

Kittitas County

Teaway Solar Reserve

Comments from:

Marc Eylar

Assistant Coordinator, KCNWCB

August 9, 2010

- 1. Email chain: Marc T. Eylar to Nichole Seidell, et al. Comments on Vegetation Management Plan, dated August 9, 2010.**
- 2. Email chain: Marc T. Eylar to Anna Nelson, et al., subject “TSR Meeting Notes 5/8/10,” dated August 9, 2010.**
- 3. Email chain: Marc T. Eylar to Anna Nelson, et al., subject “TSR TAC Meeting Notes – 5/8/10,” with attached Vegetation Management Plan and Sensitive Species Surveys, dated August 9, 2010.**

From: Marc T. Eylar [mailto:marc.eylar@co.kittitas.wa.us]
Sent: Monday, August 09, 2010 10:37 AM
To: 'Nichole.Seidell@ch2m.com'
Cc: Anna Nelson
Subject: Comments for Veg Plan (sorry for delay)

Comments on the Vegetation Management Plan are below:

7.2 Operations and Maintenance BMPs and Mitigation Measures

7.2.1 Noxious Weed Control

The following BMPs for noxious weed control will be presented to the Kittitas County Noxious Weed Control Board (NWCB). The Veg Mgt Plan was not presented to our office....I did not view it until I became involved with the Tree Replacement TAC. That is neither here nor there, but that is why these comments were not presented earlier.

- Weed monitoring and any necessary control efforts will be completed annually.
- Ground application of herbicides will be with a dripless wand applicator carried over the site either on foot in a backpack sprayer or in a tank on a rubber-tired all-terrain vehicle (ATV). Herbicide(s) used will be limited to types that do not move through the soil and whose affect is immediate but short-lived. Herbicide(s) used will be approved for use near or in wetlands to avoid unintentional affects to aquatic species. These specifications would severely limit your toolbox when it comes to herbicide applications. According to those specs, you couldn't apply from a truck or make any boom applications from any vehicle. And limiting it to short-lived herbicides does not necessarily make it "safer" or more environmentally friendly. The project area is 982 acres with a large variance in soil type, existing vegetation cover, amount of water present, etc. Herbicide choice should be based on the target species and the site location.
- Herbicide mixes will be colored with dye to aid in post-application monitoring.
- The first pass of each application will be made parallel to the buffer zones in such a way that chemicals cannot drift into the buffers. Certain chemicals are approved within buffer zones if spot spraying for the purpose of noxious weed management. I am not saying you would necessarily need to use chemicals within the buffer zones, but it should be an option if needed.
- Wetland buffers will be maintained and are described in detail in Attachment B, *Wetland Delineation Report*.

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message id: 38eb45916c6dcbdac24bb8719d004a14

From: Marc T. Eylar [mailto:marc.eylar@co.kittitas.wa.us]
Sent: Monday, August 09, 2010 10:40 AM
To: Anna Nelson
Subject: FW: TSR TAC Meeting Notes- 5/18/10

Response from Botanist.

Marc

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]
Sent: Monday, June 21, 2010 3:29 PM
To: Marc T. Eylar
Subject: FW: TSR TAC Meeting Notes- 5/18/10

see below

From: O'Neill, Peggy/PDX
Sent: Monday, June 21, 2010 3:26 PM
To: Seidell, Nichole/PDX; Storey, Renee/PDX
Subject: RE: TSR TAC Meeting Notes- 5/18/10

Nichole,

I looked back through my field notes and we did identify some plant as rush skeletonweed in several areas of the site. There is always the possibility that I identified it incorrectly, but I am generally pretty accurate. Scotch broom is definitely there.

Peggy

Peggy O'Neill, PWS
Senior Project Technologist

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From: Marc T. Eylar [mailto:marc.eylar@co.kittitas.wa.us]
Sent: Friday, May 28, 2010 1:30 PM

To: Seidell, Nichole/PDX
Subject: RE: TSR TAC Meeting Notes- 5/18/10

Okay, well that makes it easy.

So first off, can I get a map and/or database of the survey that was completed. Two species in particular caught my eye in the list of species found: Scotch Broom and Rush Skeletonweed. I can see SB being on the site, and it would be a big priority for control; but RS on the site would not seem very likely (but possible). It would be a HUGE priority if it was indeed located on the site.

Second: our office would like to have periodic access to the site for the purpose of noxious weed surveys (I can contact Jeff Jones regarding this as well) and also would be willing to offer control (our cost) on certain high priority species if we receive permission to make herbicide applications on site. We already have a standing agreement with Jeff Jones concerning herbicide applications on American Forest property.

Finally, I had a couple comments regarding the Veg Plan but can't seem to find my copy from the meeting. Could you send me another copy to jog my memory.

Thanks Nichole.

Marc

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]
Sent: Friday, May 28, 2010 1:16 PM
To: Marc T. Eylar
Subject: RE: TSR TAC Meeting Notes- 5/18/10

That would be me. Thanks, Marc.

From: Marc T. Eylar [mailto:marc.eylar@co.kittitas.wa.us]
Sent: Friday, May 28, 2010 1:15 PM
To: Seidell, Nichole/PDX
Subject: RE: TSR TAC Meeting Notes- 5/18/10

Hi Nichole, who would I talk to with TSR about comments concerning the Vegetation Management Plan, the weed/plant survey that was done, and an agreement to access the site throughout the year for the purposes of noxious weed surveys.

Thanks.

Marc Eylar
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From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]
Sent: Friday, May 28, 2010 1:08 PM

To: anelson@GordonDerr.com; Brenda Larsen; Kirk Holmes; howard@sawtoothdg.com; jjones@forestllc.com; Jay.Lorenz@ch2m.com; Marc T. Eylar; MattS@strategies360.com; MARTIN.MAUNEY@dnr.wa.gov; William.Meyer@dfw.wa.gov; Travis.Nelson@dfw.wa.gov
Subject: TSR TAC Meeting Notes- 5/18/10

TSR TAC,

Draft meeting minutes from the May 18th meeting are attached for you review. Please provide edits/comments to Jay Lorenz by June 4. We will make the meeting minutes final after your review.

Thank you for your participation and valuable contributions to the TAC.

Nichole

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And here were Nicholes responses to a couple other questions I had.

Marc

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]
Sent: Monday, June 21, 2010 3:06 PM
To: Marc T. Eylar
Subject: RE: TSR TAC Meeting Notes- 5/18/10

Hi Marc,

See the responses below.

From: Marc T. Eylar [mailto:marc.eylar@co.kittitas.wa.us]
Sent: Friday, May 28, 2010 1:30 PM
To: Seidell, Nichole/PDX
Subject: RE: TSR TAC Meeting Notes- 5/18/10

Okay, well that makes it easy.

So first off, can I get a map and/or database of the survey that was completed. Attached please see the sensitive species report which was submitted with the August 2009 SEPA/CUP to the County. Two species in particular caught my eye in the list of species found: Scotch Broom and Rush Skeletonweed. I can see SB being on the site, and it would be a big priority for control; but RS on the site would not seem very likely (but possible). It would be a HUGE priority if it was indeed located on the site. I am waiting for a response back from our botanists on this.

Second: our office would like to have periodic access to the site for the purpose of noxious weed surveys (I can contact Jeff Jones regarding this as well) and also would be willing to offer control (our cost) on certain high priority species if we receive permission to make herbicide applications on site. We already have a standing agreement with Jeff Jones concerning herbicide applications on American Forest property. I am checking with the client on this.

Finally, I had a couple comments regarding the Veg Plan but can't seem to find my copy from the meeting. Could you send me another copy to jog my memory. See the attached from the February 2010 SEPS/CUP Supplement that TSR submitted to the County.

Thanks Nichole.

Marc

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Report

Vegetation Management Plan: Teaway Solar Reserve Kittitas County, Washington

Prepared for
Teaway Solar Reserve, LLC

February 2010

Prepared by
CH2MHILL



**Printed on
Recycled and
Recyclable
Paper**

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1 Vicinity Map
2 Proposed Site Layout
3 Habitat Types within the Proposed Project Site

1.0 Introduction

Teanaway Solar Reserve, LLC (TSR) proposes to construct an array of solar collection panels on 477 acres of privately held land near Cle Elum, Washington. (See Appendix A, Figure 1.) The proposed solar panel project site would be constructed on land leased from American Forest Holdings, LLC, which is managed and operated by American Forest Land Company, LLC of Ellensburg, Washington. The total leased parcel covers 982 acres (proposed project area). This Vegetation Management Plan (Plan) was developed in order to avoid or alleviate impacts to vegetation resources that are expected to result from the project and to provide TSR with guidance during and after construction for the management of vegetation resources within the proposed project area.

The proposed project site currently contains important habitat for wildlife, particularly elk, and supports a high diversity of native plant species. For this reason, this management plan uses many conservation and mitigation measures defined for the wind power industry by the Washington Department of Fish and Wildlife (WDFW) (2009).

This Plan also provides mitigation goals for offsetting the expected reduction in carbon-sequestering conifers with project implementation. Tree seedlings will be planted in nearby conservation easement lands and/or riparian corridors along degraded areas of the Teanaway River to mitigate for the permanent loss of tree cover under panels and facilities.

1.1 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 Appendix A, Figure 2). 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 (see SEPA Checklist Attachment J, Figure 3), private roads such as Loping Lane, and public roads that are privately maintained such as Wiehl Road.

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.

The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The Teanaway River is the largest naturally flowing tributary in the Upper Yakima Basin. It supports populations of spring chinook salmon, steelhead, and bull trout. Several reaches of the Teanaway River and its tributaries do not meet Washington State's numeric water quality standards for stream temperature and several segments of the Teanaway River have been placed on Washington State's 303(d) list of impaired water bodies.

