
Report

Sensitive Species Surveys for the Teanaway Solar Reserve Kittitas County, Washington

Prepared for
Teanaway Solar Reserve, LLC

February 2010

Prepared by
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1.0 Introduction

CH2M HILL conducted rare plant and wildlife surveys in June and July 2009 for the proposed Teanaway Solar Reserve (TSR) project. The proposed project is located on private land in an unincorporated area of Kittitas County, Washington. The purpose of the surveys was to identify potential populations of special status species and to determine whether proposed project activities will affect these populations.

This report provides a brief overview of the project, describes the methodology followed to conduct the surveys, presents survey results and conclusions, and offers recommendations for the future, including proposed measures for avoiding or minimizing impacts.

2.0 Project Description

2.1 Site Location

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (see Figure 1 in Appendix A for map of site location). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet. The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road, private roads such as Loping Lane, and Wiehl Road, which is a dedicated public road that is maintained privately and not by the County.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 477 acres within the proposed project area. The remaining acres are currently undeveloped open space, but may accommodate some future expansion of the project after appropriate surveys are conducted to address any environmental concerns and compliance with any underlying federal, state, or local permitting requirements.

2.2 Purpose and Need

The purpose of the proposed project is to generate up to 75 direct current megawatts (MWdc) of photovoltaic (PV) solar energy for distribution to utilities and communities seeking to optimize their renewable and sustainable energy sources. The project was conceived by Teanaway Solar Reserve, LLC in response to the growing need for sustainable energy sources and the State of Washington's Renewable Electricity Standard, Revised Code of Washington (RCW) Title 19, mandate that by the year 2020, the state's largest electric utilities meet 15 percent of their retail electric load with renewable electricity (for example, wind and solar energy). The standard first takes effect in 2012 with a requirement of 3 percent through 2015, then 9 percent from 2016 through 2019 and 15 percent thereafter.

2.3 Key Components

The proposed project will consist of the following key components:

- Solar modules
- Field inverters

- Field transformers
- Electrical conductors
- Electrical substation and switchyard
- Operations and maintenance (O&M) building and supervisory control and data acquisition (SCADA) system
- Overhead interconnection transmission line
- Access and maintenance roads

Key components are summarized below.

2.3.1 Solar Modules

Solar modules in a metal frame on supporting mounting structures will be used. The solar modules are manufactured offsite and will be delivered to the site by truck in wooden crates or cardboard boxes. The solar modules are mounted in a fashion that orients the modules toward the sun.

2.3.2 Field Inverters

Up to 80 power inverters will be needed for the project. The inverters can be placed outdoors or they can be placed in enclosures.

2.3.3 Field Transformers

Up to 80 power transformers will be required for the solar field arrays. The transformers are contained within prefabricated cabinets and will rest on concrete pads.

2.3.4 Electrical Conductors

Underground 34.5-kV electrical conductors will be installed in trenches along improved maintenance roads onsite at depths of 36 inches or greater. Conductors will be direct-burial or placed in a polyvinyl chloride (PVC) conduit.

2.3.5 Electrical Substation and Switchyard

TSR proposes to construct, in compliance with design and installation requirements from Bonneville Power Administration (BPA), an electrical substation that will interconnect the solar field with the existing 345-kV BPA transmission line. It has yet to be determined if certain elements of the line and substation will be owned and constructed by BPA, but for purpose of environmental review and this permit application, all elements of the line and the substation (up to the point of interconnection with BPA's existing transmission line) are proposed as part of the project.

The substation will be located in the southern part of the project site, to minimize the size of the associated transmission line. The substation will require a level, fenced area of approximately 6 acres. The 6-acre area will be graveled with no vegetation. The substation will contain a small control house, transformer(s), circuit breakers and switches, steel support structures, an A-frame dead-end tower structure, and overhead electrical bus work. The control house will be up to 16 feet high, 60 feet long, and 30 feet wide. The dead-end tower structure will be up to 120 feet high. Transformers and oil-filled equipment will be underlain with appropriate containment structures. The appearance of the substation will be similar to that of many other substations throughout the Pacific Northwest.

2.3.6 O&M Building and SCADA System

A storage and operations and maintenance (O&M) building will store spare parts (e.g., modules and fuses), testing equipment, and cleaning equipment. The building will be of cinderblock construction or pre-engineered with an overall footprint of approximately 1,000 square feet and will be located within the 6 acre fenced substation area. A supervisory control and data acquisition (SCADA) system will be installed within the substation boundary to collect operating and performance data from the TSR facilities, and provide remote operation of the solar panels

2.3.7 Overhead Interconnection Transmission Line

A new 345-kV transmission line is required to connect the new substation to the existing BPA line. The substation will be located in the southern part of the project site, to minimize the size of the associated transmission line. A new BPA tower is required to replace the existing tower in the BPA easement (as noted in the site plan). The replacement tower would reroute the three existing 345-kV power lines via an existing 200-foot-wide right-of-way (ROW) within the leasehold through the substation and back to the replacement BPA tower.

2.3.8 Access and Maintenance Roads

The site will be accessed via Kittitas County and private roads that interconnect with Highway 970. The major County access road is Red Bridge Road. Loping Lane is a private road and Wiehl Road is a privately maintained public road; TSR has easement rights over both roads.

3.0 Sensitive Species Surveys

CH2M HILL biologists conducted surveys of a total of 580 acres, of which 477 acres are included in the proposed project area, for rare plant and wildlife species in June and early July of 2009. Figure 2 (Appendix A) shows the sensitive species survey area within the 982-acre proposed project area.

A species was considered to be rare if it met one or more of the following listing criteria:

- Federally listed as threatened or endangered (*Endangered Species Act of 1973* [16 U.S.C. 1531-1544, 87 Stat. 884])
- State listed as threatened or endangered (State of Washington *Endangered, Threatened, and Candidate Species Classification* WAC 232-12-297)

Target species included all plant and wildlife taxa listed by the U.S. Fish and Wildlife Service (USFWS) or the state of Washington as *Endangered* or *Threatened* and potentially occurring in Kittitas County, Washington. A species was determined to have potential to occur in the survey area if its known or expected geographic range includes the survey area or the vicinity of the survey area, and if its known or expected habitat is represented within or adjacent to the survey area.

3.1 Rare Plant Survey

The purpose of the rare plant survey was to locate all populations of special status plants within the survey area, to precisely record and map their locations using geographic positioning system (GPS) technology with submeter accuracy, and to determine the size and phenology of each rare plant population and its microhabitat characteristics.

3.1.1 Methods

Office Review. The office review consisted of compiling a list of special-status plant species potentially occurring within the survey area, and reviewing topography and soils maps, recent aerial photography, and information on habitat requirements for any of the potentially occurring species.

Sources consulted included the following:

- *List of Known Occurrences of Rare Plants in Washington: Kittitas County* (Washington Natural Heritage Information System [WNHIS], February 2009)
- *State of Washington Priority Habitats and Species (PHS) List* (Washington Department of Fish and Wildlife [WDFW], 2008)
- *Federally Listed, Proposed, Candidate Species and Species of Concern Under the Jurisdiction of the Fish and Wildlife Service Which May Occur Within Kittitas County, Washington* (USFWS, July 24, 2008) (provided in Appendix B)
- *Topographic Map of the Teanaway, Washington Quadrangle* (United States Geological Service [USGS], 1985 Provisional Edition)
- *Soil Survey, Kittitas County Area, Washington* (NRCS Soils Survey, 2009)
- *Field Guide to Selected Rare Plants of Washington* (Washington Natural Heritage Program, 2009) (provided in Appendix C)

Field Investigation. Surveys were floristic in nature and were conducted according to the U.S. Bureau of Land Management Survey Protocols for Survey and Manage Strategy 2 Vascular Plants (Whiteaker et al., 1998).

