail has been authorized as a national historic trail. Only the routes and cutoffs identified in the National Park Service's 1987 Eligibility / Feasibility Study and Environmental Assessment for National Historic Trail Authorization have been authorized as the California and Pony Express National Historic Trails.

The Department of the Interior's Office of the Solicitor has established that additional routes and cutoffs determined to be directly associated with a national historic trail may be added through (1) a study to determine the feasibility and suitability of designating such routes as components of a national historic trail, and (2) subsequent congressional action amending the original act for a particular trail.

For the California and the Pony Express Trails, this plan identifies high-potential sites and segments as required by the National Trails System Act (see appendixes E and F and maps 2-6). According to the National Trails System Act, high-potential historic sites are

those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion.

#### High-potential route segments are

those segments of a trail which would afford a high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route.

Historic sites and segments associated with the trails, either listed on or determined eligible for listing on the National Register of Historic

Places, are included in the list of high-potential sites. Other historic resources that may be worthy of management consideration may in the future be considered for inclusion among the list of high-potential sites and segments if research confirms their significance and integrity.

Updates of the list of high-potential sites and segments for the Oregon and the Mormon Pioneer National Historic Trails are included (see appendixes G-H, I-J, and maps 7-11).

Federally owned sites and segments of these trails are considered federal protection components and should receive special attention by managing agencies to enhance their trail-related values.

Many high-potential resources are not under federal jurisdiction. In those cases the National Trails System Act (sec 3 (a) (3)) authorizes a procedure whereby landowners can have their historic sites certified as components of a national historic trail (see appendix K for a more detailed description of the certification procedure).

## Legislative Authority

The Oregon and the Mormon Pioneer Trails were authorized as national historic trails by Congress in 1978 (see National Trails System Act, sections 5 (a) (3) and (4), respectively). In 1992 Congress established the California and Pony Express National Historic Trails (see National Trails System Act sec. 5 (a) (18) and (19), respectively). The 1992 legislation amending the National Trails System Act directs the secretary of the interior to

provide for the development and maintenance of [these] trails within federally administered areas.

The legislation also directs the secretary to

cooperate with and encourage those states through which the trails pass to operate, develop, and maintain any portions of these trails which are located outside the boundaries of federally administered areas.

The National Trails System Act also authorizes the secretary of the interior to enter into cooperative agreements with states, local governments, landowners, and private organizations or individuals to help operate, develop, and maintain trail portions outside federal jurisdiction. These cooperative agreements can include provisions for limited financial or technical assistance to encourage participation in trail management activities. Cooperative agreements can also secure volunteer assistance for the protection and management of the trails and their related resources.

# APPENDIX H. OREGON NATIONAL HISTORIC TRAIL—HIGH-POTENTIAL SITES

NO	SITE NAME	COUNTY	STATE	QUAD 1:100,000	DESCRIPTION	NATIONAL REGISTER STATUS	OWNERSHIP	THREATS TO RESOURCES/ VISITOR SERVICES
1	Upper Independence Landing (Wayne City)	Jackson	MO	Kansas City	Wayne City, a "paper city" on the south bank of the Missouri River about 3.5 miles north of Independence Courthouse Square, was the closest Missouri River landing to the town of Independence, but the climb up the bluffs was steep and tortuous. It rivaled the landing at Blue Mills during the 1830s and 1840s and that at Westport from the 1840s through the 1850s. It was very popular until the flood of 1844 washed away the landing.	Not listed	Private	Modern developments have altered the historic scene, and flooding has changed the landing dramatically. A small overlook at the north end of Cement City Road is fenced, but it needs additional interpretation.
2	Independence Courthouse Square Complex	Jackson	MO	Kansas City	The location of frenzied outfitting activity throughout the 1840s and early 1850s, Independence was the jumping-off point for the Santa Fe and Oregon trails. The town includes several historic buildings, monuments, and Independence Spring. As the place of convergence of early routes from the Mississippi Valley, this square was the last significant point of supply until the mid-1840s, when Westport also became an outfitting town. When J. Quinn Thornton visited Independence in 1846, he found "a great Babel of African slaves, indolent dark-skinned Spaniards, profane and dust-laden bullwhackers going to and from Santa Fe with their immense wagons, and emigrant families bound for the Pacific, all cheerful and intent on their embarkation upon the great prairie wilderness."	Several structures are listed	Public (City of Independence)	Modern development may alter the historic scene.
3	Santa Fe Trail Park Ruts	Jackson	MO	Kansas City	The Oregon Trail/Independence Road is visible as a swale south of this Independence city park, near Santa Fe Road and 29 <sup>th</sup> Street. There are intermittent swales and traces in an undeveloped field owned by the RLDS Church, up through a couple of backyards to the southwest, and ending on the east side of 3122 Santa Fe Road.	Listed	Public	Future development may impact the historic scene. The site needs additional interpretation.
4	Eighty-fifth Street Ruts	Jackson	MO	Olathe	A preserved trail swale, rare in this urban setting, can be found in a grassed lot at Eighty-fifth and Manchester, heading southwest. This alignment is the only one of up to three alternates in the area that has traces remaining.	Not listed	Private	Some interpretation may be possible with the owners' consent.
5	Heart (Hart) Grove Campground	Jackson	MO	Olathe	Both Oregon and California-bound emigrants traveling the Independence Road used this campground on Heart Grove Creek, a tributary of the Big Blue River. Many 1846 emigrants camped here, including the families of George and Jacob Donner and James Frazier Reed. Hiram O. Miller, traveling with the Donner-Reed Party, made this brief journal entry in 1846: "May 14 15 Camped at 'Heart Grove' Jackson County near the Indian line twenty two miles from Independence on the Big Blue."	Not listed	Private	The area has been severely impacted and there are no extent remains of the campsite or trail. Some interpretation should be done on the site.
6	Minor Park/Red Bridge Crossing of the Big Blue River	Jackson	MO	Olathe	This 27-acre park in a beautiful setting and landscape has both recreational and historic overtones. Its prominent feature is a gentle swale that cuts across the park, obviously created by wet wagons and teams pulling up the hill after crossing the Big Blue River. Emigrants heading west from Independence encountered their first river crossing at this site, a preview of the many rivers and streams to be negotiated on their long journey. On May 8, 1846, Virgil Pringle "Went 12 miles to the Blue and encamped, it being too high to cross. Another wagon capsized at the encampment. . . . No injury to persons or property." The next day his party "Crossed the Blue soon in the morning." The crossing was initially a ford; Red Bridge was constructed in 1859.	Listed	Public (Kansas City Parks and Recreation)	The ruts and swales need to be interpreted.

