

Exhibit P

Fish and Wildlife Habitats and Species

**Sunstone Solar Project
June 2023**

Prepared for



GETTING SOLAR DONE.

Sunstone Solar, LLC

Prepared by



TETRA TECH

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Acronyms and Abbreviations

APLIC	Avian Power Line Interaction Committee
Applicant	Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC
BGEPA	Bald and Golden Eagle Protection Act
Facility	Sunstone Solar Project
GIS	geographic information system
GPS	Global Positioning System
MW	megawatt
NLCD	National Land Cover Database
O&M	operations and maintenance
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAGS	Washington ground squirrel

1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a photovoltaic solar energy generation facility and related or supporting facilities in Morrow County, Oregon. This Exhibit P was prepared to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-001-0010(1)(p) and provides information about the fish and wildlife habitats and species that could be affected by the Facility, other than the species addressed in Exhibit Q.

2.0 Analysis Area

In accordance with OAR 345-001-0010(35)(c) and as stated in the September 2022 Project Order, the analysis area for fish and wildlife habitat and species consists of the site boundary and the area within 0.5 mile from the site boundary. The site boundary is defined in detail in Exhibits B and C. The Fish and Wildlife Habitat Analysis Area is shown on Figure P-1.

3.0 Agency Consultation

The Applicant has consulted with the Oregon Department of Fish and Wildlife (ODFW) regarding the appropriate protocols for documenting the presence of state sensitive species as required in OAR 345-021-0010(1)(p)(D) and the classification of fish and wildlife habitat as required in OAR 345-021-0010(1)(p)(B). A summary of this consultation process is provided below.

- A meeting was held between the Applicant, Tetra Tech, Inc. (Tetra Tech), and ODFW to introduce the Facility and discuss the planned 2022 biological surveys and any concerns ODFW may have about the Facility.
 - Pine Gate Renewables described the anticipated permitting schedule, including the anticipated Notice of Intent and preliminary Application for Site Certificate submittal dates.
 - Tetra Tech described the biological surveys planned for spring and summer 2022 in order to meet the permitting schedule, including the following survey types, extents, and timing:
 - Washington Ground Squirrel (*Urocitellus washingtoni*; WAGS; 1,000-foot buffer on suitable habitat within the site boundary): April-May 2022
 - Habitat Categorization (0.5-mile buffer on the site boundary): April-June 2022
 - General Wildlife (up to 0.5 mile from the site boundary): April-June 2022

- Raptor Nest (0.5-mile buffer on the site boundary): May 2022
 - Botanical Surveys (site boundary): June-July 2022
 - Wetlands and Waters (site boundary): March 2022 (already completed)
- ODFW concurred with the proposed survey approach, including the proposed timing and extent of surveys. ODFW noted that the Facility was well sited from a wildlife perspective.
- ODFW noted that Sand Hollow, which runs north-south through the Facility, has the highest potential for WAGS, and that few other areas, if any, would be likely to support the species.
- ODFW concurred with the ground-based raptor nest survey approach, noting that there were not many nesting structures in the area.
- A meeting was held between the Applicant, Tetra Tech, the Oregon Department of Energy and ODFW on March 23, 2023, to discuss the 2022 survey reports and potential mitigation options for the Facility.
 - Tetra Tech provided ODFW with the 2022 Wildlife Survey Report and the 2022 Habitat Categorization and Rare Plant Survey Report in advance of the meeting. ODFW concurred with the report findings and provided the following clarifications:
 - The 0.25-mile raptor nest disturbance buffer provided in ODFW's comments on the Notice of Intent was intended to apply to state sensitive raptor species, including ferruginous hawks (*Buteo regalis*), Swainson's hawks (*Buteo swainsoni*), and Western burrowing owls (*Athene cunicularia hypugaea*), if found, as well as eagles. This buffer does not need to be applied to raptor nests belonging to species that are not state sensitive (e.g., red-tailed hawks [*Buteo jamaicensis*] and great horned owls [*Bubo virginianus*]) because these species are generally more tolerant of disturbance. Structures containing any active raptor nests, however, should not be removed during the nesting season.
 - WAGS surveys are valid for 3 years so if construction begins within 3 years of surveys only the locations of known colonies need to be surveyed, to determine the current boundary to inform construction avoidance. For example, because no WAGS colonies were found during surveys at the Facility, no additional surveys would be needed if construction were to commence prior to May 2025.
 - Category 4 scrub-shrub wetlands should be added as a habitat category and subtype option for habitat categorization surveys.
 - ODFW noted that they do not currently have details on potential options to mitigate for impacts to habitat from the Facility but will work to identify options and follow-

up with the Applicant and Tetra Tech on alternatives to the typical process of acquiring a conservation easement given the relatively small anticipated mitigation need for the Facility. Taking a novel approach, such as contributing to the conservation of an existing wildlife area, would avoid creating a “postage stamp” style conservation easement, which typically have limited value to wildlife due to the small size and isolated location.

4.0 Description of Biological and Botanical Surveys Performed

OAR 345-021-0010(1)(p) 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. The applicant must include:

(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;

This section describes the biological and botanical surveys conducted in support of this exhibit as required under OAR 345-021-0010(1)(p)(A), including the timing and scope of each survey (Table P-1). The survey reports conducted in support of this Exhibit P can be found in Attachment P-1.

The Applicant conducted several biological and botanical surveys within the analysis area (site boundary plus a 0.5-mile buffer), which included an initial desktop review, followed by field surveys conducted between March and June of 2022.

4.1 Desktop and Information Review

Prior to conducting surveys in 2022, the Applicant conducted a desktop review to identify special status wildlife and plant species, as well as wetlands, with the potential to occur at the Facility. Species initially reviewed included federal and state endangered, threatened, proposed, and candidate species; species of concern; birds of conservation concern; state sensitive and sensitive-critical species; and Oregon Conservation Strategy species. The Applicant also reviewed aerial imagery and compiled habitat information, land use classification, and locations of fish and wildlife habitat conservation areas to determine suitability for special status species with the potential to occur in the Facility vicinity. Wetlands and waters desktop information was also reviewed to determine habitat potential for special status species within the analysis area. Aerial photography and topographic maps were also reviewed to assess existing habitat. In addition to reviewing publicly available sources, the Applicant submitted a request to the Oregon Biodiversity Information Center (ORBIC) to obtain site-specific records of special status species occurrences and sensitive habitats within 2 miles of the Facility (ORBIC 2021).

The desktop review included review of the following information sources:

- Ecoregional Gap Analysis of the Northwestern United States (Aycrigg et al. 2013);

- Google Earth Pro – Sunstone Solar Exhibit P Analysis Area (Google Earth Pro 2022);
- National Land Cover Database (NLCD; Dewitz 2019);
- Natural Resources Conservation Service geographic information systems (GIS) soil data (NRCS 2006);
- ODFW sensitive species list (ODFW 2021a);
- ORBIC database of known occurrences of rare plant and animal species within the vicinity of the site boundary (ORBIC 2021);
- ORBIC’s list of Oregon’s rare, threatened, and endangered species (ORBIC 2019);
- Oregon Conservation Strategy (OCS 2016);
- Oregon Department of Agriculture, Noxious Weed Policy and Classification System (ODA 2020);
- Oregon Department of Agriculture, Oregon Threatened, Endangered, and Candidate Plants (ODA 2022);
- Oregon Flora Mapping Tool (Oregon Flora 2023a);
- Oregon Flora Rare Plant Fact Sheets (Oregon Flora 2023b);
- Oregon Wildlife Explorer (Wildlife Explorer 2022);
- StreamNet fish distribution (StreamNet 2023);
- Threatened, endangered, and candidate fish and wildlife species in Oregon (ODFW 2021b);
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (USFWS 2022a);
- USFWS listed, proposed, candidate, delisted species, and species of concern in Oregon (USFWS 2022b);
- USFWS Information for Planning and Consultation (IPaC) for Morrow County, Oregon (USFWS 2023);
- USFWS Oregon Golden Eagle Nest Locations (Leal 2020);
- U.S. Geological Survey (USGS) National Hydrography Dataset (USGS 2018);
- USGS Gap Analysis Project (USGS 2011);
- University of Washington Herbarium and Image Collection (Burke Museum of Natural History and Culture 2022); and
- *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O’Neil 2001).

4.2 Field Surveys

Table P-1 provides a summary of biological and botanical field surveys conducted at the Facility in 2022 within the analysis area and site boundary (Figure P-1). The survey reports are included in Attachment P-1, except for the wetlands and waters survey report, which is included in Exhibit J, Attachment J-1.

Table P-1. Summary of Field Surveys Conducted at the Facility in 2022

Survey	Survey Timing	Reference	Extent
Habitat categorization surveys	Mid-June	Attachment P-1	Analysis area (where accessible)
Special status plant species surveys			Site boundary (where accessible)
Special status wildlife species surveys	April-June		Analysis area (where accessible)
Washington ground squirrel surveys	April-May		Site boundary plus 1,000-foot buffer in suitable Washington ground squirrel habitat (where accessible), and not separated from proposed ground disturbance by a habitat barrier.
Raptor nest surveys	Early May		Analysis area (where accessible)
Wetlands and waters surveys	Mid-March	Exhibit J, Attachment J-1	Site boundary (where accessible)

4.2.1 Habitat Categorization Surveys

The Applicant conducted habitat categorization field surveys for the Facility on June 20 and 21, 2022, within the entire analysis area where accessible, using the habitat categories set forth by the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025). Habitat types and categories were assigned to areas of no access by viewing from outside the property boundary. Additionally, special status plant species surveys, which focused survey efforts within the site boundary, were conducted concurrently with habitat categorization surveys (Attachment P-1).

Habitat boundaries were digitized in the field using Global Positioning System (GPS)-enabled tablets, and information on habitat such as dominant vegetation, existing disturbance, and any sensitive species or habitat features observed were collected. In the field, the Applicant delineated areas of relatively homogenous vegetation and characterized the composition and structure of habitat, with a minimum mapping unit of 1 acre. Each delineated vegetation polygon was assigned a habitat type, subtype, and habitat quality category guided by the habitat categorization table (see Attachment P-1 and Section 5.2). Habitat types and subtypes defined in the habitat categorization table were adapted from Johnson and O'Neil (2001) and habitat category descriptions were developed based on ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025). Data characterizing a particular habitat type and quality represented the average condition of all such polygons.

4.2.2 Special Status Plant Species Surveys

Concurrent with habitat categorization surveys in June 2022, the Applicant recorded all special status plant species within the site boundary using the Intuitive Controlled survey method, a standard and commonly accepted protocol (USFS and BLM 1998; Attachment P-1). This method

incorporates survey lines that traverse the survey area, and target the full array of major vegetation types, aspects, topographical features, habitats, and substrate types. While en route, the surveyors search for target species, and when the surveyors arrive at an area of high potential habitat (that was defined in the desktop review or encountered during the field visit), they conduct a complete survey for the target species. Surveys included an examination of all potential habitat in the site boundary.

During surveys, a list of common vascular plant species encountered was maintained (Attachment P-1) and informal collections of unknown species for later identification were made. Identification was verified by the use of appropriate plant keys; in particular, *Flora of the Pacific Northwest* (Hitchcock and Cronquist 2018).

4.2.3 Special Status Wildlife Species Surveys

Concurrently with WAGS surveys and raptor nest surveys in April and May of 2022 (described below) and habitat categorization and rare plant surveys in June 2022 (described above), the Applicant documented general wildlife and special status wildlife species use of the analysis area. Biologists documented the location, behavior, number of individuals, and pertinent notes of special status wildlife species observed during WAGS surveys in April and May, and also kept a running list of all wildlife species observed. During raptor nest surveys in May 2022 and habitat categorization and rare plant surveys in June 2022, biologists also kept a running list of wildlife species observed, including special status species. Wildlife surveys targeted special status species that had the potential to occur in the analysis area, including federal and state endangered, threatened, proposed, and candidate species; species of concern; birds of conservation concern; state sensitive and sensitive-critical species and Oregon Conservation Strategy species (Attachment P-1).

4.2.3.1 Washington Ground Squirrels

Special status wildlife species survey methods were designed specifically to verify the presence or absence of WAGS. The surveys generally followed methodology developed in the *Status and Habitat Use of the WAGS on State of Oregon Lands, South Boeing, Oregon* (Morgan and Nugent 1999), as addressed in Exhibit Q. Areas previously identified as Category 6 habitat were field verified for both habitat type and boundary, as these areas are considered unsuitable habitat for WAGS. All areas of Category 2-5 habitat were surveyed per the WAGS protocol, limited to the site boundary plus a 1,000-foot buffer (WAGS Survey Area). If an area of previously identified Category 6 habitat had become potentially suitable habitat, biologists surveyed these areas as necessary for WAGS and special status wildlife species.

The WAGS survey protocol requires two phases of surveys to increase the likelihood of detecting their presence. The Applicant completed the first survey phase on April 3, 6, 7 and 15, 2022, and the second on May 3, 4, 5, and 6, 2022. The timing of these surveys also coincided with the period of highest biological activity of neotropical migrant and breeding birds, foraging and breeding animal species, and other taxa.

4.2.4 Raptor Nest Surveys

The Applicant conducted a ground-based raptor nest survey concurrently with and following the early May 2022 second phase of WAGS surveys, to document active and inactive raptor nests within the site boundary plus a 0.5-mile buffer (Attachment P-1). The survey was performed when most raptors in the region are engaged in mid-breeding season reproductive activities (e.g., egg-laying and incubation behaviors), and as most deciduous trees had begun to leaf out. The biologist systematically searched raptor nest habitat by vehicle and on foot. To determine the status of a nest, the biologist made observations on the behavior of adults, presence of young, signs of nest building, or whitewash. If a nest was found, the biologist documented the location using a GPS-enabled tablet and collected data on an electronic data form detailing the nest status, size class, condition, substrate, height, exposure, as well as the nesting species and number of eggs or young observed during surveys.

Raptor nests were also documented incidentally during the first phase of WAGS surveys in April 2022 and habitat categorization and rare plant surveys in June 2022. Surveys in June focused on incidentally documenting activity at nests previously mapped during the May raptor nest survey as inactive but showing potential signs of nest building as well as nests documented as in-use by Swainson's hawks during the May raptor nest survey.

4.2.5 Wetlands and Waters Surveys

The Applicant conducted wetlands and waters surveys within the site boundary on March 21 and 22, 2022 (Exhibit J, Attachment J-1). The Applicant determined wetland presence per the methods in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). Data collected during wetlands and waters surveys informed habitat categorization and the determination of state sensitive species presence described in this exhibit.

5.0 Identification and Description of Habitat

OAR 345-021-0010(1)(p)(B) Identification of all fish and wildlife habitat in the analysis area, classified by the general fish and wildlife habitat categories as set forth in OAR 635-415-0025 and the sage-grouse specific habitats described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025 (core, low density, and general habitats), 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;

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

5.1 ODFW Habitat Categorization

The ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025) provides a framework for assigning one of six categories to habitats based on the relative importance of these habitats to fish and wildlife species. The ODFW definition of each habitat category is shown in Table P-2.

Table P-2. ODFW Habitat Categorization Definitions

ODFW Habitat Category	Definition
1	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.
2	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.
3	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.
4	Important habitat for fish and wildlife species.
5	Habitat for fish and wildlife having high potential to become either essential or important habitat.
6	Habitat that has low potential to become essential or important habitat for fish and wildlife.
Source: OAR 635-415-0025.	

Section 5.2 contains descriptions of all habitat types and subtypes delineated at the Facility by habitat category. Acreage calculations for habitat types and categories are shown in Section 5.3.

5.2 Description of Fish and Wildlife Habitat in the Analysis Area

Habitat types for the Facility were adapted from *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001), modified based on aerial photography, pre-survey desktop review, and surveyor knowledge of the area to reflect Facility conditions. Table P-3 describes habitat categories, types and subtypes found within the analysis area, including the vegetation and other characteristics of each habitat subtype and category (Figure P-2). During field surveys, the Applicant identified habitat that met the definitions for Category 2, 3, 4, 5, and 6 habitats (Attachment P-1). No Category 1 habitat was found within the analysis area.

Table P-3. Description of Habitat Types and Subtypes by Category within the Analysis Area

Habitat Type	Habitat Subtype	Category 2	Category 3	Category 4	Category 5	Category 6
Open Water – Lakes, Rivers, Streams	Perennial Streams Mapped by USGS having permanent (year-round) flow	<i>Fish-bearing natural stream channels that support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provides good spawning (gravel beds present, non-embedded) and/or rearing habitat, with native emergent, shrub, or forested riparian margins.</i>	<i>Fish-bearing natural stream channels that do not support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provide marginal spawning (gravel present in pockets/30% embedded) and/or rearing habitat; or non-fish-bearing natural stream channels which drain into fish-bearing streams based on StreamNet data.</i>	Non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams.	N/A	N/A
	Intermittent or Ephemeral Streams Mapped by USGS as intermittent	<i>Fish-bearing natural stream channels that support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provides good spawning (gravel beds present, non-embedded) and/or rearing habitat, with native emergent, shrub, or forested riparian margins.</i>	<i>Fish-bearing natural stream channels that do not support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provide marginal spawning (gravel present in pockets/30% embedded) and/or rearing habitat; or non-fish-bearing natural stream channels which drain into fish-bearing streams based on StreamNet data.</i>	Non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams.	Non-fish-bearing ephemeral streams or excavated channels with high restoration potential; not important habitat.	N/A
Wetlands	Emergent Wetlands Emergent wetlands with herbaceous vegetation	<i>High quality habitat, dominated by native species</i>	<i>Mixture of native and non-native plant species and low to moderate disturbance</i>	Mixture of native and non-native plant species and moderate to high disturbance	<i>Farmed or previously filled wetlands; highly disturbed, dominated by non-native plant species.</i>	N/A
	Scrub-shrub Wetlands Wetlands with woody vegetation less than 20 feet tall	<i>High quality habitat, dominated by native plant species;</i>	<i>Mixture of native and non-native plant species and low to moderate disturbance</i>	<i>Mixture of native and non-native plant species and moderate to high disturbance</i>	Farmed or previously filled wetlands; highly disturbed, dominated by non-native plant species.	N/A
Upland Grassland, Shrub-steppe, and Shrubland	Eastside Grasslands Grassland areas with few shrubs (not irrigated or cultivated/planted)	Undisturbed habitat dominated by native species (i.e., greater than 75% ground cover is native), or moderately disturbed habitat (i.e., between 50 to 75% ground cover is native) that contains a sagebrush component	<i>Moderately disturbed habitat with a mix of natives and non-natives (i.e., between 50 to 75% ground cover is native), or highly disturbed habitat (i.e., between 15 to 50% ground cover is native) that contains a sagebrush component</i>	Highly disturbed habitat with a high percentage of non-native plant species (i.e., between 15 to 50% ground cover is native), or very highly disturbed habitats (i.e., less than 15% ground cover is native) that contain a sagebrush component	Very highly disturbed habitats with a high percentage of non-native plant species (i.e., less than 15% ground cover is native), but which <u>do not</u> contain a sagebrush component	N/A
	Sagebrush Shrub-Steppe Grassland and shrubland mosaic, containing a sagebrush component	<i>High degree of cover; contains native shrubs, sagebrush and native grasses; good structure/forage for wildlife. Understory dominated by native species. More diversity than Category 3 habitat.</i>	Habitat with sagebrush that is limited within the area (e.g., relatively undisturbed habitat); high degree of cover; moderate cover by weeds, moderate structure/forage for wildlife.	<i>Important wildlife habitat that contains sagebrush and is moderately to heavily degraded and weedy habitat.</i>	<i>Very low quality dominated by non-native species but with a sagebrush component; with high restoration potential.</i>	N/A
Agriculture, Pasture, and Mixed Environs	Orchards, Vineyards, Wheat Fields, Other Row Crops	N/A	N/A	N/A	N/A	Active agricultural areas with low potential for restoration.
Urban and Mixed Environs		N/A	N/A	N/A	N/A	All developed areas.
Note: Italicized text describes habitat types and categories not found within the analysis area but presented for comparative purposes. No Category 1 habitat occurs within the analysis area.						

5.3 Quantity of Habitat Categories, Types and Subtypes within the Analysis Area

Table P-4 shows the acreages within the analysis area of each habitat type and subtype and assigned habitat category. The location of each habitat type, subtype, and category within the analysis area are shown on Figure P-2, as directed by OAR 345-021-0010(1)(p)(C). Presence of a particular habitat category within the analysis area does not indicate that this habitat will necessarily be impacted by the Facility. Table P-7 in Section 8.1 presents the areas of permanent disturbance and temporary disturbance (in acres) in each habitat category, and habitat subtype are presented in Section 8.1 with the discussion on potential impacts to fish and wildlife habitat.

Table P-4. Acres of Habitat Categories, Types and Subtypes within the Analysis Area

Habitat Type	Habitat Subtype	Acres within Analysis Area ¹					Total Acres within Analysis Area ¹
		Category 2	Category 3	Category 4	Category 5	Category 6	
Open Water - Lakes, Rivers, Streams	Intermittent or Ephemeral Streams	-	-	27.3	0.4	-	27.7
	Perennial Streams	-	-	0.4	-	-	0.4
Wetlands	Emergent Wetlands	-	-	1.5	-	-	1.5
	Scrub-shrub Wetlands	-	-	-	0.6	-	0.6
Upland Grassland, Shrub-steppe and Shrubland	Eastside Grasslands	93.4	-	338.9	687.1	-	1,119.4
	Sagebrush Shrub-steppe	-	373.8	-	-	-	373.8
Agriculture, Pasture and Mixed Environs	Orchards, Vineyards, Wheat Fields, Other Row Crops	-	-	-	-	18,028.8	18,028.8
Urban Mixed Environs	N/A	-	-	-	-	243.2	243.2
Totals		93.4	373.8	368.1	688.1	18,272.0	19,795.5
Note: Numbers may not sum correctly due to rounding. "-" means no acres are present within the analysis area. These values differ slightly from the values presented in Attachment P-1 because the survey report values were calculated using World Geodetic System 1984 (WGS84) Universal Transverse Mercator (UTM) Zone 10 projection while the Exhibit P (and ASC) values used the Albers Equal Area projection. 1. Acres represent area within the analysis area not impact areas. Impacts are discussed in Section 8.							

6.0 Identification of State 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 (ODFW) 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;

6.1 Identification of State Sensitive Species

Based on the desktop analysis and field surveys (Section 4.0), 16 state sensitive species and 2 eagle species have potential to occur in the analysis area (Table P-5). State endangered, threatened, and candidate species are addressed in Exhibit Q. Out of the 16 sensitive species, 6 are sensitive-critical species and 10 are sensitive species in the Columbia Plateau Ecoregion (Table P-5). Six of these species were observed during field surveys: Brewer's sparrow (*Spizella breweri*), burrowing owl, Lewis' woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), loggerhead shrike (*Lanius ludovicianus*), and Swainson's hawk. While not state sensitive species, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are addressed briefly in this Exhibit P as a species of concern protected under the Bald and Golden Eagle Protection Act (BGEPA). No eagles or WAGS were observed during surveys. Fish and other species that require aquatic habitat (e.g., western painted turtles [*Chrysemys picta bellii*]) were determined not to have potential to occur based on an absence of wetlands and Waters of the State in the site boundary, and thus are not discussed further in this exhibit.

6.2 Site-Specific Issues Identified by ODFW

ODFW did not identify any site-specific issues for the Facility. During the consultation described in Section 3.0, ODFW noted that the Facility was well-sited for wildlife.

Table P-5. State Sensitive Species and Eagles with Known or Potential Occurrence within the Analysis Area

Common Name	Scientific Name	ODFW ¹ Status in Columbia Plateau Ecoregion	Expected Habitat	Expected / Likelihood of Occurrence within Site Boundary ²	Observed Occurrence within Site Boundary ²	Potential Use of Habitat within Analysis Area
Mammals						
hoary bat	<i>Lasiurus cinereus</i>	S	Found in forested upland habitats, including junipers. Long-distance migrant.	Moderate	None	Limited foraging habitat available. Probable transient during migration periods.
pallid bat	<i>Antrozous pallidis</i>	S	Caves/karst, desert scrub, grassland, and shrubland. Non-migratory.	Low	None	Limited potential summer and winter habitat available, including roosting habitat in karst formations present within rock outcrops and cliffs.
silver-haired bat	<i>Lasionycteris noctivagans</i>	S	Associated with older Douglas-fir/western hemlock and ponderosa pine forests as well as juniper woodland habitat near streams, ponds and lakes. Roosts in tree cavities, under loose bark, caves, mines and in abandoned buildings. Long-distance migrant.	Moderate	None	Limited foraging habitat available. Probable transient during migration periods.
spotted bat	<i>Euderma maculatum</i>	S	Uses crevices in cliffs, caves and canyon walls for day and nights roosts. Will also roost in trees at night and typically forage in meadows, shrub-steppe, or water sources. Regional migrant.	Low	None	Limited foraging habitat available. Potential roosting habitat in karst formations present within rock outcrops and cliffs. Potential transient.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC	Found in natural caves, mines, and buildings in the summer. Hibernates October to April in caves and mines. Regional migrant.	Low	None	Limited foraging habitat available. Potential transient.
Birds						
bald eagle	<i>Haliaeetus leucocephalus</i>	None ³	Nests in forested areas adjacent to large bodies of water. Nests in trees, rarely on cliff faces and ground nests in treeless areas. Known to scavenge opportunistically on carcasses in otherwise unsuitable habitat particularly during migration.	Low	None	Potential scavenging habitat available. Potential transient.
Brewer's sparrow	<i>Spizella breweri</i>	S	Abundant east of the Cascades in sagebrush communities.	High	Observed during Wildlife Surveys (April-May 2022)	Sagebrush habitat available within the analysis area.
burrowing owl (Western)	<i>Athene cunicularia hypugaea</i>	SC	Nests in earthen burrows in open shrub-steppe regions and grasslands.	High	Observed during Wildlife Surveys (April-May 2022)	Nesting and foraging habitat available within the analysis area.
common nighthawk	<i>Chordeiles minor</i>	S	Nests and roosts on gravel or sparsely vegetated grasslands. Forages for insects in all habitats, including sagebrush and rock scablands of eastern Oregon as well as urban and developed environments.	Low	None	Limited nesting habitat and suitable foraging habitat available within the analysis area.
ferruginous hawk	<i>Buteo regalis</i>	SC	Occurs in the open landscapes east of the Cascades, most common in the foothills of the Blue Mountains. Nests on the ground or in lone or peripheral trees.	Moderate	None	Limited to moderate nesting and foraging habitat available. Potential transient.
golden eagle	<i>Aquila chrysaetos</i>	None ³	Usually nests on cliffs but also can nest in trees. Breeds in open and semi-open habitats at a variety of elevations, in tundra, shrublands, grasslands, woodland-brushlands, and coniferous forests, farmland and riparian areas. Typically forages in open habitats like grasslands, areas with steppe-like vegetation.	Low	None	Potential scavenging habitat available. Potential transient.
grasshopper sparrow	<i>Ammodramus savannarum</i>	S	Large areas of dry grassland habitat with low to moderate height and low shrub cover.	Moderate	None	Nesting and foraging habitat available within the analysis area.

Common Name	Scientific Name	ODFW ¹ Status in Columbia Plateau Ecoregion	Expected Habitat	Expected / Likelihood of Occurrence within Site Boundary ²	Observed Occurrence within Site Boundary ²	Potential Use of Habitat within Analysis Area
Lewis’ woodpecker	<i>Melanerpes lewis</i>	SC	Formerly widespread in Oregon, it is currently common year-round only in the white oak-ponderosa pine belt east of Mt. Hood. It also breeds in low numbers in open habitat along east Oregon river and stream valleys.	High	Observed during Wildlife Surveys (April-May 2022)	Limited habitat available. Potential transient.
loggerhead shrike	<i>Lanius ludovicianus</i>	S	Breeds in open habitats east of the Cascades.	High	Observed during Wildlife Surveys (April-May 2022)	Moderate breeding and foraging habitat available within the analysis area.
long-billed curlew	<i>Numenius americanus</i>	SC	Locally common breeder in open grassland areas east of the Cascades. It is most abundant in the Columbia River basin.	High	Observed during Wildlife and Habitat Surveys (April-June 2022)	Breeding and foraging habitat available within the analysis area.
sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	SC	Widespread throughout the extensive shrub-steppe of eastern Oregon. Usually associated with big sagebrush.	Moderate	None	Sagebrush habitat available within the analysis area.
Swainson’s hawk	<i>Buteo swainsoni</i>	S	Prefers bunchgrass prairies of eastern Oregon and common in the foothills of the Blue Mountains. Nests typically in solitary tree, bush, or small grove.	High	Observed during Wildlife and Habitat Surveys (April-June 2022)	Nesting and foraging habitat available within the analysis area.
Reptiles						
sagebrush lizard (northern)	<i>Sceloporus graciosus graciosus</i>	S	Found in sagebrush habitat, but also chaparral, juniper woodlands, and coniferous forests.	Moderate	None	Suitable sagebrush habitat available within the analysis area.
<div>Species and status: OCS 2016, ODA 2022; ODFW 2021a, 2021b; ORBIC 2019, 2021; Wildlife Explorer 2022</div> <div>1. ODFW Status: S = State Sensitive; SC = State Sensitive—Critical</div> <div>2. Documented occurrence:<div>Habitat Categorization and Special Status Plant Surveys — Attachment P-1; Exhibit P, Sections 4.2.1 and 4.2.2</div><div>Special Status Wildlife and Raptor Nest Surveys — Attachment P-1; Exhibit P, Sections 4.2.3 and 4.2.4</div></div> <div>3. Protected by the Bald and Golden Eagle Protection Act</div>						

7.0 Baseline Survey of Habitat Use by State Sensitive Species

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

To determine if each species was expected to use the habitat within the analysis area for breeding, foraging, or other important activities, the Applicant analyzed the known habitat and range information for each species and compared this to the habitats mapped within the analysis area.

Facility surveys documented state sensitive species' use of the analysis area. Details on the survey methodology are summarized in Section 4.0. Additional details on the methods, as well as the results, are provided in Attachment P-1. The number of observations and use of habitat in the analysis area by state sensitive species are summarized in Table P-6.

7.1 Results of Field Surveys

7.1.1 Special Status Wildlife Species Surveys

The locations of state sensitive species detected during field surveys at the Facility are shown on Figure P-3. Additionally, the habitat within which each observation occurred is described in Table P-6. The probability of detection of individual species is dependent on many factors including activity patterns of the species, timing of surveys, amount of time surveyors were present in a particular area, and detectability of the species. The number of individual observations for each species shown in Table P-6 should not be interpreted as a measure of the number of individuals present within the analysis area. This is the number of independent observations of a species, with multiple individuals tallied when observed together. Independent observations could represent repeated observations of the same individual at different times. Figure P-3 depicts the location of each special status species detection, where each detection location represents one or more individuals observed at one time.

Table P-6. Habitat Use of State Sensitive Species Observed within the Analysis Area during Field Surveys 2022

Species	ODFW Status ¹ in the Columbia Plateau	Number of Individual Observations Within Analysis Area	Habitat Subtypes of Observed Individuals (Number of Individuals)
Brewer's sparrow <i>Spizella breweri</i>	S	4	Eastside Grasslands (2); Sagebrush Shrub-steppe (2)
burrowing owl (western) <i>Athene cunicularia hypugaea</i>	SC	1	Orchards, Vineyards, Wheat Fields, Other Row Crop (1)

Species	ODFW Status ¹ in the Columbia Plateau	Number of Individual Observations Within Analysis Area	Habitat Subtypes of Observed Individuals (Number of Individuals)
Lewis' woodpecker <i>Melanerpes lewis</i>	SC	2	Urban and Mixed Environs (2)
loggerhead shrike <i>Lanius ludovicianus</i>	S	10	Sagebrush Shrub-steppe (7); Eastside Grasslands (3)
long-billed curlew <i>Numenius americanus</i>	SC	15	Eastside Grasslands (1); Orchards, Vineyards, Wheat Fields, Other Row Crops (12); Sagebrush Shrub-steppe (2)
Swainson's hawk <i>Buteo swainsoni</i>	S	26	Eastside Grasslands (7); Orchards, Vineyards, Wheat Fields, Other Row Crops (7); Sagebrush Shrub-steppe (6); Urban and Mixed Environs (6)
1. SC = Sensitive-Critical Species, S = Sensitive Species			

7.1.1.1 Brewer's Sparrow (State Sensitive)

Brewer's sparrows were observed during surveys in April and May, singing, perched, and in flight within Sand Hollow. Sand Hollow is a small valley that runs northeast-southwest through the site boundary and contains the only sagebrush (*Artemisia sp.*)-dominated habitat within the site boundary (Figure P-2; Attachment P-1).

7.1.1.2 Burrowing Owl (State Sensitive-Critical)

On April 7, biologists observed a western burrowing owl perched next to a burrow in agricultural habitat within the site boundary. The owl flew west when approached by the biologists. Early April is too early to determine nest occupancy for this species (CBOC 1993); the biologists revisited the location on May 5 at which time they determined that the burrow was no longer present (Attachment P-1).

7.1.1.3 Lewis' Woodpecker (State Sensitive-Critical)

Two Lewis' woodpecker individuals were observed during surveys on May 5. One individual was observed flying and perching on a power pole on the western edge of Sand Hollow near Oregon Route 207 and one individual was observed flying around a homestead on the western edge of the site boundary. Typical habitat for Lewis' woodpeckers is not present with the site boundary (i.e., ponderosa pine [*Pinus ponderosa*] forests, oak [*Quercus sp.*] woodlands, oak-pine woodlands, cottonwood [*Populus sp.*] riparian forests, and areas burned by wildfires; OCS 2016); therefore, these individuals (or individual observed twice) were likely migrating through the site boundary.

7.1.1.4 *Loggerhead Shrike (State Sensitive)*

Loggerhead shrikes were observed throughout Sand Hollow during surveys in April and May. Primarily solitary individuals were observed flying and calling, perched, and hunting, including individuals calling while perched on sagebrush and one individual hunting a small snake.

7.1.1.5 *Long-Billed Curlew (State Sensitive-Critical)*

Long-billed curlew were observed throughout the site boundary during surveys in April, May, and June. Individuals and pairs were observed singing, flying, calling, preening, and performing flight displays, primarily in agricultural habitat.

7.1.1.6 *Swainson's Hawk (State Sensitive)*

Several individuals and pairs of Swainson's hawks were observed throughout the analysis area during surveys in April, May, and June, including individuals associated with the Swainson's hawk nests described below and in Attachment P-1. Swainson's hawks were observed perched, hunting, flying, and copulating. Perched individuals were typically on power poles but were also observed perched on the ground and on a nest, including incubating.

7.1.2 *Raptor Nest Surveys*

A review of ORBIC and USFWS data did not identify any raptor nests within 0.5 mile of the site boundary (ORBIC 2021; Leal 2020). However, review of aerial photos identified numerous potential raptor nesting structures within 0.5 mile of the site boundary. In all, a total of 14 stick nests were found during the field survey, including three in-use (i.e., active) Swainson's hawk nests, one active great-horned owl nest, as well as four corvid nests. One nest's activity status was unknown, while five others were deemed inactive, although with potential to become active by raptors in the future.

The only state sensitive raptor species found nesting within the analysis area was Swainson's hawk. Three Swainson's hawk nests were identified, two of which were located within the site boundary (nests labeled 102 and 109 in Figure P-4). Nests 102 and 109 both had one adult incubating on the nest during May surveys; during June surveys, only nest 102 had any Swainson's hawk individuals observed near the nest. Nest 104 and 102 both are located on power poles. Nest 104 had two adults on the nest and copulation observed during May surveys as well as the adults observed nearby during June surveys.

Detailed raptor nest survey results are described in the 2022 Wildlife Survey Report (see Attachment P-1).

7.1.3 Wetlands and Waters Surveys

No wetland features were found within the site boundary. Nineteen ephemeral streams were mapped within the site boundary. Detailed results of these surveys are presented in the 2022 Wetland Delineation Report (Exhibit J, Attachment J-1). Wetlands and Waters of the State are further discussed in Exhibit J.

8.0 Description of Potential Adverse Impacts

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;

Construction and operation of the Facility will result in both permanent and temporary impacts to wildlife and their habitats, although these impacts have been minimized considerably as described in Section 9.0. Due to the multi-year construction schedule of the Facility, both permanent and temporary impacts to fish and wildlife habitat will occur in phases over this time period. Habitat mitigation, noxious weed control, and vegetation management associated with construction and operation are discussed in the Draft Habitat Mitigation Plan (Attachment P-2), Draft Noxious Weed Control Plan (Attachment P-3), and Draft Revegetation Plan (Attachment P-4), respectively.

Permanent impact areas are those that would be converted from the existing condition to a different condition for the life of the Facility. The entire solar array area fence line is considered permanently impacted and includes all solar components (i.e., modules, inverters, transformers, tracking systems, posts, underground collector lines, and other associated equipment), the distributed battery energy storage system, portions of the transmission lines, new access roads, substations, and the temporary constructions areas. These components are described in detail in Exhibit B and depicted in Exhibit C. Although it is considered permanently impacted, vegetation within the solar array area fence line will be retained and/or planted following construction and as a result there will be residual (and in some cases increased) value of these areas to wildlife.