Two survey methods were used. An Intuitive Controlled Survey was conducted throughout the survey area, and a Complete Survey was conducted in areas of high potential habitat within the survey area. Protocol for these methods is described below.

Intuitive Controlled Survey

An intuitive controlled survey was conducted throughout the survey area. The surveyor traversed the survey area to see a representative cross-section of all the major habitats and topographic features, looking for the target species while en route between different areas. When the surveyor arrived at an area of high potential (defined in the prefield review or encountered during the field visit), a complete survey for the target species was conducted.

Complete Survey

A complete survey was conducted in areas within the survey area where the most suitable habitat was located. These surveys are defined as a 100 percent visual exam of the survey area.

Lists of all vascular plant taxa encountered within each survey area were recorded in the field. Nearly all plant species found in the survey areas were identified to the level needed to determine whether they qualify as special status plants. Collections were made of specimens that could not be identified readily in the field. Final determinations were made by keying specimens using standard references such as *Vascular Plants of the Pacific Northwest: Parts 1 through 5* (Hitchcock et al., 1955–1969). Plant identification was also aided by current taxonomic guides and other standard references, including the following:

- *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973)
- *Manual of Grasses of the United States* (Hitchcock, 1971)
- *Field Guide to Selected Rare Plants of Washington* (Washington Natural Heritage Program, 2008)
- *WTU Image Collection: Plants of Washington, Lichens of Washington* (University of Washington Herbarium, Burke Museum of Natural History and Culture, 2009)

3.1.2 Results

Office Review. Twelve plant species listed by federal or state agencies as threatened or endangered were identified as potentially occurring in the vicinity of the survey area. Of those species, six were determined to potentially occur within the survey area based on evaluation of habitat requirements, elevation, and records of known occurrence. A complete list of potentially occurring plant species, including habitat requirements and bloom times, is presented in Table 1.

TABLE 1
Threatened or Endangered Plant Species That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status*	State Status*	Habitat Preference	Potential to Occur
Plants					
<i>Astragalus arrectus</i>	Palouse milk-vetch	--	LT	Open ponderosa pine/Douglas fir forests in grassy or shrub dominated openings	May occur. Historical in Kittitas County. Several species of <i>Astragalus</i> identified during site visit.
<i>Carex macrochaeta</i>	Large-awn sedge	--	LT	Moist or wet, open places, frequently found near the coast, but occurs inland as well. Grows in seepage areas, around waterfalls, in wet meadows, and along streams and lakes.	May occur. Only five known extant populations, but like many sedges, it may be underreported.

TABLE 1
Threatened or Endangered Plant Species That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status*	State Status*	Habitat Preference	Potential to Occur
<i>Delphinium viridescens</i>	Wenatchee larkspur	SoC	LT	Seasonally wet openings, moist meadows, moist microsites in open coniferous forests springs, seeps, riparian areas.	May occur. Known range is very small, but southern extent of know range is less than 15 miles north of proposed project area.
<i>Ophioglossum pusillum</i>	Adder's-tongue	--	LT	Wet meadows, grassy swales, moist woods, mud creeks.	May occur. Historical in Kittitas County. Few extant populations left in range, however potential habitat is present.
<i>Sidalcea oregana var. calva</i>	Wenatchee Mountain checker-mallow	LE	LE	Moist meadows that have surface water or are saturated in the upper portions of the soil profile into early summer. Taxon also occurs in open ponderosa pine/Douglas fir forests and along edges of shrub thickets.	May occur. Range covers roughly 30 square miles of habitat S/SE of Leavenworth, Washington.
<i>Spirathes diuvialis</i>	Ute's ladies tresses	LE	LE	Broad low-elevation intermontane valley plains, with deltaic meandered wetland complexes; restricted to calcareous, temporarily inundated wet meadow zones and segments of channels and swales where there is stable subsurface moisture and relatively low vegetation cover. There are four 4 known sites in WA. One is in a periodically flooded alkaline flat (moist meadow) adjacent to a ponderosa pine/Douglas-fir woodlands and sagebrush steppe with big sagebrush, bitterbrush, and rabbitbrush. The other three sites are adjacent to the Columbia River on stabilized gravel bars that are moist throughout the growing season.	Not likely to occur. Occurs between 720 and 1,500 feet elevation. Project area is between 2,100 and 2,800 feet elevation.

* Status Codes:

LE = Listed Endangered (Federal or State)

LT = Listed Threatened (Federal or State)

SoC = Species of Concern (Federal)

FC = Federal Candidate for Listing (Federal)

SC = Washington State Candidate for Listing (State)

Sources: USFWS, 2009; WDFW, 2009; WDNR, 2009.

Field Investigation. CH2M HILL botanists conducted field surveys for rare plant species and potential rare plant habitat on June 16 through 19 and July 9, 2009. This range of survey dates was selected to encompass all or a portion of the blooming times of the special status

plants potentially occurring within the project area. Approximately 580 acres were evaluated for the potential presence of rare plant species.

Plant Species Observed

The field survey identified a total of 81 species: 3 trees, 7 shrubs, 12 graminoids, and 56 forbs, and 3 herbaceous species. No special status plant species were found within the survey area. Table 2 presents a complete list of all plant species identified during the course of the field surveys. Appendix D contains photos of typical habitat types that occur in the survey area.

TABLE 2
Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
Alismataceae	<i>Alisma plantago-aquatica</i>	European water plantain		X	forb
Apiaceae	<i>Ligusticum grayii</i>	Gray's lovage	X		forb
	<i>Lomatium nudicaule</i>	bare-stem desert parsley	X		forb
	<i>Lomatium triternatum</i>	nine-leaf desert parsley	X		forb
	<i>Oenanthe sarmentosa</i>	Pacific water -parsley	X		forb
Asteraceae	<i>Achillea millefolium</i>	wooly yarrow	X		forb
	<i>Anaphalis margaritacea</i>	pearly-everlasting	X		forb
	<i>Arnica sororia</i>	foothills arnica	X		forb
	<i>Balsamorhiza sagittata</i>	arrow-leaf balsamroot	X		forb
	<i>Chondrilla juncea</i>	rush skeletonweed		X	forb
	<i>Chrysanthemum leucanthemum</i>	ox-eye daisy		X	forb
	<i>Cirsium vulgare</i>	bull thistle		X	forb
	<i>Crepis occidentalis</i>	western hawksbeard	X		forb
	<i>Crepis setosa</i>	rough hawksbeard		X	forb
	<i>Eriophyllum lanatum</i>	wooly sunflower	X		forb
	<i>Gnaphalium palustre</i>	marsh cudweed	X		forb
	<i>Hieracium scouleri</i>	wooly-weed	X		forb
	<i>Madia glomerata</i>	mountain tarweed	X		forb
	<i>Madia gracilis</i>	slender tarweed	X		forb
	<i>Madia minima</i>	small-headed tarweed	X		forb
	<i>Senecio sylvaticus</i>	wood groundsel	X		forb