In general, the proposed project area is open ponderosa pine (*Pinus ponderosa*) forest with a mixed bunchgrass-forb understory. A few areas support wetlands and aspen groves. Habitat across the proposed project areas is rated as Category II by the WDFW. (Class I and Class II habitats are considered the highest priorities for current statewide conservation action in Washington. Class I habitats have a greater number of associated species of

Greatest Conservation Need [SGCN] than the Class II habitats and Class II habitats have a greater number of associated SGCN than the Class III habitats. Class IV habitats are generally low-value habitats, and this is the only class that generally requires no mitigation for impacts.) The proposed project area supports elk herds, at least seasonally, and is considered habitat for elk and deer.

1.2 Purpose and Intent

The purpose of the proposed project is to generate up to 75 direct current megawatt (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 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.

Oregon and California have adopted similar standards. Depending on the commercial terms available for the power sales, the utilities that may buy the power from the project could change over time.

TSR proposes to develop the site with key components described below to maximize its solar energy potential, based on its commitment to providing renewable energy and becoming the leading (in terms of energy production and environmentally sensitive development and management of its solar production site) sustainable energy production location in North America. The following factors will be analyzed to determine optimal location within the site defined below:

- Significant solar radiation (insolation)
- Site accessibility
- Avoidance of environmentally sensitive areas
- Limited visibility from offsite locations

All utility-scale solar energy facilities require relatively large areas for solar radiation collection when used to generate electricity at a commercial scale, and the large arrays of solar collectors may interfere with natural sunlight, rainfall, and drainage, which could have a variety of effects on plants and animals. Proper siting decisions and conservation mitigation measures described in this Plan were developed to help avoid land disturbance and land use impacts and to mitigate for unavoidable impacts to vegetation.

1.2.1 Key Project 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 supervisory control and data acquisition (SCADA) system
- Overhead interconnection transmission line
- Access and maintenance roads

Key components are described in more detail in the project description section of the Expanded SEPA Checklist.

1.3 Goals and Objectives

To meet the purpose and intent of this Plan, goals, and objectives were developed to guide vegetation management activities related to project construction and solar production O&M. These goals and objectives for vegetation management are described below:

1.3.1 Vegetation Maintenance

- Maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site.
 - **Objective:** Woody vegetation removal and ongoing management will be necessary to prevent interference with solar collectors. Measures will be implemented to protect herbaceous plant cover on site, including under collectors, to the fullest extent possible in order to retain high carbon sequestration potential for the site, to avoid extreme changes in hydrological infiltration-runoff ratio, to protect wildlife forage, and to maintain vegetation diversity to the greatest extent possible.
 - **Objective:** Restoration of impacted areas, of weed control areas, and for future decommissioning of the site will be based on native species currently on site.
- Develop and maintain native plant communities that are resistant to non-native plant invasion.
 - **Objective:** Develop and implement construction BMPs that will prevent weed invasion into project area and limit construction impacts to the smallest footprint possible.

1.3.2 Revegetation

- Maintain carbon sequestration potential after woody vegetation removal.
 - **Objective:** Develop or enhance woody vegetation on nearby parcels to offset the negative impacts to woody vegetation from the construction of solar panels and other facilities.
- Preserve and maintain the land's aesthetic values to the fullest extent possible while developing electrical production.
 - **Objective:** Provide screening around the perimeter of the project area and make trees available for neighboring landowners to plant on their land to provide additional screening as they see fit. These plantings will further enhance potential carbon sequestering.

1.3.3 Agency Coordination

Through the formation of a Technical Advisory Committee (TAC), present the WDFW and the Washington Department of Natural Resources (WDNR) with a plan to provide conservation measures that will compensate for the loss of native vegetation that will be permanently affected by project construction and O&M without negatively impacting forest health, fire risk, and elk habitat by overstocking trees in areas that are already high-value forests. This would mean replacing and/or upgrading deteriorated native vegetation nearby.

- **Objective:** Present the WDFW with a plan to ensure that vegetation removal and associated revegetation mitigation activities are consistent with, or complementary to, objectives for weed prevention, fish and wildlife habitat, erosion control, ground cover, riparian reserves, and fire/fuels management. Promote the idea of a TAC with Kittitas County, WDNR, WDFW and other stakeholders to help guide the deliberation process for tree planting locations and stocking rates that would best serve elk habitat values, forest health values, and fire prevention measures. Investigate opportunities to use tree plantings along segments of the Teanaway River that are currently listed by the U.S. Environmental Protection Agency (EPA) as impaired water bodies (303(d)) because of high temperatures to improve shading and channel morphology over time.

1.3.4 Weed Control

Comply with recommendations of the Washington State and Kittitas County Weed Control Boards for Region 6 Class A, B, and C weeds, which require land owners within weed-control districts to protect and preserve the land and resources from the degrading impact of noxious weeds.

- **Objective:** Reduce cover of noxious weeds. Restore cover by native plant species in areas of temporary disturbance. Maintain a clean, healthy environment with diverse native plant assemblages that resemble current conditions.

1.4 Summary of Plan Implementation Actions

The intent of the Plan is to provide Teanaway Solar Reserve, WDFW, WDNR, and Kittitas County with the information needed to evaluate vegetation management activities associated with proposed project construction and operations and maintenance activities. The Plan will ultimately provide Teanaway Solar Reserve with information needed to implement vegetation management activities for the project over the long term.

This Plan is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contributions of funds between Teanaway Solar Reserve and other stakeholders relative to the Plan will be handled in accordance with applicable laws, regulations, and procedures including those for government procurement and printing. This Plan does not provide such authority.

The Plan consists of three separate but inter-related elements of implementation; each deals with a specific aspect of vegetation management:

1. **Vegetation Maintenance** - describes measures for the routine removal and disposal of vegetation that interferes with safe and effective project construction and long-term operations, while protecting herbaceous vegetation on the site.
2. **Noxious Weed Prevention and Control** - prescribes methods for the prevention and control of noxious weeds in the project boundary.
3. **Revegetation** - outlines the measures to replace woody vegetation that will be removed from the project site by planting woody vegetation on other appropriate locations. It also discusses the procedure for revegetating abandoned road segments. Revegetation includes replanting all areas disturbed during construction. It also describes activities for decommissioning the project site.

2.0 Planning and Coordination

Implementation of the Plan is the primary responsibility of TSR. However, since much of the project is located in the leased land and habitat concerns for elk are important, other stakeholders have important roles in its implementation through the consultation process. The proposed solar panel project site is on land leased from American Forest Holdings, LLC, which is managed and operated by American Forest Land Company, LLC (AFL) of Ellensburg, Washington. Conservation easements for sections for impacted uplands nearby and for impaired segments of the Teanaway River will be investigated in coordination with Kittitas County, WDFW and WDNR. Assessment of the suitability of all potential mitigation replanting sites for elk would include consultation with WDFW.

2.1 Permits and Authorizations

Table 1 outlines the permits and authorizations required to construct the proposed project. Several of these permits involve vegetation avoidance or management.

TABLE 1
Required Permits and Authorizations

Act/Law	Permit/Authorization	Permit Trigger	Agency/Contact
Federal Permits			
Section 404 Clean Water Act Compliance	Section 404—Nationwide Permit	May be required if road improvements impact wetlands along Loping Lane	U.S. Army Corps of Engineers
State Permits			
Historic Preservation Act Compliance	Section 106 Review	Applicants receiving a section 404 permit from the U.S. Army Corps must undergo a Section 106 review	Washington Authority Delegated to State Department of Archaeology and Historic Preservation (DAHHP)
State Environmental Policy Act	Chapter 197-11 Washington Administrative Code	Conditional use permit per Kittitas County	Authority Delegated to Kittitas County
Clean Water Act—Section 401 Compliance	Water Quality Certification	Applicants receiving a section 404 permit from the U.S. Army Corps are required to obtain a section 401 water quality certification	Washington Department of Ecology
National Pollutant Discharge Elimination System (NPDES)	General Construction Permit	Required for land disturbances greater than 1 acre	Washington Department of Ecology
Forest Practices Act (76.09 RCW)	Forest Practices Permit	Harvesting trees from onsite	Washington Department of Natural Resources (WDNR)
County Permits			
Land Use Review	Conditional Use Permit	Development occurring within Kittitas County	Kittitas County
Land Use Review	Development Agreement	Development occurring within Kittitas County	Kittitas County
Land Use Review	Cultural Resources	Development occurring within Kittitas County	Kittitas County
Land Use Review	Stormwater	Development occurring within Kittitas County	Kittitas County
Land Use Review	Critical Areas Ordinance	Development occurring within Kittitas County	Kittitas County
Land Use Review	Construction Permit	Development occurring within Kittitas County	Kittitas County

2.2 Summary of Construction Activities and Components

Site preparation will consist of clearing the existing vegetation only in those areas where construction, grading, and road improvements will occur. Site preparation will be limited to maintenance roads, the O&M facility, the substation, and the solar facility. Once the site is prepared, the installation of foundations, trackers, modules, inverter pads and enclosures, and substation foundation can begin.

