APPENDIX B-1
SAGE-GROUSE WALKING TRANSECT SURVEY REPORT

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ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
cm	centimeters
DPS	Distinct Population Segment
GPS	global positioning system
HCA	Habitat Concentration Area
kg	kilograms
kV	kilovolt
lbs	pounds
mph	miles per hour
POWER	POWER Engineers, Inc.
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator
WDFW	Washington Department of Fish and Wildlife
WHCWG	Washington Wildlife Habitat Connectivity Working Group
YTC	U.S. Army Yakima Training Center

1.0 INTRODUCTION

Pacific Power proposes to construct, operate and maintain a new 230 kilovolt (kV) transmission line in the south-central portion of Washington State from the Vantage Substation near the Wanapum Dam to the Pomona Heights Substation near Selah, Washington. The last transmission line built by Pacific Power to serve the electrical loads in the Yakima Valley was the Pomona-Wanapum 230 kV transmission line which was constructed in the mid-1970s. Since that time, energy demand in the Yakima Valley has continued to grow. Pacific Power planning studies have identified the loss of the existing Pomona-Wanapum 230 kV transmission line as the single most critical outage condition on the Mid-Columbia system. The planned line will mitigate the risk and ensure reliable, efficient service. This line will improve the overall reliability, security and operating flexibility of the electrical system that serves the Yakima area. The Project would be designed for one 230 kV three-phase (three conductors) circuit and shield wires. H-frame wood pole structures are proposed for most of the line located in open terrain. The H-frame structures would be between 65 and 90 feet tall (and in some cases 100 feet tall), and spaced approximately 750 to 900 feet apart, depending on terrain. The planned in-service date for the new transmission line is late 2015.

1.1 Project Location

The Survey Area is located in south-central Washington between the Pomona Heights Substation east of Selah, Washington and the Vantage Substation east of the Wanapum Dam on the Columbia River. The U.S. Army Yakima Training Center (YTC) lies directly between the two substations; no access is allowed in the center of the YTC because it is used by the Army for live fire training operations. Surveys for greater sage-grouse leks were conducted in 2010 along potential routes which passed through the northern portion of the YTC and then south along the west side of Interstate 82 to the Pomona Heights Substation; along potential routes that avoided the majority of the southern portion of the YTC and paralleled the southern boundary; and along potential routes which did not intersect the YTC lands, traveled south along the eastern side of the Columbia River and then west to the Pomona Heights Substation. Potential routes which avoided the majority of the YTC lands were surveyed for greater sage-grouse leks again in 2011.

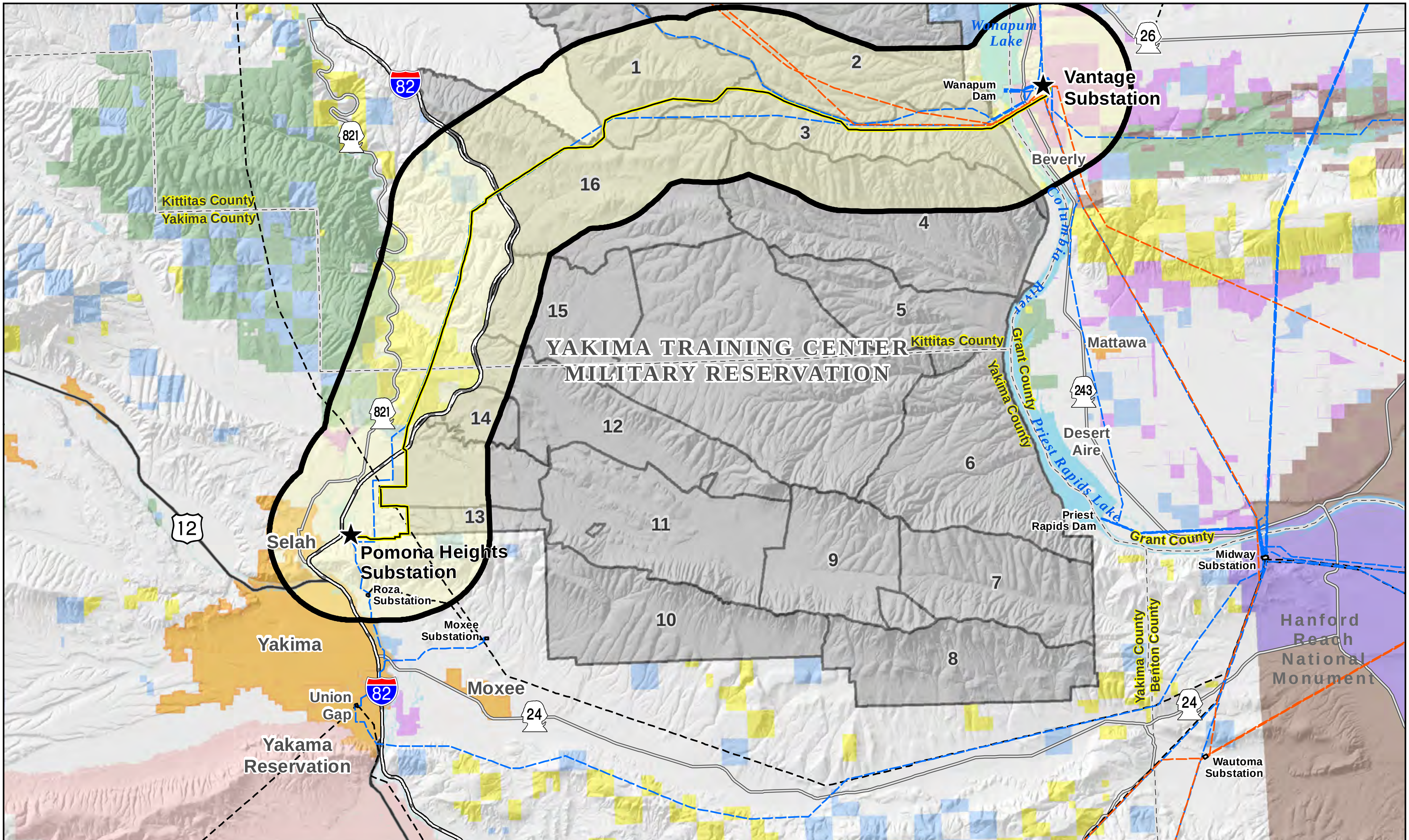
In 2013, the potential routes which passed through the northern portion of the YTC and then south along the west side of Interstate 82 to the Pomona Heights Substation were brought back into consideration. Surveys described in this report only occurred in suitable greater sage-grouse habitat on YTC and BLM properties along this potential route (Figure 1). This route will hereafter be referred to as the Proposed Northern Route.

1.2 Survey Need

The greater sage-grouse (*Centrocercus urophasianus*) is listed as a Candidate species under the Federal Endangered Species Act, as Threatened by the Washington Department of Fish and Wildlife (WDFW) (WAC 232-12-297), and as a Sensitive species by the Bureau of Land Management (BLM). Large expanses of mature sagebrush habitat are a key aspect used by greater sage-grouse throughout the year. While the consensus among some researchers and land managers is that transmission lines present a negative impact on greater sage-grouse (Braun et al. 2002; Knick et al. 2003; Knick et al. 2010; Wisdom et al. 2011), other reports show that the negative impacts may be overstated (Wisinski 2007; Johnson et al. 2010; Nonne et al. 2013).

Through discussions with the U.S. Fish and Wildlife Service (USFWS), the WDFW, and the BLM, Pacific Power has committed to conduct walking brood route surveys (as described in Connelly et al. 2003) for greater sage-grouse occurrence along the Proposed Northern Route within the YTC and BLM lands to the west of Interstate 82. Pacific Power contracted with POWER Engineers, Inc.

(POWER) to conduct these surveys for greater sage-grouse habitat and occurrence along and directly adjacent to the Proposed Northern Route. Aerial lek surveys could not be completed in 2013 because the lekking period had already expired prior to identification of the need for greater sage-grouse surveys.



Vantage - Pomona Heights 230kV Transmission Line Project

Figure 1
2013 NNR Route Alternative and Sage-Grouse Survey Area

Project Features
- Project Substation
- NNR Route Alternative

Existing Transmission
- 500 kV Transmission
- 230 kV Transmission
- 115 kV Transmission
- Substation

Transportation
- Interstate Highway
- US Highway
- State Highway

Base Features
- YTC Training Area
- County Boundary
- Survey Buffer (3 mi)
- Municipality

Jurisdiction
- Private Individual or Company
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Washington Department of Fish and Wildlife
- State of Washington
- Yakima Training Center (DOD)
- U.S. Fish and Wildlife Service
- Department of Energy

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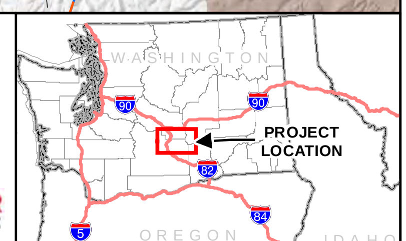

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2.0 SPECIES ECOLOGY

Greater sage-grouse which may occur along the Proposed Northern Route are a portion of the Columbia Basin Distinct Population Segment (DPS). The YTC supports one of two Washington populations remaining in the Columbia Basin DPS. The second population is located in Douglas and Grant Counties. Annual surveys for leks and lek counts have been conducted by YTC personnel to monitor trends and assess population status. Ten leks have been active since 1999. As of 2001, the ten year population average on the YTC is 289 birds. Starting in 1989 radio telemetry research and population monitoring has shown that adult use and nesting and brood rearing occurs primarily south of Umtanum ridge in proximity to leks.

The greater sage-grouse is the largest grouse species in North America with a body length ranging from 55 to 71 centimeters (cm) (22 to 28 inches), a wingspan between 83 and 96 cm (33 to 38 inches), and a body weight of 1 to 3 kilograms (kg) (3 to 6 pounds [lbs]). Males are the larger sex and have a distinct white breast, black throat, black belly, and a mottled brown back. When displaying on a lek, the tail of a male is raised in a large, distinct fan, the chest is extended, and two distinct yellow air sacs just under the neck are inflated and deflated repeatedly. Females are smaller than males and are drabber in appearance with mottled brown on the back and chest (Sibley 2003). Females do not display on leks. Instead, they remain in the sagebrush on the periphery of the lek and observe the males.

Greater sage-grouse are closely associated with sagebrush ecosystems of western North America. Sagebrush habitat types have a tremendous amount of natural variation in vegetative composition, habitat fragmentation, topography, substrate, weather, and frequency of fire. Consequently, greater sage-grouse are adapted to a mosaic of sagebrush habitats throughout their range, including relatively tall sagebrush such as big sagebrush (*Artemisia tridentata*), three-tip sagebrush (*A. tripartita)*, silver sagebrush (*A. cana*); relatively low sagebrush (*A. arbuscula)*, black sagebrush (*A. nova*); forb-rich mosaics of low and tall sagebrush; riparian meadows; steppe dominated by native grasses and forbs; scrub-willow (*Salix* spp.); and sagebrush savannas (Hays et al. 1998; Connelly et al. 2003).

Leks are historical display grounds which are used annually where males gather to display for females during the spring mating season. Lek attendance varies throughout the species range, but typically begins as winter snow begins to melt. Mating typically peaks in early April, but peak male attendance typically occurs later in April or early May when attendance by yearling males begins to increase (Christiansen 2007); however, lek attendance may be delayed by a lingering snow pack. Leks are typically barren areas surrounded by mature sagebrush. Leks are rarely located on slopes greater than ten percent (10%) and typically have open, unobstructed sight lines which provide two major advantages to grouse: 1) it allows females on the periphery of the lek to view the displaying males; and 2) it allows displaying males to spot potential predators. While displaying on the lek, males also make a loud, deep call, called “booming,” which can be heard from over a mile away during favorable conditions. Leks are typically attended in the early morning hours, but males may display well before dawn during a full moon if the sky is clear.

Nests are placed in thick vegetative cover usually dominated by mature sagebrush. Vegetatively diverse habitat may be an important aspect of nesting habitat to offer vertical and horizontal concealment (Connelly et al. 1991; Gregg et al. 1994). Density of herbaceous cover can be an important indicator of habitat quality for pre-nesting, nesting, and brood rearing hens. Herbaceous cover averaging 18 cm (seven inches) in height and greater has been identified as an important characteristic of sage-grouse nesting and brood rearing habitat (Gregg et al. 1994; Schroeder et al. 1999).

One reason the greater sage-grouse is so dependent on the presence of mature sagebrush is that leaves of various sagebrush species dominate their diet throughout the fall, winter, and early spring (Connelly et al. 2003). The presence of tall sagebrush which extends above snow level and is available as forage during the winter months is a key factor in determining greater sage-grouse winter habitat. Insects such as grasshoppers (*Orthoptera*), beetles (*Coleoptera*), and ants (*Hymenoptera*) are important for juveniles, particularly during the first three weeks of life, and forbs increase in importance as juveniles age. Adults will occasionally take insects in the late spring and summer, although forbs and sagebrush make up the bulk of the diet during these times (Schroeder et al. 1999; Pyle and Crawford 1996).

2.1 Previous Surveys

POWER conducted a series of three aerial greater sage-grouse lek surveys for Pacific Power in 2010 and 2011 along all route alternatives, including a three mile buffer on each side of the route alternatives. The surveys conducted in 2010 included the Proposed Northern Route; however, YTC authorities expressed concern over this potential route in a letter dated May 28, 2010. In this letter, YTC authorities stated that any future transmission lines to the west of Interstate 82, on the YTC property in the northern portion, or directly along the southern boundary must be buried so as to not interfere with military training operations. Routes were subsequently redesigned to avoid the YTC and to parallel the southern boundary. Only these redesigned southern routes were surveyed in 2011. In early 2013, YTC authorities approved possibility of the Proposed Northern Route to cross the YTC property.

The survey protocol used for the 2010 and 2011 aerial surveys was based on the protocol used by the YTC for their aerial greater sage-grouse lek surveys. POWER contracted with Central Valley Helicopters of Ellensburg, Washington to perform the surveys. The aircraft was an Enstrom 480 helicopter, which has large Plexiglas windows in the foot-wells, doors, and windshield to provide maximum visibility during surveys. Data recorded during each flight included start time, end time, wind speed, wind direction, temperature, cloud cover, and any greater sage-grouse occurrences. Wind speeds were recorded from the Ellensburg or Yakima Airfield weather report, depending on which was closer to the Survey Area that day.

Surveys did not take place if winds were greater than 15 miles per hour (mph), if visibility was less than five miles, or if it was raining. Areas which were excluded from surveys included highly agricultural areas, and slopes greater than 15%. Transects flown over suboptimal habitat, such as areas highly fragmented by agriculture, slopes greater than 15% or recently burned areas, were farther apart and flown at higher altitudes and faster speeds as described in Connelly et al. (2003). The YTC greater sage-grouse survey protocol states that aerial greater sage-grouse lek surveys may take place until May 15. Surveys held in 2010 occurred on April 19, 20, and 22; April 26, 27, and 28; and May 12 and 13. Surveys held in 2011 occurred on March 29 and 30; April 12, 13, and 14; and April 27, 28, and 29.

No greater sage-grouse leks were identified during any of the aerial surveys. Two individual greater sage-grouse were observed from the helicopter south of the YTC during the 2010 surveys. These individuals were not attending a lek when observed. No greater sage-grouse or leks were observed during the 2011 surveys.

3.0 METHODOLOGY

POWER conducted a series of two walking greater sage-grouse brood route surveys for Pacific Power in late May and early July 2013 along the Proposed Northern Route within potentially suitable habitat on the YTC and BLM properties. The survey protocol used for this Project was based on methods described for brood route surveys in Connelly et al. (2003). While the YTC greater sage-grouse survey protocol states that aerial greater sage-grouse lek surveys may take place until May 15th, all parties agreed that the lekking season likely ended early in 2013 due to the low snow pack and warm, early spring. This necessitated the need for other survey methods, such as brood route surveys.

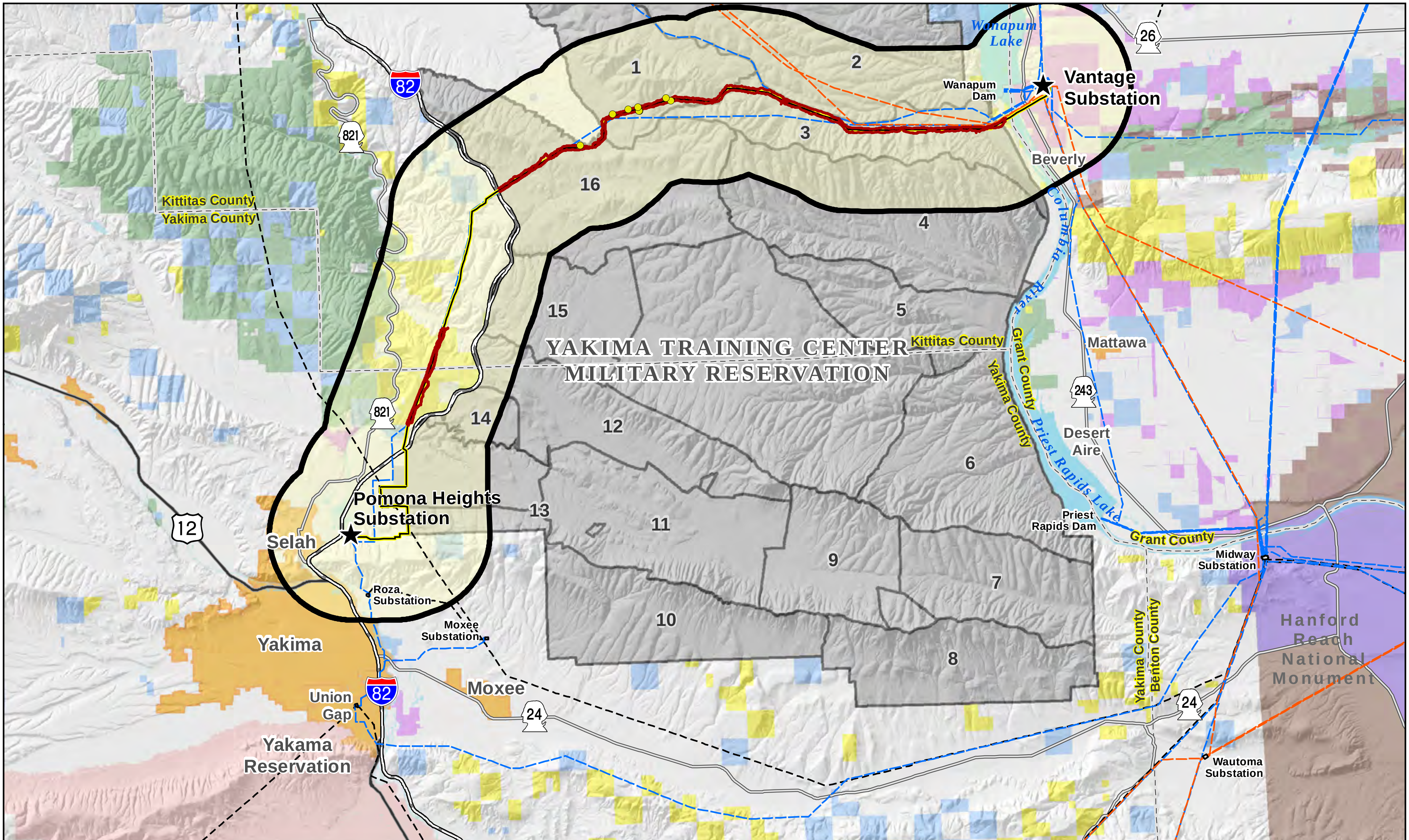
Two surveyors traversed wandering transects along each side of the proposed transmission line route documenting all occurrences, or evidence of occurrence, of greater sage-grouse observed. Wandering transects roughly paralleled the proposed transmission line route approximately 300 feet along each side. A Garmin GPSmap 76CSx handheld global positioning system (GPS) was used to display the proposed transmission line route so that surveyors would have a point of reference during their surveys. Data recorded during each survey included observer, location, and any greater sage-grouse occurrences or evidence of occurrence (i.e., scat, nests/eggshells, feathers, cecal casts, or tracks), and a track log of the survey route (Appendix A).

4.0 RESULTS

Surveys occurred in any lands on the YTC or BLM parcels which presented potentially suitable habitat. It should be noted that the majority of the route surveyed occurs on marginal to poor greater sage-grouse habitat. Much of the lands traversed on the YTC are steeply sloped and provided little to no sagebrush cover. A large portion of the BLM land surveyed was recently burned and now represents a near monoculture of cheatgrass. The best potential habitat occurred on YTC lands located between Manastash Ridge and Boylston Mountains to the east of the private agricultural area known as Badger Pocket. Nearly all greater sage-grouse sign observed during the surveys occurred in this area.

The first round of surveys took place from May 18 through May 21, 2013. Individual survey tracks were recorded using the handheld GPS units and are displayed in Figure 2. No greater sage-grouse were observed during the first round of surveys. Evidence of greater sage-grouse use was observed in the form of scat identified in eight locations. All scat found was located on YTC-lands between Manastash Ridge and Boylston Mountains in the central portion of the proposed corridor (Figure 2). The scat appeared to indicate spring, summer, or fall use of the area—no winter-type scat was observed. Photographs and Universal Transverse Mercators (UTMs) were recorded at each location.

The second round of surveys took place from June 29 through July 1, 2013. Individual survey tracks were recorded using the handheld GPS units and are displayed in Figure 3. No greater sage-grouse were observed during the second round of surveys. Evidence of greater sage-grouse use was observed in the form of scat identified in three locations. All scat found was located on YTC-lands between Manastash Ridge and Boylston Mountains in the central portion of the proposed corridor (Figure 3). The scat was in close proximity to those identified during the first round of surveys. Scat identified appeared to indicate spring, summer, or fall use of the area – no winter-type scat was observed. Photographs and UTMs were recorded at each location.



Vantage - Pomona Heights 230kV Transmission Line Project

Figure 2
May 2013
Sage-Grouse Survey Results

Project Features
- Project Substation
- NNR Route Alternative

Sage-Grouse Surveys
- Sage-grouse Evidence
- Survey Transect

Existing Transmission
- 500 kV Transmission
- 230 kV Transmission
- 115 kV Transmission
- Substation

Transportation
- Interstate Highway
- US Highway
- State Highway

Base Features
- YTC Training Area
- County Boundary
- Survey Buffer (3 mi)
- Municipality

Jurisdiction
- Private Individual or Company
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Washington Department of Fish and Wildlife
- State of Washington
- Yakima Training Center (DOD)
- U.S. Fish and Wildlife Service
- Department of Energy

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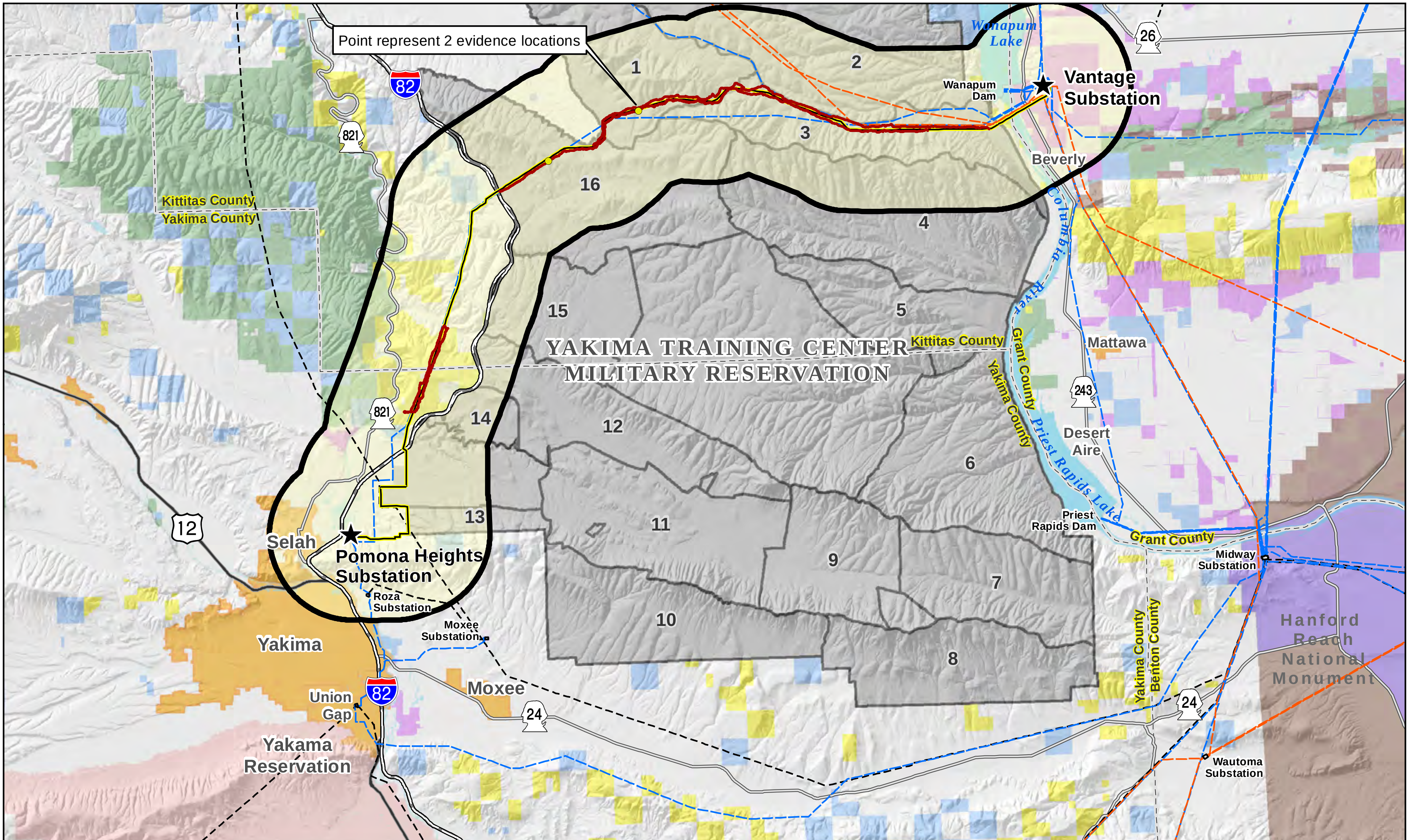
PROJECT LOCATION



Vantage - Pomona Heights 230kV Transmission Line Project

Figure 2
July 2013
Sage-Grouse Survey Results

Project Features
- Project Substation
- NNR Route Alternative

Sage-Grouse Surveys
- Sage-grouse Evidence
- Survey Transect

Existing Transmission
- 500 kV Transmission
- 230 kV Transmission
- 115 kV Transmission
- Substation

Transportation
- Interstate Highway
- US Highway
- State Highway

Base Features
- YTC Training Area
- County Boundary
- Survey Buffer (3 mi)
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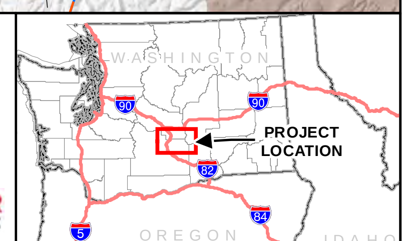


5.0 HABITAT CONNECTIVITY IMPACT ANALYSIS

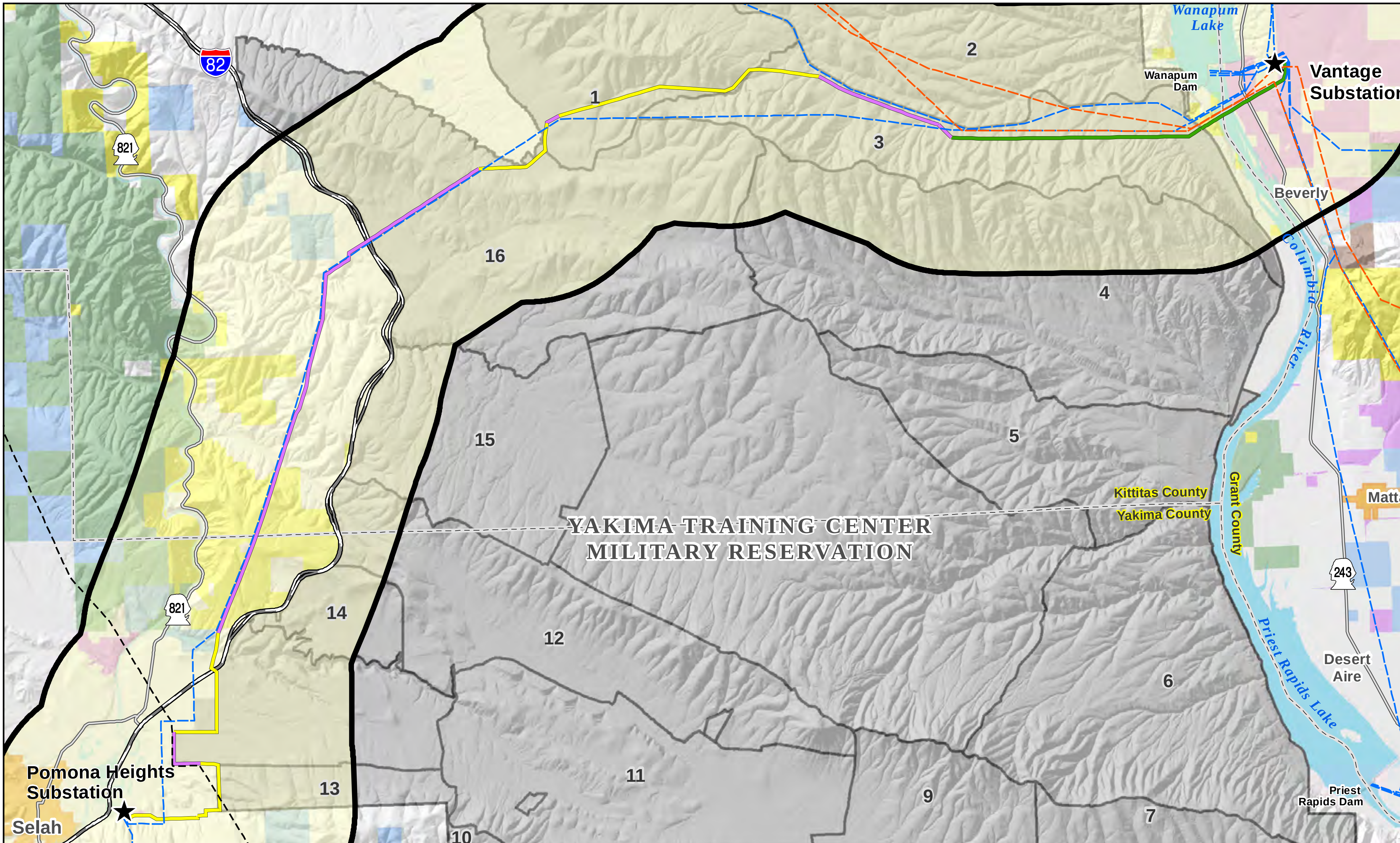
The Washington Wildlife Habitat Connectivity Working Group (WHCWG) was established in an effort to better protect the natural resources of Washington State. In 2010, the group completed the Washington Statewide Connectivity Analysis, which represents a statewide scientific analysis of connectivity throughout the state (WHCWG 2010). This model was designed to provide an informational tool for land and resources managers, conservationists, private land owners, and other interested parties. After completing the statewide analysis, the group completed a more focused effort on the Columbia Plateau Ecoregion and several species which reside there (WHCWG 2012). Greater sage-grouse was one of 11 species which for which connectivity potential was modeled in detail (Robb and Schroeder 2012).

Four Habitat Concentration Areas (HCAs) were identified for greater sage-grouse in Washington and an analysis of the potential connectivity between these areas was completed. The four HCAs included the population on the YTC, the Mansfield Plateau/Moses Coulee population, Crab Creek drainage in Lincoln County, and the Yakima Reservation in Yakima County. A genetic analysis of the two largest HCAs, the YTC and Mansfield Plateau/Moses Coulee, revealed that little to no gene flow occurs between these two populations. This indicates that these two populations are essentially cut off from one another and no birds are currently moving between these populations.

The connectivity analysis was completed by identifying various landcovers and anthropogenic disturbances along potential routes that greater sage-grouse may take if they attempted to travel from one HCA to another. Landcovers and anthropogenic disturbances were given a score depending upon the obstacle to species movement. For instance, a landcover with a score of **0** indicates that the area presents no resistance to species movement; shrubsteppe habitat received a resistance value of **0** in the analysis. Values ranging from **1 – 4** were used to reflect a relatively low resistance to movement; the centerline of local roads received a resistance value of **2**. Landcover and anthropogenic disturbances which received higher scores that would indicate a higher resistance to greater sage-grouse movement include forested areas (19), greater than 20 and less than or equal 40 acres per dwelling unit (19), freeway centerline (24), one transmission line greater than or equal to 230 kV (7), and multiple transmission lines greater than or equal to 230 kV (9).

Modeling of the potential connectivity between the YTC and Mansfield Plateau/Moses Coulee population indicate a potential travel corridor does exist between the two populations, but is constricted at the northern end by development around the Rock Island Dam, and at the southern end by Interstate 90, wind development, and existing transmission lines. Potential connectivity between the YTC and Yakima Reservation population is essentially blocked by development around the city of Yakima, agricultural development, and Interstate 82. The analysis concluded that overall, none of the identified connectivity corridors provide ideal connectivity between the four HCAs for greater sage-grouse in the Columbia Plateau Ecoregion. The report suggests that improvement of connectivity would require expansion of existing HCAs, establishment of new HCAs, and/or improving habitat quality within the connectivity corridors.

Currently, the northern portion of the YTC contains four transmission lines of 230 kV or greater which would all occur in close proximity to the proposed northern route. The Proposed Northern Route would parallel two 500 kV transmission lines with steel lattice support structures and two 230 kV transmission lines with wood H-frame support structures for approximately 8.3 miles near the Vantage Substation, and parallel one 230 kV transmission line with wood H-frame support structures for an additional 17.5 miles. The Proposed Northern Route would not occur directly adjacent to an existing transmission line for approximately 15.2 miles of its entire route (Figure 4). The addition of the proposed transmission line where it parallels multiple existing transmission lines would not increase the connectivity resistance as scored by the WHCWG because of the multiple lines. The addition of the proposed transmission line would increase the potential connectivity score from seven to nine where it would parallel one 230 kV transmission line through the northwestern portions of the YTC, and then south through privately held property and BLM property before entering Pomona Heights Substation. Implementation of the proposed northern route would create an additional barrier to greater sage-grouse movement between the YTC population and the Mansfield Plateau/Moses Coulee population to the north and the Yakima Reservation population to the southwest. However, the impacts of the additional barrier would be minimized by placing the new transmission line adjacent to existing transmission infrastructure. While the proposed transmission line would occur for 15.2 miles where it would not be cited directly adjacent to an existing line, an existing 230 kV transmission line is never more than one mile away.



Vantage - Pomona Heights 230kV
Transmission Line Project

Figure 4
Paralleling Existing Transmission Lines

Project Features
- Project Substation

NNR Route Alternative Paralleling Existing Transmission Lines
- Multiple Lines
- Single Line
- No lines

Existing Transmission
- 500 kV Transmission
- 230 kV Transmission
- 115 kV Transmission

Transportation
- Interstate Highway
- US Highway
- State Highway

Base Features
- YTC Training Area
- County Boundary
- Survey Buffer (3 mi)
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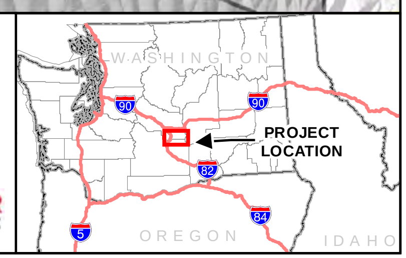

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APPENDIX A FIELD SURVEY FORM

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Sage-Grouse Summer Pedestrian Count (Brood Route)

			Observer		To Grouse		Number of Grouse				
Obser ver	Date	Time	Unit/ Wypt	NAD 83 UTMs	Distan ce	Bearing	Juv	Males	Fem ales	Detection (Audio, Visual, scat, Eggshells, etc.)	Comments
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APPENDIX B-2
SAGE-GROUSE HABITAT ASSESSMENT

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TABLES:

FIGURES:

ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
BLM	U.S. Bureau of Land Management
DEIS	Draft Environmental Impact Statement
GAP	Gap Analysis Program
GIS	geographic information system
I-82	Interstate 82
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
kV	kilovolt
MR	Manastash Ridge Subroute
NNR	New Northern Route
POWER	POWER Engineers, Inc.
ROW	right-of-way
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Pacific Power proposes to construct, operate and maintain a new 230 kilovolt (kV) transmission line in the south-central portion of Washington State from the Vantage Substation near the Wanapum Dam to the Pomona Heights Substation near Selah, Washington. The original proposed project analyzed in the Draft Environmental Impact Statement (DEIS) consists of three route alternatives (consisting of 10 variations) approximately following the southern and eastern flanks of the Joint Base Lewis-McChord Yakima Training Center (JBLM YTC). In April, 2013 the New Northern Route (NNR) was identified (hereafter Preliminary-NNR). Vegetation and grouse surveys were conducted on accessible portions of the route during May to July, 2013. Subsequent to the field surveys, routing adjustments were made due to new requirements for separation distance from existing transmission lines and concerns about sage-grouse. The locations of the NNR and Manastash Ridge (MR) Subroute were finalized in November, 2013. The Final-NNR passes through the northern portion of the JBLM YTC and then south along the west side of Interstate 82 to the Pomona Heights Substation. The MR skirts Manastash Ridge, west of Badger Hollow in the northwestern portion of the JBLM YTC (Figure 1). To facilitate analysis and discussion the new routes are broken into eight NNR segments (NNR-1 through NNR-8) and one MR segment (MR-1).

A greater sage-grouse (*Centrocercus urophasianus*) habitat assessment was conducted on each of the route alternatives. In 2011, the three southern alternatives were assessed using a combination of quantitative ground-based surveys (on accessible public lands) and analysis of remote-sensing data (on inaccessible private lands). The details of the methods and results are described in the Sage-grouse Habitat Assessment in Appendix B-2 of the Vantage to Pomona Heights DEIS (POWER 2011). The Final-NNR and MR were assessed in 2013 using a blend of remote sensing data and field data collected during vegetation and grouse surveys conducted on the Preliminary-NNR during May-July, 2013.

2.0 METHODS

Greater sage-grouse habitat assessments in the NNR and MR rights-of-way (ROW) were conducted in 2013 by using a combination of remote sensing data and field data collected during vegetation surveys conducted May 13-23, 2013 and July 25-27, 2013 (POWER 2013a), and sage-grouse walking transect surveys conducted May 18-21, 2013, and June 29-July 1, 2013 (POWER 2013b).

Breeding (nesting and early brood-rearing), summer (late-brood rearing), and winter habitat suitability was mapped within a 150-foot corridor along the NNR and MR (the final ROW will vary from 120 feet to 150 feet wide). Areas were designated as suitable, marginal, or unsuitable for each of the three seasonal habitat types. Determinations of suitability were made by qualitatively assessing the habitat indicators described in the U.S. Bureau of Land Management's (BLM's) Sage-Grouse Habitat Assessment Framework (Stiver et al. 2010). BLM's habitat indicators are adapted from and similar to previously published habitat indicators (Connelly et al. 2000; Sather-Blair et al. 2000; Hagen et al. 2007) that have been in wide use for over a decade and were used during the 2011 sage-grouse habitat assessments of the southern alternatives (POWER 2011). Habitat determinations were driven largely by sagebrush cover, and general understory character (e.g., areas dominated by annual grasses were not considered suitable breeding or summer habitat). Wherever supported by data, the other habitat indicators (Stiver et al. 2010) were used as well (e.g., sagebrush height, sagebrush growth form, perennial grass and forb heights and cover, preferred forb availability).

It was necessary to supplement the field data with remote sensing data because portions of the proposed ROW on non-federal lands were not accessible, portions of the ROW were adjusted due to decreased line separation requirements that allowed the proposed NNR and the existing Pomona-Wanapum line to be placed closer together, or were new locations identified after the field visits. Specifically, while the majority of the Final-NNR route within segments NNR-1, NNR-2, and NNR-8 remained unchanged (a small portion of the Final-NNR in these segments deviates by about 30 meters from the Preliminary-NNR), the majority of the portion within segments NNR-3, NNR-4, and NNR-5 deviates by approximately 30 meters, and the majority of the route within segments NNR-6 and NNR-7 deviates by 60 meters to 1.6 kilometers. Route MR-1 had not yet been identified and thus was not visited during surveys.

Remote sensing data and existing datasets that informed the habitat assessment included:

- Aerial imagery from July 9, 2013 (Google Earth) was used to assess sagebrush cover, proximity to sagebrush (summer habitat), the amount of human infrastructure, and the greenness of the herbaceous cover in July. Green vegetation was assumed to indicate mesic or moist vegetation and was also used as a rough proxy for perennial grass and forb cover and forb availability. Green upland areas were assumed to be suitable summer (late brood-rearing) habitat as long as proximity to sagebrush was <100 meters. Areas dominated by bare ground, by the annual exotic cheatgrass (*Bromus tectorum*), or by the native but typically xeric Sandberg bluegrass (*Poa secunda*) were quite brown in the July imagery. These assumptions were cross-referenced and validated by field observations and photographs.
- Landcover type geographic information system (GIS) layers were used to determine general overstory (e.g., sagebrush vs. grassland) and understory (perennial grass/forb vs. annual grass) vegetation. The JBLM YTC landcover type vegetation data was used on JBLM YTC lands and U.S. Geological Survey (USGS) Gap Analysis Program (GAP) data (USGS 2010; 2012) was used for portions of the ROW outside of the JBLM YTC.
- Google Earth was used to assess elevation, slope, and aspect as secondary considerations when assessing habitat suitability. For example, riparian areas in heavily incised drainages were not considered suitable summer habitat. For another example, it was assumed that north and east facing slopes and swales would require taller sagebrush to provide suitable winter habitat compared with sagebrush heights on windswept/solar south and west facing slopes.
- Sage-grouse locations, from telemetry and observation data provided by JBLM YTC (Cadwell et al. 1998; Livingston and Nyland 2002; JBLM YTC 2009), were used to assess historic occupancy and seasonality of sage-grouse use in or near the ROW.

Data collected along the Preliminary-NNR by POWER Engineers, Inc. (POWER) botanists and wildlife biologists during May-July 2013 that informed the habitat assessment included:

- Landcover type designations, identified at 0.25-mile intervals along the Preliminary-NNR were used to determine general overstory and understory vegetation.
- Landscape photos, typically taken at 0.25-mile intervals along the Preliminary-NNR, were used to qualitatively assess shrub height and cover, sagebrush growth form (columnar or spreading), grass and forb height and cover, and species composition.
- Plant species lists, collected for each Preliminary-NNR segment, were used to assess preferred forb availability.
- Vegetation survey field notes sometimes provide additional location-specific information about vegetation composition and structure.
- Locations and character of grouse sign identified during 2013 surveys were used to assess occupancy and seasonality of sage-grouse use in or near the ROW.

3.0 RESULTS AND DISCUSSION

The proposed NNR and MR avoid the highest concentration of occupied, suitable sage-grouse habitat that occurs closer to the geographic center of the JBLM YTC. NNR closely follows an existing 230 kV transmission line for its entire length—generally paralleling within 200 feet, and deviating by up to one mile for three short stretches. For the eastern nine miles, along NNR-7 and NNR-8, two existing 500 kV transmission lines also occur within one mile of the proposed route. Elevations range from approximately 500 to 3,350 feet above mean sea level (amsl) as the proposed ROW passes through a variety of steppe vegetation, ranging from relatively intact sagebrush with a perennial grass understory, to annual grasslands and disturbed ground. Consequently the seasonal habitat suitability is somewhat patchy and differs among the route segments. Generally speaking, the central and eastern portions of the proposed ROW contain the most suitable habitat overall (i.e., considering all seasonal habitats), while the relatively disturbed, weedy southern portions contain less suitable habitat. The highest concentration of suitable habitat occurs near the head of Badger Pocket, in Route Segments NNR-4, NNR-5, and the western end of NNR-6, with another concentration of suitable habitat in NNR-7. Suitability, often differed by seasonality. For instance the relatively high-elevation portion of the ROW (greater than 3,000 feet amsl) traversing the north-facing slopes of the Saddle Mountains, where high cover of sagebrush was often confined to swales and drainages, crosses suitable summer (late-brood rearing) and breeding habitat, but does not have suitable winter habitat because north facing swales at this elevation are likely to harbor some of the deepest patches of snow on the entire JBLM YTC landscape. Much of the western portion of the ROW is dominated by cheatgrass, especially on south-facing slopes. Areas with adequate sagebrush cover and a cheatgrass understory may provide suitable winter habitat, when sagebrush is the primary food resource, but are not suitable habitat during the breeding and summer seasons when forb and perennial grass cover is important (Stiver et al. 2010). Some areas, particularly within NNR-6 and NNR-7, had a moderate cover of sagebrush, estimated to be between 10 and 15 percent cover. These areas were delineated as suitable winter and summer habitat, but marginal breeding habitat due to the need for higher sagebrush density during the breeding season (Stiver et al. 2010).

A sense of habitat occupancy can be gleaned from telemetry and observational data provided by JBLM YTC and presence data collected along ground-based transect surveys by POWER biologists in 2013. The preponderance of documented grouse locations occurred greater than three miles to the south and east of the proposed NNR and MR. Moderate use was documented near route segments NNR-4, NNR-5, and NNR-6. No grouse were seen during ground transect surveys conducted in May and July of 2013; scat was observed in six locations adjacent to NNR-6, one location on NNR-5, and one location on NNR-4. Based on scat characteristics all of the observed scat appeared to be from spring and summer use; no winter scat was found. Based on 2011 data, there are two active leks and 12 historic leks within four miles of the proposed route. JBLM YTC defines a historic lek as a lek that has not been active for at least ten years. The nearest active lek is 3.3 miles east of Route Segment NNR-3.

Overall 221 acres (23 percent) of the ROW is classified as suitable breeding habitat and 368 acres (39 percent) is marginal breeding habitat. For winter habitat, 413 acres (44 percent) is suitable and 232 acres (24 percent) is marginal. During the summer (late brood-rearing) season 330 acres (35 percent) provides suitable habitat and 306 acres (32 percent) provides marginal habitat. Specific habitat delineations are described for each route segment below, and summarized in Table 1. Habitat suitability maps are shown for breeding habitat (Figure 2), winter habitat (Figure 3), and summer habitat (late brood-rearing habitat; Figure 4). A summary of vegetation type for each route segment, compiled from GAP data, JBLM YTC vegetation data, and botanical data collected during 2013 field surveys, is shown in Table 2.

3.1 Route Segment NNR-1

Route Segment NNR-1 is a short segment, passing through a suburban residential area with heavily fragmented shrub-steppe and a prevalence of disturbed ground and cheatgrass. Other infrastructures in the vicinity include existing 115 kV and 230 kV transmission lines. Within the ROW, the entire 43-acre segment (100 percent) was classified as unsuitable grouse habitat in all seasons, due to anthropogenic disturbance and vegetation condition. Available occupancy data supports our classification. According to JBLM YTC telemetry and observational data, the nearest documented sage-grouse use is over one mile from the segment, with documented regularly occupied habitats beginning about three miles east of the segment and extending east and north throughout much of the central portions of YTC. The nearest lek is over five miles away.

3.2 Route Segment NNR-2

Route Segment NNR-2 winds through and is adjacent to residential and non-vegetated urban areas in the JBLM YTC Cantonment area and ends where the route segment crosses Interstate 82 (I-82). Other infrastructures in the vicinity include existing 115kV and 230kV transmission lines. Disturbed ground, weeds, and annual grassland are the prevalent cover types. On the outskirts of the developed areas, the route passes through a few patches of sagebrush with a primarily annual grass understory. These patches (29 acres; 31 percent) were classified as marginal winter habitat due to adequate sagebrush cover but proximity to developed areas. No suitable habitat was identified for any season within Route Segment NNR-2. The entire segment was considered unsuitable during the breeding and summer seasons due to proximity to developed areas and the prevalence of a cheatgrass understory—as opposed to the native bunchgrasses and forbs that sage-grouse rely on for food and cover during the breeding and summer seasons. As with Route Segment NNR-1, JBLM YTC data indicates that the nearest documented sage-grouse use is over one mile from the segment, with documented occupied habitats beginning about three miles east of the segment and extending east and north throughout much of the central portions of the JBLM YTC. There is one active lek, Beller DZ, and three historic leks within four miles of the segment. The historic leks are in close proximity to the Beller DZ lek, which is 3.6 miles northeast of the segment. It was first discovered in 2011 with seven males displaying; six males attended the lek in 2012 and four attended in 2013. In 2011 a secondary (satellite) lek was used, located approximately 2,000 feet away. Use was not observed at the secondary lek in 2013. The authors suspected the presence of a nearby satellite lek that might explain the apparent decline in lek counts (SEE 2013).