TABLE 2
Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<i>Symphyotrichum spathulatum</i>	western mountain aster	X		forb
	<i>Tragopogon dubius</i>	yellow salsify		X	forb
	<i>Wyethia amplexifolia</i>	narrow-leaf wyethia	X		forb
Berberidaceae					
	<i>Berberis repens</i>	creeping Oregongrape	X		shrub
Boraginaceae					
	<i>Lithospermum ruderale</i>	Columbia puccoon	X		forb
	<i>Myosotis laxa</i>	small-flowered forget-me-not	X		forb
	<i>Plagiobothrys scouleri</i>	Scouler's popcorn-flower	X		forb
Caprifoliaceae					
	<i>Symphoricarpos albus</i>	snowberry	X		shrub
Caryophyllaceae					
	<i>Agrostemma githago</i>	common corncockle		X	forb
	<i>Symphoricarpos oreophilis</i>	mountain snowberry	X		shrub
Convolvulaceae					
	<i>Convolvulus arvensis</i>	field Morning-glory		X	forb
Cyperaceae					
	<i>Carex hoodii</i>	Hood's sedge	X		graminoid
	<i>Carex pachystachya</i>	thick-headed sedge	X		graminoid
	<i>Carex utriculata</i>	inflated sedge	X		graminoid
	<i>Scirpus microcarpus</i>	small-fruited bulrush	X		forb
Fabaceae					
	<i>Cytisus scoparius</i>	Scotch broom		X	shrub
	<i>Lathyrus japonicus</i>	pinewoods peavine	X		forb
	<i>Lupinus polyphyllus</i>	large-leaf lupine	X		forb
	<i>Lupinus sericeus</i>	silky lupine	X		forb
	<i>Vicia americana</i>	American purple vetch	X		forb
Gentianaceae					
	<i>Centaurium erythraea</i>	centaury		X	forb
Juncaceae					

TABLE 2
Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
Lamiaceae	<i>Juncus parryi</i>	Parry's rush	X		graminoid
	<i>Prunella vulgaris</i>	self-heal		X	forb
Liliaceae	<i>Camassia quamash</i>	common camas	X		forb
	<i>Veratrum insolitum</i>	Siskiyou false-hellebore	X		forb
	<i>Zigadenus venenosus</i>	death camas	X		forb
Malvaceae	<i>Sidalcea oregana var. procera</i>	Oregon checkmallow	X		forb
Pinaceae	<i>Pinus ponderosa</i>	ponderosa pine	X		tree
	<i>Pseudotsuga menziesii</i>	Douglas-fir	X		tree
Plantaginaceae	<i>Plantago major</i>	common plantain	X		forb
Poaceae	<i>Agropyron smithii</i>	western wheatgrass	X		graminoid
	<i>Agropyron spicatum</i>	bluebunch wheatgrass	X		forb
	<i>Agrostis longiligula</i>	Pacific bentgrass	X		graminoid
	<i>Agrostis scabra</i>	rough bentgrass	X		graminoid
	<i>Danthonia spicata</i>	poverty oatgrass	X		graminoid
	<i>Elymus elymoides</i>	squirreltail			graminoid
	<i>Elymus glaucus</i>	blue wild-rye	X		graminoid
	<i>Festuca idahoensis</i>	Idaho fescue	X		graminoid
	<i>Phleum pratense</i>	common timothy		X	graminoid
	<i>Poa bulbosa</i>	bulbous bluegrass		X	graminoid
Polemoniaceae	<i>Collomia grandiflora</i>	large flowered collomia	X		forb
	<i>Navarretia breweri</i>	Brewer's navarretia	X		forb
	<i>Navarretia intertexta</i>	needle-leaf navarretia	X		forb
Polygonaceae	<i>Eriogonum umbellatum</i>	sulfur buckwheat	X		forb

TABLE 2
Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<i>Polygonum polygaloides</i> <i>spp.confertiti</i>	close-flowered knotweed	X		forb
	<i>Rumex acetosella</i>	sheep sorrel		X	forb
Ranunculaceae					
	<i>Ranunculus acris</i>	tall ranunculus		X	forb
Rosaceae					
	<i>Fragaria virginiana</i>	wild strawberry	X		forb
	<i>Potentill drummondii</i>	Drummonds cinquefoil	X		forb
	<i>Rosa woodsii</i>	Wood's rose	X		shrub
	<i>Spiraea betulifolia</i>	white spiraea	X		shrub
Rubiaceae					
	<i>Galium boreale</i>	northern bedstraw	X		forb
Salicaceae					
	<i>Populus tremuloides</i>	quaking aspen	X		tree
	<i>Salix scouleriana</i>	Scouler's willow	X		shrub
Scrophulariaceae					
	<i>Castilleja hispida</i>	harsh paintbrush	X		forb
	<i>Castilleja tenuis</i>	hairy Indian paintbrush	X		forb
	<i>Delphinium nuttallianum</i>	upland larkspur	X		forb
	<i>Penstemon procerus</i>	small flowered penstemon			forb
	<i>Verbascum thapsus</i>	wooly mullein	X		forb
Valerianaceae					
	<i>Plectritis macrocera</i>	white plectritis	X		forb

3.2 Wildlife Survey

3.2.1 Methods

Office Review. The office review consisted of compiling a list of special status wildlife species potentially occurring within the proposed survey area. The office review included review of state and federal rare species lists, recent aerial photography, and information on habitat requirements for any of the potentially occurring species.

Sources consulted included the following:

- *Species of Concern in Washington State* (WDFW June 2009)
- *State of Washington Priority Habitats and Species (PHS) List* (WDFW, 2008)
- *Federally Listed, Proposed, Candidate Species and Species of Concern Under the Jurisdiction of the Fish and Wildlife Service Which May Occur Within Kittitas County, Washington.* (USFWS, July 24, 2008) (provided in Appendix B).

Field Investigation. CH2M HILL biologists conducted reconnaissance-level field surveys on June 16 through 19 and July 9, 2009. A reconnaissance-level survey identifies all habitats within the survey area to determine whether there is onsite habitat with the potential to support a listed species. Recommendations are made for further protocol-level surveys for individual species if suitable habitat has been identified. Protocol-level surveys are intensive surveys with specific requirements according to the particular individual wildlife species.

Approximately 580 acres were evaluated for the potential presence of wildlife species.

3.2.2 Results

Office Review. A review of the *Species of Concern in Washington State* and the *State of Washington Priority Habitats and Species (PHS) List* resulted in four wildlife species which have the potential to occur in the vicinity of the proposed survey area. Table 3 summarizes WDFW PHS species, their habitat requirements, and likelihood of occurring in the survey area.

The database includes occurrences of both black-backed woodpecker and mountain quail approximately 1.0 mile from the project boundary. In addition, several occurrences of northern goshawk are documented approximately 1.5 to 1.8 miles from the northern edge of the survey area. The PHS database also includes elk and mule deer habitat regions approximately 0.8 to 1.5 miles from the proposed project area. While neither species is listed, these PHS listed habitats likely provide important winter habitat for elk and mule deer.

TABLE 3
Species Listed in the WDFW PHS Database that May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status	State Status	Preferred Habitat	Potential to Occur	Notes
Birds						
<i>Picoides arcticus</i>	Black-backed woodpecker	--	SC	Mature coniferous forests that have been burned within 5 years	Unlikely	
<i>Accipiter gentilis</i>	Northern goshawk	SoC	SC	Mature coniferous forests. Often found on moderate slopes at mid to high elevations. Also found along forest edges and occasionally in mixed coniferous/deciduous forests.	May Occur	

TABLE 3
Species Listed in the WDFW PHS Database that May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status	State Status	Preferred Habitat	Potential to Occur	Notes
<i>Oreortyx pictus</i>	Mountain quail	--	--	Requires dense thicket cover with accessible openings on slopes on mountains and foothills. Often associated with thickets in burned or cut areas. Require a reliable source of water during the summer.	Unlikely	Species of Local Significance

Mammals

<i>Cervus Canadensis nelsoni</i>	Elk	--	--	Productive grasslands, meadows, or clear cuts, interspersed with closed-canopy forests. Year round range varies from 2,500 to 10,000 acres, and usually includes distinct summering and wintering grounds.	Documented	
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Source: WDFW, 2009.