2.3 Site Clearing and Grading

The project area will require clearing to address the potential for damage to the project from blown down trees, decreased power efficiency of the solar modules because of shading, the risk of fire from fuel buildup within the project area, and the need to create a 100-foot firebreak along the project's perimeters as described below. To clear the site for installing the project facilities, trees will be harvested within the project area on an as-needed basis for facilitating the each construction phase of the project (Table 2-1). Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. TSR will obtain a permit from the WDNR and contract with a professional forester to harvest these trees in accordance with the Forest Practices Act (FPA). Because the bottoms of the solar modules will be approximately 3 feet above grade, any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

Trees within the 100-foot firebreak will be limbed up to 12 feet, as negotiated with Kittitas County Fire District 7. This minimizes the need to remove the entire tree, thus potentially decreasing the visual impact to nearby landowners. Also, existing trees with a dbh of 3 inches or greater will be replanted at a 3:1 ratio. Although there is no legal requirement for this action, TSR is committed to undertaking efforts that will further the potential long-term sustainability of the land. These two measures will provide greater carbon sequestration, wildlife habitat, and soil stabilization opportunities than are currently available on the site.

Construction equipment such as tractors, backhoes, loaders, dozers, and graders will be needed to clear brush and vegetation from the site as needed, and to grade roads and foundation locations. If the slope of the land is excessive, terracing, or retaining walls may be required.

3.0 Existing Conditions

Five vegetation categories or habitat types were mapped for the project area based on classification descriptions using Chappel *et al.* (2001) and field studies performed by CH2M HILL in the summer of 2009. These five habitat types are illustrated in Appendix A, Figure 3:

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

These vegetation categories are described in more detail below. Two of the vegetation categories described below are Washington Priority Habitats: Upland Aspen Forest and Herbaceous Wetlands. Because these habitats comprise only a small portion of the site, direct impacts to these habitats from construction and operation of the project will be avoided.

Native plant diversity is high across the project area, 66 of the 81 (81 percent) plant species found during rare plant inventories were native species.

3.1 Ponderosa Pine Forest and Woodlands

Ponderosa Pine Forest and Woodlands vegetation is the dominant vegetation category found on the proposed project site. The project site has been actively managed as commercial timberlands for the past 100 years. The proposed project area was last logged in 2001-2002, leaving relatively few trees per acre and open stands of predominantly ponderosa pine (*Pinus ponderosa*). Crown cover of larger ponderosa pine, commercial grade, (greater than 8 inches diameter at breast height [dbh]) currently is approximately 10 to 15 percent across the proposed project site. Ponderosa pine stands growing on site are dominated by an overstory of 50-year-old ponderosa pine trees with a subcomponent of Douglas-fir (*Pseudotsuga menziesii*) trees. Saplings of both species are present in the understory.

The understory is dominated by a mixture of native bunchgrass species, including Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), squirreltail (*Elymus elymoides*), and western wheatgrass (*Pascopyrum smithii*). Common native forbs in the understory are arrowleaf balsamroot (*Balsamorhiza sagittata*), yarrow (*Achillea millefolium*), silky lupine (*Lupinus* spp.), sticky purple geranium (*Geranium viscosissimum*), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

The variety of Oregon checkermallow found on site is the more common of two varieties of this species. A second variety of this checkermallow (*Sidalcea oregana* var. *calva*) was federally listed under the Endangered Species Act as Endangered on December 22, 1999 (64 FR 71680). Rare plant surveys completed for the proposed project site in 2009 determined that the Oregon checkermallow variety found on site is not the endangered variety (CH2M HILL 2010).

Non-native species, such as bulbous bluegrass (*Poa bulbosa*), ventenata (*Ventenata dubia*), and rush skeletonweed (*Chondrilla juncea*) are abundant in many areas. Rush skeletonweed is a Class B noxious weed in Washington.

3.2 Open Water—Lakes, Rivers, and Streams

Several ephemeral streams and one artificially ponded area occur within the proposed project area. Streambeds were vegetated to varying extents and all dry at the time of the field visits (June and July 2009). Typical herbaceous grass and forb species within most dry channels include 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 Woods' rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), cinquefoil (*Potentilla* spp.), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

3.3 Herbaceous Wetlands

Herbaceous wetland habitats within the survey area consist of depressional wetlands dominated by herbaceous vegetation. Exposed soils were cracked, which is evident of altering drying and wetting periods. Water arrives as either snowmelt or rain. These wetlands support hydrophytic herbaceous vegetation and meet the criteria for hydric soils and wetland hydrology. Common plant species within these wetlands were creeping spikerush (*Eleocharis palustris*), Parry's rush (*Juncus parryi*), marsh cudweed (*Gnaphalium palustre*), and several sedge (*Carex* spp.) species. The non-native, annual grass ventenata (*Ventenata dubia*) had invaded most of the depressional wetlands and dominated them as they dried. Herbaceous wetlands are located within the proposed project area boundary but will not be impacted by project activities (see Appendix A, Figure 2).

3.4 Riparian

Riparian habitat is found adjacent to some of the ephemeral stream channels in the survey area. Riparian habitat is located in the transitional area between the stream channel and ponderosa pine forest. It typically consists of a dense shrub layer composed of a mixture of oceanspray (*Holodiscus discolor*), mountain spiraea (*Spiraea betulifolia*), Woods' rose (*Rosa woodsii*), and ponderosa pine. Oregon checkermallow (*Sidalcea oregana* var. *procera*) was often found in the understory of these areas.

3.5 Upland Aspen Forest

A small grove of aspen (*Populus tremuloides*) forest occurs along one drainage and around an artificially impounded pond in the southwestern portion of the survey area. Associated species include ponderosa pine, snowberry, and wild rose. This aspen grove is within the proposed project area boundary, but will not be impacted by project activities as it is located outside of the proposed project site boundary (see Appendix A, Figure 2).

4.0 Vegetation Maintenance

This section provides a set of procedures and associated BMPs to guide the routine removal and disposal of vegetation during construction and during O&M. Ongoing O&M vegetation removal will be limited to woody vegetation that could potentially interfere with safe and effective project operations. Vegetation maintenance goals for the Plan are:

- Maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site.
- Develop and maintain native plant communities that are resistant to non-native plant invasion.

The objectives of these goals are described in described in Section 1.4. Two general categories of vegetation impact (described in Section 2.2 Construction Activities and Components and Section 2.3 O&M Activities) will occur. Construction activities are likely to be of short duration, but they will be permanent in areas where roads or structures will be constructed. Some construction activities will have more short-term impacts, such as areas used for staging or slash collection. O&M activities will continue to occur over the life of the project and are long-term impacts.

4.1 Maintain Herbaceous Plant Diversity.

Goal 1 of this plan is to maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site during construction and O&M activities. Construction BMPs are provided in Section 7.1 to avoid impacts to plants that will not be directly and permanently removed by construction activities. These include erosion control and temporary fencing protection. In addition, site preparation will consist of clearing the existing vegetation only in those areas where construction, grading, and road improvements will occur. Temporary staging and material storage areas will be located within areas that will be required for later construction to minimize site disturbance. Site preparation will be limited to maintenance roads, the O&M facility, the substation, and the solar facility. Once the site is prepared, the installation of foundations, trackers, modules, inverter pads and enclosures, and substation foundation will use built roads. Avoiding incidental impacts to vegetation that will not be permanently impacted helps promote plant communities that are more resistant to non-native plant invasion.

As described in Section 2.3 above, woody vegetation management will be necessary to prevent interference with solar collectors. The bottoms of the solar modules will be approximately 3 feet above the ground; any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Approximately 10 to 15 percent of the crown cover currently on the proposed project site is commercial-size timber (larger than 8-inch dbh). Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

Trees within the 100-foot firebreak will be limbed up to 12 feet, as negotiated with Kittitas County Fire District 7.

Goal 2 will be discussed primarily under Section 5.0 Weed Control. However, maintaining healthy, diverse herbaceous plant communities for carbon sequestering has the added bonus of making the project site more resistant to non-native plant invasion.

The objective of this goal is to develop and implement construction BMPs that will prevent weed invasion into the project area and ensure construction impacts are limited to the smallest footprint possible.

5.0 Weed Control

Routine weed control will be required to ensure vegetation growth does not interfere with the operation of any equipment. The frequency of visits will be determined by the growth rate and density of the vegetation left on the site once construction is complete. TSR will comply with the Development Agreement, included as Attachment E of the Conditional Use Permit. TSR is also contractually bound to reclaim the site to address any damage caused by the demolition and removal of any alterations or improvements to the site, including the project.

While attempting to reach weed control goals and objectives, TSR will take a long-term, integrated approach. It will strive to reduce herbicide use over the long term while making measurable progress toward vegetation management goals over the short term. Reliance solely upon broadleaf herbicides without additional tools would be expensive, increase

health concerns, and ultimately lead to losses in native broadleaf diversity. An aggressive, creative, and fully integrated management approach to weed control will be promoted.

Table 2 lists the known non-native species currently found within the project area boundaries and the status of each as a noxious weed. This is not an exhaustive weed list and other species may be introduced onto the site during construction. Appendix B lists all current noxious weeds for Washington. Eradication of Class B weeds with reseeding of native species will be implemented to contain infestations. Control of all other non-native species from spreading and eradicating if possible is recommended in order to ease site restoration after the project facilities are removed in the future.

TABLE 2
Non-native Species Currently Known to Occur within the Proposed Project Area

Common Name	Scientific Name	Status in Washington ^a	Recommended Action
Common corncockle	<i>Agrostemma githago</i>		Control
European water plantain	<i>Alisma plantago-aquatica</i>		Control
Centaury	<i>Centaurium erythraea</i>		Control
Rush skeletonweed	<i>Chondrilla juncea</i>	Class B	Eradicate and reseed
Ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	Class B	Eradicate and reseed
Bull thistle	<i>Cirsium vulgare</i>	Class C	Control
Field bindweed/ morning glory	<i>Convolvus arvensis</i>	Class C	Control
Rough hawksbeard	<i>Crepis setosa</i>		Control
Scotch broom	<i>Cytisus scoparius</i>	Class B	Eradicate and reseed
Common timothy	<i>Phleum pratense</i>		Control
Bulbous bluegrass	<i>Poa bulbosa</i>		Control
Self-heal	<i>Prunella vulgaris</i>		Control
Tall buttercup	<i>Ranunculus acris</i>		Control
Sheep sorrel	<i>Rumex acetosella</i>		Control
Yellow salsify	<i>Tragopogon dubius</i>		Control
Ventenata	<i>Ventenata dubia</i>		Control

Notes:

^a Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.