Temporary impact areas include areas proposed to be temporarily impacted during construction of the underground collector lines, the transmission lines, and the perimeter fencing, where these disturbances occur outside the solar array area fence line. Exhibit C presents the temporary and permanent impacts of each Facility component. Restoration of the temporary impact areas will occur following construction, as will revegetation within portions of the solar array area fence line not occupied by permanent infrastructure as described in the Draft Revegetation Plan (Attachment P-4).

8.1 Potential Impacts to Fish and Wildlife Habitat

This section describes potential adverse impacts to fish and wildlife habitat from construction and operation of the Facility. Some of these impacts will be avoided and/or minimized as described in

Section 9.0. Impacts that cannot be avoided will be mitigated for as described in Section 9.0 and the Draft Habitat Mitigation Plan (Attachment P-2).

Table P-7 provides the number of acres of each habitat type, subtype, and category that will be permanently or temporarily impacted by the Facility. These habitats are described in Section 5.0. The Applicant has minimized impacts to Category 2, 3, 4, and 5 habitats by micro-siting facilities on Category 6 habitat to the extent feasible.

Table P-7. Potential Impacts by Habitat Category, Type, and Subtype

Habitat Type	Habitat Subtype	Impacts (Acres)	
		Permanent	Temporary
Category 2			
Upland Grassland, Shrub-Steppe, and Shrubland	Eastside Grasslands	<0.1	0.4
Category 2 Total		<0.1	0.4
Category 4			
Open Water – Lakes, Rivers, Streams	Intermittent or Ephemeral Streams	-	<0.1
Upland Grassland, Shrub-Steppe, and Shrubland	Eastside Grasslands	17.9	2.7
Category 4 Total		17.9	2.7
Category 5			
Upland Grassland, Shrub-Steppe, and Shrubland	Eastside Grasslands	18.5	2.2
Category 5 Total		18.5	2.2
Category 6			
Agriculture, Pasture, and Mixed Environs	Orchards, Vineyards, Wheat Fields, Other Row Crops	9397.4	51.3
Urban and Mixed Environs		7.7	1.2
Category 6 Total		9,405.1	52.6
Grand Total		9,441.5	57.8
Note: Totals in this table may not appear to sum correctly due to rounding. “-” means no impact while <0.1 means greater than zero but less than 0.05 acre impact.			

8.1.1 Category 2 Habitat

Impacts to Category 2 habitat (0.4 acre) are anticipated to be primarily temporary. Within the analysis area this habitat consists of two isolated areas of high-quality Eastside Grassland habitat (Figure P-2). This habitat contains a high density and ground cover of native grasses and forbs with scattered native shrubs within the analysis area. The dominant native grasses in this habitat consist

of bluebunch wheatgrass (*Pseudoroegneria spicata*), and Sandberg bluegrass (*Poa secunda*). The dominant native forbs consist of snow buckwheat (*Eriogonum niveum*), and yarrow (*Achillea millefolium*). The native shrubs in this habitat consist primarily of rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), big sagebrush (*Artemisia tridentata*), and broom snakeweed (*Gutierrezia sarothrae*).

Impacts to this habitat category are primarily the result of the overhead collector line crossing of this habitat within Sand Hollow. These areas are anticipated to take less than 5 years to recover. Table P-7 identifies <0.1 acres of permanent impact to this habitat category due to the overlap of the solar array area fence line with this habitat mapped along a wheat field on the east side of Sand Hollow; this small impact acreage is the results of the approximate nature of the boundary of the wheat field where the solar array is sited rather than a true impact to Category 2 habitat.

8.1.2 Category 3 Habitat

All of the Category 3 habitat within the analysis area is Sagebrush Shrub-Steppe habitat, primarily located in Sand Hollow (Table P-7; Figure P-2). This habitat consists of even components of native shrubs and annual grasses. The dominant shrub in this habitat is big basin sagebrush, followed by rubber rabbitbrush. In the understory groundcover is predominantly exotic annual grasses cheatgrass (*Bromus tectorum*) and cereal rye (*Secale cereale*) interspersed with non-native forbs such as prickly lettuce (*Lactuca serriola*) and tall tumble mustard (*Sisymbrium altissimum*), and native forbs such as arrowleaf balsamroot (*Balsamorhiza sagittata*) and yarrow. These areas are not disturbed by grazing, off-road driving or development. No Category 3 habitat is proposed to be impacted.

8.1.3 Category 4 Habitat

Potential impacts to Category 4 habitats are primarily to Eastside Grasslands habitat (Table P-7) and include permanent and temporary impacts. Category 4 Eastside Grasslands areas contain similar species as the Category 3 Eastside Grasslands described above, but are dominated by non-native species and are relatively degraded due to grazing, invasive species, and proximity to roads and other human disturbance. Less than 0.1 acre of temporary impacts are anticipated to Intermittent or Ephemeral Streams habitat. These impacts consist of three crossings of ephemeral streams (which are not Waters of the State) mapped during wetlands surveys (see Exhibit J, Attachment J-1); these crossings include two underground collector line crossings of ephemeral streams, and one overhead line crossing of the ephemeral stream within Sand Hollow. The crossing within Sand Hollow is conservatively identified as a temporary impact but this stream is anticipated to be spanned during final design. These areas provide some habitat for wildlife but are degraded and lack trees. These Category 4 habitat types are anticipated to take less than 5 years to recover.

8.1.4 Category 5 Habitat

Potential impacts to Category 5 habitat include permanent and temporary impacts to Eastside Grassland habitats (Table P-7). Category 5 Eastside Grasslands potentially impacted are very highly disturbed by non-native species, two-track roads, and are generally isolated between active agricultural fields or located adjacent to roads. Category 5 Eastside Grasslands are primarily composed of non-native cereal rye, cheatgrass, squirreltail (*Elymus elymoides*), rattail fescue (*Vulpia myuros*), and native fiddleneck (*Amsinckia* sp.) and yarrow. The areas of Eastside Grassland include scattered native shrubs such as big sagebrush, yellow rabbitbrush, rubber rabbitbrush, and broom snakeweed. Category 5 Eastside Grasslands are anticipated to take less than 5 years to recover.

8.1.5 Category 6 Habitat

Impacts to Category 6 habitat primarily consists of permanent impacts to the Orchards, Vineyards, Wheat Fields, Other Row Crops habitat subtype, which consist of dryland wheat fields upon which the solar array area fence line has been sited. Otherwise, impacts to Category 6 habitat include temporary impacts to the Orchards, Vineyards, Wheat Fields, Other Row Crops habitat subtype (i.e., dryland wheat) and temporary and permanent impacts to the Urban and Mixed Environs habitat subtype (i.e., paved roads and other developed areas). No orchards or vineyards are proposed to be impacted by the Facility.

8.2 Potential Impacts to State Sensitive Species

This section addresses potential impacts to state sensitive species identified in Section 6.0. Habitat modification resulting from construction activities will occur in permanent impact areas, and the associated impacts will vary by species. In addition to these habitat-related impacts (e.g., habitat loss and modification), potential adverse impacts to sensitive species due to construction and operation may include the introduction of noxious weeds and other non-native invasive species, potential nesting and breeding disturbance, structure collision, vehicular collision, and disturbance related to artificial lighting.

8.2.1 Mammals

Five state sensitive bat species have the potential to occur within the analysis area: hoary bats (*Lasiurus cinereus*), pallid bats (*Antrozous pallidis*), silver-haired bats (*Lasionycteris noctivagans*), spotted bats (*Euderma maculatum*), and Townsend's big-eared bats (*Corynorhinus townsendii*). The site contains a small area of cliff habitat with karst formations and an abandoned barn, which present suitable roost habitat for hoary bats, pallid bats, and Townsend's big-eared bats (Table P-5). Foraging habitats such as wetlands and perennial waters do not occur within the site boundary. Additionally, construction activities will generally occur during daylight hours, as feasible (e.g., barring a construction delay that necessitates night construction), when bats are generally absent, and thus construction activities are not anticipated to disturb foraging bats.

Three of these species have low potential to occur in the Facility vicinity due to minimal suitable habitat but are probable transients during migration periods: pallid bat, spotted bat, and Townsend's big-eared bat. Hoary bats and silver-haired bats have been detected during surveys for other nearby energy facilities, and therefore have moderate potential to occur in the Facility vicinity. Furthermore, the Facility does not provide suitable breeding habitat (forests) for hoary and silver-haired bats, and minimal roosting habitat (trees and caves) for any of the five sensitive bat species mentioned here, within the analysis area (Table P-5).

Any impacts to bats that do occur, despite the minimal number of trees within the analysis area, would likely be limited to late summer and fall, during the migratory period for tree-roosting bats. Post-construction bat mortality data at utility scale photovoltaic solar energy sites are limited; however, three publicly available studies from California sites have reported small numbers of bat carcasses found both during fatality searches and incidentally (WEST 2017). Data from non-photovoltaic solar facilities with higher bat fatalities reported (e.g., a power-trough facility in California) suggest that the timing of potential bat fatalities at solar facilities is primarily in late summer and fall. While cause of mortality in these studies is generally inconclusive based on the condition of the carcasses when found, some of these may be due to collision with facility infrastructure. Insects may be attracted to lighting around structures, which may in turn attract bats to forage near facility infrastructure. Thus, artificial lighting at night may increase the risk of collision fatalities. However, the potential for collision risk due to artificial night lights will be avoided and minimized, as described in Section 9.0. As a result, construction and operation of the Facility are anticipated to have minimal impact on these bat species.

8.2.2 Birds

Ten state sensitive bird species and two protected eagle species have the potential to occur within the analysis area (Table P-5). All bird species with habitat requirements overlapping with those occurring within the analysis area could be potentially impacted by the Facility. Construction and operation of the Facility will result in minimal permanent loss of habitat, which nevertheless could displace some nesting and foraging birds. However, birds using the limited habitat within the site boundary are expected to relocate to other suitable habitat in the greater vicinity of the Facility. Additionally, the vast majority of Facility infrastructure is sited on agricultural land (i.e., dryland wheat) that is currently regularly disturbed as a result of farming operations (e.g., plowing, harvesting, biosolids application) and as a result habitat loss and displacement of nesting and foraging birds is expected to be minimal. As described in Section 9.0, impacts have been minimized to wildlife habitat within Sand Hollow, which contains the largest contiguous swath of non-cultivated habitat in the site boundary and includes the majority of state sensitive bird species detections from surveys in 2022 (Figure P-3).

Avian mortality at the Facility due to collision with infrastructure is also possible, although the available data on avian mortality at utility scale solar energy sites suggests mortality at photovoltaic facilities is comparatively low. According to Walston et al. (2016), a comparison of avian fatalities between a photovoltaic facility and two power tower solar sites revealed a

significantly lower fatality rate at the photovoltaic facility. In a study by Kosciuch et al. (2020) that analyzed fatality monitoring data from 10 photovoltaic solar facilities in the Southwestern U.S., a high-end estimate of 2.5 birds per megawatt (MW) per year was calculated, but this was reduced to an average annual fatality rate of 1.8 birds per MW per year when an outlier project in the Coastal California Bird Conservation Region was excluded. The study also found that water-obligate birds were present in 90 percent of studies in the Sonoran and Mojave Deserts Bird Conservation Region, and that the adjusted composition was greater for water associates and obligates near the Salton Sea, a stopover and wintering habitat for water birds. The contribution of water associates and obligates was minimal for facilities farthest from the Salton Sea, including the one facility in the Great Basin Bird Conservation Region (within which the Facility is also located) in Nevada included in the study. The closest large water body to the Facility is the Carty Reservoir approximately 9 miles northwest of the site boundary.

In Oregon, results of a fatality study at a 56-MW photovoltaic facility near Prineville detected only three bird fatalities during one year of standardized searches, including only two native birds: horned lark (*Eremophila alpestris*) and a dark-eyed junco (*Junco hyemalis*) (ODOE 2020). These findings, which are the first for the region in Oregon, imply that significant fatality events are unlikely at photovoltaic solar facilities in the area. However, low numbers of common ground-dwelling bird species fatalities are possible (ODOE 2020).

DeVault et al. (2014) conducted a study on avian utilization of photovoltaic installations located at or close to five airports in the United States. The study found that passerine species, such as red-winged blackbirds, use the shade provided by panels during summer days and occasionally perch on panels to sing in the early breeding season, resembling the behavior of mourning doves at a photovoltaic facility studied in Walston et al. (2016) and WEST (2014). Additionally, DeVault et al. (2014) observed insectivorous avian species foraging near the arrays but found that the abundance of foraging birds was similar to nearby grasslands. Therefore, some avian species use of the Facility is expected following construction. No fatalities were clearly attributable to collision with panels.

In addition, collisions with power lines are unlikely because most medium voltage collection lines associated with the Facility will be buried, and transmission lines and overhead collection lines will be constructed following the Avian Powerline Interaction Committee (APLIC) recommendations for collision avoidance (APLIC 2012). Powerline electrocution is also not expected at the Facility because all overhead collector and transmission lines will be constructed following the latest APLIC design standards (APLIC 2006).

The limited avian mortality and usage data for utility scale solar energy sites suggest that mortality at photovoltaic facilities in particular is low; therefore, impacts to sensitive bird species with the potential to occur within the site boundary are addressed below in terms of habitat removal, structural collision, vehicular collision, artificial lighting, and nesting disturbance during construction and operation. Measures described in Section 9.0 will be used to minimize or avoid these potential impacts.

- **Bald eagle (BGEPA):** No suitable nesting habitat for bald eagles exists within the site boundary, and none was found to occur in the analysis area during 2022 surveys

(Attachment P-1). A potential adverse impact to bald eagles is loss of scavenging habitat, mainly during migration and winter. Powerline collision and electrocution are not expected due to minimization measures incorporated into Facility design (Section 9.1.1).

- **Brewer's sparrow (state sensitive):** Brewer's sparrows were observed during 2022 surveys in the sagebrush-dominated habitat of Sand Hollow. Potential adverse impacts to this species due to the construction and operation of the Facility are habitat loss and potential nesting disturbance, although impacts to the Sagebrush Shrub-steppe habitat subtype have been avoided and impacts to Sand Hollow have been minimized, as described in Section 9.0, thus minimizing impacts to this species. Collision with infrastructure during nocturnal migration may be an adverse impact to this species.
- **Burrowing owl (state sensitive-critical):** One burrowing owl was observed during 2022 surveys near a burrow in an agricultural field, which was no longer present during a subsequent visit (Attachment P-1). Generally tolerant of human activity, and opportunistic hunters for insects and small mammals, burrowing owls may use the operating Facility to hunt and may also nest if burrows become available. Therefore, construction of the Facility may result in loss of hunting and breeding habitat but some use of the site boundary may continue following construction. Potential operational impacts to this species include collision with vehicles during the breeding season.
- **Common nighthawk (state sensitive):** No common nighthawks (*Chordeiles minor*) were recorded during 2022 surveys (Attachment P-1). Construction and operation of the Facility could pose a risk to nesting common nighthawks, as nest sites can include a variety of substrates in open areas including bare ground, gravel, and lithosol. Males also tend to roost on gravel roads, and therefore may roost within the site boundary. Nesting disturbance and collision with vehicles could occur during construction and operation.
- **Ferruginous hawk (state sensitive-critical):** No ferruginous hawks were observed during 2022 surveys (Attachment P-1). The primary potential impact to this species is foraging habitat loss, although ground squirrel colonies, which are prey for this species, are not known to occur within the site boundary.
- **Golden eagle (BGEPA):** No suitable nesting habitat for golden eagles exists within the site boundary, and none was found to occur in the analysis area during 2022 surveys (Attachment P-1). A potential adverse impact to golden eagles is loss of scavenging habitat. Power-line collision and electrocution are not expected due to minimization measures incorporated into Facility design (Section 9.1.1).
- **Grasshopper sparrow (state sensitive):** Grasshopper sparrows (*Ammodramus savannarum*) were not recorded during 2022 surveys but have the potential to occur due to the presence of suitable habitat (Attachment P-1). Construction and operation of the Facility will result in the loss of some suitable breeding and foraging habitat for grasshopper sparrows. Generally a nocturnal migrant, this species may be attracted to artificial lights during migration; therefore, collision is an additional potential adverse impact to this species during construction and operation of the Facility.

- **Lewis's woodpecker (sensitive-critical):** This species was expected to have a limited potential to occur at the Facility, as a vagrant during migration, but two occurrences of Lewis' woodpecker individuals were observed during 2022 surveys on May 5 (Attachment P-1). Typical habitat for Lewis' woodpeckers is not present with the site boundary; therefore, these individuals (or one individual observed twice) were likely migrating through the site boundary. Construction of the Facility will not impact suitable habitat. Additionally, as a diurnal migrant, this species will not be adversely impacted by artificial lighting. However, potential adverse impacts may occur for migrant individuals passing through due to collision with vehicles intermittently operating on site.
- **Loggerhead shrike (state sensitive):** Loggerhead shrikes were observed using sagebrush habitat throughout Sand Hollow during 2022 surveys (Attachment P-1). Although limited suitable habitat is available for this species, the primary potential adverse impacts to loggerhead shrike are habitat loss and nesting disturbance. Little information exists regarding whether this species is a nocturnal or diurnal migrant; therefore, impacts to this species during migration due to artificial lighting are unknown.
- **Long-billed curlew (state sensitive-critical):** This species was observed during 2022 surveys, and is patchily distributed, but relatively common at the Facility (Attachment P-1). The Facility is in their typical breeding range in Oregon. Potential adverse impacts due to Facility operation include displacement from potential nesting and foraging habitat as well as potential collision with vehicles operating on site during the spring and early summer months. Additionally, long-billed curlews are susceptible to human disturbance during the breeding season, which can result in nest abandonment or disruption of brood-rearing (Dugger and Dugger 2002); the construction of the Facility may adversely impact active breeding attempts if construction occurs in proximity to long-billed curlew during the breeding season.
- **Sagebrush sparrow (state sensitive-critical):** No sagebrush sparrows (*Artemisiospiza nevadensis*) were observed during 2022 surveys (Attachment P-1). Potential adverse impacts to sagebrush sparrows are habitat loss, nesting disturbance, and possibly lighting-related disturbance during migration, though its migratory behavior is poorly described.
- **Swainson's hawk (state sensitive):** This species was observed nesting in the analysis area during 2022 surveys (Attachment P-1). Construction may result in loss of hunting or nesting habitat during breeding and migration. The Swainson's hawk is broadly distributed and quite common during spring and summer at the Facility. Construction may disturb active breeding attempts if it occurs during the Swainson's hawk breeding season. Swainson's hawks are more likely to hunt in dryland wheat than are most other raptor species (Bechard et. Al. 2010). Thus, the modifications to the Facility as proposed may also decrease foraging opportunities for these raptors during spring and summer, when they are present on the Columbia Plateau.

8.2.3 Reptiles

No state sensitive reptiles have been documented within the site boundary. No suitable habitat exists for turtles, such as the state sensitive-critical western painted turtle, within the site boundary. Some potential exists for the northern sagebrush lizard (*Sceloporus graciosus graciosus*) to occur in Sagebrush Shrub-Steppe habitats within the site boundary. As such, minimal potential for adverse impacts to state sensitive reptiles or their habitats are expected from construction and operation of the Facility.

8.2.4 Fish

No adverse impacts to state sensitive fish or their habitats are expected from construction and operation of the Facility due to lack of fish-bearing water features within the site boundary.

9.0 Avoidance and Mitigation

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 general fish and wildlife habitat mitigation goals and standards described in OAR 635-415-0025 and a description of any measures proposed by the applicant to avoid, minimize, and provide compensatory mitigation for the potential adverse impacts described in (F) in accordance with the sage-grouse specific habitat mitigation requirements described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025, and a discussion of how the proposed measures would achieve those goals and requirements; and

This section identifies the avoidance, minimization, and mitigation measures that have been and will be implemented to avoid, minimize, and mitigate potential adverse impacts to fish and wildlife habitat and state sensitive species, and describes how these measures will ensure the Facility meets the ODFW habitat mitigation goals.

9.1 Avoidance and Minimization

9.1.1 Facility Design

Measures employed during Facility design to avoid and minimize impacts to fish and wildlife habitat, as well as state sensitive species, included the following:

- To the extent feasible, the Applicant sited the Facility on previously disturbed habitat, including agricultural fields and degraded grassland habitat, and minimized impacts to Sand Hollow, which contains the largest contiguous swath of non-cultivated habitat in the site boundary.

- The Applicant will construct all overhead collector and transmission lines following the latest APLIC design standards (APLIC 2006, 2012). This is expected to minimize the risk of electrocution and collision to raptors generally, and to bald eagles, golden eagles, Swainson's hawks, and ferruginous hawks in particular.
- The medium voltage collector line system will be buried where feasible.
- The Applicant will implement down-shield lighting for permanent lighting at the substations and operations and maintenance (O&M) enclosure. Outdoor lighting will be sited, limited in intensity, shielded, and hooded in a manner that prevents the lighting from projecting onto adjacent properties, roadways, and waterways. This is expected to minimize the risk of avian collision with Facility infrastructure for all birds and bats in general, but to nocturnal migrant species (including Brewer's sparrows, sagebrush sparrows, and grasshopper sparrows) and to the crepuscular, insectivorous common nighthawk in particular. Down-shield lighting will be in place year-round, mitigating impacts to birds and bats both during migration and while foraging for insects at any time of the year.

9.1.2 Construction

Measures for avoiding and minimizing impacts to fish and wildlife habitat, state sensitive, and other wildlife species will be implemented during construction as follows:

- Construction vehicles will be limited to 20 miles per hour on all Facility access roads (excluding public roads). This is expected to limit impacts specifically to burrowing owls, common nighthawks, long-billed curlews, and to all wildlife in general.
- The Applicant will develop and implement a Facility-specific worker environmental training program throughout the construction of the Facility. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training will include information regarding the sensitive biological resources including potentially occurring listed and sensitive species, individual responsibilities associated with the Facility, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation.
- No construction will occur within 0.25 mile of active state sensitive raptor species nests (e.g., active Swainson's hawk nests during their nesting season, April 1 to August 15) unless a site-specific exception is made in coordination with ODFW.

9.1.3 Operation

Following construction, measures for avoiding and minimizing impacts to fish and wildlife habitat and to state sensitive and other wildlife species during operations, will be implemented as follows:

- The Applicant identified a licensed local wildlife rehabilitator capable of responding to the Facility in the event of injured wildlife. Blue Mountain Wildlife

(<https://bluemountainwildlife.org/>, 541-278-0215), located in Pendleton, Oregon, has confirmed the ability to respond to injured native wildlife, especially migratory birds, at the Facility (Lynn Tompkins, personal communication, April 11, 2023).

- O&M vehicles will be limited to 20 miles per hour on all Facility access roads (excluding public roads). This is expected to limit impacts specifically to burrowing owls, common nighthawks, long-billed curlews, and to all wildlife in general.
- The Applicant will develop and implement a Facility-specific worker environmental training program throughout the operation of the Facility. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training will include information regarding the sensitive biological resources including potentially occurring listed and sensitive species, individual responsibilities associated with the Facility, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation.

9.2 Mitigation

After avoidance and minimization measures have been implemented, some impacts to wildlife habitat and sensitive species will remain. Impacts to wildlife habitat will be mitigated for according to ODFW Habitat Mitigation Policy goals and standards, as described in the Draft Habitat Mitigation Plan (Attachment P-2).

10.0 Monitoring Program

OAR 345-021-0010(1)(p)(H) A description of the applicant's proposed monitoring plans to evaluate the success of the measures described in (G).

The Applicant will conduct noxious weed and revegetation monitoring as described in the Draft Noxious Weed Control Plan (Attachment P-3) and Draft Revegetation Plan (Attachment P-4), respectively. The Applicant will conduct wildlife monitoring as described in the Draft Wildlife Monitoring Plan (Attachment P-5). Monitoring related to mitigation success is described in the Draft Habitat Mitigation Plan (Attachment P-2).

11.0 Conclusion

As part of the Facility siting process, the fish and wildlife habitats within the analysis area were identified and categorized pursuant to OAR 635-415-0025. Based on survey results, no Category 1 habitat was identified. Permanent unavoidable impacts to Categories 4 and 5 habitats will be mitigated consistent with OAR 635-415-0025. Temporary impacts to habitat will be mitigated through revegetation.

Therefore, based on the information provided in this exhibit, there is sufficient evidence upon which the Energy Facility Siting Council may find that the design, construction, and operation of the Facility, taking into account the proposed mitigation measures, are consistent with the fish and wildlife mitigation goals and standards of OAR 635-415-0025. Accordingly, the Applicant demonstrates compliance with OAR 345-022-0060.

12.0 Submittal Requirements and Approval Standards

12.1 Submittal Requirements

Table P-8. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(p) 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. The applicant must include:	-
(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;	Section 4.0
(B) Identification of all fish and wildlife habitat in the analysis area, classified by the general fish and wildlife habitat categories as set forth in OAR 635-415-0025 and the sage-grouse specific habitats described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025 (core, low density, and general habitats), 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;	Section 5.0
(C) A map showing the locations of the habitat identified in (B);	Figure P-2
(D) Based on consultation with the Oregon Department of Fish and Wildlife (ODFW) 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;	Section 6.0
(E) A baseline survey of the use of habitat in the analysis area by species identified in (D) performed according to a protocol approved by the Department and ODFW;	Sections 4.0 and 7.0
(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;	Section 8.0

Requirement	Location
(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 general fish and wildlife habitat mitigation goals and standards described in OAR 635-415-0025 and a description of any measures proposed by the applicant to avoid, minimize, and provide compensatory mitigation for the potential adverse impacts described in (F) in accordance with the sage-grouse specific habitat mitigation requirements described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025, and a discussion of how the proposed measures would achieve those goals and requirements; and	Section 9.0
(H) A description of the applicant's proposed monitoring plans to evaluate the success of the measures described in (G).	Section 10.0

12.2 Approval Standards

Table P-9. Approval Standard

Requirement	Location
OAR 345-022-0060 Fish and Wildlife Habitat	–
To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are consistent with:	–
(1) The general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025(1) through (6) in effect as of February 24, 2017, and	Section 9.0
(2) For energy facilities that impact sage-grouse habitat, the sage-grouse specific habitat mitigation requirements of the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-415-0025(7) and OAR 635-140-0000 through -0025 in effect as of February 24, 2017.	Not Applicable

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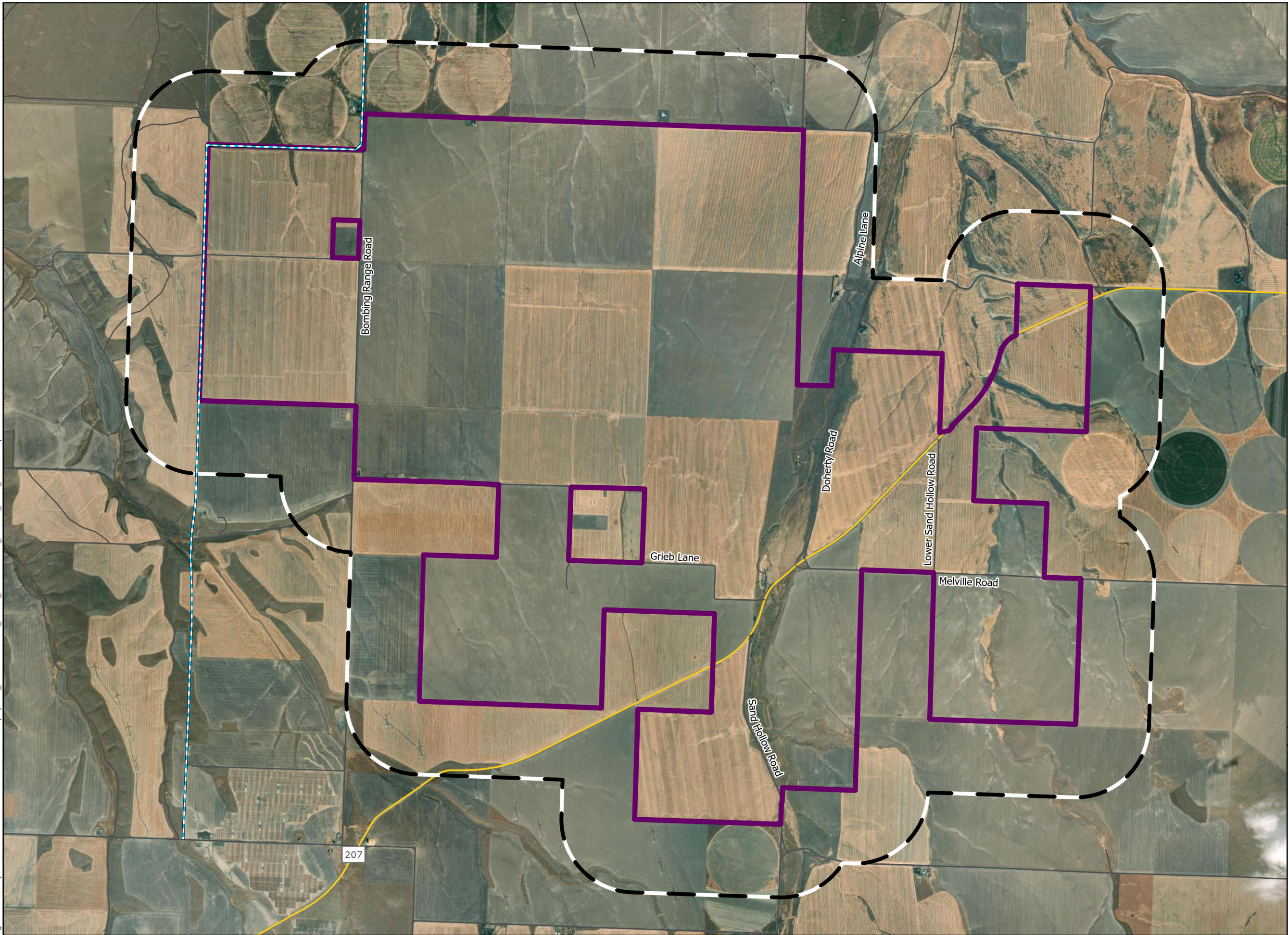
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Figures

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Sunstone Solar Project

Figure P-1
Analysis Area for Fish and Wildlife Habitat

MORROW COUNTY, OR

- Site Boundary
- Analysis Area (0.5-mile Buffer)
- State Highway
- Local Roads
- Existing UEC Transmission Line

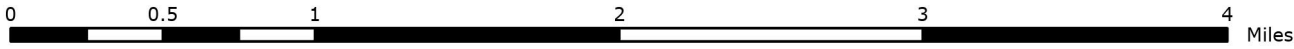


Reference Map



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NOT FOR CONSTRUCTION

Sunstone Solar Project

**Figure P-2
Habitat Categories and Subtypes in the
Analysis Area**

MORROW COUNTY, OR

- Site Boundary
- Map Grid
- Analysis Area (0.5-mile Buffer)
- State Highway
- Local Roads
- Existing UEC Transmission Line

Habitat Subtypes by Category

Category 2

Eastside Grasslands

Category 3

Sagebrush Shrub-steppe

Category 4

Eastside Grasslands

Emergent Wetland

Intermittent or Ephemeral Stream

Perennial Stream

Perennial Stream

Category 5

Eastside Grasslands

Intermittent or Ephemeral Stream

Scrub-shrub Wetland

Category 6

Orchards, Vineyards,

Wheat Fields, Other Row Crop

Urban and Mixed

Environs



Reference Map



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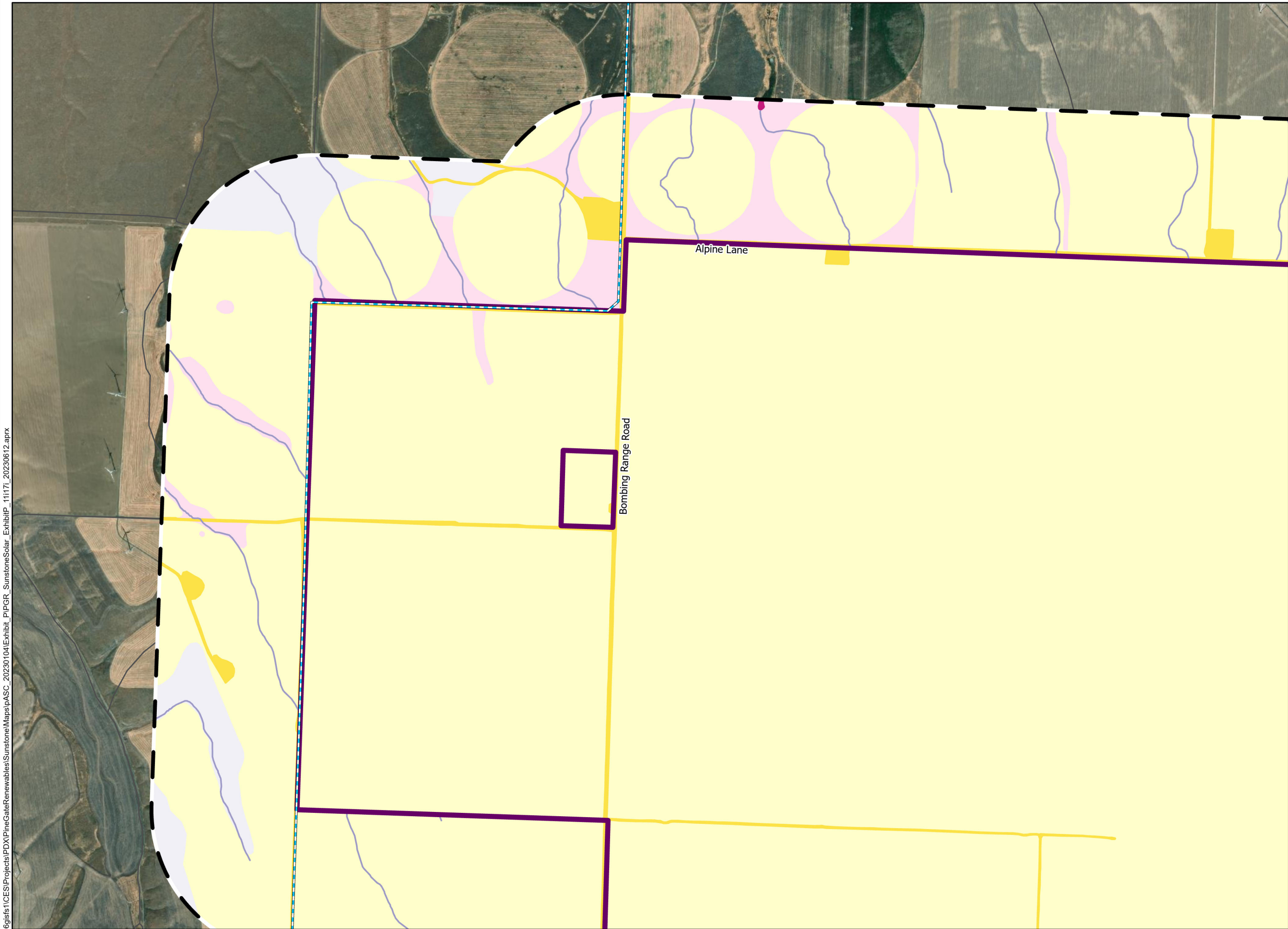
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Sunstone Solar Project

Figure P-2.1
Habitat Categories and Subtypes in the Analysis Area

MORROW COUNTY, OR

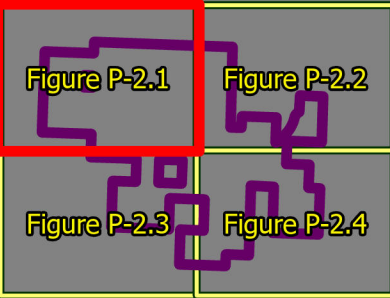
- Site Boundary
- Analysis Area (0.5-mile Buffer)
- Local Roads
- Existing UEC Transmission Line

Habitat Subtypes by Category

- Category 4**
- Eastside Grasslands
 - Intermittent or Ephemeral Stream
- Category 5**
- Eastside Grasslands
 - Scrub-shrub Wetland
- Category 6**
- Orchards, Vineyards, Wheat Fields, Other Row Crop
 - Urban and Mixed Environs