A review of Appendix B resulted in two wildlife species which have the potential to occur in the vicinity of the survey area. Table 4 summarizes the species, their habitat requirements, and the likelihood of occurrence in the survey area.

TABLE 4
USFWS Listed Threatened or Endangered Wildlife Species That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status*	State Status*	Habitat Preference	Potential to Occur
<i>Martes pennanti</i>	Fisher	C	LE	Mature, closed-canopy coniferous forests with some deciduous trees present, primarily along riparian corridors.	Unlikely. Rare in Washington State.
<i>Canis lupus</i>	Gray wolf	LE	LE	Dense, unfragmented coniferous forests.	Unlikely. Only one wolf known to occur in Washington State, in southeast Washington.

* Status Codes:

LE = Listed Endangered (Federal or Washington status)

LT = Listed Threatened (Federal or Washington status)

SoC = USFWS Species of Concern

C=Federal Candidate for Listing

SC = Washington State Candidate for Listing

Source: USFWS, 2009.

Field Investigation. Results indicated a total of five natural habitat types within the survey area. Most of these can be named by using the Chappel et al. (2001) system of vegetation classification. Survey area natural vegetation types are as follows:

- Ponderosa Pine Forest and Woodlands
- Open Water – Lakes, Rivers, and Streams
- Herbaceous Wetlands
- Riparian
- Upland Aspen Forest

These habitat types are illustrated on Figure 3 (Appendix A) and described below. Appendix D contains photos of typical habitat types that occur in the survey area.

Ponderosa Pine Forest and Woodlands

The Ponderosa Pine Forest and Woodland habitat (Appendix D: Photo 1) within the survey area is the most abundant of the five habitat types. The survey area has been actively managed as commercial timberlands for the past 100 years. The area was last logged in 2001-2002, leaving relatively few trees per acre and open stands of predominantly ponderosa pine (*Pinus ponderosa*) trees with Douglas-fir (*Pseudotsuga menzeisii*) present as a subdominant species. Stands typically consist of an overstory of 50-year-old ponderosa pine trees with an understory of mid-successional trees and saplings. There is a mixed herbaceous understory comprised of several co-dominants. Species include arrowleaf balsamroot (*Balsamorhiza sagittata*), yarrow (*Achillea millefolium*), bulbous bluegrass (*Poa bulbosa*), ventenata (*Ventenata dubia*), and several species of fescue (*Festuca* spp.), wheatgrass (*Agropyron* spp.), and lupine (*Lupinus* spp.). Populations of Oregon checker-mallow (*Sidalcea oregana* var. *procera*) and sticky purple geranium (*Geranium viscosissimum*) were also observed.

Open Water—Lakes, Rivers, and Streams

Several intermittent streams and one artificially ponded area (Appendix D: Photo 2) are found within or crossing the survey area. All of the streams were dry at the time of the field visits and all were vegetated to varying extents. Typical vegetation within most channels includes herbaceous grass and forb species, including Brewer's navarretia (*Navarretia brewerii*), poverty oatgrass (*Danthonia spicata*), and small tarweed (*Madia exigua*). Other channels were dominated by dense shrub and herb species including wild rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), cinquefoil (*Potentilla* spp.), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

Herbaceous Wetlands

Herbaceous Wetland habitats within the survey area consist of depressional wetlands dominated by herbaceous vegetation (Appendix D: Photo 3). Exposed soils were cracked, evidence of altering drying and wetting periods (Appendix D: Photo 3). These systems are not hydrologically connected to any stream or drainage ditch. Water arrives as either snowmelt or precipitation. These wetlands support hydrophytic herbaceous vegetation, and met the criteria for hydric soils and wetland hydrology. Common plant species within these wetlands were creeping spikerush and ventenata.

Riparian

The Riparian habitat (Appendix D: Photo 4) is found adjacent to some of the intermittent stream channels in the survey area. It generally consists of a dense shrub layer immediately

adjacent to the stream gradually transitioning to ponderosa pine forest. Typical species include oceanspray (*Holodiscus discolor*), mountain spiraea (*Spiraea betulifolia*), Oregon checkermallow (*Sidalcea oregana* var. *procera*), Wood’s rose (*Rosa woodsii*), and ponderosa pine.

Upland Aspen Forest

A small patch of aspen (*Populus tremuloides*) forest occurs along a drainage and around an artificially impounded pond in the southwestern portion of the survey area (Appendix D: Photo 5). Associated species include ponderosa pine, snowberry, and wild rose.

Species Observed. Wildlife observed during the field survey consisted of 10 bird and 2 mammal species. Evidence of wildlife (e.g., scat, burrows) observed in the survey area indicate the presence of rodents and coyote (*Canis latrans*).

Table 5 presents the list of all wildlife species observed during the field surveys.

TABLE 5
Wildlife Species Observed, June-July 2009 Field Investigation

Common Name	Scientific Name
Red-tailed hawk	<i>Buteo jamaicensis</i>
Stellar’s jay	<i>Cyanocitta stelleri</i>
Common raven	<i>Corvus corax</i>
White-headed woodpecker	<i>Picoides albolarvatus</i>
Hairy woodpecker	<i>Picoides villosus</i>
Northern flicker	<i>Colaptes auratus</i>
White-crowned sparrow	<i>Zonotrichia albicollis</i>
Chipping sparrow	<i>Spizella passerina</i>
Western tanager	<i>Piranga ludoviciana</i>
Western wood peewee	<i>Contopus sordidulus</i>
Mule deer	<i>Odocoileus hemiones</i>
Rocky Mountain Elk	<i>Cervus canadensis nelsoni</i>

No state or federally listed threatened or endangered wildlife species were observed within the survey area. A state candidate species, the white-headed woodpecker, was observed in the northwest portion of the survey area. Both male and female woodpeckers were observed close to the main access road. The male was observed foraging in a stand of adult ponderosa pine, while the female was located excavating a nest in a snag approximately 10 feet from the road.

4.0 Conclusions and Recommendations

CH2M HILL biologists conducted surveys for rare plant and wildlife species throughout the survey area. The purpose of the surveys was to identify potential populations of special status species and to determine whether proposed project activities will affect these populations.

4.1 Conclusions

The surveys identified 81 plant species, 12 wildlife species, and 5 habitat types. No state or federally listed endangered or threatened species were observed in the survey area during field surveys. The following conclusions were derived:

- Three habitat types in the survey area, Upland Aspen, Riparian, and Herbaceous Wetlands, are considered Washington Priority Habitats (Aspen Stands, Riparian, and Freshwater Wetlands). Impacts to these habitats from construction and operation of the project will not occur as facilities were micro-sited to avoid these areas.
- Back-backed woodpeckers are unlikely to be impacted by the development of this project, as activities relating to this project will not involve the documented area. Black-backed woodpeckers require habitat that includes stands of mature conifers that have experienced a burn event within the last 5 years. No stands of burned, mature conifer trees exist in the survey area. In addition, the proposed project is unlikely to impact any mountain quail or northern goshawk habitat, as no activities related to this project will occur near the PHS listing.
- Both the mule deer and elk PHS regions are located outside the proposed project area, and will not be impacted by project activities.
- Potential suitable habitat for several listed species does occur within the Ponderosa Pine Forest and Woodland habitat. However, habitats within the survey area have been disturbed and fragmented by commercial forest practices and by residential development in the surrounding area. State or federal resource agencies may require additional surveys to determine if any rare plants or listed wildlife species occur in the survey area.
- The proposed project is not expected to result in any significant impacts to special status species. However, potentially suitable habitat may be temporarily and permanently impacted. Temporary impacts may occur in conjunction with the placement and use of heavy equipment during project construction. Permanent impacts will occur due to habitat alteration and tree removal. Removal of trees for project placement will disturb and fragment the existing forested habitat.