NO	SITE NAME	COUNTY	STATE	QUAD 1:100,000	DESCRIPTION	NATIONAL REGISTER STATUS	OWNERSHIP	THREATS TO RESOURCES/ VISITOR SERVICES
114	Well Spring	Morrow	OR	Hemiston	Well Spring, an important emigrant campsite and water source, made travel possible for weary emigrants and their worn-out teams across this dry stretch of the Columbia Plateau. Most emigrants left the Umatilla River, crossed Butter Creek, and pressed on to camp at Well Spring. The spring was always a meager source of water, but it was a crucial oasis, since this portion of the trail was usually traveled in late August or early September when the intermittent streams were normally dry. Riley Root made the journey from Butter Creek on August 24, 1848, and camped at Well Spring: "18 . miles, over a poor tract of the Columbia River valley, to camp, at the foot of a hill, by a spring, calld Well spring, rising in the center of a large mound of decayd vegetation, and sinking suddenly again, within a few feet of where it issues. . . . No grass nor water exists along this day's route, where emigrants might refresh themselves and their weary teams. . . . The spring at camp should be watched during the night by a strong guard, to keep thirsty cattle from falling into it, out of which they cannot extricate themselves." The spring has been seriously impacted over the years and is now virtually dry. Remains of a stage station, a graveyard which dates from the emigration era, and trail ruts can be found nearby.	Listed	Public (DOD)	Support of the U.S. Navy is needed to complete the development of Well Spring. Several wayside exhibits have been erected near the spring.
115	Fourmile Canyon	Gilliam	OR	Goldendale	After the Oregon Trail passed the desert-like range near Well Spring, it entered more rolling range country, transected by numerous small canyons. Over a mile of deep ruts can be found at a BLM interpretive site where the trail crossed Fourmile Canyon. Emigrants pressed on as rapidly as possible across this country because of dwindling supplies and their concern that winter would soon be upon them. Lydia A. Rudd struggled across Fourmile Canyon on September 23, 1852: "Continued our tedious journey . . . encamped on the hills wood plenty a little dry grass but no water ice nearly an inch thick this morning Mount Hood a peak of the Cascades loomed in the [sky] covered with snow Henry and myself are just able to move and that is all."	Not listed	Public (BLM)/ Private	Vandalism is a problem. Ruts on private land should be marked and preserved.
116	John Day River Crossing	Gilliam, Sherman	OR	Goldendale	After three days of sand, rock, blustery winds, and shortages of wood and water while crossing the Columbia Plateau, emigrants were relieved to arrive at the John Day River. This was the first of several major rivers flowing north toward the Columbia that would have to be crossed, but the McDonald ford provided an easy crossing. The river is normally only 8-12 inches deep during late summer, and the ford has a smooth, pebbly bottom. Esther Belle McMillan Hanna arrived at McDonald Ford on September 1, 1852: We had a very steep hill to descend in coming to it [John Day River]. We all rejoiced to see water once more as our poor beasts had had none since yesterday noon. We have encamped on the river bottom, which is large and very level. Will remain here until tomorrow to rest out cattle and ourselves and conclude on the route we will take." After ascending the west side of the canyon—"one of the most difficult hills we have met on the whole journey across the plains"—emigrants could take the right fork of the trail to go to the Dalles, or, after 1848, they could take the left fork and follow a cutoff to the Barlow Road.	Not listed	Public (BLM)/ Private	None known.