3.3 Route Segment NNR-3

Route Segment NNR-3 runs west of I-82, closely following an existing 230 kV transmission line and roughly paralleling the highway. Suitable habitat is restricted to the northern two-thirds of this route segment. Much of this segment consists of annual grassland and perennial grassland, especially on south-facing slopes near the southern end of the segment. The northern two-thirds of the route segment are dominated by sagebrush steppe with a perennial grass understory. Habitat suitability is influenced largely by varying densities of sagebrush. Overall, roughly one-third of the route segment was considered unsuitable habitat for any season. Roughly one-third of the segment held suitable winter and summer habitat, and the remaining one-third provides marginal habitat during winter and summer. Due to a need for higher sagebrush densities during the breeding season, some of the suitable winter and summer habitat only provides marginal breeding habitat—overall 19 percent of the segment had enough sagebrush to be considered suitable for breeding and 47 percent was classified as marginal breeding habitat. JBLM YTC data documents very little sage-grouse use to the west of the segment—nearly all documented use occurs east of I-82, greater than one mile from the segment. The nearest single documented grouse location was a transmittered bird that occurred 0.6 mile west of the north end of the segment, in April 2005. The preponderance of JBLM YTC data indicates a general lack of movement across the Route Segment NNR-3. During 2013 ground-based surveys on public lands within NNR-3 no sign of grouse use was observed (POWER 2013b). There is one active lek and seven historic leks within four miles of the segment. The active lek, Beller DZ, is located 3.3 miles east of the south end of the segment; this is the same lek discussed in Section 3.2.

3.4 Route Segment NNR-4

Still closely paralleling an existing 230 kV transmission line, Route Segment NNR-4 turns east, crosses I-82 and Manastash Ridge, and ends just south of agricultural land within Badger Pocket. Sagebrush cover is relatively high, though patchy, throughout this relatively flat segment. West of the highway the segment is largely dominated by sagebrush with an annual grass understory, whereas east of the highway, a perennial grass understory becomes prevalent. The majority of this segment provides suitable or marginal sage-grouse habitat. Designations were driven largely by sagebrush cover.

Specifically, suitable breeding and summer habitat occurs on 39 percent of the 83-acre segment —all of it occurring east of I-82; an additional 53 percent is marginal breeding habitat, and 57 percent is marginal summer habitat. Suitable winter habitat occurs on 65 percent of the segment, including the areas west of I-82 with a sagebrush overstory and cheatgrass understory. Marginal winter habitat composes 31 percent of the segment. There are six historic leks within four miles of the route segment; all of them are southeast of the segment. The nearest active lek is 5.4 miles southeast of the segment. Several data-points from the 1990s document sage-grouse use of the vicinity, and of the area to the northwest of the segment and southwest of Badger Pocket. A few data points from 2005 indicate continued use of the area. Four walking transects during two visits in May and July of 2013 revealed just one instance of sign of recent grouse use of the segment (POWER 2013b). While the data indicates movement across this segment between the core JBLM YTC area and the small area of habitat on and near Manastash Ridge between NNR-4 and MR-1, movements between the JBLM YTC grouse population and the Mansfield Plateau/Moses Coulee population in Douglas County may be unlikely to occur across this segment because grouse would have to cross the agriculturally developed Badger Pocket and/or Ellensburg area, as well as the I-90 highway corridor. The Badger Pocket gap in sagebrush habitat ranges from about 1.5 miles wide at the southeast end to over 10 miles wide at the northwest end. Modeling by Washington Habitat Connectivity Working Group did not identify the area west of Badger Pocket as an important linkage zone to connect sage-grouse populations (Robb and Schroeder 2012).

3.5 Route Segment NNR-5

This short route segment briefly diverges from the existing 230 kV transmission line by approximately 0.5 mile to bypass agricultural land within Badger Pocket. This flat area is nearly uniformly covered by relatively dense sagebrush steppe with a perennial grass understory. The segment overlaps 31 acres of suitable year-round habitat, covering 95 percent of the ROW. The remaining five percent of the segment contains marginal winter and summer habitat and unsuitable breeding habitat. JBLM YTC data contains several grouse locations within a mile of the segment, primarily from the 1990s and mainly to the south of the ROW. There are five historic leks within four miles of the route segment, but the nearest active lek is approximately 4.6 miles southeast of the segment. Four walking transects during two visits in May and July of 2013 revealed just one instance of sign of recent grouse use of the segment (POWER 2013b).

3.6 Route Segment NNR-6

Route Segment NNR-6 climbs to an elevation of over 3,300 feet amsl as it traverses the rugged north slopes of the Saddle Mountains. NNR-6 consists almost entirely of relatively intact sagebrush steppe with a perennial grass understory, but in most areas the sagebrush cover is relatively low (e.g., less than 5 to 10 percent). Pockets of dense sagebrush primarily occur in swales and drainages—these are the same areas that would be expected to collect deep deposits of windblown snow on the relatively high elevation north facing slopes, likely limiting winter suitability during typical-weather years. But these same areas harbor relatively mesic pockets of sagebrush with a lush, forb-rich understory that likely stays relatively green during the summer months in typical years.

Overall, the 117-acres within the ROW for this segment consists of suitable summer habitat for 33 percent of its length and marginal summer habitat for 28 percent, while breeding habitat is suitable for 14 percent of its length and marginal for 36 percent, and winter habitat is suitable for 16 percent of the segment and marginal for 23 percent. JBLM YTC telemetry and observational data indicates some use of the area near and also north of the route segment, though density of grouse observations in this area do not approach densities in the core use areas that occur greater than six miles south of the segment. Ground based surveys of the Preliminary-NNR in May and July of 2013 revealed grouse sign in six locations near this segment—each of these was located a few hundred meters north of the western half of Route Segment NNR-6, generally near Foster Creek (POWER 2013b). The nearest active lek is located approximately 3.5 miles south of the route segment. Three males were observed attending this lek in 2013. After the lek's discovery in 2007, lek counts have ranged from zero to three males and averaged two males. Additionally, five historic leks are located within four miles of the route segment. The nearest of these is approximately 1.4 miles from the centerline. Based on Washington Habitat Connectivity Working Group modeling, NNR-6 and NNR-7 cross the most promising linkage zone connecting the JBLM YTC sage-grouse population with the Mansfield Plateau/Moses Coulee population in Douglas County (Robb and Schroeder 2012).

3.7 Route Segment NNR-7

Route Segment NNR-7 continues along the north slope of the Saddle Mountains, gradually dropping in elevation from 2,400 feet at the west end to 900 feet near the Columbia River. The segment continues to closely follow the existing 230 kV transmission line for its entire length; for the eastern five miles an existing 500 kV transmission line also closely parallels the proposed route segment. The vegetation is relatively intact sagebrush steppe with a perennial grass understory. The western three miles of the segment have moderate cover of sagebrush, providing mainly marginal habitat. Much of the eastern five miles contains higher cover of sagebrush, much of which provides apparently suitable grouse habitat, though relatively little use of the area has been documented.

Overall, the 150-acre route segment is composed of 43 percent suitable breeding habitat and 57 percent marginal breeding habitat. Winter and summer habitat is suitable for 67 percent of the segment and marginal for 32 percent of the segment. JBLM YTC data documents less sage-grouse use in the NNR-7 area than in the areas surrounding NNR-4, NNR-5, and NNR-6. A small number of locations have been documented within two miles on either side of the route segment, mostly from data collected during the 1990s. POWER biologists did not observe any sign of use during 2013 surveys. The nearest active lek is approximately 4.5 miles southwest of the route segment. There is one historic lek within four miles of the segment—it is located 0.75 mile north of the centerline. Based on Washington Habitat Connectivity Working Group modeling, NNR-6 and NNR-7 cross the most promising linkage zone connecting the JBLM YTC sage-grouse population with the Mansfield Plateau/Moses Coulee population in Douglas County (Robb and Schroeder 2012).

3.8 Route Segment NNR-8

This short route segment parallels the existing 230 kV and 500 kV transmission lines as it crosses the Columbia River and ends at the Vantage Substation. Patchy sagebrush with a perennial grass understory covers roughly half of the ROW; most of the remaining area is either rocks and open water or cheatgrass and other weeds. Breeding habitat is classified as suitable for 26 percent of the 50-acre segment, and marginal for 23 percent of the area. Winter and summer habitat is classified as suitable for 34 percent of the ROW and marginal for 15 percent of the area.

Though apparent habitat exists within Route Segment NNR-8, there is no evidence of occupied habitat. This segment lies northeast of the JBLM YTC population. Two isolated observations have been documented 0.7 and 1.6 miles southwest of the segment. Very few grouse observations have been documented east of the Columbia River, where most of NNR-8 lies; the nearest is 3.6 miles away. The nearest documented active lek is 11 miles west of the segment, and the one historic lek within four miles of the segment is located 2.1 miles northwest of the segment.

3.9 Route Segment MR-1

This 12-mile subroute is a proposed alternative to the 4.5-mile NNR-4 route segment. Shaped like a horseshoe, it circumnavigates Manastash Ridge on the west, north, and east, avoiding most of the grouse habitat in the vicinity of Route Segment NNR-4. Vegetation along the route includes sagebrush with a perennial grass understory, sagebrush with an annual grass understory dominates the western part of the route segment, and weedy disturbed ground is prevalent along parts of the eastern stretch adjacent to agricultural Badger Pocket. The route contains apparent habitat, but based on JBLM YTC data, generally lies beyond the perimeter of habitat with documented occupancy (Cadwell et al. 1998; Livingston and Nyland 2002; JBLM YTC 2009).

Breeding habitat is classified as suitable along 15 percent of the route and marginal on 49 percent. Summer habitat is suitable for 26 percent of the route and marginal for 53 percent. Winter habitat is suitable for 62 percent and marginal for 16 percent. Most of the west arm of the segment has adequate sagebrush cover for winter use, but an annual grass understory that limits suitability for breeding and summer use.

Several sage-grouse locations are documented along the MR-1 and between this route segment and NNR-4, but MR-1 likely follows the edge of potential habitat. Only two grouse locations have been documented north or northwest of the segment. Some of the agricultural land in Badger Pocket could possibly provide summer habitat, depending on what crops are grown. Two historic locations occurred within Badger Pocket and a few locations are documented within the sagebrush close to the edge of the agricultural fields. The nearest active lek is located 5.4 miles southeast of the segment. There are five historic leks within four miles of the segment. While the data indicates sage-grouse habitat use near MR-1, movements between the JBLM YTC grouse population and the Mansfield Plateau/Moses Coulee population in Douglas County may be unlikely to occur across this segment because grouse would have to cross the agriculturally developed Badger Pocket and/or Ellensburg area. The Badger Pocket gap in sagebrush habitat ranges from about 1.5 miles wide at the southeast end to over 10 miles wide at the northwest end. Modeling by Washington Habitat Connectivity Working Group did not identify the area west of Badger Pocket as an important linkage zone to connect sage-grouse populations (Robb and Schroeder 2012).

TABLE 1 SUMMARY OF HABITAT SUITABILITY WITHIN THE ROW BY SEASON AND ROUTE SEGMENT

Route Seg-ment	Breeding Habitat						Winter Habitat						Summer Habitat					
	Suitable		Marginal		Unsuitable		Suitable		Marginal		Unsuitable		Suitable		Marginal		Unsuitable	
	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
NNR-1		0%		0%	43.4	100%		0%		0%	43.4	100%		0%		0%	43.4	100%
NNR-2		0%		0%	91.2	100%		0%	28.6	31%	62.6	69%		0%		0%	91.2	100%
NNR-3	32.6	19%	78.9	47%	57.2	34%	59.2	35%	59.4	35%	50.0	30%	57.0	34%	54.5	32%	57.2	34%
NNR-4	32.1	39%	43.3	53%	7.0	8%	53.4	65%	25.4	31%	3.7	4%	32.1	39%	46.6	57%	3.7	4%
NNR-5	30.6	95%		0%	1.8	5%	30.6	95%	1.7	5%	0.1	0%	30.6	95%	1.7	5%	0.1	0%
NNR-6	16.1	14%	42.7	36%	58.4	50%	19.0	16%	26.7	23%	71.5	61%	38.5	33%	33.0	28%	45.7	39%
NNR-7	63.7	43%	85.0	57%	0.9	1%	100.1	67%	48.5	32%	0.9	1%	100.1	67%	48.5	32%	0.9	1%
NNR-8	12.9	26%	11.7	23%	25.3	51%	17.0	34%	7.6	15%	25.3	51%	17.0	34%	7.6	15%	25.3	51%
MR-1	32.7	15%	105.8	49%	77.0	36%	134.6	62%	34.3	16%	46.5	22%	55.1	26%	113.9	53%	46.5	22%
Total	220.7	23%	367.5	39%	362.2	38%	413.9	44%	232.4	24%	304.0	32%	330.4	35%	305.9	32%	314.0	33%

TABLE 2 SUMMARY OF LANDCOVER TYPES WITHIN THE ROW BY ROUTE SEGMENT

VEGETATION TYPE	TYPICAL HABITAT SUITABILITY FOR SAGE-GROUSE	ACRES AND PERCENTAGES WITHIN RIGHT-OF-WAY (75 FEET FROM EITHER SIDE OF ROUTE SEGMENT CENTERLINES)									
		NNR- 1	NNR-2	NNR-3	NNR-4	NNR-5	NNR-6	NNR-7	NNR-8	MR-1	ALL
Sagebrush/ Perennial Grassland	Potentially suitable, year-round.	18%	22%	58%	47%	90%	93%	100%	51%	37%	58%
Sagebrush/ Annual Grassland	Potentially suitable in winter. Unsuitable in breeding and summer seasons	0%	9%	4%	16%	0%	0%	0%	4%	0%	3%
Bitterbrush/ Perennial Grass	Potentially suitable in breeding and summer seasons, depending on surrounding vegetation. Unsuitable in winter.	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Unspecified Shrubland	Potentially suitable, year-round.	33%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Non-forested Riparian, Intermittent Stream or Dry Gully	Potentially suitable, especially during breeding and summer seasons.	1%	0%	0%	0%	2%	0%	0%	1%	0%	0%
Agriculture	Potentially suitable during summer season, depending on surrounding vegetation. Unsuitable during winter and breeding seasons.	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Perennial Grassland	Potentially suitable during summer season, depending on surrounding vegetation. Unsuitable during winter and breeding seasons.	0%	3%	5%	2%	0%	7%	0%	4%	0%	2%
Unspecified Grassland	Potentially suitable during summer season, depending on surrounding vegetation. Unsuitable during winter and breeding seasons.	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rabbitbrush/Annual Grassland	Generally unsuitable	0%	5%	0%	0%	0%	0%	0%	1%	0%	0%
Annual Grassland and Noxious Weeds	Unsuitable	4%	31%	28%	31%	3%	0%	0%	19%	41%	21%
Developed, Disturbed, or Firebreak	Unsuitable	31%	27%	1%	1%	5%	0%	0%	4%	22%	10%
Trees	Unsuitable	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Rocks and Open Water	Unsuitable	0%	0%	3%	0%	0%	0%	0%	16%	0%	1%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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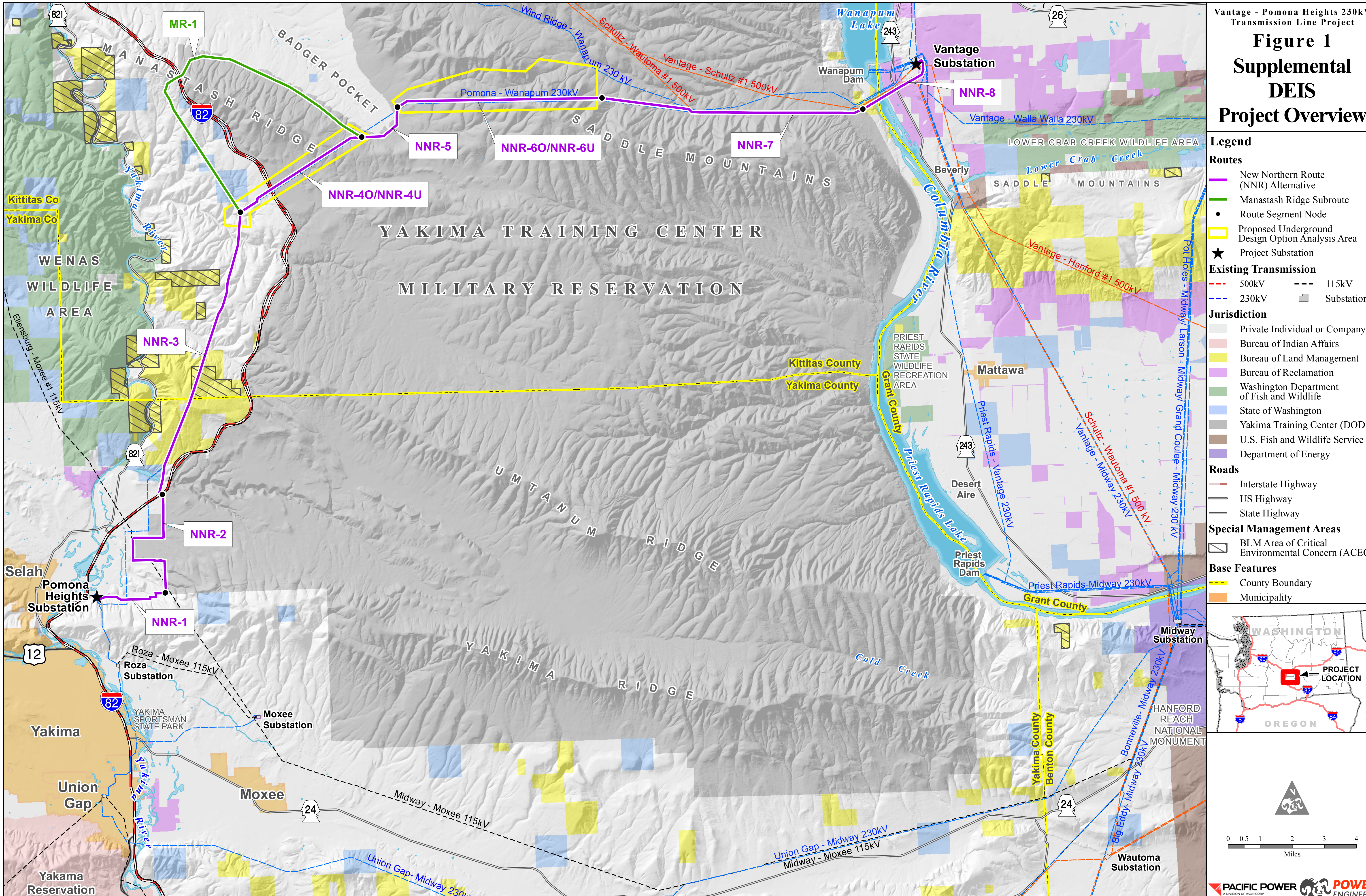

Figure 1
Supplemental DEIS Project Overview

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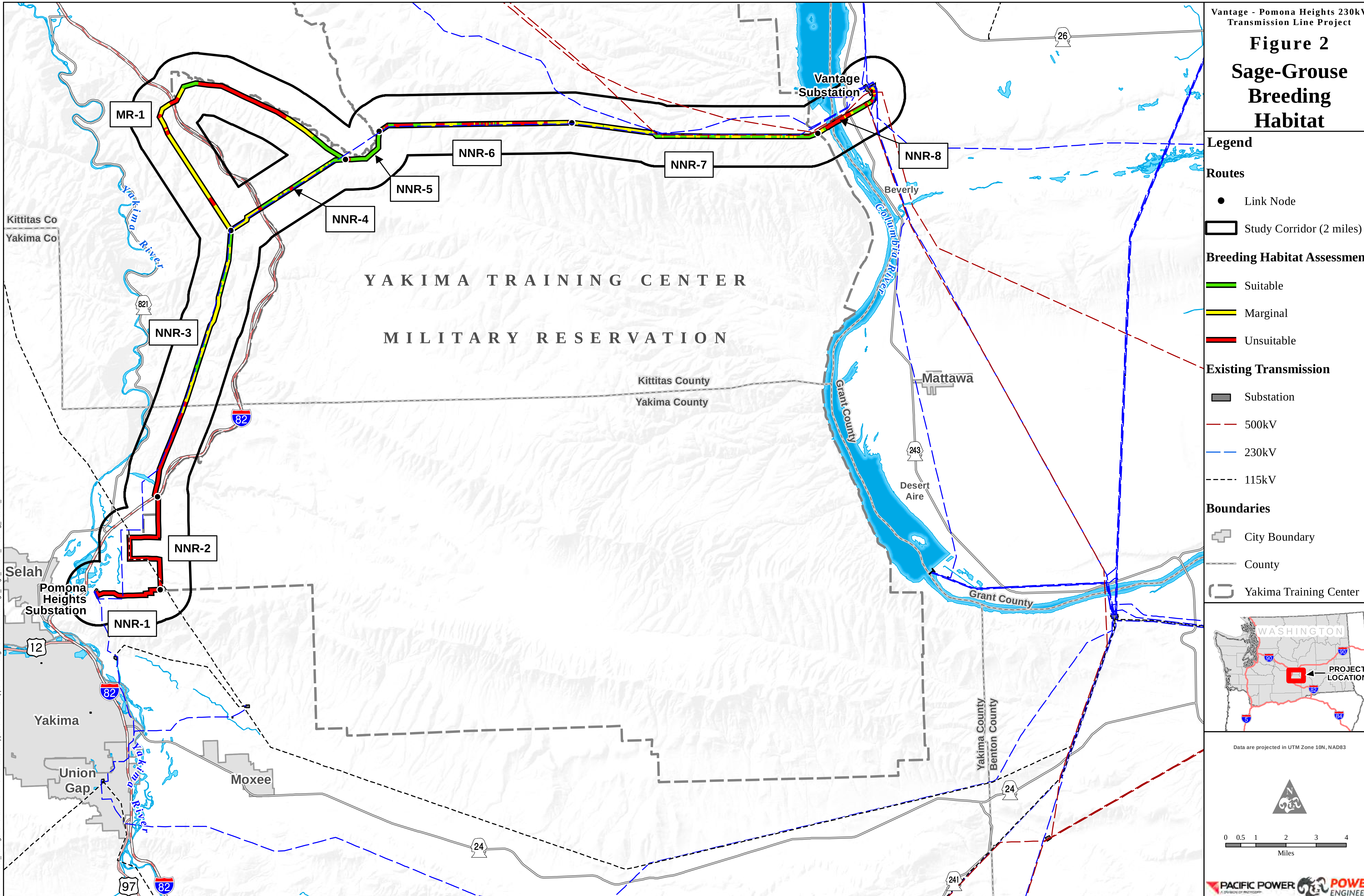

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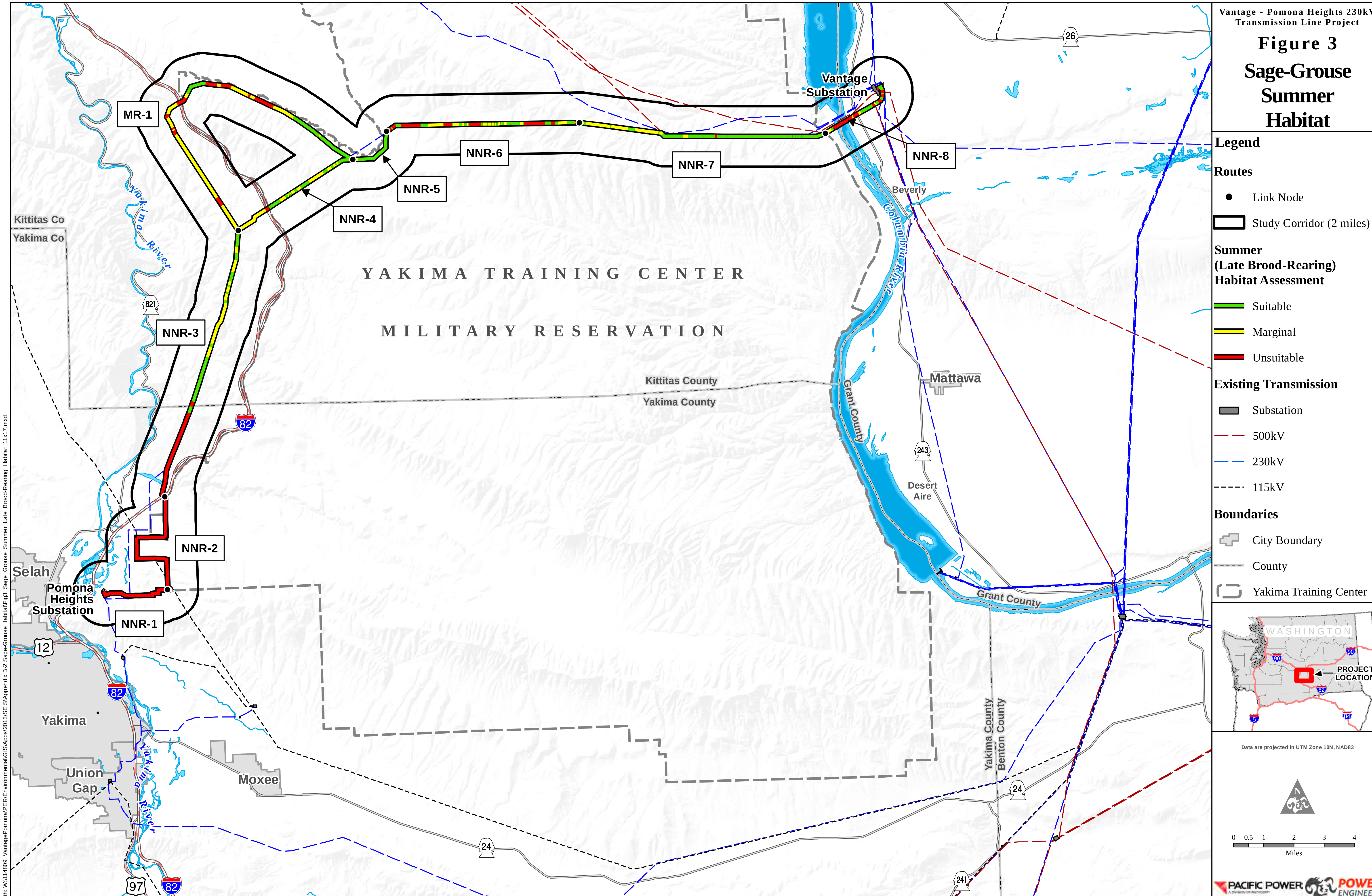
Vantage - Pomona Heights 230kV Transmission Line Project
Figure 3
Sage-Grouse Summer Habitat
Legend
Routes
Link Node
Study Corridor (2 miles)
Summer (Late Brood-Rearing) Habitat Assessment
Suitable
Marginal
Unsuitable
Existing Transmission
Substation
500kV
230kV
115kV
Boundaries
City Boundary
County
Yakima Training Center
WASHINGTON
PROJECT LOCATION
Data are projected in UTM Zone 10N, NAD83
0 0.5 1 2 3 4
Miles
PACIFIC POWER
POWER ENGINEERS
YAKIMA TRAINING CENTER
MILITARY RESERVATION
Vantage Substation
Pomona Heights Substation
MR-1
NNR-1
NNR-2
NNR-3
NNR-4
NNR-5
NNR-6
NNR-7
NNR-8
Kittitas Co
Yakima Co
Kittitas County
Yakima County
Grant County
Benton County
Yakima River
Columbia River
Beverly
Mattawa
Desert Aire
Selah
Yakima
Union Gap
Moxee
Path: W:\114809_VantagePomona\PER\Environmental\GIS\Apps\2013SEIS\Appendix B-2 Sage-Grouse Habitat\Fig3_Sage_Grouse_Summer_Late_Brood-Rearing_Habitat_11x17.mxd

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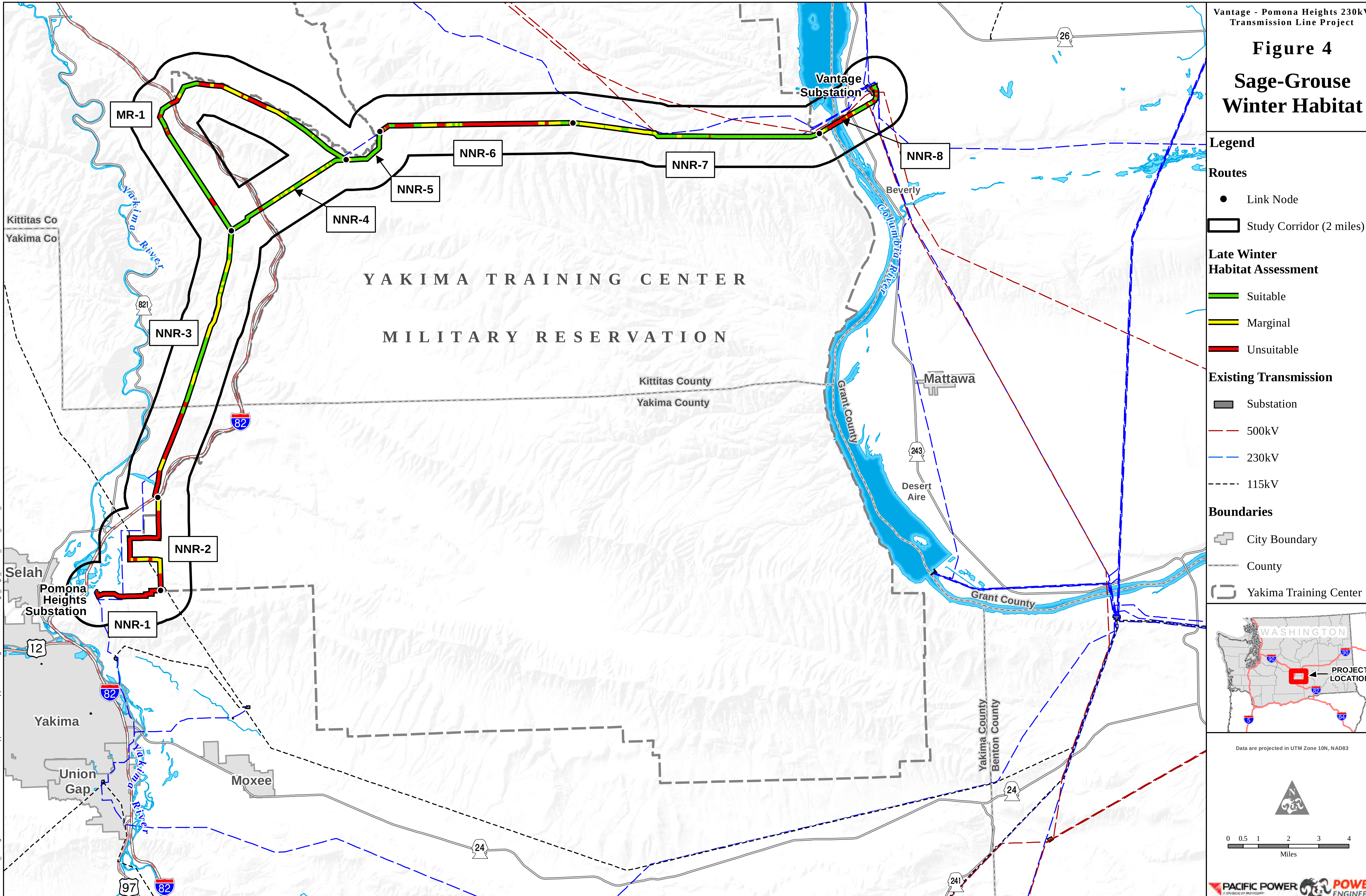

Vantage - Pomona Heights 230kV Transmission Line Project
Figure 4
Sage-Grouse Winter Habitat
Legend
Routes
Link Node
Study Corridor (2 miles)
Late Winter Habitat Assessment
Suitable
Marginal
Unsuitable
Existing Transmission
Substation
500kV
230kV
115kV
Boundaries
City Boundary
County
Yakima Training Center
WASHINGTON
PROJECT LOCATION
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Vantage Substation
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MR-1
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NNR-2
NNR-3
NNR-4
NNR-5
NNR-6
NNR-7
NNR-8
Kittitas Co
Yakima Co
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Grant County
Benton County
Yakima River
Columbia River
Beverly
Mattawa
Desert Aire
Selah
Yakima
Union Gap
Moxee

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APPENDIX B-3
SPECIAL STATUS PLANTS REPORT

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ACRONYMS AND ABBREVIATIONS

BLM	U.S. Bureau of Land Management
DEIS	Draft Environmental Impact Statement
GAP	Gap Analysis Program
GPS	global positioning system
ISSSSP	Inter-agency Special Status / Sensitive Species Program
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
kV	kilovolt
MR	Manastash Ridge Subroute
NNR	New Northern Route
POD	Plan of Development
Reclamation	Bureau of Reclamation
ROW	right-of-way
SDEIS	Supplemental Draft Environmental Impact Statement
USFWS	U.S. Fish and Wildlife Service
WNHP	Washington Natural Heritage Program
WSDOT	Washington State Department of Transportation

1.0 INTRODUCTION

Pacific Power proposes to construct, operate and maintain a new 230 kilovolt (kV) transmission line in the south-central portion of Washington from the Vantage Substation near the Wanapum Dam to the Pomona Heights Substation near Selah, Washington. The original proposed Project analyzed in the DEIS consisted of 10 end-to-end alternatives approximately following the southern and eastern flanks of the Joint Base Lewis-McChord Yakima Training Center (JBLM YTC). In April, 2013 the New Northern Route (NNR) was identified (hereafter Preliminary-NNR). Special status plant surveys were conducted on accessible portions of that route during May and July 2013. After the field surveys, routing adjustments were made due to new requirements for separation distance from existing transmission lines and concerns about sage-grouse. The locations of the NNR and Manastash Ridge Subroute (MR) were finalized in November 2013. The Final-NNR occurs along the west side of Interstate 82 and then passes through the northern portion of the JBLM YTC to the Vantage Substation. The MR skirts Manastash Ridge, west of Badger Pocket in the northwestern portion of JBLM YTC. To facilitate analysis and discussion the new routes are broken into eight NNR segments (NNR-1 through NNR-8) and one MR subroute (MR-1).

The 2013 special status plant surveys were conducted on approximately 584 acres or 30.5 centerline miles of federal and Washington State Department of Transportation (WSDOT) lands on the Preliminary-NNR segments. Portions of Bureau of Reclamation (Reclamation) and U.S. Bureau of Land Management (BLM) lands which had been surveyed for the Draft Environmental Impact Statement (DEIS) in 2011 and were incorporated into the Preliminary-NNR and the Final-NNR were not revisited. Noxious weed surveys coincided with the special status plant surveys, and these are discussed in a separate report (Appendix B-4 of the Supplemental Draft Environmental Impact Statement [SDEIS]).

Due to the routing adjustments that occurred following the special status plant surveys, 43 percent (16.2 of the total 37.7 centerline miles) of federal and WSDOT lands within the Final-NNR were surveyed in 2013 (14.6 miles) and 2011 (1.6 miles). Table 1 shows how the Preliminary-NNR and the Final-NNR segments correspond to each other and the centerline miles surveyed during 2011and 2013, by land jurisdiction, that are still part of the Final-NNR. In this report, special status plants that were documented in 2013 are included whether or not they still occur in the Final-NNR, but it is noted whether they are in the Final-NNR. Habitat and general plant species lists (Appendix C) show the Preliminary-NNR route segments where they were documented and the corresponding Final-NNR segments.

TABLE 1 SPECIAL STATUS PLANT SURVEY STATUS AND CENTERLINE MILES FOR THE FINAL-NNR

FINAL-NNR ROUTE SEGMENTS			PRELIMINARY-NNR ROUTE SEGMENTS WHERE 2011/2013 SURVEYS WERE CONDUCTED AND ARE STILL PART OF FINAL-NNR[b] (MILES)					
SEGMENT NUMBER	JURIS-DICTION[a]	TOTAL MILES	NNR-1	NNR-2	NNR-3	NNR-4	NNR-5	TOTAL SURVEYED
NNR-1	Reclamation	0.2	0.2 (0.1 miles in 2011 and 0.1 miles in 2013)					0.2
	Private	2.1						
	TOTAL	2.4	0.2					0.2
NNR-2	Private	<0.1						
	WSDOT	<0.1						
	JBLM YTC	5.0		5.0 (2013)				5.0
	TOTAL	5.0		5.0				5.0

FINAL-NNR ROUTE SEGMENTS			PRELIMINARY-NNR ROUTE SEGMENTS WHERE 2011/2013 SURVEYS WERE CONDUCTED AND ARE STILL PART OF FINAL-NNR[b] (MILES)					
SEGMENT NUMBER	JURIS-DICTION[a]	TOTAL MILES	NNR-1	NNR-2	NNR-3	NNR-4	NNR-5	TOTAL SURVEYED
NNR-3	BLM	3.6			3.6[c] (entire length of ROW but only 1/3 its width; 2013)			3.6[c]
	Private	5.0						
	WSDOT	0.7			0.5 (2013)			0.5
	TOTAL	9.3			4.1[c]			4.1[c]
NNR-4o/NNR-4u	Private	1.2						
	WSDOT	0.1						
	JBLM YTC	3.3				3.3[c] (2.9 of this is for entire length of ROW but only 1/3 its width; 2013)		3.3[c]
	TOTAL	4.5				3.3[c]		3.3[c]
NNR-5	JBLM YTC	1.8				1.6 (2013)		1.6
NNR-6o/NNR-6u	JBLM YTC	6.4						
NNR-7	JBLM YTC	8.2				0.1 (2013)		0.1
NNR-8	BLM	0.4					0.4 (0.1 miles in 2011 and 0.3 miles in 2013)	0.4
	Reclamation	1.4					1.4 (2011)	1.4
	Private	0.5						
	Water	0.4						
	TOTAL	2.7					1.8	1.8
MR-1	DNR	1.7						
	Private	3.5						
	JBLM YTC	6.6				<0.1 (2013)		<0.1
	TOTAL	11.9				<0.1		<0.1
GRAND TOTAL		52.3	0.2	5.0	4.1[c]	5.0[c]	1.8	16.2[c]

[a]Special status plant surveys are required on lands managed by the BLM, Reclamation, JBLM YTC, and WSDOT, which cumulatively total 37.7 centerline miles of the Final-NNR.
[b]There were 1.6 centerline miles surveyed in 2011 and 14.6 centerline miles surveyed in 2013 that are still within the Final-NNR.
[c]Even though only 1/3 of the width of the right-of-way (ROW) were surveyed in 2013, these values are included in the grand total, as they are fairly representative of the entire ROW for the Final-NNR.

2.0 METHODS

In 2013, qualified botanists surveyed for target special status plant species on federal and WSDOT lands within the right-of-way (ROW) corridor for the Preliminary-NNR alternate route segments west of the Columbia River, which was almost entirely accessible. Methodology for 2013 surveys is described below. In addition, 2011 special status plant survey data for the portion of Final-NNR-8 east of the Columbia

River is also included in this document, for ease of evaluating the entire NNR. This survey followed BLM Procedures for Vegetation Inventory and Rare Plant Clearances, which was provided by the BLM (M. Boyter, March 2011).

Surveyor Qualifications

Special status plant surveys were conducted by botanists who have the following minimum qualifications:

- An academic background (bachelor's degree or higher in botany) or equivalent experience in plant taxonomy;
- The taxonomic experience to identify, through personal knowledge or the use of technical floras, most species encountered in the field, and an understanding of how to contact taxonomic experts for species that they are unable to identify;
- The skills to use global positioning system (GPS) to adequately map occurrences of special status plant species; and
- Familiarization of the potential special status plant species in the Project area.

All of the botanists who conducted special status plant surveys in 2013 had also been involved in conducting the 2011 botanical surveys.

Field Preparation

As the habitat of the Preliminary-NNR (and subsequently the Final-NNR) corresponded with the habitat surveyed in 2011, 2013 surveys used the same target special status plant list updated to account for changes in species status (ISSSSP 2012; WNHP 2012a,b,c; USFWS 2012, 2013a,b; Appendix A). There were a few additions and a few deletions of species based on agency updates to the list, but overall it is nearly identical to the list used in 2011.

In 2011, the special status plant list was developed by compiling a list of all special status species known to project counties (Benton, Grant, Kittitas, and Yakima), data which was accessed from the Washington Natural Heritage Program (WNHP) and BLM (M. Boyter, March 2011). The list included those species listed by the U.S. Fish and Wildlife Service (USFWS) or State of Washington, classified as Washington Sensitive on the Inter-agency Special Status / Sensitive Species Program (ISSSSP) species list, or addressed as sensitive in the Final Environmental Impact Statement for the Fort Lewis Army Growth and Force Structure Realignment: Fort Lewis and Yakima Training Center, Washington (Fort Lewis Directorate of Public Works 2010).

The special status plant list was further refined to only include species meeting any of the following criteria:

- All special status plant species known to occur within 0.25 mile of the any of the Preliminary-NNR or DEIS alternatives (M. Boyter, March 2011, May 2013; WNHP 2013);

- All special status plant species that are known to occur on or near the JBLM YTC (Fort Lewis Directorate of Public Works 2010);

- Washington BLM Sensitive species documented or suspected to occur on the BLM Spokane District having potentially suitable habitat in the Preliminary-NNR or DEIS alternatives. This was defined as elevation (400 to 2,850 feet) and Gap Analysis Program (GAP) vegetation (GAP 2012; 2010) within 0.25 mile of the alternate routes surveyed in 2011 and 2013. Species associated with forested habitats and high elevations were typically removed from the list, while species associated with sagebrush steppe, basalt cliffs, rivers, etc. were included. Wetlands and riparian areas occur on federal lands along the alternative route segments, so species associated with these habitats were also included. Habitat surveyed along the Preliminary-NNR in 2013 corresponds to similar habitat requirements as the 2011 surveys.

Most special status plant species occur in highly specific habitats, which require specific information on the associated plant community, co-occurring species, geology, soils, elevation, and topographic location for each species. Sources of information for plant species included the *Vascular Plants of the Pacific Northwest: Vols. I-V* (Hitchcock et al. 1969), *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973), the WNHP plant guide (WNHP and BLM 2005), *Field Guide to the Rare Plants of Washington* (Camp and Gamon 2011), WNHP special status plant data within the study corridor (WNHP 2013), BLM (M. Boyter, March 2011, May 2013), species-specific literature, and botanists' personal knowledge of the species.

The phenology for each species is important since many special status plant species can only be accurately identified when they are flowering and/or fruiting. The phenology of all target special status species was assessed to determine when and how many surveys would be needed to accurately survey for all special status plant species. Based on this, complete surveys were determined to be needed during April/May and June/July so that all species are surveyed (preferably late April to mid-May and mid-June to mid-July). A third survey was also determined to be needed for wetlands and riparian areas in late-July to mid-August, to address special status plants associated with these habitats that have a late-summer phenology, including Ute ladies'-tresses (*Spiranthes diluvialis*), a federally threatened plant species.

However, weather conditions and plant phenology during the first round of botanical surveys in mid-May indicated that conditions were one month early in 2013, which required adjustment of the desired survey windows. Nearly all plants species, except wetland species and some noxious weeds only identifiable to genus, were identifiable during the 2013 mid-May surveys, including target special status plant species with a June survey window. Plant phenology in mid-May 2013 was similar to conditions during late June 2011. To address these unusual conditions, it was determined that the mid-May survey should serve as the late June survey, and a follow-up survey in late July would be conducted in wetland habitats (including surveying for Ute ladies'-tresses). The follow-up survey in late July included re-surveying where potential noxious weed or special status plant species were potentially located. In addition, since the Preliminary-NNR underwent route adjustments following the 2013 surveys, portions of the Final-NNR have not been surveyed for special status plants.

Field Survey

A pedestrian survey was conducted May 13-20, 2013 for special status plant species on federal and WSDOT lands within the 150 foot (ca 46 meter) ROW corridor. Botanists walked roughly parallel intuitive meandering transects while they were targeting habitats most likely to support special status plant species, with a 40 foot (12 meter) separation between surveyors. The survey was floristic, meaning that all taxa were identified to the level necessary to determine if they are special status plant or noxious weed species.

A second survey was conducted during July 25-27, 2013 in the two wetland areas identified during the May 2013 survey, one which had potential habitat for Ute ladies'-tresses. In addition, noxious weed sites were re-visited if they were only identifiable to genera during the May 2013 survey. There was also one dodder (*Cuscuta* sp.) having the potential to be a special status or noxious weed species which was revisited due to its late summer bloom time required for species identification. The dodder was determined to have neither status.

All methods followed the BLM Procedures for Vegetation Inventory and Rare Plant Clearances, which was provided by the BLM botanist. An OR/WA BLM GeoBOB Flora/Fauna Survey Form (V. 1.4) was completed for each of the route segments surveyed, which included information on landowner, survey location and acreage, observers, date(s) surveyed, plant species encountered, target special status plant species, and habitat/environmental conditions.

Habitat and plant community information was collected for assessing potential suitable habitat for special status plants. In addition, the following information was collected during the surveys: names of all plant species observed and whether it is a dominant species, presence and percent cover of cryptogamic crusts, moisture/ disturbance/soil conditions, and elevation/aspect/slope. This was largely done during the May survey, but additional species and observations were added during the July survey.

If any target special status plant species were discovered, information about each species/location were filled out using an OR/WA BLM GeoBOB Site and Observations Form (V. 1.4; includes information on species, location, observers, date observed, phenology, reproduction/health, threats, associated species, and habitat/environmental conditions). A survey-grade GPS was used to document the survey route and the occurrence of target special status plant species discovered.

Very steep slopes and other conditions that posed a safety hazard were not surveyed, although this seldom occurred along the Preliminary-NNR. Very steep slopes are typically avoided for installation of transmission line structures. In addition, botanists communicated with JBLM YTC personnel to ensure surveys were coordinated with training activities.

3.0 RESULTS

There were 30.5 of 41.2 centerline miles of the Preliminary-NNR surveyed in 2013, with the following exceptions: a 0.1 mile section on WSDOT lands that was too steep to be safely completed and another small area between interstate lanes; a 0.4 mile section crossing the Columbia River; 8.7 miles of private land; and a 1.4 mile section east of the Columbia River which was surveyed in 2011. As previously described, there are 16.2 centerline miles surveyed in 2011 or 2013 that are still part of the Final-NNR (which includes 37.7 centerline miles on federal or WSDOT lands).

Plant phenology was at least one month early in 2013, so that mid-May 2013 conditions were similar to late June 2011 (see Field Preparation above). This was likely due to the unusually dry, slightly warmer weather conditions during the 2012-2013 water year (October to September). Total precipitation during the year-to-date water year (October 2012 to April 2013) was just 18 percent below the 1981-2010 mean. However, total precipitation during January to April 2013 was 58 percent below the 1981-2010 mean (NOAA 2013), which explains the dry conditions and early phenology in 2013. Based on these conditions, the survey targeting late April to mid-May special status plant species may be incomplete because many early species probably would not have been detectable, although information about the potential for suitable habitat is assessed in this document.

The list of target special status plants in Appendix A indicates during which survey(s) each species was targeted and is designed to be used with the GeoBOB survey forms. Table 2 shows a comparison of the habitat suitability by route segment and Appendix B shows the data used for making these calculations. Appendix C presents a list of all plant communities that were documented on accessible federal lands for each route segment. A list of all plant species documented during the surveys is provided in Appendix D. The BLM has requested that GeoBOB survey forms and special status plant site observation forms be filled out for the surveys, and these are provided separately and include photographs and maps. The GeoBOB survey forms provide more information about the environmental conditions along each route segment. The GeoBOB site observation forms provide more information about each special status plant species occurrence.

All special status plant species detected in 2013 or in the WHNP database are listed in Table 2. There were no 2011 or 2013 special status plant occurrences detected in surveyed portions of Final-NNR segments NNR-1, NNR-2, NNR-4, NNR-5, NNR-7, NNR-8, or MR-1. No portion of Final-NNR-6 was surveyed. There are WNHP database records that intersect the ROW of Final-NNR segments NNR-2, NNR-6, NNR-7, and NNR-8 (Table 2).

During 2013 surveys, there were two occurrences of Hoover's desert parsley (*Lomatium tuberosum*) documented on BLM lands that were also in the WNHP database, although only one of these occurrences is in the Final-NNR-3 (Table 2). One very extensive occurrence of Pauper milkvetch (*Astragalus misellus* var. *pauper*) was documented on BLM lands within the ROW of the Final-NNR-3. This occurrence was much more extensive in the Preliminary-NNR-3. The Preliminary-NNR-3 ROW was adjusted so that one-third of the ROW width still overlaps the Final-NNR-3.Pauper milkvetch is presumably also extensive within the adjacent portion of ROW not surveyed in 2013. There was also one occurrence of snowball cactus (*Pediocactus simpsonii* var. *robustior*) documented on BLM lands in the ROW of Final-NNR-3, which also extends into adjacent areas that were part of the Preliminary-NNR-3. In addition, the WNHP database (2013) has one occurrence of Hoover's tauschia (*Tauschia hooveri*) known to private lands on the Final-NNR-3, so there may be potential for this species on public lands in the vicinity.

Other special status plants that were detected in 2013 but are no longer in the Final-NNR (previously in Preliminary-NNR-4 on JBLM YTC lands) are listed in Table 2. These include occurrences of weakstem flaccida (*Cryptantha flaccida*), snowball cactus, and longsepal globemallow (*Iliamna longisepala*). Weakstem cryptantha documented in the ROW of Preliminary-NNR-4 was keyed and verified to be *C. flaccida* in the 1973 Hitchcock treatment, and not *C. rostellata*, which has recently been merged into *C. flaccida*. This means that the *C. flaccida* documented in Preliminary-NNR-4 may or may not be a special status species, but it was documented as if it is a special status species until taxonomic issues can be resolved. Both weakstem cryptantha occurrences were re-visited during the July 2013 surveys, and collected specimens, but the seeds on the collections were not identifiable. However, this is likely no longer an issue because this species is not currently known to the Final-NNR, just the Preliminary-NNR. In addition, this species locally inhabits the sideslopes of dry drainages which would be spanned if it were present but not yet detected in the Final-NNR.