4.2 Recommendations

4.2.1 Best Management Practices (BMPs)

Best management practices (BMPs) will be implemented during construction to avoid and reduce temporary and permanent impacts to the extent practicable. In the event that a state

or federally listed threatened or endangered plant or wildlife species is observed during project development, work will be halted immediately and a qualified biologist notified.

BMPS will be implemented wherever surface disturbances occur. These measures include, but are not limited to, the following:

- Protect trees, shrubbery, and other vegetation not designated for removal from damage caused by the project construction.
- Seed areas of temporary soil disturbance with the specified temporary seed mix.
- Install filter bags, sediment fences, sediment filter fabric traps, and graveled construction accesses as necessary for erosion control.
- Cover stockpiles with impervious materials when unattended or during rainfall.
- Locate construction staging areas for storage, maintenance, and fueling of construction equipment minimum of 150 feet from creeks or wetlands. Show staging areas on the construction plans.
- Prevent petroleum products and other harmful material from entering wetland or waterways.
- Upon completion of construction, seed or plant all areas temporarily disturbed by construction activities with native plants.

4.2.2 Mitigation

All recommended surveys have been completed. It is still possible that individuals or populations of rare plant species may be encountered in the course of project construction. In the event of such a discovery, a qualified botanist will be retained to verify identity of the plant(s) and make recommendations for addressing the situation. All efforts will be made to avoid disturbance to such species. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable. If such efforts are not possible, mitigation for impacts to the plant(s) will be required. Mitigation measures will be specific to each plant species.

Possible avoidance and mitigation measures may include the following:

- Implement micrositeing: slight relocations of project facilities to avoid rare plant populations.
- Remove and conserve plants; replant following construction.
- Replant areas temporarily disturbed by construction activities with seed obtained from a qualified cultivator of rare plants.
- Mitigate by seeding an approved offsite area with the same species.
 - Mitigation will require approval of the agencies, as well as monitoring for a defined period of time.

5.0 References

5.1 Cited in Text

- Chappell, C.B., R.C. Crawford, C. Barrett, J. Kagan, D.H. Johnson, M. O'Mealy, G.A. Green, H.L. Ferguson, W.D. Edge, E.L. Greda, and T.A. O'Neill. 2001. "Wildlife Habitats: Descriptions, Status, Trends, and System Dynamics." Pages 22-114 in D.H. Johnson and T.A. O'Neil, managing directors. *Wildlife-Habitat Relationships in Oregon and Washington*. Oregon State University Press, Corvallis.
- Nelson, J.R. 1994. "Guidelines for Assessing Effects of Proposed Developments on Rare Plants and Plant Communities." In: Skinner and Pavlik, ed. *Inventory of Rare and Endangered Vascular Plants of California* (5th ed.). California Native Plant Society. Sacramento, California. Page 29.
- Natural Resource Conservation Service (NRCS). 2009. *Soil Survey, Kittitas County Area, Washington*. http://www.or.nrcs.usda.gov/pnw_soil/wa_reports.html
- Seattle Audubon Society. 2009. Birdweb. <http://www.birdweb.org/birdweb/index.aspx>
- U.S. Fish and Wildlife Service (USFWS). 1993. *Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review*. *Federal Register* 58(188): 51144-51190. September 30.
- U.S. Fish and Wildlife Service (USFWS). 1996a. "Endangered and Threatened Species; Notice of Reclassification of 96 Candidate Taxa." *Federal Register* 61(40):7457-7463. February 28.
- U.S. Fish and Wildlife Service (USFWS). 1996b. "Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species." *Federal Register* 61(40):7596-7613. February 28.
- U.S. Fish and Wildlife Service (USFWS). 2008. *Federally Listed Threatened, Endangered, Proposed, Candidate Species, and Species of Concern Which May Occur within Kittitas County, Washington*. July 24, 2008.
- U.S. Geological Survey (USGS). 1985 Provisional Edition. *Topographic Map of the Teanaway, Washington Quadrangle*
- Washington Department of Fish and Wildlife (WDFW). 2008. *State of Washington Priority Habitats and Species (PHS) List*.
- Washington Department of Fish & Wildlife (WDFW). 2009. *Species of Concern in Washington State*. <http://wdfw.wa.gov/wlm/diversity/soc/soc.htm>. June 2009.
- Washington Natural Heritage Information System (WNHIS). 2009. *List of Known Occurrences of Rare Plants in Washington: Kittitas County*. <http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/kittitas.html>. February 2009.
- Whiteaker, L., J. Henderson, R. Holmes, L. Hoover, R. Leshner, J. Lippert, E. Olson, L. Potash, J. Seevers, M. Stein, and N. Wogen. 1998. Survey Protocols for Survey and Manage

Strategy 2 Vascular Plants. Unpublished report. United States Department of Agriculture Forest Service and United States Department of the Interior Bureau of Land Management. On file with the Regional Ecosystem Office, P.O. Box 3623, Portland, Oregon. December.

5.2 Background Research—Plant Identification

Cooke, S.S. 1997. *A Field Guide to the Common Wetland Plants of Washington and Northwestern Oregon*. Seattle Audubon Society. Seattle, Washington.

Guard, B.J. 1955. *Wetland Plants of Oregon and Washington*. Lone Pine Publishing. Renton, Washington.

Hitchcock, C.L. 1971. *Manual of Grasses of the United States*. Dover Publications. New York, New York.

Hitchcock, C.L. and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press. Seattle and New York.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1969. *Vascular Plants of the Pacific Northwest. Part 1: Vascular Cryptogams, Gymnosperms, and Monocotyledons*. University of Washington Press. Seattle, Washington.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1964. *Vascular Plants of the Pacific Northwest. Part 2: Salicaceae to Saxifragaceae*. University of Washington Press. Seattle, Washington.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1961. *Vascular Plants of the Pacific Northwest. Part 3: Saxifragaceae to Ericaceae*. University of Washington Press. Seattle, Washington.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1959. *Vascular Plants of the Pacific Northwest. Part 4: Ericaceae through Campanulaceae*. University of Washington Press. Seattle, Washington.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1955. *Vascular Plants of the Pacific Northwest. Part 5: Compositae*. University of Washington Press. Seattle, Washington.

Niehaus, T.F. and C.L. Ripper. 1976. *A Field Guide to Pacific States Wildflowers: Washington, Oregon, California, and Adjacent Areas*. The Peterson Field Guide Series. Houghton Mifflin Company. Boston and New York.

Pojar, J. and A. MacKinnon. 1994. *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia, & Alaska*. Lone Pine Publishing. Redmond, Washington.