Class B Weeds: Non-native species presently limited to portions of the state. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority.

Class C Weeds: Noxious weeds which are already widespread in Washington or are of special interest to the state's agricultural industry. The Class C status allows counties to enforce control if locally desired.

6.0 Revegetation

Existing trees with a diameter at breast height (dbh) of 3 inches or greater will be replanted at a 3:1 ratio. Although there is no legal requirement for this mitigation, TSR is committed to undertaking efforts that will further the long-term sustainability of the land. These two measures may provide greater carbon sequestration, wildlife habitat, and soil stabilization opportunities than are currently available onsite. On the other hand, if trees are stocked too heavily, elk forage habitat values decrease, fire dangers increase, and forest health issues increase. In order to address locations where these trees can be planted, TSR will coordinate with the TAC (Kittitas County, WDNR, and WDFW).

The Forest Practices Act (FPA) requires 150 or more well-distributed, vigorous, undamaged seedlings per acre of commercial tree species (the site is dominated by Ponderosa Pine) 3 years post harvest. As a general rule, a stand is replanted within 1 or 2 years after harvest. Beyond this, the FPA does not have a specific stocking standard related to forest health or fire issues. Further standards will be developed by the TAC.

6.1 Agency Coordination

TSR is forming a TAC to address mitigation for tree replacement (TAC commitment letters are provided in Appendix C). TSR will plan and coordinate meetings between these stakeholders to discuss and formulate a planting plan and to determine acceptable final goals for a monitoring plan. At a minimum, the planting plan would include the following elements:

- Determine suitable parcels for planting, both upland areas and areas along the Teanaway River, including riparian and upland buffers will be considered.
- Define areas for ponderosa pine planting so that plantings would not result in overstocking areas just to meet total numbers. Suitable stocking rates for ponderosa pine forest in this area are 150 trees per acre.

The TAC includes at a minimum TSR, Kittitas County, WDNR, and WDFW.

6.2 Monitoring

Once plantings are in place, the success of plantings will be monitored annually for 3 years by TSR by installing monitoring plots. Plots will be monitored for seedling survival for the duration of 3 years. If the viable seedlings meet or exceed 150 stems 3 years post planting, the site is considered fully stocked and WDNR will close the FPA permit. An annual monitoring report will be sent to Kittitas County, WDNR, and WDFW, at a minimum

6.3 Revegetation Guidance

6.3.1 Temporary Disturbance Seeding

Areas temporarily disturbed by construction activities, including the areas under solar arrays, will be revegetated with native species. Annual revegetation monitoring will be undertaken to ensure that all seeded revegetation sites meet a minimum cover standard of 70 percent cover composed of predominantly native species within 3 years. A general seeding mixture consisting of 12 pounds per acre of pure live seed (PLS) from a certified

weed-free source will be planted on disturbed sites at a ratio of 4 pounds of bluebunch wheatgrass (*Pseudoroegneria spicata*), 2 pounds of Idaho fescue (*Festuca idahoensis*), 2 pounds of prairie junegrass (*Koeleria macrantha*), 2 pounds needle-and-thread grass (*Hesperostipa comata*), 1 pound of arrowleaf balsamroot (*Balsamorhiza sagittata*), and 1 pound of silky lupine (*Lupinus sericeus*).

6.3.2 Road Decommissioning during Construction

Several small roads segments located near wetlands will be abandoned during construction of the project to avoid impacts to the wetland resource.

6.3.3 Decommissioning

Per the Development Agreement (Attachment E of the Conditional Use Permit) TSR will return the site in good condition and, at the landowner's request, to remove any or all of the project's components. For more details on project decommissioning, see Attachment E of the Conditional Use Permit. TSR will also reclaim the site to address any damage caused by the demolition and removal of any alterations or improvements to the site, including the project. Decommissioning could include removing all facilities and roads. It is likely to include reseeding and replanting areas disturbed by construction activities at the project site with a diverse mix of native plants. If some of the species currently on site, particularly the forb species, are not readily available commercially, this agreement could require seed collection to fulfill the intent of the decommissioning language.

7.0 Best Management Practices (BMPs) and Mitigation Measures

7.1 Construction BMPs and Mitigation Measures

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:

- Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. TSR will obtain a permit from the WDNR and contract with a professional forester to harvest these trees in accordance with the Forest Practices Act.
- It is TSR's intent not to burn woody debris, slash, or logging refuse. Any woody debris chipped on site will be put to a beneficial use (e.g. chipped material will be sent to a compost facility, used for paper or ground cover). If burning is necessary, TSR will secure the necessary permits from the regulatory agencies and no more than approximately 130 consumable tons of material will be burned.
- Slash production from logging will use a chipper, such as the Hydro-ax, to de-limb and process slash and small trees. This will be done in confined staging areas on or next to proposed or current roadways. The resulting chips could be used as composting chips,

ground cover, or erosion control material, or taken to a mulch center for recycling. Kittitas County has a new compost center north in Ellensburg, which is approximately 25 miles from the project site. No slash or brush piles permanently left on the project site to inadvertently impact herbaceous vegetation cover.

- All trees, shrubbery, and other vegetation not designated for removal will be protected from damage caused by the project construction.
- Areas of temporarily disturbed by construction activities will be seeded with the specified seed mix.
- Install filter bags, sediment fences, sediment filter fabric traps, and graveled construction accesses as necessary for erosion control, where possible.
- 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.
- Petroleum products and other harmful material will be prevented from entering wetland or waterways at all times.
- Upon completion of construction, seed or plant all areas of temporary disturbance due to construction activities with native plants.
- Erect construction fencing along buffered boundaries of all wetland and riparian areas and aspen groves within the proposed project site prior to construction to avoid inadvertent impacts to these habitats.
- Monitor areas used for staging after construction to determine if impacts to these areas are temporary. If weeds invade or native plants on these sites appear to be dead or unhealthy the year following construction, weeds will be controlled and these areas will be overseeded with the same seeding mixture described for other disturbed areas.
- Where seeding is necessary, seeding mixture consisting of 12 pounds of PLS from a certified weed-free source will be planted on this prepared surface at a ratio of 4 pounds of bluebunch wheatgrass (*Pseudoroegneria spicata*), 2 pounds of Idaho fescue (*Festuca idahoensis*), 2 pounds of prairie junegrass (*Koeleria macrantha*), 2 pounds needle-and-thread grass (*Hesperostipa comata*), 1 pound of arrowleaf balsamroot (*Balsamorhiza sagittata*), and 1 pound of silky lupine (*Lupinus sericeus*).

7.2 Operations and Maintenance BMPs and Mitigation Measures

7.2.1 Noxious Weed Control

The following BMPs for noxious weed control will be presented to the Kittitas County Noxious Weed Control Board (NWCB).

- Weed monitoring and any necessary control efforts will be completed annually.
- Ground application of herbicides will be with a driplless wand applicator carried over the site either on foot in a backpack sprayer or in a tank on a rubber-tired all-terrain

vehicle (ATV). Herbicide(s) used will be limited to types that do not move through the soil and whose affect is immediate but short-lived. Herbicide(s) used will be approved for use near or in wetlands to avoid unintentional affects to aquatic species.

- Herbicide mixes will be colored with dye to aid in post-application monitoring.
- The first pass of each application will be made parallel to the buffer zones in such a way that chemicals cannot drift into the buffers.
- Wetland buffers will be maintained and are described in detail in Attachment B, *Wetland Delineation Report*.