Habitats documented during 2013 surveys were used to estimate potentially suitable habitat for special status plants on all lands surveyed. Unsuitable habitat included: agriculture; developed, road, or firebreak; irrigation canal; noxious weeds; turf grass; planted trees; and water body. Marginal habitat included annual grassland, perennial grassland, rabbitbrush/annual grassland, and sagebrush annual grassland. Suitable habitat included aspen, basalt cliff/rock, forested riparian, intermittent stream or dry gully, native trees, non-forested riparian, and sagebrush/perennial grassland. Unknown habitat was too coarsely defined to estimate and included grassland and shrubland.

TABLE 2 2013 SPECIAL STATUS PLANT SPECIES LOCATIONS AND HABITAT SUITABILITY ON FEDERAL OR WSDOT LANDS, BASED ON SURVEY AND WNHP DATA[1]

FINAL NNR ROUTE SEGMEN	SPECIAL STATUS PLANTS IN ROW	DATA SOURCE AND LAND OWNERSHIP	OCCUPIED HABITAT	PERCENT SURVEYED	SUITABLE HABITAT	MARGINAL HABITAT	UNSUITABLE HABITAT
NNR - 1	None	N/A	None	100.0% (0.2/0.2 miles)	1.1 acres (sagebrush/ perennial grassland)	Trace[2]	1.8 acres
NNR – 2	None	N/A	None	100.0% (5.0/5.0 miles)	20.0 acres (sagebrush/ perennial grassland with trace[2] amount of riparian)	30.3 acres	40.2 acres
NNR - 3	Basalt daisy (*Erigeron basalticus*) Pauper milkvetch (*Astragalus misellus* var. *pauper*) Hoover's desert-parsley (*Lomatium tuberosum*) Snowball cactus (*Pediocactus simpsonii* var. *robustior*) Hoover's tauschia (*Tauschia hooveri*)	WNHP database/ private and WSDOT 2013 survey/ BLM 2013 survey/ BLM; WHNP database/ BLM and private 2013 survey/ BLM WNHP database/ private	2007 record in WNHP database, but species not observed during survey (steep basalt area at canyon bottom) 34.6 acres documented during 2013 survey, survey, but only 12.7 acres is in proposed ROW due to route adjustments since the 2013 survey; also documented from 2009 record in WNHP database 0.3 acre documented during 2013 survey, but only 0.2 acre is in proposed ROW due to route adjustments since the 2013 survey; also documented from 2008 records in WNHP database 4.6 acres documented during 2013 survey, but only 0.9 acres is in proposed ROW due to route adjustments since the 2013 survey; no records in WNHP database for ROW Documented from 1990 records in WNHP database, but species not observed during survey. This could be	96.5% (4.1/4.3 miles) 3.7 of 4.1 miles was surveyed entire length of ROW but only 1/3 its width	26.1 acres (sagebrush/ perennial grassland, basalt cliff/rock, and trace[2] amount of intermittent stream/dry gully and native trees)	50.7 acres	0.7 acre

FINAL NNR ROUTE SEGMEN	SPECIAL STATUS PLANTS IN ROW	DATA SOURCE AND LAND OWNERSHIP	OCCUPIED HABITAT	PERCENT SURVEYED	SUITABLE HABITAT	MARGINAL HABITAT	UNSUITABLE HABITAT
			due to when the survey was conducted; Hoover's tauschia is identifiable only in early spring.				
NNR - 4	None	N/A	None	97.4% (3.3/3.3 miles) 2.9 of 3.3 miles was surveyed entire length of ROW but only 1/3 its width	41.4 acres (sagebrush/ perennial grassland, forb, bitterbrush/ perennial grassland, and trace[2] amount of intermittent stream/dry gully		
NNR - 5	None	N/A	None	91.6% (1.6/1.8 miles)	29.8 acres (sagebrush/ perennial grassland and intermittent stream/dry gully	None	2.6 acres
NNR – 6	Suksdorf's monkey-flower (*Mimulus suksdorfii*)	WNHP database/ JBLM YTC	Documented from 1995 records in WNHP database. The species was not observed during survey; however, surveys were not conducted on this entire route segment.	0.0% (0.0/6.4 miles)	109.9 acres (sagebrush/ perennial grassland and forb)	7.2 acres	None
NNR - 7	Dwarf evening-primrose (*Camissonia pygmaea*) Bristle-flowered collomia (*Collomia macrocalyx*) Gray cryptantha (*Cryptantha leucophaea*)	WNHP database/ BLM & JBLM YTC lands WNHP database/ JBLM YTC WNHP database/ BLM and	Documented from 1995 records in WNHP database. The species was not observed during survey; however, surveys were conducted on a small portion (1.6%) of this route segment. Documented from 1995 records in WNHP database. The species was not observed during survey; however, surveys were conducted on a small portion (1.6%) of this route segment. Documented from 2003 records in WNHP database. The species was not observed during survey; however,	1.6% (0.1/8.2 miles)	149.5 acres (sagebrush/ perennial grassland)	None	Trace[2]

FINAL NNR ROUTE SEGMEN	SPECIAL STATUS PLANTS IN ROW	DATA SOURCE AND LAND OWNERSHIP	OCCUPIED HABITAT	PERCENT SURVEYED	SUITABLE HABITAT	MARGINAL HABITAT	UNSUITABLE HABITAT
		JBLM YTC	surveys were conducted on a small portion (1.6%) of this route segment.				
	Miner's candle (*Cryptantha scoparia*)	WNHP database/ JBLM YTC	Documented from 2002 records in WNHP database. The species was not observed during survey; however, surveys were conducted on a small portion (1.6%) of this route segment.				
	Suksdorf's monkey-flower (*Mimulus suksdorfii*)	WNHP database/ JBLM YTC	Documented from 1995 records in WNHP database. The species was not observed during survey; however, surveys were conducted on a small portion (1.6%) of this route segment.				
	Caespitose evening-primrose (*Oenothera caespitosa ssp. caespitosa*)	WNHP database/ JBLM YTC	Documented from 1994 records in WNHP database. The species was not observed during survey; however, surveys were conducted on a small portion (1.6%) of this route segment.				
NNR – 8	Dwarf evening-primrose (*Camissonia pygmaea*)	WNHP database/ BLM and JBLM YTC	Documented from 1995 records in WNHP database, but species not observed during survey				
	Gray cryptantha (*Cryptantha leucophaea*)	WNHP/ BLM and JBLM YTC	Documented from 2003 records in WNHP database, but species not observed during survey				
MR – 1	None	N/A	None	0.5% (0.03/6.6 miles)	72.6 acres (sagebrush/ perennial grassland)	31.8 acres	47.7 acres
Special status plants	Snowball cactus (*Pediocactus*	2013 survey/ JBLM YTC	<0.1 acres documented during 2013 survey, but none is in proposed ROW			No longer applicable	

FINAL NNR ROUTE SEGMEN	SPECIAL STATUS PLANTS IN ROW	DATA SOURCE AND LAND OWNERSHIP	OCCUPIED HABITAT	PERCENT SURVEYED	SUITABLE HABITAT	MARGINAL HABITAT	UNSUITABLE HABITAT
documented in 2013 that are no longer in Final-NNR (all on Preliminary-NNR 4/JBLM YTC lands)	*simpsonii* var. *robustior*)		due to route adjustments since the 2013 survey; no records in WNHP database for ROW				
	Longsepal globemallow (*Iliamna longisepala*)	2013 survey/ JBLM YTC	0.2 acres documented during 2013 survey, but none is in proposed ROW due to route adjustments since the 2013 survey; no records in WNHP database for ROW				
	Snowball cactus (*Pediocactus simpsonii* var. *robustior*)	2013 survey/ JBLM YTC	3.6 acres documented during 2013 survey, but none is in proposed ROW due to route adjustments since the 2013 survey; no records in WNHP database for ROW				
	Weakstem cryptantha (*Cryptantha flaccida*) (re keyed to the 1973 treatment of *C. flaccida*)	2013 survey/ JBLM YTC	1.4 acres documented during 2013 survey, but none is in Final-NNR				
	Snowball cactus (*Pediocactus simpsonii* var. *robustior*)	2013 survey/ JBLM YTC	<0.1 acres documented during 2013 survey, but none is in Final-NNR				

[1]Data sources include 2011/2013 field surveys and special status plant data from the WNHP (2013) and BLM (M. Boyter, May 2013). There is no unknown habitat on federal or WSDOT lands within the NNR, due to nearly complete habitat accessibility. Habitat suitability corresponds to values shown in Appendix B.
[2]Trace is indicated where habitat land area was 0.49 acre or less.

Ute ladies'-tresses (*Spiranthes diluvialis*) was surveyed during July 25-27, 2013 in the two wetlands located on federal lands at the time of surveys. One wetland is located in Final-NNR-2. The other wetland is located near Final-NNR-6, but is no longer inside the ROW. During the mid-May 2013 survey, both locations appeared to have marginal habitat for Ute ladies'-tresses consisting of disturbed wetlands. Surveys were conducted during the appropriate time of year at both wetlands to verify presence or absence of the species. Two botanists thoroughly surveyed both small wetland areas to ensure 100% survey, and no Ute ladies'-tresses plants were found. In addition, both wetlands appeared to have even less suitable habitat by the time the wetlands were revisited in late-July. One portion of the wetland in Final-NNR-2 was completely dry by late July and the second portion was dominated by noxious weeds and invasive species, such as purple loosestrife (*Lythrum salicaria*). For the second wetland located near Final-NNR-6 (outside of the ROW), the potential Ute ladies'-tresses habitat was dry by mid-July and completely dominated by perennial pepperweed (*Lepidium latifolium*)

The Final-NNR-2 wetland is bisected by a paved road in the JBLM YTC Cantonment Area. The north side of the road has a small drainage pond with standing water and tall herbaceous and woody vegetation, which abruptly changes to upland habitat on the wetland edge. The south side of the road is a small wetland shaded by trees that was completely dry by late July. A drainage culvert connects the wetland. Vegetation present included species such as narrowleaf willow (*Salix exigua*), purple loosestrife, water speedwell (*Veronica anagalis-aquatica*), mountain rush (*Juncus arcticus* ssp. *littoralis*), common rush (*Juncus effusus*), slenderbeak sedge (*Carex athrostachya*), water horsetail (*Equisetum fluviatile*), and hardstem bulrush (*Schoenoplectus acutus* var. *acutus*).

The wetland in Preliminary-NNR-4 that was visited is closest to Final-NNR-6, but since it is 1.0 mile away from Final-NNR-6 this wetland is no longer relevant to the SDEIS. This wetland is along Foster Creek and water is present at the bottom of this narrow, steep ravine. Herbaceous wetland vegetation is only present at the bottom of the ravine, although trees and shrubs associated with wetlands occur between the bottom and top of the ravine. This is the same location where longsepal globemallow was documented. There is an area that was wet in mid-May adjacent and east of the ravine, but it had completely dried up by late-July and completely dominated by perennial pepperweed, a noxious weed. Several bird nests were observed in shrubs and trees in Foster Creek. Vegetation present included species such as black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), willow (*Salix* spp.), chokecherry (*Prunus virginiana*), Lewis' mock orange (*Philadelphus lewisii*), panicled bulrush (*Scirpus microcarpus*), field horsetail (*Equisetum arvense*), Kentucky bluegrass (*Poa pratensis*), western columbine (*Aquilegia formosa*), and western white clematis (*Clematis ligusticifolia*).

Late July 2013 photograph of NNR–2 wetland (north side of paved road)

Late July 2013 photograph of NNR–2 wetland (south side of paved road)

Mid-May 2013 photograph of NNR–6 wetland

Late-July 2013 photograph of NNR–6 wetland (from a distance) and the adjacent perennial pepperweed field in area that was wet in mid-May

The special status plant species and habitat suitability information that is still current for the Final-NNR should be used to assess potential effects of the proposed Project to special status plant species on federal lands. In addition, WNHP data on special status plant occurrences that are mapped as intersecting the Final-NNR ROW corridor should be included in comparing potential effects, although most of these occurrences include large buffers so it is difficult to accurately determine whether these occurrences truly intersect the ROW.

4.0 RECOMMENDATIONS

Pacific Power is committed to protecting and preserving special status plants during construction, operation, and maintenance of the proposed Project. A Special Status Plant Protection Plan will be developed and incorporated into the final Plan of Development (POD) for the proposed 230 kV Vantage to Pomona Transmission Line Project. The Plan will be developed in consultation with the agencies and will describe:

- Regulations related to special status plant management;
- List of all special status plants suspected to occur in the Project area, and whether they are also known to occur within the ROW corridor;
- Procedures for pre-construction special status plant surveys; and
- Procedures for minimizing and avoiding special status plant occurrences during construction, operations, and maintenance activities for the proposed Project.

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APPENDIX A – LIST OF TARGET SPECIAL STATUS PLANT SPECIES

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APPENDIX A LIST OF TARGET SPECIAL STATUS PLANT SPECIES

SCIENTIFIC NAME	COMMON NAME	STATUS[1,2,3]	SUS/DOC ON BLM OR JBLM YTC[4]	DOC[1] WITHIN 0.25 MILE OF ALL ALT. ROUTES[5]	HABITAT REQUIRED[6]	PHENOLOGY[6]	LATE-APRIL/MID-MAY TARGET	MID-JUNE/MID-JULY TARGET	LATE-JULY/AUGUST TARGET
Aliciella leptomeria	Great Basin gilia	WT			Open sandy or rocky areas; dry open places at low elevations, especially in sandy or sandy soil, gravelly bluffs, and on caliche; associated with sagebrush steppe; 470-6,890 ft.	mid May to June	X		
Allium bisceptrum	twincrest onion	BLM-S, WS	SUS		Meadows and aspen groves, less frequently on open slopes.	June to July		X	
Allium constrictum	constricted Douglas' onion	BLM-S	DOC		Rocky benches; vernally moist areas on flat basalt and drier lithosols and around the margins of rocky vernal ponds. Grows in stiff sagebrush/Sandberg's bluegrass habitat type; 2,070-2,550 ft.	May to July	X	X	
Ammannia robusta	grand redstem	BLM-S, WT	SUS		Moist, heavy soil around ponds, rivers, and other wet places; deep sandy loam to gravelly soils. Along the Columbia River in riparian mudflat wetlands dominated by annual species.	May to July	X	X	
Anagallis minima	chaffweed	WS			Moist ground or around vernal pools from the coast to the interior valleys; 400-2,340 ft.	May to August (September)	X	X	X
Antennaria parvifolia	Nuttall's pussy-toes	BLM-S, WS	DOC		Dry open areas, often sandy or in Ponderosa pine forest openings.	May to July	X	X	
Artemisia borealis var. wormskioldii	Wormskiold's northern wormwood	C, BLM-S, WE	SUS		Sandy soil with cobble on low ground along Columbia River; sandy soil with cobbles, on low ground near the edge of the river.	April to May	X		
Astragalus arrectus	Palouse milk-vetch	BLM-S, WT	SUS		Grassy hillsides to sagebrush flats, river bluffs, and open ponderosa pine/Douglas-fir forests in grassy or shrub dominated openings; 1,000-4,000 ft.	(late April) May to June (early July)	X	X	
Astragalus columbianus	Columbia milk-vetch	SOC, BLM-S, WS	DOC	DOC	Dry often sandy places with sparse vegetation usually on slopes but sometimes on flats; associated with shrub-steppe vegetation zone; 500-2,100 ft.	March to May	X	X	
Astragalus geyeri	Geyer's milk-vetch	BLM-S, WT	DOC	DOC	Arid sandy soils, flat to dunes; sandy desert, especially on dunes; 630-670 ft.	April to July	X	X	

SCIENTIFIC NAME	COMMON NAME	STATUS[1,2,3]	SUS/DOC ON BLM OR JBLM YTC[4]	DOC[1] WITHIN 0.25 MILE OF ALL ALT. ROUTES[5]	HABITAT REQUIRED[6]	PHENOLOGY[6]	LATE-APRIL/MID-MAY TARGET	MID-JUNE/MID-JULY TARGET	LATE-JULY/AUGUST TARGET
Astragalus microcystis	least bladdery milk-vetch	BLM-S, WS	DOC		Open prairies, foothills, and ponderosa pine forests.	May to July	X	X	
Astragalus misellus var. pauper	Pauper milk-vetch	BLM-S, WS	DOC	DOC	Sagebrush steppe, often in low sage open areas; open ridgetops and upper slopes, and rarely middle and lower slopes; 500-3,000 ft.	April to June		X	
Astragalus sinuatus	Whited's milk-vetch	BLM-S, WE	DOC		Rocky hillsides with sagebrush	April to June	X	X	
Camissonia pygmaea	dwarf evening-primrose	BLM-S, WS	DOC	DOC	Sagebrush and lower foothills; unstable soil or gravel in steep talus slopes, dry washes, banks and roadcuts; growing with big sagebrush and wild buckwheat.	May to July		X	
Camissonia scapoidea ssp. scapoidea	naked-stemmed evening-primrose	BLM-S, WS	DOC	DOC	Mostly in the sagebrush desert; especially on rocky or sandy soil; 600-900 ft.	May to July	X	X	
Carex comosa	bristly sedge	BLM-S, WS	DOC		Marshes, lake shores, and wet meadows; 50-2,000 ft.	May to August	X	X	X
Carex macrochaeta	large-awn sedge	BLM-S, WT	SUS		Marshes, shores and other moist or wet open places, often near the beach.	mid-May to July; summer	X	X	
Cistanthe rosea	rosy pussypaws	BLM-S, WT	SUS		Sagebrush desert to arid montane forest; within low swales in sandy soil among big sagebrush; 520-530 ft.	May to June	X	X	
Collomia macrocalyx	bristle-flowered collomia	BLM-S, WS	DOC	DOC	Dry, open places at lower elevations; sparsely vegetated and associated with sagebrush steppe; a cryptogram crust is present on the rocks and soil; early spring, flowers ephemeral; 850-2,100 ft.	April to May	X		
Cryptantha flaccida (recently changed from *C. rostellata*)	weakstem cryptantha	BLM-S, WT	DOC	DOC	Dry, open places; 600-2,900 ft.	April to June	X		
Cryptantha gracilis	narrow-stem cryptantha	BLM-S, WS	DOC		Talus and pockets of silt; associated with sagebrush steppe; in Washington this species has been found in talus and pockets of silt; 1,250-2,680 ft.	May to June	X	X	

SCIENTIFIC NAME	COMMON NAME	STATUS[1,2,3]	SUS/DOC ON BLM OR JBLM YTC[4]	DOC[1] WITHIN 0.25 MILE OF ALL ALT. ROUTES[5]	HABITAT REQUIRED[6]	PHENOLOGY[6]	LATE-APRIL/MID-MAY TARGET	MID-JUNE/MID-JULY TARGET	LATE-JULY/AUGUST TARGET
Cryptantha leucophaea	gray cryptantha	SOC, BLM-S, WS	DOC	DOC	Dry, often sandy places; with sparse vegetation, usually on slopes but sometimes on flats; near the Columbia and lower Yakima rivers; 300-2,500 ft.	April to May	X		
Cryptantha scoparia	miner's candle	BLM-S, WS	DOC	DOC	Dry, open slopes and flats, commonly among sagebrush; gravel bars and alluvial slopes and thin gravelly soil over basalt; 1,200-1,280 ft.	May to July	X	X	
Cryptantha spiculifera	Snake River cryptantha	BLM-S, WS	DOC	DOC	Sandy knolls and badlands and talus at low elevations; dry, open, flat or sloping areas in stable or stony soils.	April to July	X	X	
Cuscuta denticulata	desert dodder	WT			Occurs on various shrubs (*Artemisia* and *Chrysothamnus*) within desert areas; 880 ft.	June to September		X	X
Eatonella nivea	white eatonella	WT	DOC		Dry, sandy desert or volcanic areas; populations are on bare soil in sparsely vegetated sagebrush steppe, associated with other annuals.	April to May	X		
Eleocharis rostellata	beaked spike-rush	WS	DOC	DOC	Marshes and boggy sites around lakes, in alkaline or highly calcareous areas, often around hot springs; also in coastal salt marshes; 500-1,850 ft.	June to September		X	X
Erigeron basalticus	basalt daisy	SOC, BLM-S, WT	DOC	DOC	Cliff crevices on basalt cliffs, in rocky canyons; Yakima River and Selah Creek. Associated with the Yakima Basalt Formation, which occurred during the late Miocene; 1,250-1,500 ft.	May to June	X	X	
Erigeron piperianus	Piper's daisy	BLM-S, WS	DOC	DOC	Dry, open places, often among sagebrush; 400-2,250 ft.	May to June	X	X	
Eriogonum codium	Umtanum desert buckwheat	T, BLM-S, WE	SUS		Flat to gently sloping microsites near the top of the steep, north-facing basalt cliffs near salt scrub habitats overlooking the Columbia River; restricted to the exposed top of the basalt Lolo Flow. Assoc. include spiny hopsage, *Phacelia linearis, Cryptantha pterocarya, Camisonia minor*, and cheatgrass; 1,100-1,320 ft.	May to late-August	X	X	
Hackelia diffusa var. diffusa	diffuse stickseed	BLM-S, WT	DOC		Shaded areas, cliffs, talus, wooded flats, and slopes; along and near the Columbia River; 300-1,200 ft.	May to June	X	X	
Hackelia hispida var. disjuncta	sagebrush stickseed	BLM-S, WS	DOC		Rocky, unstable talus slopes and cliffs, usually with little other vegetation; 600-2,100 ft.	May to July	X	X	

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Heterotheca oregona var. oregona	Oregon goldenaster	BLM-S, WT	SUS		On sand and gravel bars along rivers; chiefly west of the Cascade Mountains but also occasionally along their eastern base; 2,600 ft.	June to September		X	
Iliamna longisepala	longsepal globemallow	BLM-S, WS	DOC	DOC	Dry open hillsides and gravelly streamsides of sagebrush and open ponderosa pine forests; lower levels on the east side of the Cascade Mountains; 500-4,500 ft.	June to September		X	
Juncus hemiendytus var. hemiendytus	dwarf rush	WT			Mud flats, the edge of vernal pools, and moist to wet meadows; 2,300-2,430 ft.	May to July	X	X	
Juncus howellii	Howell's rush	BLM-S, WT	SUS		Moist ground in the mountains; 2,840 ft.	July to August			X
Juncus uncialis	inch-high rush	BLM-S, WS	DOC		Open fields to montane meadows; swales, moist places and vernal pools; associated with channeled scablands and mound and swale topography; 2,100-2,290 ft.	June to August		X	X
Lipocarpha aristulata	awned halfchaff sedge	BLM-S,WT	SUS	DOC	Wetlands along the Columbia River, wet soil and mud in bottomlands; sandbars and beaches; 328-1,312 ft.	June to September		X	X
Lobelia kalmii	Kalm's lobelia	WE	DOC	DOC	Marl or peat bogs, along shores and in other wet places.	late July to August			X
Loeflingia squarrosa var. squarrosa	loeflingia	WT			Low swales within sandy areas and associated with *Artemisia tridentata*; 400-500 ft.	May	X		
Lomatium serpentinum	Snake Canyon desert-parsley	BLM-S, WS	DOC		Lower elevations just above river level in moderately deep sandy or rocky soil and/or open rocky slopes.	April to June (July)	X	X	
Lomatium tuberosum	Hoover's desert-parsley	SOC, BLM-S, WS	DOC	DOC	Loose rocky slopes and basalt drainage channels; rocky hillsides; 600-2,300 ft.	March to May	X		
Micromonolepis pusilla	red poverty-weed	WT			Desert regions, often on alkaline soils; salt-encrusted soil around/beneath *Sarcobatus* shrubs; 1,950-2,210 ft.	April to June	X	X	
Mimulus suksdorfii	Suksdorf's monkey-flower	BLM-S, WS	DOC	DOC	Open, moist or rather dry places, from the valleys and foothills to rather high elevations in the mountains; associated with sagebrush steppe.	May to August	X	X	

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Minuartia nuttallii ssp. fragilis	Nuttall's sandwort	BLM-S, WT	DOC	DOC	Dry basalt scree slopes, open, gravelly benches, or limestone talus from open sagebrush hills to alpine slopes; 5,413-7,874 ft.	April to May (August)	X	X	
Nicotiana attenuata	coyote tobacco	BLM-S, WS	DOC	DOC	Dry, sandy bottom lands, dry rocky washes, and in other dry open places; 400-10,000 ft.	June to August		X	
Oenothera caespitosa ssp. caespitosa	caespitose evening-primrose	BLM-S, WS	DOC	DOC	Talus slopes, road cuts, and dry hills; as well as along the flat river terrace of the Columbia River; associated with *Artemisia tridentata* or *Artemisia rigida*; 400-1,200 ft.	June to August	X	X	
Ophioglossum pusillum	Adder's-tongue	BLM-S, WT	DOC		Meadows, pastures, old fields, roadside ditches, and flood plain woods in seasonally wet, rather acid soil; circumboreal, but not at the highest latitudes; 40-2,300 ft.	June to September		X	
Orthotrichum praemorsum	bryophyte	SOC, WE			Rocks, rarely lava, dry montane areas; middle elevations		X	X	
Oxytropis campestris var. wanapum	Wanapum crazyweed	SOC, BLM-S, WE	DOC		Gravelly floodplains of the Columbia River; big sagebrush/bluebunch wheatgrass.	May to June	X		
Pediocactus simpsonii var. robustior	snowball cactus	BLM-S, WS	DOC	DOC	Thin, rocky soil on ridge tops, desert valleys, and low mountains; found at elevations from 1000 to 4000 feet in Washington; associated with *Artemisia rigida*.	May to August	X	X	X
Penstemon eriantherus var. whitedii	fuzzytongue penstemon	BLM-S, WS	DOC		Dry, open places in between shrubs; in the plains, valleys, and foothills, sometimes ascending to moderate elevations in the mountains; associated with *Artemisia tridentata*, *Purshia tridentata*, *Salvia dorrii*, *Eriogonum* sp., and *Chrysothamnus nauseosus*; 525-3,835 ft.	May to June	X	X	
Penstemon wilcoxii	Wilcox's penstemon	BLM-S, WS	SUS		West facing slopes of small canyons, and in dry and rocky habitats; open or often wooded, sometimes rocky places, from the foothills to moderate elevations in the mountains; associated species include *Holodiscus*	May to June (July)	X	X	

SCIENTIFIC NAME	COMMON NAME	STATUS[1,2,3]	SUS/DOC ON BLM OR JBLM YTC[4]	DOC[1] WITHIN 0.25 MILE OF ALL ALT. ROUTES[5]	HABITAT REQUIRED[6]	PHENOLOGY[6]	LATE-APRIL/MID-MAY TARGET	MID-JUNE/MID-JULY TARGET	LATE-JULY/AUGUST TARGET
					discolor, *Physocarpus malvaceus*, *Rosa* sp., and *Symphoricarpos albus*; 2,300-4,200 ft.				
Phacelia tetramera	dwarf phacelia	BLM-S, WS	DOC		Alkaline flats, sinks, depressions, and washes; occurs in *Artemisia tridentata/Poa secunda* and *Artemisia rigida/Poa secunda* plant communities; 1,200-2,200 ft.	April to June	X	X	
Physaria douglasii ssp. tuplashensis	White Bluffs bladderpod	T (but not known to project counties), BLM-S, WT	SUS		Big sagebrush/bluebunch wheatgrass association, restricted to dry, barren, nearly vertical exposures of calcium carbonate soil.	June to July		X	
Pinus albicaulis	whitebark pine	C, BLM-S			A timberline tree, rarely below 4,500-5,000 ft.	Year round	X	X	X
Polyctenium fremontii var. fremontii	Fremont's combleaf	BLM-S, WT	DOC		Gravelly clay, sagebrush desert, damp or wet meadows, near shallow ponds, stony swales, dried vernal pools, and banks and beds of vernal streamlets. In Washington the species occurs on a plateau, close to a road in the shallow silty loam soil of a vernal pond depression within sagebrush steppe and lithosol communities; 2,300 ft.	May to June	X	X	
Polygonum austiniae	Austin's knotweed	WT			Dry to moist flats or banks, from the sagebrush plains into the lower mountains, often in *Pinus ponderosa* forest.	June to August		X	X
Rorippa columbiae	Columbia Cress	BLM-S, WE	DOC	DOC	Moist, sandy or cobbly soil, such as river floodplains and ephemeral ponds. Associated with the Columbia River, snow -fed streams and lakes, wet meadows, irrigation ditches and roadside ditches; apparently requires wet soil throughout the growing season.	(April) July to October			X
Rotala ramosior	lowland toothcup	BLM-S, WT	SUS		Wet, swampy places, lakes and pond margins, and along free-flowing river reaches in association with *Juncus* and *Eleocharis* species; 200-2,259 ft.	June to August		X	X
Scouleria marginata	marginate splashzone moss	BLM-S, WT	DOC		On rocks in streams and rivers in splash zone	July to October			X

SCIENTIFIC NAME	COMMON NAME	STATUS[1,2,3]	SUS/DOC ON BLM OR JBLM YTC[4]	DOC[1] WITHIN 0.25 MILE OF ALL ALT. ROUTES[5]	HABITAT REQUIRED[6]	PHENOLOGY[6]	LATE-APRIL/MID-MAY TARGET	MID-JUNE/MID-JULY TARGET	LATE-JULY/AUGUST TARGET
Sidalcea oregana var. calva	Wenatchee Mountain checker-mallow	E (but not for project counties), WE	SUS		Dry forests to moist meadows; sagebrush plains, meadowland, and ponderosa pine forest; 1,900-3,200 ft.	May to June (mid-August)		X	
Silene seelyi	Seely's silene	SOC, BLM-S, WS	SUS		Cliffs and talus slopes; basalt and granitic crevices on rock outcrops in absence of other species; 1,500-7,000 ft.	May to August	X	X	
Sisyrinchium sarmentosum	pale blue-eyed grass	SOC, BLM-S, WT	SUS		Dry to moist meadows, swampy areas, sea level to moderate elevations in the mountains.	July to August		X	
Spiranthes diluvialis	Ute ladies'-tresses	T, WE	SUS		Moist meadow habitats along floodplains, oxbows, and stream and river terraces; subirrigated or spring-fed abandoned stream channels and valleys; and lakeshores; specifically, swales, narrow meander channels, and similar wetland and riparian habitats in valley bottom landscapes that retain moisture through late-summer.	mid-July to August			X
Spiranthes porrifolia	western ladies-tresses	BLM-S, WS	SUS		Moist swampy areas, wet meadows, along streams, in bogs, and on seepage slopes. At some Washington locations, is known to be associated with special status plant species *Ophioglossum pusillum*.	(May) July to September		X	X
Tauschia hooveri	Hoover's tauschia	SOC, BLM-S, WT	DOC	DOC	Sagebrush scablands, often barren rocky clay.	March to May	X		

[1]ISSSSP=Inter-agency Special Status / Sensitive Species Program species (ISSSSP) 2008a,b; 2012, [2]WNHP 2012a,b,c; and [3]USFWS, 2012, 2013a,b,c. [4]Habitat required and phenology data are based on Hitchcock et al. (1969), Hitchcock and Cronquist (1973), WNHP and BLM (2005), WNHP (2013), Camp and Gamon (2011), and USFWS (2013c). Key: ft = feet; E – Federal Endangered; T – Federal Threatened; C – Federal Candidate; P – Federal Proposed; SOC – Federal Species of Concern; BLM-S – BLM Washington Sensitive; BLM-C – BLM Washington Candidate; WE – Washington State Endangered; WT – Washington State Threatened; WC – Washington State Candidate, and WS – Washington State Sensitive. SUS/DOC (suspected or documented) on BLM or JBLM YTC[4] is based on ISSSSP (2008a,b and 2012) and Fort Lewis Directorate of Public Works (2010). DOC within 0.25 mile or within TRS of Alternates[5] is based on data which was accessed from the Washington Natural Heritage Program (WNHP 2010, 2013) and BLM (M. Boyter, March 2011 and May 2013). Habitat required and phenology data[6] are based on Hitchcock et al. (1969), Hitchcock and Cronquist (1973), WNHP and BLM (2005), WNHP (2010), and Camp and Gamon (2011).

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APPENDIX B – HABITAT WITHIN THE ROW CORRIDOR AND SUITABILITY FOR SPECIAL STATUS PLANT SPECIES, BY ROUTE SEGMENT

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APPENDIX B HABITAT WITHIN THE FINAL-NNR ROW CORRIDOR AND SUITABILITY FOR SPECIAL STATUS PLANT SPECIES[1], BY LAND OWNERSHIP (IN ACRES)[2].

HABITAT DESCRIPTION	NNR – 1		NNR – 2		NNR – 3		NNR – 4O/ NNR-4U		NNR – 5		NNR – 6O/ NNR-6U		NNR – 7		NNR – 8		MR – 1	
	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	PUBLIC	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER
Agriculture		0.5															T	
Developed, Road, or Firebreak	T	13.5	22.3	0.6	0.6	0.6	1.0	T	1.7				T		1.2	0.9	47.7	
Irrigation Canal									T									
Noxious Weeds	1.7	T	13.1		T	T	11.8		0.9						T			
Turf Grass			1.8															
Planted Trees/ Watered Poplar		T	3.0															
Water Body		T													T	7.9		
TOTAL UNSUITABLE	1.8	14.5	40.2	0.6	0.7	0.6	12.8	T	2.6	0.0	0.0	0.0	T	0.0	1.3	8.8	47.7	0.0
Annual Grassland			15.0	T	42.0	5.1	1.0	12.0							5.6	3.7	31.8	56.8
Perennial Grassland			2.7		7.7	1.2	1.8				7.2				2.1			
Rabbitbrush/ Annual Grassland	T	T	4.1	T											T			
Sagebrush/ Annual Grassland			8.5		1.1	6.4	3.8	9.3							0.9	0.9		
TOTAL MARGINAL	T	T	30.3	T	50.7	12.7	6.6	21.3	0.0	0.0	7.2	0.0	0.0	0.0	9.1	4.6	31.8	56.8
Basalt cliff/rock					3.3	1.1									T			
Bitterbrush/ Perennial Grass							1.1											
Forb							2.5				14.6							
Forested Riparian			T			T												
Intermittent Stream or Dry Gully		0.6			T	T	T	T	0.7									
Native Trees					T	T												
Non-Forested Riparian			T			T									T	T		
Sagebrush/ Perennial Grassland	1.1	6.7	19.9		22.5	76.1	37.7	T	29.1		95.3		149.5		21.7	3.8	72.6	6.6
TOTAL SUITABLE	1.1	7.3	20.0	0.0	26.1	77.7	41.4	T	29.8	0.0	109.9	0.0	149.5	0.0	22.1	3.9	72.6	6.6
Grassland		4.3																
Shrubland		14.5																

HABITAT DESCRIPTION	NNR – 1		NNR – 2		NNR – 3		NNR – 4O/ NNR-4U		NNR – 5		NNR – 6O/ NNR-6U		NNR – 7		NNR – 8		MR – 1	
	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	PUBLIC	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER	PUBLIC	OTHER
TOTAL UNKNOWN SUITABILITY	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRAND TOTAL	2.8	40.6	90.5	0.7	77.6	91.1	60.8	21.7	32.4	0.0	117.1	0.0	149.6	0.0	32.6	17.4	152.1	63.4

[1]Suitability for special status plant species is defined as the potential of each habitat to support special status plant species listed in Appendix A. Unsuitable habitats have zero potential to support any of the special plant species. Marginal habitats have potential to support fringe habitat for some of the special status plant species, and/or are generally lower quality habitats in the field. Suitable habitats have the potential to support characteristic habitat for some of the special status plant species, and/or are generally higher quality habitats in the field. Habitats with unknown suitability do not provide enough information to designate them into the marginal or suitable habitats, but do have enough information to determine they are not unsuitable. Since the DEIS, "perennial grassland" has been changes from unknown to marginal, and several other values have also been added.

[2]Habitats are based on survey results on federal and state lands (PUBLIC) and estimates of non-federal lands based on aerial interpretation (OTHER). Trace (T) is indicated where land area was 0.49 or less acres.

APPENDIX C - LIST OF PLANT COMMUNITIES AND ASSOCIATED ROUTE SEGMENTS

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APPENDIX C LIST OF PLANT COMMUNITIES DOCUMENTED DURING 2013 SURVEYS

HABITAT	PLANT COMMUNITY OR DOMINANT SPECIES PRESENT-COMMON NAME	PLANT COMMUNITY OR DOMINANT SPECIES PRESENT-SCIENTIFIC NAME	PRIORITY	PRELIMINARY-NNR SEGMENT(S)	CORRESONDING FINAL-NNR SEGMENT(S)
Perennial grasslands	Crested wheatgrass*	*Agropyron cristatum*		NNR-1, NNR-2, NNR-4	NNR-1, NNR-2, NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Sagebrush/perennial grass areas	Stiff sagebrush-Bluebunch wheatgrass*	*Artemisia rigida-Pseudoroegneria spicata*		NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Sagebrush/perennial grass areas	Stiff sagebrush- Sandberg bluegrass*	*Artemisia rigida-Poa secunda*	3	NNR-3, NNR-4	NNR-3, NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Sagebrush/perennial grass areas	Big sagebrush-Bluebunch wheatgrass*	*Artemisia tridentata-Pseudoroegneria spicata*	3	NNR-1, NNR-2, NNR-3, NNR-4, NNR-5	NNR-1, NNR-2, NNR-3, NNR-4o/NNR-4u, NNR-5, NNR-7, NNR-8, and MR-1
Sagebrush/annual grass areas	Big sagebrush-Cheatgrass*	*Artemisia tridentata-Bromus tectorum*		NNR-2, NNR-3, NNR-5	NNR-2, NNR-3, and NNR-8
Sagebrush/perennial grass areas - Non-native	Big sagebrush-Bulbous bluegrass*	*Artemisia tridentata-Poa bulbosa*		NNR-3	NNR-3
Sagebrush/perennial grass areas	Big sagebrush-Idaho fescue*	*Artemisia tridentata-Festuca idahoensis*	3	NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Sagebrush/perennial grass areas	Big sagebrush-Sandberg bluegrass*	*Artemisia tridentata-Poa secunda*	3	NNR-4, NNR-5	NNR-4o/NNR-4u, NNR-5, NNR-7, NNR-8, and MR-1
Sagebrush/perennial grass areas	Big sagebrush-Needle and thread*	*Artemisia tridentata-Hesperostipa comata*	1	NNR-3	NNR-3
Annual grasslands	Non-native annual grassland*	*Bromus tectorum*		NNR-2, NNR-3, NNR-4	NNR-2, NNR-3, NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Noxious weeds	Non-native perennial grassland*	*Centaurea sp.*		NNR-2	NNR-2
Rabbitbrush/annual grass areas	Rubber rabbitbrush-Cheatgrass*	*Ericameria nauseosa -Bromus tectorum*		NNR-2, NNR-5	NNR-2, NNR-8
Perennial grasslands	Needle and thread-Sandberg bluegrass	*Hesperostipa comata-Poa secunda*	1	NNR-5	NNR-8
Perennial grasslands	Sandberg bluegrass-Narrowleaf mock goldenweed*	*Poa secunda-Nestotus stenophyllus*		NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Perennial grass areas - Non-native	Bulbous bluegrass-Cheatgrass*	*Poa bulbosa-Bromus tectorum*		NNR-2	NNR-2
Forested Riparian	Black cottonwood-?	*Populus balsamifera ssp. trichocarpa-?*		NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Forested Riparian	Black cottonwood-Coyote	*Populus balsamifera ssp.*		NNR-2	NNR-2

HABITAT	PLANT COMMUNITY OR DOMINANT SPECIES PRESENT-COMMON NAME	PLANT COMMUNITY OR DOMINANT SPECIES PRESENT-SCIENTIFIC NAME	PRIORITY	PRELIMINARY-NNR SEGMENT(S)	CORRESONDING FINAL-NNR SEGMENT(S)
	willow	*trichocarpa-Salix exigua*			
Perennial grasslands	Bluebunch wheatgrass*	*Pseudoroegneria spicata*		NNR-1, NNR-4	NNR-1, NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Perennial grasslands	Bluebunch wheatgrass-Hooker's balsamroot*	*Pseudoroegneria spicata-Balsamorhiza hookeri*		NNR-3	NNR-3
Perennial grasslands	Bluebunch wheatgrass-Stiff sagebrush*	*Pseudoroegneria spicata-Artemisia rigida*		NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Perennial grasslands	Bluebunch wheatgrass-Cheatgrass*	*Pseudoroegneria spicata-Bromus tectorum*		NNR-3	NNR-3
Bitterbrush	Antelope bitterbrush-Bluebunch wheatgrass*	*Purshia tridentata-Pseudoroegneria spicata*	2	NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1
Non-forested Riparian	Coyote willow	*Salix exigua*		NNR-4	NNR-4o/NNR-4u, NNR-5, NNR-7, and MR-1

[1]Plant community names are predominantly based on Steppe Vegetation of Washington (Daubenmire 1970). Where it is not based on Daubenmire 1970, it is based on documenting the dominant tree, shrub, grass, and/or forb species present. An asterisk (*) indicates that the community is a dominant community in at least one link within the ROW corridor. Priority plant community status is based on list of 2009 WNHP Priority Rare Plant Communities or Wetlands http://www1.dnr.wa.gov/nhp/refdesk/plan/CommunityList.pdf (WNHP 2009).

APPENDIX D – List of Plant Species Documented on Federal Lands Within the ROW Corridor, by Route Segment

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APPENDIX D LIST OF PLANT SPECIES DOCUMENTED ON FEDERAL AND WSDOT LANDS WITHIN THE PRELIMINARY-NNR ROW CORRIDOR AND CORRESPONDING FINAL-NNR ROUTE SEGMENTS.[1]

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Asteraceae	ACMI2	*Achillea millefolium*	Common yarrow	X	X	X	X	D
Poaceae	ACHY	*Achnatherum hymenoides*	Indian ricegrass		X	X	X	X
Poaceae	ACLE8	*Achnatherum lemmonii*	Lemmon's needlegrass		X		X	
Poaceae	ACTH7	*Achnatherum thurberianum*	Thurber's needlegrass	X	X	D	X	X
Asteraceae	ACRE3	*Acroptilon repens*	Russian knapweed		D			
Lamiaceae	AGUR	*Agastache urticifolia*	Nettleleaf giant hyssop				X	
Asteraceae	AGHE2	*Agoseris heterophylla*	Annual agoseris		X		X	
Poaceae	AGCR	*Agropyron cristatum*	Crested wheatgrass	D	D	D	X	
Poaceae	AGSC5	*Agrostis scabra*	Rough bentgrass		X			
Alismataceae	ALTR7	*Alisma triviale*	Northern water plantain		X			
Liliaceae	ALAC4	*Allium acuminatum*	Tapertip onion		X	X	X	X
Liliaceae	ALAM2	*Allium amplectens*	Slim-leaf onion					X
Poaceae	ALAE	*Alopecurus aequalis*	Shortawn foxtail				X	
Brassicaceae	ALAL3	*Alyssum alyssoides*	Pale madwort		X	X	X	
Amaranthaceae	AMAL	*Amaranthus albus*	Prostrate pigweed		X			
Amaranthaceae	AMRE	*Amaranthus retroflexus*	red-root pigweed					X
Rosaceae	AMAL2	*Amelanchier alnifolia*	Saskatoon serviceberry			X	X	X
Boraginaceae	AMSIN	*Amsinckia sp.*	Fiddleneck				X	
Boraginaceae	AMTE3	*Amsinckia tessellata*	Bristly fiddleneck		X	X	X	X
Asteraceae	ANMA	*Anaphalis margaritacea*	Western pearly everlasting		X			
Asteraceae	ANDI2	*Antennaria dimorpha*	Low pussytoes	X	X	X	X	X
Asteraceae	ANMI3	*Antennaria microphylla*	Littleleaf pussytoes			X	X	
Asteraceae	ANRO2	*Antennaria rosea*	Rosy pussytoes			X		
Ranunculaceae	AQFO	*Aquilegia formosa*	Western columbine				X	
Brassicaceae	ARCU	*Arabis cusickii*	Cusick's rockcress				X	
Brassicaceae	ARLE	*Arabis lemmonii*	Lemmon's rockcress			X	X	
Brassicaceae	ARABI2	*Arabis sp.*	Rockcress			X	X	
Brassicaceae	ARSP	*Arabis sparsiflora*	Sicklepod rockcress				X	
Asteraceae	ARCTI	*Arctium sp.*	Burdock		X			
Caryophyllaceae	ARFR	*Arenaria franklinii*	Franklin's sandwort				X	
Asteraceae	ARFU3	*Arnica fulgens*	Foothill arnica			X	X	
Asteraceae	ARDR4	*Artemisia dracunculus*	Tarragon			X		
Asteraceae	ARLU	*Artemisia ludoviciana*	White sagebrush			X	X	

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Asteraceae	ARRI2	*Artemisia rigida*	Scabland sagebrush			D	D	D
Asteraceae	ARTR2	*Artemisia tridentata*	Big sagebrush	D	D	D	D	D
Asteraceae	ARTRT	*Artemisia tridentata ssp. tridentata*	Basin big sagebrush			D	D	X
Asteraceae	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	Wyoming big sagebrush		D	D	D	D
Asteraceae	ARTR4	*Artemisia tripartita*	Threetip sagebrush			X		
Asclepiadaceae	ASSP	*Asclepias speciosa*	Showy milkweed		X	X	X	
Liliaceae	ASOF	*Asparagus officinalis*	Garden asparagus					X
Boraginaceae	ASPR	*Asperugo procumbens*	German-madwort				X	
Fabaceae	ASCA12	*Astragalus caricinus*	Buckwheat milkvetch		X	X	X	X
Fabaceae	ASCO11	*Astragalus conjunctus*	Idaho milkvetch			X	X	
Fabaceae	ASFI	*Astragalus filipes*	Basalt milkvetch	X	X	X	X	X
Fabaceae	ASLE8	*Astragalus lentiginosus*	Freckled milkvetch				X	
Fabaceae	ASMIP	*Astragalus misellus var. pauper*	Pauper milkvetch			X		
Fabaceae	ASPU9	*Astragalus purshii*	Woollypod milkvetch	X	X	X	X	X
Fabaceae	ASSC6	*Astragalus sclerocarpus*	Stalked-pod milk-vetch					X
Fabaceae	ASTRA	*Astragalus sp.*	Milkvetch		X		X	
Fabaceae	ASSP7	*Astragalus speirocarpus*	Threadstalk milkvetch		X	X	X	X
Fabaceae	ASSU7	*Astragalus succumbens*	Columbia milkvetch					X
Chenopodiaceae	ATCA2	*Atriplex canescens*	Fourwing saltbush				X	
Asteraceae	BACA3	*Balsamorhiza careyana*	Carey's balsamroot		X	X	X	D
Asteraceae	BAHO	*Balsamorhiza hookeri*	Hooker's balsamroot			D	X	
Asteraceae	BARO2	*Balsamorhiza rosea*	Cutleaf balsamroot				D	X
Chenopodiaceae	BASC5	*Bassia scoparia*	Burningbush		X			X
Asteraceae	BROB	*Brickellia oblongifolia*	Mojave brickellbush			X	X	
Poaceae	BRAR5	*Bromus arvensis*	Field brome				X	X
Poaceae	BRCA5	*Bromus carinatus*	California brome				X	
Poaceae	BROMU	*Bromus sp.*	Brome				X	
Poaceae	BRTE	*Bromus tectorum*	Cheatgrass	X	D	D	D	D
Boraginaceae	BUAR3	*Buglossoides arvensis*	Corn gromwell			X		
Liliaceae	CAMA5	*Calochortus macrocarpus*	Sagebrush mariposa					X
Brassicaceae	CAMI2	*Camelina microcarpa*	littlepod false flax				X	
Onagraceae	CAAN14	*Camissonia andina*	Blackfoot River evening primrose				X	
Brassicaceae	CADR	*Cardaria draba*	Hoary cress		X		X	