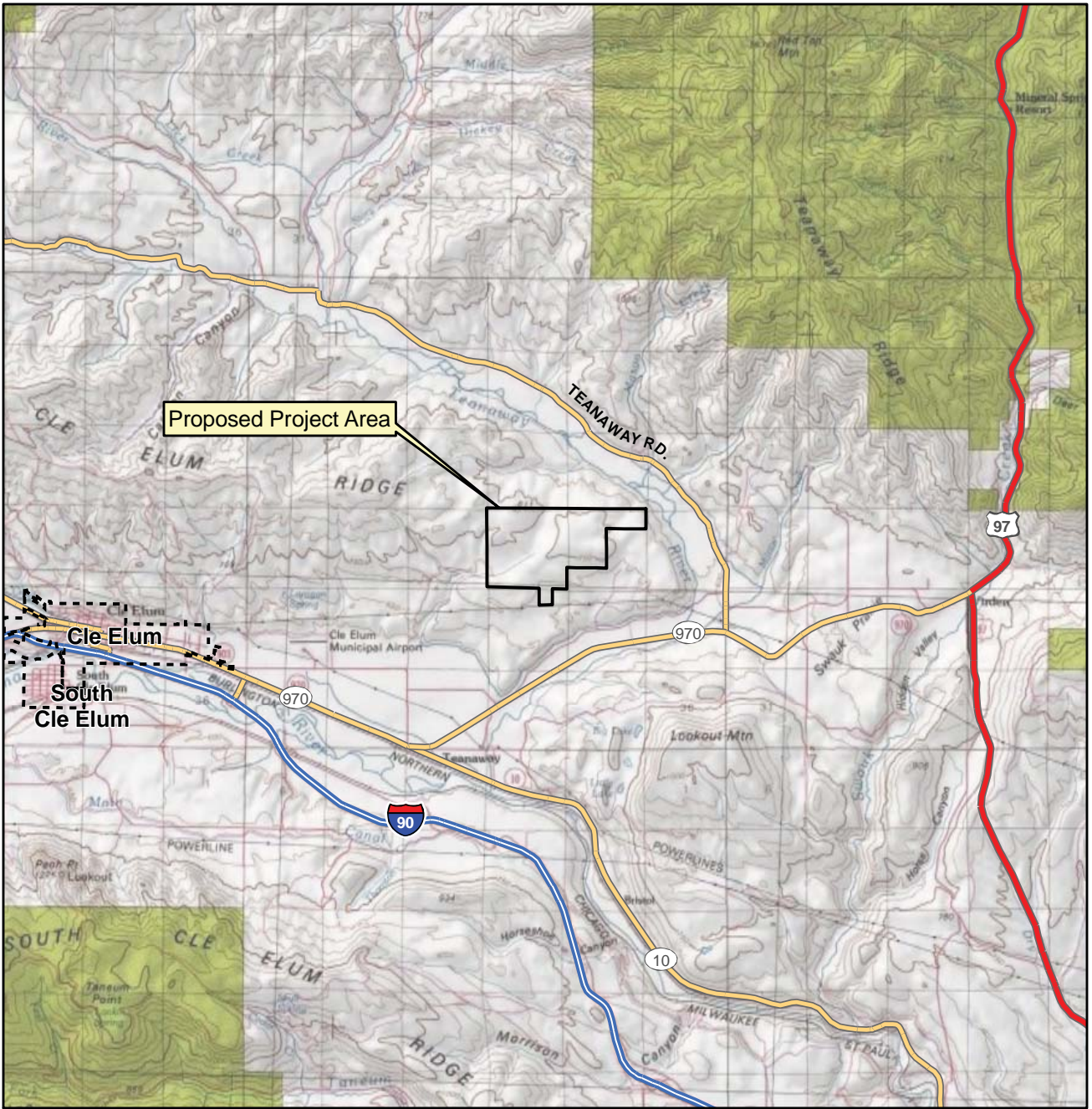
Taylor, R.J. 1990. *Northwest Weeds*. Mountain Press Publishing Company. Missoula, Montana.

University of Washington Herbarium. 2009. *WTU Image Collection: Plants of Washington, Lichens of Washington*. Burke Museum of Natural History and Culture.
<http://biology.burke.washington.edu/herbarium/imagecollection.php?>

Washington Natural Heritage Program (WNHP). 2008. *Field Guide to Selected Rare Plants of Washington*. Washington State Department of Natural Resources.
<http://www1.dnr.wa.gov/nhp/refdesk/fguide/htm/fgmain.htm>






Whitson, T. (ed.). 2000. *Weeds of the West*. Western Society of Weed Science. University of Wyoming.

APPENDIX A
Figures



VICINITY MAP

LEGEND

-  Proposed Project Area
-  City Boundary
-  Interstate
-  Highway
-  Major Road

Note:
1. USGS 100K Quadrangle: Wenatchee.

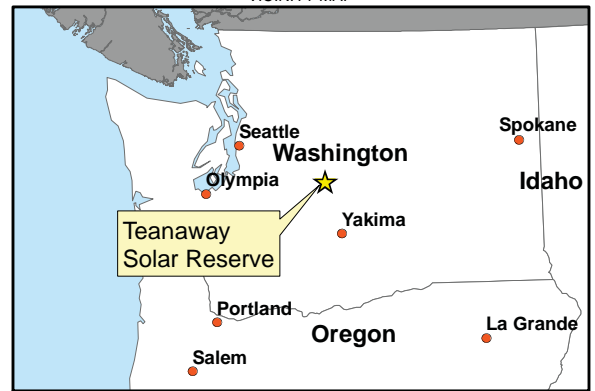
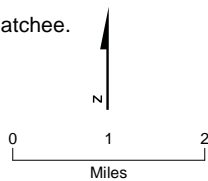
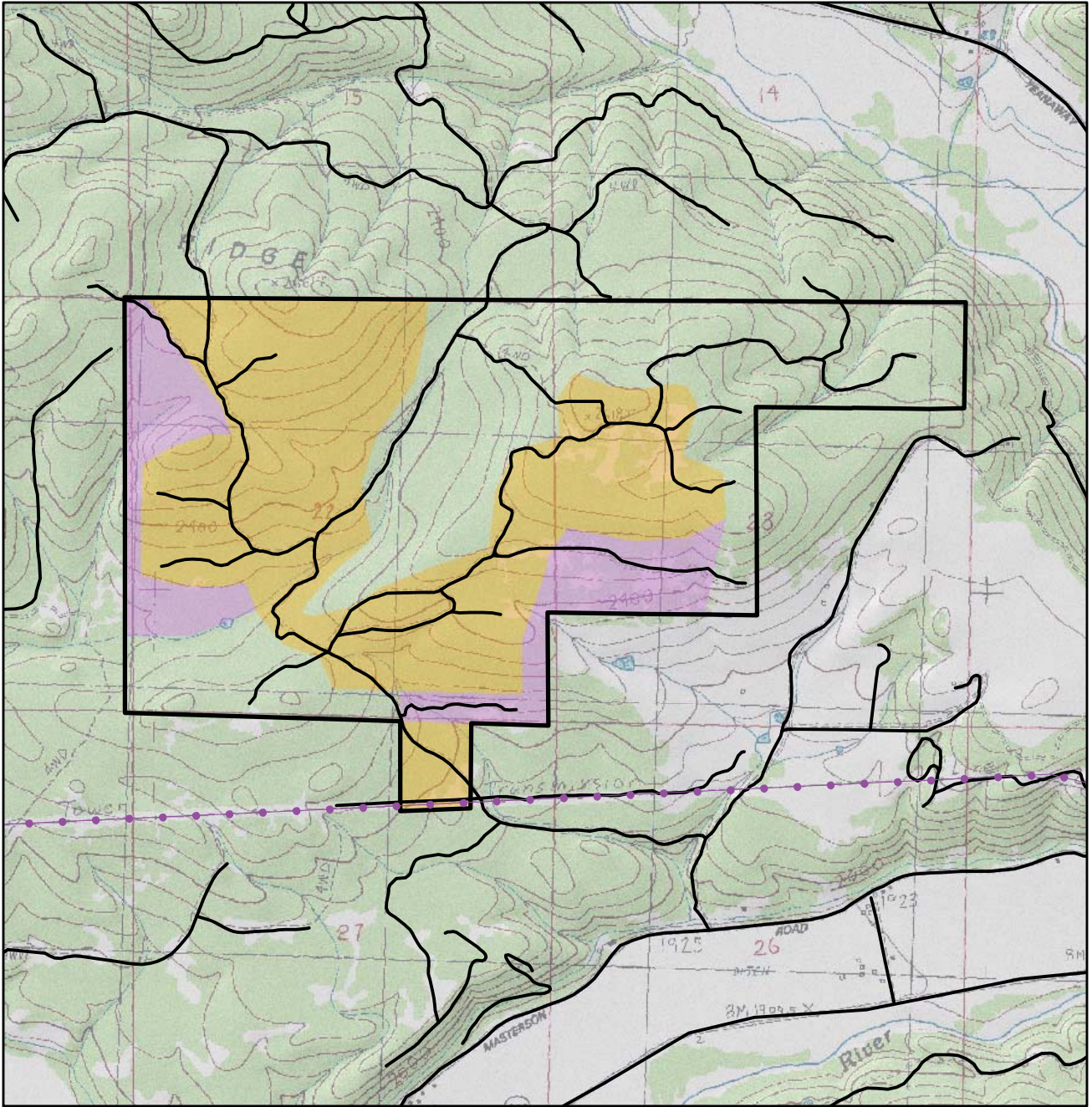