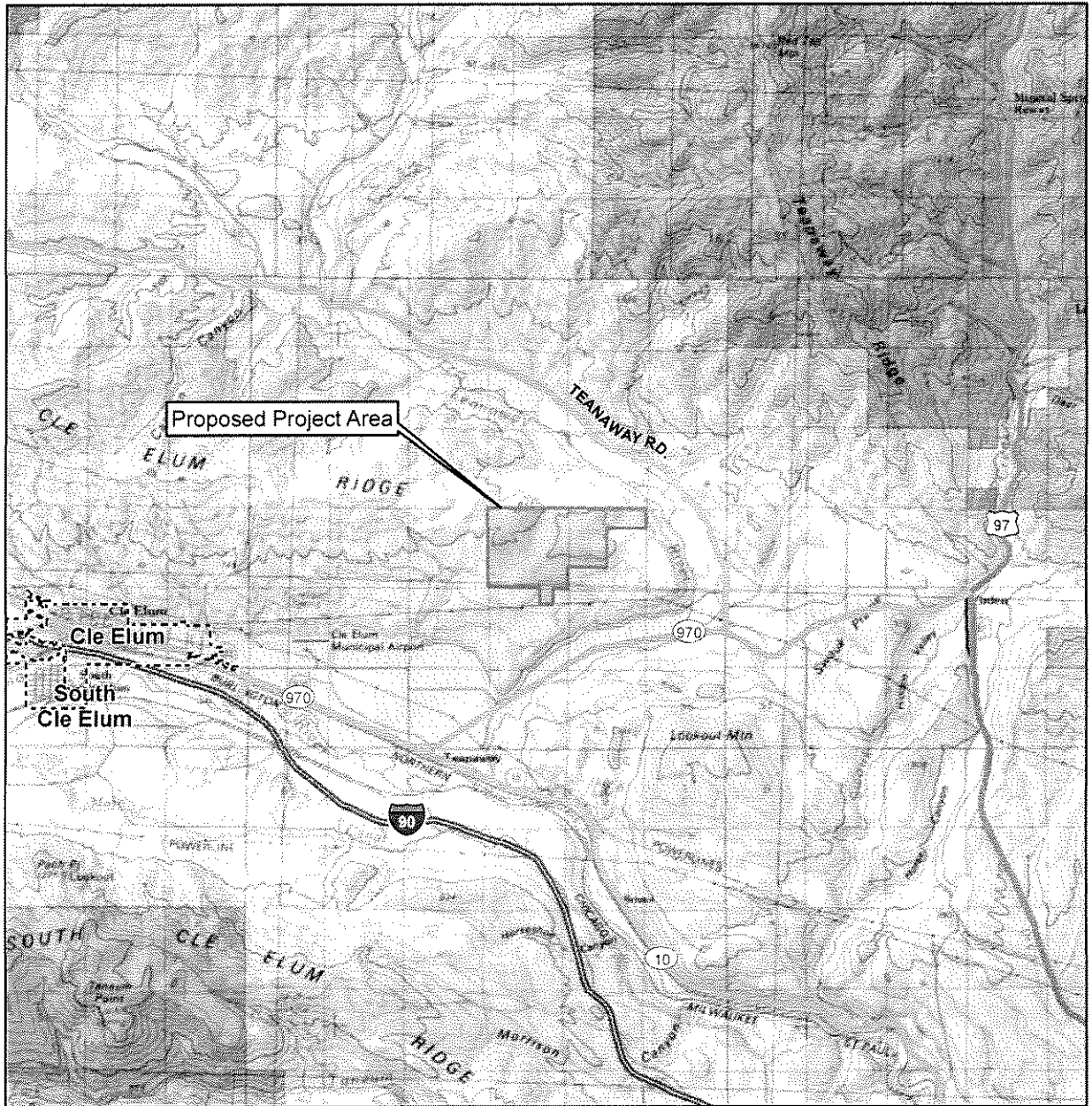
8.0 References

CH2M HILL. 20101. *Sensitive Species Surveys for the Teanaway Solar Reserve Kittitas County, Washington*. February.

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." *Wildlife-Habitat Relationships in Oregon and Washington*. D.H. Johnson and T.A. O'Neil, managing directors. Oregon State University Press, Corvallis. Pages 22-114.






Washington Department of Fish and Wildlife (WDFW). 2009. *Washington Department of Fish and Wildlife Wind Power Guidelines*.

APPENDIX A
Figures



VICINITY MAP

LEGEND

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

Note:

1. USGS 100K Quadrangle: Wenatchee.

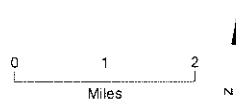
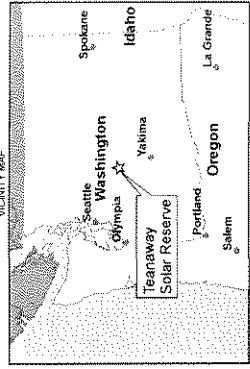


FIGURE 1
Vicinity Map
 Vegetation Management Plan
 Teanaway Solar Reserve
 Kittitas County, Washington



LEGEND

- Proposed Project Features**
- Proposed Project Area (982 Acres)
 - Proposed Project Site (477 acres)
 - Proposed PV Array Block
 - Proposed Field Inverter and Field Transformer
 - Proposed Substation/O&M Facility
 - Proposed Transmission Line
 - Proposed Transmission Structure
 - Proposed Maintenance Road
 - Proposed Improved Maintenance Road
 - Existing Maintenance Road (Planned Decommissioning)
 - Proposed Improved County Access Road
 - Proposed Improved Private Access Road
- Existing Features**
- Existing BPA Transmission Line and ROW
 - Existing Road
 - Stream
 - Stream Buffer
 - Welland
 - Welland Buffer

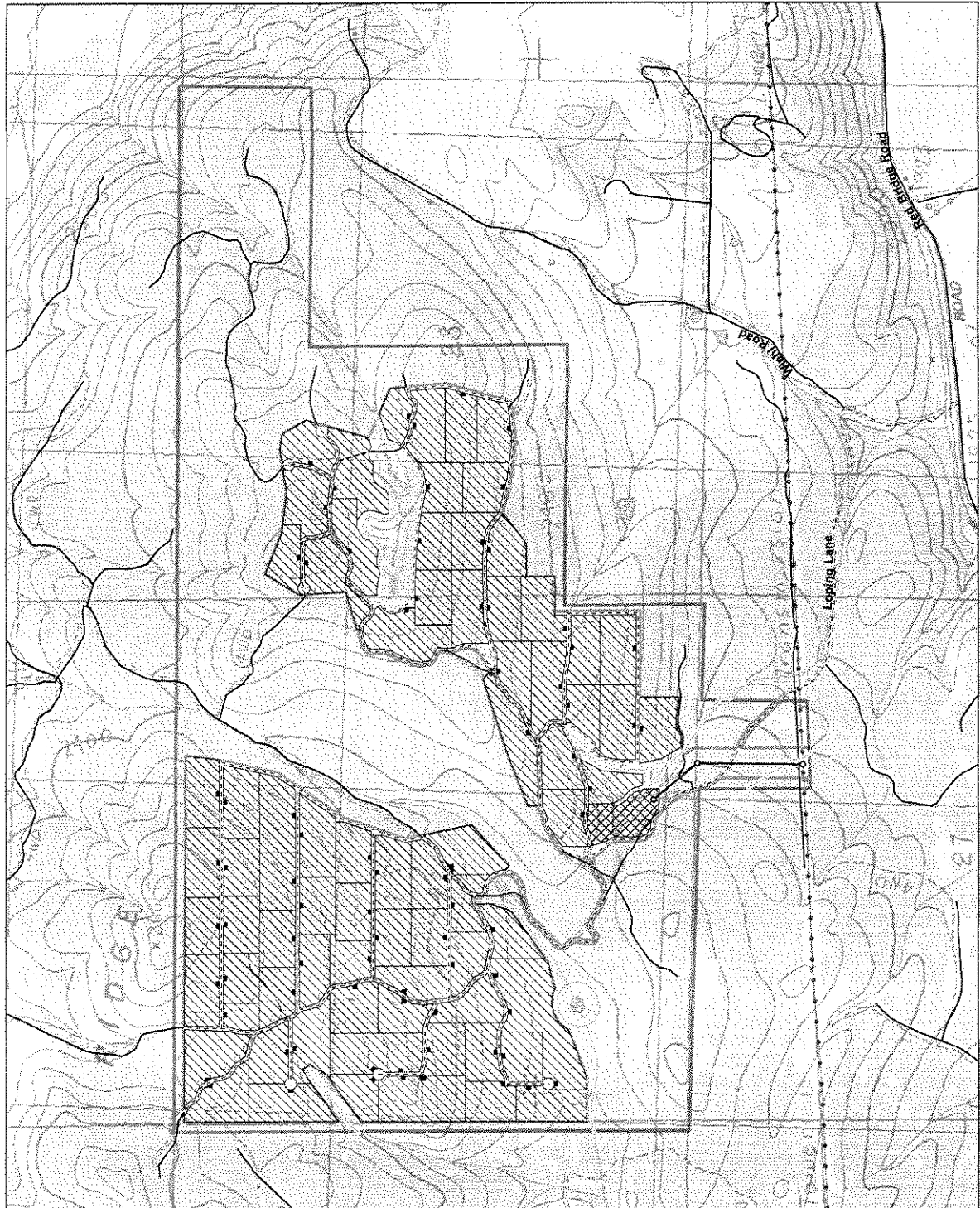
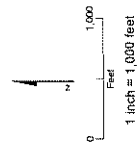
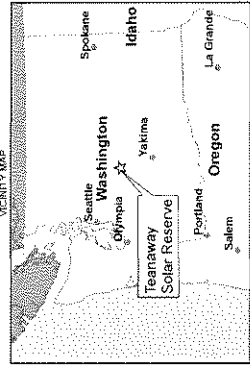


FIGURE 2
Proposed Site Layout
 Vegetation Management Plan
 Teanaway Solar Reserve
 Kittitas County, Washington



- LEGEND**
- Proposed Project Area (982 Acres)
 - Proposed Project Site (477 acres)
 - Biological Survey Area
- Habitat**
- Herbaceous Wetlands
 - Open Water
 - Ponderosa Pine Forest and Woodlands
 - Riparian
 - Upland Aspen
 - Existing Transmission Line (with an approximate 150-foot corridor)
 - Existing Road

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

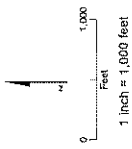


FIGURE 3
Habitat Types Within the Proposed Project Site
 Vegetation Management Plan
 Teahway Solar Reserve
 Kittitas County, Washington

APPENDIX B

Washington Noxious Weeds (2009)

Noxious Weeds are non-native plants introduced to Washington State that can be highly destructive, competitive, and difficult to control. These plants invade our croplands, rangeland, forests, parks, rivers, lakes, wetlands, and estuaries causing both ecological and economical damage that affects us all. Noxious weeds can:

- Lower crop yields
- Reduce forage quality
- Destroy plant and animal habitat
- Displace native plants
- Reduce recreational opportunities (e.g., fishing, hunting, swimming and hiking)
- Clog waterways
- Decrease land values
- Increase erosion and wildfire risk
- And some are toxic to humans and livestock

To help protect the State's resources and economy, the Washington State Noxious Weed Control Board adopts a State Noxious Weed List each year (WAC 16-750). This list classifies weeds into three major classes – A, B, and C – based on the stage of invasion of each species and the seriousness of the threat they pose to Washington State. This classification system is designed to:

- Prevent small infestations from expanding by eradicating them when they are first detected
- Restrict already established weed populations to regions of the state where they occur and prevent their movement to un-infested areas
- Allow flexibility of weed control at the local level for weeds that are already widespread.