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Asteraceae	CAAC	*Carduus acanthoides*	Spiny plumeless thistle		X		X	
Cyperaceae	CAAT3	*Carex athrostachya*	Slenderbeak sedge		X			
Cyperaceae	CADO2	*Carex douglasii*	Douglas' sedge				X	
Scrophulariaceae	CACE4	*Castilleja cervina*	Deer Indian paintbrush		X			
Scrophulariaceae	CASTI2	*Castilleja sp.*	Indian paintbrush				X	
Asteraceae	CEDI3	*Centaurea diffusa*	Diffuse knapweed	X	D	X	X	X
Caryophyllaceae	CERAS	*Cerastium sp.*	Chickweed				X	
Ranunculaceae	CETE5	*Ceratocephala testiculata*	Curveseed butterwort		X		X	
Asteraceae	CHDO	*Chaenactis douglasii*	Douglas' dustymaiden	X	X	X	X	X
Euphorbiaceae	CHGL13	*Chamaesyce glyptosperma*	Ribseed sandmat					X
Onagraceae	CHANA2	*Chamerion angustifolium ssp. angustifolium*	Fireweed					X
Brassicaceae	CHTE2	*Chorispora tenella*	Crossflower		X	X	X	
Polygonaceae	CHORI2	*Chorizanthe sp.*	Spineflower				X	
Asteraceae	CHVI8	*Chrysothamnus viscidiflorus*	Yellow rabbitbrush	X	X	X	X	D
Poaceae	CILA2	*Cinna latifolia*	Drooping woodreed				X	
Asteraceae	CIAR4	*Cirsium arvense*	Canada thistle	X	X		X	
Asteraceae	CIVU	*Cirsium vulgare*	Bull thistle				X	
Portulaceae	CLPE	*Claytonia perfoliata*	Miner's lettuce			X	X	
Portulaceae	CLAYT	*Claytonia sp.*	Springbeauty				X	
Ranunculaceae	CLLI2	*Clematis ligusticifolia*	Western white clematis	X	X	X	X	
Fabaceae	CLLU2	*Cleome lutea*	Yellow spiderflower					X
Scrophulariaceae	COPA3	*Collinsia parviflora*	Maiden blue eyed Mary		X	X	X	X
Polemoniaceae	COGR4	*Collomia grandiflora*	Grand collomia	X	X	X	X	
Polemoniaceae	COLI2	*Collomia linearis*	Tiny trumpet				X	
Santalaceae	COUM	*Comandra umbellata*	Bastard toadflax	X			X	X
Convulvulaceae	COAR4	*Convolvulus arvensis*	Field bindweed		X			X
Asteraceae	COCA5	*Conyza canadensis*	Canadian horseweed		X			
Asteraceae	CRAC2	*Crepis acuminata*	Tapertip hawksbeard			X	X	X
Asteraceae	CRAT	*Crepis atribarba*	Slender hawksbeard	X	X	X	X	
Asteraceae	CRIN4	*Crepis intermedia*	Limestone hawksbeard				X	
Asteraceae	CRMO4	*Crepis modocensis*	Modoc hawksbeard		X	X	X	
Asteraceae	CROC	*Crepis occidentalis*	Largeflower hawksbeard				X	
Asteraceae	CREPI	*Crepis sp.*	Hawksbeard					X
Boraginaceae	CRCI2	*Cryptantha circumscissa*	Cushion cryptantha				X	X

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Boraginaceae	CRFL4	*Cryptantha flaccida*	Weakstem cryptantha				X	
Boraginaceae	CRIN8	*Cryptantha intermedia*	Clearwater cryptantha			X		
Boraginaceae	CRPT	*Cryptantha pterocarya*	Wingnut cryptantha			X	X	X
Boraginaceae	CRSI2	*Cryptantha simulans*	Pinewoods cryptantha			X		
Boraginaceae	CRYPT	*Cryptantha sp.*	Cryptantha				X	X
Cuscutaceae	CUEP	*Cuscuta epithymum*	Clover dodder				X	
Ranunculaceae	DELI3	*Delphinium lineapetalum*	Thinpetal larkspur				X	
Ranunculaceae	DENU2	*Delphinium nuttallianum*	Twolobe larkspur					X
Ranunculaceae	DELPH	*Delphinium sp.*	Larkspur			X	X	X
Brassicaceae	DEPI	*Descurainia pinnata*	Western tansymustard		X		X	
Brassicaceae	DESO2	*Descurainia sophia*	Herb sophia	X	X	X	X	
Brassicaceae	DESCU	*Descurainia sp.*	Tansymustard		X		X	
Dipsacaceae	DIFU2	*Dipsacus fullonum*	Fuller's teasel				X	
Primulaceae	DOPU	*Dodecatheon pulchellum*	Darkthroat shootingstar			X	X	
Brassicaceae	DRVE2	*Draba verna*	Spring draba	X	X	D	X	
Dryopteridaceae	DRYOP	*Dryopteris sp.*	Woodfern			X	X	
Elaeagnaceae	ELAN	*Elaeagnus angustifolia*	Russian olive		X			
Poaceae	ELEL5	*Elymus elymoides*	Squirreltail		X	X	X	X
Onagraceae	EPBR3	*Epilobium brachycarpum*	Tall annual willowherb	X	X	X	X	X
Onagraceae	EPCI	*Epilobium ciliatum*	Fringed willowherb		X		X	
Equisetaceae	EQAR	*Equisetum arvense*	Field horsetail				X	X
Equisetaceae	EQFL	*Equisetum fluviatile*	Water horsetail		X			
Asteraceae	ERNA10	*Ericameria nauseosa*	Rubber rabbitbrush	X	D	X	D	D
Asteraceae	ERFI2	*Erigeron filifolius*	Threadleaf fleabane			X	X	X
Asteraceae	ERLI	*Erigeron linearis*	Desert yellow fleabane	X	X	X	X	D
Asteraceae	ERPO2	*Erigeron poliospermus*	Purple cushion fleabane		X	X	X	X
Asteraceae	ERPU2	*Erigeron pumilus*	Shaggy fleabane	X	X	X	X	X
Asteraceae	ERIGE2	*Erigeron sp.*	Fleabane				X	X
Polygonaceae	ERCO12	*Eriogonum compositum*	Arrowleaf buckwheat				X	X
Polygonaceae	ERDO	*Eriogonum douglasii*	Douglas' buckwheat				X	X
Polygonaceae	EREL5	*Eriogonum elatum*	Tall woolly buckwheat				X	
Polygonaceae	ERHE2	*Eriogonum heracleoides*	Parsnipflower buckwheat		X	X	X	X
Polygonaceae	ERMI4	*Eriogonum microthecum*	Slender buckwheat		X	X	X	X
Polygonaceae	ERNI2	*Eriogonum niveum*	Snow buckwheat					X
Polygonaceae	EROV	*Eriogonum ovalifolium*	Cushion buckwheat				X	

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Polygonaceae	ERSP7	*Eriogonum sphaerocephalum*	Rock buckwheat			X	D	X
Polygonaceae	ERST4	*Eriogonum strictum*	Blue Mountain buckwheat	X	X	X	X	X
Polygonaceae	ERTH4	*Eriogonum thymoides*	Thymeleaf buckwheat		X	D	D	X
Asteraceae	ERLA6	*Eriophyllum lanatum*	Common woolly sunflower	X	X	X	D	
Geraniaceae	ERCI6	*Erodium cicutarium*	Redstem stork's bill	X	X	X	X	X
Brassicaceae	ERCA14	*Erysimum capitatum*	Sanddune wallflower	X			X	
Poaceae	FEID	*Festuca idahoensis*	Idaho fescue	X	X	D	D	X
Oleaceae	FRPE	*Fraxinus pennsylvanica*	Green ash		X			
Liliaceae	FRPU2	*Fritillaria pudica*	Yellow fritillary		X	X	X	X
Rubiaceae	GAAP2	*Galium aparine*	Stickywilly		X	X	X	
Rubiaceae	GABO2	*Galium boreale*	Northern bedstraw			X	X	
Rubiaceae	GAMEA2	*Galium mexicanum ssp. asperulum*	Mexican bedstraw	X				
Rubiaceae	GAMU2	*Galium multiflorum*	Shrubby bedstraw				X	
Rubiaceae	GALIU	*Galium sp.*	Bedstraw		X		X	
Polemoniaceae	GISI	*Gilia sinuata*	Rosy gilia					X
Polemoniaceae	GILIA	*Gilia sp.*	Gilia					X
Chenopodiaceae	GRSP	*Grayia spinosa*	Spiny hopsage		X	X	X	D
Asteraceae	GUSA2	*Gutierrezia sarothrae*	Broom snakeweed				X	
Boraginaceae	HADIA	*Hackelia diffusa var. arida*	Sagebrush stickseed				X	
Asteraceae	HECU2	*Helianthus cusickii*	Cusick's sunflower		X	X	X	
Poaceae	HECO26	*Hesperostipa comata*	Needle and thread	X	X	D	X	X
Caryophyllaceae	HOUM	*Holosteum umbellatum*	Jagged chickweed	X	X	D	X	X
Poaceae	HOMU	*Hordeum murinum*	Mouse barley		X			
Poaceae	HORDE	*Hordeum sp.*	Barley			X	X	
Hydrophyllaceae	HYCA4	*Hydrophyllum capitatum*	Ballhead waterleaf				X	
Clusiaceae	HYPE	*Hypericum perforatum*	Common St. Johnswort				X	
Brassicaceae	IDSC	*Idahoa scapigera*	Oldstem idahoa				X	
Malvaceae	ILLO2	*Iliamna longisepala*	Longsepal wild hollyhock				X	
Juncaceae	JUAC	*Juncus acuminatus*	Tapertip rush		X			
Juncaceae	JUARL	*Juncus arcticus ssp. littoralis*	Mountain rush		X			
Juncaceae	JUDU2	*Juncus dudleyi*	Dudley's rush		X			
Juncaceae	JUEF	*Juncus effusus*	Common rush		X			
Juncaceae	JUNO2	*Juncus nodosus*	Knotted rush		X			
Poaceae	KOMA	*Koeleria macrantha*	Prairie Junegrass			X	X	X
Asteraceae	LASE	*Lactuca serriola*	Prickly lettuce		X	X	X	X

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Boraginaceae	LAOCO	*Lappula occidentalis var. occidentalis*	Flatspine stickseed		X		X	
Asteraceae	LAGL5	*Layia glandulosa*	Whitedaisy tidytips					X
Brassicaceae	LEDE	*Lepidium densiflorum*	Common pepperweed				X	
Brassicaceae	LELA2	*Lepidium latifolium*	Broadleaved pepperweed				X	
Brassicaceae	LEPE2	*Lepidium perfoliatum*	Clasping peppergrass	X	X	X	X	
Brassicaceae	LEPID	*Lepidium sp.*	Pepperweed			X	X	
Portulacae	LERE7	*Lewisia rediviva*	Bitter root			X	X	
Poaceae	LECI4	*Leymus cinereus*	Basin wildrye		X	X	X	X
Polemoniaceae	LIPU11	*Linanthus pungens*	Granite prickly phlox			X	X	X
Scrophulariaceae	LIDA	*Linaria dalmatica*	Dalmatian toadflax	X	X			
Saxifragiaceae	LIGL2	*Lithophragma glabrum*	Bulbous woodland-star				X	
Saxifragiaceae	LIPA5	*Lithophragma parviflorum*	Smallflower woodland-star			X	X	
Boraginaceae	LIRU4	*Lithospermum ruderale*	Western stoneseed		X	X	X	
Apiaceae	LOCA4	*Lomatium canbyi*	Canby's biscuitroot		X	X	X	X
Apiaceae	LOCU2	*Lomatium cuspidatum*	Wenatchee desertparsley				X	
Apiaceae	LODI	*Lomatium dissectum*	Fern-leaf biscuitroot			D	X	X
Apiaceae	LONU2	*Lomatium nudicaule*	Barestem biscuitroot			X		
Apiaceae	LOQU2	*Lomatium quintuplex*	Umtanum desertparsley				X	
Apiaceae	LOMAT	*Lomatium sp.*	Biscuit root		X	X	X	X
Apiaceae	LOTR2	*Lomatium triternatum*	Nine-leaf biscuitroot		X	D	X	
Apiaceae	LOTU	*Lomatium tuberosum*	Hoover's desert-parsley			X		
Caprifoliaceae	LOIN5	*Lonicera involucrata*	Twinberry honeysuckle				X	
Fabaceae	LOUNU	*Lotus unifoliolatus var. unifoliolatus*	American bird's-foot trefoil					X
Fabaceae	LUAR3	*Lupinus argenteus*	Silvery lupine		X		D	
Fabaceae	LUBI	*Lupinus bicolor*	Miniature lupine		X			
Fabaceae	LUPU	*Lupinus pusillus*	Rusty lupine					X
Fabaceae	LUSE4	*Lupinus sericeus*	Silky lupine			X	X	X
Fabaceae	LUPIN	*Lupinus sp.*	Lupine	X	X	X	D	
Lamiaceae	LYCOP4	*Lycopus sp.*	Waterhorehound		X			
Lythraceae	LYSA2	*Lythrum salicaria*	Purple loosestrife		X			
Asteraceae	MACA2	*Machaeranthera canescens*	Hoary tansyaster		X		X	X
Asteraceae	MAEX	*Madia exigua*	Small tarweed		X	X	X	X
Asteraceae	MAGR3	*Madia gracilis*	Grassy tarweed					X
Fabaceae	MEPO3	*Medicago polymorpha*	Burclover					X
Fabaceae	MESA	*Medicago sativa*	Alfalfa		X	X		X

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Fabaceae	MEOF	*Melilotus officinalis*	Yellow sweet-clover	X	X	X	X	X
Loasaceae	MEAL6	*Mentzelia albicaulis*	Whitestem blazingstar					X
Campanulaceae	MELO4	*Mertensia longiflora*	Small bluebells			X	X	
Campanulaceae	MERTE	*Mertensia sp.*	Bluebells				X	
Asteraceae	MILA	*Microseris laciniata*	Cutleaf silverpuffs					X
Polemoniaceae	MIGR	*Microsteris gracilis*	Slender phlox			X	X	
Scrophulariaceae	MIGU	*Mimulus gutattus*	Common monkey-flower				X	
Scrophulariaceae	MIMUL	*Mimulus sp.*	Monkey-flower		X			
Caryophyllaceae	MINUN2	*Minuartia nuttallii ssp. nuttallii*	Nuttall's sandwort				X	X
Lamiaceae	MOOD	*Monardella odoratissima*	Mountain monardella				X	
Moraceae	MOAL	*Morus alba*	White mulberry					X
Boraginaceae	MYLA	*Myosotis laxa*	Bay forget-me-not				X	
Boraginaceae	MYSC	*Myosotis scorpioides*	True forget-me-not				X	
Boraginaceae	MYOSO	*Myosotis sp.*	Forget-me-not				X	
Brassicaceae	NAOF	*Nasturtium officinale*	Watercress				X	
Hydrophyllaceae	NEBR	*Nemophila breviflora*	Basin nemophila	X		X	X	
Lamiaceae	NECA2	*Nepeta cataria*	Catnip		X		X	
Asteraceae	NEST5	*Nestotus stenophyllus*	Narrowleaf mock goldenweed		X	D	D	
Asteraceae	NOTR2	*Nothocalais troximoides*	Sagebrush false dandelion		X	X	X	
Onagraceae	OEPA	*Oenothera pallida*	Pale evening primrose					X
Cactaceae	OPPO	*Opuntia polyacantha*	Plains pricklypear		X	X		
Orobanchaceae	ORCA2	*Orobanche californica*	California broomrape					X
Orobanchaceae	ORCO5	*Orobanche corymbosa*	Flat-top broomrape					X
Orobanchaceae	ORFA	*Orobanche fasciculata*	Clustered broomrape					X
Orobanchaceae	ORABA	*Orobanche sp.*	Broomrape				X	
Scrophulariaceae	ORBA2	*Orthocarpus barbatus*	Grand Coulee owl's-clover	X	X	X	X	
Asteraceae	PACA15	*Packera cana*	Woolly grounsel				X	
Vitaceae	PAVI5	*Parthenocissus vitacea*	Woodbine		X			
Poaceae	PASM	*Pascopyrum smithii*	Western wheatgrass				X	X
Boraginaceae	PESE	*Pectocarya setosa*	Moth combseed				X	
Boraginaceae	PECTO	*Pectocarya sp.*	Combseed				X	
Cactaceae	PESIR	*Pediocactus simpsonii var. robustior*	Snowball cactus			X	X	
Scrophulariaceae	PEDE4	*Penstemon deustus*	Scabland penstemon					X
Scrophulariaceae	PEGA	*Penstemon gairdneri*	Gairdner's beardtongue			X	X	

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Scrophulariaceae	PEGL4	*Penstemon glandulosus*	Stickystem penstemon				X	
Scrophulariaceae	PEHU	*Penstemon humilis*	Low beardtongue			X		
Scrophulariaceae	PERIR	*Penstemon richardsonii var. richardsonii*	Richardson's penstemon			X	X	
Scrophulariaceae	PERY	*Penstemon rydbergii*	Rydberg's penstemon				X	
Scrophulariaceae	PESP	*Penstemon speciosus*	Royal penstemon			X		
Hydrophyllaceae	PHHA	*Phacelia hastata*	Silverleaf phacelia		X	X	X	X
Hydrophyllaceae	PHHE2	*Phacelia heterophylla*	Varileaf phacelia		X			
Hydrophyllaceae	PHLI	*Phacelia linearis*	Threadleaf phacelia			X	X	X
Hydrophyllaceae	PHACE	*Phacelia sp.*	Phacelia				X	
Poaceae	PHAR3	*Phalaris arundinacea*	Reed canarygrass		X			
Portulaceae	PHSP10	*Phemeranthus spinescens*	Spiny fameflower				X	
Hydrangeaeceae	PHLE4	*Philadelphus lewisii*	Lewis' mock orange			X	X	X
Polemoniaceae	PHAC2	*Phlox aculeata*	Sagebrush phlox		X		X	
Polemoniaceae	PHHO	*Phlox hoodii*	Spiny phlox	X		X	D	X
Polemoniaceae	PHLO2	*Phlox longifolia*	Longleaf phlox		X	X	X	X
Polemoniaceae	PHSP	*Phlox speciosa*	Showy phlox		X		X	X
Brassicaceae	PHCH	*Phoenicaulis cheiranthoides*	Wallflower phoenicaulis			X	X	
Brassicaceae	LEDO2	*Lesquerella douglasii (=Physaria douglasii ssp. douglasii)*	Douglas' bladderpod					X
Pinaceae	PICO	*Pinus contorta*	lodgepole pine					X
Plantaginaceae	PLLA	*Plantago lanceolata*	Narrowleaf plantain					X
Valerianaceae	PLMA4	*Plectritis macrocera*	Longhorn plectritus	X	X	X	X	
Poaceae	POBU	*Poa bulbosa*	Bulbous bluegrass	X	D	D	X	X
Poaceae	POCO	*Poa compressa*	Canada bluegrass				X	
Poaceae	POCU3	*Poa cusickii*	Cusick's bluegrass				X	
Poaceae	POPR	*Poa pratensis*	Kentucky bluegrass		X		X	
Poaceae	POSE	*Poa secunda*	Sandberg bluegrass	X	D	D	D	D
Polygonaceae	POAV	*Polygonum aviculare*	Prostrate knotweed		X			X
Polygonaceae	POHY2	*Polygonum hydropiperoides*	Swamp smartweed		X			
Poaceae	POMO5	*Polypogon monspeliensis*	Annual rabbitsfoot grass		X			
Salicaceae	POBAT	*Populus balsamifera ssp. trichocarpa*	Black cottonwood		D	D	X	X
Salicaceae	POTR5	*Populus tremuloides*	Quaking aspen				X	
Rosaceae	POBI7	*Potentilla biennis*	Biennial cinquefoil		X			
Rosaceae	PORE5	*Potentilla recta*	Sulphur cinquefoil				X	

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Rosaceae	PRVI	*Prunus virginiana*	Chokecherry			X	X	
Poaceae	PSJU3	*Psathyrostachys juncea*	Russian wildrye			X		
Poaceae	PSSP6	*Pseudoroegneria spicata*	Bluebunch wheatgrass	D	D	D	D	D
Apiaceae	PTTE	*Pteryxia terebinthina*	Turpentine wavewing			X	X	
Rosaceae	PUTR2	*Purshia tridentata*	Antelope bitterbrush	X	X	X	D	D
Ranunculaceae	RASC3	*Ranunculus sceleratus*	Cursed buttercup				X	
Anacardiaceae	RHGL	*Rhus glabra*	Smooth sumac			X		X
Grossulariaceae	RIAU	*Ribes aureum*	Golden currant		X		X	
Grossulariaceae	RICE	*Ribes cereum*	Wax currant			X	X	
Grossulariaceae	RIBES	*Ribes sp.*	Currant				X	
Fabaceae	ROPS	*Robinia pseudoacacia*	Black locust		X			
Rosaceae	ROGY	*Rosa gymnocarpa*	Dwarf rose				X	
Rosaceae	ROSA5	*Rosa sp.*	Rose		X		X	
Rosaceae	ROWO	*Rosa woodsii*	Woods' rose				X	X
Rosaceae	RUBU5	*Rubus sp.* (not noxious, no flowers/fruits)	Blackberry		X			
Polygonaceae	RUCR	*Rumex crispus*	Curly dock		X			
Polygonaceae	RUMEX	*Rumex sp.*	Dock				X	
Salicaceae	SAEX	*Salix exigua*	Narrowleaf willow		D	D		
Salicaceae	SALIX	*Salix sp.*	Willow		X		D	
Chenopodiaceae	SATR12	*Salsola tragus*	Prickly Russian thistle		X	X	X	X
Lamiaceae	SADO4	*Salvia dorrii*	Purple sage		X	X	X	D
Caprifoliaceae	SAMBU	*Sambucus sp.*	Elderberry				X	
Cyperaceae	SCACA	*Schoenoplectus acutus var. acutus*	Hardstem bulrush		X			
Cyperaceae	SCAM6	*Schoenoplectus americanus*	Chairmaker's bulrush		X			
Cyperaceae	SCMI2	*Scirpus microcarpus*	Panicled bulrush				X	
Selaginellaceae	SELAG	*Selaginella sp.*	Spikemoss			X	X	X
Asteraceae	SEIN2	*Senecio integerrimus*	lambstongue ragwort				X	
Asteraceae	SEVU	*Senecio vulgaris*	Old-man-in-the-Spring				X	
Brassicaceae	SIAL2	*Sisymbrium altissimum*	Tall tumblemustard	X	D	D	D	X
Asteraceae	SOCA6	*Solidago canadensis*	Canada goldenrod		X			
Asteraceae	SOLID	*Solidago sp.*	Goldenrod			X		
Sparganiaceae	SPARG	*Sparganium sp.*	Bur-reed		X			
Poaceae	SPCR	*Sporobolus cryptandrus*	Sand dropseed					X
Asteraceae	STMIM	*Stephanomeria minor var. minor*	Narrowleaf wirelettuce					X

FAMILY	CODE	SPECIES	COMMON NAME	FINAL-NNR ROUTE SEGMENTS				
				NNR-1 (NNR-1)[2]	NNR-2 (NNR-2)	NNR-3 (NNR-3)	NNR-4o/NNR-4u, NNR-5, & NNR-7[3] (NNR-4)	NNR-8 (NNR-5)
Asteraceae	STPA2	*Stephanomeria paniculata*	Tufted wirelettuce		X			X
Asteraceae	STEPH	*Stephanomeria sp.*	Wirelettuce			X	X	
Caprifoliaceae	SYAL	*Symphoricarpos albus*	Common snowberry				X	
Asteraceae	TAOF	*Taraxacum officinale*	Common dandelion				X	
Asteraceae	TECA2	*Tetradymia canescens*	Spineless horsebrush			X	X	
Poaceae	THIN6	*Thinopyrum intermedium*	Intermediate wheatgrass		X			
Asteraceae	TOFL5	*Townsendia florifer*	Showy Townsend daisy		X	X	X	X
Anacardiaceae	TOXIC	*Toxicodendron spp.*	Poison oak				X	
Asteraceae	TRDU	*Tragopogon dubius*	Yellow salsify	X	X	X	X	X
Fabaceae	TRMA3	*Trifolium macrocephalum*	Largehead clover			X	X	
Liliaceae	TRITE	*Triteleia hyacinthina*	White brodiaea		X	X	X	X
Typhaceae	TYPHA	*Typha sp.*	Cattail		X			
Ulmaceae	ULPU	*Ulmus pumila*	Siberian elm		X			X
Urticaceae	URDI	*Urtica dioica*	Stinging nettle				X	
Scrophulariaceae	VETH	*Verbascum thapsus*	Common mullein		D	X	X	X
Scrophulariaceae	VEAN2	*Veronica anagallis-aquatica*	Water speedwell		X		X	
Violaceae	VITR3	*Viola trinervata*	Rainier violet		X	D	X	
Poaceae	VUBR	*Vulpia bromoides*	Brome fescue		X			
Poaceae	VUOC	*Vulpia octoflora*	Sixweeks fescue			X	X	X
Poaceae	VULPI	*Vulpia sp.*	Fescue	X	X		D	
Dryopteridaceae	WOOR	*Woodsia oregana*	Oregon cliff fern			X	X	
Liliaceae	ZIPA2	*Zigadenus paniculatus*	Foothill deathcamas					X
Liliaceae	ZIGAD	*Zigadenus sp.*	Deathcamas		X		X	X
Liliaceae	ZIVE	*Zigadenus venenosus*	Meadow death camas					X

[1]All plant nomenclature is based on USDA Plants Database (USDA 2013). Dominant species with >5% cover are indicated by a “D”. All other species are indicated by an “X”.
[2]Preliminary-NNR Route Segments are provided in parentheses.
[3]No surveys were conducted within Final-NNR-6, but Preliminary-NNR-4 would be the closest route segmen

APPENDIX B-4
NOXIOUS WEED REPORT

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ACRONYMS AND ABBREVIATIONS

BLM	U.S. Bureau of Land Management
DEIS	Draft Environmental Impact Statement
GPS	global positioning system
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
kV	kilovolt
MR	Manastash Ridge Subroute
NNR	New Northern Route
POD	Plan of Development
Reclamation	Bureau of Reclamation
ROW	right-of-way
WSDOT	Washington State Department of Transportation

1.0 INTRODUCTION

Pacific Power proposes to construct, operate and maintain a new 230 kilovolt (kV) transmission line in the south-central portion of Washington from the Vantage Substation near the Wanapum Dam to the Pomona Heights Substation near Selah, Washington. The original proposed Project analyzed in the Draft Environmental Impact Statement (DEIS) consisted of 10 end-to-end alternatives approximately following the southern and eastern flanks of the Joint Base Lewis-McChord Yakima Training Center (JBLM YTC). In April, 2013 the New Northern Route (NNR) was identified (hereafter Preliminary-NNR). Special status plant surveys were conducted on accessible portions of that route during May and July 2013. After the field surveys, routing adjustments were made due to new requirements for separation distance from existing transmission lines and concerns about sage-grouse. The locations of the NNR and Manastash Ridge Subroute (MR) were finalized in November 2013. The Final-NNR occurs along the west side of Interstate 82 and then passes through the northern portion of the JBLM YTC to the Vantage Substation. The MR skirts Manastash Ridge, west of Badger Pocket in the northwestern portion of the JBLM YTC (Figure 1). To facilitate analysis and discussion, the new routes are broken into eight NNR segments (NNR-1 through NNR-8) and one MR subroute (MR-1).

The 2013 noxious weed surveys were conducted on approximately 584 acres or 30.5 centerline miles of federal and Washington State Department of Transportation (WSDOT) lands on the Preliminary-NNR segments. Portions of Bureau of Reclamation (Reclamation) and U.S. Bureau of Land Management (BLM) lands which had been surveyed for the DEIS in 2011 and were incorporated into the Preliminary-NNR and the Final-NNR were not revisited. Special status plant surveys coincided with the noxious weed surveys, and are discussed in a separate report (Appendix B-3 of the SDEIS). Due to the routing adjustments that occurred following the noxious weed surveys, 43 percent (16.2 of the total 37.7 centerline miles) of federal and WSDOT lands within the Final-NNR were surveyed in 2013 (14.6 miles) and 2011 (1.6 miles). Table 1 shows how the Preliminary-NNR and the Final-NNR segments correspond to each other and the centerline miles surveyed during 2011and 2013, by land jurisdiction, that are still part of the Final-NNR.

TABLE 1 NOXIOUS WEED SURVEY STATUS AND CENTERLINE MILES FOR THE FINAL-NNR

FINAL-NNR ROUTE SEGMENTS			PRELIMINARY-NNR ROUTE SEGMENTS WHERE 2011/2013 SURVEYS WERE CONDUCTED AND ARE STILL PART OF FINAL-NNR[b] (MILES)					
SEGMENT NUMBER	JURIS-DICTION[a]	TOTAL MILES	NNR-1	NNR-2	NNR-3	NNR-4	NNR-5	TOTAL SURVEYED
NNR-1	Reclamation	0.2	0.2 (0.1 mile in 2011 and 0.1 mile in 2013)					0.2
	Private	2.1						
	TOTAL	2.4	0.2					0.2
NNR-2	Private	<0.1						
	WSDOT	<0.1						
	JBLM YTC	5.0		5.0 (2013)				5.0
	TOTAL	5.0		5.0				5.0
NNR-3	BLM	3.6			3.6[c] (entire length of ROW but only 1/3 its width; 2013)			3.6[c]

FINAL-NNR ROUTE SEGMENTS			PRELIMINARY-NNR ROUTE SEGMENTS WHERE 2011/2013 SURVEYS WERE CONDUCTED AND ARE STILL PART OF FINAL-NNR[b] (MILES)					
SEGMENT NUMBER	JURIS-DICTION[a]	TOTAL MILES	NNR-1	NNR-2	NNR-3	NNR-4	NNR-5	TOTAL SURVEYED
	Private	5.0						
	WSDOT	0.7			0.5 (2013)			0.5
	TOTAL	9.3			4.1[c]			4.1[c]
NNR-4o/NNR-4u	Private	1.2						
	WSDOT	0.1						
	JBLM YTC	3.3				3.3[c] (2.9 of this is for entire length of ROW but only 1/3 its width; 2013)		3.3[c]
	TOTAL	4.5				3.3[c]		3.3[c]
NNR-5	JBLM YTC	1.8				1.6 (2013)		1.6
NNR-6o/NNR-6u	JBLM YTC	6.4						
NNR-7	JBLM YTC	8.2				0.1 (2013)		0.1
NNR-8	BLM	0.4					0.4 (0.1 miles in 2011 and 0.3 miles in 2013)	0.4
	Reclamation	1.4					1.4 (2011)	1.4
	Private	0.5						
	Water	0.4						
	TOTAL	2.7					1.8	1.8
MR-1	DNR	1.7						
	Private	3.5						
	JBLM YTC	6.6				<0.1 (2013)		<0.1
	TOTAL	11.9				<0.1		<0.1
GRAND TOTAL		52.3	0.2	5.0	4.1[c]	5.0[c]	1.8	16.2[c]

[a]Noxious weed surveys are required on lands managed by the BLM, Reclamation, JBLM YTC, and WSDOT, which cumulatively total 37.72 centerline miles of the Final-NNR.
[b]There were 1.6 centerline miles surveyed in 2011 and 14.6 centerline miles surveyed in 2013 that are still within the Final-NNR.
[c]Even though only 1/3 of the width of the ROW were surveyed in 2013, these values are included in the grand total, as they are fairly representative of the entire ROW for the Final-NNR.

Each year, the State Noxious Weed Control Board adopts, by rule (WAC 16-750), the State Noxious Weed List. This list determines which plants will be considered noxious weeds and where control will be required in Washington State. This approach allows control activities of land owners - both public and private - to be prioritized towards the protection and enhancement of Washington's agriculture and natural areas in the most cost-effective manner.

There are three classes of noxious weeds on the State Noxious Weed List. These include:

- Class A: Non-native species that are limited in distribution in Washington. State law requires that these weeds be eradicated.
- Class B: Non-native species that are either absent from or limited in distribution in some portions of the state but very abundant in other areas. The goals are to contain the plants where they are already widespread and prevent their spread into new areas.
- Class C: Non-native plants that are already widespread in Washington State. Counties can choose to enforce control, or they can educate residents about controlling these noxious weeds.

Once the State Noxious Weed List is adopted, county and district weed lists are created from the updated State Noxious Weed List. County weed lists include all State Class A weeds and Class B weeds designated by the state for control their area according to WAC 16-750. Counties and districts can then select additional Class B weeds and Class C weeds that they will require control of in their area.

2.0 METHODS

In 2013, qualified botanists surveyed for noxious weed species on federal and WSDOT lands within the ROW corridor for the Preliminary-NNR route segments, which was almost entirely accessible. Methodology for 2013 surveys is described below. In addition, 2011 noxious weed survey data for the portion of Final-NNR-8 east of the Columbia River is also included in this document.

Surveyor Qualifications

Noxious weed surveys were conducted by botanists who have the following minimum qualifications:

- An academic background (bachelor's degree or higher in botany) or equivalent experience in plant taxonomy;
- The taxonomic experience to identify, through personal knowledge or the use of technical floras, most species encountered in the field, and an understanding of how to contact taxonomic experts for species that they are unable to identify;
- The skills to use a global positioning system (GPS) to adequately map noxious weeds; and
- Familiarization of the potential noxious weed species in the Project area.

All of the botanists who conducted noxious weed surveys in 2013 had also been involved in the 2011 botanical surveys.

Field Preparation

The list of target noxious weeds is provided in Appendix A and was developed to include those designated by the Washington State Noxious Weed Control Board (2013), plus any additional noxious weeds designated by the Project counties for the NNR (Grant, Kittitas, and Yakima). Sources of information for noxious weed species included the *Vascular Plants of the Pacific Northwest: Vols. I-V* (Hitchcock et al. 1969), *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973), *Noxious Weeds that Harm Washington: Eastern and Western Washington Field Guides* (WSNWCB 2009a,b), *Weeds of the West* (Whitson et al. 2000), and botanists' personal knowledge of the species.

Field Survey

A pedestrian survey was conducted May 13-20, 2013 for noxious weed species on federal and WSDOT lands within the 160 foot (ca 49 meter) ROW corridor. Botanists walked roughly parallel intuitive meandering transects, with a 40 foot (12 meter) separation between surveyors. The survey was floristic, meaning that all taxa were identified to the level necessary to determine if they are special status plant or noxious weed species (except if the plant was in an unidentifiable stage; i.e., from grazing).

All noxious weeds were mapped, or documented with GPS and noted if a noxious weed was not far enough along to determine species. Most noxious weeds during the May 2013 survey were much farther along than typical for the time of year, and either flowering or in the pre-bud stage. During July 25-27, 2013 botanists re-visited and re-mapped noxious weed sites which had been identified as needing follow-up confirmation.

A survey-grade GPS was used to document the occurrence of target noxious weed species discovered. For each noxious weed species occurrence discovered, the following attributes were documented: species name, date, surveyor name(s), estimated number of plants, estimated cover, and estimated land area occupied.

Very steep slopes and other conditions that posed a safety hazard were not surveyed, although this seldom occurred along the Preliminary-NNR. In addition, botanists communicated with JBLM YTC personnel to ensure surveys were coordinated with training activities.

3.0 RESULTS

For the Preliminary-NNR, 30.5 of 41.2 centerline miles were surveyed in 2013. Unsurveyed areas included: a 0.1 mile section on WSDOT lands that was too steep to be safely completed and another small area between interstate lanes; a 0.4 mile section crossing the Columbia River; 8.7 miles of private land; and a 1.4 mile section east of the Columbia River which was surveyed in 2011. For the Final-NNR, as previously described, 16.2 centerline miles surveyed in 2011 and 2013 are still part of the Final-NNR (which includes 37.7 centerline miles on federal or WSDOT lands).

Sixteen noxious weed species were documented on federal and WSDOT lands of the Final-NNR, including eight Washington Class B species and eight Washington Class C species (Tables 2 through 4). No Washington Class A species were documented. The control of Washington Class C species is at the discretion of each county. In this report, noxious weeds that were documented in 2013 for the Preliminary-NNR are included in Table 2, regardless of whether or not they still occur in the Final-NNR. All other tables and figures show only noxious weeds documented in the Final-NNR.

TABLE 2 SPECIES BIOLOGY AND LIST OF NOXIOUS WEED LOCATIONS BY ROUTE SEGMENT

SPECIES NAME	SPECIES BACKGROUND [1,2,3,4]				LEGAL NOXIOUS STATUS [4,5,6]		PRELIMINARY-NNR SEGMENTS	CORRESPONDING FINAL-NNR SEGMENTS
	LIFE SPAN	GROWTH HABIT	REPRODUCTIVE MECHANISMS	HABITAT	ST	CO		
Russian knapweed *Acroptilon repens*	perennial	forb	creeping roots, seeds	Disturbed land such as cultivated fields, orchards, pastures and roadsides.	Class B	G, K, Y	NNR – 2	NNR – 2, NNR - 3
Burningbush *Bassia scoparia* (=*Kochia scoparia*)	annual	forb	seeds	Cultivated fields, roadsides, ditch banks and waste areas.	Class B	G	NNR – 2, NNR – 5	NNR – 2, NNR – 8
Hoary cress *Cardaria draba*	perennial	forb	creeping roots, seeds	Moist, open unshaded areas. Can invade irrigated pastures, ditch banks, roadsides and waste areas. Typically does not invade arid rangelands.	Class C	G, K	NNR – 2, NNR – 4	NNR – 5
Spiny plumeless thistle *Carduus acanthoides*	annual, biennial	forb	seeds	Pastures, stream valleys, fields, and roadsides	Class B	G	NNR – 2, NNR – 4	NNR – 5
Diffuse knapweed *Centaurea diffusa*	annual, perennial	forb	seeds	Disturbed areas, dry pasturelands, and meadows.	Class B	G, K, Y	NNR – 1, NNR – 2, NNR – 3, NNR – 4, NNR – 5	NNR – 1, NNR – 2, NNR – 3, NNR – 4o/NNR – 4u, NNR – 5, NNR – 8
Canada thistle *Cirsium arvense*	perennial	forb	creeping roots, seeds	Wide habitat range and fairly adaptable. Disturbed open areas with moderate moisture conditions. Along roadsides, railroad ROW, rangeland, forestland, cropland, and abandoned fields.	Class C	G, K	NNR – 1, NNR – 2, NNR – 4	NNR – 1, NNR – 2, NNR – 5

Bull thistle *Cirsium vulgare*	biennial	forb	seeds	Pastures, fields, roadsides, and disturbed sites.	Class C	G, K	NNR – 4	NNR – 5
Field bindweed *Convolvulus arvensis*	perennial	vine, forb	creeping roots, seeds	Disturbed cultivated and waste areas.	Class C	G, K	NNR – 2, NNR – 5	NNR – 2, NNR – 8
Horseweed (marestail) *Conyza canadensis*	annual, biennial	forb	seeds	Pastures, meadows, cultivated fields, along roadsides, and in waste areas.	Class C	K	NNR – 2	NNR – 2
Fuller's teasel *Dipsacus fullonum*	biennial	forb	seeds	Moist sites, especially irrigation ditches, canals, and disturbed sites.	Class C	G, K	NNR – 4	N/A
Common St. Johnswort *Hypericum perforatum*	perennial	forb	seeds, short runners	Disturbed sunny, well-drained areas with gravelly or sandy soils.	Class C	G, K	NNR – 4	NNR – 5
Perennial pepperweed *Lepidium latifolium*	perennial	forb	seeds, deep roots	Waste places, wet areas, ditches, roadsides, and cropland.	Class B	G,K,Y	NNR – 4	N/A
Dalmatian toadflax *Linaria dalmatica*	perennial	forb/ herb	creeping roots, seeds	Well-drained, coarse textured soils. Disturbed areas such as roadsides, gravel pits, rangelands and waste areas.	Class B	G, K, Y	NNR – 1, NNR – 2	NNR – 1, NNR – 2
Purple loosestrife *Lythrum salicaria*	perennial	forb	creeping roots, seeds	Aquatic sites such as canals, ditches, or pond shorelines.	Class B	G,K,Y	NNR-2	NNR – 2
Reed canarygrass *Phalaris arundinacea*	perennial	grass	creeping roots, seeds	Wet ground, along streams and in marshes.	Class C	G, K, Y	NNR-2	NNR – 2
Sulphur cinquefoil *Potentilla recta*	perennial	forb	seeds	Disturbed areas, roadsides, pastures.	Class B	G,K,Y	NNR – 4	NNR – 5
Russian thistle *Salsola tragus (=S. iberica)*	annual	forb	seeds	Disturbed dry sites such as cultivated dryland agriculture and over-grazed rangelands.	Class C	K	NNR – 2, NNR – 3, NNR – 4, NNR – 5	NNR – 2, NNR – 3, NNR – 5, NNR – 8

Groundsel *Senecio vulgaris*	annual, biennial	forb	seeds	Disturbed sites such as roadsides, railroad beds and pastures.	Class C	G, K	NNR – 4 (on road outside of ROW)	N/A
Puncturevine *Tribulus terrestris*	annual	forb	seeds	Pastures, cultivated fields, waste areas, and along highways and roads	B	G	NNR – 1	NNR – 1

Sources: USDA 2013[1], WNWCB 2013[2], WNWCB 2009[3], Whitson et al. 2000[4], Noxious Weed Control Board of Grant County 2013[5], Kittitas County Noxious Weed Control Board 2013[6], Yakima County Noxious Weed Board 2011[7]; State of Washington Noxious Weed Designations: Class A– have a limited distribution in Washington. State law requires that these weeds be eradicated; Class B – are either absent from or limited in distribution in some portions of the state but very abundant in other areas. The goals are to contain the plants where they are already widespread and prevent their spread into new areas; Class C – are already widespread in Washington State. Counties can choose to enforce control, or they can educate residents about controlling these noxious weeds (WNWCB 2013); County Noxious Weed Lists: G=Grant; K=Kittitas; Y=Yakima.

TABLE 3 LAND AREA OF NOXIOUS WEED SPECIES BY FINAL-NNR SEGMENT (ACRES)[1]

Species Name	Acres of Noxious Weeds								
	NNR – 1	NNR – 2	NNR – 3	NNR-4o/ NNR-4u	NNR – 5	NNR-6o/ NNR-6u	NNR – 7	NNR - 8	MR – 1
Russian knapweed *Acroptilon repens*		3.4	0.1						
Burningbush[2] *Bassia scoparia* (=*Kochia scoparia*)		X						X	
Hoary cress *Cardaria draba*					T				
Diffuse knapweed *Centaurea diffusa*	1.7	10.5	T	11.8	0.8			0.1	
Canada thistle *Cirsium arvense*	T	T			0.3				
Bull thistle *Cirsium vulgare*					T				
Field bindweed *Convolvulus arvensis*		T						T	
Horseweed (marestail) *Conyza canadensis*		0.1							
Common St. Johnswort *Hypericum perforatum*					T				
Dalmatian toadflax *Linaria dalmatica* ssp. *dalmatica*	0.8	0.7							
Purple loosestrife *Lythrum salicaria*		T							
Reed canarygrass *Phalaris arundinacea*		T							
Sulphur cinquefoil *Potentilla recta*					0.1				
Russian thistle[2] *Salsola tragus (=S. iberica)*		X	X	X	X		X	X	
Puncturevine *Tribulus terrestris*	1.7								
TOTAL NOXIOUS WEEDS	4.1	14.7	0.1	11.8	1.3			0.1	

[1]Fuller's teasel (*Dipsacus fullonum*), perennial peppperweed (*Lepidium latifolium*), and groundsel (*Senecio vulgaris*) were documented in the Preliminary-NNR during 2013 surveys, but do not occur on the Final-NNR.
T=Trace (<0.05)
[2]X=Burningbush and Russian thistle were not mapped due to their ubiquitous and often dominant nature; an "X" is indicated if present.

Figures 1 and 2 show the distribution of all noxious weeds found on federal and WSDOT lands for each route segment. All noxious weed species were mapped, except for two species because of their ubiquitous nature where present. These include burningbush (*Bassia scoparia*; Class B) and Russian thistle (*Salsola tragus*; Class C). Many areas where noxious weeds were documented were characterized by vectors for weed establishment and spread, such as roads, the JBLM YTC fire breaks, areas with past fire events, abandoned pasture land, riparian areas, agricultural lands and associated irrigation canals.

TABLE 4 NUMBER OF NOXIOUS WEED SPECIES DOCUMENTED BY FINAL-NNR ROUTE SEGMENT[1]

ROUTE SEGMENT	CLASS A	CLASS B	CLASS C
NNR – 1	0	4	1
NNR – 2	0	4	5
NNR – 3	0	2	1
NNR-4o/NNR-4u	0	1	1
NNR – 5	0	3	5
NNR-6o/NNR-6u	0	0	0
NNR – 7	0	0	1
NNR – 8	0	2	2
MR – 1	0	0	0
TOTAL	0	8	8

[1]Total number of noxious weeds is cumulative and most route segments have the same noxious weed species.

4.0 RECOMMENDATIONS

Pacific Power is committed to preventing the establishment and spread of noxious weeds during construction, operation, and maintenance of the proposed Project. A Noxious Weed and Invasive Plant Management Plan will be developed and incorporated into the final Plan of Development (POD) for the proposed 230 kV Vantage to Pomona Transmission Line project. The Plan will be developed in consultation with the agencies and local weed control districts and will describe:

- Regulations related to noxious weeds and weed management;
- List of all noxious weeds relevant to the project area, and whether they are known to occur within the ROW corridor;
- Procedures for preventing the establishment and spread of noxious weeds;
- Procedures for treating noxious weeds without damaging sensitive resources; and
- Procedures for monitoring and documenting weed control activities before and during construction, and for three years after construction is completed.