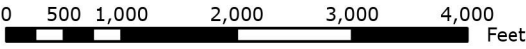


Reference Map



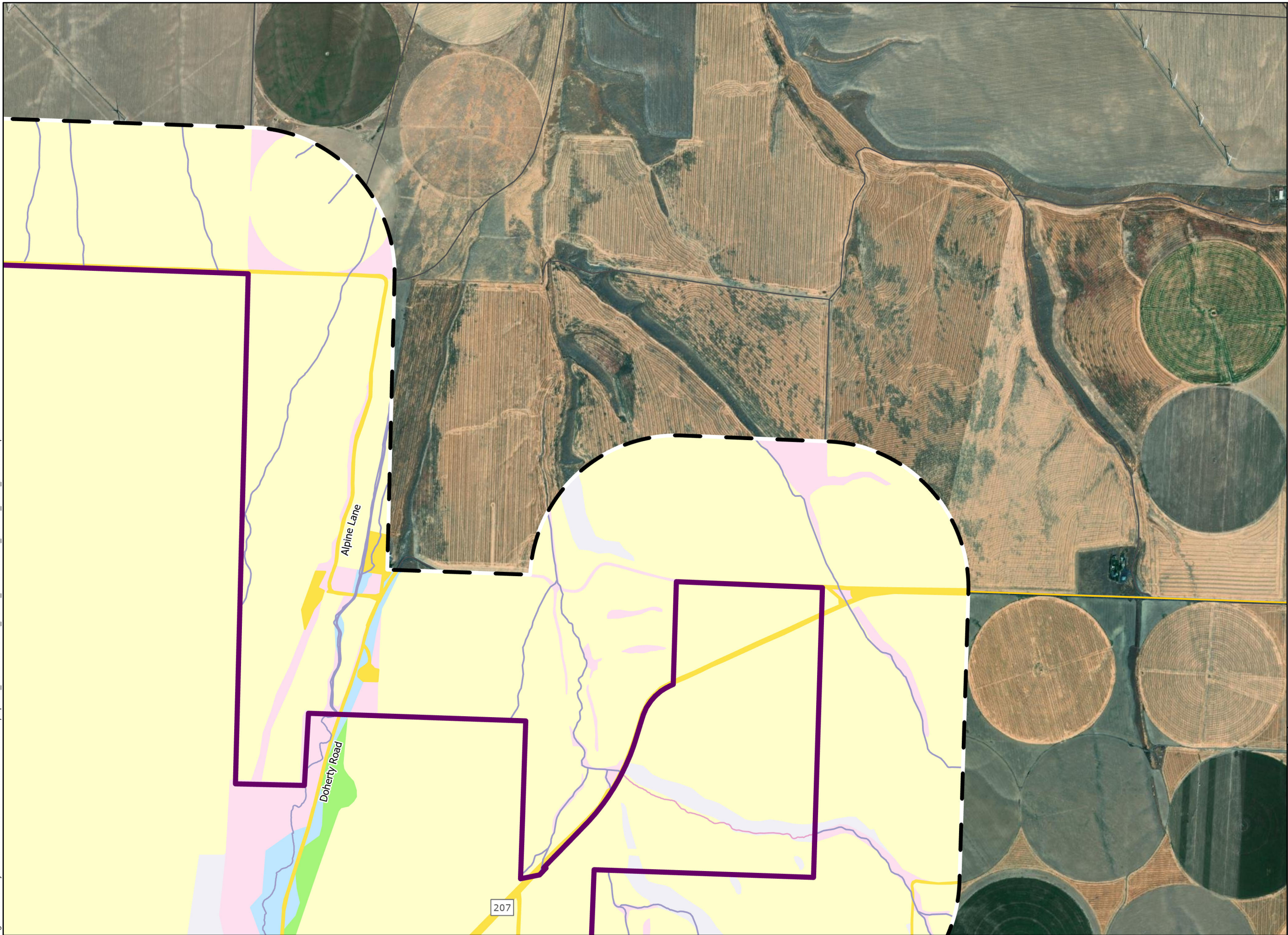
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Sunstone Solar Project

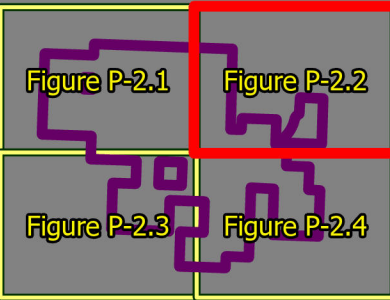
Figure P-2.2
Habitat Categories and Subtypes in the Analysis Area

MORROW COUNTY, OR

- Site Boundary
 - Analysis Area (0.5-mile Buffer)
 - State Highway
 - Local Roads
- Habitat Subtypes by Category**
- Category 2**
- Eastside Grasslands
- Category 3**
- Sagebrush Shrub-steppe
- Category 4**
- Eastside Grasslands
 - Intermittent or Ephemeral Stream
- Category 5**
- Eastside Grasslands
 - Intermittent or Ephemeral Stream
- Category 6**
- Orchards, Vineyards, Wheat Fields, Other Row Crop
 - Urban and Mixed Environs



Reference Map



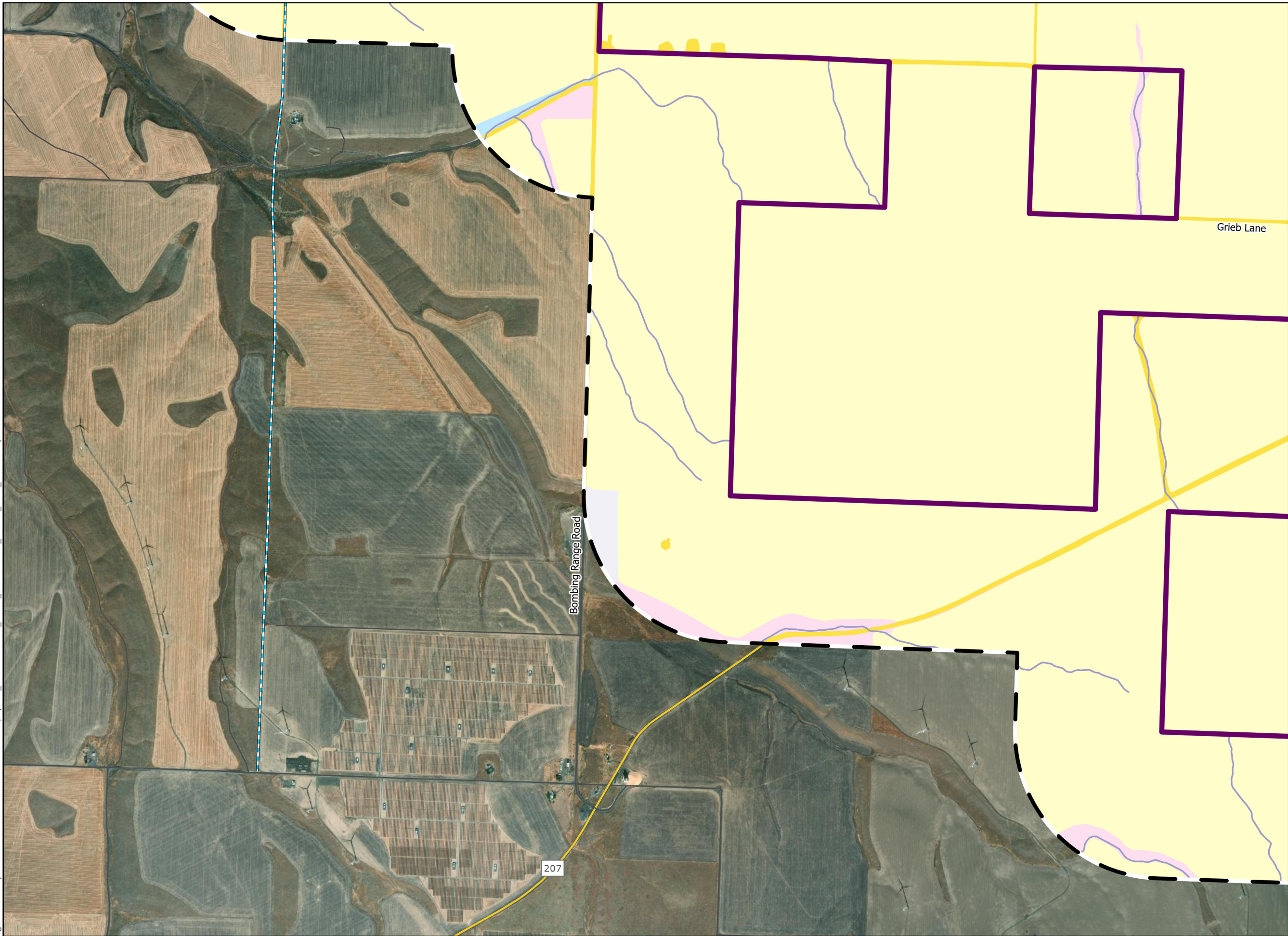
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NOT FOR CONSTRUCTION

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Sunstone Solar Project

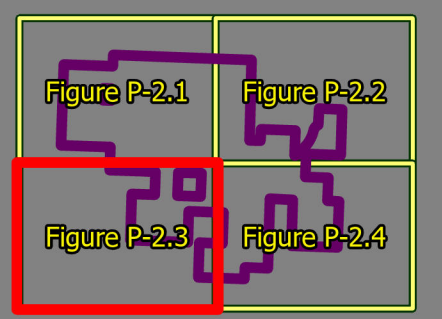
Figure P-2.3 Habitat Categories and Subtypes in the Analysis Area

MORROW COUNTY, OR

- Site Boundary
 - Analysis Area (0.5-mile Buffer)
 - State Highway
 - Local Roads
 - Existing UEC Transmission Line
- Habitat Subtypes by Category**
- Category 3**
- Sagebrush Shrub-steppe
- Category 4**
- Eastside Grasslands
 - Intermittent or Ephemeral Stream
- Category 5**
- Eastside Grasslands
- Category 6**
- Orchards, Vineyards, Wheat Fields, Other Row Crop
 - Urban and Mixed Environs

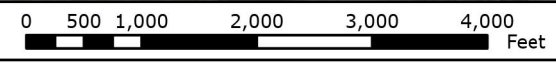


Reference Map



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WGS 1984 UTM Zone 11N



NOT FOR CONSTRUCTION

Sunstone Solar Project

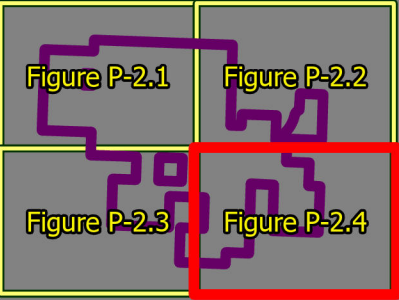
Figure P-2.4
Habitat Categories and Subtypes in the Analysis Area

MORROW COUNTY, OR

- Site Boundary
- Analysis Area (0.5-mile Buffer)
- State Highway
- Local Roads

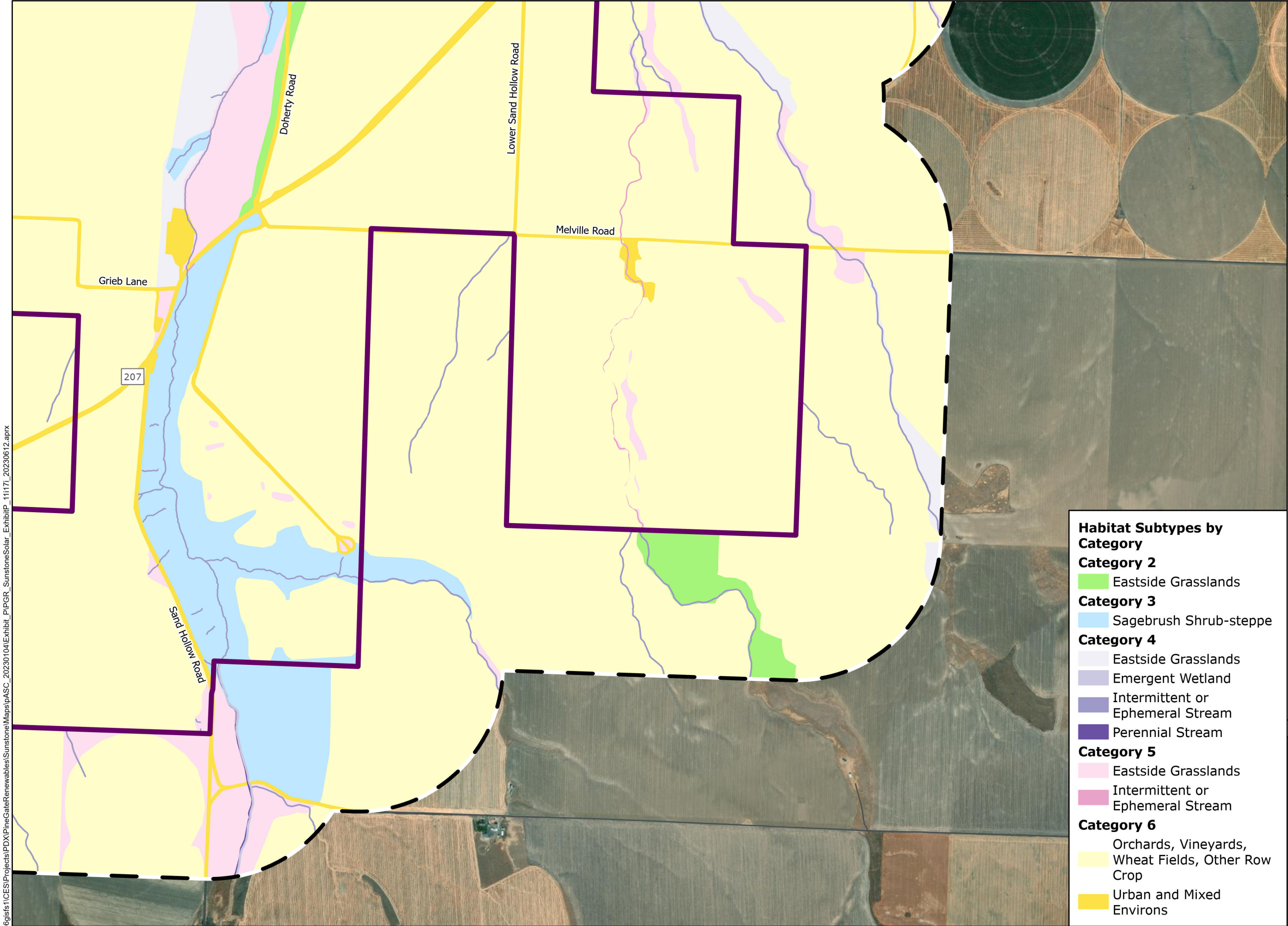


Reference Map



Habitat Subtypes by Category

- Category 2**
- Eastside Grasslands
- Category 3**
- Sagebrush Shrub-steppe
- Category 4**
- Eastside Grasslands
 - Emergent Wetland
 - Intermittent or Ephemeral Stream
 - Perennial Stream
- Category 5**
- Eastside Grasslands
 - Intermittent or Ephemeral Stream
- Category 6**
- Orchards, Vineyards, Wheat Fields, Other Row Crop
 - Urban and Mixed Environs

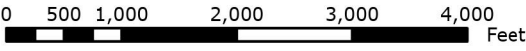


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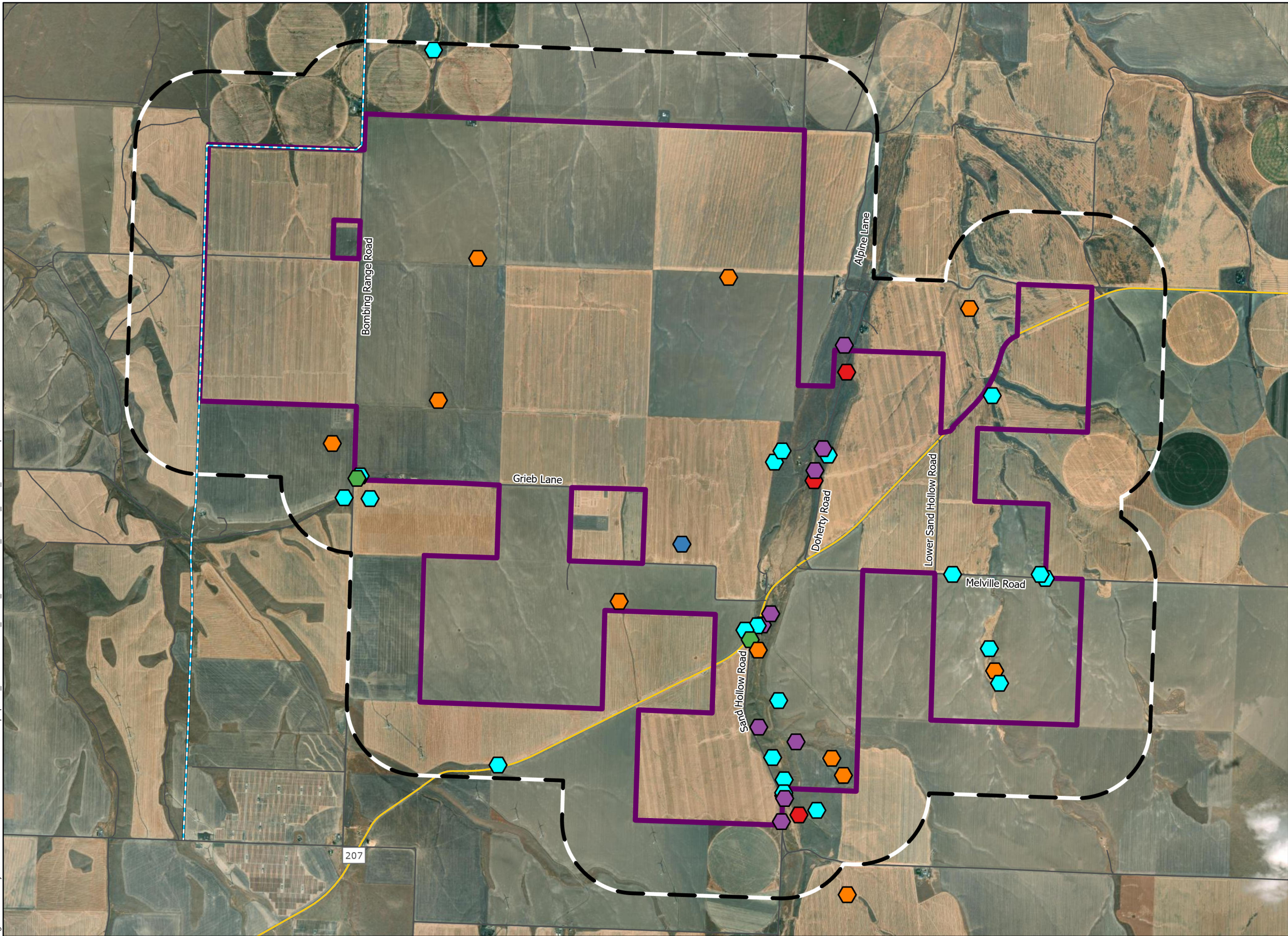
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Sunstone Solar Project

Figure P-3
Detections of Special Status Wildlife Species

MORROW COUNTY, OR

- Site Boundary
- Analysis Area (0.5-mile Buffer)
- State Highway
- Local Roads
- Existing UEC Transmission Line
- Sensitive Wildlife Species Detections**
 - Brewer's sparrow
 - Lewis's woodpecker
 - Loggerhead shrike
 - Long-billed curlew
 - Swainson's hawk
 - Western burrowing owl

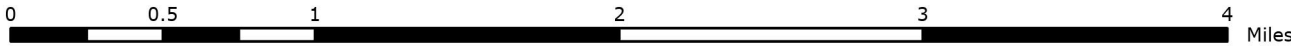


Reference Map



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Figure P-4 contains confidential and privileged information and is therefore not included in this document. It is provided under separate cover.

Attachment P-1. Biological and Botanical Survey Reports

2022 Habitat Categorization and Rare Plant Survey Report

Echo Solar Project

September 2022

Prepared for



GETTING SOLAR DONE.

Prepared by



TETRA TECH

GENERAL DISCLAIMER FOR SCIENTIFIC WORK PRODUCTS

This deliverable was prepared in accordance with generally accepted professional practices that are typically utilized for scientific work products. The work was performed within the limitations and assumptions of our approved scope of work, and the descriptive documentation associated with this deliverable. Unless explicitly included in our approved scope of work, information provided in this deliverable has not been prepared to meet industry standards for engineering and should not be used for construction.

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Attachment 2:	Habitat Types and Subtypes with Potential to Occur at the Echo Solar Project
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Attachment 4:	Select Photographs of Habitats Taken during 2022 Surveys at the Echo Solar Project
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Attachment 6:	Oregon State and Morrow County Noxious Weed Lists

Acronyms and Abbreviations

IPaC	Information for Planning and Consultation
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
PGR	Pine Gate Renewables
Project	Echo Solar Project
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

Pine Gate Renewables (PGR) plans to develop the Echo Solar Project (Project), a proposed solar project of up to 1,250 megawatts in Morrow County, Oregon. As part of its environmental due diligence, PGR contracted Tetra Tech, Inc. (Tetra Tech) to conduct biological surveys for the Project in support of an Application for Site Certificate through the Oregon Department of Energy's Energy Facility Siting Council. This summary report presents the methods and results for the biological surveys conducted in June 2022. The purpose of these surveys was to identify the presence of federal or state-listed endangered, threatened, or candidate vascular plant species and document the type and quality of wildlife habitat at the Project according to Oregon Department of Fish and Wildlife (ODFW) guidelines.

The following biological surveys were performed during June 2022:

- Habitat categorization surveys; and
- Rare plant surveys.

Surveyors also documented noxious weeds and collected data on raptor nests and other wildlife species if observed. Wildlife and raptor nest surveys are addressed in a separate report (Tetra Tech 2022a).

2.0 SURVEY AREA

The Project is located on approximately 10,992 acres within Morrow County, adjacent to Oregon Route 207 (Lexington-Echo Highway). The Project Area encompasses the proposed solar array and associated facilities. The Rare Plant Survey Area encompassed the Project Area (Figure 1), with active agricultural and developed areas excluded from rare plant surveys as these are not suitable habitat for rare plants. The Habitat Categorization Survey Area consisted of the Project Area and a 0.5-mile buffer of the Project Area (Figure 1). ODFW provided concurrence on the scope, timing, and extent of these surveys prior to Tetra Tech's field deployments (ODFW 2022).

3.0 METHODS

1.1 Habitat Categorization Surveys

Habitat types for the Project were adapted from *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001), modified based on aerial photography and pre-survey desktop review to reflect Project conditions. Habitat categories for the Project were guided by ODFW's Fish and Wildlife Habitat Mitigation Policy (Oregon Administrative Rule [OAR] 635-415-0025), which defines six habitat quality categories ranging from Category 1 habitat (i.e., essential, limited, and irreplaceable habitat) to Category 6 habitat (i.e., habitat that has low potential to become essential or important habitat for fish and wildlife). Tetra Tech reviewed the Critical Issues Analysis conducted for the Project (Tetra Tech 2021), which included a review of the National Wetlands Inventory (NWI; NWI 2021), National Hydrography Dataset (NHD; USGS 2018), and National Land Cover Database (NLCD; Dewitz 2019). Tetra Tech also reviewed data from the Oregon Biodiversity Information Center (ORBIC; ORBIC 2021) on locations of rare species and habitats in the Project vicinity that were requested

during the Critical Issues Analysis. Prior to field surveys, Tetra Tech identified preliminary habitat breaks based on aerial photography to assist the field habitat delineation effort.

In June 2022, Tetra Tech conducted field habitat categorization surveys concurrent with rare plant surveys, as discussed with ODFW (ODFW 2022). This included walking meandering transects within the Project Area and scanning the landscape to digitize habitats within the viewshed. Additional mapping was also conducted by driving Project roads and digitizing habitat from vantage points. In the field, surveyors digitized and updated polygons of relatively homogenous vegetation over aerial photos on Global Positioning System-enabled tablets and characterized the composition and structure on the field datasheets (Attachment 1). Inspection of high-resolution aerial photos was used to ensure that surveyors visited areas with unique vegetation or habitat features. In the field, each delineated vegetation polygon was assigned a habitat type, subtype, and habitat quality category guided by the draft habitat categorization table, which was developed based on Johnson and O'Neil (2001) and OAR 635-415-0025 (Attachment 2).

Habitat types and categories were not assigned to wetlands and waters in the field as they were derived from data collected during wetlands and waters surveys where available (Tetra Tech 2022b); outside of areas surveyed for wetlands and waters (i.e., outside the Project Area), NWI and NHD data in addition to field observations were used to identify and categorize wetlands and waters. Data characterizing a particular habitat subtype and quality represented the average condition of all such polygons. A minimum mapping unit of 1 acre was implemented, except for specialized habitat types such as wetlands. Some small islands in the middle of agriculture fields, individually consisting of less than 1 acre each, were delineated per guidance from ODFW due to their potential to support the state endangered Washington ground squirrel (*Urocitellus washingtoni*; ODFW 2022). Following field surveys, the digitized boundaries were downloaded and processed in a Geographic Information System. Data were reviewed for quality control and processed to incorporate wetlands and waters data.

3.1 Rare Plant Surveys

Prior to conducting field surveys, Tetra Tech conducted a desktop review to identify endangered, threatened, or candidate plant species with the potential to occur within the Project Area. This included an initial review in December 2021 (Tetra Tech 2021) as well as an updated review in June 2022 immediately prior to field surveys. Sources of information included:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database query for the Project vicinity (USFWS 2021);
- USFWS threatened, endangered, and candidate species list for Oregon (USFWS 2022);
- ORBIC list of Oregon's rare, threatened, and endangered species of Oregon (ORBIC 2019);
- ORBIC Element Occurrence Record Digital Data Set for rare, threatened or endangered species for the state of Oregon within the vicinity of the Project Area (ORBIC 2021);
- Oregon threatened, endangered, and candidate plants (Oregon Department of Agriculture [ODA] 2022); and
- The Oregon Flora Project (OFP 2022a, 2022b).

Based on review of these sources, Tetra Tech compiled a list of target plant species with the potential to occur in the Project Area. The initial list of potential, primary target species included all vascular plant species listed as endangered, threatened, or candidates for listing by the USFWS under the federal Endangered Species Act, or by the ODA under the Oregon Endangered Species Act. Tetra Tech reviewed this initial list, as well as the sources noted above, to produce a final list of target species that included all federal and state-listed and candidate plant species that have the potential to occur within or near the Project Area (Attachment 3).

Only one target species was determined to have potential to occur in Morrow County and at the Project: Laurence's milkvetch (*Astragalus collinus* var. *laurentii*), which is a federal species of concern and state threatened. Laurence's milkvetch can only be identified while fruiting between the months of June and August. Species were eliminated from consideration if their habitat was likely or known to be absent from the Project Area, or their known or suspected range did not overlap with the Project. Tetra Tech also reviewed the above desktop resources to identify ORBIC-tracked species with potential to occur within the Project Area. ORBIC-tracked species are not protected under federal or state law, but are species of conservation concern or species for which more information is needed before their status can be determined (ORBIC 2019). Surveyors were directed to document these species if observed, although they were not the primary focus of surveys.

Tetra Tech also completed a review of existing literature, herbarium records, and other sources (Burke Museum of Natural History and Culture 2022; ODA 2022; OFP 2022a, 2022b; WDNR 2022) prior to field surveys to generate fact sheets for each target and ORBIC-tracked species. These fact sheets were used by surveyors in the field and included:

- Photos of each species and its habitat;
- Information detailing habitat associations;
- Range and flowering period;
- Identifying features; and
- Characteristics distinguishing the target species from similar species within its range.

Tetra Tech conducted surveys for botanical resources in June 2022 concurrently with habitat categorization surveys. The survey schedule was chosen to cover the identification period for Laurence's milkvetch. The survey period also coincided with the identification period for the majority of the ORBIC-tracked species that have the potential to occur at the Project (see Attachment 3).

Botanical field surveys were conducted using the Intuitive Controlled survey method, a standard and commonly accepted survey protocol (USFS and BLM 1998). This method incorporates meandering transects that traverse the Project Area and target the full array of major vegetation types, aspects, topographical features, habitats, and substrate types. While en route, the surveyors search for target species, and when the surveyors arrive at an area of high potential habitat (that was defined in the pre-field review or encountered during the field visit), they conduct a complete survey for the target species. Complete surveys include an examination of 100 percent of the habitat.

During surveys, Tetra Tech maintained a running list of vascular plant species encountered and made informal collections of unknown species for later identification. Identification was verified by the use of appropriate plant keys, in particular, Flora of the Pacific Northwest (Hitchcock and Cronquist 2018).

4.0 RESULTS

4.1 Habitat Categorization Surveys

On June 20 and 21, 2022, two biologists completed habitat categorization surveys within the 19,799-acre Habitat Categorization Survey Area. Approximately 6,922 acres that were not accessible within the Habitat Categorization Survey Area (almost exclusively outside the Project Area) were categorized from adjacent accessible parcels and roads. The habitat categories, types, and subtypes delineated during field surveys are represented in Table 1 and Figure 2. The Habitat Categorization Survey Area is primarily composed of Category 6 habitat (92 percent of the Habitat Categorization Survey Area) which consists of Agriculture, Pasture, and Mixed Environs (18,032 acres; Attachment 4, Photo 8) and about 243 acres classified as Urban and Mixed Environs, which consisted of developed areas including paved and gravel roads, gravel pits, quarries, driveways, houses and other buildings, an existing substation, and other man-made structures (Attachment 4, Photo 7).

Non-agriculture and non-developed habitats primarily consist of Category 5 Eastside Grassland (687 acres), followed by Category 3 Sagebrush Shrub-Steppe (374 acres) and Category 4 Eastside Grassland (339 acres). Category 3 habitat is defined as, “essential habitat, or important and limited habitat” while Category 4 habitat is defined as “important habitat” and Category 5 habitat is defined as “having high potential to become either essential or important habitat.” Category 4 and 5 wetlands and waters were also mapped within the Habitat Categorization Survey Area (30 acres), derived from data collected during the wetlands and waters delineation, NWI and NHD data, as well as field observations during the habitat categorization surveys; the area of mapped wetlands and waters primarily (i.e., 90 percent) consisted of Intermittent and Ephemeral Streams. Finally, Category 2 Eastside Grassland, which is defined as “essential and limited habitat,” made up 93 acres (less than 1 percent) of the Habitat Categorization Survey Area (OAR 635-415-0025).

Table 1. Habitat Categories, Types, and Subtypes within the Habitat Categorization Survey Area

Habitat Type	Habitat Subtype	Habitat Category					Habitat Totals (acres)	Percent of Survey Area
		2	3	4	5	6		
Open Water – Lakes, Rivers, Streams	Intermittent or Ephemeral Streams	-	-	27	<1	-	28	<1%
	Perennial Streams			<1			<1	<1%
Wetlands	Emergent Wetlands			2			2	<1%
	Scrub-shrub Wetlands				1		1	<1%
	Eastside Grasslands	93	-	339	687	-	1,120	6%

Habitat Type	Habitat Subtype	Habitat Category					Habitat Totals (acres)	Percent of Survey Area
		2	3	4	5	6		
Upland Grassland, Shrub-steppe, and Shrubland	Sagebrush Shrub-Steppe	-	374	-	-	-	374	2%
Agriculture, Pasture, and Mixed Environs	Orchards, Vineyards, Wheat Fields, Other Row Crops	-	-	-	-	18,032	18,032	91%
Urban and Mixed Environs		-	-	-	-	243	243	1%
Category Total (acres)		93	374	368	688	18,275	19,799	100%
Percent of Survey Area		<1%	2%	2%	3%	92%	100%	-

The areas of Category 5 Eastside Grassland are primarily composed of non-native cereal rye (*Secale cereale*), cheatgrass (*Bromus tectorum*), squirreltail (*Elymus elymoides*), rattail fescue (*Vulpia myuros*), fiddleneck (*Amsinckia* sp.), and yarrow (*Achillea millefolium*). Subdominant species are a mix of natives and non-natives, including Sandberg bluegrass (*Poa secunda*), bulbous bluegrass (*Poa bulbosa*), bluebunch wheatgrass (*Pseudoroegneria spicata*), wild barley (*hordeum vulgare*), woolly plantain (*Plantago patagonica*), prickly lettuce (*Lactuca serriola*), tall tumble mustard (*Sisymbrium altissimum*), salsify (*Tragopogon* sp.), Russian thistle (*Salsola tragus*), and redstem stork's bill (*Erodium cicutarium*). The areas of Eastside Grassland include scattered native shrubs such as big sagebrush (*Artemisia tridentata*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*) and broom snakeweed (*Gutierrezia sarothrae*; Attachment 4, Photo 1). Disturbance within this habitat subtype included invasive plants and two-track roads. The Category 4 Eastside Grassland consisted of the same species as Category 5 but with lower abundance of non-native annual species and higher abundance of native perennial species such as bunchgrasses which increase the quality of habitat based on the forage value of these plant species (Attachment 4, Photo 2).

The Category 2 Eastside Grassland is composed primarily of native bunchgrasses and forbs; bluebunch wheatgrass, Sandberg bluegrass, snow buckwheat (*Eriogonum niveum*), and yarrow. Subdominant species consisted of arrowleaf balsamroot (*Balsamorhiza sagittata*), nine-leaf desert parsley (*Lomatium triternatum*), woolly plantain, woolly-pod milkvetch (*Astragalus purshii*), and shaggy fleabane (*Erigeron pumilus*). This habitat also consists of zero to five percent ground cover of native shrubs; rubber rabbitbrush, green rabbitbrush, big sagebrush and broom snakeweed (Attachment 4, Photo 4).

The Category 3 Sagebrush Shrub-Steppe is composed primarily of mature, big sagebrush, with subdominant shrub species rubber rabbitbrush (Attachment 4, Photo 3). The dominant understory species is cheatgrass and cereal rye, with a subcanopy layer composed of both native and non-native species, including prickly lettuce, yarrow, tall tumbled mustard, and arrowleaf balsamroot.

The Category 4 Intermittent or Ephemeral Streams consisted of ephemeral streams mapped within the Project Area during the wetlands and waters delineation, and intermittent streams and intermittent riverine wetlands mapped by NHD and NWI, respectively, within the 0.5-mile buffer of the

Project Area; Category 4 Intermittent or Ephemeral Streams consisted of non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams. The Category 4 Perennial Streams consisted of perennial streams mapped by NHD within the 0.5-mile buffer of the Project Area and are similarly non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams (Attachment 2). The Category 5 Intermittent or Ephemeral Streams consisted of ephemeral streams mapped within the Project Area during the wetlands and waters delineation that were disturbed (e.g., located between cultivated fields or along roads). The Category 5 Scrub-shrub Wetland consisted of a wetland dominated by multiflora rose (*Rosa multiflora*) and cattail (*Typha* sp.) observed by the habitat categorization surveyors within the 0.5-mile buffer of the Project Area. The Category 4 Emergent Wetland consisted of an emergent wetland mapped by NWI within the 0.5-mile buffer of the Project Area.

Surveyors documented two unique features during surveys: an abandoned building and cliffs (Figure 3; Attachment 4, Photos 5 and 6). The abandoned building consisted of an old barn adjacent to two snags and was located at the southern edge of the Project Area, along Sand Hollow; the building and snags have the potential to provide suitable habitat for bats and birds, in particular cavity nesting birds. The cliffs were located underneath a quarry and adjacent to mature sagebrush habitat within Sand Hollow and may provide nesting habitat for birds; the cliffs were located adjacent to Highway 207, immediately south of the highway on land owned by the State of Oregon.

4.2 Rare Plant Surveys

In response to a formal request to ORBIC, Tetra Tech received vascular plant element occurrence records in the vicinity of the Project Area, which included one element occurrence record for the state threatened Laurence's milkvetch (*Astragalus collinus* var. *laurentii*), approximately 0.5-mile north of the Project Area at its closest location (ORBIC 2021). The desktop review identified this species as the only federal or state threatened, endangered, or candidate species with potential to occur within the Project Area. Tetra Tech identified several other vascular plant species tracked by ORBIC that have the potential to occur at the Project (Attachment 3).

Tetra Tech conducted field surveys for rare plants within the Project Area on June 20 and 21, 2022, concurrent to habitat categorization surveys. A total of 42 vascular plant species were observed in the Project Area (Attachment 5). Of the 42 species observed, 22 (52 percent) are non-native species. No target or ORBIC-tracked species (Attachment 3) were observed within the Project Area. Approximately 2 acres within the Project Area were not accessible at the time of surveys but were determined based on aerial photos and observations from adjacent, accessible areas to have a low likelihood of supporting Laurence's milkvetch based on the abundance of non-native species and lack of typical suitable habitat. Additionally, due to the abundance of non-native invasive species and noxious weeds as well as the existing disturbance in general, very little typical habitat for Laurence's milkvetch was observed within the Project Area overall.

Tetra Tech recorded three ODA-listed (ODA 2020) and one additional Morrow County listed (Morrow County 2022) noxious weed species within and adjacent to the Project Area during surveys and documented the location and the estimated number of plants or the extent of the populations observed (Table 2, Figure 3). Table 2 lists the noxious weed species observed, their noxious weed

designation (i.e., status), and the frequency of observations. State and county-listed noxious weed lists are presented in Attachment 6.