To learn more about noxious weeds and noxious weed control in Washington State, please contact:

WA State Noxious Weed Control Board

P.O. Box 42560
 Olympia, WA 98504-2560
 (360)-725-5764

Email: noxiousweeds@agr.wa.gov

Website: <http://www.nwcb.wa.gov>

Or

WA State Department of Agriculture

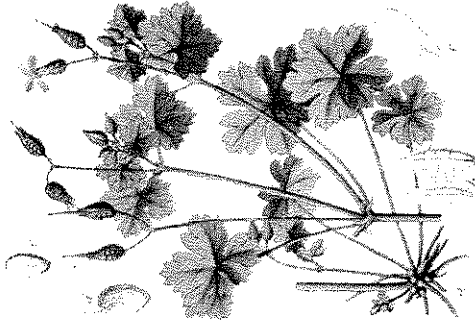
21 North First Avenue #103
 Yakima, WA 98902
 (509) 225-2604

Or

**Your local County
 Noxious Weed Control Board**

**Please help protect Washington's
 economy and environment
 from noxious weeds!**

2009 Washington State Noxious Weed List



Shiny geranium, *Geranium lucidum*, a new Class A noxious weed

Figure from *Deutschlands Flora in Abbildungen* at <http://www.biolib.by>
 Johann Georg Sturm in 1796.
 Image taken from Wikimedia Commons

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.

Class B Weeds: Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. Please contact your County Noxious Weed Control Coordinator to learn which species are designated in your area.

Class C Weeds: Noxious weeds which are already widespread in WA or are of special interest to the state's agricultural industry. The Class C status allows counties to enforce control if locally desired. Other counties may choose to provide education or technical consultation.

Class A Weeds

Eradication is required

buffalobur	<i>Solanum rostratum</i>
common crupina	<i>Crupina vulgaris</i>
cordgrass, common	<i>Spartina anglica</i>
cordgrass, dense flower	<i>Spartina densiflora</i>
cordgrass, salt meadow	<i>Spartina patens</i>
■ cordgrass, smooth	<i>Spartina alterniflora</i>
dyers woad	<i>Isatis tinctoria</i>
eggleaf spurge	<i>Euphorbia oblongata</i>
○ false brome	<i>Brachypodium sylvaticum</i>
floating primrose-willow	<i>Ludwigia pepioides</i>
○ flowering rush	<i>Butomus umbellatus</i>
garlic mustard	<i>Alliaria petiolata</i>
giant hogweed	<i>Heracleum manjagazzianum</i>
goatsrue	<i>Galega officinalis</i>
hawkweed, European	<i>Hieracium sabaudum</i>
hawkweed, yellow devil	<i>Hieracium floribundum</i>
hydrilla	<i>Hydrilla verticillata</i>
johnsongrass	<i>Sorghum halepense</i>
knawweed, bighead	<i>Centaurea macrocephala</i>
knawweed, Vochin	<i>Centaurea nigrescens</i>
kudzu	<i>Pueraria montana var. lobata</i>

meadow clary	<i>Salvia pratensis</i>
purple starthistle	<i>Centaurea calcitrapa</i>
reed sweetgrass	<i>Glyceria maxima</i>
ricefield bulrush	<i>Schoenoplectus mucronatus</i>
sage, clary	<i>Salvia sclarea</i>
sage, Mediterranean	<i>Salvia aethiops</i>
○ shiny geranium	<i>Geranium lucidum</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Spanish broom	<i>Spartium junceum</i>
spurge flax	<i>Thymelaea passerina</i>
Syrian bean-caper	<i>Zygophyllum fabago</i>
Texas blueweed	<i>Helianthus ciliaris</i>
thistle, Italian	<i>Carduus pycnocephalus</i>
thistle, milk	<i>Silybum marianum</i>
thistle, slenderflower	<i>Carduus tenuiflorus</i>
variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
velvetleaf	<i>Achillea theophrasti</i>
wild four o'clock	<i>Mirabilis nyctaginea</i>

Class B Weeds

Austrian fieldcress	<i>Rorippa austriaca</i>
blackgrass	<i>Alopecurus myosuroides</i>
blueweed	<i>Echium vulgare</i>
Brazilian ebodea	<i>Egeria densa</i>
bugloss, annual	<i>Anchusa arvensis</i>
bugloss, common	<i>Anchusa officinalis</i>
butterfly bush	<i>Buddleia davidii</i>
camellthorn	<i>Alhagi maurorum</i>
common catsear	<i>Hypochaeris radicata</i>
common fennel	<i>Foeniculum vulgare</i>
common reed	<i>Phragmites australis</i>
(nonnative genotypes)	
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
fanwort	<i>Cabomba caroliniana</i>
gorse	<i>Ulex europaeus</i>
grass-leaved arrowhead	<i>Sagittaria graminea</i>
hawkweed, oxtongue	<i>Picris hieracioides</i>
hawkweed, mouseear	<i>Hieracium pilosella</i>
hawkweed, orange	<i>Hieracium aurantiacum</i>
hawkweed, polar	<i>Hieracium atratum</i>
hawkweed, queen-devil	<i>Hieracium glomeratum</i>
hawkweed, smooth	<i>Hieracium laevigatum</i>
hawkweed, yellow	<i>Hieracium caespitosum</i>

herb-Robert	<i>Geranium robertianum</i>
hoary alyssum	<i>Barbarea hircana</i>
houndstongue	<i>Cynoglossum officinale</i>
indigobush	<i>Amontha fruticosa</i>
knawweed, black	<i>Centaurea nigra</i>
knawweed, brown	<i>Centaurea jacea</i>
knawweed, diffuse	<i>Centaurea diffusa</i>
knawweed, meadow	<i>Centaurea jacea x nigra</i>
knawweed, Russian	<i>Acroptilon repens</i>
knawweed, spotted	<i>Polygonum bohemicum</i>
knawweed, Bohemian	<i>Polygonum sachalinense</i>
knawweed, giant	<i>Polygonum polystachyum</i>
knawweed, Himalayan	<i>Polygonum cuspidatum</i>
knawweed, Japanese	<i>Kochia scoparia</i>
kochia	<i>Soliva sessilis</i>
lawweed	<i>Leprodiclis holosteoides</i>
lepyrodiclis	<i>Cenchrus lanispinus</i>
longspine sandbur	<i>Lysimachia vulgaris</i>
loosestrife, garden	<i>Lythrum salicaria</i>
loosestrife, purple	<i>Lythrum virgatum</i>
loosestrife, wand	<i>Leucanthemum vulgare</i>
oxeye daisy	<i>Myriophyllum aquaticum</i>
parrotfeather	<i>Lepidium latifolium</i>
perennial pepperweed	<i>Sonchus arvensis</i> ssp. <i>arvensis</i>
perennial sowthistle	<i>Impatiens glandulifera</i>
policeman's helmet	<i>Conium maculatum</i>
poison-hemlock	
puncturevine	<i>Tribulus terrestris</i>
rush, skeletonweed	<i>Chondrilla juncea</i>
saltcedar	<i>Tamarix ramosissima</i>
Scotch broom	<i>Cytisus scoparius</i>
spurge laurel	<i>Daphne laureola</i>
spurge, leafy	<i>Euphorbia esula</i>
spurge, myrtle	<i>Euphorbia myrsinites</i>
sulfur cinquefoil	<i>Patentia recta</i>
swainsonpea	<i>Sphaerophysa salsula</i>
tansy ragwort	<i>Senecio jacobaea</i>
thistle, musk	<i>Carduus nutans</i>
thistle, plumeless	<i>Carduus acanthoides</i>
thistle, Scotch	<i>Onopordum acanthium</i>
water primrose	<i>Ludwigia hexapetala</i>
white bryony	<i>Bryonia alba</i>
wild carrot	<i>Daucus carota</i>
wild chervil	<i>Anthriscus sylvestris</i>

Class C Weeds

absinth wormwood	<i>Artemisia absinthium</i>
babysbreath	<i>Gypsophila paniculata</i>
black henbane	<i>Hyoscyamus niger</i>
cereal rye	<i>Secale cereale</i>
common groundsel	<i>Senecio vulgaris</i>
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
curly-leaf pondweed	<i>Potamogeton crispus</i>
English ivy - four cultivars only	<i>Hedera helix</i> 'Ballia', 'Pittsburgh', and 'Star', 'H. hibernica' 'Hibernica'
○ evergreen blackberry	<i>Rubus laciniatus</i>
field bindweed	<i>Convolvulus arvensis</i>
fragrant water lily	<i>Nymphaea odorata</i>
hairy whitecap	<i>Cardaria pubescens</i>
hairy willow-herb	<i>Epilobium hirsutum</i>
hawkweed, common	<i>Hieracium lachenalii</i>
hawkweeds, nonnative and invasive species not listed elsewhere	<i>Hieracium</i> spp.
○ Himalayan blackberry	<i>Rubus armeniacus</i>
hoary cress	<i>Cardaria draba</i>
jointed goatgrass	<i>Aegilops cylindrica</i>
old man's beard	<i>Clematis vitalba</i>
reed canarygrass	<i>Phalaris arundinacea</i>
scentless mayweed	<i>Matricaria perforata</i>
smoothseed alfalfa	<i>Cuscuta approximata</i>
dodder	
spikeweed	<i>Hemizonia pungens</i>
spiny cocklebur	<i>Xanthium spinosum</i>
thistle, bull	<i>Cirsium vulgare</i>
thistle, Canada	<i>Cirsium arvense</i>
white cockle	<i>Silene latifolia</i> ssp. <i>alba</i>
yellow archangel	<i>Lamiumstrum galeobdolon</i>
yellow flag iris	<i>Iris pseudacorus</i>
yellow toadflax	<i>Linaria vulgaris</i>

- New additions to the 2009 Noxious Weed List
- Change in Noxious Weed Class

APPENDIX C
TAC Commitment Letters

Seidell, Nichole/PDX

From: MAUNEY, MARTY (DNR) [MARTIN.MAUNEY@dnr.wa.gov]
Sent: Wednesday, February 10, 2010 6:48 PM
To: Seidell, Nichole/PDX
Cc: MAUNEY, MARTY (DNR)
Subject: RE: Teanaway Solar Reserve- Vegetation Mitigation TAC

Nichole:

Thanks for the chance to talk with you and Travis Nelson this afternoon. I am looking forward to working with you on the TAC. I will be the DNR's representative on the TAC. Please let Kittitas County know this, as well as my contact information, in case they should need to get a hold of me.