FIGURE 1
Vicinity Map

Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

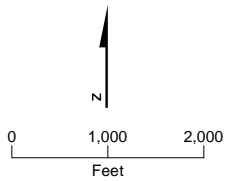
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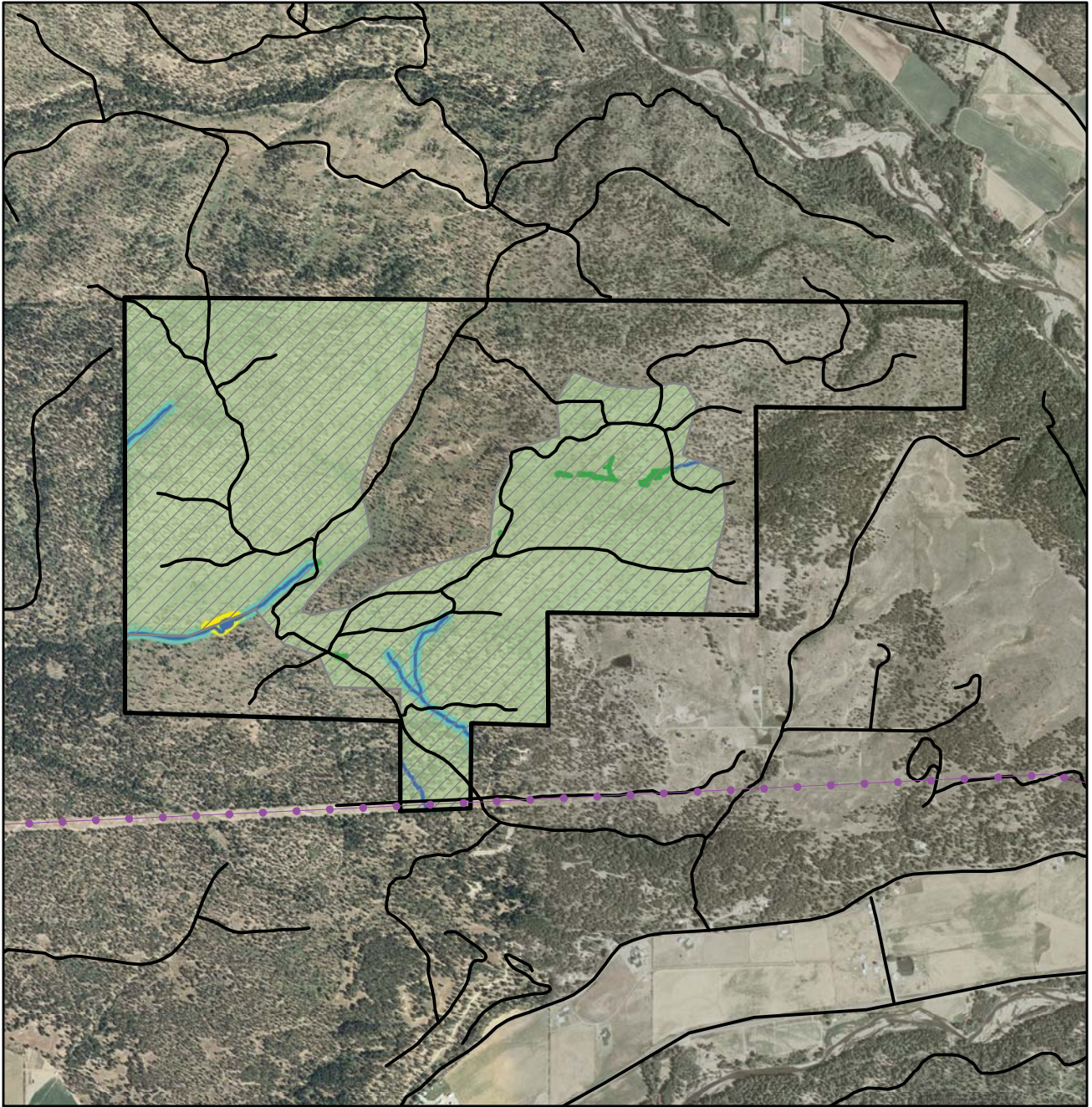
-  Proposed Project Area
-  July 2009 Survey Area
-  June 2009 Survey Area
-  Existing BPA Transmission Line
-  Existing Road

Note:
1. USGS 24K Quadrangle: Teanaway.







FIGURE 2
Survey Area Map
Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington





VICINITY MAP

LEGEND

- | | |
|--|---|
|  Proposed Project Area | Habitat |
|  Biological Survey Area |  Herbaceous Wetlands |
|  Existing BPA Transmission Line |  Open Water |
|  Existing Road |  Ponderosa Pine Forest and Woodlands |
| |  Riparian |
| |  Upland Aspen |

Note:
1. Aerial Imagery: 2006 1m NAIP.