Table 2. Noxious Weeds Observed During Surveys

Scientific Name	Common Name	Oregon State Status ¹	Morrow County Status ²	Frequency
<i>Aegilops cylindrica</i>	jointed goatgrass	B	B	Few small patches
<i>Chondrilla juncea</i>	rush skeletonweed	B*, T	A	Occasional single plants
<i>Secale cereal</i>	cereal rye	–	B	Scattered large-sized patches
<i>Tribulus terrestris</i>	puncture vine	B*	B	Few small to large-sized patches

1. Oregon State "A" designated weeds: Weeds of known economic importance which occur in the state in small enough infestations to make eradication/containment possible; or which are not known to occur, but their presence in neighboring states makes future occurrence in Oregon seem imminent. "B" designated weeds: Weeds of economic importance which are regionally abundant, but which may have limited distribution in some counties. "T" Designated Weed: A priority noxious weed designated by the Oregon State Weed Board as a target for which the ODA will develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the "A" or "B" list. Species marked with a (*) are targeted for biocontrol (ODA 2020).

2. Morrow County Noxious Weeds – "A" List – Any plant that is determined by the weed advisory board, and so declared by the County Board of Commissioners to be injurious to public health, crops, livestock, land, or property under provisions of Oregon State Statute and thus mandated for control. Weeds of Economic Importance – "B" List – Weeds of limited distribution in the county and subject to intensive control or eradication where feasible (Morrow County 2022).

Cereal rye (*Secale cereal*) was abundant in the previously disturbed areas outside of active crop fields; it is primarily found in previously disturbed ground. Rush skeletonweed (*Chondrilla juncea*) was found in isolated populations on the hillside between active cropland and a gravel county road. Puncture vine (*Tribulus terrestris*) and jointed goatgrass (*Aegilops cylindrica*) were found in the highly disturbed border in between active cropland and roads.

Three of the four noxious weed species observed were state and/or County "B" listed weeds (Table 2; Morrow County 2022, ODA 2020). One species, rush skeletonweed, is also an "A" List Weed in Morrow County and a state "T" designated weed, meaning that ODA has targeted this species for prevention and control (Morrow County 2022; ODA 2020).

5.0 SUMMARY AND CONCLUSIONS

Based on vegetative characteristics, Tetra Tech mapped six upland habitat subtypes and categories within the Habitat Categorization Survey Area: Category 6 Agriculture, Pasture, and Mixed Environs; Category 6 Urban and Mixed Environs; Category 2, 4 and 5 Eastside Grassland, and Category 3 Sagebrush Shrub-Steppe. Tetra Tech also mapped five wetland and water habitat subtypes and categories within the Habitat Categorization Survey Areas based on desktop resources and wetland delineation surveys: Category 4 and 5 Intermittent and Ephemeral Streams; Category 4 Perennial Streams; Category 4 Emergent Wetland; and Category 5 Scrub-shrub Wetland. Two unique features that may provide bird and bat habitat were documented: an abandoned building and a cliff. Although these habitat types and features may provide some value to wildlife, the Habitat Categorization Survey Area is relatively disturbed, dominated by agriculture as well as invasive annual species and subject to ongoing human disturbance.

As described in Section 4.1, habitat at the Project meets the definition of Categories 2, 3, 4, 5, and 6 as defined in OAR 635-415-0025. The mitigation goal for Category 2 habitat is no net loss of habitat

quantity or quality and to provide a net benefit of habitat quantity or quality, with a mitigation strategy of in-kind and in-proximity mitigation. The mitigation goal for Category 3 and 4 habitat is no net loss of habitat quantity or quality. For Category 3 the mitigation strategy is in-kind and in-proximity mitigation. Category 4 habitat has a mitigation strategy that is in-kind or out-of-kind, and in-proximity or off-proximity. The mitigation goal for Category 5 habitat is to provide a net benefit in habitat quantity or quality with a mitigation strategy of actions that improve habitat conditions. The mitigation goal for Category 6 habitat is to minimize impact and the mitigation strategy is to minimize direct habitat loss and avoid off-site impacts. Permanent impacts to Category 2, 3, 4, and 5 habitat typically require mitigation in order to meet ODFW Fish and Wildlife Habitat Mitigation Policy goals (e.g., permanent impacts to Category 3 and 4 habitat are typically mitigated for at a 1:1 ratio; mitigation for impacts to Category 2 and 5 habitat are typically greater than and less than a 1:1 ratio, respectively, and determined in coordination with ODFW on a Project-specific basis). No mitigation is required for impacts to Category 6 habitat. Therefore, mitigation will be required as a condition of Project development if impacts extend beyond areas mapped as Category 6.

During surveys within the Project Area, Tetra Tech did not observe the one target plant species that had the potential to occur at the Project—Laurence’s milkvetch—or any of the ORBIC tracked species. Tetra Tech mapped four state and/or county noxious weeds. In general, the Project Area is dominated by agriculture and non-native, invasive species, and is subject to ongoing human disturbance.

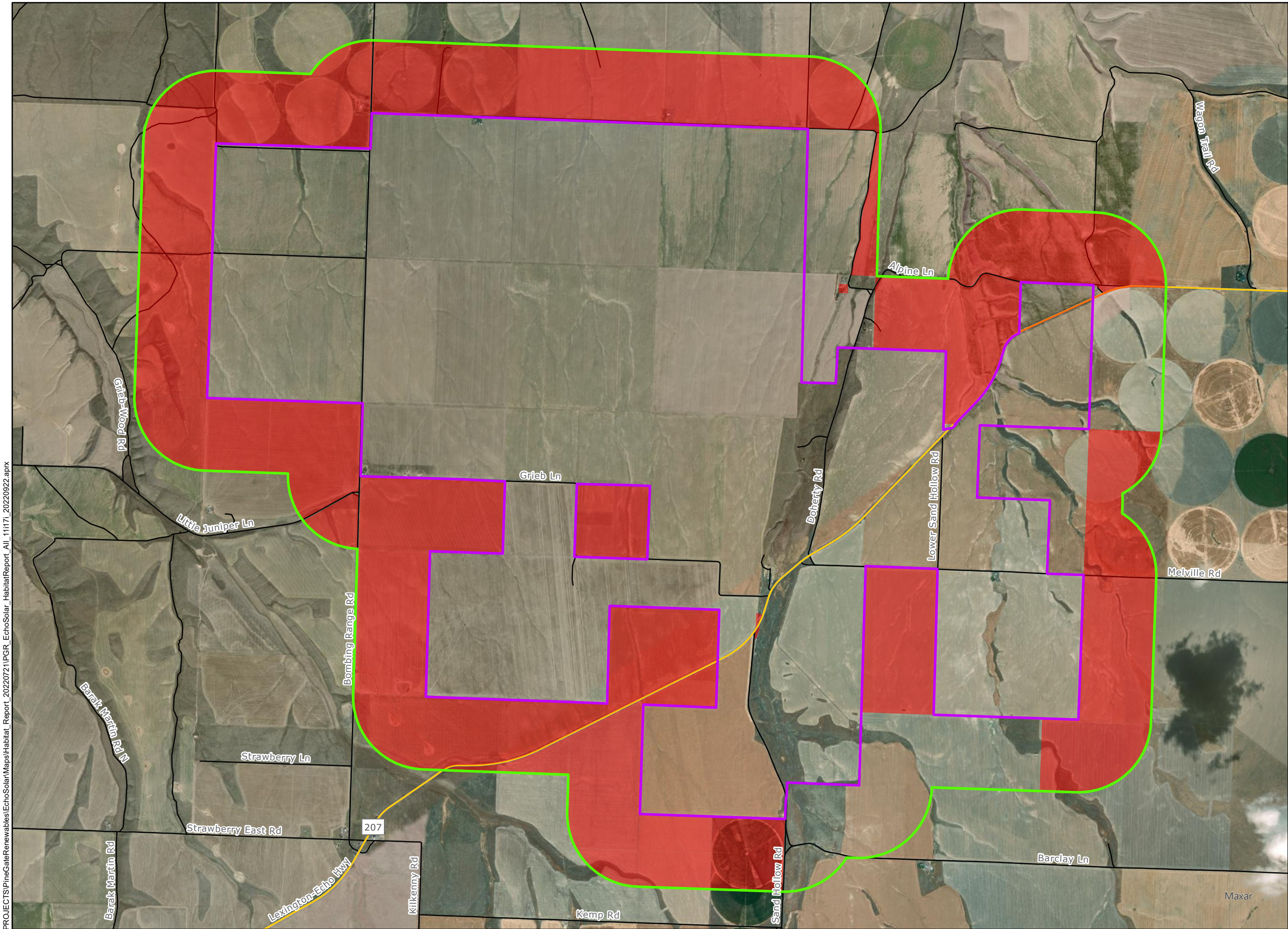
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FIGURES

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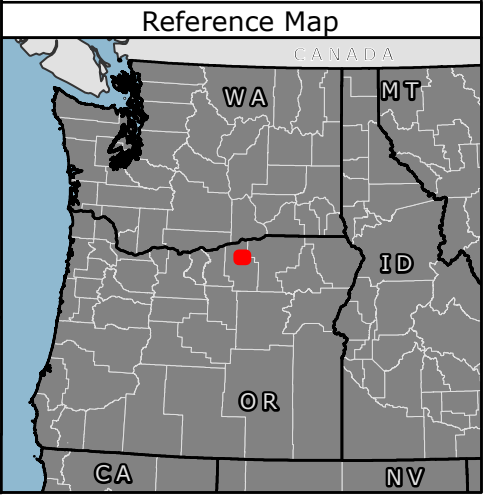


Echo Solar Project

Figure 1
Habitat Categorization
and
Rare Plant Survey Areas

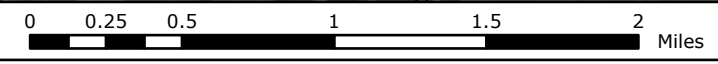
MORROW COUNTY, OR

- Rare Plant Survey Area (Project Area)
- Habitat Categorization Survey Area (Project Area plus 0.5-mile buffer)
- No Access Granted
- State Highway
- Local Roads



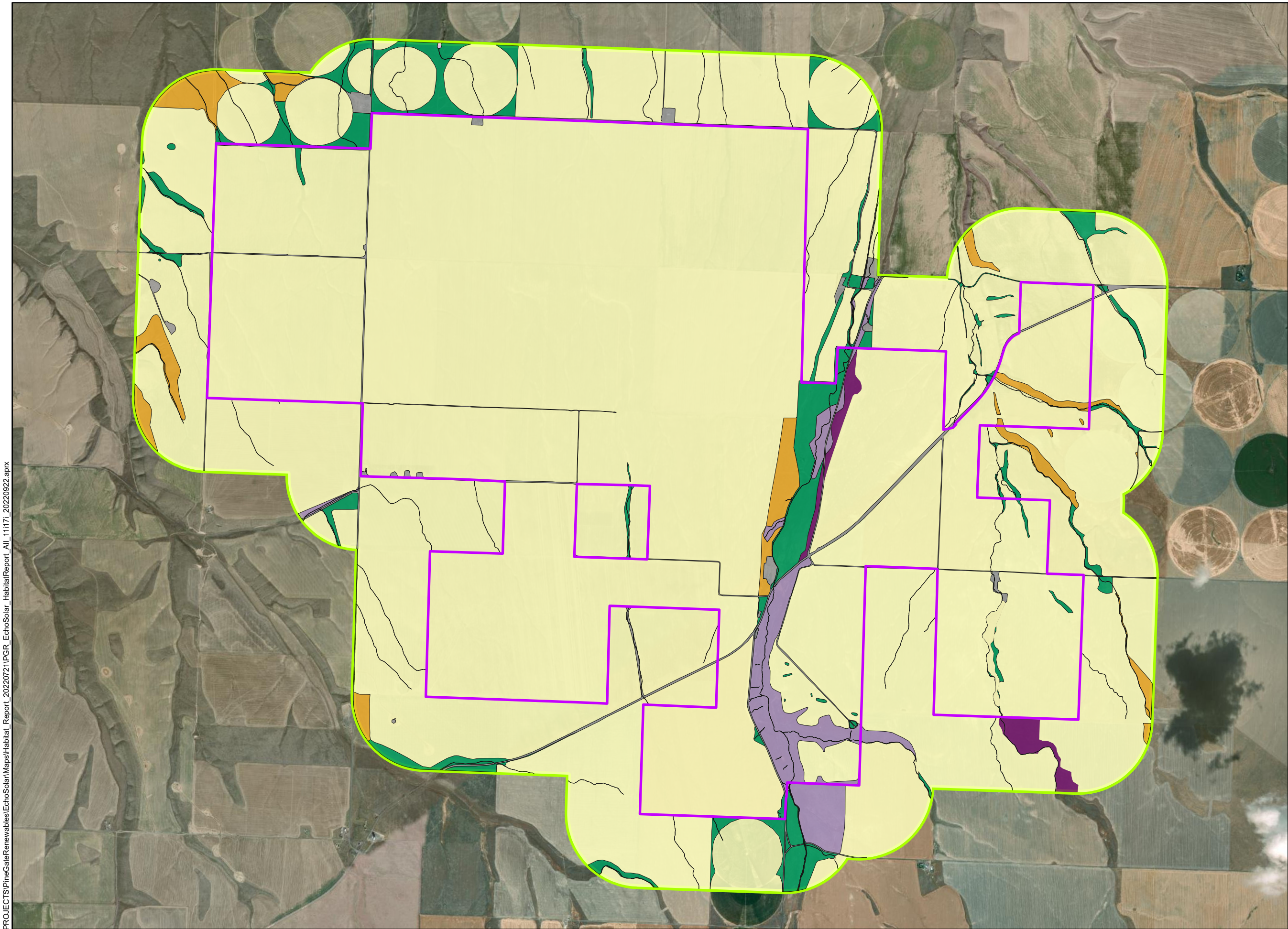
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WGS 1984 UTM Zone 11N



NOT FOR CONSTRUCTION

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Echo Solar Project

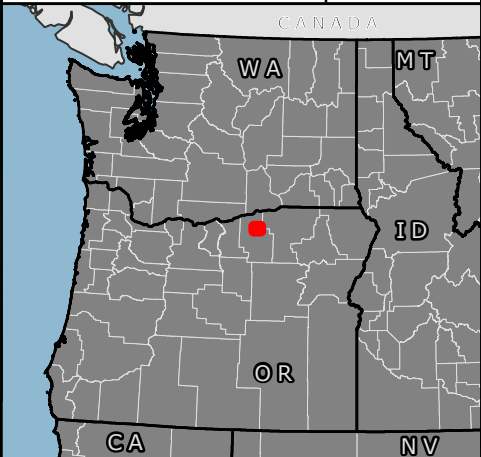
Figure 2
Habitat Categorization
Results

MORROW COUNTY, OR

- Project Area
- Habitat Survey Area
- Habitat Category, Subtype**
- 2, Eastside Grasslands
- 3, Sagebrush Shrub-steppe
- 4, Eastside Grasslands
- 4, Freshwater Emergent Wetland
- 4, Intermittent or Ephemeral Stream
- 4, Perennial Stream
- 5, Eastside Grasslands
- 5, Intermittent or Ephemeral Stream
- 5, Shrub Scrub Wetland
- 6, Orchards, Vineyards, Wheat Fields, Other Row Crop
- 6, Urban and Mixed Environs



Reference Map



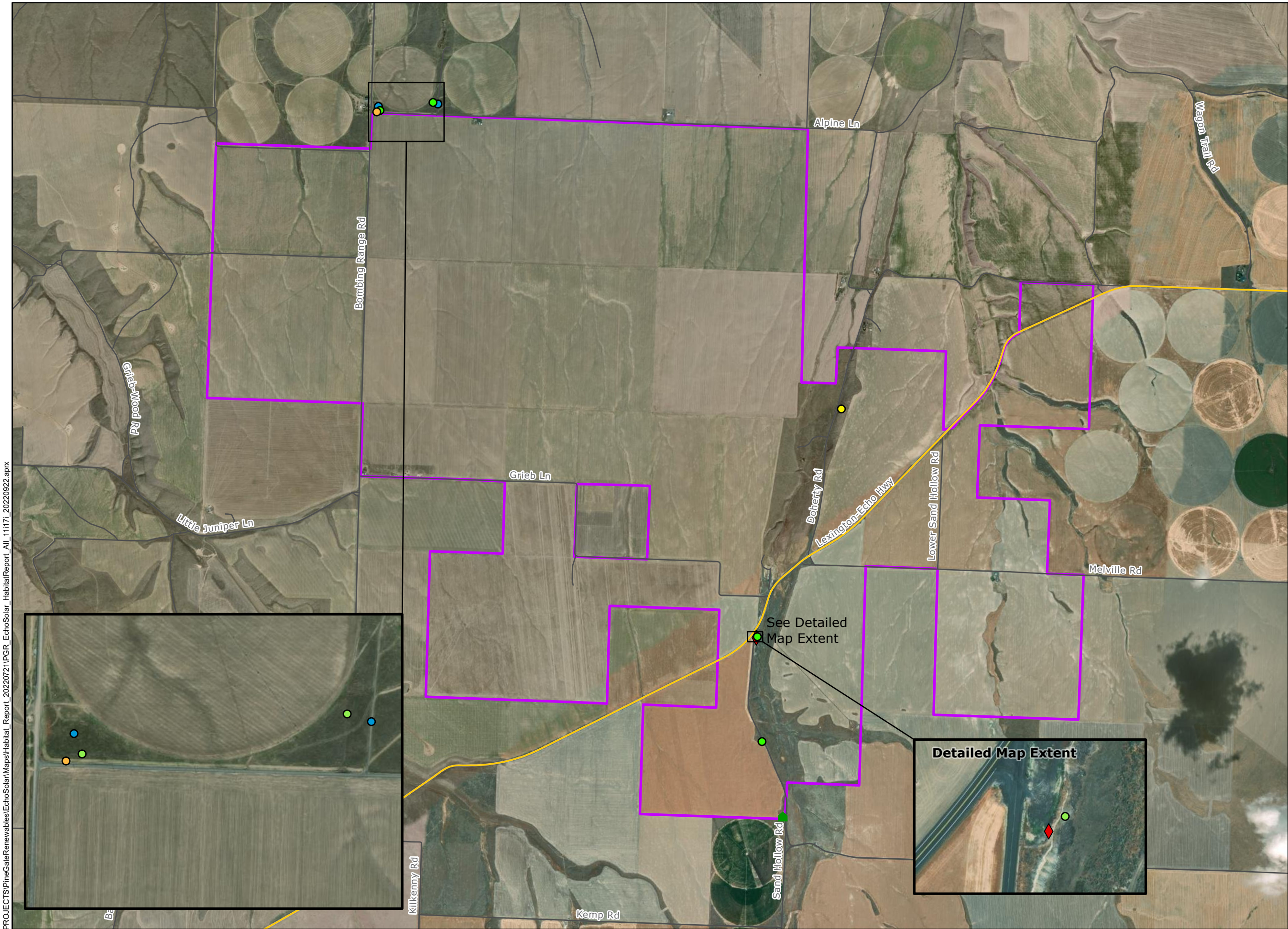
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WGS 1984 UTM Zone 11N

0 0.25 0.5 1 1.5 2 Miles

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Echo Solar Project

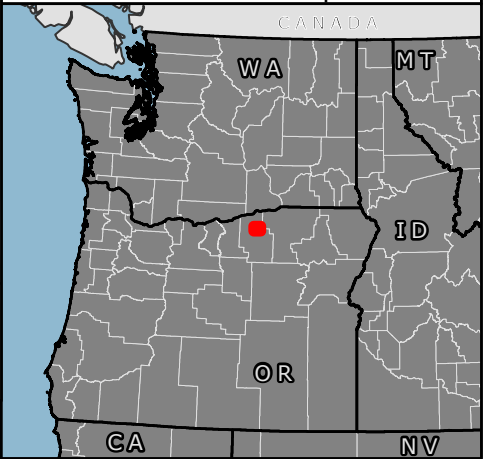
Figure 3
Noxious Weeds
and
Unique Features

MORROW COUNTY, OR

- Project Area
- State Highway
- Local Roads
- Noxious Weeds**
 - Cereal Rye (County B Listed)
 - Jointed Goatgrass (County and State B Listed)
 - Puncturevine (County and State B Listed)
 - Rush Skeletonweed (County A Listed, State B Listed)
- Unique Features**
 - Abandoned Building
 - Cliffs



Reference Map



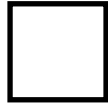
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WGS 1984 UTM Zone 11N

0 0.25 0.5 1 1.5 2 Miles

NOT FOR CONSTRUCTION

ATTACHMENT 1: HABITAT CATEGORIZATION FIELD DATASHEET

ECHO SOLAR HABITAT CATEGORIZATION**HABITAT CATEGORY**

Date _____ Surveyor(s) _____

Site Description**EFSC Habitat Types and Subtypes:** (circle one habitat subtype)**Open water-lakes, rivers, streams:**

Permanent ponds/lakes (PL) / Seasonal ponds (SP) / Perennial streams (PS) / Intermittent or ephemeral streams (IS)

Wetlands:

Emergent wetlands (EW) / Scrub-shrub wetlands (SW)

Upland grassland, shrub-steppe and shrubland:

Eastside grassland (EG) / Rabbitbrush-snakeweed shrubland (RS) / Sagebrush shrub-steppe (SS)

Agriculture, pasture, and mixed environs:

Planted grasslands (PG) / Orchards, vineyards, wheat fields, other row crops (AG) / Irrigated pastures and hay meadows (PA)

Cliffs, caves and talus (CT)**Urban and mixed environs (UR)****Notes if confusion:**

Detailed Vegetation Measurements**Dominant $\geq 20\%$, Subdominant 10-20%***Trees***

Dominant species _____

Subdominant species _____

Avg. dbh (in.) _____ Canopy closure (%) _____ No. subcanopy layers _____

Percent native cover _____ Percent bare ground or duff _____

Stumps present? Yes No

Snags present? Yes No Snag stage (circle one) 1 2 3 4 5 Abundance ____/ac

Forest phase per Brown: GF SHR OSP CSPA LGSAA OGDD

Shrubs

Dominant species _____

Subdominant species _____

Canopy closure (%) _____ No. subcanopy layers _____

Percent native cover _____ Percent bare ground or duff _____

Percent cryptobiotic crust (if applicable) _____

Herbs & Grasses

Dominant species _____

Subdominant species _____

Canopy closure (%) _____ No. subcanopy layers _____

Percent native cover _____ Percent bare ground or duff _____

Percent cryptobiotic crust (if applicable) _____

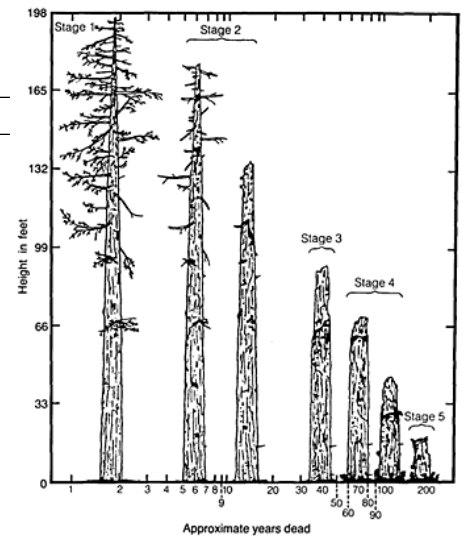


Figure 5.—Five stages of deterioration of Douglas-fir snags (adapted from Cline et al. 1980).

Other Descriptions

Disturbance type(s), check all that apply within the polygon, and for disturbances outside but in view of the polygon, insert the estimated distance in meters between the polygon edge and the disturbance:

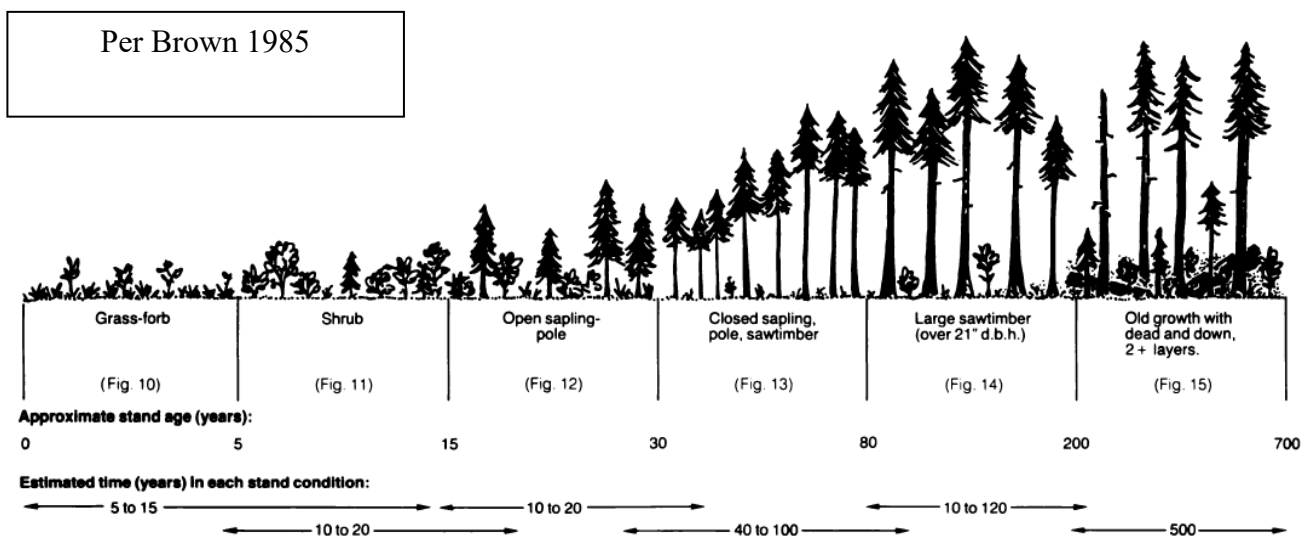
<input type="checkbox"/> Grazing	<input type="checkbox"/> Thinning	<input type="checkbox"/> Wind Farm
<input type="checkbox"/> Invasive plants	<input type="checkbox"/> Quarry	<input type="checkbox"/> Fire
<input type="checkbox"/> Clearcut Logging	<input type="checkbox"/> Residence or Farm	<input type="checkbox"/> Other Building
<input type="checkbox"/> Railroad	<input type="checkbox"/> Communications Tower	<input type="checkbox"/> Campground
<input type="checkbox"/> Dirt Road	<input type="checkbox"/> Gravel Road	<input type="checkbox"/> Asphalt road
<input type="checkbox"/> Row Crop	<input type="checkbox"/> Urban Area	<input type="checkbox"/> Erosion
<input type="checkbox"/> Recreation, if so what kind? _____		Other (please specify) _____

Vegetation height:

Any sensitive species seen or habitat specifically noted (if yes, please explain)? Yes No

Any special features (for example: caves, mine openings, cliffs, rimrock, rock outcrops, talus slopes, abandoned buildings, large snags, abandoned wood bridges, balds and bluffs, wetland habitats (if yes, please explain)? Yes No

Any additional notes:



Forested habitat descriptions: OG=at least >21 dbh with two canopy layers and downed logs, Lg Saw=21-35 dbh with less than two canopy layers, CSPA=>60 canopy cover and <21dbh, OSP= <60% canopy cover, 1-9dbh, Cat 5= <1 dbh, >60% canopy cover

ATTACHMENT 2: HABITAT TYPES AND SUBTYPES WITH POTENTIAL TO OCCUR AT THE ECHO SOLAR PROJECT

Habitat Type ¹	Habitat Subtype ¹	Category 1 ²	Category 2 ²	Category 3 ²	Category 4 ²	Category 5 ²	Category 6 ²
Upland Grassland, Shrub-steppe, and Shrubland	Eastside Grasslands, Rabbitbrush/Snakeweed Shrubland, and Shrub-Steppe Habitats	Active Washington ground squirrel colony with a 785-foot buffer of suitable ground squirrel habitat.	4,921-foot (1.5-km) buffer on active WAGS colony except where there are habitat barriers to dispersal.				
Open Water – Lakes, Rivers, Streams	Permanent Ponds/Lakes <i>Open water areas, including natural lakes, reservoirs, stock ponds, beaver ponds</i>		Natural lakes or beaver ponds with high-quality habitat.	Most other open water areas with lower-quality habitat (for example, some habitat requisites missing or bullfrogs abundant).	Highly degraded open water area, dominated by non-native vegetation or no vegetation around margins, generally on the east side of the Cascades (for example, highly degraded stock pond).		
	Seasonal Ponds <i>Open water areas that contain water part of the year</i>		Seasonal ponds with high quality, mostly native vegetation.	Seasonal ponds with lower-quality habitat that is still dominated by native plant species.	Highly degraded, with a higher proportion of non-native vegetation or no vegetation around margins (for example, a west side seasonal stock pond).	Habitat almost completely dominated by non-native plant species or otherwise highly degraded.	
	Perennial Streams <i>Mapped by USGS having permanent (year-round) flow</i>		Fish-bearing natural stream channels that support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provides good spawning (gravel beds present, non-embedded) and/or rearing habitat, with native emergent, shrub, or forested riparian margins.	Fish-bearing natural stream channels that do not support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provide marginal spawning (gravel present in pockets/30% embedded) and/or rearing habitat; or non-fish-bearing natural stream channels which drain into fish-bearing streams based on StreamNet data.	Non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams.		
	Intermittent or Ephemeral Streams <i>Mapped by USGS as intermittent</i>		Fish-bearing natural stream channels that support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provides good spawning (gravel beds present, non-embedded) and/or rearing habitat, with native emergent, shrub, or forested riparian margins.	Fish-bearing natural stream channels that do not support native, migratory fish based on StreamNet data or input from ODFW fish biologists; and provide marginal spawning (gravel present in pockets/30% embedded) and/or rearing habitat; or non-fish-bearing natural stream channels which drain into fish-bearing streams based on StreamNet data.	Non-fish-bearing natural stream channels that do not directly drain into fish-bearing streams.	Non-fish-bearing ephemeral streams or excavated channels with high restoration potential; not important habitat.	
Wetlands	Emergent Wetlands <i>Emergent wetlands with herbaceous vegetation</i>	Any bog or fen.	High quality habitat, dominated by native species.	Mixture of native and non-native plant species and low to moderate disturbance.	Mixture of native and non-native plant species and moderate to high disturbance.	Farmed or previously filled wetlands; highly disturbed, dominated by non-native plant species.	

Habitat Type ¹	Habitat Subtype ¹	Category 1 ²	Category 2 ²	Category 3 ²	Category 4 ²	Category 5 ²	Category 6 ²
	Scrub-shrub Wetlands <i>Wetlands with woody vegetation less than 20 feet tall</i>	Any bog or fen.	High quality habitat, dominated by native plant species.	Mixture of native and non-native plant species and low to moderate disturbance.		Farmed or previously filled wetlands; highly disturbed, dominated by non-native plant species.	
Upland Grassland, Shrub-steppe, and Shrubland	Eastside Grasslands <i>Grassland areas with few shrubs (not irrigated or cultivated/planted)</i>		Undisturbed habitat dominated by native species (i.e., greater than 75% ground cover is native), <u>OR</u> moderately disturbed habitat (i.e., between 50 to 75% ground cover is native) that contains a sagebrush component.	Moderately disturbed habitat with a mix of natives and non-natives (i.e., between 50 to 75% ground cover is native), <u>OR</u> highly disturbed habitat (i.e., between 15 to 50% ground cover is native) that contains a sagebrush component.	Highly disturbed habitat with a high percentage of non-native plant species (i.e., between 15 to 50% ground cover is native), <u>OR</u> very highly disturbed habitats (i.e., less than 15% ground cover is native) that contain a sagebrush component	Very highly disturbed habitats with a high percentage of non-native plant species (i.e., less than 15% ground cover is native), but which <u>do not</u> contain a sagebrush component.	
	Rabbitbrush / Snakeweed Shrubland <i>Grassland and shrubland mosaic, with a dominate shrub mix of rabbitbrush and snakeweed providing at least 40% ground cover, and not containing a sagebrush component</i>		Undisturbed habitat dominated by native species (i.e., greater than 75% ground cover is native) with a dominant rabbitbrush and/or snakeweed component.	Moderately disturbed habitat with a mix of natives and non-natives (i.e., between 50 to 75% ground cover is native), with a dominant rabbitbrush and/or snakeweed component.	Highly disturbed habitat with a high percentage of non-native plant species (i.e., between 15 to 50% ground cover is native), with a dominant rabbitbrush and/or snakeweed component.	Very highly disturbed habitats with a high percentage of non-native plant species (i.e., less than 15% ground cover is native), with a dominant rabbitbrush and/or snakeweed component.	
	Sagebrush Shrub-Steppe <i>Grassland and shrubland mosaic, containing a sagebrush component</i>		High degree of cover; contains native shrubs, sagebrush and native grasses; good structure/forage for wildlife. Understory dominated by native species. More diversity than Category 3 habitat.	Habitat with sagebrush that is limited within the area (e.g., relatively undisturbed habitat); high degree of cover; moderate cover by weeds, moderate structure/forage for wildlife.	Important wildlife habitat that contains sagebrush and is moderately to heavily degraded and weedy habitat.	Very low quality dominated by non-native species but with a sagebrush component; with high restoration potential.	
Agriculture, Pasture, and Mixed Environs	Planted Grasslands			Croplands planted to grassland with characteristics necessary to potentially provide habitat for sensitive wildlife due to cover and forage quality.	Croplands planted to grassland that lack later seral stage vegetative communities or are of less importance as wildlife habitat due to management or location.	Croplands planted to grassland that lack later seral stage vegetative communities and are highly disturbed or degraded, and have high restoration potential.	
	Orchards, Vineyards, Wheat Fields, Other Row Crops						Active agricultural areas with low potential for restoration.
	Irrigated Pastures and Hay Meadows				Potential habitat for wildlife.		
Cliffs, Caves, and Talus		Sites with bat hibernacula.	Sites with known bat colonies.	Sites without bat colonies.			
Urban and Mixed Environs							All developed areas.
<div>1. Habitat Types and Subtypes adapted from Johnson and O'Neil (2001).</div> <div>2. Habitat Category descriptions developed based on Oregon Department of Fish and Wildlife’s Fish and Wildlife Habitat Mitigation Policy (Oregon Administrative Rule 635-415-0025). "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. "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. "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. "Habitat Category 4" is important habitat for fish and wildlife species. "Habitat Category 5" is habitat for fish and wildlife having high potential to become either essential or important habitat. "Habitat Category 6" is habitat that has low potential to become essential or important habitat for fish and wildlife.</div>							

ATTACHMENT 3: FEDERAL AND STATE-LISTED AND ORBIC-TRACKED VASCULAR PLANT SPECIES WITH THE POTENTIAL TO OCCUR AT THE ECHO SOLAR PROJECT

Attachment 3. Federal and State-Listed and ORBIC-tracked Vascular Plant Species with Potential to Occur at the Echo Solar Project

Scientific Name	Common Name	Federal	State	ORBIC	Habitat	Survey Period
<i>Abronia mellifera</i>	white sand verbena			3	Dunes and sandy soils at low elevations (328-6562 feet).	Flowers May–July
<i>Astragalus collinus</i> var. <i>laurentii</i>	Laurence's milkvetch	SOC	T	1	Sandy or rocky soils overlying basalt on dry slopes mostly at elevations between 2,000 to 3,400 feet, although species has been reported at elevations as low as 400 feet. Documented nearby.	Fruits needed; late May–August
<i>Astragalus conjunctus</i> var. <i>conjunctus</i>	Idaho milkvetch			3	Dry rocky slopes, scablands, and hilltops throughout the sagebrush desert, typically above 2,000 feet. Nearby.	Bloom time typically April through June
<i>Astragalus sclerocarpus</i>	The Dalles (Stalked-pod) milkvetch			4	Dunes and sandy barrens at low elevations; dry sandy banks and terraces in the steppe and lower montane zones. Documented nearby.	Flowers in June
<i>Astragalus succumbens</i>	Columbia milkvetch			4	Sagebrush deserts, sandy barrens, and lower foothills.	Blooms April–June
<i>Boechera cusickii</i>	Cusick's rockcress			3	Sagebrush flats to open ponderosa pine forests, often on lithosol; basaltic bluffs, rocky slopes, rock crevices, gravelly hillsides, sagebrush hills, outcrops of volcanic rock at 1,965 -5,905 feet. Echo is below elevation range.	Blooms March–May
<i>Heliotropium curassavicum</i>	salt heliotrope			2	Saline places at low elevations, often in the beds of dried ponds. Likely lack of suitable habitat at Echo.	June–September
<i>Juncus interior</i>	Interior rush			2	Dry, upland sites in prairies, exposed sites in disturbed areas, ditches in sandy or clayey soil.	May–June
<i>Leymus flavescent</i>	sand wildrye			2	Occurs in sandy soils throughout its range. Associated with <i>Hesperostipa comata</i> . Has also been found on sandy roadsides.	June–July
<i>Penstemon acuminatus</i> var. <i>acuminatus</i>	Sand dune penstemon			3	Dry, open, sandy places at low elevations.	Flowers April–June
<i>Penstemon deustus</i> var. <i>variabilis</i>	hot-rock penstemon			1	Dry foothills and lowlands, on open, dry, thin soils over basalt; 1,800 - 3,200 feet. Echo is below elevation range.	June–July
<i>Physaria douglasii</i> ssp. <i>douglasii</i>	Columbia bladderpod			3	Sagebrush desert, especially near or in juniper or ponderosa pine woodlands.	March–July
<p>Note: Highlighted species are target species (i.e., Federal and State Threatened, Endangered, and Candidate Vascular Plant Species with Potential to Occur at the Project).</p> <p>Federal: SOC = Species of Concern</p> <p>State: T= Threatened</p> <p>ORBIC: 1=Threatened or Endangered Throughout Range, 2=Threatened or Endangered in Oregon but Secure Elsewhere, 3=Review, 4=Watch</p> <p>Resources: ODA 2022; ORBIC 2019, 2021; OFP 2022a, 2022b; USFWS 2021, 2022; WDNR 2022</p>						

ATTACHMENT 4: SELECT PHOTOGRAPHS OF HABITATS TAKEN DURING 2022 SURVEYS AT THE ECHO SOLAR PROJECT



Photo 1. Category 5, Upland Grassland, Shrub-steppe, and Shrubland, Eastside Grassland.