Sincerely:

Marty Mauney
Forest Practices Forester
Southeast Region
Washington State Department of Natural Resources (DNR)
(509) 925-0909 (office)
(509) 856-7054 (cell)
marty.mauney@dnr.wa.gov

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]
Sent: Wednesday, February 10, 2010 4:21 PM
To: Nelson, Travis W (DFW); MAUNEY, MARTY (DNR)
Subject: Teanaway Solar Reserve- Vegetation Mitigation TAC

Thank you both for taking the time to discuss the TAC for the Teanaway Solar Reserve.

I appreciate your willingness to serve as a member of the TAC. As I mentioned on the phone call today, we are submitting supplemental information to Kittitas County on February 22, 2010.

If you wouldn't mind responding to this email and confirming my understanding that you (or someone from your agency) is willing to serve on the TAC, that would be a huge help to us.

Again, thanks for your time and I look forward to working with you on this project!

Nichole Seidell
CH2M HILL, Inc.
503.872.4803 (office)
503.329.2543 (cell)
503.736.2000 (fax)
nseidell@ch2m.com

From: [Nelson, Travis W \(DFW\)](#)
To: [Seidell, Nichole/PDX](#)
Subject: RE: Teanaway Solar Reserve- Vegetation Mitigation TAC
Date: Wednesday, February 10, 2010 6:55:19 PM

Nicole,

WDFW will participate in a Technical Advisory Committee (TAC) for the Teanaway Solar Reserve. WDFW involvement will be dependent upon staff availability and term of commitment.

Travis Nelson
Washington Department of Fish and Wildlife
Renewable Energy Section Manager
600 Capitol Way North
Olympia, WA 98501-1091
phone: 360-902-2390
facsimile: 360-902-2946
Travis.Nelson@dfw.wa.gov

From: Nichole.Seidell@ch2m.com [<mailto:Nichole.Seidell@ch2m.com>]
Sent: Wednesday, February 10, 2010 4:21 PM
To: Nelson, Travis W (DFW); MAUNEY, MARTY (DNR)
Subject: Teanaway Solar Reserve- Vegetation Mitigation TAC

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Again, thanks for your time and I look forward to working with you on this project!

Nichole Seidell
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503.329.2543 (cell)
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nseidell@ch2m.com

Report

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

Prepared for
Teanaway Solar Reserve, LLC

August 2009

Prepared by
CH2MHILL



**Printed on
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Recyclable
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1 Vicinity Map
2 Survey Area Map
3 Habitat Types

1.0 Introduction

CH2M HILL conducted rare plant and wildlife surveys in June and July 2009 for the proposed Teanaway Solar Reserve (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, and private roads such as Loping Lane and Wehl Road.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 580 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 (Applicant) 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
- Inverter Buildings

- Underground Electrical Conductors
- Substation
- Transmission Line
- Access Roads
- Operations and Maintenance (O&M) Building

Key components are summarized below.

2.4 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.

2.5 Inverter Buildings

Up to 40 inverter buildings will be needed. The inverters can be placed outdoors. An example inverter building includes a concrete pad, and prefabricated facilities are available such as the 2-MW enclosed system offered by Xantrex.

2.6 Underground Electrical Conductors

Underground electrical conductors will be installed in trenches at a depth in compliance with the Kittitas County code (36 inches or greater). Conductors will be buried directly or placed in a polyvinylchloride (PVC) conduit.

2.7 Substation

The Applicant proposes to construct an electrical substation that will interconnect with the 345-kV BPA transmission line. The substation will require a level, fenced area of approximately 10 acres. The 10-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, and overhead electrical bus work. Its appearance will be similar to that of many other substations throughout the Pacific Northwest.

2.8 Transmission Line

A new 345-kV transmission line will be needed to connect the new substation to the existing BPA line. If the substation is located at the BPA right-of-way, this line would be very short. The line would have two circuits, one into the substation and one out of the substation. The construction could be similar to the existing lattice towers, and require a right-of-way of up to 300 feet in width.

2.9 Access 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 and Weihl Road are private roads over which the Applicant has easement rights.

3.0 Sensitive Species Surveys

CH2M HILL biologists conducted surveys of the 580-acre survey 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.* United States Fish and Wildlife Service (USFWS), July 24, 2008 (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) (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.
<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 4 know 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

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<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
	<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

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<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>Centaureum erythraea</i>	centaury		X	forb
Juncaceae					
	<i>Juncus parryi</i>	Parry's rush	X		graminoid
Lamiaceae					
	<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

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<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>Navarretai 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
	<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

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
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.* Washington Department of Fish & Wildlife (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.* United States Fish and Wildlife Service (USFWS), July 24, 2008 (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 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	
<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	

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 (*Danthoia 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 hemionus</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). Because these habitats comprise only a small portion of the

survey area, impacts to these habitats from construction and operation of the project can likely be avoided.

- 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.
- Take care to prevent petroleum products and other harmful material from entering wetland or waterways.
- Upon completion of construction, seed or plant all areas of disturbance 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 micro-siting; slight relocations of project facilities to avoid rare plant populations.
- Remove and conserve plants; replant following construction.
- Replant disturbed area 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.

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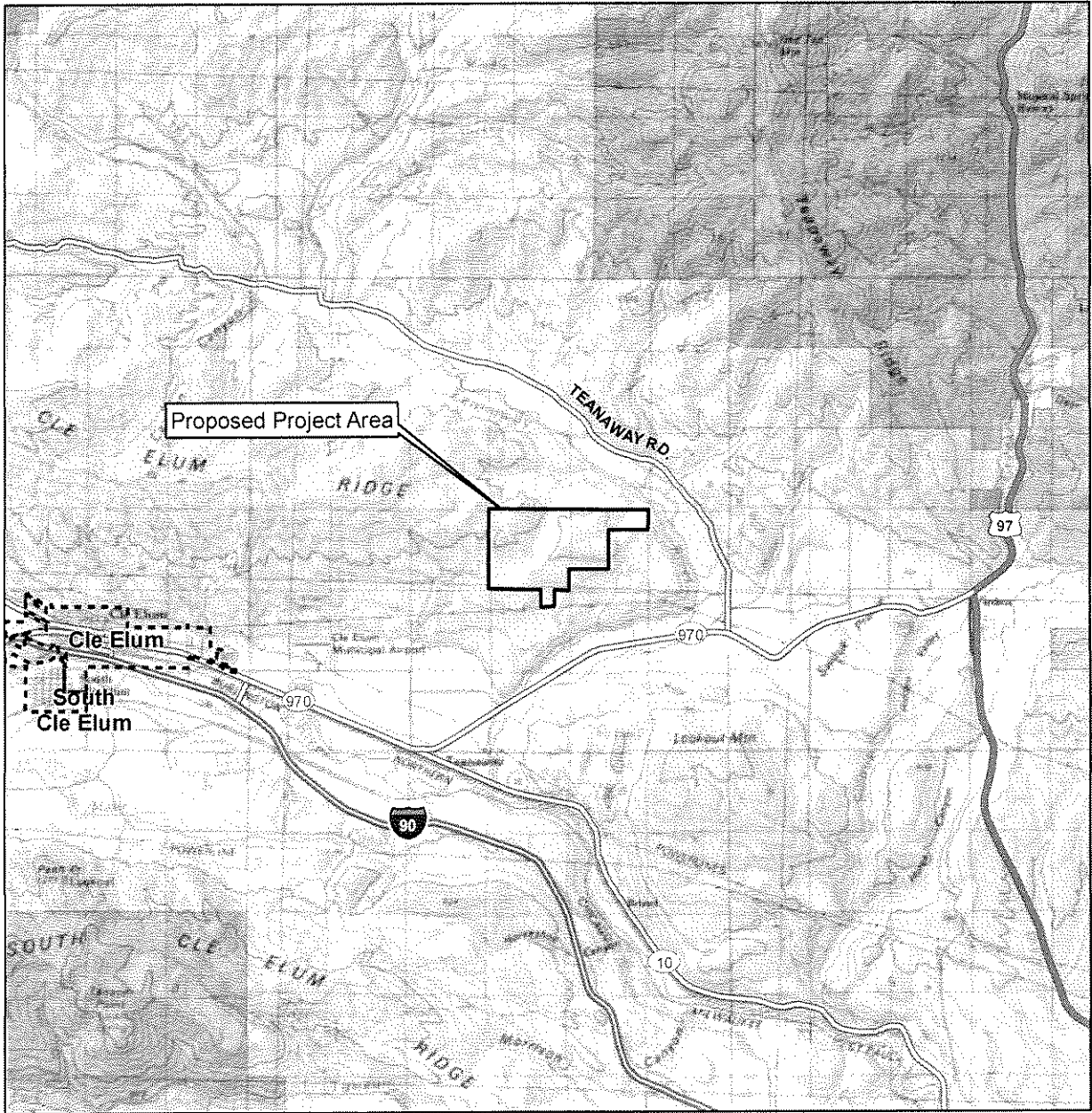
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APPENDIX A
Figures