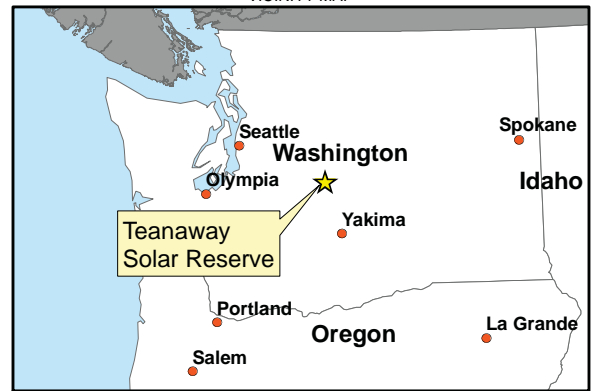
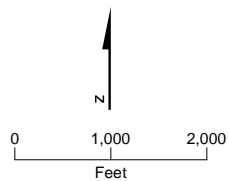


FIGURE 3
Habitat Types

Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington

APPENDIX B
U.S. Fish and Wildlife Service
Species List

KITTITAS COUNTY

Updated 7/24/2008

LISTED

Endangered

Gray wolf (*Canis lupus*)

Threatened

Bull trout (*Salvelinus confluentus*) – Columbia River distinct population segment

Grizzly bear (*Ursus arctos horribilis*)

Canada lynx (*Lynx canadensis*)

Marbled murrelet (*Brachyramphus marmoratus*)

Northern spotted owl (*Strix occidentalis caurina*)

Spiranthes diluvialis (Ute ladies'-tresses), plant

Designated

Critical habitat for the northern spotted owl

Critical habitat for the Columbia River distinct population segment of the bull trout

CANDIDATE

Fisher (*Martes pennanti*) - West Coast distinct population segment

Greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin distinct population segment

Yellow-billed cuckoo (*Coccyzus americanus*)

SPECIES OF CONCERN

Animals

Bald eagle (*Haliaeetus leucocephalus*) (delisted, monitor status)

Black swift (*Cypseloides niger*)

Burrowing owl (*Athene cunicularia*)

Ferruginous hawk (*Buteo regalis*)

Larch Mountain salamander (*Plethodon larselli*)

Loggerhead shrike (*Lanius ludovicianus*)

Long-eared myotis (*Myotis evotis*)

Northern goshawk (*Accipiter gentilis*)

Olive-sided flycatcher (*Contopus cooperi*)

Pacific lamprey (*Lampetra tridentata*)

Pallid Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)

Peregrine falcon (*Falco peregrinus*) (Delisted, monitor status)

Pygmy whitefish (*Prosopium coulteri*)
Redband trout (*Oncorhynchus mykiss*)
River lamprey (*Lampetra ayresi*)
Sagebrush lizard (*Sceloporus graciosus*)
Sharptail snake (*Contia tenuis*)
Townsend's ground squirrel (*Spermophilus townsendii*)
Western brook lamprey (*Lampetra richardsoni*)
Western gray squirrel (*Sciurus griseus griseus*)
Westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
Wolverine (*Gulo gulo*)

Vascular Plants

Astragalus columbianus (Columbia milk-vetch)
Cypripedium fasciculatum (Clustered lady's-slipper)
Delphinium viridescens (Wenatchee larkspur)
Lomatium tuberosum (Hoover's desert-parsley)
Phacelia minutissima (Least phacelia)
Pinus albicaulis (Whitebark pine)
Silene seelyi (Seely's silene)
Tauschia hooveri (Hoover's tauschia)

Mosses

Orthotrichum praemorsum

APPENDIX C
Washington Natural Heritage Program
Species List



[Return to Washington
Natural Heritage Program](#)

**Washington
Natural
Heritage
Program**

Reference Desk

Reference Desk	Location Search	Rare Plants	Rare Animals	Communities
GIS	Field Guides	Publications	Natural Heritage Plan	

**Washington Natural Heritage Information System
List of Known Occurrences of Rare Plants in Washington
February 2009
Kittitas County**

A key to status fields appears below. If a scientific name is underlined you may click on it to go to a field guide page (pdf format, average size 300 kb) for that taxon.

Scientific Name	Common Name	State Status	Federal Status	Historic Record
Agoseris elata	tall agoseris	S		
Anemone patens var. multifida	pasqueflower	T		
Anthoxanthum hirtum	common northern sweet grass	R1		H
Astragalus arrectus	Palouse milk-vetch	T		H
Astragalus columbianus	Columbia milk-vetch	S	SC	
Astragalus misellus var. pauper	Pauper milk-vetch	S		
Camissonia pygmaea	dwarf evening-primrose	S		
Camissonia scapoidea ssp. scapoidea	naked-stemmed evening-primrose	S		
Carex comosa	bristly sedge	S		H
Carex macrochaeta	large-awn sedge	T		H
Carex pauciflora	few-flowered sedge	S		
Carex scirpoidea ssp. scirpoidea	Canadian single-spike sedge	S		
Chaenactis thompsonii	Thompson's chaenactis	S		
Collomia macrocalyx	bristle-flowered collomia	S		
Cryptantha gracilis	narrow-stem cryptantha	S		
Cryptantha leucophaea	gray cryptantha	S	SC	
Cryptantha rostellata	beaked cryptantha	T		
Cryptantha scoparia	miner's candle	S		
Cypripedium fasciculatum	clustered lady's-slipper	S	SC	
Delphinium viridescens	Wenatchee larkspur	T	SC	
Eatonella nivea	white eatonella	T		
Erigeron basalticus	basalt daisy	T	SC	
Erigeron piperianus	Piper's daisy	S		H
Erigeron salishii	Salish fleabane	S		H
Gentiana douglasiana	swamp gentian	S		
Hackelia hispida var. disjuncta	sagebrush stickseed	S		H
Iliamna longisepala	longsepal globemallow	S		
Juncus howellii	Howell's rush	T		
Lomatium tuberosum	Hoover's desert-parsley	S	SC	

<u>Mimulus suksdorfii</u>	Suksdorf's monkey-flower	S	
<u>Minuartia nuttallii ssp. fragilis</u>	Nuttall's sandwort	T	
<u>Montia diffusa</u>	branching montia	S	H
<u>Nicotiana attenuata</u>	coyote tobacco	S	
<u>Oenothera caespitosa ssp. caespitosa</u>	caespitose evening-primrose	S	
<u>Ophioglossum pusillum</u>	Adder's-tongue	T	H
<u>Oxytropis campestris var. gracilis</u>	slender crazyweed	S	H
<u>Pediocactus nigrispinus</u>	snowball cactus	R1	
<u>Pellaea breweri</u>	Brewer's cliff-brake	S	
<u>Penstemon eriantherus var. whitedii</u>	fuzzytongue penstemon	S	
<u>Phacelia minutissima</u>	least phacelia	E	SC
<u>Pyrrocoma hirta var. sonchifolia</u>	sticky goldenweed	S	
<u>Sidalcea oregana var. calva</u>	Wenatchee Mountain checker-mallow	E	LE
<u>Silene seelyi</u>	Seely's silene	S	SC
<u>Spiranthes porrifolia</u>	western ladies-tresses	S	
<u>Subularia aquatica var. americana</u>	water awlwort	R1	
<u>Tauschia hooveri</u>	Hoover's tauschia	T	SC

Description of Codes

Historic Record:

H indicates most recent sighting in the county is before 1977.

State Status

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness.

Values include:

E = Endangered. In danger of becoming extinct or extirpated from Washington.

T = Threatened. Likely to become Endangered in Washington.

S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.

X = Possibly extinct or Extirpated from Washington.

R1 = Review group 1. Of potential concern but needs more field work to assign another rank.

R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

Federal Status

Federal Status under the U.S. Endangered Species Act(USESA) as published in the Federal Register:

LE = Listed Endangered. In danger of extinction.

LT = Listed Threatened. Likely to become endangered.

PE = Proposed Endangered.

PT = Proposed Threatened.

C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.

SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

APPENDIX D
Site Photographs



Photo 1: View of ponderosa pine forest and woodland in project area.



Photo 2: View of open water habitat in project area. Several intermittent streams present, as well.



Photo 3: View of herbaceous wetland in project area.



Photo 4: View of riparian habitat overhanging intermittent stream channel.



Photo 5: Upland aspen habitat south of artificially impounded pond. Aspen rings the pond in association with ponderosa pine and Douglas fir and continues for a short distance up the drainage.