Photo 2. Category 4, Upland Grassland, Shrub-steppe, and Shrubland, Eastside Grassland.



Photo 3. Category 3, Upland Grassland, Shrub-steppe, and Shrubland, Sagebrush Shrub-Steppe.



Photo 4. Category 2, Upland Grassland, Shrub-steppe, and Shrubland, Eastside Grassland.



Photo 5. Cliffs (Unique Feature) underneath quarry and along mature sagebrush habitat.



Photo 6. Abandoned building (Unique Feature) including an abandoned barn and two snags.



Photo 7. Category 6 Urban and Mixed Environs. Existing substation.



Photo 8. Category 6 Agriculture, Pasture, and Mixed Environs, Orchards, Vineyards, Wheat Fields, Other Row Crops.

ATTACHMENT 5: VASCULAR PLANT SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 5. VASCULAR PLANT SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

Common Name	Scientific Name
Grasses	
bluebunch wheatgrass ¹	<i>Pseudoroegneria spicata</i>
bulbous bluegrass	<i>Poa bulbosa</i>
cheatgrass	<i>Bromus tectorum</i>
cattail	<i>Typha</i> sp.
cereal rye ²	<i>Secale cereale</i>
foxtail millet	<i>Setaria italica</i>
intermediate wheatgrass	<i>Thinopyrum intermedium</i>
jointed goatgrass ²	<i>Aegilops cylindrica</i>
needle and thread grass ¹	<i>Hesperostipa comata</i>
Sandberg bluegrass ¹	<i>Poa secunda</i>
squirreltail ¹	<i>Elymus elymoides</i>
rattail fescue	<i>Vulpia myuros</i>
common barley	<i>hordeum vulgare</i>
Forbs	
arrowleaf balsamroot ¹	<i>Balsamorhiza sagittata</i>
common flax	<i>Linum usitatissimum</i>
redstem stork's-bill	<i>Erodium cicutarium</i>
common yarrow ¹	<i>Achillea millefolium</i>
fiddleneck	<i>Amsinckia</i> sp.
Gray's biscuitroot ¹	<i>Lomatium grayi</i>
mariposa lily	<i>Calochortus</i> sp.
multiflora rose	<i>Rosa multiflora</i>
nine-leaf desert lomatium ¹	<i>Lomatium triternatum</i>
prickly lettuce	<i>Lactuca serriola</i>
puncture vine ²	<i>Tribulus terrestris</i>
rush skeletonweed ²	<i>Chondrilla juncea</i>
Russian thistle	<i>Salsola tragus</i>
salsify	<i>Tragopogon</i> sp.
shaggy fleabane ¹	<i>Erigeron pumilus</i>
snow buckwheat ¹	<i>Eriogonum niveum</i>
tall tumbled mustard	<i>Sisymbrium altissimum</i>
woolly plantain ¹	<i>Plantago patagonica</i>
woollypod milkvetch ¹	<i>Astragalus purshii</i>
Shrubs	
big sagebrush ¹	<i>Artemisia tridentata</i>

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 5. VASCULAR PLANT SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

Common Name	Scientific Name
broom snakeweed ¹	<i>Gutierrezia sarothrae</i>
yellow rabbitbrush ¹	<i>Chrysothamnus viscidiflorus</i>
rubber rabbitbrush ¹	<i>Ericameria nauseosa</i>
Trees	
bigleaf maple ¹	<i>Acer macrophyllum</i>
black locust ¹	<i>Robinia pseudoacacia</i>
Italian poplar	<i>Populus nigra</i> var. <i>italica</i>
ponderosa pine ¹	<i>Pinus ponderosa</i>
Russian olive	<i>Elaeagnus angustifolia</i>
western juniper ¹	<i>Juniperus occidentalis</i>
1. Native 2. State and/or County Noxious Weed	

ATTACHMENT 6: OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 6. OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

Common Name	Scientific Name	Oregon State Status ¹	Morrow County Status ²
African rue	<i>Peganum harmala</i>	A (T)	-
Atlantic ivy	<i>Hedera hibernica</i>	B	-
Armenian (Himalayan) blackberry	<i>Rubus armeniacus</i> (R. procerus, R. discolor)	B	-
Barbed goatgrass	<i>Aegilops triuncialis</i>	A (T)	-
Biddy-biddy	<i>Acaena novae-zelandiae</i>	B	-
Bigseed dodder	<i>Cuscuta indecora</i>	B	-
Bohemian knotweed	<i>Fallopia x bohemica</i>	B	-
Brazilian waterweed; South American waterweed	<i>Egeria densa</i>	B	-
Buffalobur	<i>Solanum rostratum</i>	B	-
Bull thistle	<i>Cirsium vulgare</i>	B	-
Butterfly bush	<i>Buddleja davidii</i> (B.variabilis)	B	-
Camelthorn	<i>Alhagi pseudalhagi</i>	A	-
Canada thistle	<i>Cirsium arvense</i>	B	B
Cape-ivy	<i>Delairea odorata</i>	A (T)	-
Cereal rye	<i>Secale cereal</i>	-	B
Coltsfoot	<i>Tussilago farfara</i>	A	-
Common bugloss	<i>Anchusa officinalis</i>	B (T)	-
Common cordgrass	<i>Spartina anglica</i>	A	-
Common crupina	<i>Crupina vulgaris</i>	B	A
Common frogbit	<i>Hydrocharis morus-ranae</i>	A	-
Common reed	<i>Phragmites australis</i> ssp. australis	B	-
Creeping yellow cress	<i>Rorippa sylvestris</i>	B	-
Cutleaf teasel	<i>Dipsacus laciniatus</i>	B	-
Dalmatian toadflax	<i>Linaria dalmatica</i>	B (T)	A
Dense-flowered cordgrass	<i>Spartina densiflora</i>	A (T)	-
Diffuse knapweed	<i>Centaurea diffusa</i>	B	B
Dodder; Field dodder	<i>Cuscuta campestris</i>	-	B
Dyers woad	<i>Isatis tinctoria</i>	B	-
English hawthorn	<i>Crataegus monogyna</i>	B	-
English ivy	<i>Hedera helix</i>	B	-
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	B	-
False brome	<i>Brachypodium sylvaticum</i>	B	-
False indigo bush	<i>Amorpha fruticosa</i>	B	-

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 6. OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

Common Name	Scientific Name	Oregon State Status ¹	Morrow County Status ²
Field bindweed	<i>Convolvulus arvensis</i>	B	B
Five-angled dodder	<i>Cuscuta pentagona</i>	B	-
Flowering rush	<i>Butomus umbellatus</i>	-	A
French broom	<i>Genista monspessulana</i>	B	-
Garlic mustard	<i>Alliaria petiolata</i>	B (T)	-
Giant knotweed	<i>Fallopia sachalinense</i> (<i>Polygonum</i>)	B	-
Giant reed	<i>Arundo donax</i>	B (T)	-
Goatsrue	<i>Galega officinalis</i>	A (T)	-
Gorse	<i>Ulex europaeus</i>	B (T)	-
Hairy whitetop	<i>Lepidium pubescens</i> (<i>Cardaria</i>)	B	-
Halogeton	<i>Halogeton glomeratus</i>	B	-
Herb Robert geranium	<i>Geranium robertianum</i>	B	-
Himalayan knotweed	<i>Fallopia polystachyum</i> (<i>Polygonum</i>)	B	-
Hoary alyssum	<i>Berteroa incana</i>	A (T)	-
Houndstongue	<i>Cynoglossum officinale</i>	B	A
Hydrilla	<i>Hydrilla verticillata</i>	A	-
Iberian starthistle	<i>Centaurea iberica</i>	A (T)	-
Italian thistle	<i>Carduus pycnocephalus</i>	B	-
Japanese dodder	<i>Cuscuta japonica</i>	A	-
Japanese knotweed (fleece flower)	<i>Fallopia japonica</i>	B	-
Johnsongrass	<i>Sorghum halepense</i>	B	B
Jointed goatgrass	<i>Aegilops cylindrica</i>	B	B
Jubata grass, Andean pampas grass	<i>Cortaderia jubata</i>	B	-
King-devil hawkweed; Tall hawkweed	<i>Hieracium piloselloides</i> (<i>Pilosella piloselloides</i>)	A	-
Kochia; burning bush	<i>Bassia scoparia</i> (<i>Kochia scoparia</i>)	B	B
Kudzu	<i>Pueraria lobata</i>	A (T)	-
Leafy spurge	<i>Euphorbia esula</i>	B (T)	A
Lens-podded whitetop	<i>Lepidium chalepensis</i>	B	-
Lesser celandine	<i>Ranunculus ficaria</i>	B	-
Matgrass	<i>Nardus stricta</i>	A (T)	-
Meadow hawkweed	<i>Hieracium caespitosum</i> (<i>H. pratense</i> ; <i>Pilosella caespitosuma</i>)	B (T)	-

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 6. OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

Common Name	Scientific Name	Oregon State Status ¹	Morrow County Status ²
Meadow knapweed	<i>Centaurea debeauxii</i> (<i>Centaurea pratensis</i>)	B	-
Mediterranean sage	<i>Salvia aethiopis</i>	B	A
Medusahead rye	<i>Taeniatherum caput-medusae</i>	B	B
Milk thistle	<i>Silybum marianum</i>	B	-
Mouse-ear hawkweed	<i>Hieracium pilosella</i>	A (T)	-
Musk thistle	<i>Carduus nutans</i>	B	A
Myrtle spurge	<i>Euphorbia myrsinites</i>	B	B
Oblong spurge	<i>Euphorbia oblongata</i>	A (T)	-
Old man's beard	<i>Clematis vitalba</i>	B	-
Orange hawkweed	<i>Hieracium aurantiacum</i> (<i>Pilosella aurantiacum</i>)	A (T)	-
Ovate goatgrass	<i>Aegilops ovata</i>	A	-
Parrot feather	<i>Myriophyllum aquaticum</i>	B	-
Paterson's curse	<i>Echium plantagineum</i>	A (T)	-
Perennial peavine	<i>Lathyrus latifolius</i>	B	-
Perennial pepperweed	<i>Lepidium latifolium</i>	B (T)	B
Perennial sowthistle	<i>Sonchus arvensis</i>	-	B
Pheasant's eye	<i>Adonis aestivalis</i>	B	-
Plumeless thistle	<i>Carduus acanthoides</i>	A (T)	A
Poison hemlock	<i>Conium maculatum</i>	B	B
Policeman's helmet	<i>Impatiens glandulifera</i>	B	-
Portuguese broom	<i>Cytisus striatus</i>	B (T)	-
Puncturevine	<i>Tribulus terrestris</i>	B	B
Purple loosestrife	<i>Lythrum salicaria</i>	B	A
Purple nutsedge	<i>Cyperus rotundus</i>	A	-
Purple starthistle	<i>Centaurea calcitrapa</i>	A (T)	-
Ragweed	<i>Ambrosia artemisiifolia</i>	B	-
Ravenna grass	<i>Saccharum ravennae</i>	A (T)	-
Ribbongrass	<i>Phalaris arundinacea</i> var. <i>picta</i>	B (T)	-
Rush skeletonweed	<i>Chondrilla juncea</i>	B (T)	A
Russian knapweed	<i>Acroptilon repens</i> (<i>Centaurea repens</i>)	B	B
Saltcedar	<i>Tamarix ramosissima</i>	B (T)	-
Saltmeadow cordgrass	<i>Spartina patens</i>	A (T)	-
Scotch broom	<i>Cytisus scoparius</i>	B	-

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 6. OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

Common Name	Scientific Name	Oregon State Status ¹	Morrow County Status ²
Scotch thistle	<i>Onopordum acanthium</i>	B	A
Shiny leaf geranium	<i>Geranium lucidum</i>	B	-
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	A	-
Slender-flowered thistle	<i>Carduus tenuiflorus</i>	B	-
Small broomrape	<i>Orabanche minor</i>	B	-
Smooth cordgrass	<i>Spartina alterniflora</i>	A (T)	-
Smooth distaff thistle	<i>Carthamus baeticus</i>	A	-
Smoothseed alfalfa dodder	<i>Cuscuta approximata</i>	B	-
Spanish broom	<i>Spartium junceum (Cytisus junceum)</i>	B	-
Spanish heath	<i>Erica lusitanica</i>	B	-
Spikeweed	<i>Hemizonia pungens</i>	B	A
Spiny cocklebur	<i>Xanthium spinosum</i>	B	-
Spotted knapweed	<i>Centaurea stoebe (C. maculosa)</i>	B (T)	B
Spurge laurel	<i>Daphne laureola</i>	B	-
Squarrose knapweed	<i>Centaurea virgata (C. triumphetti)</i>	A (T)	-
St. Johnswort; Klamathweed	<i>Hypericum perforatum</i>	B	B
Sulfur cinquefoil	<i>Potentilla recta</i>	B	-
Swainsonpea; Alkali swainsonpea; Austrian peaeweed	<i>Sphaerophysa salsula</i>	B	-
Syrian bean-caper	<i>Zygophyllum fabago</i>	A	-
Tansy ragwort	<i>Senecio jacobaea (Jacobaea vulgaris)</i>	B (T)	A
Taurian thistle	<i>Onopordum tauricum</i>	A (T)	-
Tree of heaven	<i>Ailanthus altissima</i>	B	-
Turkish thistle	<i>Carduus cinereus</i>	A (T)	-
Velvetleaf	<i>Abutilon theophrasti</i>	B	-
Ventenata; North Africa grass	<i>Ventenata dubia</i>	B	B
Water hemlock	<i>Cicuta douglasii</i>	-	B
Water primrose	<i>Ludwigia peploides, L. hexapetala, L. grandiflora</i>	B (T)	-
Water soldiers	<i>Stratiotes aloides</i>	A	-
Wetted (curly plumeless) thistle	<i>Carduus crispus</i>	A (T)	-
West Indian spongeplant	<i>Limnobium laevigatum</i>	A	-
White bryonia	<i>Bryonia alba</i>	A	-
Whitetop; hoary cress	<i>Lepidium draba</i>	-	A
Woolly distaff thistle	<i>Carthamus lanatus</i>	A (T)	-

2022 HABITAT CATEGORIZATION AND RARE PLANT SURVEY REPORT
ATTACHMENT 6. OREGON STATE AND MORROW COUNTY NOXIOUS WEED LISTS

Common Name	Scientific Name	Oregon State Status ¹	Morrow County Status ²
Yellow archangel	<i>Lamium galeobdolon</i>	B	-
Yellow flag iris	<i>Iris pseudacorus</i>	B	A
Yellow floating heart	<i>Nymphoides peltata</i>	A (T)	-
Yellow hawkweed	<i>Hieracium floribundum</i>	A (T)	-
Yellow nutsedge	<i>Cyperus esculentus</i>	B	-
Yellow starthistle	<i>Centaurea solstitialis</i>	B	A
Yellow toadflax	<i>Linaria vulgaris</i>	B	A
Yellow tuft	<i>Alyssum murale</i> , <i>A. corsicum</i>	A (T)	-
<p>1. Oregon State "A" designated weeds: Weeds of known economic importance which occur in the state in small enough infestations to make eradication/containment possible; or which are not known to occur, but their presence in neighboring states makes future occurrence in Oregon seem imminent. "B" designated weeds: Weeds of economic importance which are regionally abundant, but which may have limited distribution in some counties. "T" Designated Weed: A priority noxious weed designated by the Oregon State Weed Board as a target for which the ODA will develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the "A" or "B" list. Species marked with a (*) are targeted for biocontrol (ODA 2020).</p> <p>2. Morrow County Noxious Weeds – "A" List – Any plant that is determined by the weed advisory board, and so declared by the County Board of Commissioners to be injurious to public health, crops, livestock, land or property under provisions of Oregon State Statute and thus mandated for control. Weeds of Economic Importance – "B" List – Weeds of limited distribution in the county and subject to intensive control or eradication where feasible (Morrow County 2022).</p> <p>Note: Species names are as listed by ODA (2020) and Morrow County (2022).</p>			

2022 Wildlife Survey Report

Echo Solar Project

October 2022

Prepared for



GETTING SOLAR DONE.

Prepared by



TETRA TECH

GENERAL DISCLAIMER FOR SCIENTIFIC WORK PRODUCTS

This deliverable was prepared in accordance with generally accepted professional practices that are typically utilized for scientific work products. The work was performed within the limitations and assumptions of our approved scope of work, and the descriptive documentation associated with this deliverable. Unless explicitly included in our approved scope of work, information provided in this deliverable has not been prepared to meet industry standards for engineering and should not be used for construction.

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1.0 INTRODUCTION

Pine Gate Renewables (PGR) plans to develop the Echo Solar Project (Project), a proposed solar project of up to 1,250 megawatts in Morrow County, Oregon. As part of its environmental due diligence, PGR contracted Tetra Tech, Inc. (Tetra Tech) to conduct biological surveys for the Project in support of an Application for Site Certificate (ASC) through the Oregon Department of Energy's (ODOE) Energy Facility Siting Council (EFSC). This summary report presents the methods and results for the biological surveys conducted in April and May 2022, as well as select results (i.e., incidental raptor nest and other wildlife observations) from biological surveys conducted in June 2022. The purpose of the April and May 2022 surveys was to identify the presence of special status species and their habitats, including the state endangered Washington ground squirrel (WAGS; *Uroditellus washingtoni*) and inventory raptor nests in the Project vicinity to identify breeding raptors that could be affected by the Project.

The following biological surveys were performed during April and May of 2022:

- WAGS surveys;
- General wildlife surveys; and
- Raptor nest surveys.

Habitat categorization and rare plant surveys were conducted in June 2022 and are addressed in a separate report (i.e., Tetra Tech 2022); incidental raptor nest and other wildlife observations recorded during habitat categorization and rare plant surveys are reported here.

2.0 SURVEY AREA

The Project is located on approximately 10,992 acres within Morrow County, adjacent to Oregon Route 207 (Lexington-Echo Highway). The Project Area encompasses the proposed solar array and associated facilities. The WAGS Survey Area encompassed the Project Area plus a 1,000-foot buffer in contiguous suitable habitat (755 acres; Figure 1); this excluded active agricultural and developed areas as well as areas of suitable habitat outside the Project Area separated from the Project Area by unsuitable habitat. The Raptor Nest Survey Area encompassed the Project Area as well as an additional 0.5-mile buffer of the Project Area (19,799 acres; Figure 1). General wildlife surveys were conducted concurrent with WAGS Surveys, within the WAGS Survey Area, and wildlife were also recorded if observed during raptor nest surveys and habitat categorization and rare plant surveys, which extended up to 0.5-mile from the Project Area. Oregon Department of Fish and Wildlife (ODFW) staff provided concurrence on the scope, timing, and extent of these surveys prior to Tetra Tech's field deployments (ODFW 2022).

3.0 METHODS

3.1 Washington Ground Squirrel Surveys

WAGS are a small ground squirrel associated with shrub-steppe habitats of the Columbia Basin Ecoregion (Verts and Carraway 1998). WAGS occur only in the Columbia Basin of eastern Washington and north-central Oregon. In Oregon, the WAGS range extends from Umatilla County, west through

Gilliam and Morrow counties, to the John Day River. Concern for the long-term viability of WAGS populations led to their listing by ODFW as endangered in January 2000. On September 21, 2016, the U.S. Fish and Wildlife Service (USFWS) announced that listing the WAGS as endangered under the federal Endangered Species Act of 1973 was not warranted (USFWS 2016a). The objective of these surveys was to identify WAGS colonies within the WAGS Survey Area, so that impacts to WAGS may be avoided or minimized.

Tetra Tech reviewed the Critical Issues Analysis conducted for the Project (Tetra Tech 2021), which included a review of National Land Cover Database (NLCD; Dewitz 2019) and Natural Resources Conservation Service (NRCS) Geographic Information Systems (GIS) soil data (NRCS 2006). Tetra Tech also reviewed data from the Oregon Biodiversity Information Center (ORBIC; ORBIC 2021) on locations of Washington ground squirrel occurrences in the Project vicinity that were requested during the Critical Issues Analysis (Tetra Tech 2021). Tetra Tech also conducted a preliminary desktop review of habitat to determine potential suitability for WAGS prior to field surveys. Areas considered unsuitable habitat for WAGS include active agricultural areas and developed areas.

Prior to fieldwork, field personnel visited an active WAGS colony and received training on burrow, scat, alarm call, and squirrel identification, as well as guidance on the natural history, habitat, and survey protocol for WAGS. All field crew members also passed a hearing test to verify they were capable of hearing a frequency of 8 kilohertz, the typical frequency of alarm call vocalizations of ground-dwelling squirrels. The WAGS is the only species of ground squirrel known to occur in the vicinity of the Project Area; therefore, confusing this species for similar species such as Belding's ground squirrel is highly unlikely. Additionally, WAGS have scat that can be differentiated from other burrowing animals by its characteristic size and shape.

The surveys followed methodology generally consistent with the protocol developed in the *Status and Habitat Use of the WAGS on State of Oregon Lands, South Boeving, Oregon* (Morgan and Nugent 1999). The WAGS protocol requires two phases of surveys to increase the likelihood of detecting their presence. The first phase of surveys begins around April 1, with the next phase following at least 2 weeks later and completed by the end of May, to assure surveys are conducted prior to WAGS going into aestivation. The survey period corresponds to the time when juvenile squirrels emerge from the burrows and are most active, and thus when alarm calls are most frequent (Morgan and Nugent 1999). WAGS surveys are conducted by walking meandering transects spaced at approximately 165 feet. Biologists were assigned to document any sign of WAGS (burrows, scat, sign of fresh activity, sightings, and vocalizations) while walking the transects and stopping periodically to listen for squirrel calls.

Following the protocol of Morgan and Nugent (1999), surveys are conducted in the morning, beginning at least 1 hour after sunrise to allow for temperatures to increase sufficiently to support WAGS activity, and typically end in the early afternoon to avoid the late afternoon heat, which decreases the WAGS activity. Whenever potential WAGS sign is identified, the area immediately surrounding the sign is intensively searched for more sign by walking around the location in an outward spiral.

According to Morgan and Nugent (1999), a colony is defined by the observation of one or more WAGS observation types (auditory, visual or droppings), along with squirrel burrows of the accurate shape

and size for WAGS. If a colony is found, the information recorded includes the locations of activity centers and the colony boundary using a sub-meter accuracy GPS unit, as well as habitat characteristics, approximate number of burrows, the time, weather, and observation types when a colony is first discovered, and representative photographs of burrows, scat, and habitat.

The second phase of surveys follows the same method, except that the transects are offset between the first phase of transects as to allow for higher likelihood of detection. Additionally, during the second phase of surveys, while approaching a potential burrow identified from the first phase of surveys, biologists approach the burrow perpendicular to that of the first phase to increase the likelihood of WAGS detection. The approach direction is changed to account for topography and prevailing winds, which may affect detectability of WAGS from a given direction.

3.2 General Wildlife Surveys

Prior to conducting field surveys, Tetra Tech conducted a desktop review to identify special status wildlife species with the potential to occur at the Project, including federal and state endangered, threatened, proposed, and candidate species; species of concern; birds of conservation concern; sensitive and sensitive-critical species; and Oregon Conservation Strategy species (Attachment 1; OCS 2016, ODFW 2021, ORBIC 2019, ORBIC 2021, USFWS 2021, USFWS 2022, Wildlife Explorer 2022). Tetra Tech reviewed habitat and range information for special status wildlife species known to occur in Morrow County and the Columbia Plateau/Columbia Basin to develop the list of species that had the potential to occur at the Project (Attachment 1). Species were eliminated from consideration if their habitat was absent from the Project Area, their range did not overlap with the Project, and/or they were unlikely to pass through the Project Area during migration. The list includes state-sensitive species associated with habitat types identified during the preliminary desktop review and the December 2021 Critical Issues Analysis (Tetra Tech 2021). Tetra Tech also reviewed data from ORBIC (2021) on locations of special status species occurrences in the Project vicinity that were requested during the Critical Issues Analysis.

Concurrently with WAGS surveys and raptor nest surveys in April and May of 2022 and habitat categorization and rare plant surveys in June 2022, Tetra Tech documented general wildlife and special status species use of the Project Area. Spring surveys coincide with the period of highest biological activity of neotropical migrant and breeding birds, foraging and breeding animal species, and other taxa. Biologists documented the location, behavior, number of individuals, and pertinent notes of special status species observed during WAGS surveys in April and May, and also kept a running list of all wildlife species observed. During raptor nest surveys in May 2022 and habitat categorization and rare plant surveys in June 2022, biologists also kept a running list of wildlife species observed, including special status species.

3.3 Raptor Nest Surveys

Prior to conducting field surveys, Tetra Tech reviewed aerial photography and the results of a records request to ORBIC (2021) as well as USFWS data (Leal 2020) to identify potential raptor nesting structures and raptor nests in the vicinity of the Project. Tetra Tech conducted a ground-based raptor nest survey concurrent with and following the May 2022, second phase of WAGS surveys, to document

active and inactive raptor nests within the Project Area plus a 0.5-mile buffer as discussed with ODFW (Figure 1; ODFW 2022). The survey was performed when most raptors in the region are engaged in mid- breeding season reproductive activities (e.g., egg-laying and incubation behaviors), and as most deciduous trees had begun to leaf out.

The biologist systematically searched raptor nest habitat within the Raptor Nest Survey Area by vehicle and on foot. Nesting substrate within the Project Area was investigated from public and private roads and on foot when additional inspection was necessary. The area outside the Project Area but within the 0.5-mile buffer was searched by scanning suitable nesting habitat from public roads or the Project Area. Periodic stops were made to scan suitable habitat (e.g., trees, utility towers, power poles, and rock outcrops) and examine nests with the aid of binoculars and a spotting scope. To determine the status of a nest, the biologist made observations on the behavior of adults, presence of young, signs of nest building, or whitewash. To minimize disturbance to nesting raptors, the biologist approached nests cautiously and maintained the greatest possible distance at which the species could be identified, with distances varying depending upon nest location and behavior of nesting birds. The biologist also documented American crow (*Corvus brachyrhynchos*) and common raven (*Corvus corax*) nests and incidental observations of eagles observed during the survey. Although not raptors, American crow and common raven nests were recorded during the surveys because they could be used by nesting raptors during subsequent breeding seasons.

If a nest was found, the biologist documented the location via GPS-enabled tablet, and collected data on an electronic data form on the nest status, size class, condition, substrate, height, exposure, as well as the nesting species and number of eggs or young observed during surveys. Raptor nests were also documented incidentally during the first phase of WAGS surveys in April 2022 and habitat categorization and rare plant surveys in June 2022. Surveys in June focused on incidentally documenting activity at nests previously mapped during the May raptor nest survey as inactive but showing potential signs of nest building as well as nests documented as in-use by Swainson's hawks during the May raptor nest survey.

4.0 RESULTS

4.1 Washington Ground Squirrel Surveys

A review of ORBIC data identified multiple WAGS occurrences overlapping with the Project Area (ORBIC 2021). NRCS GIS soil data (NRCS 2006) indicated that the Project Area is composed of 12 soil types, including soils suitable for WAGS such as Warden silt loam (Greene 1999, Marr 2004), which covers the majority of the Project Area (Tetra Tech 2021). However, based on review of aerial imagery and data from the National Land Cover Database (Dewitz 2019), the Project Area appeared to consist primarily of cultivated croplands, which is not suitable habitat for WAGS.

On April 3, 6, 7, and 15, and again on May 3, 4, and 5, 2022, two to three biologists conducted WAGS surveys at the Project. In the field, biologists verified and updated the status of active agricultural and developed areas identified during desktop review (Figure 1; see Attachment 2, Photos 2 and 3). These areas confirmed as not suitable for WAGS were excluded from field surveys. Biologists delineated suitable habitat using electronic tablets. Due to access restrictions, approximately 31 acres of the 755-

acre WAGS Survey Area was not surveyed, primarily outside the Project Area but within 1,000 feet of the Project Area. Areas not surveyed for WAGS due to access restrictions included an area in between crop circles northwest of the Project Area, an area in between crop circles south of the Project Area, and an area owned by the State of Oregon adjacent to Highway 207 within the Project Area that abuts a quarry and existing substation (Figure 1). These areas were identified as having a low likelihood to support WAGS due to their disturbed conditions and isolated locations.

Biologists did not observe any active WAGS colonies within the WAGS Survey Area. A total of seven small burrows appropriate for use by small mammals and beetles were identified at three locations (e.g., see Attachment 2, Photo 1); however, no WAGS were detected calling, nor was any scat found at burrows during the first or second phase of WAGS surveys.

4.2 General Wildlife Surveys

A review of ORBIC data did not identify any special status wildlife species occurrences within the Project Area. The desktop review identified 25 special-status wildlife species with the potential to occur at the Project (Attachment 1).

On April 3, 6, 7, and 15, May 3, 4, 5, and 6, and June 20, 2022, Tetra Tech documented general wildlife and special status species use of the Project Area, concurrently with WAGS and raptor nest surveys (April and May) and habitat categorization and rare plant surveys (June). Tetra Tech observed nine special status wildlife species, all birds: Brewer's sparrow (*Spizella breweri*), Western burrowing owl (*Athene cunicularia hypugaea*), Lewis' woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), sage thrasher (*Oreoscoptes montanus*), short-eared owl (*Asio flammeus*), and Swainson's hawk (*Buteo swainsoni*) (Table 1, Attachment 3, Figure 2). No state or federally listed threatened or endangered species were documented during surveys.

Table 1. Special Status Wildlife Species Observed During Surveys

Common Name	Scientific Name	Federal ¹	Oregon ²
Brewer's sparrow	<i>Spizella breweri</i>	–	S, CSS
Lewis's woodpecker	<i>Melanerpes lewis</i>	BCC	SC, CSS
loggerhead shrike	<i>Lanius ludovicianus</i>	–	S, CSS
long-billed curlew	<i>Numenius americanus</i>	–	SC, CSS
northern harrier	<i>Circus hudsonius</i>	BCC	–
sage thrasher	<i>Oreoscoptes montanus</i>	BCC	–
short-eared owl	<i>Asio flammeus</i>	BCC	–
Swainson's hawk	<i>Buteo swainsoni</i>	–	S, CSS
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	SOC	SC, CSS

1. Federal Status: BCC = Bird of Conservation Concern, SOC = Species of Concern.

2. Oregon Department of Fish and Wildlife Status in the Columbia Plateau/Columbia Basin: CSS = Conservation Strategy Species, SC = Sensitive Critical, S = Sensitive.

Sources: OCS 2016, ODFW 2021, ORBIC 2019, ORBIC 2021, USFWS 2021, USFWS 2022, Wildlife Explorer 2022

Brewer's sparrows were observed during surveys in April and May, singing, perched, and in flight within Sand Hollow. Sand Hollow runs northeast-southwest through the Project Area and contains the only sagebrush (*Artemisia tridentata*)-dominated habitat within the Project Area (Figure 2; Tetra Tech 2022). On April 7, biologists observed a Western burrowing owl perched next to a burrow in agricultural habitat within the Project Area (Figure 2). The owl flew west when approached by the biologists. Early April is too early to determine nest occupancy for this species (CBOC 1993); the biologists revisited the location on May 5 at which time they determined that the burrow was no longer present. Two Lewis' woodpecker individuals were observed during surveys on May 5. One individual was observed flying and perching on a power pole on the western edge of Sand Hollow near Oregon Route 207 and one individual was observed flying around a homestead on the western edge of the Project Area. Typical habitat for Lewis' woodpeckers is not present with the Project Area (i.e., ponderosa pine [*Pinus ponderosa*] forests, oak [*Quercus* sp.] woodlands, oak-pine woodlands, cottonwood [*Populus* sp.] riparian forests, and areas burned by wildfires; OCS 2016); therefore, these individuals (or individual observed twice) were likely migrating through the Project Area.

Long-billed curlew were observed throughout the Project Area during surveys in April, May, and June. Individuals and pairs were observed singing, flying, calling, preening, and performing flight displays, primarily in agricultural habitat. Loggerhead shrike were observed throughout Sand Hollow during surveys in April and May. Primarily solitary individuals were observed flying and calling, perched, and hunting, including individuals calling while perched on sagebrush and one individual hunting a small snake. Northern harriers were observed flying within the Project Area in April, May, and June, and consisted of adult male harriers in April and May. One sage thrasher was observed within the Project Area during surveys in May, perched on a wheel line and foraging in agricultural stubble. One short-eared owl was flushed from a wheat field during surveys in April.

Several individuals and pairs of Swainson's hawks were observed throughout the Project Area during surveys in April, May, and June, including individuals associated with the Swainson's hawk nests described below in Section 4.3. Swainson's hawks were observed perched, hunting, flying, and copulating. Perched individuals were typically on power poles but were also observed perched on the ground and on a nest, including incubating.

4.3 Raptor Nest Surveys

A review of ORBIC and USFWS data did not identify any raptor nests within 0.5 miles of the Project Area (ORBIC 2021, Leal 2020). However, review of aerial photos identified numerous potential raptor nesting structures within 0.5 miles of the Project Area.

On May 3, 4, 5 and 6, Tetra Tech conducted raptor nest surveys within the 19,799-acre Raptor Nest Survey Area, concurrently with and following the second phase of WAGS surveys. Fourteen nests were detected during the surveys, including three in-use Swainson's hawk nests, one in-use great horned owl (*Bubo virginianus*) nest, two in-use common raven nests, two in-use American crow nests, one great horned owl nest of unknown status, and five small inactive nests with unknown species determinations (Table 2, Figure 2). Six of the nests were located within the Project Area, including two in-use Swainson's hawk nests, one in-use common raven nest, one great horned owl nest of unknown status, and two small inactive nests with unknown species determinations (Figure 1). No eagle nests,

or large nests likely to be used by eagles in the future, were found during the surveys. Bald eagle nesting sites are generally associated with aquatic foraging areas (Buehler 2020). Bald eagles are known to scavenge opportunistically on carcasses in otherwise unsuitable habitat particularly during migration. Although bald eagles may use the Project Area during migration or winter, they are not expected to nest in or near the Project based on a lack of suitable habitat conditions.

Table 2. 2022 Raptor Nest Survey Results

Nest ID	Species	Nest Status ¹	Nest Size ²	Nest Substrate	Pertinent Survey Notes
107	American crow	In-use Nest	Small	Manmade Structure	Pair of crows observed building nest on power pole May 5; crow observed flying near nest and calling June 20.
113	American crow	In-use Nest	Small	Manmade Structure	Second crow nest in this area (i.e., this nest is near nest #107).
103	Common raven	In-use Nest	Small	Manmade Structure	Raven nest on old tractor. Adult flushed from nest on approach.
108	Common raven	In-use Nest	Small	Manmade Structure	Nest on top of cell tower. Raven perched just above nest and later observed flying to nest.
100	Great horned owl	In-use Nest	Small	Manmade Structure	Nest on top of old windmill. Initially documented incidentally on April 4, during WAGS surveys. One chick observed on May 6.
102	Swainson's hawk	In-use Nest	Small	Manmade Structure	Nest on power pole. Adult observed incubating on May 4, with second adult perched one pole south. Swainson's hawk observed flying overhead on June 20.
104	Swainson's hawk	In-use Nest	Small	Manmade Structure	Nest on top of power pole. Nest building observed directly after copulation. Two adults on nest on May 6. Adult observed in nest on June 20.
109	Swainson's hawk	In-use Nest	Small	Broadleaf Tree	One adult on nest building, second bird hunting to the south on May 5. No birds observed in the area on June 20.
101	Great horned owl	Unknown	Small	Rim Rock	Nest was not found but appears to be located on east facing quarry near road. Two fledgling owls attended by two adults on May 3. Great-horned were also seen in area during April WAGS surveys.
105	Unknown	Inactive	Small	Broadleaf Tree	Possible building stage of unknown species observed on May 5. No nest found on June 20.
106	Unknown	Inactive	Small	Other	Possible building stage observed on May 5. Swainson's hawk perched one pole north. No nest found on June 20.
110	Unknown	Inactive	Small	Manmade Structure	On transmission line. Two ravens seen together, one flew off of pole with nest, but biologist could not confirm nesting activity.
111	Unknown	Inactive	Small	Manmade Structure	On transmission line, one pole south of nest 108. Nest mostly hidden from view.
112	Unknown	Inactive	Small	Manmade Structure	Another transmission line nest south of Nest #109. Mostly hidden from view, likely alternate raven nest.