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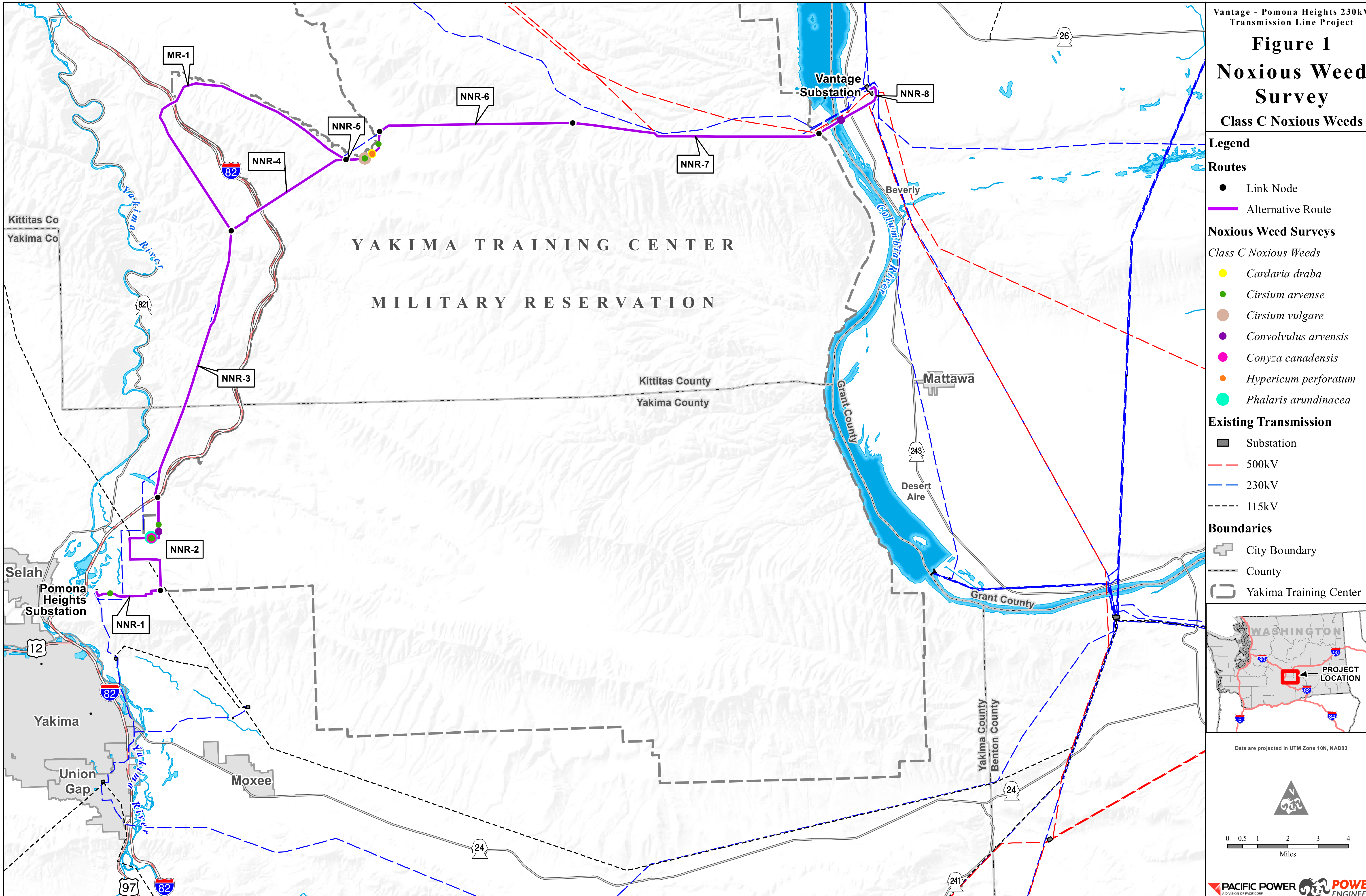

Vantage - Pomona Heights 230kV Transmission Line Project

Figure 1

Noxious Weed Survey

Class C Noxious Weeds

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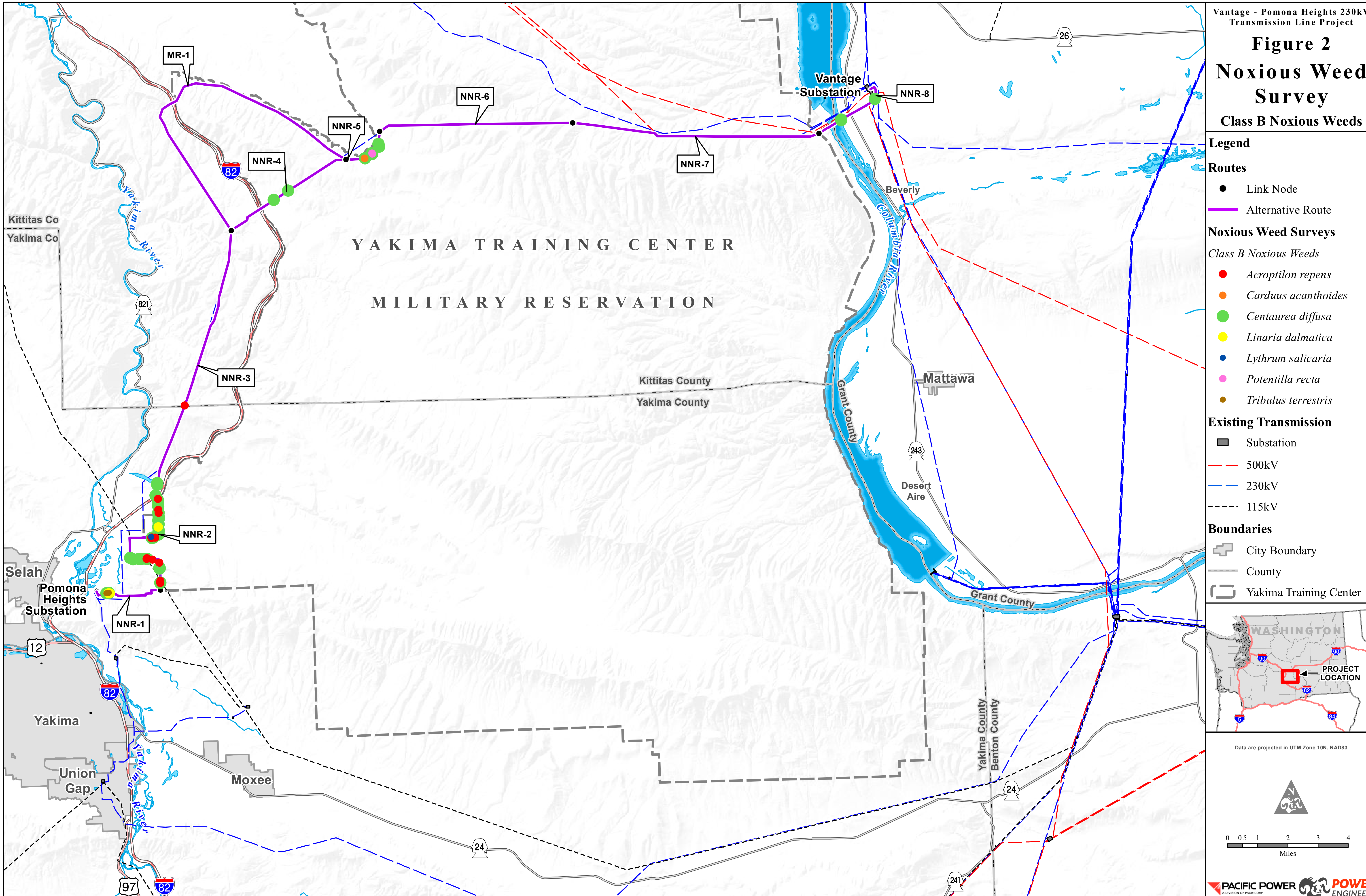
Vantage - Pomona Heights 230kV Transmission Line Project
Figure 2
Noxious Weed Survey
Class B Noxious Weeds
Legend
Routes
Link Node
Alternative Route
Noxious Weed Surveys
Class B Noxious Weeds
Acroptilon repens
Carduus acanthoides
Centaurea diffusa
Linaria dalmatica
Lythrum salicaria
Potentilla recta
Tribulus terrestris
Existing Transmission
Substation
500kV
230kV
115kV
Boundaries
City Boundary
County
Yakima Training Center
WASHINGTON
PROJECT LOCATION
Data are projected in UTM Zone 10N, NAD83
0 0.5 1 2 3 4
Miles
PACIFIC POWER
POWER ENGINEERS
YAKIMA TRAINING CENTER
MILITARY RESERVATION
MR-1
NNR-1
NNR-2
NNR-3
NNR-4
NNR-5
NNR-6
NNR-7
NNR-8
Vantage Substation
Pomona Heights Substation
Kittitas Co
Yakima Co
Kittitas County
Yakima County
Grant County
Yakima County
Benton County
Yakima River
Columbia River
Beverly
Mattawa
Desert Aire
Selah
Yakima
Union Gap
Moxee
821
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241

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APPENDIX A –NOXIOUS WEED SPECIES LIST

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APPENDIX A NOXIOUS WEED SPECIES LIST

SCIENTIFIC NAME	COMMON NAME	LEGAL NOXIOUS STATUS				CONTROL REQUIRED
		CLASS	GRANT	KITTITAS	YAKIMA	
Abutilon theophrasti	velvetleaf	A	X	X	X	Yes
Acroptilon repens	Russian knapweed	B	X	X	X	Yes: Grant, Yakima
Aegilops cylindrica	jointed goatgrass	C	X	X		Yes: Grant
Alhagi maurorum	camelthorn	B	X			Yes: Grant, Yakima
Alliaria petiolata	garlic mustard	A	X			Yes
Alopecurus myosuroides	blackgrass	B	X			Yes: Grant, Yakima
Amorpha fruticosa	indigobush	B	X			Yes: Grant, Yakima
Anchusa arvensis	annual bugloss	B	X	X		Yes: Grant, Yakima
Anchusa officinalis	common bugloss	B	X			Yes: Grant, Yakima
Anthriscus sylvestris	wild chervil	B	X			Yes: Grant, Yakima
Artemisia absinthium	absinth wormwood	C		X		
Berteroa incana	hoary alyssum	B	X			Yes: Grant, Yakima
Brachypodium sylvaticum	false-brome	A	X			Yes
Bryonia alba	white bryony	B	X			Yes: Grant, Yakima
Buddleja davidii	butterflybush	B	X	X	X	Yes: Grant, Yakima
Butomus umbellatus	flowering rush	A	X			Yes
Cabomba caroliniana	fanwort	B	X			Yes: Grant, Yakima
Cardaria draba	hoary cress	C	X	X		Yes: Grant
Cardaria pubescens	hairy whitetop	C		X		
Carduus acanthoides	plumeless thistle	B	X			Yes: Grant, Yakima
Carduus nutans	musk thistle	B	X	X	X	Yes: Grant, Yakima
Carduus pycnocephalus	thistle, Italian	A	X			Yes
Carduus tenuiflorus	slenderflower thistle	A	X			Yes
Cenchrus longispinus	longspine sandbur	B	X	X		Yes: Grant
Centaurea calcitrapa	purple starthistle	A	X			Yes
Centaurea cyanus	cornflower (bachelor's button)	C		X		Yes: Kittitas
Centaurea diffusa	diffuse knapweed	B	X	X	X	Yes: Grant
Centaurea jacea	brown knapweed	B	X			Yes: Yakima
Centaurea jacea x nigra	meadow knapweed	B	X	X	X	Yes: Grant, Yakima
Centaurea macrocephala	bighead knapweed	A	X			Yes
Centaurea nigra	black knapweed	B	X			Yes: Grant, Yakima
Centaurea nigrescens	Vochin knapweed	A	X			Yes
Centaurea solstitialis	yellow starthistle	B	X	X	X	Yes: Grant, Yakima
Centaurea stoebe	spotted knapweed	B	X	X	X	Yes: Grant, Yakima
Chondrilla juncea	rush skeletonweed	B	X	X	X	Yes: Grant, Yakima
Cirsium arvense	Canada thistle	C	X	X		Yes: Grant; and Yakima only in T7N R20, 21, 22, 23E
Cirsium vulgare	bull thistle	C	X	X		Yes: Grant
Clematis vitalba	old-man's-beard	C				
Conium maculatum	poison-hemlock	B	X	X	X	Yes: Grant
Convolvulus arvensis	field bindweed	C	X	X		Yes: Grant
Conyza canadensis	horseweed (marestail)	C		X		Yes: Kittitas
Crupina vulgaris	common crupina	A	X			Yes
Cuscuta approximata	smoothseed alfalfa dodder	C	X	X		Yes: Grant
Cynoglossum officinale	houndstongue	B	X	X	X	Yes: Grant
Cyperus esculentus	yellow nutsedge	B	X		X	Yes: Grant

SCIENTIFIC NAME	COMMON NAME	LEGAL NOXIOUS STATUS				CONTROL REQUIRED
		CLASS	GRANT	KITTITAS	YAKIMA	
Cytisus scoparius	Scotch broom	B	X	X	X	Yes: Grant, Yakima
Daphne laureola	spurge laurel	B	X			Yes: Grant
Daucus carota	wild carrot	B	X	X	X	Yes: Grant, Yakima
Dipsacus fullonum	common teasel	C		X		Yes: Grant, Kittitas
Echium vulgare	blueweed	B	X			Yes: Grant, Yakima
Egeria densa	Brazilian elodea	B	X			Yes: Grant, Yakima
Epilobium hirsutum	hairy willowherb	B	X			Yes: Grant, Yakima
Euphorbia esula	leafy spurge	B	X		X	Yes: Grant, Yakima
Euphorbia myrsinites	myrtle spurge	B	X	X	X	Yes: Grant, Kittitas
Euphorbia oblongata	eggleaf spurge	A	X			Yes
Foeniculum vulgare	common fennel	B	X			Yes: Grant
Galega officinalis	goatsrue	A	X			Yes
Geranium lucidum	shiny geranium	A	X			Yes
Geranium robertianum	herb-Robert	B	X	X		Yes: Grant, Yakima
Glyceria maxima	reed sweetgrass	A	X			Yes
Gypsophila paniculata	babysbreath	C		X		
Hedera helix 'Baltica', 'Pittsburgh', and 'Star'; H. hibernica 'Hibernica'	English ivy - four cultivars only	C				
Helianthus ciliaris	Texas blueweed	A	X		X	Yes
Hemizonia pungens	spikeweed	C	X			Yes: Grant
Heracleum mantegazzianum	giant hogweed	A	X			Yes
Hieracium atratum	polar hawkweed	B	X			Yes: Grant, Yakima
Hieracium aurantiacum	orange hawkweed	B	X	X		Yes: Grant, Yakima
Hieracium caespitosum	yellow hawkweed	B	X	X		Yes: Grant, Yakima
Hieracium floribundum	yellowdevil hawkweed	A	X			Yes
Hieracium glomeratum	queen-devil hawkweed	B	X			Yes: Grant, Yakima
Hieracium lachenalii	common hawkweed	C				
Hieracium laevigatum	smooth hawkweed	B	X			Yes: Grant, Yakima
Hieracium pilosella	mouseear hawkweed	B	X			Yes: Grant, Yakima
Hieracium sabaudum	European hawkweed	A	X			Yes
Hieracium spp.	hawkweeds, non-native and invasive species not listed elsewhere	C				
Hydrilla verticillata	hydrilla	A	X			Yes
Hyoscyamus niger	black henbane	C	X			Yes: Grant
Hypericum perforatum	common St. Johnswort	C	X	X		Yes: Grant
Hypochaeris radicata	common catsear	B	X	X	X	Yes: Grant, Yakima
Impatiens glandulifera	policeman’s helmet	B	X			Yes: Grant, Yakima
Iris pseudacorus	yellowflag iris	C	X	X		Yes: Grant, Kittitas
Isatis tinctoria	dyer’s woad	A	X			Yes
Kochia scoparia	kochia	B	X	X		Yes: Grant
Lamiastrum galeobdolon	yellow archangel	B		X		
Lepidium latifolium	perennial pepperweed	B	X	X	X	Yes: Grant
Lepyrodiclis holosteoides	lepyrodiclis	B	X			Yes: Grant, Yakima
Leucanthemum vulgare	oxeye daisy	B	X	X	X	Yes: Grant, Yakima

SCIENTIFIC NAME	COMMON NAME	LEGAL NOXIOUS STATUS				CONTROL REQUIRED
		CLASS	GRANT	KITTITAS	YAKIMA	
Linaria dalmatica ssp. *dalmatica*	Dalmatian toadflax	B	X	X	X	Yes: Grant
Linaria vulgaris	yellow toadflax	C		X		
Ludwigia hexapetala	water primrose	B	X			Yes: Grant
Ludwigia peploides	floating primrose-willow	A	X			Yes
Lysimachia vulgaris	garden loosestrife	B	X			Yes: Grant, Yakima
Lythrum salicaria	purple loosestrife	B	X	X	X	Yes: Grant, Yakima
Lythrum virgatum	wand loosestrife	B	X			Yes: Grant, Yakima
Matricaria perforata	scentless mayweed	C	X	X		Yes: Grant
Mirabilis nyctaginea	wild four-o'clock	A	X			Yes
Myriophyllum aquaticum	parrotfeather	B	X		X	Yes: Grant, Yakima
Myriophyllum heterophyllum	variable-leaf milfoil	A	X			Yes
Myriophyllum spicatum	Eurasian watermilfoil	B	X	X	X	Yes: Grant, Kittitas, Yakima
Nymphaea odorata	fragrant waterlily	C				
Nymphoides peltata	yellow floatingheart	B	X		X	Yes: Grant, Yakima
Onopordum acanthium	Scotch thistle	B	X	X	X	Yes: Grant, Yakima
Phalaris arundinacea	reed canarygrass	C				
Phragmites australis	common reed (nonnative genotypes)	B	X			Yes: Grant, Yakima
Picris hieracioides	hawkweed oxtongue	B	X			Yes: Grant, Yakima
Polygonum bohemicum	Bohemian knotweed	B		X		
Polygonum cuspidatum	Japanese knotweed	B	X	X	X	Yes: Grant
Polygonum polystachyum	Himalayan knotweed	B				
Polygonum sachalinense	giant knotweed	B	X			Yes: Grant
Potamogeton crispus	curlyleaf pondweed	C				
Potentilla recta	sulfur cinquefoil	B	X	X	X	Yes: Grant, Yakima
Pueraria montana var. lobata	kudzu	A	X			Yes
Rorippa austriaca	Austrian fieldcress	B	X			Yes: Grant, Yakima
Rubus armeniacus	Himalayan blackberry	C				
Rubus laciniatus	evergreen blackberry	C				
Sagittaria graminea	grass-leaved arrowhead	B	X			Yes: Grant, Yakima
Salsola iberica	Russian thistle	C		X		Yes: Kittitas
Salvia aethiopis	Mediterranean sage	A	X			Yes
Salvia pratensis	meadow clary	A	X			Yes
Salvia sclarea	clary sage	A	X			Yes
Schoenoplectus mucronatus	ricefield bulrush	A	X			Yes
Secale cereale	cereal rye	C	X			Yes: Grant
Senecio jacobaea	tansy ragwort	B	X	X	X	Yes: Grant, Yakima

SCIENTIFIC NAME	COMMON NAME	LEGAL NOXIOUS STATUS				CONTROL REQUIRED
		CLASS	GRANT	KITTITAS	YAKIMA	
Senecio vulgaris	common groundsel	C	X	X		Yes: Grant
Silene latifolia ssp. alba	white cockle	C	X	X		Yes: Grant
Silybum marianum	milk thistle	A	X			Yes
Solanum elaeagnifolium	silverleaf nightshade	A	X			Yes
Solanum rostratum	buffalobur	A	X	X	X	Yes
Soliva sessilis	lawnweed	B	X			Yes: Grant, Yakima
Sonchus arvensis ssp. *arvensis*	perennial sowthistle	B	X	X	X	Yes: Grant, Yakima
Sorghum halepense	johnsongrass	A	X		X	Yes
Spartina alterniflora	smooth cordgrass	A	X			Yes
Spartina anglica	common cordgrass	A	X			Yes
Spartina densiflora	dense-flowered cordgrass	A	X			Yes
Spartina patens	saltmeadow cordgrass	A	X			Yes
Spartium junceum	Spanish broom	A	X			Yes
Sphaerophysa salsula	swainsonpea	B	X		X	Yes: Grant
Tamarix ramosissima	saltcedar	B	X	X	X	Yes: Kittitas, Yakima
Tanacetum vulgare	common tansy	C		X		
Thymelaea passerina	spurge flax	A	X			Yes
Tribulus terrestris	puncturevine	B	X	X	X	Yes: Grant
Ulex europaeus	gorse	B	X			Yes: Grant, Yakima
Xanthium spinosum	spiny cocklebur	C		X		
Zygophyllum fabago	Syrian beancaper	A	X			Yes

Sources[1]: WNWCB 2009a, 2013, Noxious Weed Control Board of Grant County (2013), Kittitas County Noxious Weed Control Board (2013), and Yakima County Noxious Weed Board (2011).

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APPENDIX B-5
SAGE-GROUSE ANALYSIS AND MITIGATION REPORT

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TABLE OF CONTENTS

FIGURES:

TABLES:

ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
APLIC	Avian Power Line Interaction Committee
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
COT	Conservation Objectives Team
DEIS	Draft Environmental Impact Statement
DPS	Distinct Population Segment
ESA	Endangered Species Act
GAP	Gap Analysis Program
GIS	Geographic Information System
HCA	Habitat Concentration Area
I-90	Interstate 90
IM	Instruction Memorandum
IPC	Idaho Power Company
ISAC	Idaho Sage-grouse Advisory Committee
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
km	kilometer
kV	kilovolt
lscv	least squares cross validation
mph	miles per hour
MR	Manastash Ridge
MU	Management Unit
NERC	North American Reliability Corporation
NNR	New Northern Route
NOAA	National Oceanic and Atmospheric Administration
OHV	off-highway vehicle
PAC	Priority Area for Conservation
PDF	Project Design Feature
PHS	Priority Habitats and Species
POD	Plan of Development
POWER	Power Engineers, Inc.
Project	Vantage to Pomona Heights 230 kV Transmission Line Project
PUD	Public Utilities District
Reclamation	U.S. Bureau of Reclamation
ROW	Right-of-Way
SDEIS	Supplemental Draft Environmental Impact Statement
SEE	Stell Environmental Enterprises, Inc.
UD	Utilization Distribution
U.S.	United States
USDA	U.S. Department of Agriculture
USEPA	Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWIN	Utah Wildlife in Need
WAFWA	Western Association of Fish and Wildlife Agencies

WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WECC	Western Electricity Coordinating Council
WHCWG	Washington Habitat Connectivity Working Group
WO	Washington Office (Bureau of Land Management)
WSDOT	Washington State Department of Transportation

1.0 INTRODUCTION

On January 4, 2013, the Bureau of Land Management (BLM) released the Vantage to Pomona Heights 230 kilovolt (kV) Transmission Line Project Draft Environmental Impact Statement (DEIS) for public review and comment, identifying an Agency Preferred Alternative (Alternative D in the DEIS). Public meetings were held in February 2013 to provide the public an opportunity to give their input on the DEIS and Agency Preferred Alternative. As a result of the comments received at the public meetings and submitted in writing during the DEIS comment period, BLM, Pacific Power (Project Proponent) and the Joint Base Lewis-McChord Yakima Training Center (JBLM YTC) met and identified a new route that is located largely on JBLM YTC managed land. This new route is similar to a northern JBLM YTC route that was considered and eliminated from consideration because of Western Electricity Coordinating Council (WECC) line separation requirements in place at the time the alternative was being considered. Previously, the separation distance required the placement of the line in areas that would create conflicts with JBLM YTC's aerial operations and training on the facility. Recently, the separation standards were revised by the electrical regulating authorities, WECC and the North American Electric Reliability Corporation (NERC), to allow a much closer distance between existing transmission lines. This regulatory change would allow this alternative route to be located in close proximity (200 to 250 feet) to existing lines (Bonneville Power Administration [BPA] and Pacific Power), which allowed this alternative option to be reconsidered as the New Northern Route (NNR; see Figure 1). As was done with alternative routes analyzed in the DEIS, the NNR was evaluated for potential impacts in a Supplemental Draft Environmental Impact Statement (SDEIS).

Based on DEIS comments received from U.S. Fish and Wildlife Service (USFWS) and Washington Department of Fish and Wildlife (WDFW) regarding impacts to greater sage-grouse (*Centrocercus urophasianus*; hereafter sage-grouse), this Sage-Grouse Mitigation and Analysis Report (Report) has been prepared to expand the impact analysis and to propose a mitigation framework for the proposed Project. This Report accompanies and will be incorporated into the SDEIS and includes the following sections:

- Brief Project Description
- Regulatory Overview
- Sage-Grouse Species Ecology
- Current Conditions and Trends
- Affected Environment
- Impact Analysis
- Comparison of Impacts
- Consistency with Regulatory Environment
- Proposed Measures to Offset Project Impacts

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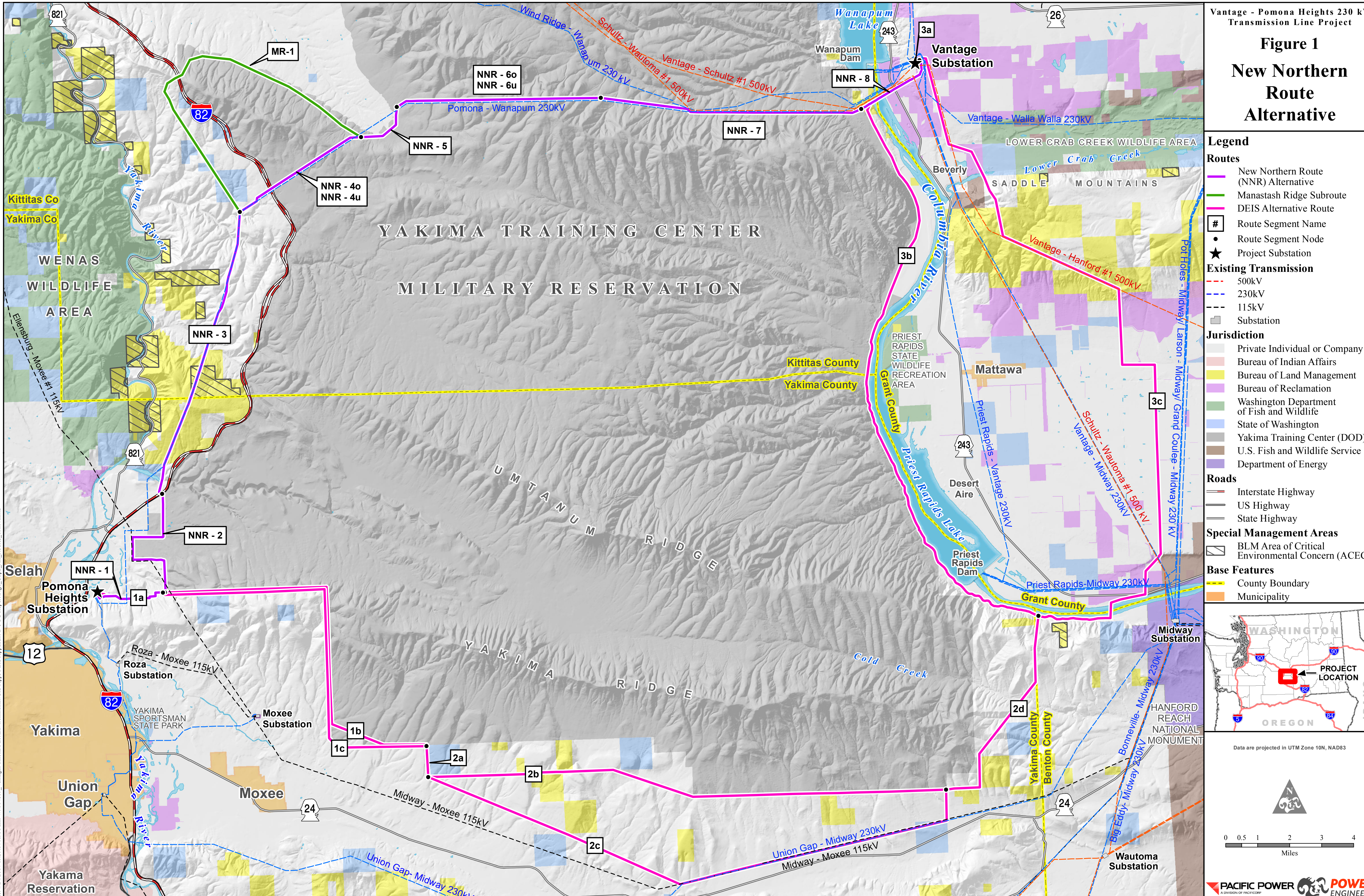

Figure 1
New Northern Route Alternative

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2.0 BRIEF PROJECT DESCRIPTION

Pacific Power proposes to construct, operate and maintain a new 230 kV transmission line from Pacific Power's Pomona Heights substation located just east of Selah, Washington in Yakima County to the BPA Vantage Substation located just east of the Wanapum Dam in Grant County, Washington.

The NNR Alternative considered in the SDEIS is approximately 40.4 miles in length. A subroute also being considered, the Manastash Ridge (MR) Subroute, adds 7.3 miles to the NNR Alternative for a total length of approximately 47.7 miles (Figure 1). The MR Subroute was proposed as an option to the NNR-4 route segment. Shaped like a horseshoe, it circumnavigates to the west, north, and east of Manastash Ridge. The NNR crosses federal land managed by the BLM, JBLM YTC, the U.S. Bureau of Reclamation (Reclamation), and state land managed by Washington State Department of Transportation (WSDOT) and Washington Department of Natural Resources (WDNR). The NNR Alternative also crosses three counties: Yakima, Kittitas and Grant Counties.

As proposed by Pacific Power, most of the transmission line would be constructed on H-frame wood structures between 65 and 90 feet tall and spaced approximately 650 to 1,000 feet apart, depending on terrain. In developed areas, single wood or steel monopole structures between 80 and 110 feet tall would be used. Single wood or steel monopole structures would be spaced approximately 400 to 700 feet apart. Steel lattice structures approximately 200 feet tall would be used where the NNR Alternative would cross the Columbia River below the Wanapum Dam.

This Report and the SDEIS considers two Design Options and one subroute: 1) NNR Alternative - Overhead Design Option; 2) NNR Alternative - Underground Design Option; and 3) NNR Alternative – MR Subroute. The Underground Design Option is being considered for two route segments (NNR-4 and NNR-6) as requested by the USFWS and WDFW regarding potential impacts to sage-grouse. The Underground Option, including components, construction technology and techniques, is discussed in detail in Chapter 2 of the SDEIS. A comparison of impacts for the Design Options and Subroute are discussed for Route Segments NNR-4, NNR-6, and MR-1 in Section 7.2.4 of this Report.

3.0 REGULATORY OVERVIEW

3.1 Federal Regulations and Policies

Sage-grouse are listed as Threatened by the state of Washington and are a BLM Sensitive species (Schroeder et al. 2003; Stinson et al. 2004). In 2001, USFWS determined that the western subspecies of sage-grouse (*Centrocercus urophasianus ssp. phaios*) met the requirements of a Distinct Population Segment (DPS); therefore, the USFWS is reanalyzing this designation since the eastern and western subspecies are no longer considered separate taxa. Petitions for listing sage-grouse range-wide were filed in 2002 and 2003, and in 2005, the USFWS concluded that listing sage-grouse was not warranted (USFWS 2005). In 2008, a status review was initiated by the USFWS to address new information that had become available since 2005 (USFWS 2008). Based on new information available, USFWS determined in March 2010 that the range-wide listing of sage-grouse under ESA was warranted, but the listing was precluded in order to complete higher priority listing actions. Range-wide the sage-grouse is considered a Candidate species under ESA (USFWS 2010a and 2010b). The USFWS is scheduled to make a final listing determination (i.e., either listing sage-grouse as Threatened or Endangered or determining that it does not warrant listing) by 2015. The USFWS's *12-Month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered* (2010a and 2010b) listed the following as potential impacts to sage-grouse resulting from power lines: 1) collisions/electrocutions, 2) consolidation of predatory birds along power lines, 3) lower recruitment rates near lines, 4) habitat fragmentation, 5) degradation of habitat due to spread of invasive plant species, 6) impacts resulting from the line's electromagnetic fields, and 7) direct loss of habitat.

Since designation of sage-grouse as a Candidate species, several BLM directives have been issued or revised regarding management direction for sage-grouse in order to prevent further declines and future listing. Federal and state regulatory requirements and guidance applicable to sage-grouse are discussed below and the Project's conformance with these regulatory requirements is discussed in Section 9.0.

In 2013, the USFWS Conservation Objectives Team (COT) published the Greater Sage-grouse Conservation Objectives: Final Report (COT Report). The COT Report provides guidelines and objectives for the conservation of sage-grouse. The main objective identified in the COT Report is to minimize habitat threats to the species so as to meet the objective of the 2006 Western Association of Fish and Wildlife Agencies' (WAFWA) Greater Sage-Grouse Comprehensive Conservation Strategy to reverse negative population trends and achieve a neutral or positive population trend. A key component of the COT Report is the identification of Priority Areas of Conservation (PACs), which are considered key habitats essential for sage-grouse conservation. The COT Report is a guidance document only. The COT Report's identification of conservation objectives does not create a legal obligation beyond the existing legal requirements for sage-grouse. The conservation framework within the COT Report consists of: 1) identifying sage-grouse population and habitat status and threats; 2) defining a broad conservation goal; 3) identifying PACs; and 4) developing specific conservation objectives and measures. The COT Report identifies four PACs within the state of Washington, two of which have extant populations, Moses Coulee and Yakima Training Center, and two historic populations undergoing reintroduction efforts with translocated birds. With the exception of a portion of NNR-8, the Project is located entirely within the Yakima Training Center PAC (see Figure 2). The sage-grouse population within this PAC is discussed in detail in Section 5.0. The COT Report (USFWS 2013) contains the following guidance for conservation objectives and measures to reduce threats within sage-grouse habitat and which are applicable for the NNR Alternative:

- Objective: Maintain and restore healthy native sagebrush plant communities.
  - Measures – Fire:
    - Restrict and contain fire.
    - Design, implement and monitor restoration activities for burned sagebrush habitat.
  - Measures – Invasive Species:
    - Reduce or eliminate disturbances that promote the spread of invasive species.
    - Monitor and control invasive vegetation post-wildfire for at least three years.
    - Require best management practices for construction projects in and adjacent to sagebrush habitats to prevent invasion.
    - Restore altered ecosystems so that non-native invasive plants are reduced to levels that do not put the area at risk of conversion if a catastrophic event were to occur.
- Objective: Avoid development of infrastructure within PACs. Measures include:
  - Avoid infrastructure construction in sage-grouse habitat, both within and outside of PACs.
  - Power transmission corridors which cannot avoid PACs should be buried (if technically feasible) and disturbed habitat should be restored.

- If avoidance is not possible, consolidate new structures with existing features and/or preclude development of new structures within locally important sage-grouse habitats.
    - Consolidation with existing features should not result in a cumulative corridor width of greater than 656 feet (200 meters).
    - Habitat function lost from placement of infrastructure should be replaced.
- Infrastructure corridors should be designed and maintained to preclude introduction of invasive species.
- Restrictions limiting use of roads should be enforced.
- Remove transmission lines and roads that are duplicative or are not functional.
- Transmission line towers should be constructed to severely reduce or eliminate nesting and perching by avian predators, most notably ravens, thereby reducing anthropogenic subsidies to those species.
- Mitigate impacts to habitat.
- Remove (or decommission) non-designated roads within sagebrush habitats.

In addition to the COT Report, BLM's Washington, D.C. office (WO) has issued two recent Instruction Memoranda (IMs) for sage-grouse: WO IM 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures (BLM 2010); and WO IM 2012-044, BLM National Greater Sage-Grouse Land Use Planning Strategy (BLM 2011b). The Columbia Basin DPS of sage-grouse are addressed in other policies and planning efforts and are not covered by WO IM 2012-043. WO IM 2012-044 provides direction to the BLM for the consideration of conservation measures identified in two documents: A Report on National Greater Sage-Grouse Conservation Measures (Sage-Grouse National Technical Team 2011) and the National Greater Sage-Grouse Planning Strategy (BLM 2011c). The National Greater Sage-Grouse Planning Strategy excludes the Washington State DPS, stating that they will be addressed through other policies and planning efforts (BLM 2011c).

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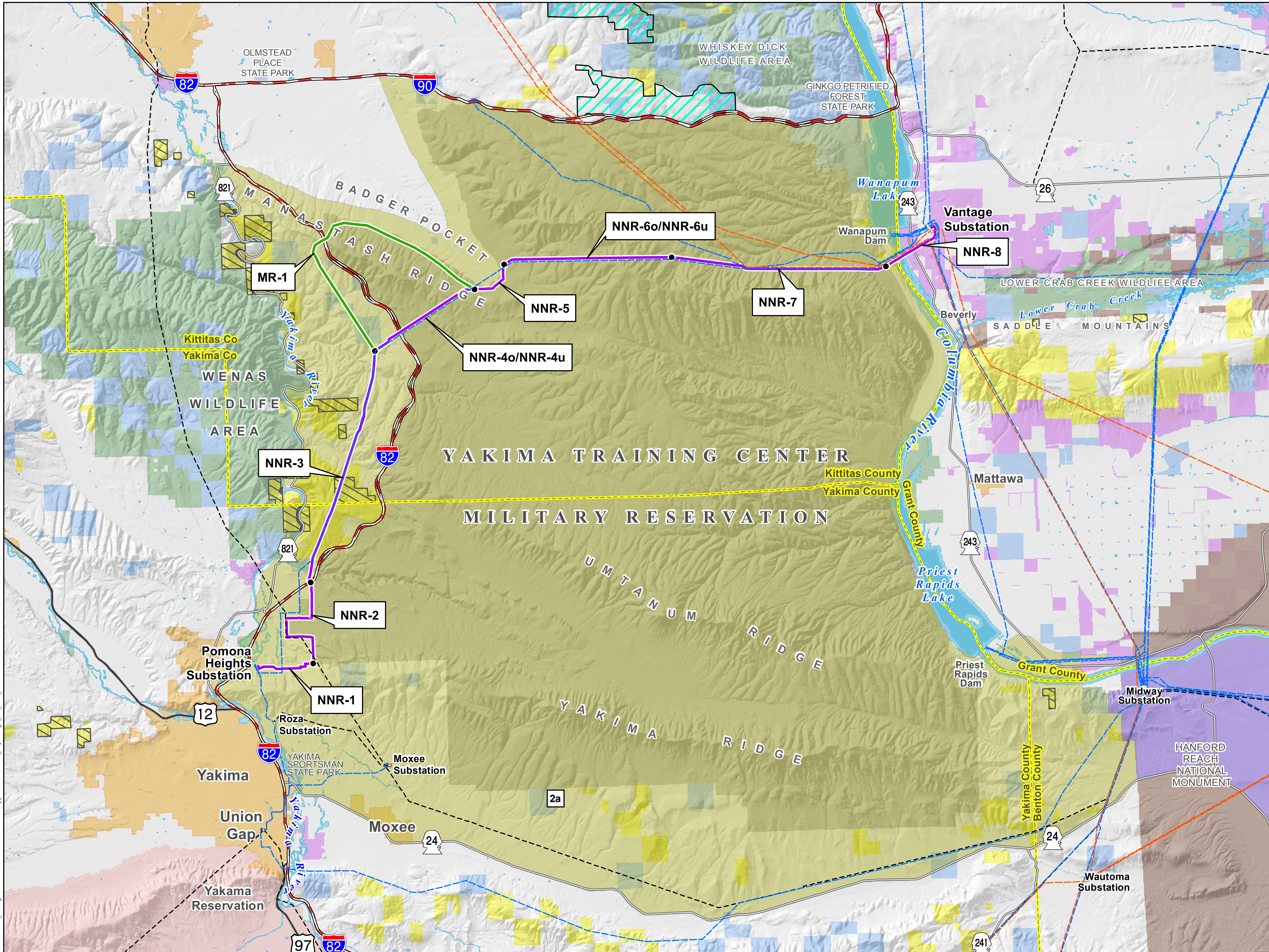
Vantage - Pomona Heights 230 kV Transmission Line Project

Figure 2
Sage-Grouse Priority Area for Conservation



Legend

Routes
- New Northern Route (NNR) Alternative
- Manastash Ridge Subroute
- Sage-Grouse Priority Area for Conservation (PAC) (Draft 2013/01)

Existing Transmission
- 500kV
- 230kV
- 115kV
- Substation

Jurisdiction
- Private Individual or Company
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Washington Department of Fish and Wildlife
- State of Washington
- Yakima Training Center (DOD)
- U.S. Fish and Wildlife Service
- Department of Energy

Roads
- Interstate Highway
- US Highway
- State Highway

Special Management Areas
- BLM Area of Critical Environmental Concern (ACEC)

Base Features
- Wind Farm
- County Boundary
- Municipality

Data are projected in UTM Zone 10N, NAD83

0 0.5 1 2 3 4 5
Miles

PACIFIC POWER
POWER ENGINEERS

Path: W:\114809_VantagePomonaPER\Environmental\GIS\Apps\2013\SEIS\SG_Report\Fig2_SG_PAC_11x17.mxd

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3.2 State Regulations and Policies

In 2004, the state of Washington published the Greater Sage-Grouse Recovery Plan (Recovery Plan) to summarize the current knowledge of sage-grouse in Washington and to outline strategies to increase population size and distribution. This Recovery Plan delineated distinctive regions in Washington, called management units (MUs), to focus recovery efforts in those areas most likely to contribute to reaching recovery objectives. Fourteen management units were delineated based on current occupancy, land ownership, location, topography, and habitat quantity, condition and potential (Stinson et al. 2004). The four MUs that would be crossed by the Project ROW corridor include: Rattlesnake Hills, JBLM YTC, Umtanum Ridge and Saddle Mountains (see Figure 3). The eight-mile-wide Project area also encompasses land within the Potholes MU. The MUs are further designated as:

- *Regularly Occupied Habitat* includes intact sagebrush communities known to be occupied by resident breeding populations of sage-grouse and are considered to be of highest conservation value. MUs within the eight-mile-wide Project area designated as Regularly Occupied Habitat are: JBLM YTC, Rattlesnake Hills and Umtanum Ridge.

- *Connectivity Habitat* includes movement corridors between seasonally used areas and between populations and includes areas important for providing habitat connections. There are no MUs within the eight-mile-wide Project area designated as Connectivity Habitat. Colockum MU, designated as Connectivity Habitat, is located approximately five miles north of Route Segments NNR-4 and NNR-5.

- *Occasionally Occupied Habitat* includes habitat that may be occupied on a seasonal or irregular basis, but is not regularly occupied by sage-grouse. Within the eight-mile-wide Project area, Saddle Mountains MUs is designated as Occasionally Occupied Habitat.

- *Expansion Habitat* includes areas where expansion could occur through an improvement in habitat quality. The Potholes MUs is within the eight-mile-wide Project area and has been designated as Expansion Habitat.

The Recovery Plan's goal is to establish a viable population of sage-grouse in a substantial portion of its historic range in Washington, with specific recovery objectives focusing on the breeding season population. The Recovery Plan states that recovering sage-grouse to a viable population will require an increase in population density, an expansion of occupied areas, and an improvement in habitat quality. Current and past management efforts focused on maintaining the existing populations and distributions of sage-grouse, while recovery efforts will focus on increasing the numbers and distribution of sage-grouse in Washington. Some of the designated MUs will require substantial restoration efforts to support breeding and wintering populations and may require coordinated efforts between public and private land managers to maintain and improve habitat (Stinson et al. 2004). Recovery Plan conservation strategies that are applicable to the proposed Project are discussed below and consistency with these strategies is discussed in Section 9.0.

- Protect sage-grouse populations:
    - Protect active sage-grouse leks from human disturbance. The Recovery Plan recommends minimizing disturbance from construction and development activities, particularly within 0.6 mile (1.0 kilometer) of breeding habitat during February - June.

    - Protect nesting and brood-rearing areas from disturbance. The Recovery Plan states that wherever possible, prevent disturbance in sage-grouse nesting and brood-rearing habitat between March 1 and June 15.
    - Reduce collision and predation hazards posed by poles, wires and fences. The Recovery Plan states: new power lines and utilities should use existing corridors or be located so as to minimize collision risk and damage to habitat; existing power lines should be buried or modified with perch guards to prevent use as a raptor perch site; and unneeded fences in sage-grouse use areas should be removed.
- Protect sage-grouse habitat on public lands:
    - Protect habitat from fire. The Recovery Plan states that fire management plans should be developed and implemented on public lands to prevent catastrophic destruction of sage-grouse habitat.
    - Protect important sage-grouse habitat on public lands from development and agricultural conversion.
    - Manage riparian habitats by promoting recovery of vegetation in riparian zones and avoiding road development and human disturbance in wet meadows.
    - Discourage expansion of road system on public lands in management units. The Recovery Plan states: new roads, trails or rights-of-way (ROWs) should be avoided; avoid improvements to existing, unused, and unpaved roads; promote closures of unnecessary roads or those that are negatively impacting habitat quality.
- Restore degraded habitat:
    - The Recovery Plan states that shrub-steppe restoration projects should use native seed sources, suppress cheatgrass and weeds, restore bunchgrass and native forb understory, reestablish sagebrush, and restore degraded wet meadows or vegetation at developed streams.

3.3 JBLM YTC Regulations and Policies

JBLM YTC has developed a Western Sage-Grouse Management Plan (Livingston 1998) that describes the current knowledge of and threats facing sage-grouse on the JBLM YTC. It outlines protection measures and procedures to be followed to ensure that the JBLM YTC sage-grouse population persists into the future. Protection for sage-grouse and its habitat within this Plan was expanded to an additional 33,000 acres in 2011 with the application of additional fire management and sage-grouse conservation related mitigation measures contained in the Record of Decision Fort Lewis Army Growth and Force Structure Realignment (Army 2011). As such, JBLM YTC has designated two sage-grouse protection zones: primary and secondary. The primary protection zone includes areas that are considered as essential sage-grouse habitat. Secondary protection zones provide indirect benefits to sage-grouse due to the application of fire management practices and habitat restoration efforts within these areas (JBLM YTC 2002). JBLM YTC sage-grouse management includes:

- Sage-grouse protection during breeding:
    - Buffer leks by 0.6 mile. These areas are closed to all training activities and other land use practices between midnight and 9:00 a.m. from February 1-May 15; and
    - Sage-grouse protection areas are off limits to all military training activities, except for the use of existing ranges, between February 1 and June 15.
- Sage-grouse habitat protection:
    - Bivouacking, digging, and maneuver training activities are designed to reduce or eliminate impacts to sage-grouse habitat within sage-grouse protection areas;
    - Fire is managed in accordance with JBLM YTC's Wildland Fire Management Plan; and

    - Noxious weeds are controlled in accordance with state and federal law and in coordination with a JBLM YTC wildlife biologist.
- Habitat restoration in disturbed areas:
    - Conduct assessment of current and potential habitat availability, rank habitat according to species need, identify and prioritize potential restoration sites, and monitor restored sites.
- Monitoring population trends:
    - JBLM YTC began formal monitoring and research of lek counts in 1989. Sage-grouse lek surveys are conducted on an annual basis to monitor leks.

4.0 SAGE-GROUSE SPECIES ECOLOGY

4.1 Introduction

Sage-grouse is a sagebrush- (*Artemisia* spp.) obligate species of the western United States and Canada (Schroeder et al. 1999). The historic distribution of sage-grouse covers 57 million acres in eleven states (WGA 2012) and is largely coincident with the occurrence of sagebrush dominated habitats in the Columbia Basin, Snake River Plain, Rocky Mountain Province, Great Basin, Colorado Plateau and Great Plains (Connelly et al. 2004). Range-wide declines in sage-grouse populations over the past century have been attributed to human settlement, land use patterns (e.g., grazing, agriculture, energy development), fire, and introduced weeds resulting in landscape-scale declines in the extent, integrity and quality of sagebrush habitats (USFWS 2010).

4.2 Life History and Habitat Requirements

4.2.1 Species Description

Sage-grouse is the largest grouse in North America (Schroeder et al. 1999). Adult males range in size from 66 to 76 centimeters in total length and may weigh over 3.0 kilograms during the breeding season; adult females are smaller with total lengths ranging from 48 to 58 centimeters and weighing between 1.3 and 1.7 kilograms. Plumage of both males and females is variegated with dorsal patterns of gray, black and buff providing cryptic coloration for concealment in sagebrush cover; however, males are more colorful with a distinct black throat and bib and a white breast concealing two yellowish to greenish gular sacs (Stinson et al. 2004). Sage-grouse are known for their breeding displays in early spring when males congregate in open areas within sagebrush and perform elaborate displays that include inflating their gular sacs. Females select mates at these breeding display grounds, called “leks,” and then nest, typically within four miles of a lek (Connelly et al. 2000). Sage-grouse habitat requirements vary seasonally and they often select different habitats during breeding, late brood-rearing and wintering seasons (Schroeder et al. 1999). Seasonal habitats will be discussed in more detail below. Diet consists primarily of sagebrush; however, sage-grouse will shift to insects and forbs during spring and summer (Stinson et al. 2004).

Sage-grouse populations may be migratory or non-migratory, based on landscape-scale distribution of essential resources, seasonal changes in resource availability and established behavior patterns of local populations. Movements of migratory populations may exceed 46 miles. Connelly et al. (2000) identified three types of sage-grouse populations based on seasonal movements:

- Non-migratory populations make seasonal habitat shifts that are less than 6.2 miles;
- One-stage migratory populations make movements greater than 6.2 miles between two seasonal ranges; and

- Two-stage migratory populations make movements greater than 6.2 miles among three seasonal ranges.

Despite seasonal movements at a range of scales, high site fidelity is indicated with grouse returning to the same areas year after year. Females may nest within 656 feet of the previous year's nest (Schroeder 1997). Grouse populations at the JBLM YTC are considered non-migratory.

Sage-grouse are generally longer lived, have lower reproductive rates and higher annual survival rates compared to most gallinaceous (upland game) birds. Most females nest as yearlings; however, this varies across the species range. Connelly et al. (2000) reported that virtually all yearling females nested in Washington, 22% of yearling females did not nest in Oregon, and 45% of yearling females did not nest in Idaho (Connelly et al. 2000). Nest success varies across range from 12 to 86% and also annually. Average clutch size varies from 6.0 to 9.5 rangewide and within Washington (Schroeder 1997). A ratio of greater than or equal to 2.25 surviving juveniles per hen in the fall should result in stable or increasing populations (Connelly et al. 2000). Overall, few annual surplus birds exist from year to year. Low reproductive rates slow recovery from losses (USFWS 2010).

4.2.2 Seasonal Habitats

Although dependent on sagebrush throughout the year, sage-grouse shift among habitats based on seasonal differences in nutrition and cover requirements and the relative proximity of habitats providing resources. Seasonal use habitats considered essential for maintaining healthy sage-grouse populations include: 1) breeding and early brood-rearing, 2) summer/late brood-rearing and 3) wintering habitats.

Breeding and Early Brood-Rearing

The breeding and early brood-rearing season is considered the most sensitive time of year for sage-grouse. It is during this time that sage-grouse perform courtship and select mates, prepare for nesting, nest and raise chicks. Breeding habitats are roughly centered on leks. Leks are established in open areas with good visibility surrounded by sagebrush providing escape habitat, forage and thermal refuge. These open areas may include playas, lake beds, bare soil, short grass patches, landing strips, roads, agricultural fields, burns and similar sites. Leks are where males compete for mating opportunities by performing strutting displays and producing complex vocalizations. Trees or other tall structures are generally not within line of sight of leks and are uncommon within two miles (Connelly et al. 2000; Stiver et al. 2010).

After mating, females retreat from leks and seek out nest sites. Average distance from leks to nest sites varies among populations. Reported averages range from 0.7 to 3.6 miles, but this distance may exceed 12 miles. In disturbed or fragmented habitats, females may nest further from leks (Connelly et al. 2000). Cadwell et al. (1994) reported that female grouse in the JBLM YTC population nested an average of three miles from their capture lek. Doherty et al. (2010) report that of 527 sage-grouse nests monitored in the Powder River Basin of Wyoming and Montana, 79% were located within 3.1 miles of the lek and 95% were within 6.2 miles. Sage-grouse nests are most often established under larger sagebrush, but in some cases, other plant species may be used (Connelly et al. 2000). Nest success is higher under a cover of sagebrush (53%) versus cover of other plant species (22%). Successful nests in sagebrush are located in stands with greater average cover and taller and denser grass understory than unsuccessful nests. Sveum et al. (1998) in a study of the JBLM YTC population found most nests (71%) were in big sagebrush with an intact bunchgrass understory. Sagebrush cover in nesting habitat typically ranges from 15 to 25%, with a sagebrush height of 12 to 30 inches (Stiver et al. 2010). Pre-laying habitats with diverse forbs provide calcium, phosphorus and protein to hens (Gregg et al. 2008). The condition of pre-laying habitats may greatly affect nest initiation rate, clutch size and success (Connelly et al. 2000). Once chicks have hatched, brood-rearing habitats become critical. Early brood-rearing habitats occur close to nests but movements may exceed 1.9 miles as grouse move to areas that have an abundance and diversity of herbaceous plants and insects, but may have lower sagebrush cover. Breeding/early brood-rearing season generally occurs from March 1 to June 30 (Stiver et al. 2010).

Summer/Late Brood-Rearing

Late brood-rearing occurs during approximately July 1 to September 30 (Connelly et al. 2000; Stiver et al. 2010). During summer as chicks grow and vegetation dries out, sage-grouse may shift habitats. These late brood-rearing habitats tend to be more mesic sites and may be dominated by sagebrush but may also include wet meadows, farm fields and irrigated areas adjacent to sagebrush habitats (Connelly et al. 2000). Suitable late brood-rearing habitat is characterized by 10 to 25% sagebrush canopy cover, 15 to 30 inches sagebrush height, common presence of preferred forbs, and ≥15% perennial grass and forb canopy cover; however, late brood-rearing can occur in agricultural fields with adjacent sagebrush. Within the JBLM YTC population, females, on average, spend the summer and fall approximately four miles from the lek, while males average seven to eight miles away from the lek during summer (Cadwell et al. 1994). By fall a slow shift toward winter range begins. Sage-grouse continue to supplement their diet with remaining succulent forbs but by early winter a transition to a sagebrush-dominant diet resumes.