LEGEND

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

Note:

1. USGS 100K Quadrangle: Wenatchee.

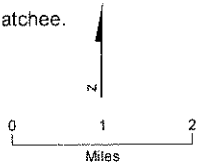
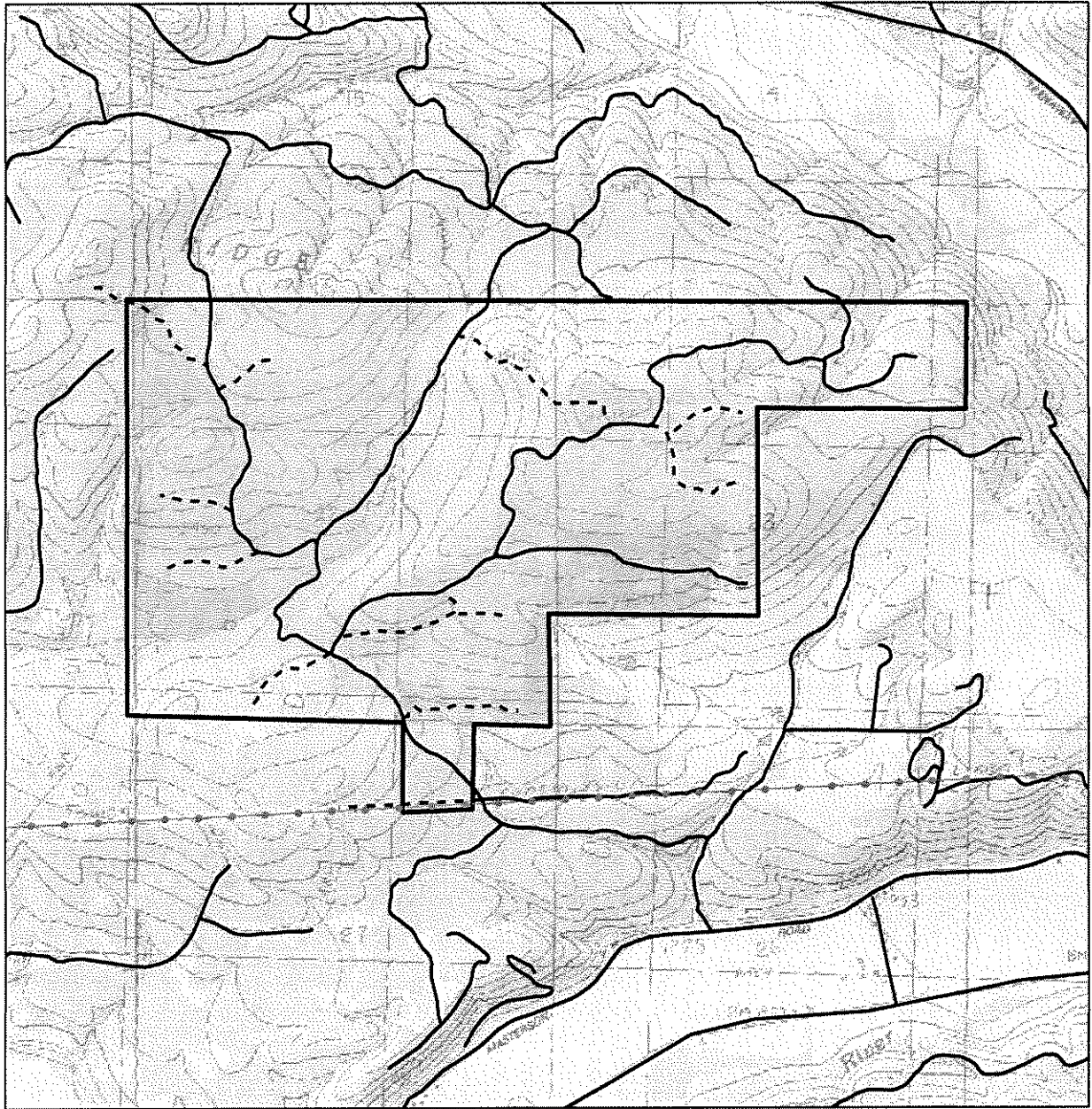


FIGURE 1
Vicinity Map

Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington



- LEGEND**
- Proposed Project Area
 - July 2009 Survey Area
 - June 2009 Survey Area
 - Existing BPA Transmission Line
 - Road
 - Minor Dirt Road

Note:
 1. USGS 24K Quadrangle: Teanaway.

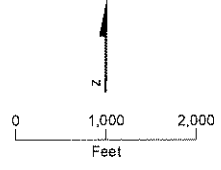
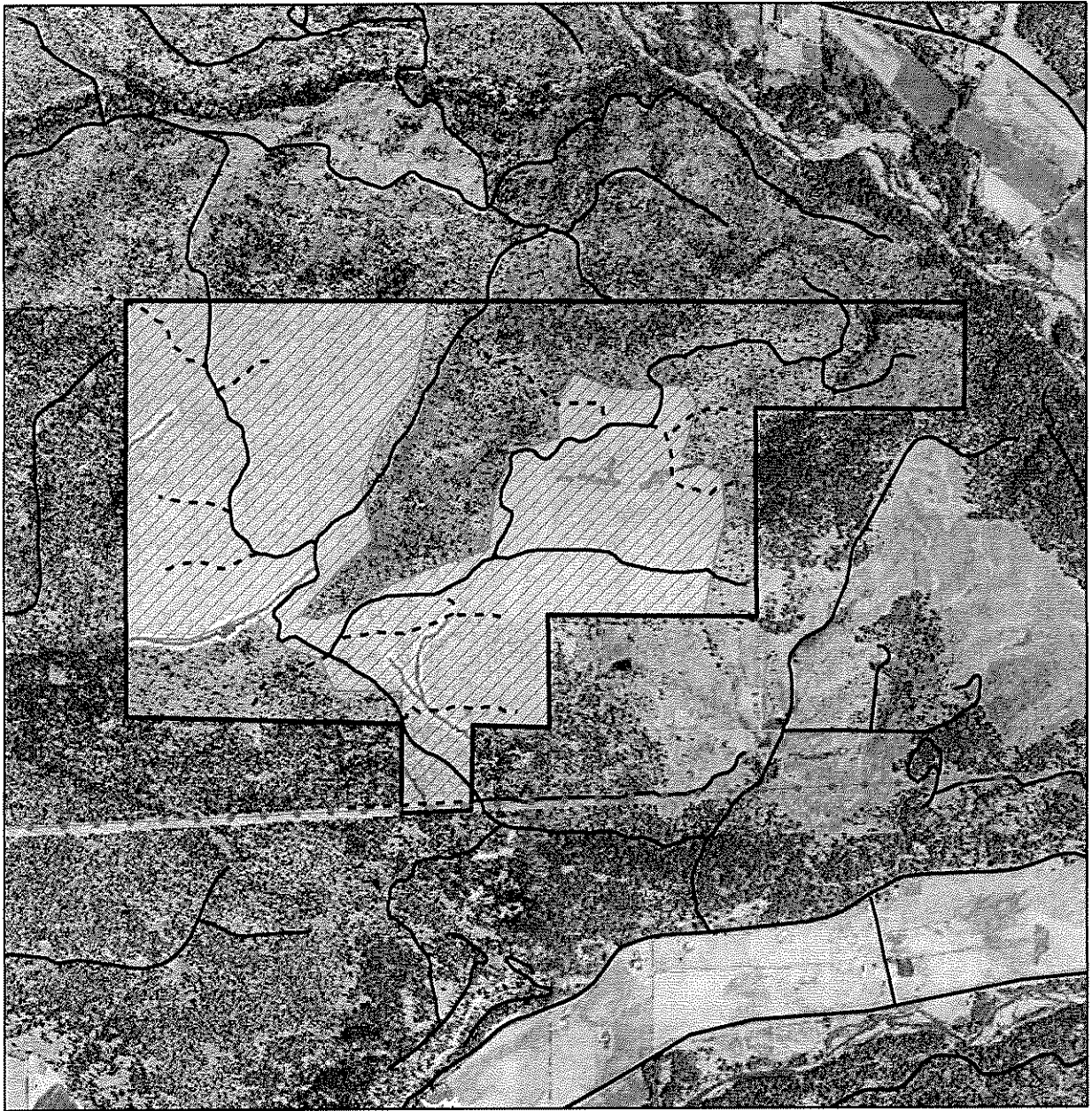


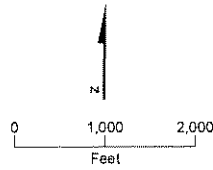
FIGURE 2
Survey Area Map
 Sensitive Species Surveys Report
 Teanaway Solar Reserve
 Kittitas County, Washington



LEGEND

- | | |
|---|---|
| <ul style="list-style-type: none"> Proposed Project Area Biological Survey Area Existing BPA Transmission Line Road Minor Dirt Road | <p>Habitat</p> <ul style="list-style-type: none"> Herbaceous Wetlands Open Water Ponderosa Pine Forest and Woodlands Riparian Upland Aspen |
|---|---|

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



VICINITY MAP



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**



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

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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.