1. Nest Status (adapted from the 2016 Eagle Rule [USFWS 2016b] and Postupalsky [1974]): Inactive: Defined by the absence of any adult, egg, or dependent young at the nest, or signs of building or adding to the nest in preparation for egg-laying. In-use Nest: The presence of eggs, dependent young, or adult on the nest, or signs of building or adding to the nest in preparation for egg-laying. Unknown: A nest that is present but for which surveyors are unable to determine status (e.g., vegetation around the nest site obscured the view of nest, etc.).

2. Nest Size: Classified as large or small; small nests were those estimated by the biologist as having a diameter of less than 24 inches, comprised of smaller sticks, and with other characteristics typical of nests used by smaller raptors and not by eagles. Large nests were those estimated by the biologist as having a diameter of 24 inches or greater, comprising larger sticks, and with other characteristics typical of nests used by eagles and other large raptors.

One nest (great-horned owl nest #100) was initially detected incidentally during the first phase of WAGS surveys, on April 4; activity at this nest was confirmed again on May 6 during raptor nest surveys (see Attachment 2, Photo 4). All other nests shown in Table 2 were initially detected during raptor nest surveys between May 3 and 6. Activity was observed again incidentally at three nests (American crow nest #107 and Swainson's hawk nests #102 and #104) on June 20, during habitat categorization and rare plant surveys. No activity was detected at three previously documented nests (Swainson's hawk nest #109 and unknown species nests #105 and #106) on June 20, during habitat categorization and rare plant surveys. As described above, WAGS surveys and habitat categorization and rare plant surveys did not include a systematic search of the Raptor Nest Survey Area.

No eagles or state or federally listed threatened or endangered species were documented during the raptor nest surveys. Most of the nests were found on manmade structures including on transmission line poles, a cell tower, an old windmill, and an old tractor. Of the 14 detected nests, two were in broadleaf trees and one was in rimrock (Table 2).

Great horned owl and Swainson's hawk were the only raptor species observed nesting in the Raptor Nest Survey Area. The great horned owl uses a wide range of nesting habitats, usually adopts a nest that was built by another species, and is common in eastern Oregon. The Swainson's hawk is a state sensitive species (ODFW 2021). Swainson's hawks have relatively large area requirements. Significant losses of grassland habitat have contributed to declines of this species (OCS 2016). In addition to the state sensitive designation for Swainson's hawks, all species observed nesting during surveys are protected by the Migratory Bird Treaty Act.

5.0 SUMMARY AND CONCLUSIONS

Tetra Tech did not observe any WAGS activity during surveys. Although WAGS are known to occur in the Project vicinity, the majority of the Project Area is in active agricultural rotation and is thus not suitable habitat for WAGS. Areas that could not be surveyed in 2022 due to access restrictions have a low likelihood of supporting WAGS due to their disturbed conditions and isolated locations. ODFW recognizes protocol WAGS surveys for a period of three years. Typically, if construction begins within three years of conducting the protocol survey, but not within one year of the protocol survey, a pre-construction survey is required only within areas of suitable WAGS habitat where ground disturbing activity would occur. Therefore, the results of these surveys are considered valid for three years and subject to confirmation prior to construction.

Nine special status species were documented during Project surveys: Brewer's sparrow, Western burrowing owl, Lewis' woodpecker, long-billed curlew, loggerhead shrike, northern harrier, sage thrasher, short-eared owl, and Swainson's hawk. Six of these nine species are considered state sensitive or state sensitive-vulnerable species; none of these species are state or federally listed threatened or endangered species. Special status species were primarily documented within Sand Hollow, within and adjacent to the sagebrush-dominated habitat located within this draw. However, species typically found within open habitats (e.g., long-billed curlew) were primarily observed within the agricultural habitat that dominates the Project Area. These nine special status species are likely to use the Project during breeding and/or migration.

Tetra Tech detected 14 nests during raptor nest surveys, including three in-use nests belonging to the state sensitive species Swainson's hawk. Other nesting species documented included great horned owl, American crow, and common raven. ODFW typically recommends that a 0.25-mile non-disturbance buffer be placed around Swainson's hawk nests from April 1 to August 15 to avoid potential adverse impacts to nesting birds if determined to be active (i.e., in-use) during construction (EFSC 2020, ODOE 2020). Pre-construction surveys are typically required to be conducted the season prior to construction to determine nest status and inform avoidance during construction. There is no ODFW-recommended buffer for American crow and common raven nests, but 100 to 300 feet may be sufficient to prevent disturbance, depending on the activity. Based on a review of renewable energy projects permitted through the EFSC, ODFW does not typically provide a recommended buffer for nests used by great-horned owls; however, ODFW provided a comment on the Project Notice of Intent broadly recommending that no construction occur within 0.25-mi of active raptor nests during the nesting season (Cherry 2022). Further coordination with ODFW is recommended to clarify the buffer recommendation for non-sensitive nesting raptors.

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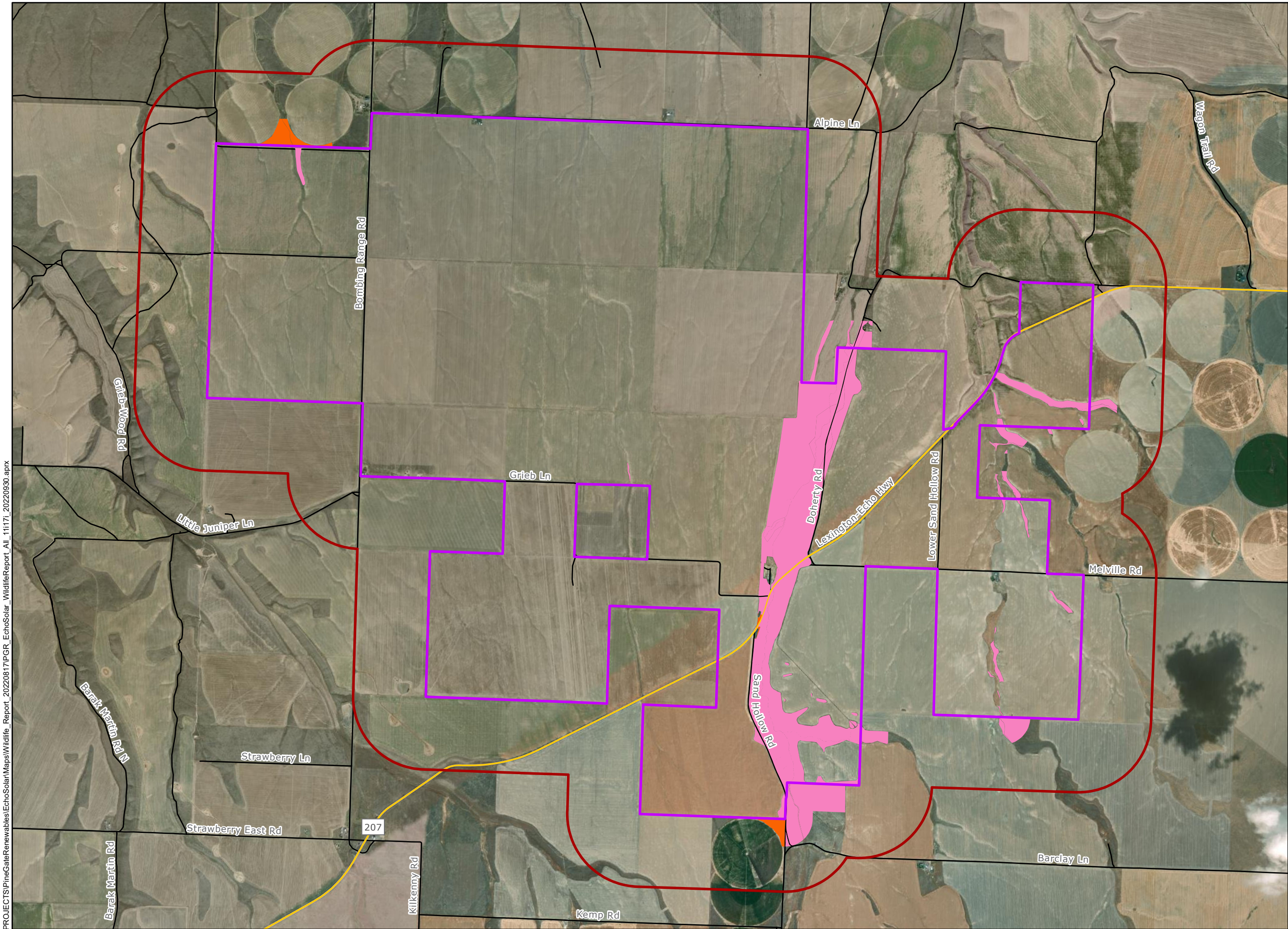
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FIGURES

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Echo Solar Project

Figure 1
WAGS and
Raptor Nest
Survey Areas

MORROW COUNTY, OR

- Project Area
- State Highway
- Local Roads
- Raptor Nest Survey Area
- WAGS Survey Area**
 - Not Surveyed (No Access)
 - 2022 Survey Area

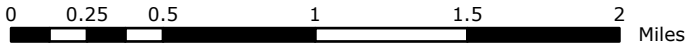


Reference Map



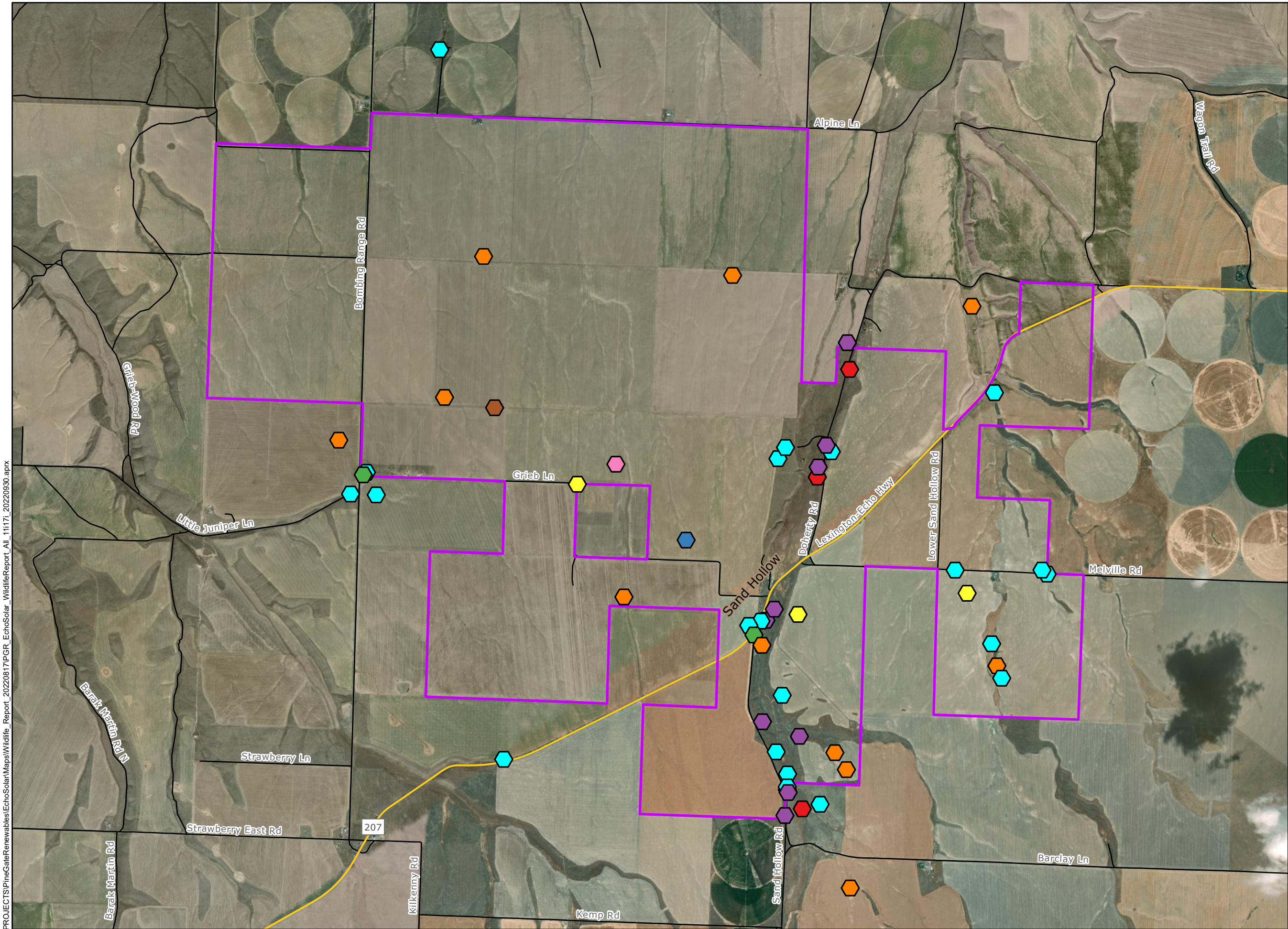
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Echo Solar Project

Figure 2
Special Status
Wildlife Species
Observations

MORROW COUNTY, OR

- Project Area
State Highway
Local Roads
- Special Status Species**
- Brewer's sparrow
 - Lewis's woodpecker
 - Loggerhead shrike
 - Long-billed curlew
 - Northern harrier
 - Sage thrasher
 - Short-eared owl
 - Swainson's hawk
 - Western burrowing owl



Reference Map



1:40,000

WGS 1984 UTM Zone 11N

0 0.25 0.5 1 1.5 2 Miles

NOT FOR CONSTRUCTION

Figure 3, Raptor Nest Survey Results, contains confidential information and will be submitted under separate cover.

ATTACHMENT 1: SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR AT THE ECHO SOLAR PROJECT

ATTACHMENT 1. SPECIAL STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR AT THE ECHO SOLAR PROJECT

Common Name	Scientific Name	Federal Status ¹	Oregon Status ²
BIRDS			
bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	–
Brewer's sparrow *	<i>Spizella breweri</i>	–	S, CSS
common nighthawk	<i>Chordeiles minor</i>	–	S, CSS
ferruginous hawk	<i>Buteo regalis</i>	SOC	SC, CSS
golden eagle	<i>Aquila chrysaetos</i>	BGEPA	–
grasshopper sparrow	<i>Ammodramus savannarum</i>	–	S, CSS
Lewis's woodpecker *	<i>Melanerpes lewis</i>	BCC	SC, CSS
loggerhead shrike *	<i>Lanius ludovicianus</i>	–	S, CSS
long-billed curlew *	<i>Numenius americanus</i>	–	SC, CSS
northern harrier *	<i>Circus hudsonius</i>	BCC	–
sage thrasher *	<i>Oreoscoptes montanus</i>	BCC	–
short-eared owl *	<i>Asio flammeus</i>	BCC	–
sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	–	SC, CSS
Swainson's hawk *	<i>Buteo swainsoni</i>	–	S, CSS
tricolored blackbird	<i>Agelaius tricolor</i>	SOC	–
Western burrowing owl *	<i>Athene cunicularia hypugaea</i>	SOC	SC, CSS
INVERTEBRATES			
monarch butterfly	<i>Danaus plexippus</i>	C	CSS
MAMMALS			
hoary bat	<i>Lasiurus cinereus</i>	–	S, CSS
pallid bat	<i>Antrozous pallidus</i>	–	S, CSS
silver-haired bat	<i>Lasionycteris noctivagans</i>	–	S, CSS
spotted bat	<i>Euderma maculatum</i>	–	S, CSS
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	–	SC, CSS
Washington ground squirrel	<i>Uroditellus washingtoni</i>	–	E, CSS
REPTILES			
northern sagebrush lizard	<i>Sceloporus graciosus graciosus</i>	SOC	S, CSS
Western painted turtle	<i>Chrysemys picta</i>	–	SC, CSS
<p>*Observed during 2022 surveys (See Figure 2)</p> <p>1. Federal Status: BGEPA = Bald and Golden Eagle Protection Act, BCC = Bird of Conservation Concern, SOC = Species of Concern, C = Candidate.</p> <p>2. Oregon Department of Fish and Wildlife Status in the Columbia Plateau/Columbia Basin: CSS = Conservation Strategy Species, E = Endangered, SC = Sensitive Critical, S = Sensitive.</p> <p>Sources: OCS 2016, ODFW 2021, ORBIC 2019, ORBIC 2021, USFWS 2021, USFWS 2022, Wildlife Explorer 2022</p>			

ATTACHMENT 2: SELECT PHOTOGRAPHS TAKEN DURING 2022 WILDLIFE SURVEYS AT THE ECHO SOLAR PROJECT



Photo 1. Burrow within grassland dominated by non-native species; coyote den close by; no WAGS activity. 4/6/2022.



Photo 2. Small patch of WAGS habitat adjacent to cultivated cropland. 4/7/2022.



Photo 3. WAGS habitat adjacent to cultivated cropland. 4/7/2022.



Photo 4. Great-horned owl, In-use Nest #100. Adult incubating nest on windmill. 5/5/2022.



Photo 5. Great-horned owl, Unknown Nest #101. Two fledglings observed attended by two adults. 5/3/2022.



Photo 6. Swainson's hawk, In-use Nest #102. Adult incubating nest on power pole. 5/4/2022.



Photo 7. Unknown Inactive Nest #105. 5/5/2022.



Photo 8. Swainson's hawk, In-use Nest #109. Adult flying to nest in broadleaf tree. 5/5/2022.

ATTACHMENT 3: COMPLETE LIST OF WILDLIFE SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

ATTACHMENT 3. COMPLETE LIST OF WILDLIFE SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

Common Name	Scientific Name	Observed during WAGS and Raptor Nest Surveys (April-May 2022)	Observed during Habitat and Rare Plant Surveys (June 2022)
BIRDS			
American crow	<i>Corvus brachyrhynchos</i>	X	X
American kestrel	<i>Falco sparverius</i>	X	X
American pipit	<i>Anthus rubescens</i>	X	
American robin	<i>Turdus migratorius</i>	X	X
bank swallow	<i>Riparia riparia</i>	X	
barn swallow	<i>Hirundo rustica</i>	X	X
black-billed magpie	<i>Pica hudsonia</i>		X
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	X	
Brewer's sparrow *	<i>Spizella breweri</i>	X	
brown-headed cowbird	<i>Molothrus ater</i>	X	X
Bullock's oriole	<i>Icterus bullockii</i>	X	
chipping sparrow	<i>Spizella passerina</i>	X	
cliff swallow	<i>Petrochelidon pyrrhonota</i>	X	
common raven	<i>Corvus corax</i>	X	X
dark-eyed junco	<i>Junco hyemalis</i>	X	
Eurasian collared dove	<i>Streptopelia decaocto</i>	X	
European starling	<i>Sturnus vulgaris</i>	X	X
gray flycatcher	<i>Empidonax wrightii</i>	X	
golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	X	
great horned owl	<i>Bubo virginianus</i>	X	
horned lark	<i>Eremophila alpestris</i>	X	X
house finch	<i>Haemorhous mexicanus</i>	X	
house sparrow	<i>Passer domesticus</i>	X	X
house wren	<i>Troglodytes aedon</i>	X	
killdeer	<i>Charadrius vociferus</i>	X	X
lark sparrow	<i>Chondestes grammacus</i>	X	
Lewis's woodpecker *	<i>Melanerpes lewis</i>	X	
loggerhead shrike *	<i>Lanius ludovicianus</i>	X	
long-billed curlew *	<i>Numenius americanus</i>	X	X
mourning dove	<i>Zenaida macroura</i>	X	X
northern flicker	<i>Colaptes auratus</i>	X	
northern harrier *	<i>Circus cyaneus</i>	X	X

ATTACHMENT 3. COMPLETE LIST OF WILDLIFE SPECIES OBSERVED AT THE ECHO SOLAR PROJECT

Common Name	Scientific Name	Observed during WAGS and Raptor Nest Surveys (April-May 2022)	Observed during Habitat and Rare Plant Surveys (June 2022)
pine siskin	<i>Spinus pinus</i>	X	
red-tailed hawk	<i>Buteo jamaicensis</i>	X	X
red-winged blackbird	<i>Agelaius phoeniceus</i>	X	
ring-necked pheasant	<i>Phasianus colchicus</i>	X	
rock pigeon	<i>Columba livia</i>	X	
rough-legged hawk	<i>Buteo lagopus</i>	X	
ruby-crowned kinglet	<i>Corthylio calendula</i>	X	
sage thrasher *	<i>Oreoscoptes montanus</i>	X	
sandhill crane	<i>Antigone canadensis</i>	X	
savannah sparrow	<i>Passerculus sandwichensis</i>	X	
Say's phoebe	<i>Sayornis saya</i>	X	
sharp-shinned hawk	<i>Accipter striatus</i>	X	
short-eared owl *	<i>Asio flammeus</i>	X	
Swainson's hawk *	<i>Buteo swainsoni</i>	X	X
tree swallow	<i>Tachycineta bicolor</i>	X	
turkey vulture	<i>Cathartes aura</i>		X
vesper sparrow	<i>Poocetes gramineus</i>	X	
Western burrowing owl *	<i>Athene cunicularia hypugaea</i>	X	
Western kingbird	<i>Tyrannus verticalis</i>	X	
Western meadowlark	<i>Sturnella neglecta</i>	X	X
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	X	
yellow-rumped warbler	<i>Setophaga cornata</i>	X	
MAMMALS			
American badger	<i>Corvus brachyrhynchos</i>	X	
coyote	<i>Canis latrans</i>	X	
mule deer	<i>Odocoileus hemionus</i>	X	
pronghorn antelope	<i>Antilocapra americana</i>	X	
REPTILES			
gopher snake	<i>Pituophis catenifer deserticola</i>	X	
pygmy short-horned lizard	<i>Phrynosoma douglasi</i>	X	
*Special Status Species (See Attachment 1)			

Attachment P-2. Draft Habitat Mitigation Plan

Sunstone Solar Project

Draft Habitat Mitigation Plan

Prepared for



Sunstone Solar, LLC

Prepared by



June 2023

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1.0 Introduction

Sunstone Solar LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a solar energy generation facility and related or supporting facilities in Morrow County, Oregon. The Facility site boundary encompasses approximately 10,960 acres and is located entirely on private land. The Facility will connect with the existing Umatilla Electric Cooperative (UEC) 230-kilovolt Blue Ridge Line.

This Draft Habitat Mitigation Plan (HMP) describes how the Applicant will mitigate for the unavoidable wildlife habitat impacts of the Facility and therefore, in conjunction with Exhibit P of the Application for Site Certificate (ASC), demonstrates how the Applicant will construct and operate the Facility consistent with the Oregon Department of Fish and Wildlife (ODFW) Fish and Wildlife Habitat Mitigation Policy, Oregon Administrative Rule (OAR) 635-415-0025. The Applicant has conducted habitat categorization surveys and other biological studies that inform habitat categorization in accordance with the ODFW Fish and Wildlife Habitat Mitigation Policy, and has avoided and minimized impacts to wildlife and habitat as described in Exhibit P of the ASC. The actual acres of impacts and the associated mitigation needs will be determined based on the final design by phase and included in a final HMP prior to construction of any Facility phase.

2.0 Temporary and Permanent Impacts

Construction and operation of the Facility will result in both permanent and temporary impacts to wildlife and their habitats, although these impacts have been minimized considerably as described in Exhibit P of the ASC. Due to the multi-year construction schedule of the Facility, both permanent and temporary impacts to fish and wildlife habitat will occur in phases over this time period.

Permanent impact areas are those that would be converted from the existing condition to a different condition for the life of the Facility. The entire solar array area fence line is considered permanently impacted and includes all solar components. Although it is considered permanently impacted, vegetation within the solar array area fence line will be retained and/or planted following construction and as a result there will be residual (and in some cases improved) value of these areas to wildlife.

Temporary impact areas include temporary impacts from the underground collector lines and transmission lines outside the solar array area fence line, as well as temporary impacts around the outside of the perimeter fencing. Restoration of the temporary impact areas will occur following construction, as will revegetation within portions of the solar array area fence line not occupied by permanent infrastructure. The duration of temporary impacts to habitat will vary by habitat subtype. For example, the recovery period for agricultural areas that were temporarily disturbed could be as short as 1 to 3 years and grasslands generally recover within 3 to 7 years. The Applicant will restore temporary impact areas consistent with the Draft Revegetation Plan attached to Exhibit

P of the ASC. Therefore, temporary impacts will be mitigated through successful implementation of the Draft Revegetation Plan (Attachment P-4 to Exhibit P).

Table 1 lists the acres that will be permanently or temporarily impacted by the Facility, organized by habitat category and subtype. These habitats are described in Exhibit P of the ASC and in the biological survey reports attached to Exhibit P (Exhibit P, Attachment P-1).

Table 1. Temporary and Permanent Impacts by Habitat Category and Habitat Subtype

Habitat Category	Habitat Subtype	Permanent Acres Impacted	Temporary Acres Impacted
2	Eastside Grasslands	<0.1	0.4
Total Category 2		<0.1	0.4
4	Intermittent or Ephemeral Streams	-	<0.1
	Eastside Grasslands	17.9	2.7
Total Category 4		17.9	2.7
	Eastside Grasslands	18.5	2.2
Total Category 5		18.5	2.2
6	Orchards, Vineyards, Wheat Fields, Other Row Crops	9,397.4	51.3
	Urban and Mixed Environs	7.7	1.2
Total Category 6		9,405.1	52.6
Grand Total		9,441.5	57.8
Note: Totals in this table may not sum correctly due to rounding; "-" means no impact while <0.1 means greater than zero but less than 0.05 acres impact.			

3.0 Methods for Calculating Mitigation

Table 2 shows the methods for calculating mitigation for permanent impacts. No mitigation is proposed for temporary impacts beyond the restoration of habitat. No mitigation is required for impacts to Category 6 areas.

Prior to construction of any phase of the Facility, the Applicant will provide an estimate, in tabular format, of the acres of permanent impacts and mitigation ratios shown in Table 2 to provide an updated estimate of mitigation needs for that phase.

Table 2. Mitigation Calculation

Habitat Category	Permanent Impacts (acres)¹	Mitigation Ratio²	Mitigation Need	Mitigation Description
Category 4	17.9	1:1	17.9	The mitigation goal for Category 4 habitat is to provide no net loss in quantity or quality. Mitigation can be in-kind or out-of-kind, in-proximity or off-proximity mitigation.
Category 5	18.5	0.5:1	9.3	The mitigation goal for Category 5 habitat is to provide net benefit in habitat quantity or quality. The mitigation strategy is actions that improve habitat conditions.
Grand Total	-	-	27.2	--
1. Acres of permanent impact requiring mitigation, which excludes habitat types and categories with less than a 0.05 acre mitigation need as well as Category 6 areas. 2. Acres mitigation per acres impacted.				

4.0 Mitigation

The Applicant proposes to contribute funding to an ongoing conservation effort being conducted by a conservation organization (e.g., The Nature Conservancy [TNC]) or at the direction of ODFW (e.g., at an ODFW wildlife management area) to meet the mitigation needs of the Facility. This funding would allow additional conservation actions to occur that would not otherwise be conducted and would therefor benefit wildlife in these areas. Supplementing existing efforts in conservation and/or wildlife areas would provide a greater benefit to wildlife across the landscape than creating a new easement not connected to existing conservation areas and known wildlife use. The Applicant discussed this approach in a March 23, 2023 meeting with ODFW and the Oregon Department of Energy (ODOE) in which ODFW agreed that identifying an existing conservation effort to supplement was preferable to developing a “postage stamp”-style conservation easement given the relatively small anticipated mitigation need for the Facility.

Considering this approach, example mitigation options could include funding of one round of weed control on an area equivalent to the mitigation need for Category 5 habitat (i.e., 9.3 acres) and funding of one round of weed control followed by seeding of native grasses, forbs, and/or shrubs, as appropriate, on an area equivalent to the mitigation need for Category 4 habitat (i.e., 17.9 acres) in an existing conservation area or an ODFW wildlife management area. The mitigation funds would be based on the final impact acres determined prior to construction and the market rate of herbicide materials (e.g., Open Range G, imazapic [i.e., Plateau], or Rejuvra) and labor at that time. In this example option, the treatment areas would be monitored for 3 to 5 years to document pre- and post-treatment conditions. This monitoring would be designed to document changes in species diversity and composition. Monitoring would be funded by the Applicant and conducted by the

Applicant, its contractors, or another designated entity (e.g., the conservation organization or ODFW) and the results of monitoring would be reported to ODFW and ODOE following each monitoring effort. In this example, the mitigation would be considered successful and the Facility's mitigation obligations met when all treatments (chemical applications and seeding) have been performed and documented in accordance with the methods described in this HMP.

ODFW provided follow-up to the March 23, 2023 meeting with the Applicant on April 20, 2023, confirming that ODFW is supportive of payment-to-provide mitigation actions for the Facility on lands that are already in conservation easement. ODFW provided contact information for the TNC Columbia Basin Preserves Manager, who has expressed interest in partnering with energy developers for habitat improvements on TNC-managed properties. The Applicant will coordinate with TNC to identify appropriate mitigation opportunities on TNC-managed properties, and will continue to work with ODFW to ensure that the mitigation options appropriately mitigate for impacts to habitat from the Facility. ODFW noted that because the goal for Category 5 impacts is to mitigate for impacts through actions that contribute to essential or important habitat, the TNC property would be a great fit because it provides habitat for sensitive species and Washington ground squirrels (*Urocitellus washingtoni*) and could benefit from habitat enhancements such as herbicide application. For impacted Category 4 habitat, ODFW recommended an additional action to achieve no net loss (e.g. seeding/planting), dependent on the needs of the chosen mitigation site, which is reflected in the description of potential mitigation actions above. TNC's focus in the area is on conserving and restoring over 23,000 acres of grassland and shrub-steppe habitat centered on the Boardman Conservation Area near Boardman, Oregon¹. The final mitigation option and the associated details will be incorporated into the final HMP. This mitigation will satisfy the ODFW Habitat Mitigation Policy Goals for impacts to Category 4 and 5 habitat.

5.0 Amendment of the HMP

The HMP may be amended from time to time by agreement of the Applicant and the Oregon Energy Facility Siting Council (EFSC). Such amendments may be made without amendment of the site certificate. EFSC authorizes ODOE to agree to amendments to this plan. ODOE shall notify EFSC of all amendments, and EFSC retains the authority to approve, reject, or modify any amendment of this plan agreed to by ODOE.

¹ The Boardman Grasslands and TNC's work at the Boardman Conservation Area in Morrow County are further described on TNC's website:
<https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/desktop/cbg/Pages/Boardman-Grassland.aspx>

Attachment P-3. Draft Noxious Weed Control Plan

Sunstone Solar Project Draft Noxious Weed Control Plan

Prepared for



Sunstone Solar, LLC

Prepared by



Tetra Tech, Inc.

June 2023

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Appendices

- Appendix A: Oregon State Noxious Weed List
- Appendix B: Morrow County Noxious Weed List

1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a photovoltaic solar energy generation facility and related or supporting facilities in Morrow County, Oregon. The proposed Facility will generate up to 1,200 megawatts (MW) of nominal and average generating capacity using solar panels wired in series and in parallel to form arrays, which in turn are connected to electrical infrastructure. Additionally, the Facility will also include a 1,200-MW distributed battery energy storage system for the purpose of stabilizing the solar resource. The Applicant proposes to permit a range of photovoltaic and related or associated technology within a site boundary that allows for micro siting flexibility in consideration of the perpetual evolution of technology and maximization of space efficiency, thereby allowing developmental flexibility to address varying market requirements. These facilities are all described in greater detail in Exhibit B of the Application for Site Certificate (ASC).

This Draft Noxious Weed Control Plan has been prepared to comply with Oregon Administrative Rule 660-033-0130 (38)(h)(D), which states, in regard to photovoltaic solar power generation facilities, that:

“Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weed species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long-term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval.”

Noxious weeds are non-native, aggressive plants with the potential to cause significant damage to native ecosystems and/or cause significant economic losses. Noxious weeds are opportunistic plant species that readily flourish in disturbed areas, are difficult to control, and thereby can compete with and/or prevent native plant species from re-establishing. Notably, the likelihood of introduction or explosion of noxious weeds is correlated with new disturbances in a region, such as large-scale construction projects. In addition, noxious weed species can adversely affect the structure, composition, and success of revegetation efforts associated with construction-related temporary disturbances.

The intent of this Plan is to provide clear methods to prevent the introduction and spread of designated noxious weeds from the construction and operation of the Facility, control existing populations of noxious weeds within construction areas, and monitor the success of efforts to prevent and control noxious weeds. The Applicant and its contractors will be responsible for implementing the methods detailed in this Plan.

2.0 Regulatory Framework

2.1 State of Oregon

In Oregon, a noxious weed is defined under Oregon Revised Statutes (ORS) 569.175 as “a terrestrial, aquatic, or marine plant designated by the State Weed Board under ORS 569.615 as among those representing the greatest public menace and as a top priority for action by weed control programs.”. Noxious weeds have been declared by ORS 569.350 as a menace to public welfare, and control of these plants is the responsibility of private landowners and operators, as well as county, state, and federal governments.

The Oregon State Weed Board (OSWB) was created by the Oregon Department of Agriculture (ODA) under ORS 569.600. OSWB provides recommendations for noxious weed control at the state-level and is responsible for updating the State Noxious Weed List. The OSWB and the ODA classify noxious weeds in Oregon in accordance with the ODA Noxious Weed Classification System (ODA 2022). There are three designations under the State’s system:

- **A Listed Weed:** A weed of known economic importance that occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent.
 - **Recommended Action:** Infestations are subject to eradication or intensive control when found.
- **B Listed Weed:** A weed of economic importance that is regionally abundant, but may have limited distribution in some counties.
 - **Recommended Action:** Limited to intensive control at the state, county, or regional level as determined on a site-specific, case-by-case basis. Where implementation of a fully integrated statewide management plan is not feasible, biological control (when available) shall be the primary control method.
- **T-Designated Weed:** A designated group of weed species selected from either the A or B list as a focus for prevention and control by the Noxious Weed Control Program. Action against these weeds will receive priority. T-designated noxious weeds are determined by the OSWB, which directs ODA to develop and implement a statewide management plan.

2.2 Morrow County

The Morrow County Code Enforcement Ordinance establishes procedures for enforcing Morrow County Code through the authority granted to general law counties by ORS Chapter 203. Section 11 of the county Code Enforcement Ordinance, updated on July 5, 2021, establishes Morrow County as a weed control district, defines what is considered a noxious weed or weed of economic importance, identifies the responsibility of private landowners to control weeds, and outlines the authority of the weed control district and Morrow County Weed Coordinator/Inspector to administer and enforce weed control in the ordinance (Morrow County 2021).

Morrow County has its own weed classification system that differs from the state. Morrow County defines two classifications of weeds (Morrow County 2022):

- **Noxious Weeds - “A List”:** Any plant that is determined by the weed advisory board and so declared by the County Board of Commissioners to be injurious to public health, crops, livestock, land, or property under provisions of Oregon State Statute and thus mandated for control.
- **Weeds of Economic Importance - “B List”:** Weeds of limited distribution in the county and subject to intensive control or eradication where feasible.

2.3 State and County Weed Lists

The ODA lists 46 Class A species and 98 Class B species for the state of Oregon, 47 of which are T-designated (ODA 2022; Appendix A). Morrow County specifically recognizes 36 species of noxious weeds (Appendix B; Morrow County 2021). Although not all of the Morrow County listed noxious weeds noted in Appendix B occur in the vicinity of the Facility, the Applicant and its contractors should be aware of the entire list while monitoring and controlling weeds. Noxious weeds known to occur in the vicinity of the site boundary are discussed in Section 3.0.

3.0 Noxious Weeds Identified at the Facility

In June, 2022 Tetra Tech completed rare plant and habitat categorization surveys within and adjacent to Facility site boundary. During those surveys, four listed noxious weed species were documented, including three ODA-listed noxious weed species and four Morrow County listed species noxious weed species. Table 1 lists the noxious weed species observed, their noxious weed designation (i.e., status), and the frequency of observations. Locations of these noxious weeds documented during surveys are included in Exhibit P, Attachment P-1 of the ASC. Three of the four noxious weed species observed were state and/or County “B” listed weeds (Table 1; Morrow County 2021, ODA 2022). One species, rush skeletonweed (*Chondrilla juncea*), is an “A” List Weed in Morrow County and a state “T”-designated weed, meaning that ODA has targeted this species for prevention and control (Morrow County 2021; ODA 2022).