Winter

Winter habitats are reached by December. Wintering habitat is typically similar throughout the species range and contains tall sagebrush or windswept areas with shallow snow accumulations. Sagebrush cover ranges from 10 to 30% with approximately 10 to 14 inches of height above the average snow depth (Stiver et al. 2010). Sage-grouse feed exclusively on sagebrush during winter. Big sagebrush is dominant, but grouse will feed on a variety of other sagebrush species, depending on availability (Connelly et al. 2000).

5.0 CURRENT CONDITIONS AND TRENDS, REGIONAL OVERVIEW

5.1 Regional and Washington Populations

The WDFW reports that the historical distribution of sage-grouse in Washington spanned the extent of shrub steppe and meadow steppe habitats of the Columbia Basin of eastern Washington in an area exceeding 22,000 square miles (Stinson et al. 2004). Although negative trends in sage-grouse populations had been noted since the early 1900s (Connelly et al. 2000), precipitous declines in Washington became apparent in the 1970s. Sixty-six percent of lek complexes documented in 1960 are now vacant (Schroeder et al. 2011). The population size in Washington declined more than 50% between 1970 and 2011. The current range within Washington is now approximately 8% of the presumed historic range and limited to two populations with a total of approximately 1,200 sage-grouse (Robb and Schroeder 2012). The Moses Coulee population, numbering approximately 930 birds, is found in Douglas and Grant Counties on mostly private land. The second population is located in Kittitas and Yakima Counties on the JBLM YTC land which is used for combat readiness training. In 2013, the sage-grouse population at JBLM YTC was estimated to be at 221 birds. Both populations are considered isolated from each other as well as the more distant populations in Oregon and Idaho (WDFW 2004). Connectivity among populations is discussed in Section 5.2 - Habitat Connectivity.

Both historic and recent declines in sage-grouse populations are largely the result of habitat loss and fragmentation associated with conversion of native sagebrush landscapes for human land uses (principally agriculture) and widespread degradation of remaining habitat through poor land management practices and the invasion of aggressive exotic weeds; however, over harvesting may have aggravated the impacts of habitat fragmentation and accelerated local extinctions (Stinson et al. 2004). In the Moses Coulee population in Douglas and Grant Counties, sage-grouse occupy a mosaic of native habitats, dryland wheat and lands enrolled in the Conservation Reserve Program with sagebrush steppe comprising only 44% of the area. The JBLM YTC sage-grouse population is found on the largest intact shrub steppe site in the state (Schroeder et al. 2011; Sveum et al. 1998). The JBLM YTC population is discussed at length in Section 6.0 - Affected Environment.

5.2 Habitat Connectivity

Maintenance and restoration of habitat connectivity has important implications for the genetic and demographic health of wildlife populations. Anthropogenic features and land uses can reduce connectivity by fragmenting habitat and hindering the movement of wildlife. Fragmented landscapes with reduced connectivity support fewer animals and isolated local populations face higher local extinction rates and lower likelihood of recolonization as well as loss of genetic diversity (Beissinger and McCullough 2002). Given predicted climate change, connectivity conservation may have especially important implications in the future as species must move to adapt to changing vegetation patterns and shifting habitats (Heller and Zavaleta 2009). Development and agriculture have fragmented sagebrush-steppe within Washington and habitat connectivity is degraded and threatened for many species (WHCWG 2010).

The JBLM YTC sage-grouse population is one of two geographically distinct populations in Washington; the second population is located in the Mansfield Plateau/Moses Coulee area in Douglas and Grant Counties (Stinson et al. 2004). The JBLM YTC population is isolated from the Mansfield Plateau/Moses Coulee population by more than 30 miles and from populations in Oregon and Idaho by about 150 miles (Robb and Schroeder 2012). These populations have reduced genetic diversity relative to populations outside of Washington, and differ genetically from each other suggesting a recent genetic bottleneck and little gene-flow between these populations (Benedict et al. 2003; Oyler-McCance et al. 2005).

Sage-grouse exhibit two types of long-distance movements: 1) natal dispersal (movement a juvenile makes from its natal home range to its own adult home range) and 2) seasonal migrations. Minimal existing dispersal information indicates average natal dispersal distances for juvenile sage-grouse is approximately five miles, though movements of up to 20 miles have been recorded for adult females in Washington (Robb and Schroeder 2012). Sage-grouse in the JBLM YTC population are non-migratory with only localized movements between seasonal use areas, whereas some birds in the Mansfield Plateau/Moses Coulee population exhibit migratory patterns (Robb and Schroeder 2012).

The Washington Wildlife Habitat Connectivity Working Group (WHCWG) was formed to address the need to identify the most important areas for maintaining and enhancing habitat connectivity within the state. The partnership is among several state and federal agencies, tribes, and non-governmental organizations and is co-led by WDFW and WSDOT. The WHCWG has completed a statewide connectivity analysis (WHCWG 2010) and a Columbia Plateau connectivity analysis (WHCWG 2012), including a species-specific connectivity analysis for sage-grouse (Robb and Schroeder 2012). For sage-grouse, the Columbia Plateau analysis improved upon the statewide analysis by using telemetry and lek data, accounting for additional anthropogenic features, and improving the resolution.

The general WHCWG analyses identified the "Connected Backbone," running north-south through the JBLM YTC, as the most important linkage zone in the Columbia Plateau Ecoregion. A second important corridor in the JBLM YTC area was identified as the "Lower Crab Creek Linkage Zone," stretching east from JBLM YTC and facilitating east-west movement between the "Connected Backbone" and another north-south band in eastern Washington, the "Braided Scablands Swath" (WHCWG 2012).

Sage-grouse specific WHCWG analyses identified four Habitat Concentration Areas (HCA) within Washington. These include the JBLM YTC and Mansfield Plateau/Moses Coulee populations already mentioned and two reintroduced populations, one in the northern Crab Creek drainage in Lincoln County and one on the Yakama Reservation in Yakima County. Sage-grouse were translocated to the Yakama Reservation in 2006, but as of 2012 there were no confirmed observations of breeding activity (Robb and Schroeder 2012).

The WHCWG analyzed connectivity among the four HCAs by assigning resistance values to various landcovers and anthropogenic features along potential routes that sage-grouse may take if they attempted to travel from one HCA to another. The resistance values relied upon published literature and the professional judgment of biologists and expert reviewers. Assigned resistance values for landcover ranged from 0 (e.g., sagebrush-steppe) to 19 (forest). Resistance values for anthropogenic features ranged from 0 (e.g., 1,640 to 3,280-foot buffer of 230 kV transmission line) to 99 (housing with <10 acres/dwelling unit). Intermediate resistance values included local roads (2), wind turbines (9 for a 148-foot buffer, 4 for a 1,640-foot buffer, 1 for a 0.6 mile buffer), major highways (19 for centerline, 3 for a 1,640-foot buffer), and freeways (24 for centerline, 4 for a 1,640-foot buffer). Transmission lines were given resistance values comparable to wind turbines (7 for a single 230 kV line, 3 for a 1,640 foot buffer). For two adjacent 230 kV lines the resistance values were not doubled, but increased by approximately 25% (9 for a double line, 4 for 1,640-foot buffer, 1 for a 0.6 mile buffer; Robb and Schroeder 2012).

The WHCWG analysis identified the linkage between the JBLM YTC HCA and the Mansfield Plateau/Moses Coulee HCA as "fairly good" (see Figure 8). Much of the habitat along this corridor is shrub steppe that is protected within state-owned wildlife areas. Impediments to this linkage include the relative steepness of the terrain, and disturbance associated with Interstate 90 (I-90), several existing transmission lines, and wind energy development. Conditions for movement are best in the central portion of the linkage, but there are areas of concern at both ends. Near its northern end, the modeled corridor is constricted as it crosses the Columbia River near Rock Island Dam. Near the southern end, north of I-90 and the proposed Project, the linkage is constricted by wind energy development (Robb and Schroeder 2012).

The connectivity model is illustrated in Figure 8 and potential impacts of the proposed Project on sage-grouse connectivity are discussed in Section 7.2.3 Impacts Common to all Route Segments, Habitat Connectivity and Linkage.

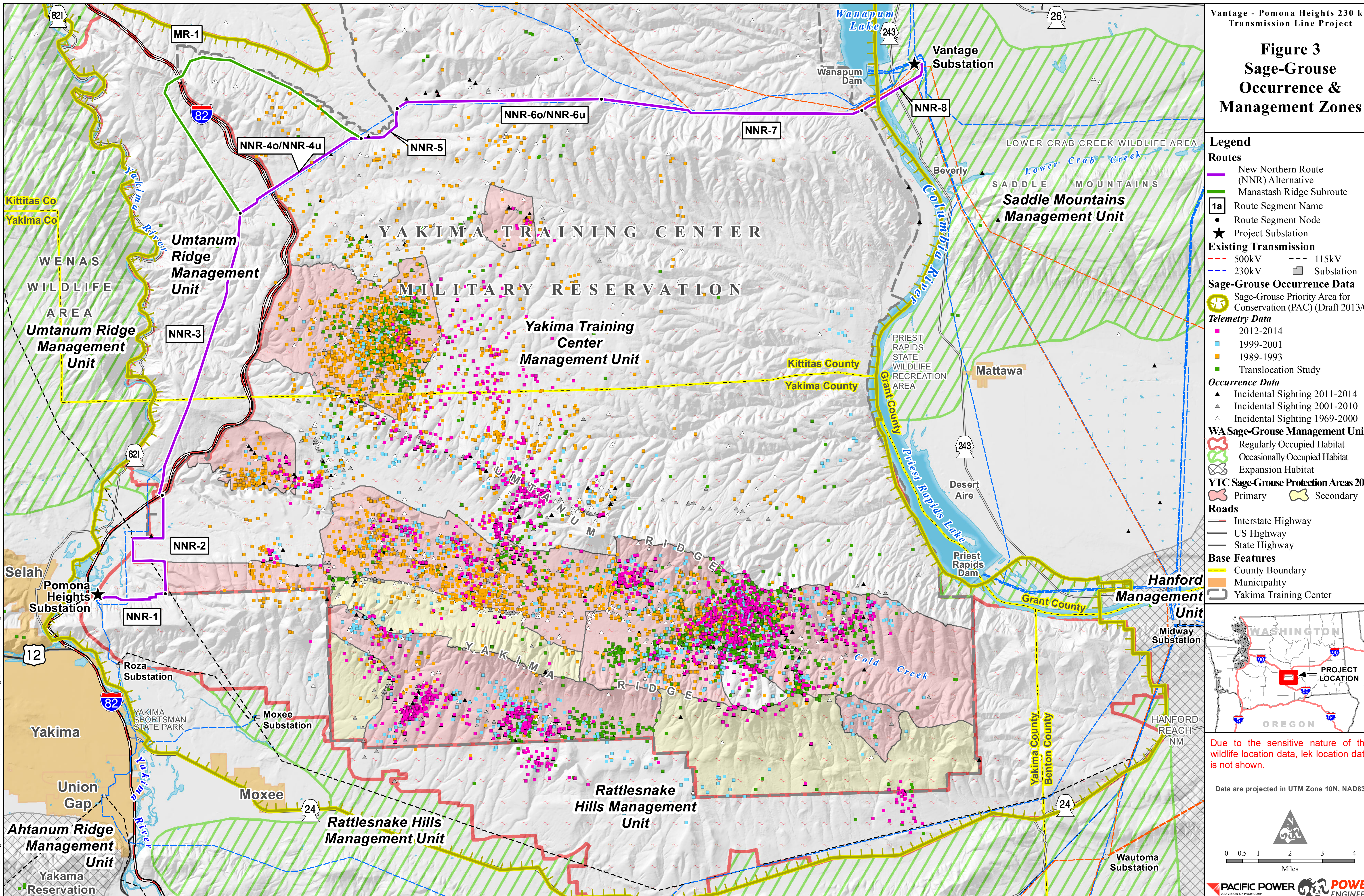
6.0 AFFECTED ENVIRONMENT

6.1 Project Area Description

For the purposes of this sage-grouse analysis, the Project area is defined as an eight-mile-wide analysis area of the NNR and MR Subroute: a four-mile buffer of the route centerline. The Project area included in the DEIS for sage-grouse consisted of a two-mile-wide corridor: one mile from either side of route segment centerlines. For the SDEIS, the Project area was expanded to an eight-mile-wide corridor based on input from JBLM YTC and USFWS. For description and analysis of individual route segments (Sections 6.5 and 7.2.4), a four-mile buffer of each route segment was used; please note that the buffers of each route segment overlap each other, so the sum of the route segment analysis areas is greater than the overall route analysis area for each alternative. The overall impacts are described for each alternative in Section 8.0 Comparison of Impacts by Alternative.

The proposed Project lies within the Columbia Plateau ecoregion, which covers most of central and eastern Washington, as well as limited parts of Oregon and Idaho (USEPA 2010). The Columbia Plateau is an arid sagebrush steppe and grassland that is surrounded by ecoregions that are typically moister, forested and mountainous (USEPA 2010). Approximately 15 million acres of steppe habitat existed in eastern Washington prior to Euro-American settlement (Daubenmire 1970; Stinson et al. 2004). Roughly half of the original steppe habitat in Washington has been lost to agriculture and human development with approximately 7.4 million acres remaining (Stinson et al. 2004). Washington greater sage-grouse populations declined as shrub-steppe habitat was lost and currently only about 8% of the historical range in Washington is occupied.

The majority of the proposed Project is within the JBLM YTC, the largest remaining contiguous block of intact shrub-steppe in the state of Washington (JBLM YTC 2002). The JBLM YTC grouse population is one of two geographically distinct populations remaining in Washington and contains approximately 200 of the statewide estimated 1,200 sage-grouse (Robb and Schroeder 2012; Teske 2013). The proposed Project approximately follows the western and northern edges of the JBLM YTC sage-grouse population (see Figure 3).



Vantage - Pomona Heights 230 kV Transmission Line Project

Figure 3 Sage-Grouse Occurrence & Management Zones

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6.2 Habitat

With the exception of NNR-8, all of the route segments are within the JBLM YTC PAC (Figure 2) and cross the following MUs designated as Regularly Occupied Habitat: Rattlesnake Hills, Yakima Training Center, and Umtanum Ridge. The portion of NNR-8 that is east of the Columbia River is within the Saddle Mountains MU designated as Occasionally Occupied Habitat. The eight-mile-wide Project area also encompasses land within the Potholes (Expansion Habitat) MU and land not designated for sage-grouse management (Figure 3).

The proposed MR-1 Subroute and NNR route segments avoid passing through any of JBLM YTC's protection zones. A small stretch within NNR-2 passes immediately adjacent to the edge of a primary protection zone. Most of the western two-thirds of the NNR route are within four miles of various primary protection zones located east and south of the NNR route. There are no secondary protection zones within four miles of the NNR route (Figure 3).

Elevations along the proposed route range from approximately 500 to 3,350 feet above mean sea level (amsl). The Project area is dominated by shrub-steppe vegetation, with the most prevalent vegetation cover types including: 1) sagebrush steppe with a perennial grass understory and 2) annual grassland/noxious weeds. Other common cover types include: 1) sagebrush steppe with an annual grass understory, 2) perennial grassland, 3) forb-dominated communities and 4) agricultural, developed and disturbed areas. Other shrublands and riparian areas are present, but make up a relatively small part of the eight-mile-wide Project area.

Generally, sagebrush steppe with a perennial grass understory has the best potential to provide year-round suitable habitat for sage-grouse. Other shrubland and grassland habitat types have some potential to provide suitable or marginal habitat during one or more seasons depending on surrounding habitat and site-specific characteristics. Suitability of habitat for sage-grouse depends on several site-specific factors, including: 1) sagebrush cover, 2) sagebrush height and 3) cover, height, and species composition of forbs and perennial grasses (Stiver et al. 2010).

A sage-grouse habitat assessment in the NNR Alternative and MR Subroute ROW was conducted in 2013 using a combination of remote sensing data and field data collected during vegetation surveys and sage-grouse walking transect surveys. Field surveys were conducted in the ROW for a preliminary NNR Alternative; however following the surveys, routing adjustments were made due to new requirements for separation distance from existing transmission lines and concerns about sage-grouse. The locations of the final NNR Alternative and MR Subroute were finalized in November 2013. Due to the route adjustments, field surveys were not conducted along these new locations. Detailed methods and results are included in SDEIS Appendix B-2 (Sage-Grouse Habitat Assessment, New Northern Route and Manastash Ridge Subroute). Habitat determinations were made largely by sagebrush cover, as determined using aerial imagery, and by general understory character (e.g., areas dominated by annual grasses were not considered suitable breeding or summer habitat). The proposed ROW passes through a variety of steppe vegetation, ranging from relatively intact sagebrush with a perennial grass understory, to annual grasslands and disturbed ground. Consequently the seasonal habitat suitability is somewhat patchy and differs among the NNR and MR route segments. Generally speaking, the central and eastern portions of the proposed NNR ROW contain the most suitable habitat, while the relatively disturbed, weedy southern portions contain less suitable habitat. The highest concentration of suitable habitat occurs near Badger Pocket in Route Segments NNR-4, NNR-5, and the western end of NNR-6, with another concentration of suitable habitat in NNR-7. Suitability often differed by seasonality. For example, the relatively high-elevation portion of the ROW (>3,000 feet amsl) traversing the north-facing slopes of the Saddle Mountains, where high sagebrush cover was confined to swales and drainages where blowing snow gets deposited, crosses suitable summer (late-brood rearing) and breeding habitat, but does not have suitable winter habitat, because the sagebrush is confined to pockets that likely have the deepest snow cover. Much of the western portion of the NNR ROW is dominated by cheatgrass, especially on south-facing slopes. Areas with adequate sagebrush cover and a cheatgrass understory may provide suitable winter habitat, when sagebrush is the primary food resource, but are not suitable habitat during the breeding and summer seasons when forb and perennial grass cover is important (Stiver et al. 2010). Overall 23% of the NNR ROW was classified as suitable breeding habitat and 39% as marginal breeding habitat. For winter habitat, 44% was classified as suitable and 24% as marginal. During the summer (late brood-rearing) season, 35% provides suitable habitat and 32% provides marginal habitat. Specific habitat delineations are described for each route segment below and summarized in SDEIS Appendix B-2 - Habitat Assessment.

While a detailed, fine-scale habitat assessment was conducted within the NNR ROW, it was not feasible to use the same fine-scale methodology for the entire eight-mile-wide Project area. To estimate habitat suitability within the Project area, land cover data was used. A composite of United States Geological Survey Gap Analysis Program (USGS GAP) data, JBLM YTC vegetation data, and vegetation data collected during POWER Engineers' field surveys was used to delineate 12 categories of land cover type. Each of these was in turn assigned a sage-grouse habitat suitability value (suitable, marginal, or unsuitable). The assigned values were as follows: 1) suitable habitat includes "sagebrush/perennial grassland", 2) marginal habitat includes "sagebrush/annual grassland", "riparian", "intermittent stream", and "bitterbrush/perennial grassland" and 3) unsuitable habitat includes "forb", "perennial grassland", "rabbitbrush/annual grassland", "annual grassland and noxious weeds", "basalt cliffs/rock", "tree", and "other" (includes agriculture, developed/disturbed areas, and open water). Overall, approximately 61% of the eight-mile-wide Project area was classified as suitable habitat, 2% as marginal, and 37% as unsuitable. It should be noted that this is only a coarse-scale approximation of true habitat suitability for sage-grouse, which is ultimately dependent on the condition of the vegetation community. In addition to the appropriate species composition within the vegetation community, an assessment of habitat conditions includes structural components such as canopy cover and height that provide additional information on the quality and habitat suitability for sage-grouse. For example, within the habitat classified as "sagebrush/perennial grassland" (and therefore considered as suitable sage-grouse habitat) some areas are likely to have insufficient sagebrush cover to provide truly suitable habitat.

6.3 Existing Infrastructure and Disturbances

Within the Project area, sagebrush-steppe habitat has been fragmented by the invasion of non-native plants, roads, residential development, livestock grazing, agricultural land use, existing transmission lines and altered fire-regimes. The proposed NNR Alternative closely parallels the existing Pacific Power Pomona-Wanapum 230 kV transmission line that primarily uses H-frame poles similar to the ones identified for the proposed Project. At the eastern end of the Project area (NNR-7 and NNR-8), one additional 230 kV transmission line (Puget Sound Energy Wanapum-Wind Ridge) and two 500 kV lines (BPA Schultz-Wautoma and BPA Schultz-Vantage) exist within one mile of the proposed NNR Alternative. Other prominent infrastructure and disturbance within the Project area includes urban and suburban development, JBLM YTC facilities, bivouac areas and training activities, road networks (I-82, state and county highways, all-weather gravel access roads for military training, and numerous light-duty dirt roads), agricultural areas, communication towers, canals, and fire breaks. Generally speaking, infrastructure and disturbance is heaviest at the southwestern end of the NNR Alternative Project area (NNR-1 and NNR-2) and lightest along the north-central portion, near Route Segment NNR-6. Locations of existing infrastructure and disturbance are discussed in Section 6.5 (Route Segment Considerations).

Wildfires have occurred within and near the eight-mile-wide Project area, the majority of which were concentrated within the JBLM YTC boundary. Due to the type and intensity of military training that occurs at the JBLM YTC, the incidence and risk of fire is higher compared with adjacent lands and naturally occurring fire cycles. The incidence of fire ignition and spread at the JBLM YTC has been declining since 1996 due to improvements to their fire management policy, increased support and maintenance of firebreaks (JBLM YTC 2002).

Livestock grazing occurs outside of JBLM YTC on both public and private lands. In addition to grazing on private land, grazing leases are authorized on BLM land and WDNR state trust land. Livestock grazing, which decreases cover of native forbs and perennial bunchgrasses, ended on JBLM YTC land in 1995 (Livingston 1998). Spring and summer habitat suitability for sage-grouse depends on sufficient cover of forbs and bunchgrasses.

6.4 Sage-Grouse Population Range Estimates and Leks

Based on location data provided by JBLM YTC, including telemetry data and incidental observations, it is apparent that sage-grouse use within the eight-mile-wide Project area occasionally occurs but is rare relative to the core area of sage-grouse use in the center of JBLM YTC, particularly in recent years (Figure 3). To generate a clearer picture of relative density of use by the JBLM YTC sage-grouse population, a fixed kernel density analysis was conducted using telemetry data. Fixed kernel density estimates were calculated in Geospatial Modeling Environment (GME Version 0.7.2., http://www.spatialecology.com, accessed 12 Feb 2014) at a scale of 100 x 100-m pixels using the least squares cross validation (lscv) bandwidth estimator. The kernel density method is commonly used to compute probabilistic estimates of utilization distribution (UD) within individual animal home ranges, using random location data consisting of discrete points (Fuller et al. 2005). The location data is usually collected using radio or satellite telemetry devices attached to animals to provide random, unbiased locations. While most often used to estimate distribution of use for individuals, the method has also been used to estimate UDs for populations (Coates et al. 2013). The output of the UD analysis is a continuous probability surface. Among kernel density home range analysis studies, a 95% isopleth is commonly derived from a UD to represent the home range, and a core area is often represented by 80% or 50% isopleths. To yield easily interpretable metrics, 95% and 80% isopleths were generated in our analysis. Areas within the isopleths represent probabilities of utilization. The 95% isopleth encompasses 95% of the predicted distribution of all grouse habitat use for the JBLM YTC population; for the lay reader, this concept can be roughly approximated the following way: on an “average” day, 95% of the grouse would be expected to occur within the 95% isopleth, or alternatively the “average” grouse spends 95% of its time within the 95% isopleth. For the purposes of analysis, this will represent the “population range”. Likewise, 80% of the sage-grouse usage can be expected to occur within the 80% isopleth, i.e. the “core population range”. The estimated population range and core population range facilitate comparison of relative densities of sage-grouse use within and near each NNR segment and MR Subroute and aid in predicting the level of impact the proposed Project would have on the overall JBLM YTC sage-grouse population.

Available location data includes three telemetry studies from sage-grouse captured on JBLM YTC. These studies range from 25 years old to present, with specific years of study including 1989-1993, 1999-2001, and 2012-2014. Other available location data includes a telemetry study from sage-grouse translocated to JBLM YTC from Oregon and incidental observations collected from 1969 through 2012. All of these data are presented in Figure 3 to show documented sage-grouse use in and around the eight-mile-wide Project area. Data from translocated birds was not analyzed as it is unlikely that newly transplanted birds would provide an accurate picture of use by the local population. Incidental observations were not analyzed because the lack of standardized protocol and opportunistic nature of those observations would lead to biased results that would have as much or more to do with density of use by human observers as density of use by sage-grouse. Sage-grouse experts from BLM, JBLM YTC and USFWS determined that data from the three telemetry studies of locally captured sage-grouse would be retained and use for the kernel analysis.

In each study, sage-grouse were captured at a broad array of lekking areas throughout the population area and are assumed to provide a spatially representative sample of the overall population (Cadwell et al. 1998; Livingston and Nyland 2002; SEE 2013). Migratory populations of sage-grouse utilize spatially discrete seasonal areas, defined by Stiver et al. (2012) as Breeding (March through June), Summer (late brood-rearing; July through September), and Winter (October through February). Though the JBLM YTC population of sage-grouse is known to be non-migratory, the possibility of seasonal differences in utilization was examined. Data was subsampled to include one randomly selected location from each telemetered bird during each of the three seasons. Data was subsampled to avoid pseudoreplication that would occur if numerous points were used for each animal when the question of interest was utilization by the entire population. Pseudoreplication would be expected to result in a model that overfits the data, i.e., the results would closely fit the sampled data, but would poorly fit the actual population. The biased probabilities would yield a convoluted UD that tightly fits the observed locations and underestimates the population range size. In fact, a comparison of the UDs from the subsample versus the original data confirmed the predicted difference in UD size and shape; the convoluted UD from the original data underestimated the population range size by 22% relative to the subsample. The subsamples included 346 location points from 1989-1993, 111 points from 1999-2001, and 82 points from 2012-2014. A comparison of UDs generated separately for each season confirmed that seasonal differences do not occur at the population scale, so the three seasons were lumped for subsequent analysis.

A comparison of UDs generated separately for each of the three study periods (1989-1993, 1999-2001, and 2012-2014) did reveal a substantial difference among study periods. Telemetry data from the 2012-2014 study was selected for the final analysis because impact of the proposed Project on sage-grouse can be most reliably assessed using the current distribution of sage-grouse (Figure 4 Sage-Grouse Estimated Population Range and Core Range, 2012-2014). A time series, displaying UDs from each study period, is displayed in Figure 5 (Time Series of Sage-Grouse Estimate Population Ranges, 1989-2014).

Based on the kernel density model, the current population range (95% isopleth) does not overlap the proposed NNR ROW (see Figure 4). This does not indicate that absolutely no sage-grouse use ever occurs in the proposed NNR ROW, but that use would be expected to be very rare relative to the area within the estimated population range; approximately 5% of all sage grouse use is expected to occur outside of the population range. Estimates beyond the 95% range are not typically attempted and would not be reliable (Fuller et al. 2005). During ground transect surveys conducted along the proposed NNR in May and July of 2013, no sage-grouse were observed; however, sage-grouse scat was observed in six locations adjacent to NNR-6, one location on NNR-5 and one location on NNR-4. These results indicate that some sage-grouse use of the ROW does occur, but that use is rare (i.e., less than 5%). The estimated 95% isopleth population range does overlap the eight-mile-wide Project area of the NNR and MR routes, but the core population range (80% isopleth) does not. Acreages of population range within the eight-mile-wide Project area are shown in Table 1 and described for each route segment (Section 6.5) by alternative (Section 8.0).

A time-series of the three study periods reveals a southeastward shift in the JBLM YTC sage-grouse population range and core population range since 1989. It is beyond the scope of this report to speculate at length on possible causes of the shift, but it should be noted that the existing 230 kV Pomona-Wanapum transmission line was built in the early 1970s, more than 15 years before the earliest available sage-grouse location data. An examination of fire history at JBLM YTC (see Figure

6) does not suggest a relationship between fire history and the shift in sage-grouse distribution. The formerly occupied area suffered minimal burns relative to areas within the current core population range. The shift in sage-grouse distribution may have been influenced by JBLM YTC training maneuvers. Most of the sage-grouse range shift occurred during the 1993 to 1999 period in JBLM YTC Training Areas TA-15 and TA-16. According to JBLM YTC (personal communication 2014), there was a period of heavy training maneuvers during the mid-1990s, with particularly high activity levels in TA-16. It is also possible that the population shift was not a response to any change in habitat or disturbance levels, but merely a response to population declines, such that if the TA-15 and TA-16 areas held inherently lower quality habitat to begin with relative to the core area, they simply may have been the first areas to be abandoned as the population declined from over 300 birds during the 1989-1993 period to approximately 200 birds during the most recent period.

The population range during the most recent period (2012-2014) provides the most useful information for predicting Project impacts on the current grouse population. Nevertheless, the historic population ranges might be indicative of areas likely to be reoccupied in the future if the JBLM YTC sage-grouse population recovers and expands into currently unoccupied areas. Future occupancy is speculative in nature and would depend on a number of factors including wildfire occurrence, military training activities and future habitat condition.

Active, inactive, and historical leks are shown in Table 2 and discussed in Section 6.5 for each NNR route segment. Leks are classified by JBLM YTC as: 1) active - a lek with at least two male grouse observed displaying on at least two different days during the previous year or during the last year checked; 2) inactive - has been active sometime during the previous 10 years, but was not active during the last year checked; or 3) historical - a formerly active lek site in which no activity has been observed for the previous 10 years (JBLM YTC 2014; SEE 2013).

Lek complexes are defined as active leks within 1.8 miles of each other and have been used to estimate the JBLM YTC sage-grouse population size and trends (SEE 2013) (Schroeder et al. 2000). Fourteen lek complexes are known to occur within JBLM YTC, containing approximately 19 leks. Of the fourteen lek complexes, two have not been attended by male sage-grouse since the early 1990s. Lek surveys are conducted on JBLM YTC on a yearly basis with priority given to areas with prior sage-grouse sightings during the breeding period and active, inactive and historic lek locations. No new leks were documented on JBLM YTC during the 2013 lek surveys and it is unlikely that an undocumented major lek exists on JBLM YTC in searchable areas. Additional leks may be present on JBLM YTC in unsearchable areas (i.e., Central Impact Area) and on adjacent private lands (SEE 2013).

In 2013, seven active leks, from seven lek complexes were documented within the JBLM YTC sage-grouse population with a total count of 85 lekking males. Two of the seven active leks are within four miles of the proposed NNR (Table 2). Both of these leks were greater than three miles from the proposed NNR route and both are relatively small leks, accounting for a total of seven of the 85 lekking males on JBLM YTC (8%).

The first active lek (hereafter lek #1) is located approximately 3.4 miles from Route Segment NNR-3. Lek #1 was considered an active lek starting in 2011. In 2013, four males were observed attending lek #1 which was down from 2011 and 2012 attendance numbers (seven and six male grouse, respectively). In 2011 a secondary (satellite) lek was used, located approximately 2,000 feet away from Lek #1. Use was not observed at the secondary lek in 2013.

The second active lek (hereafter lek #2) occurs approximately 3.5 miles from NNR-6. Lek #2 was discovered in 2007 and was considered an active lek beginning in 2008. Lek #2 had three males attending in 2013, with an average of 2 males attending during the past 6 years (SEE 2013). Table 3 shows lek counts from 1989 to 2013 for each lek complex within the entire JBLM YTC sage-grouse population, including leks greater than four miles from the proposed NNR segments.

Historical leks are known to have occurred within four miles of all route segments except Route Segment NNR-1 (see Table 2).

In 2013, the sage-grouse population at JBLM YTC was estimated to be at 221 birds, the highest population estimate since the 2006 estimate of 229 sage-grouse (SEE 2013; Table 3; Figure 7). The sage-grouse population at JBLM YTC is above the management goal of 200 for the second time in the last seven years (SEE 2013; JBLM YTC 2002). The 24-year average population estimate for JBLM YTC is 273 sage-grouse, although there has been an overall annual decline in the population. From 2007 through 2010 and again in 2012, population estimates were below 200. This may have been a result of habitat loss from fires (2006-2009); however, since 2009, little existing sage-grouse habitat has been lost to fire and areas that burned from 2006-2009 have experienced grass and shrub recovery due to restoration efforts (SEE 2013).

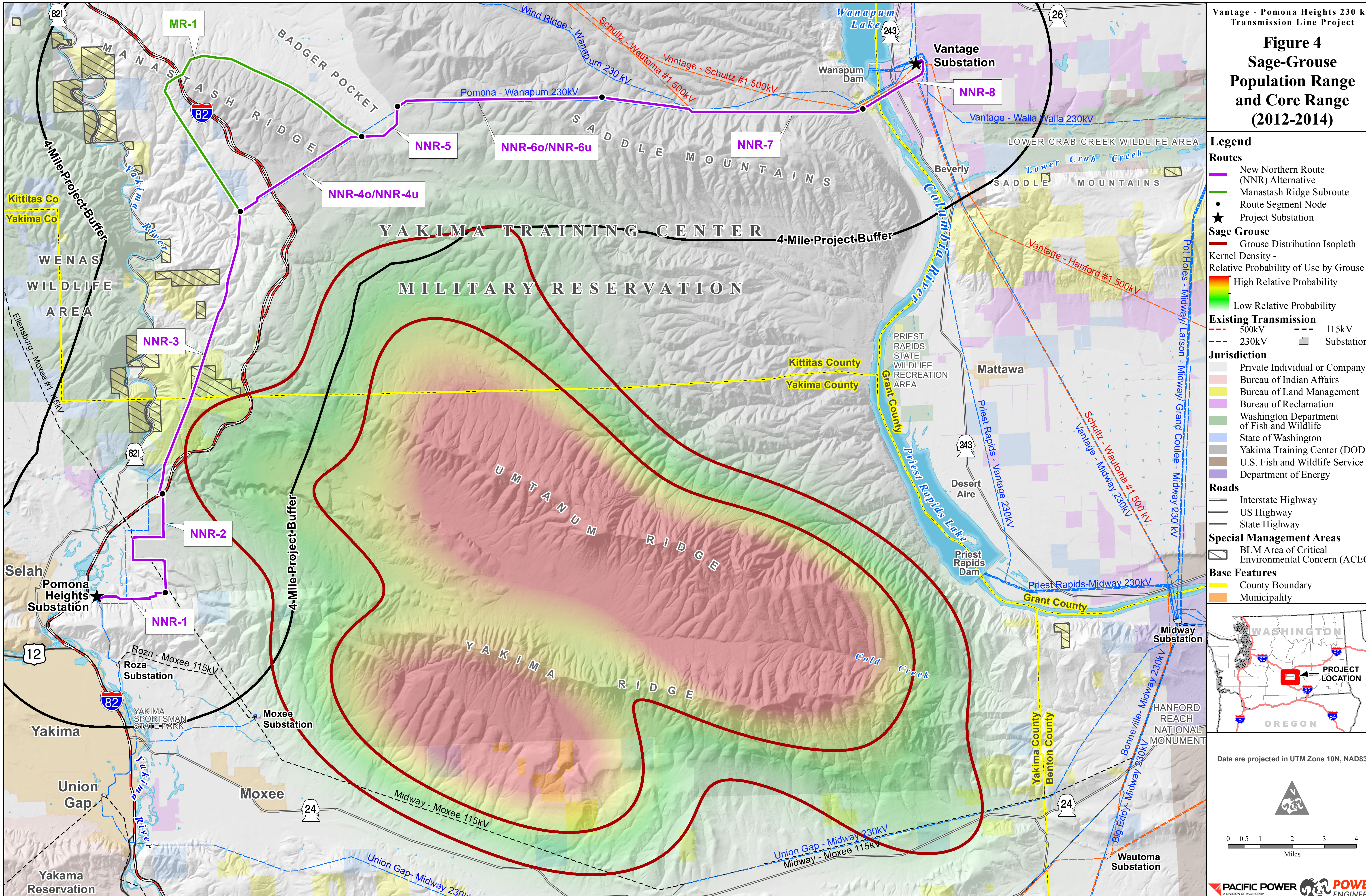

Figure 4
Sage-Grouse Population Range and Core Range (2012-2014)

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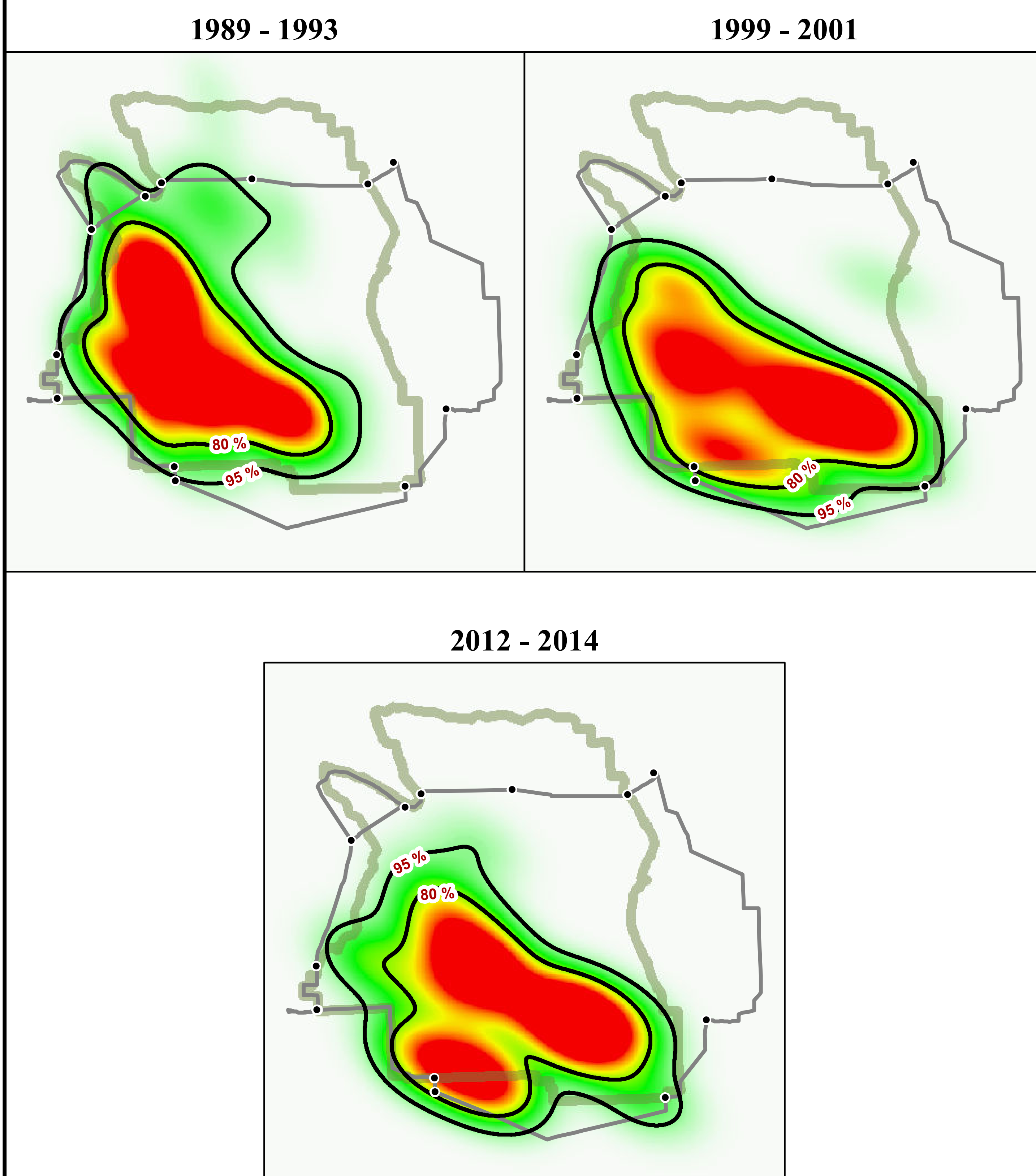

Vantage - Pomona Heights 230 kV
Transmission Line Project

Figure 5
Time series of
Sage-Grouse
Population Ranges

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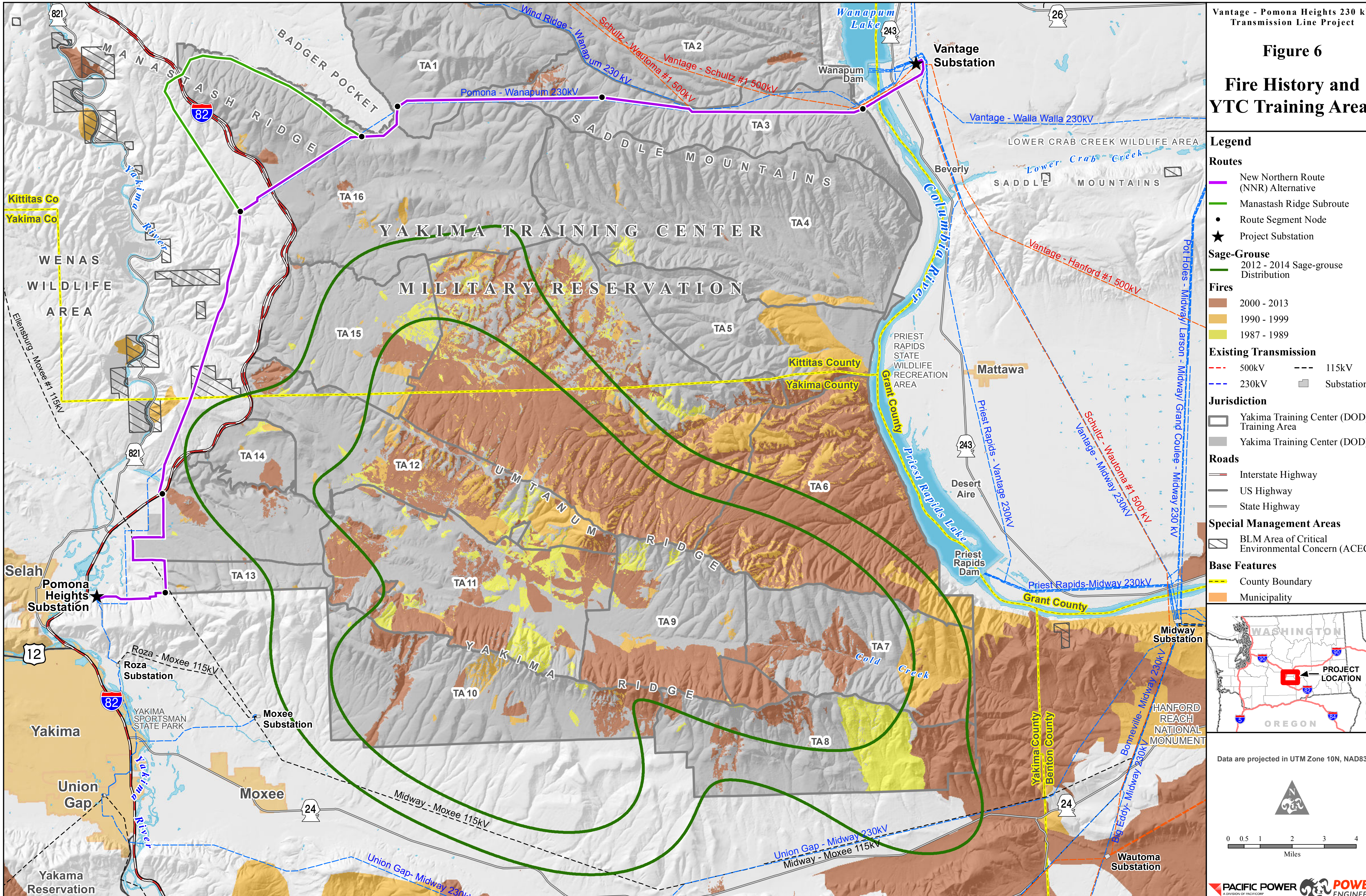

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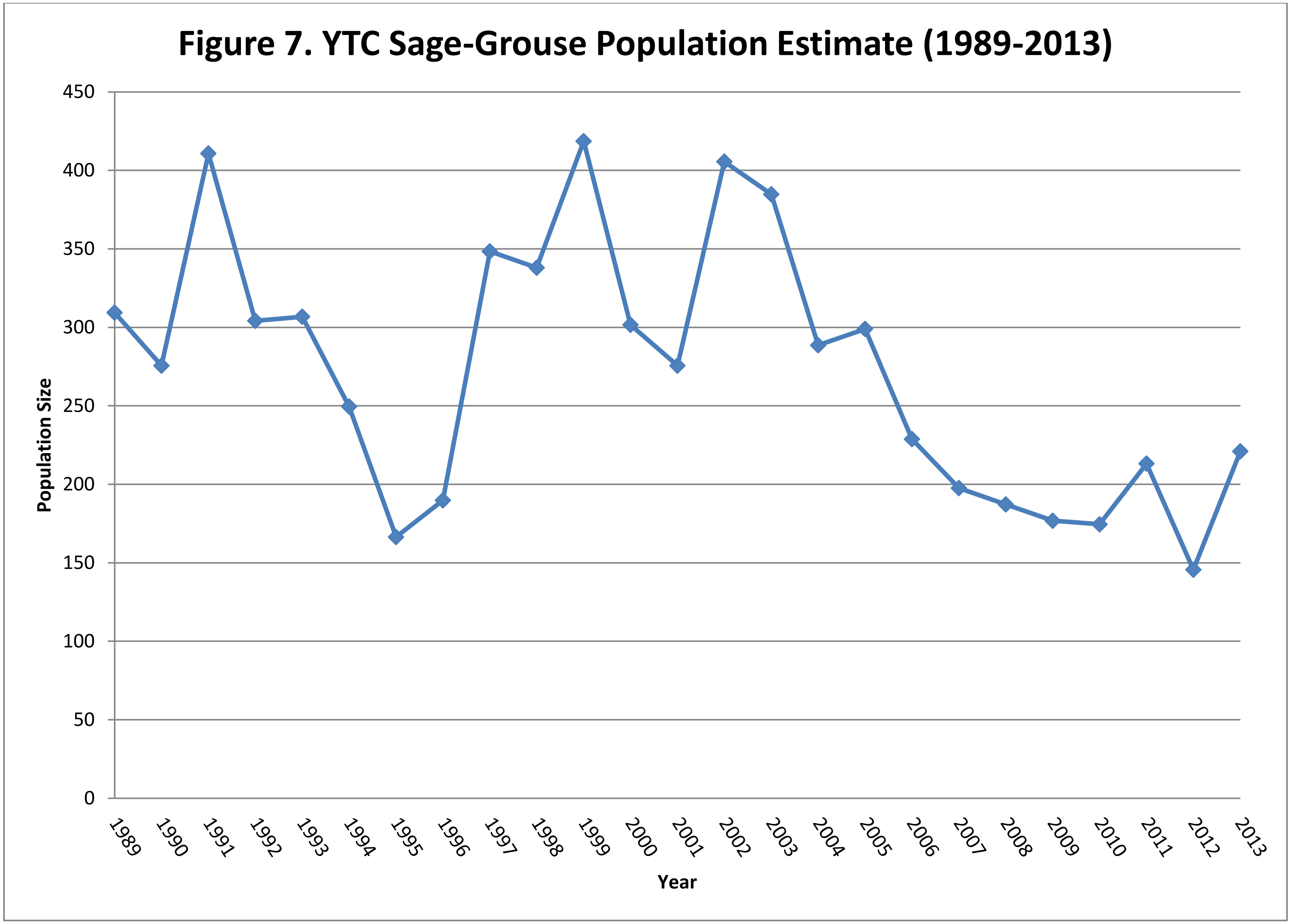
Figure 7. YTC Sage-Grouse Population Estimate (1989-2013)
Population Size
Year
0
50
100
150
200
250
300
350
400
450
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

TABLE 1 ACRES OF SAGE-GROUSE ESTIMATED POPULATION RANGE WITHIN FOUR MILES OF THE PROPOSED NNR SEGMENTS

ROUTE SEGMENT	POPULATION RANGE[1]				CORE POPULATION RANGE[2]			
	ACRES WITHIN ROW	% OF ROW	ACRES WITHIN 4-MILE BUFFER	% OF 4-MILE BUFFER	ACRES WITHIN ROW	% OF ROW	ACRES WITHIN 4-MILE BUFFER	% OF 4-MILE BUFFER
NNR-1	0	0%	360	10%	0	0%	0	0%
NNR-2	0	0%	850	22%	0	0%	0	0%
NNR-3	0	0%	1,184	19%	0	0%	0	0%
NNR-4o/NNR-4u	0	0%	136	3%	0	0%	0	0%
NNR-5	0	0%	103	3%	0	0%	0	0%
NNR-6o/NNR-6u	0	0%	1	0%	0	0%	0	0%
NNR-7	0	0%	0	0%	0	0%	0	0%
NNR-8	0	0%	0	0%	0	0%	0	0%
MR-1	0	0%	98	1%	0	0%	0	0%

Notes: [1] Population Range is based on 95% isopleth of fixed kernel analysis from 82 telemetry locations of 28 grouse in 2012-2014. [2] Core Population Range is based on 80% isopleth. The Isopleths define the area predicted to contain 95% and 80% of sage-grouse use.