Cereal rye (*Secale cereale*) was abundant in the previously disturbed areas outside of active crop fields and was generally found in previously disturbed ground. Rush skeletonweed was found in isolated small populations or single individuals on the hillside between active cropland and a gravel county road. Puncturevine (*Tribulus terrestris*) and jointed goatgrass (*Aegilops cylindrica*) were found in the highly disturbed border in between active cropland and roads. The Applicant may conduct an additional pre-construction noxious weed survey and/or coordinate with landowners regarding noxious weed presence to identify the noxious weeds present at the Facility at the time of construction to inform management actions.

Table 1. Noxious Weeds Observed during Surveys in 2022

Scientific Name	Common Name	Oregon State Status ¹	Morrow County Status ¹	Frequency
<i>Aegilops cylindrica</i>	Jointed goatgrass	B	B	Few small patches.
<i>Chondrilla juncea</i>	Rush skeletonweed	B*, T	A	Occasional single plants.
<i>Secale cereale</i>	Cereal rye	Not listed	B	Scattered large-sized patches.
<i>Tribulus terrestris</i>	Puncturevine	B*	B	Few small to large-sized patches.
1. Definitions for state and county noxious weed status are provided in Sections 2.1 and 2.2, respectively. Species marked with a (*) are targeted for biocontrol (ODA 2022).				

4.0 Noxious Weed Management

This section of this Plan describes the steps the Applicant will take to prevent and control the establishment and spread of noxious weed species during both construction and operation of the Facility. Noxious weed control methods for the Facility described in this Plan have been developed utilizing information from the ODA Noxious Weed Control Program and the Morrow County Weed Department.

The management of noxious weeds will be considered throughout all stages of construction and operation of the Facility and will include:

- **Prevention:** Implementing measures to prevent the spread of noxious weeds during construction, operation, and maintenance activities.
- **Treatment:** Treating noxious weed populations with their appropriate control methods, at appropriate time intervals.
- **Monitoring:** Assessing noxious weed changes within the Facility site boundary over time and ensuring that legacy as well as new weed populations are not increasing their distributions.

The Applicant's objective is to prevent the introduction of new noxious weed populations and the spread of existing noxious weed populations. The methods described below will be implemented to minimize the spread of noxious weeds during construction activities. New noxious weeds detected during post-construction revegetation will be considered a result of construction activities and will be controlled accordingly.

4.1 Prevention

Prior to the start of construction, all personnel will be instructed on the importance of noxious weed control. As part of start-up activities, and to help facilitate the avoidance of existing infestations and identification of new infestations, the Applicant or their construction contractor will provide information and training to all construction personnel regarding noxious weed

identification and prevention strategies. Operations and maintenance personnel will be similarly informed. The importance of preventing the spread of noxious weeds in areas not currently infested and controlling the proliferation of noxious weeds already present within or near the Facility will be emphasized.

Implementation of the following best management practices will also aid in minimizing the spread of noxious weeds during construction activities, revegetation efforts, and operation and maintenance activities. The following practices center around ensuring that noxious weed seeds or reproductive plant fragments are not unintentionally dispersed within or outside of the Facility boundaries by personnel or their vehicles. These practices allow for responsible movement around sites with noxious weeds already present, and ensure that new populations or species are not accidentally introduced into the Facility boundaries.

- Flagging areas of noxious weed infestations prior to construction to alert construction personnel;
- Limiting vehicle access to designated routes, whether existing roads or newly constructed roads, and the outer limits of construction disturbances per the final design for the Facility;
- Limiting vehicle traffic in noxious weed-infested areas;
- Cleaning construction vehicles prior to entering the Facility for the first time and upon completion of work at the Facility at a wash station located within at an onsite location, or at a public car wash in the vicinity of the Facility;
- Cleaning vehicles and equipment associated with ground disturbance and movement of topsoil utilizing a mobile wash station after performing work in noxious weed-infested areas and prior to performing work in non-infested areas;
- Where feasible, not moving topsoil and other soils from noxious weed infested areas outside of the infested areas and returning them to their previous location during reclamation activities;
- Treating soils from infested areas with a pre-emergent herbicide prior to initiation of revegetation efforts, depending on site-specific conditions;
- Providing information regarding target noxious weed species at the operations and maintenance buildings;
- Treating noxious weeds via mechanical or chemical control (see Section 4.2);
- Preventing conditions favorable for noxious weed germination and spread by revegetating temporarily disturbed areas as soon as practicable;
- Monitoring areas of disturbance for noxious weeds after construction (see Section 4.3), during the normal course of revegetation maintenance of temporary workspaces, and implementing control measures as appropriate;
- Revegetating the site with appropriate, local native seed or native plants; when these are not available, non-invasive, and non-persistent non-native species may be used; and

- Ensuring that seed and straw mulch used for site rehabilitation and revegetation are certified free of noxious weed seed and propagules.

4.2 Treatment

Control of noxious weeds will be implemented through mechanical or chemical control measures. The Applicant will be responsible for hiring a qualified contractor to implement the treatment of noxious weeds. The Applicant will ensure that noxious weed management actions will be conducted by specialists with the following qualifications:

- Experience in native plant, non-native and invasive plants, and noxious weed identification;
- Experience in noxious weed mapping;
- If chemical control is used, specialists must possess a Commercial or Public Pesticide Applicator License from the ODA or possess an Immediately Supervised Pesticide Trainee License and be supervised by a licensed applicator;
- Training in noxious weed management or Integrated Pest Management with an emphasis in noxious weeds; and
- Experience in coordination with agencies and private landowners.

Existing noxious weed populations should be prevented from expanding in size and density and should not be spread to new sites. Where practicable, existing populations of noxious weeds should be eradicated. If it is determined that noxious weeds have invaded areas immediately adjacent to the Facility (e.g., areas visible just beyond the outer limits of construction disturbances associated with the Facility or along access roads) as a result of construction, the Applicant will contact the landowner and seek approval to treat those noxious weed populations.

Long-term weed control methods will be described in a long-term monitoring plan as described in Section 4.3. The main factor in long-term weed control is successful revegetation with non-weedy species as described in the Draft Revegetation Plan (see Exhibit P, Attachment P-4). As noted above, short-term noxious weed control will be done through mechanical or chemical treatment. However, it will be important to ensure that the short-term treatment does not affect the establishment of the native perennial cover that will help provide the long-term control. Additionally, early detection and control of small noxious weed populations before they can expand into larger populations is extremely important for successful weed control efforts.

Noxious weed control will continue until the disturbed areas meet the identified success criteria described in Section 4.3. Supplemental seeding of desirable species may be needed to achieve this goal. Fertilizer application will be limited in areas treated for noxious weeds, as fertilizer can stimulate the growth of noxious weeds, and the timing of revegetation activities will need to be coordinated with noxious weed treatments.

4.2.1 Mechanical Treatment

Mechanical treatment will be the primary method of treatment for existing noxious weed populations within the boundaries of the Facility. Mechanical control methods rely on removal of plants, seed heads, and/or cutting roots with a shovel or other hand tools or equipment that can be used to remove, mow, or disc noxious weed populations. Hand removal of plants is also included under this treatment method. Mechanical methods are useful for smaller, isolated populations of noxious weeds in areas of sensitive habitats. Additionally, hand removal of small infestations can minimize soil disturbance, allowing desirable species to remain and limiting conditions favorable for noxious weeds.

Some rhizomatous plants can spread by discing or tillage. In addition, rush skeletonweed, which has been identified within the Facility site boundary (Section 3.0), can reproduce vegetatively from small segments of root, and discing or tilling can facilitate the spread of this species. As such, implementation of discing will be species-specific and avoided in areas where rush skeletonweed individuals have been found.

If discing is employed in areas that will be revegetated following construction, subsequent seeding will be conducted to re-establish desirable vegetative cover that will stabilize the soils and slow the potential re-invasion of noxious weeds. Discing, tilling, or other mechanical treatments that disturb the soil surface within native habitats will also be avoided in favor of herbicide application, which is an effective means of reducing the size of noxious weed populations as well as preventing the establishment of new infestations.

4.2.2 Chemical Treatment

Chemical control can effectively remove noxious weeds through use of selective herbicides. The specific herbicide used and the timing of application will be chosen based on the specific noxious weed being treated, as appropriate herbicides differ between species and types of plants (i.e., dicots such as rush skeletonweed versus monocots such as jointed goatgrass). Example treatment methods, as well as the recommended timing of treatments for the four target noxious weeds identified within the Facility, are summarized in Table 2. The status of herbicide approval (e.g., confirming herbicides are approved for use by the U.S. Environmental Protection Agency [EPA] and ODA) will be checked annually.

Prior to construction and every fall season during facility operation, the Applicant or its contractor will consult with the Morrow County Weed Coordinator on timing, method, and application rates for each identified weed species of concern, to allow for adaptive weed management given changes in weed control effectiveness from noxious weed species tolerance to herbicide treatment over time. Results of the consultation shall be reported in the Applicant's annual monitoring report. Any alternative control methods can be proposed by the Applicant or its contractors after consulting with the Morrow County Weed Coordinator and included in the Applicant's annual monitoring report.

The application of herbicides will be to identified, treatable, noxious weed infestations. The Applicant or their contractors will coordinate with the Morrow County Weed Coordinator to determine which populations are treatable and will notify landowners of proposed herbicide use on their lands prior to application. If a noxious weed population is deemed to be untreatable (e.g., too widespread and established in an area to successfully control), the Applicant will implement the applicable prevention measures discussed in Section 4.1, except for treatment with herbicides.

Table 2. Recommended Treatment for Target Noxious Weed Species

Scientific Name	Common Name	Treatment Method and Timing
<i>Aegilops cylindrica</i>	Jointed goatgrass	<p>Glyphosate – Apply to actively growing plants emerged before bolt stage (i.e., stage of growth where growth is focused on seed development versus leaf development).</p> <ul style="list-style-type: none"> Rate: 0.38 to 0.75 lb ae/a¹ <p>Imazapic – Apply pre-emergence in fall. Due to the residual effect of this herbicide, it will not be used in areas to be revegetated.</p> <ul style="list-style-type: none"> Rate: 0.063 to 0.188 lb/a¹ <p>Sulfometuron – Apply in fall or in late winter before jointed goatgrass is 3 inches tall.</p> <ul style="list-style-type: none"> Rate: 1 to 1.5 oz ai/a (1.33 to 2 oz/a)¹
<i>Chondrilla juncea</i>	Rush skeletonweed	<p>2,4-D or MCPA – Apply to rosettes in the spring immediately before or during bolting.</p> <ul style="list-style-type: none"> Rate: 2 lb ae/a¹ <p>Aminocyclopyrachlor + chlorsulfuron – Apply to actively growing plants in spring.</p> <ul style="list-style-type: none"> Rate: 1.8 to 3.2 oz/a¹ aminocyclopyrachlor + 0.7 to 1.3 oz/a chlorsulfuron (4.5 to 8 oz/a of product) <p>Aminopyralid (Milestone) – Spring or fall when rosettes are present.</p> <ul style="list-style-type: none"> Rate: 1.75 oz ae/a (7 fluid oz/a Milestone)¹ <p>Clopyralid – Apply to rosettes in fall or up to early bolting in spring.</p> <ul style="list-style-type: none"> Rate: 0.25 to 0.375 lb ae/a (0.66 to 1 pint/a)¹ <p>Picloram – Apply from late fall to early spring. For best results, apply just before or during bolting.</p> <ul style="list-style-type: none"> Rate: 1 lb ae/a¹
<i>Secale cereale</i>	Cereal rye	<p>Postemergence, non-selective herbicides such as glyphosate can control cereal rye. Glyphosate does not provide residual weed control, so any plants that emerge after treatment will not be controlled. Other herbicides that have found to provide control include Clethodim, Hexazinone, Rimsulfuron, Sethoxydim, and Sulfometuron.</p>

Scientific Name	Common Name	Treatment Method and Timing
<i>Tribulus terrestris</i>	Puncturevine	<p>2,4-D amine or 2,4-D LV ester– Apply every 3 weeks during growing season or when new seedlings appear.</p> <ul style="list-style-type: none"> Rate: 1 to 2 lb ae in 10 to 20 gal water for spot treatments <p>Aminocyclopyrachlor + chlorsulfuron– Apply to actively growing plants in spring.</p> <ul style="list-style-type: none"> Rate: 1.8 to 3.2 oz/a aminocyclopyrachlor + 0.7 to 1.3 oz/a chlorsulfuron (4.5 to 8 oz/a of product) <p>Bentazon (Basagran) + imazamox (Raptor)– Apply to small, actively growing puncture vine</p> <ul style="list-style-type: none"> Rate: 0.75 to 1 lb ai/A bentazon + 0.031 lb ai/a imazamox (4 oz/A Raptor) <p>Bromacil + diuron– Apply before weeds emerge.</p> <ul style="list-style-type: none"> Rate: 8 lb ai/A (10 lb/a)¹ <p>Chlorsulfuron– Apply late fall or late winter preemergence to growth. Needs moisture to activate.</p> <ul style="list-style-type: none"> Rate: 1 oz ai/a (1.5 oz/a)¹ <p>Fomesafen – Apply pre- and postemergence, depending on crop.</p> <ul style="list-style-type: none"> Rate: 1 to 2 pints/A (0.25 to 0.5 lb ai/a)¹ <p>Imazapic – Apply early postemergence when plants are cracking.</p> <ul style="list-style-type: none"> Rate: 0.125 to 0.188 lb ai/a¹ <p>Indaziflam – Apply at least several weeks prior to expected germination of puncture vine. Apply to dry soils when rain is not expected for at least 48 hours. Can be successfully applied several months in advance of weed germination.</p> <ul style="list-style-type: none"> Rate: Grazed areas 0.046 to 0.065 lb ai/a (3.5 to 5 oz/a Rejuvra); areas not grazed or cut for hay 0.046 to 0.09 lb ai/A (3.5 to 7 oz/a Rejuvra). Use lower rates only where weed pressure is light and shorter period of residual activity is desired. <p>Norflurazon – Apply in fall to spring, before puncture vine emerges.</p> <ul style="list-style-type: none"> Rate: Refer to label. Adjust rates depending on soil texture and organic matter <p>Paraquat – Apply as a postemergence spray to puncture vine foliage</p> <ul style="list-style-type: none"> Rate: 0.38 to 0.49 lb ai/a¹
Sources: DiTomaso et al. 2013; LCNWCB 2022; Prather and Peachey 2022.		
¹ a = acre; ae = acid equivalent; ai = active ingredient; lb= pound; oz = ounces		

4.2.2.1 Herbicide Application and Handling

Herbicide application will adhere to EPA and ODA standards. Only those herbicides that are approved by the EPA and ODA will be used. In general, application of herbicides will not occur when the following conditions exists:

- Wind velocity exceeds 15 miles per hour for granular application, or exceeds 10 miles per hour for liquid applications;
- Snow or ice covers the foliage of target species; or
- Adverse weather conditions are forecasted within the next few days.

Hand application methods (e.g., backpack spraying) may be used in roadless areas or in rough terrain. Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used mainly in open areas that are readily accessible by vehicle. Calibration checks of equipment will be conducted prior to spraying activities, as well as periodically throughout use, to ensure that appropriate application rates are achieved.

Herbicides will be transported to the Facility daily with the following stipulations:

- Only the quantity needed for that day's work will be transported.
- Concentrate will be transported in approved containers only, and in a manner that will prevent spilling, stored separately from food, clothing, and safety equipment.
- Mixing will be done off-site and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive species' habitat. No herbicides will be applied at these areas unless authorized by the appropriate regulatory agencies.
- All herbicide equipment and containers will be inspected daily for leaks.
- Herbicides use will be in accordance with all manufacture's label recommendations and warnings.

4.2.2.2 Herbicide Spills and Cleanups

All appropriate precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate. Contractors will keep spill kits in their vehicles and in an appropriate storage shed to allow for quick and effective response to spills. Items included in the spill kit will be:

- Protective clothing and gloves;
- Adsorptive clay, "kitty litter," or other commercial adsorbent;
- Plastic bags and a bucket;
- A shovel;
- A fiber brush and screw-in handle;
- A dustpan;
- Caution tape;
- Highway flares (use on existing hard-top roads only); and
- Detergent.

Response to an herbicide spill will vary with the size and location of the spill, but general procedures include:

- Stopping the leak;

- Containing the spilled material;
- Traffic control;
- Dressing the clean-up team in protective clothing;
- Cleaning up and removing the spilled herbicide, as well as the contaminated adsorptive material and soil; and
- Transporting the spilled herbicide and contaminated material to an authorized disposal site.

4.2.2.3 Herbicide Spill Reporting

All herbicide contractors will have readily available copies of the appropriate material safety data sheets for the herbicides used at their disposal and will keep copies of the material safety data sheets in the application vehicle. All herbicide spills will be reported in accordance with applicable laws and requirements. If a spill occurs, the appropriate agency and spill coordinators will be notified promptly. In case of a spill into wetlands and waterbodies, the appropriate federal, state, and county agencies will be notified immediately.

4.3 Monitoring

Following construction, monitoring for noxious weeds will be conducted annually for the first 5 five years to assess weed growth and inform noxious weed control measures. Annual checks for noxious weed infestations will also enable the Applicant to respond to new noxious weeds infestations in a timely manner and ensure the success of the site's revegetation. Annual noxious weed inspections will occur across the entire Facility through visual inspection of the site while driving and/or walking. These inspections will be used to inform ongoing noxious weed control efforts.

The initial monitoring survey will be scheduled slightly before herbicide application, as applicable, to identify any noxious weed species within the areas to be treated, with a focus on target noxious weed species observed prior to construction (Table 1), or other populations of target noxious weeds not previously observed.

Monitoring will assess the success of noxious weed treatments and will document any new noxious weed infestations observed. These results will be summarized in annual monitoring reports that describe the treatment success, make recommendations to improve treatment success (if necessary), and note any new target noxious weed species or emergence. Reports will be submitted to the Oregon Department of Energy (ODOE), Oregon Department of Fish and Wildlife (ODFW), and Morrow County annually.

Based on the success of control efforts after the fifth year of annual monitoring, the Applicant will consult with ODOE and ODFW to design a long-term weed control plan. The Applicant will maintain ongoing communication with individual landowners, the Morrow County Weed Coordinator, and ODOE regarding noxious weeds within the Facility. Landowners may also contact the Applicant directly to report the presence of noxious weeds related to Facility activity. The Applicant will control the noxious weeds on a case-by-case basis and prepare a summary of measures taken for

that landowner. During the operational period of the Facility, the Applicant will control noxious weeds as described in the long-term weed control plan.

The following contact information for the Morrow County Weed Coordinator will be used and updated as needed:

Corey Sweeney, Weed Coordinator
Morrow County Public Works
365 West Highway 74
Lexington, OR 97839
(541) 989-9502
mcweed@co.morrow.or.us

5.0 Plan Amendment

This Plan may be amended from time to time by agreement of the Applicant and the Oregon Energy Facility Siting Council (EFSC). Such amendments may be made without amendment of the site certificate. EFSC authorizes ODOE to agree to amendments to this plan. ODOE shall notify EFSC of all amendments, and EFSC retains the authority to approve, reject, or modify any amendment of this plan agreed to by ODOE. This Plan may also be amended periodically as the Applicant continues to evaluate and modify, as needed, agricultural dual use activities at the Facility.

6.0 References

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Prather, T., and E. Peachey. 2022. Section Y - Control of Problem Weeds. Pacific Northwest Weed Management Handbook. Oregon State University. Corvallis, OR. Available online at:

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Appendix A: Oregon State Noxious Weed List



**OREGON
DEPARTMENT OF
AGRICULTURE**

Noxious Weed Policy and Classification System 2022

Noxious Weed Control Program

Address: 635 Capitol Street NE, Salem, Oregon 97301

Phone: (503) 986-4621 **Fax:** (503) 986-4786

www.oregon.gov/ODA/programs/Weeds/Pages/AboutWeeds.aspx

Mission Statement

To protect Oregon's natural resources and agricultural economy from the invasion and proliferation of invasive noxious weeds.

Program Overview

The Oregon Department of Agriculture (ODA) Noxious Weed Control Program provides statewide leadership for coordination and management of state listed noxious weeds. The state program focuses on noxious weed control efforts by implementing early detection and rapid response projects for new invasive noxious weeds, implementing biological control, implementing statewide inventory and survey, assisting the public and cooperators through technology transfer and noxious weed education, maintaining noxious weed data and maps for priority listed noxious weeds, and assisting land managers and cooperators with integrated weed management projects. The Noxious Weed Control Program also supports the Oregon State Weed Board (OSWB) with administration of the OSWB Grant Program, developing statewide management objectives, developing weed risk assessments, and maintaining the state noxious weed list.

Tim Butler
Program Manager
tbutler@oda.state.or.us
(503) 986-4621

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Noxious Weed Control Policy and Classification System

Definition

“Noxious weed” means a terrestrial, aquatic or marine plant designated by the Oregon State Weed Board under ORS 569.615 as among those representing the greatest public menace and as a top priority for action by weed control programs.

Noxious weeds have become so thoroughly established and are spreading so rapidly on private, state, county, and federally owned lands, that they have been declared by ORS 569.350 to be a menace to public welfare. Steps leading to eradication, where possible, and intensive control are necessary. It is further recognized that the responsibility for eradication and intensive control rests not only on the private landowner and operator, but also on the county, state, and federal governments.

Weed Control Policy

Therefore, it shall be the policy of ODA to:

1. Assess non-native plants through risk assessment processes and make recommendations to the Oregon State Weed Board for potential listing.
2. Rate and classify weeds at the state level.
3. Prevent the establishment and spread of listed noxious weeds.
4. Encourage and implement the control or containment of infestations of listed noxious weed species and, if possible, eradicate them.
5. Develop and manage a biological weed control program.
6. Increase awareness of potential economic losses and other undesirable effects of existing and newly invading noxious weeds, and to act as a resource center for the dissemination of information.
7. Encourage and assist in the organization and operation of noxious weed control programs with government agencies and other weed management entities.
8. Develop partnerships with county weed control districts, universities, and other cooperators in the development of control methods.
9. Conduct statewide noxious weed surveys and weed control efficacy studies.

Weed Classification System

The purpose of this Classification System is to:

1. Act as the ODA's official guideline for prioritizing and implementing noxious weed control projects.
2. Assist the ODA in the distribution of available funds through the Oregon State Weed Board to assist county weed programs, cooperative weed management groups, private landowners, and other weed management entities.
3. Serve as a model for private and public sectors in developing noxious weed classification systems that aid in setting effective noxious weed control strategies.

Criteria for Determining Economic and Environmental Significance

Detrimental Effects

1. A plant species that causes or has the potential to cause severe negative impacts to Oregon's agricultural economy and natural resources.
2. A plant species that has the potential to or does endanger native flora and fauna by its encroachment into forest, range, aquatic and conservation areas.
3. A plant species that has the potential or does hamper the full utilization and enjoyment of recreational areas.
4. A plant species that is poisonous, injurious, or otherwise harmful to humans and/or animals.

Plant Reproduction

1. A plant that reproduces by seed capable of being dispersed over wide areas or that is long-lived, or produced in large numbers.
2. A plant species that reproduces and spreads by tubers, creeping roots, stolons, rhizomes, or other natural vegetative means.

Distribution

1. A weed of known economic importance which occurs in Oregon in small enough infestations to make eradication/containment possible; or not known to occur, but its presence in neighboring states makes future occurrence seem imminent.
2. A weed of economic or ecological importance and of limited distribution in Oregon.
3. A weed that has not infested the full extent of its potential habitat in Oregon.

Difficulty of Control

A plant species that is not easily controlled with current management practices such as chemical, cultural, biological, and physical methods.

Noxious Weed Control Classification Definitions

Noxious weeds, for the purpose of this system, shall be listed as either A or B, and may also be designated as T, which are priority targets for control, as directed by the Oregon State Weed Board.

- **A Listed Weed:**

A weed of known economic importance which occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent (Table I).

Recommended action: Infestations are subject to eradication or intensive control when and where found.

- **B Listed Weed:**

A weed of economic importance which is regionally abundant, but which may have limited distribution in some counties (Table II).

Recommended action: Limited to intensive control at the state, county or regional level as determined on a site specific, case-by-case basis. Where implementation of a fully integrated statewide management plan is not feasible, biological control (when available) shall be the primary control method.

- **T-Designated Weed (T):**

A designated group of weed species selected from either the A or B list as a focus for prevention and control by the Noxious Weed Control Program. Action against these weeds will receive priority. T-designated noxious weeds are determined by the Oregon State Weed Board and directs ODA to develop and implement a statewide management plan.

Weed Biological Control

Oregon implements biological control, or “biocontrol” as part of its integrated pest management approach to managing noxious weeds. This is the practice of using host-specific natural enemies such as insects or pathogens to control noxious weeds. The Oregon Department of Agriculture Noxious Weed Program has adopted the International Code of Best Practices for biological control of weeds. Only safe, effective, and federally- approved natural enemies will be used for biocontrol.

Table I: A Listed Weeds

Common Name	Scientific Name
African rue (T)	<i>Peganum harmala</i>
Camelthorn	<i>Alhagi pseudalhagi</i>
Cape-ivy (T)*	<i>Delairea odorata</i>
Coltsfoot	<i>Tussilago farfara</i>
Common frogbit	<i>Hydrocharis morsus-ranae</i>
Cordgrass	
Common	<i>Spartina anglica</i>
Dense-flowered (T)	<i>Spartina densiflora</i>
Saltmeadow (T)	<i>Spartina patens</i>
Smooth (T)	<i>Spartina alterniflora</i>
Delta arrowhead (T)	<i>Sagittaria platyphyla</i>
European water chestnut	<i>Trapa natans</i>
Flowering rush (T)	<i>Butomus umbellatus</i>
Garden yellow loosestrife (T)	<i>Lysimachia vulgaris</i>
Giant hogweed (T)	<i>Heracleum mantegazzianum</i>
Goatgrass	
Barbed (T)	<i>Aegilops triuncialis</i>
Ovate	<i>Aegilops ovata</i>
Goatsrue (T)	<i>Galega officinalis</i>
Hawkweed	
King-devil*	<i>Hieracium piloselloides</i>
Mouse-ear (T)*	<i>Hieracium pilosella</i>
Orange (T)*	<i>Hieracium aurantiacum</i>
Yellow (T)	<i>Hieracium floribundum</i>
Hoary alyssum (T)	<i>Berteroa incana</i>
Hydrilla	<i>Hydrilla verticillata</i>
Japanese dodder	<i>Cuscuta japonica</i>
Kudzu (T)	<i>Pueraria lobata</i>
Matgrass (T)	<i>Nardus stricta</i>
Oblong spurge (T)	<i>Euphorbia oblongata</i>
Paterson's curse (T)	<i>Echium plantagineum</i>
Purple nutsedge	<i>Cyperus rotundus</i>
Ravennagrass (T)	<i>Saccharum ravennae</i>
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Squarrose knapweed (T)	<i>Centaurea virgata</i>

(T) T-Designated Weed (See page 4)

(Continued)

Table I: A Listed Weeds

Common Name	Scientific Name
Starthistle	
Iberian (T)	<i>Centaurea iberica</i>
Purple (T)	<i>Centaurea calcitrapa</i>
Syrian bean-caper	<i>Zygophyllum fabago</i>
Thistle	
Plumeless (T)	<i>Carduus acanthoides</i>
Smooth distaff	<i>Carthamus baeticus</i>
Taurian (T)	<i>Onopordum tauricum</i>
Turkish (T)	<i>Carduus cinereus</i>
Wetted (curly plumeless) (T)	<i>Carduus crispus</i>
Woolly distaff (T)	<i>Carthamus lanatus</i>
Water soldiers	<i>Stratiotes aloides</i>
West Indian spongeplant	<i>Limnobium laevigatum</i>
White bryonia	<i>Bryonia alba</i>
Yellow floating heart (T)	<i>Nymphoides peltata</i>
Yellowtuft (T)	<i>Alyssum murale</i> , <i>A. corsicum</i>

(T) T-Designated Weed (See page 4)

Table II: B Listed Weeds

Common Name	Scientific Name
Armenian (Himalayan) blackberry	<i>Rubus armeniacus</i> (<i>R. procerus</i> , <i>R. discolor</i>)
Biddy-biddy	<i>Acaena novae-zelandiae</i>
Broom	
French*	<i>Genista monspessulana</i>
Portuguese (T)	<i>Cytisus striatus</i>
Scotch*	<i>Cytisus scoparius</i>
Spanish	<i>Spartium junceum</i>
Buffalobur	<i>Solanum rostratum</i>
Butterfly bush	<i>Buddleja davidii</i> (<i>B. variabilis</i>)
Common bugloss (T)	<i>Anchusa officinalis</i>
Common crupina*	<i>Crupina vulgaris</i>
Common reed	<i>Phragmites australis</i> ssp. <i>australis</i>
Common viper's bugloss	<i>Echium vulgare</i>
Creeping yellow cress	<i>Rorippa sylvestris</i>
Cutleaf teasel	<i>Dipsacus laciniatus</i>
Dodder	
Smoothseed alfalfa	<i>Cuscuta approximata</i>
Five-angled	<i>Cuscuta pentagona</i>
Bigseed	<i>Cuscuta indecora</i>
Dyer's woad	<i>Isatis tinctoria</i>
English hawthorn	<i>Crataegus monogyna</i>
Eurasian watermilfoil*	<i>Myriophyllum spicatum</i>
False brome	<i>Brachypodium sylvaticum</i>
Field bindweed*	<i>Convolvulus arvensis</i>
Garlic mustard (T)	<i>Alliaria petiolata</i>
Geranium	
Herb Robert	<i>Geranium robertianum</i>
Shiny leaf	<i>Geranium lucidum</i>
Giant reed (T)*	<i>Arundo donax</i>
Gorse* (T)	<i>Ulex europaeus</i>
Halogeton	<i>Halogeton glomeratus</i>
Houndstongue	<i>Cynoglossum officinale</i>

* Biocontrol (See page 4)

(T) T-Designated Weed (See page 4)

(Continued)

Table II: B Listed Weeds

Common Name	Scientific Name
Indigo bush	<i>Amorpha fruticosa</i>
Ivy	
Atlantic	<i>Hedera hibernica</i>
English	<i>Hedera helix</i>
Johnsongrass	<i>Sorghum halepense</i>
Jointed goatgrass	<i>Aegilops cylindrica</i>
Jubata grass	<i>Cortaderia jubata</i>
Knapweed	
Diffuse*	<i>Centaurea diffusa</i>
Meadow*	<i>Centaurea pratensis</i>
Russian*	<i>Acroptilon repens</i>
Spotted* (T)	<i>Centaurea stoebe (C. maculosa)</i>
Knotweed	
Bohemian*	<i>Fallopia x bohemica</i>
Giant*	<i>Fallopia sachalinensis (Polygonum)</i>
Himalayan	<i>Polygonum polystachyum</i>
Japanese*	<i>Fallopia japonica (Polygonum)</i>
Kochia	<i>Kochia scoparia</i>
Lesser celandine	<i>Ranunculus ficaria</i>
Meadow hawkweed (T)	<i>Pilosella caespitosum (Hieracium)</i>
Mediterranean sage*	<i>Salvia aethiopis</i>
Medusahead rye	<i>Taeniatherum caput-medusae</i>
Old man's beard	<i>Clematis vitalba</i>
Parrot feather	<i>Myriophyllum aquaticum</i>
Perennial peavine	<i>Lathyrus latifolius</i>
Perennial pepperweed (T)	<i>Lepidium latifolium</i>
Pheasant's eye	<i>Adonis aestivalis</i>
Pine echium	<i>Echium pininana</i>
Poison hemlock*	<i>Conium maculatum</i>
Policeman's helmet	<i>Impatiens glandulifera</i>
Primrose-willow	
Large-flower (T)	<i>Ludwigia grandiflora</i>
Water primrose (T)	<i>Ludwigia hexapetala</i>
Floating (T)	<i>Ludwigia peploides</i>

*Biocontrol (See page 4)

(T) T-Designated Weed (See page 4)

(Continued)

Table II: B Listed Weeds

Common Name	Scientific Name
Puncturevine*	<i>Tribulus terrestris</i>
Purple loosestrife*	<i>Lythrum salicaria</i>
Ragweed	<i>Ambrosia artemisiifolia</i>
Ribbongrass (T)	<i>Phalaris arundinacea</i> var. <i>Picta</i>
Rose	
Dog	<i>Rosa canina</i>
Sweetbriar	<i>Rosa rubiginosa</i>
Rush skeletonweed* (T)	<i>Chondrilla juncea</i>
Saltcedar* (T)	<i>Tamarix ramosissima</i>
Small broomrape	<i>Orabanche minor</i>
South American waterweed	<i>Egeria densa</i> (<i>Elodea</i>)
Spanish heath	<i>Erica lusitanica</i>
Spikeweed	<i>Hemizonia pungens</i>
Spiny cocklebur	<i>Xanthium spinosum</i>
Spurge laurel	<i>Daphne laureola</i>
Spurge	
Leafy* (T)	<i>Euphorbia esula</i>
Myrtle	<i>Euphorbia myrsinites</i>
St. Johnswort*	<i>Hypericum perforatum</i>
Sulfur cinquefoil	<i>Potentilla recta</i>
Swainsonpea	<i>Sphaerophysa salsula</i>
Tansy ragwort* (T)	<i>Senecio jacobaea</i> (<i>Jacobaea vulgaris</i>)
Thistle	
Bull*	<i>Cirsium vulgare</i>
Canada*	<i>Cirsium arvense</i>
Italian*	<i>Carduus pycnocephalus</i>
Milk*	<i>Silybum marianum</i>
Musk*	<i>Carduus nutans</i>
Scotch	<i>Onopordum acanthium</i>
Slender-flowered*	<i>Carduus tenuiflorus</i>
Toadflax	
Dalmatian* (T)	<i>Linaria dalmatica</i>
Yellow*	<i>Linaria vulgaris</i>
Tree of heaven	<i>Ailanthus altissima</i>

*Biocontrol (See page 4)

(T) T-Designated Weed (See page 4)

(Continued)

Table II: B Listed Weeds

Common Name	Scientific Name
Velvetleaf	<i>Abutilon theophrasti</i>
Ventenata grass	<i>Ventenata dubia</i>
Whitetop	
Hairy	<i>Lepidium pubescens</i>
Lens-podded	<i>Lepidium chalepensis</i>
Whitetop (hoary cress)*	<i>Lepidium draba</i>
Yellow archangel	<i>Lamiastrum galeobdolon</i>
Yellow flag iris	<i>Iris pseudacorus</i>
Yellow nutsedge	<i>Cyperus esculentus</i>
Yellow starthistle*	<i>Centaurea solstitialis</i>

*Biocontrol (See page 4)

(T) T-Designated Weed (See page 4)

Appendix B: Morrow County Noxious Weed List

Appendix A

NOXIOUS WEEDS

Rush Skeletonweed
Yellow Starthistle
Tansy Ragwort
Dalmatian & Yellow Toadflax
Mediterranean Sage
Leafy Spurge
Spikeweed
Musk Thistle
Scotch Thistle
Purple Loosestrife
Common Crupina
White Top
Hounds tongue
Plumeless Thistle
Flowering Rush
Yellow Flag Iris

Appendix B

WEEDS OF ECONOMIC IMPORTANCE

Poison Hemlock
Canada Thistle
Jointed Goatgrass
St. Johnswort
Perennial Sowthistle
Field Bindweed
Cereal Rye
Wild Oats
Johnsongrass
Knapweeds-Russian, Diffuse, Spotted
Field Dodder
Water Hemlock
Medusahead Rye
Puncturevine
Kochia
Perennial Pepperweed
Myrtle Spurge
Ventenata

Attachment P-4. Draft Revegetation Plan

Sunstone Solar Project Draft Revegetation Plan

Prepared for



GETTING SOLAR DONE.

Sunstone Solar, LLC

Prepared by



TETRA TECH

Tetra Tech, Inc.

June 2023

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1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a solar photovoltaic solar energy generation facility and related or supporting facilities in Morrow County, Oregon. The proposed Facility will generate up to 1,200 megawatts (MW) of nominal and average generating capacity using solar panels wired in series and in parallel to form arrays, which in turn are connected to electrical infrastructure. Additionally, the Facility will also include a 1,200 MW distributed battery energy storage system for the purpose of stabilizing the solar resource. The Applicant proposes to permit a range of photovoltaic and related or associated technology within a site boundary that allows for micro-siting flexibility in consideration of the perpetual evolution of technology and maximization of space efficiency, thereby allowing developmental flexibility to address varying market requirements. These facilities are all described in greater detail in Exhibit B of the Application for Site Certificate (ASC).

This Draft Revegetation Plan (Plan) has been prepared to guide restoration of areas temporarily disturbed during construction of the Facility, as well as revegetation of areas within the solar array fence line area. This Plan will be updated, as necessary, in coordination with the Oregon Department of Energy (ODOE), the Oregon Department of Fish and Wildlife (ODFW), and Morrow County, and will be updated as needed to reflect the final layout of the Facility.

Throughout construction, revegetation, and operation activities, the Applicant will take appropriate actions to prevent the spread of state and county listed noxious weeds. A stand-alone Draft Noxious Weed Control Plan has also been prepared (see Exhibit P, Attachment P-3), which contains information on state and Morrow County listed noxious weeds, noxious weeds observed during surveys, and treatment and monitoring of noxious weeds.

2.0 Site Description

The Facility includes a 10,960-acre site boundary within which all Facility components will be located. The Facility lies within the Columbia Plateau Ecoregion at elevations from approximately 879 to 1,440 feet. The Facility is sited entirely on private land, which primarily consists of agriculture land used for growing dryland wheat. Native vegetation within the site boundary has been modified primarily through agricultural conversion, but also through the introduction of exotic grasses and other non-native vegetation.

Habitat mapping and categorization of the site boundary were conducted for the Facility in 2022. Habitat types within the site boundary include Agriculture, Pasture, and Mixed Environs (habitat subtype: Orchards, Vineyards, Wheat Fields, Other Row Crops); Urban and Mixed Environs; Upland Grassland, Shrub-steppe, and Shrubland (habitat subtypes: Eastside Grasslands, Sagebrush Shrub-steppe); Wetlands (habitat subtype: Emergent Wetlands); and Open Water-Lakes, Rivers, Streams (habitat subtype: Intermittent or Ephemeral Streams). Details on habitat types, subtypes, and

categories can be found in Exhibit P of the Facility's ASC, especially Attachment P-1 which contains the biological survey reports. Details on potential impacts to habitat from construction and operation of the Facility, as well as avoidance and minimization measures, can be found in the ASC Exhibits P and Q.

3.0 Description of Temporary and Permanent Impacts

Construction of the Facility will result in up to about 58 acres of temporary and 9,442 acres of permanent impacts (see Exhibits C and P). Although actual impacts may change depending on the final layout, solar modules, and other associated facilities, this value represents the estimated maximum acreage of impact. Exhibit P details the acres of each habitat subtype that will be temporarily and permanently disturbed during construction and operation of the Facility. All areas within the solar array fence line area are considered a permanent impact and will be mitigated as such in the Habitat Mitigation Plan (HMP; Exhibit P, Attachment P-2).

Temporary impacts will occur in areas outside the solar array fence line area that will be disturbed during construction activities, but which will not be occupied by permanent facilities. Temporary disturbance will occur in association with the construction of aboveground and underground collector and transmission lines, new roads, and perimeter fence line. The entire solar array fence line area will occupy approximately 9,441 acres within 20 fenced areas. As noted above, this area is considered permanently impacted; however, vegetation within the solar array fence line area will be retained and/or revegetated, providing residual (and in some cases increased) wildlife and ecological value during operation of the Facility and this area would be reclaimed upon retirement.

To the maximum extent practicable, existing vegetation root systems (e.g., crop stubble, fallow vegetation) will be left intact during construction, although construction vehicles driving across the site may affect these existing root systems. Areas where the slope and gradient are within the solar panel and racking tolerances will receive minimal grading, with grading in those areas limited to the roads, inverter, and energy storage footprints only. This preservation of existing root systems will minimize soil erosion, providing both improved compliance with stormwater and dust management requirements, facilitate revegetation success, and preserve soil productivity for future agricultural use. Construction will be coordinated and sequenced with landowners to maintain land in current production and weed control until just prior to construction. This will avoid land being left unmanaged and minimize weed issues that can complicate revegetation.

Table 1 presents the estimated maximum acreage of temporary and permanent impacts to habitat subtypes associated with Facility construction and operation. Table 1 will be updated prior to construction to reflect the final impact acreage by habitat subtype for the final layout. Figures depicting the location of Facility infrastructure are included in Exhibit C, and a figure depicting these habitat subtypes within the site boundary is available in Exhibit P.

Table 1. Maximum Temporary and Permanent Impacts by Habitat Subtype

ODFW Habitat Category	Habitat Subtype	Permanent Disturbance (Acres)^{1, 2}	Temporary Disturbance (Acres)¹
2	Eastside Grasslands	<0.1	0.4
4	Intermittent or Ephemeral Streams	-	<0.1
4	Eastside Grasslands	17.9	2.7
5	Eastside Grasslands	18.5	2.2
Category 2, 4, and 5 Habitat Total		36.4	5.3
6	Orchards, Vineyards, Wheat Fields, Other Row Crops	9,397.4	51.3
	Urban and Mixed Environs	7.7	1.2
Category 6 Habitat Subtotal		9,405.1	52.6
Grand Total¹		9,441.5	57.8
<p>Note: Totals in this table may not appear to sum correctly due to rounding. “-” means no impact while <0.1 means greater than zero but less than 0.05 acre impact.</p> <p>1. Additional details associated with temporary and permanent impacts are provided in Exhibit C of the ASC.</p> <p>2. Acres of permanent disturbance includes the entire area within the solar array area fence line including the footprints of all solar components and supporting facilities, as well as the areas outside of the footprint of permanent components and facilities (e.g., areas underneath and between rows of solar panels).</p>			

4.0 Revegetation Methods

This plan addresses revegetation methods for temporary impacts to non-agriculture (i.e., Orchards, Vineyards, Wheat Fields, Other Row Crops habitat subtype) and non-developed (i.e., Urban and Mixed Environs habitat subtype) habitat types, as well as revegetation and vegetation management of lands within the solar array fence line area. Restoration of temporarily disturbed developed habitat (i.e., Urban and Mixed Environs habitat subtype) will be determined on a case-by-case basis and is not covered further in this plan. Temporary disturbances to agricultural habitat (i.e., Orchards, Vineyards, Wheat Fields, Other Row Crops habitat subtype) will be restored as described in Section 4.2. The Applicant will restore temporarily disturbed areas by re-establishing slope, surface stability, and drainage features, as needed, followed by soil preparation and seeding. Soil preparation and seeding techniques are described below.

Revegetation will begin as soon as feasible after completion of each construction phase. Seeding and planting will be done in a timely manner and in the appropriate season to facilitate germination and establishment of seeded species.

4.1 Site Preparation

As noted above, existing vegetation root systems (e.g., crop stubble, fallow vegetation) will be left intact during construction to the maximum extent practicable. Areas where the slope and gradient are within the solar panel and racking tolerances will receive minimal grading, with grading in

those areas limited to the roads, inverter, and energy storage footprints only. In areas where soil is removed during construction, the following measures will be taken where appropriate:

- Site 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.
- During construction, excavated soils will be stockpiled by soil horizon, so that they can be replaced in proper order with the topsoil on the surface, preventing mixing of topsoil and subsoils and maintaining soil productivity. The conserved soil will be put back in place as topsoil prior to revegetation activities.
- Topsoil and other soils from noxious weed infested areas will not be moved outside of the infested areas and will be returned to their previous location during reclamation activities.
- Movement of topsoil and other soils from non-infested areas will be limited to eliminate the transport of weed seeds, roots, or rhizomes.
- Areas of severe machine or vehicle tracking that would hinder seeding success and are unnecessary for soil stabilization will be regraded.
- Prior to seeding and/or planting of revegetation areas, soils will be prepared to facilitate revegetation success.
- Where applicable, soils will be mechanically scarified (e.g., tilling or ripping the soil) to an appropriate depth to reduce the potential effects of compaction, to maintain soil productivity, and reduce the potential for erosion on compacted soils.
- In general, the soil needs to be prepared into a firm, fine-textured seedbed that is relatively free of debris before seeding or planting. Shallow tilling with a disc, followed by a harrow or drag if necessary, can typically achieve this. If replaced soil is too soft, then seeds may be buried too deep to properly germinate; a roller or culti-packer should be used to pack down the soil.
- In non-cropland areas, site complexity will be considered during soil preparation. For instance, it may be desirable to purposely create an uneven, patchy site that allows for depressions and other microsites that result in small variations in aspect and moisture holding to promote complexity.
- The Applicant or a designated construction contractor will use mulching and other appropriate practices, as required by the anticipated National Pollutant Discharge Elimination System (NPDES) 1200-C permit, to control erosion and sediment during construction and revegetation work.

4.2 Revegetation of Temporarily Disturbed Agricultural Lands

Temporarily disturbed agricultural lands will be reseeded with the appropriate crop or maintained as fallow in consultation with the landowner or farm operator. The Applicant will also consult with the landowner or farm operator to determine seed mix, application methods, and rates for seed and fertilizer. Success of cropland revegetation will have been achieved when production of the revegetated area is comparable to that of adjacent, non-disturbed croplands of the same type. Success determination will involve consultation with the landowner or farm operator, and the Applicant will report to ODOE on the success of cropland restoration efforts. Noxious weed control

is necessary for successful revegetation of croplands and will be implemented per the methods described in the Draft Noxious Weed Control Plan (Exhibit P, Attachment P-3).

4.3 Revegetation of Other Habitat

During construction, the Applicant will implement site stabilization measures, including seeding of temporarily disturbed areas according to the Applicant's anticipated NPDES 1200-C permit.

Approximately 6 months prior to commercial operation of each phase of construction, the Applicant will meet with ODFW, ODOE, and Morrow County Weed Control Authority personnel to review the actual extent and conditions of temporarily impacted areas, confirm the revegetation methods to be implemented, and to revisit reference sites as necessary.

Following each construction phase, all areas, with the exception of temporarily disturbed agricultural lands, will be reseeded with a mix of native or non-invasive, non-persistent non-native grasses and forbs (see Section 4.3.2). All seeds will be obtained from a reputable supplier in compliance with the Oregon Seed Law (Oregon Administrative Rule 603-056).

The seed mixes may include species selected to enhance soil health, such as nitrogen-fixing species, if determined to be appropriate based on coordination with ODOE and ODFW. Including these species in the seed mix would help the other plant species thrive and increase long-term survival of desired species. Additionally, the seed mixes include species intended to provide broader ecosystem benefits, such as pollinator species, that will benefit the surrounding landscape. The seed mix for temporarily disturbed areas outside of the solar array fence line area will include taller native species of grasses and pollinator-friendly forbs to increase overall site biodiversity and increase benefits to wildlife and pollinators, while the seed mix for areas within the solar array fence line area will include lower growing grasses and pollinator-friendly forbs compatible with desired vegetation conditions under the solar arrays (i.e., species whose mature height would not interfere with or shade the solar array). Using native, or non-invasive non-native pollinator-friendly, plants as ground cover under solar panels can also help recharge groundwater, reduce erosion, and improve soil carbon sequestration (Neale and Atre 2020).

The seeding methods and timing of planting will be appropriate to the seed mixes (see Section 4.3.2), weather conditions (e.g., precipitation, wind speed, temperature, etc.), and site conditions (including area size, slope, and erosion potential) based upon consultation with ODFW, the Morrow County Weed Control Supervisor, and the seed supplier. Seeding between late-fall and late-winter/early-spring is typically recommended; however, the Applicant will consult with ODFW, Morrow County Weed Control, and/or the seed supplier to determine the optimal timing for seed application based on climatic conditions of the particular year when construction and revegetation efforts are implemented. Three common seed application methods that may be used are broadcast seeding, drill seeding, and hydroseeding; each of these are discussed further below. Other seeding methods may be proposed for review and approval prior to revegetation efforts.

4.3.1 Seeding Methods

4.3.1.1 Broadcast Seeding

Broadcast seeding is the application of seed directly to the ground surface. This method may be chosen for areas with shallow and rocky soils, and the type of broadcast spreader would depend on the size of the area to be seeded and the terrain.

In this method, the seed mix would be broadcast using at least the application rates specified by the seed supplier for broadcast seeding. When feasible, due to the seasonality of when planting can occur, the entire area will be seeded after grading is complete but before placement of Facility components, providing more flexibility in seed application. In those instances where seeding occurs prior to installation of components, follow-up seeding will occur in areas temporarily disturbed by installation and any areas that are deficient in vegetation from the first round of seeding.

Immediately following seed application, hydromulch or certified weed-free straw would be applied. Broadcast seeding will not be employed if winds exceed 5 miles per hour. If certified weed-free straw is unavailable, the Applicant or a designated construction contractor will identify a local source of straw. The local source of the straw will be approved by the county weed master and ODFW prior to purchase. This straw will either be crimped into the ground or applied with a tackifier.

4.3.1.2 Drill Seeding

Drill seeding can be used for larger areas with deeper soils and moderate to gentle terrain to accommodate mechanical equipment. This method provides the advantage of planting the seed at a uniform depth and may provide better soil to seed contact. Using a range seed drill, seeds will be sown according to the application rates recommended by the seed supplier. Drill seeding will be difficult after Facility components have been installed so it will primarily be used if seeding occurs after grading is complete but before components are installed or in areas that were temporarily disturbed during construction that do not have any permanent infrastructure (e.g., temporary access roads, laydown areas).

4.3.1.3 Hydroseeding

Hydroseeding is most applicable for areas drill or broadcast seeding machinery cannot access, this usually includes steeper sloped or narrow terrain, but can be used in all terrains. Soil bed preparation is also crucial for growth success and frequently includes tracking perpendicular to the slope to create micro conditions for seed. Flat grading and compaction are not recommended.

Seeding rates increase by 30 to 50 percent of broadcast seeding rates or single applications per consultation with the seed supplier and ODFW. Prior to hydroseeding the tackifier and fertilizer, if included, will be reviewed and approved in consultation with ODFW.

4.3.2 Seed Mixes

Two seed mixes are proposed for revegetation efforts: one for revegetation of temporarily disturbed areas outside the solar array fence line area, and one for revegetation of areas within the solar array fence line area. Tables 2 and 3 present example seed mixes that would be considered for

revegetation. However, the number of seed mixes and composition of the final seed mixes will be determined in consultation with ODOE and ODFW and will be based on pre-construction conditions and the availability of seed at the time of procurement.

Grassland Seed Mix #1 would be appropriate for revegetation of temporarily disturbed areas outside the solar array fence line area, with the exception of areas that would be returned to agricultural production following construction (as noted in Section 4.2). The example seed mix is presented in Table 2 and contains a mixture of native grasses and native, pollinator-friendly forbs. This seed mix includes a mixture of deep-rooted grasses and flowering plants as these types of species can capture and filter stormwater, build topsoil, and provide food sources and for native insects (Davis 2021). Forbs included in this seed mix were also chosen based on their bloom period. Including plants that flower throughout the growing season provides a continuous source of nectar and pollen and can attract a variety of pollinators (NRCS 2011).

Table 2. Example Grassland Seed Mix #1

Growth Habit	Common Name	Scientific Name	Percent of Mix
Grasses	Bluebunch wheatgrass ¹	<i>Pseudoroegneria spicata</i>	35
	Sandberg's bluegrass ²	<i>Poa secunda</i> ssp. <i>secunda</i>	15
	Bottlebrush squirreltail	<i>Elymus elymoides</i>	10
	Needle-and-thread grass ³	<i>Hesperostipa comata</i>	10
Forbs	Common sunflower ⁴	<i>Helianthus annuus</i>	5
	Hoary aster	<i>Dieteria (Machaeranthera) canescens</i>	5
	Lupine	<i>Lupinus leucophyllus</i> , <i>L. sericeus</i> , <i>L. sulphureus</i>	5
	Munro's globemallow ⁵	<i>Sphaeralcea munroana</i>	5
	Western blue flax	<i>Linum lewisii</i>	5
	Yarrow	<i>Achillea millefolium</i>	5
<ol style="list-style-type: none"> 1. An alternative to bluebunch wheatgrass is Snake River wheatgrass (<i>Elymus wawawaiensis</i>; also sold as "Secar" bluebunch wheatgrass). 2. An alternative to Sandberg's bluegrass is big bluegrass (<i>Poa secunda</i> subsp. <i>juncifolia</i>; also sold as <i>P. ampla</i>). 3. Alternatives to needle-and-thread grass include the native bunchgrass Indian ricegrass (<i>Achnatherum [Oryzopsis] hymenoides</i>) or the non-native bunchgrasses crested wheatgrass (<i>Agropyron cristatum</i>) and sheep/hard fescue (<i>Festuca ovina</i>/F. <i>trachyphylla</i>). 4. An alternative to common sunflower is curlycup gumweed (<i>Grindelia squarrosa</i>). 5. An alternative to Munro's globemallow is blanketflower (<i>Gaillardia aristata</i>) 			

A second grassland seed mix, Grassland Seed Mix #2, is suggested for revegetation within the solar array fence line area, including areas that previously consisted of agricultural lands. The example seed mix presented in Table 3 contains a mixture of low-growing native and non-native grasses and native and non-native pollinator friendly forbs which would be compatible with desired vegetation conditions under the solar arrays (i.e., species whose mature height would not interfere with or shade the solar array). Similar to Grassland Seed Mix #1, this seed mix includes a mixture of deep-rooted grasses and flowering plants that flower throughout the growing season.

Table 3. Example Grassland Seed Mix #2

Growth Habit	Common Name	Scientific Name	Percent of Mix
Grasses	Sandberg's bluegrass	<i>Poa secunda</i> ssp. <i>secunda</i>	35
	Bottlebrush squirreltail, common squirreltail	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	15
	Desert fescue ¹	<i>Vulpia microstachys</i>	10
	Thurber's needlegrass	<i>Achnatherum thurberianum</i>	10
Forbs	Pacific lupine ²	<i>Lupinus lepidus</i>	5
	Bigseed bisuitroot ³	<i>Lomatium macrocarpum</i>	5
	Erigeron/fleabane	<i>Erigeron filifolius</i> , <i>E. linearis</i> , or <i>E. pumilus</i>	5
	Oregon sunshine	<i>Eriophyllum lanatum</i>	5
	Snow buckwheat	<i>Eriogonum niveum</i>	5
	Wollypod milkvetch	<i>Astragalus purshii</i>	5
<ol style="list-style-type: none"> 1. Alternatives to desert fescue are sixweeks fescue (<i>Vulpia octoflora</i>) or sheep/hard fescue (<i>Festuca ovina</i>/<i>F. trachyphylla</i>). 2. Alternatives to Pacific lupine are American vetch (<i>Vicia americana</i>) or clover (<i>Trifolium macrocephalum</i>, <i>T. pratense</i>, <i>T. repens</i>). 3. An alternative to bigseed biscuitroot is longleaf phlox (<i>Phlox longifolia</i>). 			

5.0 Revegetation Documentation

Records will be kept of revegetation efforts, both for agricultural lands and other habitat. Records will include:

- Date construction phase was completed;
- Description of the affected area;
- Date revegetation was initiated;
- Description of the revegetation effort;
- Supporting figures representing the location, acres affected, and pre-disturbance condition of the revegetation area; and
- Confirmation from the landowner that temporary disturbances in cropland have been satisfactorily restored.

The Applicant will update these records periodically as revegetation work occurs, and will provide ODOE with copies of these records along with submission of the monitoring report that is required by the Site Certificate.

6.0 Monitoring

6.1 Revegetation Monitoring

6.1.1 *Monitoring of Temporarily Disturbed Revegetated Areas*

Following implementation of revegetation efforts, the Applicant will monitor the temporarily disturbed areas that have been revegetated as described in this section, unless the landowner has converted the area to land uses that preclude meeting revegetation success criteria. Monitoring will be conducted by a qualified botanist or revegetation specialist; this monitoring will be done annually for 5 years, starting in the first growing season after seeding. Monitoring methods will be determined in consultation with ODOE and ODFW prior to construction.

Following annual monitoring, a monitoring report will be prepared and will include:

- The results of annual monitoring;
- The investigator's assessment of whether the revegetated areas are trending toward meeting the success criteria;
- Assessments of factors impacting the ability of the revegetated area to trend towards meeting the success criteria; and
- Recommendations of remedial actions, if any.

The Applicant will report the investigator's findings and recommendations regarding wildlife habitat recovery and revegetation success within 60 days of the inspection to ODOE and ODFW.

Based on the fifth annual assessment, a long-term monitoring plan will be developed in coordination with ODOE and ODFW. This may include remedial actions and/or additional monitoring for areas that have been determined by ODOE, in consultation with ODFW, not to have met the success criteria.

6.1.1.1 *Reference and Monitoring Sites*

To determine if the revegetation of temporarily disturbed areas are meeting success criteria (see Section 6.1.1.2), paired monitoring and reference sites will be established in each of the habitat subtypes that will be temporarily disturbed by construction (with the exception of agricultural land). Reference sites are intended to represent target conditions for the revegetation effort. Vegetation within monitoring sites in revegetation areas will be compared with those in the associated reference sites to measure success of the revegetation activities. During each assessment, revegetated areas will be compared to reference sites based on the success criteria defined in Section 6.1.1.2.

Prior to operation, reference sites—areas of habitat quality similar to those found prior to disturbance at the areas to be revegetated—will be identified in consultation with ODOE and ODFW. Reference sites will be chosen with consideration to land use patterns, soil types, terrain, and presence of noxious weeds. Alternate reference sites may be chosen in consultation with ODOE

and ODFW if land use changes, wildfire, or other disturbance makes a chosen reference site no longer representative of target conditions.

The number of reference sites will be determined prior to construction and will represent the range of temporarily disturbed habitat areas for all Category 2, 4, and 5 habitats (see Table 1). Proposed reference sites will be chosen based on review of aerial imagery, information from previous surveys conducted for the Facility, local knowledge of the site, and soil survey data (NRCS 2023).

Final selection of proposed reference sites will include a site visit conducted at the appropriate time to evaluate baseline conditions within these reference sites. These site visits will document the following:

- Vascular plant species present;
- Native/non-native status of species present;
- Approximate percent cover of dominant species;
- Approximate percent cover of state and county-listed noxious weeds; and
- Evidence of ongoing, recent, or past disturbance.

Per ODFW recommendations on other projects, a minimum of one monitoring site will be located within habitats where temporary disturbances will be less than 5 acres in size. Therefore, one monitoring site and one reference site will be established within each habitat category of temporarily disturbed Eastside grasslands habitat subtype for a total of three monitoring sites and three reference sites. No monitoring site is proposed for the less than 0.1 acre of temporary impact anticipated to the Intermittent or Ephemeral Streams habitat subtype, although this area will be revegetated if not avoided during final design.

Monitoring sites within each habitat subtype and category will be selected using a stratified randomization process utilizing existing habitat mapping. Additional monitoring locations will be chosen, through the stratified randomization process, as alternative locations in case one of the original monitoring locations is deemed unacceptable during the first revegetation monitoring effort.

6.1.1.2 Success Criteria

In each monitoring report, the Applicant will include an assessment of whether the temporarily disturbed revegetated areas are meeting or trending toward meeting the success criteria. Revegetation areas would be deemed successfully revegetated when the success criteria outlined the sections below are met. Final determination of whether the Applicant has met the revegetation obligations will be made by ODOE, in consultation with ODFW.

Temporarily disturbed areas will be deemed successfully revegetated when the habitat quality at a monitoring site is equal to or surpasses the habitat quality at the associated reference site, as follows:

- **Native Forbs:** Cover of native forbs should be at least 75 percent of the reference site within 5 years. Diversity of forbs should be equal to the diversity of forbs measured on the reference site within 5 years.
- **Native and Desirable Grasses:** Cover of native and desirable (i.e., species included in seed mixes and/or native species that have naturally colonized) grass species is at least 85 percent similar to reference sites.
- **Noxious Weeds:** Presence and cover of noxious weeds is equal to or less than that of the reference site.

6.1.2 Monitoring of Revegetated Land within Solar Array Fence Line Area

As noted in Section 3.0, all areas within the solar array fence line area are considered a permanent impact and will be mitigated as such in the HMP (Exhibit P, Attachment P-2). Therefore, no monitoring is required for revegetation of this area. However, the Applicant will conduct periodic monitoring within this area to assess the following site conditions:

- Species composition and percent cover of native forbs and grasses;
- Percent cover of bare soil;
- Degree of erosion;
- Percent cover of noxious weeds; and
- Qualitative assessment of overall vigor of vegetation within revegetated areas.

6.2 Remedial Action

After each monitoring visit, the Applicant's qualified investigator will report to the Applicant regarding the revegetation progress of each revegetation area. If applicable, the investigator will make recommendations to the Applicant for reseeding, weed control, or other remedial measures for areas that are not showing progress toward achieving revegetation success. The investigator will provide a description of factors that may be contributing to the lack of revegetation success. The Applicant will include the investigator's recommendations for remedial actions and the measures taken in that year's monitoring report. ODOE may require reseeding or other remedial measures in cases where success criteria have not been met.

If a revegetation area is damaged by wildfire during the first 5 years following initial seeding, the Applicant will work to restore the damaged area. The Applicant will continue to report on revegetation progress during the remainder of the 5-year period. The Applicant will report to ODOE and ODFW the area impacted by the fire (with a map or figure).

7.0 Plan Amendment

This Plan may be amended from time to time by agreement of the Applicant and the Oregon Energy Facility Siting Council (EFSC). Such amendments may be made without amendment of the site certificate. EFSC authorizes ODOE to agree to amendments to this plan. ODOE shall notify EFSC of all amendments, and EFSC retains the authority to approve, reject, or modify any amendment of this plan agreed to by ODOE..

8.0 References

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Attachment P-5. Draft Wildlife Monitoring Plan

Sunstone Solar Project Draft Wildlife Monitoring Plan

Prepared for



Sunstone Solar, LLC

Prepared by



Tetra Tech, Inc.

June 2023

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1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a photovoltaic solar energy generation facility and related or supporting facilities in Morrow County, Oregon. The proposed Facility will generate up to 1,200 megawatts (MW) of nominal and average generating capacity using solar panels wired in series and in parallel to form arrays, which in turn are connected to electrical infrastructure. Additionally, the Facility will also include a 1,200-MW distributed battery energy storage system for the purpose of stabilizing the solar resource. The Applicant proposes to permit a range of photovoltaic and related or associated technology within a site boundary that allows for micro siting flexibility in consideration of the perpetual evolution of technology and maximization of space efficiency, thereby allowing developmental flexibility to address varying market requirements. These facilities and the anticipated phasing of construction are all described in greater detail in Exhibit B of the Application for Site Certificate (ASC).

This Draft Wildlife Monitoring Plan (WMP) describes wildlife monitoring the Applicant will conduct during operation of the Facility. This WMP has the following components:

1. Raptor nest surveys
2. Washington ground squirrel (WAGS; *Urocitellus washingtoni*) monitoring
3. Wildlife Reporting and Handling System (WRHS)
4. Data reporting

This WMP will be updated, as necessary, in coordination with the Oregon Department of Energy (ODOE) and the Oregon Department of Fish and Wildlife (ODFW) and will be updated as needed to reflect the final layout of the Facility.

2.0 Raptor Nest Surveys

The objectives of raptor nest surveys are: (1) to count raptor nests on the ground or above ground at the Facility; and (2) to determine whether there are noticeable changes in nesting activity or nesting success in the local populations of raptor species, with particular focus on Swainson's hawks (*Buteo swainsoni*), the only state sensitive raptor species documented nesting during baseline surveys.

The Applicant will conduct long-term ground-based monitoring of nests identified during the baseline raptor nest surveys, as well as any other nests identified subsequently. The ground-based surveys will be used to evaluate nest success by gathering data on active nests, on nests with young, and on young fledged. The Applicant will employ qualified personnel to perform raptor nest surveys.

2.1 Initial Monitoring

The first monitoring season will be in the first full raptor nesting season after the commercial operating date. During the first monitoring season, the surveyor will conduct one ground survey for raptor nests in late May or early June and additional surveys as described in this section. The ground surveys will be conducted within the site boundary to determine nesting success.

All nests discovered during the anticipated pre-construction surveys and any nests discovered during post-construction surveys, whether active or inactive, will be given identification numbers. Global Positioning System (GPS) coordinates will be recorded for each nest. Locations of inactive nests will be recorded because they could become occupied during future years.

Determining nest occupancy may require one or two visits to each nest. For occupied nests, the Applicant will determine nesting success by a minimum of one ground visit to determine species, number of young, and young fledged. “Nesting success” means that the young have successfully fledged (reach advanced stage of development in which the young are capable of independent movements). Nests that cannot be monitored due to the landowner denying access will be checked from a distance where feasible.

After the first monitoring season, the surveyor will analyze this one year of data compared to the baseline data. The Applicant will provide a summary of the first-year results in the monitoring report described in Section 5.0

2.2 Long-Term Monitoring

The surveyor will conduct raptor nest surveys at 5-year intervals for the life of the Facility.¹ The surveyor will conduct a long-term raptor nest survey in the raptor nesting season every 5 years after the first monitoring season in years divisible by 5. This may result in a greater than 5-year period between the initial monitoring season and the first long-term monitoring season (e.g., if the initial monitoring season is 2028, the first long-term monitoring season would be 2035 rather than 2033).

In conducting long-term surveys, the surveyor will follow the same survey protocols as the initial survey, unless the surveyor proposes alternative protocols that are approved by ODOE. In developing an alternative protocol, the surveyor will consult with ODFW and will take into consideration other raptor nest monitoring conducted in adjacent or overlapping areas.

The surveyor will analyze the data to identify any trends in the number of raptor breeding attempts the Facility supports and the success of those attempts. The surveyor will submit a report after each year of long-term raptor nest surveys.

¹ As used in this plan, “life of the Facility” means continuously until the Facility is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

3.0 Washington Ground Squirrel Monitoring

No WAGS were detected during baseline surveys, but any new colonies that are detected incidentally during other surveys, such as raptor nest monitoring, will be documented and the extent of those colonies delineated and included in future WAGS monitoring and reporting activities.

If any incidental WAGS are detected, the Applicant will employ qualified personnel to monitor these locations every 5 years thereafter in years divisible by five for the life of the Facility (i.e., on the same monitoring schedule as the raptor nest surveys). The survey area will include the colonies (i.e., groups of active burrows) and a buffer of 785 feet in suitable habitat, if accessible. The surveyors will walk linear transects spaced 165 to 230 feet (50 to 70 meters) apart two times between February 15 and May 31. Surveys of each location will be spaced at least 2 weeks apart. Surveyors will record locations of activity centers and colony boundaries using a sub-meter accuracy GPS unit; approximate number of burrows; and representative photographs of burrows and scat. Surveyors will describe habitat characteristics at each location and note any noticeable land use or habitat changes that may have occurred since detection.

After each survey, the Applicant will report the results to ODFW and ODOE and will include maps of the areas surveyed and detection locations. WAGS surveys will not be conducted if there are barriers to WAGS dispersal (i.e., active agriculture fields, highways, perennial waterbodies).

4.0 Wildlife Reporting and Handling System

The Applicant will document fatalities found during routine maintenance activities and any other incidentally detected fatalities. However, systematic post-construction fatality monitoring studies are not likely to produce significant findings or provide meaningful data on impacts based on the attributes of this Facility (especially relative to the costs that they incur to implement) as described below, and therefore no systematic post-construction fatality monitoring study is proposed for the Facility nor is one needed to meet the standards under Oregon Administrative Rule (OAR) 345-022-0060. If evidence of significant fatality events is detected by operations and maintenance (O&M) staff, the Applicant will coordinate with ODOE and ODFW regarding the need for systematic post-construction fatality monitoring and adaptive management.

Although mortality at the Facility due to collision with infrastructure is possible, as it is with most human development (e.g., buildings), the available literature on avian mortality at utility-scale photovoltaic solar energy sites suggests that mortality at these facilities is comparatively low (Walston et al. 2016, Loss et al. 2014, Kosciuch et al. 2020, Smith et al. 2021). In Oregon, results of a fatality study at a 56-MW photovoltaic facility near Prineville detected only three bird fatalities, only two of which were native birds (i.e., a horned lark [*Eremophila alpestris*] and a dark-eyed junco [*Junco hyemalis*]), during 1 year of standardized searches (ODOE 2020). These results suggest that large fatality events are unlikely at photovoltaic solar facilities in the region but that low numbers of fatalities of common ground-dwelling bird species could be detected at the Facility (ODOE 2020),

and may be similar to background mortality levels. Post-construction fatality monitoring studies conducted at utility-scale photovoltaic solar facilities to date have reported lower fatality rates compared to other human development types, with fatalities in general primarily composed of resident ground-nesting birds.

In contrast to wind energy development, impacts to wildlife from photovoltaic solar development are primarily associated with habitat loss rather than direct mortality from collisions. The Facility is located almost entirely on wheat fields, and impacts to wildlife habitat will be minimal, restricted primarily to small tracts of disturbed grasslands. This habitat will be mitigated in accordance with ODFW's Habitat Mitigation Policy (OAR 635-415-0025), as described in the Facility's Exhibit P and Habitat Mitigation Plan (Attachment P-2 to Exhibit P). The Applicant will adhere to standard best management practices including following Avian Powerline Interaction Committee guidelines for minimizing avian collisions and electrocutions (APLIC 2006, 2012), primarily burying the medium voltage collector line system, and implementing down-shield lighting for permanent lighting at the substations and O&M buildings, and identifying a licensed local wildlife rehabilitator capable of responding to the Facility in the event of injured wildlife. Thus, the Facility has already minimized the risk of avian collision fatalities, based on known risk factors such as lighting (Gehring et al. 2009; Kerlinger et al. 2010; USFWS 2012, 2013).

Additionally, post-construction fatality monitoring is not necessary for the Applicant to meet the standards under OAR 345-022-0060 (i.e., that the design, construction and operation of the facility, taking into account mitigation, are consistent with the general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025, ODFW's Fish and Wildlife Habitat Mitigation Policy) because the mitigation goals and standards relate to fish and wildlife habitat quality and quantity rather than fatalities of fish and wildlife individuals. OAR 635-415-0025 goals and standards for impacts to Category 2, 3, 4, and 5 habitat (i.e., the habitat categories addressed in the Facility's Habitat Mitigation Plan) include avoidance and, where impacts are unavoidable, mitigation to achieve the goal of no net loss of either habitat quantity or quality (Category 2, 3 and 4 habitat) and/or a net benefit in habitat quantity or quality (Category 2 and 5 habitat). Fatality monitoring, in itself, does not improve or maintain habitat quantity or quality, nor would the results of monitoring affect the habitat mitigation ratios or the size of the mitigation need described in the Facility's Habitat Mitigation Plan attached to Exhibit P. Therefore, a systematic post-construction fatality monitoring study is not necessary for the Energy Facility Siting Council (EFSC) to determine that the Facility is consistent with OAR 635-415-0025

Although standardized fatality searches will not be implemented, all incidentally detected fatalities will be reported in the WRHS. The WRHS is a program for O&M staff to report wildlife (including bird and bat) casualties found during operation of the Facility. O&M staff will be trained in the methods needed to carry out this program. This monitoring program includes the initial response, handling, and reporting of bird and bat carcasses discovered incidental to maintenance operations ("incidental finds"). A minimum of approximately 20 permanent O&M staff are anticipated to be on-site for Facility operations and be responsible for WRHS program implementation. If a battery energy storage system is installed, additional workers will be on-site, but they will likely be contract employees and will not be included in WRHS program implementation. As part of routine

O&M activities, O&M staff will visit each inverter pad approximately monthly to visually inspect equipment. If evidence of significant fatality events is detected by O&M staff, the Applicant will coordinate with ODOE and ODFW regarding the need for systematic post-construction fatality monitoring.

All carcasses discovered by O&M staff will be photographed and recorded. If O&M staff find a carcass at the Facility, they will notify qualified personnel who will identify the carcass. If the qualified personnel determines that a carcass is a state or federally threatened or endangered or otherwise protected species, agency reporting procedures and timelines specified in Section 5.0 shall be followed.

Prior to construction, the Applicant will develop and implement a protocol for handling injured birds. Any injured native birds found at the Facility may be carefully captured by trained qualified personnel and transported to a qualified rehabilitation specialist approved by ODOE. Alternatively, the Applicant may contact a qualified rehabilitation specialist approved by ODOE to respond to injured wildlife. Blue Mountain Wildlife (<https://bluemountainwildlife.org/>, 541.278.0215), located in Pendleton, Oregon, has confirmed the ability to respond to injured native wildlife, especially migratory birds, at the Facility (Lynn Tompkins, personal communication, April 11, 2023). The Applicant will pay costs, if any, charged for time and expenses related to care and rehabilitation of injured native birds found on the site, unless the cause of injury is clearly demonstrated to be unrelated to Facility operations.

5.0 Data Reporting

The Applicant will report wildlife monitoring data and analysis to ODOE for each calendar year in which wildlife monitoring occurs. Monitoring data include raptor nest survey data, WAGS monitoring data (if applicable), and WRHS data. The Applicant 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. In addition, the Applicant will provide to ODOE data or records generated in carrying out this WMP upon request by ODOE.

The Applicant will notify the U.S. Fish and Wildlife Service and ODFW if any federal or state endangered or threatened species are killed or injured at the Facility within 24 hours of species identification.

6.0 Plan Amendment

This WMP may be amended from time to time by agreement of the Applicant and EFSC. Such amendments may be made without amendment of the site certificate. EFSC authorizes ODOE to agree to amendments to this WMP. ODOE shall notify EFSC of all amendments, and EFSC retains the authority to approve, reject, or modify any amendment of this plan agreed to by ODOE.

7.0 References

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