TABLE 2 NUMBER OF GREATER SAGE-GROUSE LEKS WITHIN FOUR MILES OF THE PROPOSED NNR ROUTE SEGMENTS

ROUTE SEGMENT	ACTIVE OR INACTIVE LEKS (NUMBER)[1]				HISTORIC LEKS (NUMBER)[11]			
	WITHIN 0-0.6 MILE	WITHIN 0-2 MILES	WITHIN 0-3 MILES	WITHIN 0-4 MILES	WITHIN 0-0.6 MILE	WITHIN 0-2 MILES	WITHIN 0-3 MILES	WITHIN 0-4 MILES
NNR-1	0	0	0	0	0	0	0	0
NNR-2	0	0	0	1 (lek #1)	0	0	0	4
NNR-3	0	0	0	1 (lek #1)	0	0	3	9
NNR-4o/NNR-4u	0	0	0	0	3	4	5	6
NNR-5	0	0	0	0	1	3	6	6
NNR-6o/NNR-6u	0	0	0	1 (lek #2)	0	2	3	6
NNR-7	0	0	0	0	0	1	1	1
NNR-8	0	0	0	0	0	0	1	1
MR-1	0	0	0	0	1	3	5	6

Notes: [1] Leks are classified by JBLM YTC (2014; SEE 2013) as: Active - a lek with at least two male grouse observed displaying on at least two different days during the previous year or during the last year checked; Inactive - has been active sometime during the previous 10 years, but was not active during the last year checked; and Historical - a formerly active lek site in which no activity has been observed for the previous 10 years (JBLM YTC 2014; SEE 2013). [2]Includes documented sage-grouse species observations within the eight-mile-wide corridor (JBLM YTC, and PHS data).

TABLE 3 MALE SAGE-GROUSE COUNTED AT LEK COMPLEXES AND JBLM YTC POPULATION ESTIMATES FROM 1989-2013

YEAR	LEK COMPLEX														POPULATION ESTIMATE
	#1[1]	#2[1]	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	
1989	6						53	22	27	7	4				309
1990	7						50	17	25	7	0				276
1991	14						62	33	44	5	0				411
1992	19						55	15	28	0					304
1993	22						47	18	31	0					307
1994	13					3	41	15	24						250
1995	8					0	33	12	11						166
1996	7			17		16	19	8	6						190
1997	5			18		32	34	32	13						348
1998	0		5	22	14	18	42	25	4						338
1999	0		5	28	21	11	41	39	16						419
2000			4	23	21	4	32	22	10						302
2001			4	15	20	9	31	18	9						275
2002			2	19	17	20	31	28	15			5	19		406
2003			0	14	20	25	30	17	23			7	12		385
2004			0	8	18	11	28	19	18			2	7		289
2005			0	7	20	12	33	17	17			0	9		299
2006			0	5	17	13	24	7	16			0	6		229
2007		1	0	3	15	16	22	6	8			0	4	1	198
2008		2	0	1	9	15	26	5	10			1	4	1	187
2009		2	0	0	7	14	30	5	4			0	6	0	177
2010		2	0	0	5	16	25	11	4			0	4	0	174
2011	7	3	0	0	9	22	24	8	9			0	0	0	213
2012	6	0	0	0	5	17	10	4	14			0	0	0	146
2013	4	3	0	0	3	22	24	5	24			0	0	0	221

Notes: Data from SEE 2013.
[1]Lek located within four miles of the proposed NNR or MR.

6.5 Route Segment Considerations

6.5.1 Route Segment NNR-1

The landscape within the eight-mile-wide NNR-1 analysis area has experienced extensive alteration from rural and urban development and infrastructure including: the expansion of the cities of Yakima and Selah; road networks (i.e., rural, city, county, highway, I-82); canals; agriculture; JBLM YTC facilities and training activities; and existing transmission lines (e.g., 115 kV and 230 kV transmission lines). Route Segment NNR-1 is 2.4 miles long and follows Sage Trail Road for the majority of its length, following an existing distribution line and traversing through a rural residential area.

The entire route segment ROW is within the Rattlesnake Hills MU (Regularly Occupied Habitat). In addition to land not designated for sage-grouse management, the following additional MUs are present within the eight-mile-wide Project area of Route Segment NNR-1: the JBLM YTC (Regularly Occupied Habitat), Rattlesnake Hills (Occasionally Occupied Habitat) and Umtanum Ridge (Regularly Occupied Habitat and Occasionally Occupied Habitat) MUs (Table 4). The Project area also encompasses area set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover types within the analysis area of Route Segment NNR-1 are agriculture/developed/disturbed/open water areas (19,707 acres), annual grassland/noxious weeds (14,269 acres), and sagebrush with a perennial grass understory (6,904 acres). Because this route segment passes through a suburban residential area with heavily fragmented shrub-steppe habitat and a prevalence of disturbed ground and cheatgrass, the entire route segment ROW (100%) was classified as unsuitable sage-grouse habitat in all seasons (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide analysis area for NNR-1 contains 6,904 acres of suitable sage-grouse habitat (16% of the analysis area), 1,497 acres of marginal habitat (3%), and 35,172 acres of unsuitable habitat (81%; Table 5).

The estimated sage-grouse population range does not overlap the NNR-1 ROW. The route segment analysis area overlaps approximately 1% (3,871 acres) of the total JBLM YTC 95% population range. The core population range does not overlap the Project area (Figure 4). NNR-1 was not surveyed during ground transect sage-grouse surveys in 2013 due to lack of suitable habitat within the ROW. No active, inactive or historical leks are known to occur within four miles of this proposed route segment (Table 2). Sage-grouse may occur in the area on an infrequent basis, but lack of habitat, estimated population range and lek data indicate that sage-grouse are unlikely to lek near Route Segment NNR-1.

TABLE 4 SUMMARY OF DISTURBANCE TO DESIGNATED GREATER SAGE-GROUSE MANAGEMENT UNITS (ACRES) AND THE PERCENT (%) OF TOTAL DISTURBANCE THAT WOULD OCCUR WITHIN EACH MANAGEMENT UNIT

ROUTE SEGMENT	TOTAL ACRES OF DISTURBANCE	WASHINGTON GREATER SAGE-GROUSE MANAGEMENT UNITS - ACRES DISTURBED, TOTAL ACRES PRESENT WITHIN ANALYSIS AREA, PERCENT (%) OF HABITAT DISTURBED WITHIN ANALYSIS AREA BY ROUTE SEGMENT[1]									LAND NOT DESIGNATED AS A SAGE-GROUSE MANAGEMENT UNIT (Acres Disturbed)
		REGULARLY OCCUPIED HABITAT (416,031 ACRES)			OCCASIONALLY OCCUPIED HABITAT (558,301 ACRES)			EXPANSION HABITAT (411,345 ACRES)			
		ACRES DISTURBED	ACRES PRESENT WITHIN ANALYSIS AREA[2]	PERCENT DISTURBED WITHIN ANALYSIS AREA	ACRES DISTURBED	ACRES PRESENT WITHIN ANALYSIS AREA	PERCENT DISTURBED WITHIN ANALYSIS AREA	ACRES DISTURBED	ACRES PRESENT WITHIN ANALYSIS AREA	PERCENT DISTURBED WITHIN ANALYSIS AREA	
NNR-1	13.1	13.1	20,171	<1%		2,410					
NNR-2	24.2	22.5	29,202	<1%	0.5	7,563	<1%				1.2
NNR-3	52.4	52.0	60,750	<1%	0.4	13,586					
NNR-4o*	23.0	23.0	52,361	<1%		1,608					
NNR-4u*	51.3	51.3	52,361	<1%		1,608					
NNR-5	9.0	9.0	39,630	<1%							
NNR-6o*	30.6	30.6	64,143	<1%							
NNR-6u*	64.3	64.3	64,143	<1%							
NNR-7	38.1	38.1	63,601	<1%		10,569					
NNR-8	13.5	2.7	22,590	<1%	10.8	19,358	<1%		804		
MR-1	79.7	79.7	63,352	<1%		8,112					

[1]No designated Connectivity Habitat is present within the analysis area. [2]The Project area is defined as an eight-mile-wide corridor; four miles from either side of route segment centerlines. *o = overhead design option; u = underground design option. Numbers are rounded and may not sum exactly.

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TABLE 5 SUMMARY OF DISTURBANCE TO SAGE-GROUSE HABITAT BY ROUTE SEGMENT

ROUTE SEGMENT	SUITABLE HABITAT		MARGINAL HABITAT		UNSUITABLE HABITAT	
	TOTAL ACRES DISTURBED[1]	ACRES PRESENT WITHIN ANALYSIS AREA[2]	TOTAL ACRES DISTURBED[1]	ACRES PRESENT WITHIN ANALYSIS AREA[2]	TOTAL ACRES DISTURBED[1]	ACRES PRESENT WITHIN ANALYSIS AREA[2]
NNR-1	0	6,904	0	1,497	13.1	35,172
NNR-2	0	11,158	7.8	1,511	16.4	38,446
NNR-3	21.1	42,085	15.3	2,262	16.0	35,238
NNR-4o*	15.0	35,433	7.0	926	1.0	18,854
NNR-4u*	33.8	35,433	13.8	926	3.7	18,854
NNR-5	8.6	28,459	0.4	76	0	12,178
NNR-6o*	9.5	53,145	8.4	197	12.7	11,780
NNR-6u*	20.5	53,145	16.6	197	27.2	11,780
NNR-7	25.3	63,349	12.8	316	0	10,502
NNR-8	6.0	28,603	2.0	1,465	5.5	15,176
MR-1	50.0	44,010	13.3	4,019	16.4	35,410

[1]Acres disturbed are calculated using the disturbance model, with habitat suitability extrapolated from the ROW habitat assessment (SDEIS Appendix B-2 Habitat Assessment).

[2]Habitat Suitability within the eight-mile-wide Project area is derived from land cover types. Land cover types are a composite of GAP vegetation data, JBLM YTC vegetation data, and POWER field survey vegetation data. Suitable habitat includes sagebrush/perennial grassland. Marginal habitat includes sagebrush/annual grassland, riparian, intermittent stream, and bitterbrush/perennial grassland. Unsuitable habitat includes forb, perennial grassland, rabbitbrush/annual grassland, annual grassland and noxious weeds, basalt cliffs/rock, tree, and other (includes agriculture, developed/residential areas and open water).

*o = overhead design option; u = underground design option.

6.5.2 Route Segment NNR-2

Existing disturbance within the eight-mile-wide NNR-2 analysis area is largely from urban and rural development including: the expansion of the cities of Yakima and Selah; new suburban development; road networks (i.e., rural, city, county, highway, I-82); canals; agriculture; JBLM YTC facilities and training activities; and existing transmission lines (e.g., 115 kV and 230 kV transmission lines). Route Segment NNR-2 is 5.0 miles long and would parallel an existing, bladed JBLM YTC fire break road and existing roads for the majority of its length.

The entire route segment ROW is within the JBLM YTC (Regularly Occupied Habitat) MU, the Rattlesnake Hills (Regularly Occupied Habitat) MU, and Umtanum Ridge (Occasionally Occupied Habitat) MU. The eight-mile-wide Project area also encompasses land not designated for sage-grouse management, Regularly Occupied Habitat of the Umtanum Ridge MU, and Occasionally Occupied Habitat within the Rattlesnake Hills MU (Table 4). Approximately one mile of the route segment is adjacent to area set aside by JBLM YTC as a primary protection zone for sage-grouse. The eight-mile-wide Project area also includes additional JBLM YTC primary protection zones for sage-grouse.

The dominant land cover types within of the analysis area for Route Segment NNR-2 are annual grassland/noxious weeds (21,356 acres), agriculture/developed/disturbed/open water areas (14,861 acres), and sagebrush with a perennial grass understory (11,158 acres). On the outskirts of the developed areas, the ROW passes through a few patches of sagebrush with primarily an annual grass understory. These patches (31%) were classified as marginal winter habitat due to adequate sagebrush cover (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-2 analysis area contains 11,158 acres of suitable sage-grouse habitat (22% of the analysis area), 1,511 acres of marginal habitat (3%), and 38,446 acres of unsuitable habitat (75%; Table 5). No suitable habitat was identified for any season within Route Segment NNR-2 ROW. The entire ROW was considered unsuitable during the breeding and summer seasons due to proximity to developed areas and the prevalence of a cheatgrass understory, as opposed to the native bunchgrasses and forbs that sage-grouse rely on for food and cover during the breeding and summer seasons.

The estimated sage-grouse population range does not overlap the NNR-2 ROW. The route segment analysis area overlaps approximately 2% (9,146.1 acres) of the total 95% population range. The core population range does not overlap the analysis area (Figure 4). NNR-2 was not surveyed during ground transect sage-grouse surveys in 2013 due to lack of suitable habitat within the ROW. One active lek (lek #1) is known to occur within four miles of Route Segment NNR-2 (Table 2). Lek #1 is located approximately 3.7 miles northeast of Route Segment NNR-2. As it is slightly closer to Route Segment NNR-3, lek #1 is described in more detail for Route Segment NNR-3. Additionally, four historic leks occur between three and four miles east of NNR-2.

6.5.3 Route Segment NNR-3

Route Segment NNR-3 is 9.3 miles long and more or less parallels I-82. The interstate is within two miles of the route segment for its entire length and separates the segment from the core areas of the JBLM YTC sage-grouse population. Other existing disturbance within the eight-mile wide NNR-3 analysis area includes the existing Pacific Power Pomona-Wanapum 230 kV transmission line which runs alongside the proposed route segment approximately 200 feet away; State Highway 821 running more or less parallel to the west of the route segment and along the Yakima River; communication towers on Selah Butte within 1,000 feet of the route segment; urban and residential development associated with the city of Selah, along Burbank Creek and agricultural areas consisting primarily of fruit orchards.

The entire route segment ROW is within Umtanum Ridge (Regularly Occupied Habitat and Occasionally Occupied Habitat) MU. The eight-mile-wide Project area also encompasses the JBLM YTC (Regularly Occupied Habitat) MU and land not designated for sage-grouse management (Table 4). The eight-mile-wide Project area also includes area set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover types within the eight-mile-wide NNR-3 analysis area are sagebrush with a perennial grass understory (42,085 acres), annual grassland/noxious weeds (22,208 acres), agriculture/developed/disturbed/open water areas (8,202 acres) and perennial grassland (3,592 acres). Much of this route segment consists of annual grassland and perennial grassland, especially on south-facing slopes near the southern end of the route segment. The northern two-thirds of the route segment is dominated by sagebrush steppe with a perennial grass understory. Habitat suitability is influenced largely by varying densities of sagebrush. Overall, roughly one-third of the route segment ROW was considered unsuitable habitat for any season. Roughly one-third of the segment held suitable winter and summer habitat, and the remaining one-third provides marginal habitat during winter and summer. Due to a need for higher sagebrush cover during the breeding season, some of the suitable winter and summer habitat only provides marginal breeding habitat, overall 19% of the segment had enough sagebrush to be considered suitable for breeding and 47% was classified as marginal breeding habitat (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-3 analysis area contains 42,085 acres of suitable sage-grouse habitat (53% of the analysis area), 2,262 acres of marginal habitat (3%) and 35,238 acres of unsuitable habitat (44%; Table 5).

The estimated sage-grouse population range does not overlap the NNR-3 ROW. The route segment analysis area overlaps approximately 7% (12,740 acres) of the 95% population range. The core population range does not overlap the analysis area (Figure 4). The four mile long stretch of NNR-3 that occurs on BLM land was surveyed using ground transect sage-grouse surveys in 2013; no grouse or grouse sign were observed (SDEIS Appendix B-1). One active lek (lek #1) is located approximately 3.3 miles east of the southern end of Route Segment NNR-3 (Table 2). Four males were observed attending this lek in 2013 which is down from 2011 and 2012 attendance numbers; however, a secondary lek may be being utilized (SEE 2013; Table 3). This lek is within JBLM YTC's Sage-grouse Protection Area, which has measures (see Section 3.3) that are enforced seasonally around leks (0.6 mile buffer) and within nesting and brood-rearing areas (limiting travel to existing roads and to specific ranges; JBLM YTC 2002). Additionally, nine historic leks are located between two and four miles southeast of this route segment.

6.5.4 Route Segment NNR-4o/NNR-4u (Overhead and Underground)

Route Segment NNR-4 is 4.5 miles long, crossing I-82 and passing through a JBLM YTC bivouac area with a very high density of dirt and gravel roads. Other existing disturbance within the eight-mile-wide NNR-4 analysis area includes an existing 230 kV transmission line which runs alongside the proposed route segment approximately 200 feet away, State Highway 821 located along the Yakima River, and a large swath of agricultural land north of this route segment.

The route segment ROW is within the JBLM YTC (Regularly Occupied Habitat) and Umtanum Ridge (Regularly Occupied Habitat) MUs (Table 4). The eight-mile-wide Project area also encompasses the Umtanum Ridge (Occasionally Occupied Habitat) MU and land not designated for sage-grouse management. The Project area includes area set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover types within the eight-mile-wide NNR-4 analysis area are sagebrush with a perennial grass understory (35,433 acres), annual grassland/noxious weeds (7,303 acres), agriculture/developed/disturbed/open water areas (6,610 acres) and perennial grassland (2,332 acres). The majority of this route segment ROW provides suitable or marginal sage-grouse habitat. Designations were driven largely by sagebrush cover. Suitable breeding and summer habitat occurs on 39% of this route segment ROW, all of it occurring east of I-82; an additional 53% is marginal breeding habitat; and 57% is marginal summer habitat. Suitable winter habitat occurs on 65% of this route segment, including the areas west of I-82 with a sagebrush overstory and cheatgrass understory. Marginal winter habitat composes 31% of this route segment (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-4 analysis area contains 35,433 acres of suitable sage-grouse habitat (64% of the analysis area), 926 acres of marginal habitat (2%), and 18,854 acres of unsuitable habitat (34%; Table 5).

The estimated sage-grouse population range does not overlap the NNR-4 ROW. This route segment analysis area overlaps approximately 1% (1,460 acres) of the total 95% population range. The core population range does not overlap the analysis area (Figure 4). Four walking transects surveyed during two visits in May and July of 2013 revealed just one sign of recent sage-grouse use of this route segment (SDEIS Appendix B-). No active leks are known to occur within the eight-mile-wide NNR-4 analysis area (Table 2). Six historic leks are located within four miles to the southeast of the route segment.

6.5.5 Route Segment NNR-5

Existing disturbance within the eight-mile-wide NNR-5 analysis area includes primary all-weather gravel access roads and numerous light-duty dirt roads utilized for JBLM YTC military training, two JBLM YTC bivouac areas and a large swath of private agricultural land north of this route segment. This short route segment (1.8 miles) deviates slightly from the existing 230 kV transmission line to avoid private agricultural lands in the Badger Pocket area, but remains within 0.5 mile of the existing Pacific Power Pomona-Wanapum 230 kV transmission line for the entire route segment.

The entire route segment ROW is within JBLM YTC (Regularly Occupied Habitat) MU, consisting of approximately 39,630 acres within the eight-mile-wide Project area (Table 4). The Project area also encompasses land not designated for sage-grouse management and contains areas set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover type within the eight-mile-wide NNR-5 analysis area is sagebrush with a perennial grass understory (28,459 acres). Other common cover types within the analysis area include agriculture/developed/disturbed/open water areas (5,802 acres), forb (3,307 acres), and perennial grassland (2,134 acres). Suitable year-round habitat covers 95% of the ROW. The remaining 5% of the segment contains marginal winter and summer habitat and unsuitable breeding habitat (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-5 analysis area contains 28,459 acres of suitable sage-grouse habitat (70% of the analysis area), 76 acres of marginal habitat (<1%) and 12,178 acres of unsuitable habitat (30%; Table 5).

The estimated sage-grouse population range does not overlap the NNR-5 ROW. The route segment analysis area overlaps approximately 1% (1,107 acres) of the 95% population range. The core population range does not overlap the analysis area (Figure 4). Four walking transects surveyed during two visits in May and July of 2013 revealed just one sign of recent grouse use of this route segment (POWER 2013b). No active leks are known to occur within four miles of Route Segment NNR-5 (Table 2). Six historic are located within four miles of the route segment.

6.5.6 Route Segment NNR-6o/NNR-6u (Overhead and Underground)

Route Segment NNR-6 is 6.4 miles long and continues to closely parallel the existing 230 kV transmission line, staying within approximately 200 feet for the entire route segment. Other existing disturbance within the eight-mile-wide NNR-6 analysis area includes primary all-weather gravel access roads utilized for military training by the JBLM YTC, numerous light-duty dirt roads, two military bivouac areas west of the segment, a large swath of agricultural land west of the route segment and three existing transmission lines northeast of the segment, including one 230 kV transmission line and two 500 kV transmission lines.

The entire ROW for Route Segment NNR-6 is within JBLM YTC (Regularly Occupied Habitat) MU, consisting of approximately 64,143 acres within the eight-mile-wide Project area (Table 4). The Project area also includes land not designated for sage-grouse management and contains areas set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover type within the eight-mile-wide NNR-6 analysis area is sagebrush with a perennial grass understory (53,145 acres). Other common cover types within the analysis area include agriculture/developed/disturbed/open water areas (5,280 acres), forb (4,399 acres), and perennial grassland (2,023 acres). Although NNR-6 consists almost entirely of relatively intact sagebrush steppe with a perennial grass understory, in most areas the sagebrush cover is relatively low. Pockets of dense sagebrush occur primarily in swales and drainages; the same areas that would be expected to collect deep deposits of windblown snow on the relatively high elevation north facing slopes, likely limiting winter suitability during typical-weather years, but these same areas contain relatively mesic pockets of sagebrush with a lush, forb-rich understory that likely stays relatively green during the summer months in typical years. Overall, the ROW for this route segment consists of suitable summer habitat for 33% of its length and marginal summer habitat for 28%, while breeding habitat is suitable for 14% of its length and marginal for 36% and winter habitat is suitable for 16% of the segment and marginal for 23% (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-6 analysis area contains 53,145 acres of suitable sage-grouse habitat (82% of the analysis area), 197 acres of marginal habitat (<1%), and 11,780 acres of unsuitable habitat (18%; Table 5).According to WHCWG analysis, Route Segments NNR-6 and NNR-7 cross the most promising zone for connectivity between the Moses Coulee sage-grouse population and the JBLM YTC grouse population (Robb and Schroeder 2012).

The estimated sage-grouse population range does not overlap the NNR-6 ROW. The route segment analysis area overlaps less than one percent (11.2 acres) of the 95% population range. The core population range does not overlap the analysis area (Figure 4). Ground based surveys of the preliminary NNR in May and July of 2013 revealed sage-grouse sign in six locations near this route segment. Each of these was located approximately 600 feet (200 hundred meters) north of the final location for Route Segment NNR-6, generally near Foster Creek (SDEIS Appendix B-1). One active lek (lek #2) is known to occur 3.5 miles south of Route Segment NNR-6 (Table 2). Three males were observed attending this lek in 2013. After the lek's discovery in 2007, lek counts have ranged from zero to three males and averaged two males per year (Table 3). Additionally, six historic leks are located within four miles of this route segment.

6.5.7 Route Segment NNR-7

Route Segment NNR-7 is 8.2 miles long and continues to closely parallel the existing 230 kV transmission line, staying within approximately 200 feet for the entire segment. Three additional transmission lines are located within one mile of this proposed route segment, including one 230 kV transmission line and two 500 kV transmission lines. Other existing disturbance within the eight-mile-wide NNR-7 analysis area includes a paved highway, primary all-weather gravel access roads for military training, numerous light-duty dirt roads and development along the Columbia River including the town of Beverly, numerous orchards and agricultural land.

This entire route segment ROW is within JBLM YTC (Regularly Occupied Habitat) MU, comprised of approximately 63,601 acres within the eight-mile-wide Project area (Table 4). The Project area also encompasses land within Saddle Mountains (Occasionally Occupied Habitat) MU. The Project area also overlaps an area set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover type within the eight-mile-wide NNR-7 analysis area is sagebrush with a perennial grass understory (63,349 acres). Other common cover types within the analysis area include agriculture/developed/disturbed/open water areas (5,244 acres), annual grassland/noxious weeds (2,686 acres), and forb (1,856 acres). The western three miles of the ROW for Route Segment NNR-7 have moderate cover of sagebrush, providing mainly marginal habitat. Much of the eastern five miles contains higher cover of sagebrush, which could potentially provide suitable grouse habitat, though relatively little use of the area has been documented. Overall, the ROW is composed of 43% suitable breeding habitat and 57% marginal breeding habitat. Winter and summer habitat is suitable for 67% of the segment and marginal for 32% of the segment (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-7 analysis area contains 63,349 acres of suitable sage-grouse habitat (85% of the analysis area), 316 acres of marginal habitat (<1%), and 10,502 acres of unsuitable habitat (14%; Table 5). According to WHCWG analysis, Route Segments NNR-6 and NNR-7 cross the most promising zone for connectivity between the Moses Coulee sage-grouse population and the JBLM YTC grouse population (Robb and Schroeder 2012). NNR-7 is separated from more heavily occupied sage-grouse areas by the steep terrain of the Saddle Mountains and, on JBLM YTC, sage-grouse are known to prefer flatter areas (<15% slope; Livingston 1998). WHCWG did not include slope in their models, asserting that slope is not likely a factor impeding movement (Robb and Schroeder 2012).

The estimated sage-grouse population range does not overlap the NNR-7 ROW or the route segment analysis area. Four walking transects surveyed during two visits in May and July of 2013 did not reveal any sign of sage-grouse use of this route segment (POWER 2013b). No active leks are known to occur within the eight-mile-wide NNR-7 analysis area (Table 2). One historic lek is located approximately 0.75 mile north of the route segment.

6.5.8 Route Segment NNR-8

Existing disturbance within the eight-mile-wide NNR-8 analysis area includes two existing 230 kV transmission lines (Pacific Power Pomona-Wanapum and Puget Sound Energy Wanapum-Wind Ridge) and two 500 kV transmission lines (BPA Schultz-Wautoma and BPA Schultz-Vantage), the BPA Vantage Substation, a paved highway, primary all-weather gravel access roads for military training, numerous light-duty dirt roads, and development along the Columbia River including the town of Beverly, orchards, and center-pivot-irrigated agricultural land.

This route segment ROW passes from the JBLM YTC (Regularly Occupied Habitat) MU into the Saddle Mountains (Occasionally Occupied Habitat) MU. JBLM YTC Regularly Occupied Habitat within the eight-mile-wide Project area consists of approximately 22,590 acres. The Project area also encompasses land within the Potholes (Expansion Habitat) MU and land not designated for sage-grouse management. The analysis area does not overlap any JBLM YTC protection zones for sage-grouse.

The dominant land cover type within the eight-mile-wide NNR-8 analysis area is sagebrush with a perennial grass understory (28,603 acres). Other common cover types within the analysis area include agriculture/developed/disturbed/open water areas (9,858 acres), annual grassland/noxious weeds (5,181 acres) and sagebrush with an annual grass understory (1,034 acres). Patchy sagebrush with a perennial grass understory covers roughly half of the ROW; most of the remaining area is either rocks and open water or cheatgrass and other weeds. The habitat assessment classified breeding habitat as suitable for 26% of this route segment's ROW, and marginal for 23% of the ROW. Winter and summer habitat is classified as suitable for 34% of the ROW and marginal for 15% of the ROW (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide NNR-8 analysis area contains 28,603 acres of suitable sage-grouse habitat (63% of the analysis area), 1,465 acres of marginal habitat (3%) and 15,176 acres of unsuitable habitat (34%; Table 5).

The estimated sage-grouse population range does not overlap the NNR-5 ROW or the route segment analysis area. Four walking transects surveyed during two visits in May and July of 2013 did not reveal any sign of safe-grouse use of this route segment (SDEIS Appendix B-1). No active leks are known to occur within the eight-mile-wide NNR-8 analysis area (Table 2). One historic lek is located approximately 2.1 miles northwest this route segment.

6.5.9 Route Segment MR-1

This 12 mile long subroute is a proposed alternative to the 4.5 mile NNR-4 route segment. Shaped like a horseshoe, it circumnavigates to the west, north, and east of Manastash Ridge. Existing disturbance within the eight-mile-wide MR-1 analysis area includes I-82, State Highway 821, all-weather gravel access roads for military training, numerous light-duty dirt roads, two JBLM YTC bivouac areas, an existing 230 kV transmission line and a large swath of private agricultural land east of the segment.

The route segment ROW is within the Umtanum Ridge (Regularly Occupied Habitat) and the JBLM YTC (Regularly Occupied Habitat) MUs (Table 4). Regularly Occupied Habitat within the eight-mile-wide Project area comprises approximately 63,352 acres. The Project area also overlaps a portion of Umtanum Ridge (Occasionally Occupied Habitat) MU and land not designated for sage-grouse management. The Project area includes area set aside by JBLM YTC as a primary protection zone for sage-grouse.

The dominant land cover types within the eight-mile-wide MR-1 analysis area are sagebrush with a perennial grass understory (44,010 acres), agriculture/developed/disturbed/open water areas (21,366 acres), annual grassland/noxious weeds (9,100 acres), sagebrush with an annual grass understory (2,774 acres), forb (2,558 acres), and perennial grassland (2,385 acres). Based on the habitat assessment, breeding habitat is classified as suitable along 15% of the ROW and marginal on 49%. Summer habitat is suitable for 26% of this route segment and marginal for 53%. Winter habitat is suitable for 62% and marginal for 16%. Most of the west arm of this route segment has adequate sagebrush cover for winter use (as determined with aerial imagery), but cover type data indicates an annual grass understory that would limit suitability for breeding and summer use. Weedy disturbed ground is prevalent along parts of the eastern stretch adjacent to private agricultural lands in Badger Pocket (SDEIS Appendix B-2 Habitat Assessment). The eight-mile-wide MR-1 analysis area contains 44,010 acres of suitable sage-grouse habitat (53% of the analysis area), 4,019 acres of marginal habitat (5%), and 35,410 acres of unsuitable habitat (42%; Table 5).

The estimated sage-grouse population range does not overlap the MR-1 ROW. This route segment analysis area overlaps approximately 1% (1,057 acres) of the 95% population range. The core population range does not overlap the analysis area (Figure 4). No active leks are known to occur within the eight-mile- MR-1analysis area (Table 2). Six historic leks are located within the analysis area of this route segment.

7.0 IMPACT ANALYSIS (INCLUDING CONSTRUCTION, OPERATION AND MAINTENANCE ACTIVITIES)

7.1 Analysis Methods

The analysis for sage-grouse focused on impacts that could occur as a result of the construction, operation and maintenance of the proposed NNR Alternative. These impacts included: habitat loss, degradation, and fragmentation; increased predation; behavioral avoidance; disturbance and displacement; impairment of habitat connectivity; and collision. Impacts may occur directly via habitat loss through surface disturbance and mortality from construction activities or collision, or indirectly through the reduction in habitat quality or increased predation due to the addition of perching opportunities associated with transmission structures. These impact types are discussed in more detail in Section 7.2.3. Refer to Chapter 2 of the SDEIS for a detailed description of the disturbance model.

Impacts to sage-grouse were evaluated using: 1) geographic information system (GIS) data analysis of existing habitat within the Project area; 2) habitat loss calculated by using typical disturbance types associated with the construction, operation and maintenance of the proposed NNR Alternative (e.g., new access road construction, work areas); 3) the total number of structures per route segment and the anticipated number of new structures located greater than 0.25 mile from an existing line; 4) analysis of JBLM YTC corvid (raven) data; 5) analysis of the WHCWG habitat connectivity and linkage reports; 6) GIS data on active, inactive and historical lek locations and observations; and 7) sage-grouse telemetry location data (Cadwell et al. 1998; Livingston and Nyland 2002; SEE 2013). Analysis of existing habitat was based on aerial photos, vegetation data, USGS GAP data, fire history data, plant surveys, and a habitat assessment (SDEIS Appendix B-2) conducted for the proposed Project.

Two metrics were used to evaluate the potential impact of new transmission line structures: 1) the total number of new structures and 2) the number of new structures located greater than 0.25 mile from an existing line. The second metric addresses the introduction of new perches and/or nesting substrates for avian predators in areas where these substrates are not currently present. This is discussed further in Section 7.2.3.

7.1.1 Impact Criteria

Resource categories were identified for sage-grouse that included sage-grouse habitat, leks, and Washington Sage-Grouse Management Units. Sensitivity levels (i.e., high, moderate, or low) were assigned to each resource category based on potential impact types. The resource categories and sensitivity levels summarized in Table 6 served as the basis for assigning NNR Alternative impact levels, described below.

TABLE 6 SAGE-GROUSE RESOURCE CATEGORIES AND SENSITIVITY LEVELS

RESOURCE CATEGORY	SENSITIVITY	POTENTIAL IMPACTS
Sage-grouse lek – within 0 to 4 miles of the proposed NNR transmission line alternative	High	Disturbance and displacement of breeding grouse; increased predation; behavioral avoidance; reduction in breeding habitat.
Greater Sage-Grouse Regularly Occupied Habitat Management Unit	High	Reduction in habitat (abundance and quality) that serves as sage-grouse habitat.
Sagebrush/Perennial Grassland (Breeding, Late Brood-rearing/Summer, and Winter Habitat)	High	Reduction in quality habitat that is slow to recover from disturbance.

RESOURCE CATEGORY	SENSITIVITY	POTENTIAL IMPACTS
Sage-grouse lek – within > 4 miles from the proposed transmission line and within suitable habitat	Moderate	Disturbance and displacement of breeding grouse; increased predation; behavioral avoidance; reduction in breeding habitat.
Greater Sage-Grouse Connectivity Habitat Management Unit	High	Reduction in habitat (abundance and quality) that serves as a movement corridor between seasonally used areas.
Non-forested Riparian, Intermittent Stream (Breeding and Late Brood-rearing/Summer Habitat)	Moderate	Reduction in habitat that could serve as suitable seasonal habitat, especially during breeding and summer.
Bitterbrush/perennial grassland (Potential Breeding and Late Brood-rearing/Summer Habitat, depending on surrounding vegetation)	Moderate	Reduction in habitat that could be used as breeding and late brood-rearing/summer habitat
Sagebrush/Annual Grassland (Winter Habitat)	Moderate	Reduction in disturbed habitat that could provide potential suitable seasonal habitat.
Greater Sage-Grouse Expansion Habitat Management Unit	Low	Reduce habitat (abundance and quality) that could serve as expansion areas for sage-grouse.
Perennial Grassland (Potential Summer Habitat, depending on surrounding vegetation)	Low	Reduction in habitat that could be used as summer habitat.
Annual grassland, noxious weeds, rabbitbrush/annual grassland, developed/disturbed (Unsuitable Habitat)	Low	Reduction in unsuitable vegetation or disturbance in developed/disturbed areas.

7.1.2 Impact Types (Direct and Indirect)

The main impacts to sage-grouse that could occur from construction, operation, and maintenance of the proposed NNR Alternative include:

1) Habitat loss and degradation, including direct habitat loss at structures and access roads and indirect habitat loss or degradation in the surrounding landscape resulting from spread of invasive exotic weeds and fires.
2) Potential predation opportunities, primarily from avian predators using the transmission structures as perches and nesting substrates.
3) Potential behavioral avoidance of infrastructure associated with the proposed NNR Alternative.
4) Disturbance and displacement from temporary human presence during construction and maintenance activities.
5) Impairment of habitat connectivity between sage-grouse populations in Washington.
6) Direct mortality to sage-grouse through collisions with the transmission line conductor and structures, destruction of sage-grouse nests during construction, and collisions with construction and maintenance vehicles.

Each of these impacts is discussed in more detail in Section 7.2.3.

7.1.3 Impact Levels

The sage-grouse resource categories, sensitivity levels and potential impact were used to estimate potential Project level impacts for sage-grouse. In addition, the resource quality (context or the existing condition of the resource) and resource quantity (the amount of the resource potentially affected) were also considered. These criteria were applied to develop Project impact level categories of high, moderate, low and no identifiable. The impact levels are defined as follows:

High – A high level of impact would result if the construction, operation, or maintenance of the proposed Project would have the potential to cause a significant adverse change or stress to the sage-grouse population or sage-grouse habitat.

Moderate – A moderate level of impact would result if the construction, operation, or maintenance of the proposed Project would have the potential to cause some change or stress (ranging between significant and insignificant) to the sage-grouse population or sage-grouse habitat.

Low - A low level of impact would result if the construction, operation, or maintenance of the proposed Project would have the potential for an insignificant or small change or stress to the sage-grouse population or sage-grouse habitat.

No Identifiable - No identifiable impact or measurable change would occur to the sage-grouse population or sage-grouse habitat.

7.2 Impact Assessment

7.2.1 Project Design Features

The project design features (PDFs) and environmental protection measures described in this section have been incorporated into the Project design to avoid or minimize environmental impacts of the proposed Project. Pacific Power has committed to implementing these features during construction, operation and maintenance of the proposed Project. Consideration of the anticipated effectiveness of these PDFs has been incorporated into this impact assessment and, where applicable, is discussed by project impact in Sections 7.2.3 and 7.2.4.

The PDFs in this section will be reviewed, revised, and developed further, as appropriate, to reduce impacts to sage-grouse and other resources and will be included in the Plan of Development (POD) for this Project. The POD will be reviewed and approved by the federal land management agencies. If the Project is authorized, the POD will be used by the agencies in crafting the ROW and other Project-related authorizations as appropriate.

PDFs consist of features that apply to multiple resources (General) and features designed to reduce impacts for specific resources (e.g., sage-grouse, vegetation, fire, visual and cultural resources). The complete list of PDFs for all resources is presented in Chapter 2 of the SDEIS and design features relevant to sage-grouse are presented below.

<u>General</u>

GEN-1
All construction vehicle movement outside the ROW will be restricted to pre-designated access, contractor-acquired access, or public roads, unless approved by the authorized land management agency and/or landowner.

GEN-2
The spatial limits of construction activities will be predetermined, with activity restricted to those limits. Land management agencies and landowners will approve all construction spatial limits in coordination with the construction contractor. No paint or permanent discoloring agents will be applied to rocks, vegetation, fences, structures, etc., to indicate survey or construction activity limits. Work areas will be identified and sensitive areas will be flagged as s described in the POD to alert construction personnel that those areas are to be avoided.

GEN-3
In construction areas where re-contouring is not required, vegetation will be left in place wherever possible and original contour will be maintained to avoid excessive root damage and allow for re-sprouting. Disturbance will be limited to overland driving where feasible to minimize changes in the original contours.

GEN-4
To minimize ground disturbance, the alignment of any new access roads or cross country route will follow the landform contours where practicable, provided that such alignment does not cause additional impacts to resource values. Any new access road or cross country route will be approved by the appropriate land manager and/or landowner prior to use.

GEN-5
In construction areas (e.g., marshalling yards, structure site work areas, spur roads from existing access roads) where ground disturbance is significant or where re-contouring is required, surface reclamation will occur as required by the landowner or land management agency. The method of reclamation will normally consist of, but is not limited to, returning disturbed areas back to their natural contour, reseeding, installing cross drains for erosion control, placing water bars in the road, and filling ditches.

All areas on BLM, JBLM YTC, and Reclamation lands that are disturbed as a part of the construction and/or maintenance of the proposed power line will be drill seeded where practicable with a seed mixture appropriate for those areas, unless an alternative method (e.g., broadcast seeding) is required due to slope or terrain. The BLM, JBLM YTC, and Reclamation will prescribe seed mixtures to fit each range site on their respective ownerships. Drill seeding will be done in late October or November to maximize the chance of success. The Agencies may recommend broadcast seeding as an alternative method in some cases. In these cases, seed will be applied at 1.5 to 2.0 times the drill seeding rate when broadcasted and the seed will be promptly covered by methods such as harrowing, raking, or rolling with a culti-packer.

A Reclamation, Revegetation, and Monitoring Framework Plan identifying the reclamation stipulations will be developed and incorporated in the final POD, which will be approved by the BLM, JBLM YTC, and Reclamation prior to issuance of their respective authorizations.

GEN-6
A POD including specific plans to address resource specific mitigation requirements will be prepared in consultation with the agencies prior to construction being authorized. These plans will detail additional measures required to minimize potential proposed Project impacts on cultural and natural resources and human health and safety. Plans typically include reclamation and re-vegetation of the ROW, resource protection, noxious weed control, dust control, hazardous spill prevention, fire protection and control, and storm water pollution prevention.

GEN-7
The POD will outline any required monitoring guidelines for the construction, operation, and maintenance of the line in order to avoid inadvertent impacts to resources. The authorizing land management agencies will appoint an authorized inspector to oversee construction activities, inspect construction, and determine if environmental protection is being accomplished in accordance with terms of applicable documents including the ROW and the approved POD. Pacific Power will conduct a training program to inform construction crews of all ROW, permit, and other requirements and restrictions relevant to proposed Project construction.

GEN-8
Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural, paleontological and ecological resources, as outlined in the POD, PA, and HMP. To assist in this effort, the construction contract will address: (a) federal and state laws regarding antiquities, fossils, mineral materials, plants, and wildlife including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.

GEN-9
All waste products and food garbage from construction sites will be deposited in covered waste receptacles, and removed daily. Garbage will be transported to an approved or designated suitable disposal facility.

GEN-10
Within the limits of standard design and in conformance with engineering and Pacific Power requirements, structures will be placed as to avoid sensitive features, including but not limited to, wetlands, riparian areas, water courses, sensitive habitats and species, and cultural resources.

GEN-11
Construction holes left open overnight will be covered to prevent livestock or wildlife from falling in.

Biological Resources

BIO-1
Prior to construction, all supervisory construction personnel will be instructed on the protection of ecological resources. To assist in this effort, the construction contract will address: (a) federal and state laws regarding plants and wildlife; (b) the importance of these resources and the purpose and necessity of protecting them; and (c) methods for protecting sensitive resources.

BIO-2
Reasonable and prudent measures and terms and conditions identified during the consultation period under Section 7 of the Endangered Species Act (1973) as amended will be adhered to as specified by the USFWS. Conservation measures identified by USFWS during consultation will be applied on a discretionary basis. If conferencing occurs on species proposed for listing under ESA, recommendations for reducing adverse effects provided by USFWS in a conference report will be considered.

BIO-3
Special status species or other species of particular concern will be considered in accordance with management policies set forth by appropriate land management agencies (e.g., the BLM, the JBLM YTC, and Reclamation). This would entail conducting surveys for plant and wildlife species of concern along the proposed transmission line route and associated facilities (e.g., access and spur roads, staging areas, etc.) as agreed upon by the agencies. In cases where such species are identified, appropriate action will be taken to avoid adverse impacts on the species and their habitats. This may include altering the placement of roads or structures, where practical, as approved by the agencies.

BIO-5
To eliminate the spread of noxious weeds and invasive species from Project activities, a Noxious Weed and Invasive Plant Management Plan will be developed and incorporated into the final POD. The plan will be developed in consultation with the Agencies and local weed control districts and will describe: the pre-construction inventory; prevention measures and treatment methods before and

during construction; and monitoring and treatment measures that would be implemented following construction. Out of elevated concern for sage-grouse, fire prevention, and sagebrush preservation, the Noxious Weed and Invasive Plant Management Plan would emphasize control of cheatgrass during follow-up visits to prevent, to the extent practical, the establishment of cheatgrass before, during, and after establishment of reclaimed vegetation.

BIO-6
Ground disturbance will be limited to that necessary to safely and efficiently install the proposed facilities and will be described in detail in the POD.

BIO-7
Pacific Power will prepare a Reclamation, Re-vegetation, and Monitoring Framework Plan in consultation with the agencies. The plan will specify disturbance types and appropriate re-vegetation techniques to be applied to proposed Project work areas and access roads. Techniques will be approved by the appropriate land management agency and would include reseeding with certified weed-free native or other acceptable species. The plan will include operation and maintenance procedures approved by the appropriate land management agency for use of access roads and temporary work areas.

BIO-8
Wildlife and plant protection plans will be developed identifying specific measures to protect biological resources. Required protection measures could include timing restrictions, ROW clearance surveys prior to construction and the use of biological monitors to protect biological resources during construction. In situations where impacts to sensitive plants cannot be avoided by construction activities, the transplanting of plants will be considered by the appropriate land management agency. The criteria for transplanting will be included in the POD for the Project. The criteria will be formulated in coordination with the BLM and state agencies, and in compliance with federal and state law, regulation, and policy regarding sensitive species.

If any new populations of plant species of concern are discovered on federal or state lands during Project surveys or construction, these findings will be reported within 48 hours to the appropriate land management agency. Any newly discovered populations will be protected the same as currently known populations.

If any new populations of federal or state listed wildlife species are discovered during Project surveys or construction, these findings will be reported within 48 hours to the appropriate federal and/or state land management agency. Any newly discovered populations will be protected the same as currently known populations.

BIO-9
Use an agency approved mixture of native and non-native species or seed for revegetation in areas where non-native species are already well established (i.e., disturbed grassland). Where possible, a mix of native species, especially native bunchgrasses and forbs, will be utilized for revegetation. Revegetation materials will meet the requirements of federal, state and county noxious weed control regulations and guidelines.

BIO-10
Comply with all federal, state and county noxious weed control regulations and guidelines.

BIO-11

Wash all equipment before entering the Project area and when leaving areas where noxious weeds are present.

BIO-12

Minimize the blading of native plant communities during construction, operation and maintenance consistent with safe construction practices.

BIO-13

Restrict construction and maintenance activities (including helicopter construction and blasting) during sensitive periods (described below). Restricting these activities would eliminate the potential disturbance of wildlife during these critical periods of their life cycles, as identified in the Plant and Wildlife Species Protection Measures Appendix of the POD and the Sage-grouse Habitat Mitigation Framework Plan.

- Avoid construction activities within 0.25 to 1.0 mile radius of an active raptor nest, if possible, unless specific features (e.g., terrain, barriers) dictate reduced buffers. Spatial buffers and seasonal restrictions would vary depending on the species (Romin and Muck 2002). Nests of any raptor species not specified here would be buffered by 0.25 mile. Specified nest buffers include:
    - Bald eagle nest – 1.0 mile buffer from January through August.
    - Burrowing owl – 0.25 mile buffer from March through August.
    - Ferruginous hawk – 0.5 mile buffer from March through July.
    - Golden eagle – 0.5 mile buffer from January through August.
    - Osprey – 0.5 mile buffer from April through August.
    - Peregrine falcon – 1.0 mile buffer from February through August.
    - Prairie falcon – 0.25 mile buffer from April through August.

- Greater sage-grouse:
    - Avoid construction or maintenance activities within four miles of active leks from February 1 to June 15 to protect lekking, nesting, and early brood-rearing (Stinson et al. 2004; Cadwell et al. 1994).
    - Avoid construction or maintenance activities within sage-grouse winter habitat from December 1 through February 1 if winter conditions are exceptionally severe. Severe winter conditions would consist of snow cover much higher than normal (e.g., above sagebrush height) or temperatures much lower than normal. Winter construction or maintenance activities within sage-grouse winter habitat will be coordinated with JBLM YTC (Public Works Department).

- Migratory birds:
    - Avoid construction or maintenance activities during the migratory bird breeding season, typically from March through July. If construction or maintenance activities must occur during this time period, qualified biologists will conduct clearance surveys prior to activity. If migratory bird nests are identified, spatial buffers of at least 100 feet around the nest will be initiated. Individual nests will not be marked. Spatial buffers and seasonal restrictions would vary depending on the species. No ROW mowing will occur during the nesting season.

- Bald eagle wintering areas:
    - Construction or maintenance activities within 0.25 mile of a bald eagle winter roost would occur between 8:00 a.m. and 5:00 p.m.

- Big game seasonal restrictions:
  - Avoid construction or maintenance activities within big game wintering areas during the wintering season, typically December 1 through March 1, or as defined by WDFW for each big game population in question.

BIO-14
New or improved access (e.g., blading, widening existing access) that is not required for Project maintenance or by the land management agencies will be closed or rehabilitated following construction. Closing access roads would protect the resources in that area from further disturbance by limiting new or improved accessibility by off-highway vehicle (OHVs) and other motorized vehicles.

BIO-15
If sensitive wildlife species are discovered during construction, operation, and maintenance activities within the ROW or designated and approved work areas, a protective buffer zone will be established and the appropriate federal or state agency will be contacted immediately.

BIO-16
Speed limits for travel on newly constructed roads will be posted at 25 mph in order to reduce the potential for wildlife collision. Overland travel areas will have speed limits of 15 mph.

BIO-17
The Project will be designed to conform to raptor-safe design standards, including *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012) and PacifiCorp's *Bird Management Program Guidelines* (2006).

BIO-18
Any temporary fences constructed in sage-grouse habitat, as part of the proposed Project, will be fitted with markers to reduce the potential for sage-grouse collision. Any existing fences that are repaired during construction would also be fitted with markers.

BIO-19
Bird flight diverters will be installed in locations with known avian mortality through collision with transmission line infrastructure.

BIO-20
Routing and siting the proposed transmission line would maximize the use of existing utility corridors and closely parallel the existing transmission line within those corridors, typically staying within 200 feet of its centerline. The use of existing transmission line corridors will minimize impacts through the use of already established ROWs, road networks, etc.

BIO-21
Whenever possible, locations of the new structures will match the spans of adjacent transmission lines.

BIO-22
Perch deterrents will be installed on new transmission structures within four miles of an active lek.

BIO-23

No pets will be allowed on the Project site during construction, operation and/or maintenance.

BIO-24
No persistent surface water sources or other potential mosquito breeding habitat will be created.

Wildland Fire

WF-1
Pacific Power, and its contractors as appropriate, will initiate discussions with local fire districts, regional fire prevention staff, and JBLM YTC fire personnel prior to construction to provide transmission line safety training, including safety procedures for conducting fire suppression activities near a power line.

WF-2
The construction contractor will fuel all highway-authorized vehicles off-site to minimize the risk of fire. Fueling of construction equipment that is transported to the site via truck and is not highway authorized will be done in accordance with regulated construction practices, and federal, state and local laws. Helicopters will be fueled and housed at local airfields or at staging areas.

WF-3
Contractors will be required to carry fire suppression tools and equipment including (but not limited to) shovels, buckets, and fire extinguishers on all construction, operation and maintenance vehicles.

WF-4
A Fire Protection and Control Plan will be developed and incorporated into the POD. The Fire Protection and Control Plan will include measures to be implemented during construction and maintenance, such as: restricting smoking to designated areas; restricting equipment parking to sites cleared of all flammable material; equipping vehicles with appropriate fire suppression tools and equipment; and training Pacific Power and/or its contractors on fire safety, minimizing fire hazards, to safely suppress a fire until firefighters can respond.

Pacific Power and/or its contractors will notify the federal, state and local agencies of any fires, and comply with all rules and regulations administered by the federal, state and local land management agencies concerning the use, prevention, and suppression of fires, including any fire prevention orders that may be in effect at the time of the permitted activity. Pacific Power and/or its contractors will be held liable for the cost of fire suppression, stabilization, and rehabilitation when they are responsible for the cause of the fire event. In the event of a fire, personal safety will be the first priority of Pacific Power and/or its contractors.

Land Use and Recreation

LU-7
To limit new or improved accessibility into the area by OHVs and other non-authorized motorized vehicles, road access will be controlled in accordance with the management directives of the land management agencies and landowners.

7.2.2 Design Options

Overhead and Underground Design Options are being considered in the impact analysis for sage-grouse. The Underground Design Option was not analyzed in the DEIS, but is being analyzed for all resources in the SDEIS, including sage-grouse, due to comments received from wildlife management agencies (USFWS and WDFW) about potential impacts to sage-grouse. Underground Design Options are included for Route Segments NNR-4 and NNR-6. Impact differences between the Underground and Overhead Design Options are discussed in Section 7.2.4.

7.2.3 Impacts Common to all Route Segments

This section describes, in detail, potential impacts to sage-grouse that could occur for all NNR route segments. Section 7.2.4 Impacts by Route Segment highlights impact differences between the route segments.

Potential impacts that could occur as a result of Project construction, operation and maintenance are discussed in more detail below. Impacts including habitat loss and degradation, potential predation, behavioral avoidance of infrastructure, disturbance and displacement due to temporary human presence, habitat connectivity, and collision are discussed in detail below.

Habitat Loss and Degradation

Construction of the proposed Project and associated infrastructure could result in degradation and loss of sage-grouse habitat through direct and indirect impacts. Degradation of sage-grouse habitat could occur if vegetation composition and/or structure within currently suitable habitat became altered and did not adequately meet food and cover requirements for sage-grouse. Habitat loss would occur in areas where vegetation is completely removed or becomes altered such that sage-grouse are unlikely to use it.

Direct habitat loss would result from temporary trampling of herbaceous vegetation and removal of vegetation due to construction of the transmission line, access roads, and temporary work spaces. Vegetation would be permanently removed at structure bases and along permanent access roads. Vegetation removal could have a variety of effects on habitat including changes in plant community structure and composition. The degree of impact would depend on the type and amount of vegetation affected and the rate at which vegetation would regenerate after construction. Within the Project area, the recovery of vegetation would vary by plant community type. For sage-grouse, most habitat degradation and loss that occurs will be a long-term effect. While grasslands and herbaceous wetlands would generally recover within five to seven years, sagebrush steppe may require 30 to 120 years, depending on the subspecies and size of disturbance (Olson et al. 2000; Lesica et al. 2005; Baker 2006; Knick and Connelly 2011). Because the proposed NNR alternative closely parallels an existing Pacific Power transmission line for the majority of its length, utilizing nearby existing roads will reduce the need for new access roads, thus greatly decreasing the amount of direct habitat loss associated with the proposed NNR alternative. For sage-grouse, direct disturbance to sagebrush/perennial and sagebrush/annual grassland would be considered a long-term impact, regardless of disturbance type. For example, temporary work areas in sagebrush/perennial grasslands would be considered a temporary impact for some resources; however, because of the long recovery times for sagebrush, this disturbance was considered a long-term impact for sage-grouse.

Specific PDFs anticipated to be effective at minimizing direct habitat loss include: minimizing construction sites within native plant communities; maintaining intact vegetation wherever possible; utilizing overland travel wherever feasible; and reseeding disturbed areas using an appropriate land management agency or landowner approved mixture for revegetation, which will be detailed in the revegetation plan included in the POD.

Indirect impacts to habitat could occur because ground disturbance and vegetation removal increase the potential for the introduction and spread of noxious and invasive weeds (Olson 1999; Trombulak and Frissell 2000; Levine et al. 2003). Disturbed areas, such as roads and construction work areas, can act as conduits for weeds to become established in native habitats adjacent to the disturbed areas

(Gelbard and Belnap 2003). Linear features such as power lines and roads are also associated with a greater abundance of noxious and invasive weeds that decrease with increasing distance from the linear feature (Gelbard and Belnap 2003; Bradley and Mustard 2006; Bradley 2010). Non-native plant invasions have the potential to alter wildlife habitat quality by outcompeting native plants, altering the natural fire regime, and by changing ecosystem processes (e.g., nitrogen cycling). Construction of access roads and the movement of construction equipment and other vehicles along these roads would increase the potential for the spread of noxious weeds in the affected areas (Sheley et al. 1999; Gelbard and Belnap 2003). PDFs would be implemented to reduce the potential spread of noxious weeds and invasive species from Project activities and include the following: reseeding disturbed areas with certified weed-free materials (e.g., seed, borrow material, straw waddles and bale barriers); washing all equipment before entering the Project area and when leaving areas where noxious weeds are present; closing or rehabilitating new or improved access roads that are not required for maintenance; and complying with all federal, state and county noxious weed control regulations and guidelines. In addition, a Noxious Weed and Invasive Plant Management Plan would be developed in consultation with land management agencies and local weed control districts and would be incorporated into the final POD. The Noxious Weed and Invasive Plant Management Plan would emphasize control of cheatgrass during follow-up visits to prevent, to the extent practical, the establishment of cheatgrass before, during, and after establishment of reclaimed vegetation.

Habitat loss and degradation could also occur in the Project area by a wildland fire event. The Washington Sage-Grouse Recovery Plan (Stinson et al. 2004) and the range wide USFWS 12-Month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered (USFWS 2010) identify habitat loss and degradation from large-scale fires as the primary threat to remaining sage-grouse populations. The Recovery Plan states that fire prevention is critical to maintain sage-grouse populations on the JBLM YTC (Stinson et al. 2004). Non-native plants, particularly cheatgrass, create a more continuous fuel bed than native bunchgrasses, resulting in shorter intervals between occurrence of wildfires (Brown 2000; Paysen et al. 2000). Wildfires in turn, increase opportunities for cheatgrass establishment. This creates a positive feedback loop, often resulting in a self-sustaining cycle that permanently converts large portions of the landscape from sagebrush steppe to annual grasslands dominated by cheatgrass (Brown 2000; Paysen et al. 2000).

To minimize the potential for wildland fire and the resulting loss of sage-grouse habitat, the following PDFs would be implemented: all applicable fire laws and regulations would be observed during construction and operation and construction personnel would be advised of their responsibilities under these laws and regulations, including taking practical measures to report and suppress fires; the development and implementation of a Noxious Weed and Invasive Plant Management Plan with an emphasis on cheatgrass control; closing or rehabilitating new or improved access roads that are not required for maintenance; and developing and implementing a Fire Protection and Control Plan. The Fire Protection and Control Plan would be incorporated into the POD and will include measures to be implemented during construction and maintenance, such as: restricting smoking to designated areas; restricting equipment parking to sites cleared of all flammable material; equipping vehicles with appropriate fire suppression equipment; and training Pacific Power and its contractors on fire safety, minimizing fire hazards, and to safely suppress a fire until firefighters can respond. Applicable fire management measures from JBLM YTC Wildland Fire Management Plan will be incorporated into the Fire Protection and Control Plan.

A potential indirect effect of habitat loss is habitat fragmentation, which may affect habitat connectivity and predation risk. Fragmentation of habitat may be caused by the replacement of sagebrush steppe with early successional grassland habitat or by the presence of the infrastructure which may cause behavioral avoidance of the ROW, even where habitat is not directly removed. Loss of connectivity through habitat fragmentation may inhibit daily movements of sage-grouse within their home-ranges as well as migration movements. Fragmentation may also inhibit dispersal ability, leading to greater isolation among habitat patches (Saunders et al. 1991; WHCWG 2010; WHCWG 2012; Robb and Schroeder 2012). Fragmentation may increase the risk of predation by attracting predators. Howe et al. (2014) found a positive correlation between sagebrush steppe/annual grassland habitat edge and density of common ravens, a common nest predator of sage-grouse.

Predation

Transmission lines may result in increased predation on sage-grouse, particularly from avian predators (corvids and raptors) that may perch and/or nest on transmission structures and conductors. Sage-grouse are preyed upon by a variety of species, including raptors that prey on adults and chicks, and corvids and mammals that prey on eggs, newly hatched chicks, and adults. Avian predators are: golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), red-tailed hawk (*B. jamaicensis*), rough-legged hawk (*B. lagopus*), Swainson's hawk (*B. swainsoni*), gyrfalcon (*Falco rusticolus*), northern goshawk (*Accipiter gentilis*), Cooper's hawk (*A. cooperii*), American kestrel (*Falco sparverius*), merlin (*F. columbarius*), prairie falcon (*F. mexicanus*), northern harrier (*Circus cyaneus*), common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), and black-billed magpie (*Pica hudsonia*). Non-avian predators include coyote (*Canis latrans*), bobcat (*Lynx rufus*), red fox (*Vulpes fulva*), American badger (*Taxidea taxus*), weasel (*Mustela* spp.), ground squirrel (*Spermophilus* spp.) and bull snake (*Pituophis catenifer;* Schroeder et al. 1999; Connelly et al. 2011a, 2011b).

Mammalian predators and scavengers may use roads and transmission ROWs as travel corridors which may facilitate predation on sage-grouse (Bennett 1991; Forman and Alexander 1998). Because the Project ROW would occur within sagebrush steppe and grassland habitats that are already open, the effects of mammalian predation on sage-grouse are likely to be less pronounced compared with corridor effects in forested landscapes. In the relatively treeless environment of the NNR Project area, avian predators are more likely to benefit from a transmission line structures than mammalian predators. Armentrout and Haul (2005) reported that sage-grouse nests and adults associated with leks near transmission lines were lost at a higher rate to avian rather than mammalian predators. They reported that predation attributed to mammals actually occurred at a lower rate near transmission lines.

Transmission line structures provide substrates for perching, roosting and nesting for avian predators (i.e., raptors and corvids), particularly in open areas where natural substrates are limited (APLIC 2006; Knight et al. 1995; Steenhof et al. 1993). Common raven populations have increased fourfold in the western U.S. during the past 40 years (Sauer et al. 2012). Raven populations often increase following human alteration of landscapes due to increased availability of food (e.g., litter associated with human use, roadkill, refuse, landfills), water (e.g., stock ponds, reservoirs), and nesting substrates (e.g., transmission line structures, communication towers, buildings; Knight and Kawashima 1993; Kristan and Boarman 2004; Howe et al. 2014). In eastern Idaho, Howe et al. (2014) reported a 31% decrease in the odds of nesting by ravens for every 0.6 mile (1 kilometer [km]) increase in distance away from a transmission line ROW, with 48 of 82 nests in the study located on transmission poles. While specific studies linking transmission lines and predation risk for sage-grouse are lacking (UWIN 2010), raven research indirectly suggests a link between transmission lines and predation on sage-grouse. Sage-grouse nest failure has been positively correlated with raven abundance (Coates and Delehanty 2010) and occupancy (Bui et al. 2010). However, increased predation on sage-grouse might occur at some, but not all transmission line sites. A study in Nevada found no difference in sage-grouse nest success by distance to power line even though raven densities increased dramatically post-construction (Blomberg et al. 2010). Even the relationship between raven abundance and sage-grouse nest success may be complicated. In southern Wyoming, Dinkins (2013) documented lower sage-grouse nest success (22%) when ravens were detected within 550 meters of the nest compared with success at nests with no ravens detected nearby (41%).

Long-term monitoring of raven nests at JBLM YTC began in 1994. In 1994, 28 raven nests were located on JBLM YTC; seven (25%) of them were located on anthropogenic structures, including one on a power line structure (Paulus and Malkin 1995). In 2013, 47 raven nests were located on JBLM YTC, a 68% increase relative to 1994. Only two of the 47 nests were located within one mile of all the proposed NNR route segments. Both were located near Route Segment NNR-6, including one in a tree along Foster creek, and one on a building one mile south of NNR-6 and one mile east of NNR-5. Although an attempt is made to locate all raven nests on JBLM YTC each year, search efforts have not been spatially and temporally consistent (JBLM YTC personal communication 2014).

A correlation between raven abundance and transmission lines has been established elsewhere (Howe et al. 2014); at JBLM YTC the distribution of raven nests does not appear to be spatially correlated with the locations of transmission lines. None of the active raven nests identified in 2013 were located on the existing Pomona-Wanapum 230 kV transmission line structures that the proposed NNR alternative closely parallels. It is unclear if the apparent nesting patterns of ravens are real or just an artifact of spatial variation in search effort.

The Terrace Heights Landfill is located approximately 3.5 miles southeast of NNR-1 and NNR-2, and is likely to provide an abundant source of food for ravens (Paulus and Malkin 1995). Transmission line structures may be more likely to be used by ravens in areas near this abundant food supply, but. raven use may have less impact on grouse within NNR-1 and NNR-2, where urban influence and lack of suitable habitat may already limit potential for sage-grouse use.

Because raptor and corvid populations are not likely to be limited by availability of nesting and perching substrates in areas where those resources currently exist, it is reasonable to expect the effect of new transmission structures to be greatest where other tall structures, including transmission lines, do not currently exist. The NNR closely parallels an existing 230 kV transmission line (Pacific Power Pomona-Wanapum) that primarily uses H-frame poles similar to the ones proposed for the NNR Alternative. As part of the NNR alternative design, whenever feasible, new structures will match the spans of the existing Pacific Power Pomona-Wanapum transmission line; such that most new structures will be located within approximately 200 feet of an existing structure. Given the territorial nature of raptor and corvid species and density limitations imposed by food availability, it seems unlikely that adding a structure 200 feet from a similar existing one would have much, if any, effect on the density of corvids or raptors. The new structures would offer new perching opportunities that would increase the amount of sage-grouse habitat that is within view of a perch and effectively widen the corridor of increased predation risk, typically by about 200 feet.

To assess impacts to sage-grouse from the presence of additional perching sites, the total number of structures per route segment was estimated and, using a conservative approach, an assumption of one perch per structure was made. In general, the number of perching opportunities for a given route segment is directly related to its length. Table 7 presents the number of transmission structures for the proposed NNR alternative by route segment and identifies if they are located greater than 0.25 mile from an existing transmission line. As discussed in the previous paragraph, new structures in new areas are likely to have a higher impact than new structures in close proximity (<0.25 mile) to existing structures because they may encourage predators to occupy previously unoccupied areas. The proposed NNR alternative would not result in any new structures further than 0.25 mile from existing structures for Route Segments NNR-4, NNR-6, NNR-7, or NNR-8. Route Segment MR-1 would require considerably more new structures farther than 0.25 mile of an existing line compared with all other route segments combined (85 compared with 50).

TABLE 7 SUMMARY OF THE LENGTH AND NUMBER OF NEW TRANSMISSION STRUCTURES THAT WOULD NOT BE LOCATED WITHIN A QUARTER MILE OF AN EXISTING TRANSMISSION LINE

ROUTE SEGMENT	LENGTH OF ROUTE SEGMENT (MILES)	LENGTH AND PERCENT OF ROUTE SEGMENT LOCATED >0.25 MILE FROM AN EXISTING TRANSMISSION LINE	TOTAL ESTIMATED NUMBER OF NEW STRUCTURES	TOTAL ESTIMATED NUMBER OF NEW STRUCTURES LOCATED >0.25 MILE FROM AN EXISTING TRANSMISSION LINE
NNR-1	2.4	1.1 (44%)	31	14
NNR-2	5.0	2.1 (42%)	48	21
NNR-3	9.3	0.6 (7%)	69	5
NNR-4o*	4.5	0	35	0
NNR-4u*	4.5	0	4	0
NNR-5	1.8	1.2 (67%)	16	10
NNR-6o*	6.4	0	48	0
NNR-6u*	6.4	0	2	0
NNR-7	8.2	0	61	0
NNR-8	2.7	0	20	0
MR-1	11.9	11.2 (94%)	90	85

Source: Number of structures and types is based on preliminary engineering and design. *o = overhead design option; u = underground design option. The number of structures for undergrounding took into account transitions stations. For this table, transition stations were considered as a structure.

Sage-grouse predators that may nest on power line structures include golden eagle, red-tailed hawk, and common raven (Schroeder et al. 1999). Average foraging distances from nests is 0.4 mile for ravens (Boarman and Heinrich 1999) and 2.2 miles for golden eagles (Marzluff et al. 1997). An average radius of territories is: 1.0 mile for ravens (Boarman and Heinrich 1999), 1.8 miles for golden eagles (Kochert et al. 2002), and 0.5 mile for red-tailed hawks (Janes 1984). Non-breeding corvids and raptors often have larger home ranges than breeding individuals. Territories of non-breeding eagles average 2.8 miles in radius (Kochert et al. 2002). Average foraging distances for non-breeding ravens averaged 4.3 miles in southwestern Idaho (Engel and Young 1992). Non non-breeding ravens are also more likely to congregate in flocks than are territorial breeders. However, Bui et al. (2010) suggested that resident territorial ravens, rather than non-breeding transient ravens, were most likely responsible for the majority of sage-grouse nest predation because sage-grouse nest survival at their Wyoming site was correlated with raven occupancy, not density.

To minimize the potential for increased predation rates the following PDFs will be implemented: the line will closely parallel an existing 230 kV transmission line, typically staying within 200 feet; whenever possible, locations of the new structures will match the spans of adjacent transmission lines; to avoid providing food subsidies to ravens or other predators, food waste will be kept in covered receptacles and removed daily; and perch deterrents will be used within four miles of active leks.

Behavioral Avoidance of Infrastructure

Behavioral avoidance of infrastructure may be an indirect cause of habitat loss if the proposed NNR Alternative results in sage-grouse avoiding existing suitable habitat. It may be difficult to differentiate between behavioral avoidance and other effects that may decrease abundance of sage-grouse near project infrastructure such as increased predation, collisions, habitat degradation, or avoidance of human presence. This section discusses effects of behavioral avoidance on sage-grouse abundance and lek persistence, in spite of the uncertainty surrounding the mechanism for these effects.

Possible explanations for sage-grouse avoidance and extirpation of leks near transmission power lines are: 1) sage-grouse directly avoid the tall structures lines because they are adapted to inhabit treeless environments; 2) sage-grouse indirectly avoid power lines because they are avoiding the avian predators that are more abundant near power lines; or 3) a combination thereof. To date, no studies have examined mechanisms for sage-grouse avoidance of tall structures (UWIN 2010).

As discussed above, use of transmission lines by avian predators is well documented (APLIC 2006; Knight et al. 1995; Steenhof et al. 1993) and densities of avian predators may increase near transmission lines (Howe et al. 2014). Dinkins et al. (2012) documented sage-grouse avoidance of avian predators in Wyoming. Nests and brood-rearing areas were located in areas with lower densities of ravens, magpies, golden eagles, and *Buteo* hawks compared with random locations.

Reports on direct sage-grouse avoidance of power lines and effects on lek persistence are conflicting. Ellis (1984) observed that sage-grouse stopped displaying in the presence of a perched golden eagle 500 meters from the lek. Schroeder (2010) reports that in Washington, 19 of 20 leks documented within 4.6 miles of 500 kV transmission lines are now vacant compared with vacancies of 59% for leks further than 4.6 miles from 500 kV lines. The timing of the lek vacancies relative to transmission line construction is not known. Within the reintroduced Lincoln County sage-grouse population in northeastern Washington, Stonehouse (2013) found that translocated birds selected home ranges and nest sites further from roads/distribution lines. Because roads and power distribution lines were combined into a single variable, it’s not possible to determine how much of the avoidance was due to distribution lines and how much was due to roads. In a coal bed methane gas development area in northeast Wyoming, Braun et al. (2002) reported significantly slower growth rates during 11 years of monitoring for 40 sage-grouse leks within 0.25 mile of overhead power lines compared to 160 leks further from the lines. The authors speculated that high raptor predation rates because of perches were a likely cause. Wisdom et al. (2011) conducted a landscape-scale study for greater sage-grouse and Gunnison sage-grouse, comparing 22 landscape variables within currently occupied range and formerly occupied, extirpated range. Distance to transmission line was among the five most predictive variables. Mean distance to transmission lines was two times farther for occupied range than for extirpated range. Blomberg et al. (2010) compared lek attendance before construction of a transmission line in Nevada with lek attendance seven years after construction. At the 11 leks varying in distance up to 12.5 miles from the 345 kV line, overall lek attendance decreased approximately 50% following construction but there was no apparent affect of distance from the transmission line. The authors attributed the decline to a regional trend (Blomberg et al. 2010). Johnson et al. (2011) found no relationship between 11 years of lek count trends from across the sage-grouse range and the distance of the nearest power line; however, as the majority of power lines were in place before the 1997-2007 study period, the effects of the power lines may have already been manifested before the study began.

A report from Idaho Power examined lek persistence along power lines 42 years after lek surveys began and did not find a relationship between distance to power line and lek persistence. Sixty-one percent of leks within 0.6 mile of a power line were still active and lek persistence ranged from 40-84% out to 11.3 miles from a power line. Ten leks were within 0.2 mile of a power line and remained active for at least 28 years after construction (IPC 2010).

While evidence for sage-grouse behavioral avoidance of power lines is minimal and evidence of decreased lek attendance and/or persistence is inconsistent, avoidance of power lines has been well documented for other prairie grouse species and sage-grouse avoidance and/or lek decline has been well documented for other infrastructure, including communication towers, roads, and oil and gas development areas. It remains unclear which, if any, of the effects documented for oil and gas development might also apply to transmission lines.

Transmission line avoidance has been demonstrated for two related prairie grouse species. Lesser prairie chickens (*Tympanuchus pallidicinctus*) have been documented to avoid transmission lines in general (Hagen 2003; Robel et al. 2004; Pruett et al. 2009) and when selecting nest sites (Robel et al. 2004; Pitman et al. 2005). Greater prairie chickens (*Tympanuchus cupido*) have also been documented to avoid transmission lines. Documented avoidance distances ranged from greater than 328 feet up to 2,067 feet (100 meters to 630 meters). Both species cross transmission lines significantly less frequently than would be expected if movements were random (Pruett et al. 2009).

For sage-grouse, decreased lek count trends were associated with communication towers (Johnson et al. 2011). Road avoidance by sage-grouse has been documented in oil and gas development (Holloran 2005; Dzialak et al. 2012) and within two miles of I-80 in Wyoming (Connelly et al. 2004), but road avoidance may be site and season dependent (Harju et al. 2013). Several studies have found that oil and gas development affects sage-grouse negatively, but the mechanisms responsible for population declines are not understood (Reviewed by Naugle et al. 2011).

To minimize the potential for behavioral avoidance, the following PDFs will be implemented: the line will closely parallel the existing Pacific Power 230 kV transmission line, with typical transmission line separations of 200 to 300 feet; whenever possible, locations of the new structures will match the spans of the existing line; to avoid providing food subsidies to ravens or other predators, food waste will be kept in covered receptacles and removed daily; and perch deterrents will be used within four miles of active leks.

The PDFs would likely minimize the beneficial effect to avian predators which would reduce sage-grouse avoidance due to predators. These PDFs may also minimize the visual impact of the structures on sage-grouse which would reduce an avoidance effect of the structures.

The proposed NNR alternative ROW is located outside of the current JBLM YTC grouse population range, where 95% of sage-grouse use is estimated to occur (Figure 4). The eight-mile-wide Project area slightly overlaps the population range (by approximately 8%), but does not overlap the core range, where 80% of sage-grouse use is estimated to occur (Figure 4). Recent use has been documented near route segments NNR-4, NNR-5, and NNR-6, but use appears to be infrequent. No grouse were seen during ground transect surveys conducted in May and July of 2013; scat was observed in six locations adjacent to NNR-6, one location on NNR-5, and one location on NNR-4.

Based on 2013 data, there are two active leks and 12 historic leks known to occur within four miles of the proposed NNR alternative (Table 2). To ascertain the length of the proposed NNR alternative route segments that could have an impact on active leks, the length (miles) of the centerline within four miles of active leks was calculated (Table 8). Route Segment NNR-3 has the longest length of line that is within four miles of an active lek (4.1 miles). A visual analysis conducted indicates that approximately 1.6 miles (approximately 11 transmission line structures) of NNR-3 would not be visually obstructed by terrain and would therefore be visible from lek #1. Within four miles of lek #2, all transmission line structures would be visually obstructed by terrain and, therefore, not visible from the lek.

TABLE 8 MILES OF CENTERLINE WITHIN FOUR MILES OF ACTIVE GREATER SAGE-GROUSE LEKS

ROUTE SEGMENT	ACTIVE LEKS WITHIN 4 MILES (NUMBER)[1]	MILES OF CENTERLINE WITHIN 4 MILES OF ACTIVE LEK
NNR-1	0	0
NNR-2	1	1.2
NNR-3	1	4.1
NNR-4o and NNR-4u*	0	0
NNR-5	0	0
NNR-6o and NNRu6u*	1	3.7
NNR-7	0	0
NNR-8	0	0
MR-1	0	0

Notes: [1]Active leks are defined as a lek that has been attended by at least 2 male sage-grouse within the past 24 months (2012-2013; Stinson et al. 2004; SEE 2013). *o = overhead design option; u = underground design option.

Disturbance and Displacement from Temporary Human Presence

Construction, operation and maintenance activities associated with the proposed NNR alternative as well as increased access resulting from the new ROW may result in increased human disturbance to sage-grouse. Sage-grouse are known to be sensitive to human presence (Connelly et al. 2000) as well as vehicle traffic and noise (Holloran 2005; Dzialak et al. 2012). For NNR alternative locations outside of JBLM YTC, which has controlled access, the proposed NNR alternative may also result in increased human presence to areas previously inaccessible, as well as to off-road vehicle recreation (USFWS 2010).

Lek buffers recommended to protect sage-grouse from disturbance and displacement during the breeding season vary in the literature from 0.6 mile to three miles (Connelly et al. 2000; ISAC 2006). Due to heightened concern for sage-grouse within Washington, USFWS recommended this Project avoid disturbance during the breeding season within a four mile buffer of occupied leks.

The PDFs include avoiding construction and/or maintenance activities within four miles of active leks from February 1 to June 15 to protect lekking, nesting, and early brood-rearing and avoiding construction and/or maintenance activities within sage-grouse winter habitat from December 1 through February 1 if winter conditions are exceptionally severe, i.e., snow cover is much higher than normal (e.g., above sagebrush height) or temperatures are much lower than normal. Winter construction and/or maintenance activities within sage-grouse winter habitat will be coordinated with JBLM YTC. Seasonal restrictions will protect grouse during vulnerable breeding and winter periods. To further minimize disturbance to sage-grouse, additional PDFs include: restricting construction activity to predetermined spatial limits, including restrictions on use outside of the ROW; conducting pre-construction clearance surveys for sage-grouse in overland access areas; closing and/or rehabilitating new or improved access that is not required for maintenance; and imposing 25 mph speed limits on access roads and 15 mph speed limits for overland travel.

Habitat Connectivity and Linkage

The WHCWG modeled connectivity potential among the four sage-grouse populations in Washington (two established populations and two reintroduced populations). The purpose, context, and methods of the analysis are discussed in Section 5.2 Habitat Connectivity.

The WHCWG analysis identified the linkage between the JBLM YTC HCA and the Mansfield Plateau/Moses Coulee HCA as "fairly good" (Figure 8). Much of the habitat along this linkage zone is shrub steppe that is protected within state-owned wildlife areas (e.g., WDFW Colockum Wildlife Area). Impediments to this linkage include the relative steepness of the terrain and disturbance associated with I-90, several existing transmission lines, and wind energy development. Conditions for movement are best in the central portion of the linkage, but there are areas of concern at both ends. Near its northern end, the modeled linkage zone is constricted as it crosses the Columbia River near Rock Island Dam. Near the southern end, north of I-90 and the NNR, the linkage is constricted by wind energy development on state and private land (Robb and Schroeder 2012).

The lowest-cost pathway appears to intersect the NNR alternative Project area near Route Segments NNR-6 and NNR-7. Local patterns of sage-grouse distribution suggest that NNR-6 is likely to be the most important connectivity zone. Telemetry data, observational data, and population range modeling indicates a higher probability of sage-grouse use near NNR-4, NNR-5 and western NNR-6 than near eastern NNR-6 and NNR-7, but the presence of existing wind development north of I-90 reduces the linkage value of the more western segments, according to the WHCWG model. Nevertheless, it appears that the entire stretch between Badger Pocket and the Columbia River could serve as valuable linkage habitat. Route Segment NNR-7 is separated from the existing population range by the steep terrain of the Saddle Mountains. On JBLM YTC, sage-grouse prefer flatter areas (less than 15% slope; Livingston 1998). WHCWG did not include slope in their models, asserting that slope is not likely a factor impeding movement (Robb and Schroeder 2012).

The HCA on Yakama Nation lands is separated from the JBLM YTC HCA due to urban development and freeway infrastructure along I-82. The least-cost pathway connects to the JBLM YTC HCA south of the proposed Project; therefore, connectivity with the Yakima Nation HCA is unlikely to be affected by the NNR.

Because the proposed NNR closely parallels an existing Pacific Power 230 kV transmission line as it crosses the identified linkage area, the magnitude of its effect on sage-grouse movement will depend on a number of unknown variables, including the perception of the vertical structures by sage-grouse, and the potential for the structures to attract avian predators. The proposed NNR transmission line would impede sage-grouse movement, but only to the extent that sage-grouse avoid the transmission line (refer to the Behavioral Avoidance of Infrastructure discussion above). There is no research indicating how the width of a disturbance corridor (such as a transmission line ROW) influences sage-grouse movement. The resistance values assigned by WHCWG indicate that they predict that adding a second transmission line to an existing ROW corridor will increase the existing impediment by roughly 25%.

The impact of the proposed NNR alternative line also depends on the behavior of sage-grouse relative to other landscape features located between the two populations. If no movement occurs between the two populations currently, then adding an impediment would not result in a change. Genetic evidence suggests that currently there may be little movement between the two populations. Nevertheless, the effort by WHCWG to evaluate the linkages indicates motivation to restore and enhance connectivity and it is possible that impedance to movement by other existing landscape features in the linkage zone could be ameliorated in the future.

To minimize the potential for predation and behavioral avoidance and thus the impedance to movement and connectivity, the following PDF would be implemented: the line will closely parallel an existing 230 kV transmission line, with transmission centerline separation typically staying within 200 to 300 feet; whenever possible, locations of the new structures will match the spans of adjacent transmission lines; and perch deterrents will be used within four miles of active leks.

Given the current location of active leks, perch deterrents will be installed on transmission line structures within a four mile stretch of NNR-6 that is within the most likely zone for movement between populations to occur. The PDFs would likely minimize the benefits to avian predators (discussed in section 7.4.2), which would reduce sage-grouse avoidance due to predators. These PDFs may also minimize the visual impact of the structures on sage-grouse which would reduce an avoidance effect of the structures.

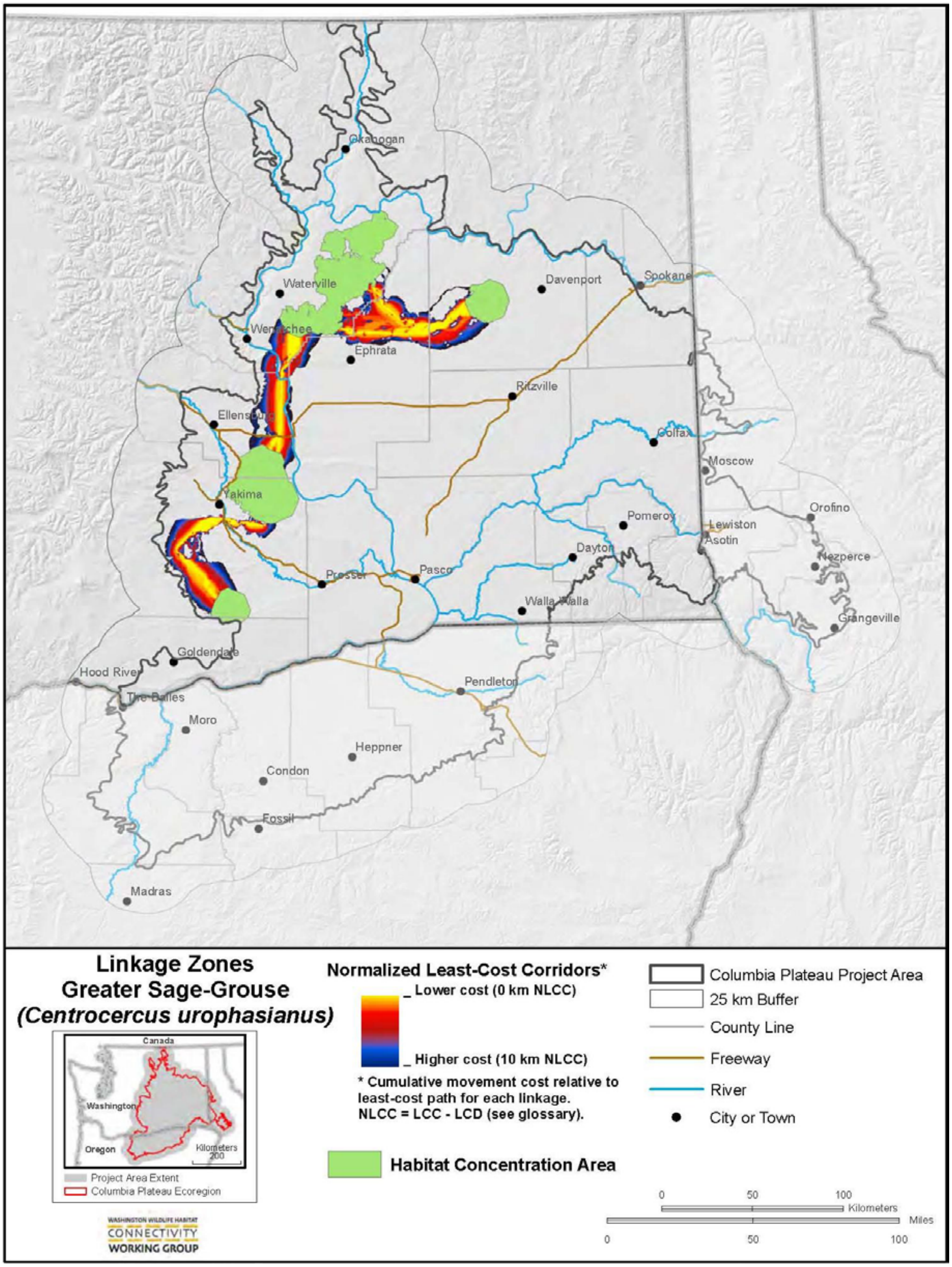

FIGURE 8 CONNECTIVITY ZONES IDENTIFIED BY WHCWG MODELING (FIGURE TAKEN FROM ROBB AND SCHROEDER 2012).

Collisions

Because research data on sage-grouse collisions with power lines are minimal, the number of sage-grouse collisions with transmission lines is difficult to evaluate (Johnson and Holloran 2010). A study in Idaho that outfitted 58 juvenile sage-grouse with radio transmitters, found two of the 11 mortalities observed (18%) resulted from collisions with a power line; however, the study does not indicate what size of transmission line was present in the study area (Beck et al. 2006). In contrast, a study in Nevada on the response of sage-grouse to construction of a 345 kV transmission line did not find any collision mortalities of the 240 hens which were outfitted with radio transmitters (Blomberg and Sedinger 2009). Additional incidental discoveries or anecdotal accounts of sage-grouse collisions with power lines exist (Schroeder 2010).

Power line collision risk may depend on several factors. Collision risk is highest with the static wire or shield wire (Faanes 1987), while collision risk with guy wires is unknown for sage-grouse (USFWS 2010). Collision risk also may depend on power line structures and configuration, location of a power line in relation to bird use areas, weather, as well as flight behavior and physiology of birds (Bevanger 1998). The placement of the proposed NNR alternative line along the northern periphery of the habitat occupied by the existing JBLM YTC grouse population (instead of through the population) and closely paralleling an existing line should reduce the risk of collision.

Although it is not possible to quantify impacts associated with each NNR route segment, it can be assumed that those route segments that affect the greatest amount of sage-grouse habitat would also likely have the highest level of collision mortality. Collision risk would have important implications for sage-grouse conservation and recovery within the linkage zone identified by WHCWG, along Route Segments NNR-6 and NNR-7.

The implementation of PDFs is anticipated to be effective at reducing the potential for injury or mortality to sage-grouse from collisions with the transmission line conductor and structures, fences, and vehicles (APLIC 2012). Applicable PDFs include: installing bird flight diverters in locations with known avian collision mortality; installing markers on any new fences constructed or repaired in sage-grouse habitat; moving vehicles and equipment at slow speeds; and restricting construction vehicle movement to pre-designated locations. In addition, direct mortality from vehicles would be reduced by avoiding construction or maintenance activities within four miles of active leks from February 1 to June 15.

7.2.4 By Route Segment

The information included below, by NNR alternative route segment, is intended to focus on highlighting differences between route segments. Impacts described below take into account the implementation of committed PDFs (Section 7.2.1) by Pacific Power. Please refer to Section 7.2.3 for a description of the impacts common to all route segments and to Section 6.5 for route segment-specific descriptions of existing infrastructure, land cover types, sage-grouse habitat, and sage-grouse use.

Route Segment NNR-1

The landscape within the eight-mile-wide NNR-1 analysis area has experienced extensive alteration from rural and urban development and infrastructure, as described in Section 6.5.

All of the short-term (10.9 acres) and long-term (2.3 acres) habitat disturbance associated with Route Segment NNR-1 is within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term basis and less than one percent on a long-term basis (Tables 4 and 7). The majority of the disturbance for this route segment would occur in habitat that has been disturbed in the past and is currently dominated by rabbitbrush, exotic annual grasses, and developed areas such as agricultural and residential areas. No disturbance from construction, operation or maintenance of the NNR Alternative is anticipated to occur within suitable or marginal sage-grouse habitat; 13.1 acres of disturbance will occur in unsuitable habitat (Table 5). PDFs implemented during construction and operation are anticipated to be effective at reducing impacts to sage-grouse habitat (refer to Sections 7.2.1 and 7.2.3). Considering the existing degraded habitat available within Route Segment NNR-1 and with the implementation of PDFs, the scale of disturbance and degradation to sage-grouse habitat is anticipated to be low for the entire route segment (2.4 miles).

Existing perching, roosting and nesting sites are available along Route Segment NNR-1 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-1 would require approximately 31 new structures; approximately 17 (55%) of these new structures would be located greater than 0.25 mile from an existing transmission line (Table 7).

There are no active leks within four miles of Route Segment NNR-1.Potential impacts to lekking sage-grouse would be minimized by the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3). With the implementation of PDFs combined with no known active or inactive leks within four miles, impacts to lekking sage-grouse with the construction of Route Segment NNR-1 is anticipated to be low.

Route Segment NNR-2

Existing disturbance within the eight-mile- NNR-2 analysis area is largely from urban and rural development, as described in Section 6.5.

The majority of short-term (18.8 acres) and the entirety of long-term (3.7 acres) habitat disturbance associated with Route Segment NNR-2 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term basis and less than one percent on a long-term basis (Tables 4 and 7). The majority of disturbance for this route segment would occur in habitat that has been disturbed in the past and is currently dominated by rabbitbrush, exotic annual grasses, and developed areas, such as agricultural and residential areas. No disturbance is predicted to occur within suitable sage-grouse habitat; 7.8 acres of disturbance is anticipated to occur in marginal habitat, and 16.4 acres within unsuitable habitat (Table 5). With the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3), the scale of disturbance and degradation to sage-grouse habitat is anticipated to be low for the entire route segment (5.0 miles).

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-2 from buildings, trees, fences associated with developed areas and existing low-voltage distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-2 would require an estimated 48 new structures; approximately 21 (44%) would be located greater than 0.25 mile from an existing transmission line (Table 7).

Approximately 1.2 miles of Route Segment NNR-2 is within four miles of an active lek. All of the structures within four miles of the active lek would be visually obstructed by terrain and therefore not visible from the lek. The lek is described in Section 6.5. Potential impacts to lekking sage-grouse would be minimized by the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3). Lek impact levels are anticipated to be low for 3.7 miles and moderate for 1.3 miles.

Route Segment NNR-3

Route Segment NNR-3 more or less parallels I-82 to the west; I-82 is within two miles of the route segment for its entire length and separates the segment from the core areas of the JBLM YTC sage-grouse population. Other existing disturbance is described in Section 6.5.

The majority of short-term (34.4 acres) and the entirety of long-term (17.6 acres) habitat disturbance associated with Route Segment NNR-3 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term basis and less than one percent on a long-term basis (Tables 4 and 7). Anticipated ground disturbance includes 21.1 acres of suitable sage-grouse habitat, 15.3 acres of marginal habitat, and 16 acres of unsuitable habitat (Table 5). PDFs are anticipated to be effective at reducing impacts to sage-grouse habitat (refer to Sections 7.2.1 and 7.2.3). The scale of disturbance and degradation to sage-grouse habitat is anticipated be low for 6.1 miles and moderate for 3.2 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-3 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-3 would require an estimated 69 new structures; approximately five (7%) would be located greater than 0.25 mile from an existing transmission line (Table 7).

Approximately 4.1 miles of Route Segment NNR-3 is within four miles of an active lek. Of the 4.1 miles of line within four miles of the active lek, approximately 1.6 miles and 11 structures would not be visually obstructed by terrain. The lek is described in Section 6.5. Potential impacts to lekking sage-grouse would be minimized by the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3). Lek impact levels are anticipated to be low for 5.2 miles and moderate for 4.1 miles.

Route Segment NNR-4o/NNR-4u

Route Segment NNR-4 crosses I-82 and passes through a JBLM YTC bivouac area with a very high density of dirt and gravel roads. Other existing disturbance is described in Section 6.5.

Route Segment NNR-4 is being considered as either an underground segment (NNR-4u) or as a standard, overhead transmission segment (NNR-4o). Undergrounding would create a larger area of ground disturbance than an overhead line would, because the overhead line would cause relatively little ground disturbance along the spanned areas between structures and the underground design option would require trenching and a permanent access road. All of the short-term (17.6 acres) and long-term (5.4 acres) habitat disturbance associated with Route Segment NNR-4o would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). All short-term (33.5 acres) and long-term (17.8 acres) ground disturbance associated with Segment NNR-4u would also be located within the Regularly Occupied Habitat MU for sage-grouse. For either option construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term or long-term basis.

For NNR-4o, anticipated disturbance includes 15 acres of suitable sage-grouse habitat, seven acres of marginal habitat, and one acre of unsuitable habitat. Undergrounding NNR-4 would increase the anticipated disturbance to 33.8 acres of suitable habitat, 13.8 acres of marginal habitat, and 3.7 acres of unsuitable habitat (Table 5). PDFs implemented during construction and operation are anticipated to be effective at reducing impacts to sage-grouse habitat (refer to Sections 7.2.1 and 7.2.3). Habitat impact levels would be low for 1.6 miles and moderate for 3.0 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-4 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-4o would require an estimated 35 new structures, all of which would be located within 0.25 mile of an existing transmission line (Table 7). The underground option, NNR-4u would need to be overhead for a short-stretch as it crosses I-82. This would require two transmission towers, both within 0.25 mile of existing structures. In addition, at each of the four transitions between above-ground and underground transmission, a transition station would be required resulting in approximately five acres of disturbance at each transition station.

No active leks are known to occur within four miles of Route Segment NNR-4 (Table 2). With the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3), impacts to lekking sage-grouse associated with the construction of Route Segment NNR-4, both the overhead and underground design option, is anticipated to be low for the entire route segment (4.5 miles).

Route Segment NNR-5

Existing disturbance within the eight-mile-wide NNR-5 analysis area includes primary all-weather gravel access roads for military training, numerous light-duty dirt roads, two JBLM YTC bivouac areas, and a large swath of agricultural land north of the segment. The route deviates slightly from the existing 230 kV transmission line but remains within 0.5 mile for the entire segment.

All of the short-term (7.5 acres) and long-term (1.5 acres) habitat disturbance associated with Route Segment NNR-5 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term or long-term basis (Tables 4 and 7). Anticipated ground disturbance includes 8.6 acres of suitable sage-grouse habitat, 0.4 acre of marginal habitat, and 0 acres of unsuitable habitat (Table 5). With the implementation of PDFs (refer to Sections 7.2.1 and 7.2.3), habitat impact levels would be low for 0.1 mile and moderate for 1.7 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-5 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-5 would require an estimated 16 new structures; approximately 10 (63%) would be located greater than 0.25 mile from an existing transmission line (Table 7).

No active leks are known to occur within four miles of Route Segment NNR-5 (Table 2). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), impacts to lekking sage-grouse associated with the construction of Route Segment NNR-5 is anticipated to be low for the entire length of the route segment (1.8 miles).

Route Segment NNR-6o/NNR-6u

Existing disturbance within the eight-mile-wide NNR-6 analysis area includes primary all-weather gravel access roads for military training, numerous light-duty dirt roads, two military bivouac areas west of the segment, a large swath of agricultural land west of the segment, and three existing transmission lines northeast of the segment, including one 230 kV line and two 500 kV lines.

Route Segment NNR-6 is being considered as either an underground segment (NNR-6u) or as a standard, overhead transmission segment (NNR-6o). Undergrounding would create a larger area of ground disturbance than an overhead line would, because the overhead line would cause relatively little ground disturbance along the spanned areas between structures and the underground design option would require trenching and a permanent access road. The amount of disturbance within each landcover type is similar for the two design options. All of the short-term (24.0 acres) and long-term (6.6 acres) habitat disturbance associated with Route Segment NNR-6o would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). All short-term (47.3 acres) and long-term (17.0 acres) ground disturbance associated with Segment NNR-6 U would also be located within the Regularly Occupied Habitat MU for sage-grouse. For either option construction activities would disturb less than1 percent of Regularly Occupied Habitat on a short-term or long-term basis.

For NNR-6o, anticipated disturbance includes 9.5 acres of suitable sage-grouse habitat, 8.4 acres of marginal habitat, and 12.7 acres of unsuitable habitat. Undergrounding NNR-6 would increase the anticipated disturbance to 20.5 acres of suitable habitat, 16.6 acres of marginal habitat, and 27.2 acres of unsuitable habitat (Table 5). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), habitat impact levels would be low for 4.5 miles and moderate for 1.9 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-6 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-6o would require an estimated 48 new structures, all of which would be located within 0.25 mile of an existing transmission line (Table 7). Although the underground option would not require transmission towers, at both transitions between above-ground and underground transmission, a transition station would be required, resulting in approximately five acres of disturbance at each transition station.

Approximately 3.7 miles of Route Segment NNR-6 is within four miles of an active lek. All of the structures within four miles of the active lek would be visually obstructed by terrain and therefore not visible from the lek. The lek is described in Section 6.5. With the implementation of PDFs (Sections 7.2.1 and 7.2.3), lek impact levels are anticipated to be low for 2.1 miles and moderate for 4.3 miles.

Route Segment NNR-7

Route Segment NNR-7 continues to closely parallel the existing 230 kV transmission line, staying within approximately 200 feet for the entire segment. Existing disturbance is described in Section 6.5.

All of the short-term (30.8 acres) and long-term (7.2 acres) habitat disturbance associated with Route Segment NNR-7 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term or long-term basis (Tables 4 and 7). Anticipated ground disturbance includes 25.3 acres of suitable sage-grouse habitat, 12.8 acres of marginal habitat, and 0 acres of unsuitable habitat (Table 5). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), habitat impact levels would be low for 2.8 miles and moderate for 5.4 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-7 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-7 would require an estimated 61 new structures; all would be located within 0.25 mile of an existing transmission line (Table 7).

No active leks are known to occur within four miles of Route Segment NNR-7 (Table 2). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), impacts to lekking sage-grouse associated with the construction of Route Segment NNR-7 is anticipated to be low for the entire route segment (8.2 miles).

Route Segment NNR-8

Existing disturbance within eight-mile-wide NNR-8 analysis area includes two existing 230 kV transmission lines, two 500 kV transmission lines, and the Vantage Substation. Other existing disturbance is described in Section 6.5.

The majority of the short-term (9.0) and long-term (1.7 acres) habitat disturbance associated with Route Segment NNR-8 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term or long-term basis (Tables 4 and 7). Anticipated ground disturbance includes 6.0 acres of suitable sage-grouse habitat, 2.0 acres of marginal habitat, and 5.5 acres of unsuitable habitat (Table 5). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), the scale of disturbance and degradation to sage-grouse habitat is anticipated to be low for 1.7 miles and moderate for 1.0 mile.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment NNR-8 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment NNR-8 would require an estimated 20 new structures; all would be located within 0.25 mile of an existing transmission line (Table 7).

No active leks are known to occur within four miles of Route Segment NNR-8 (Table 2). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), impacts to lekking sage-grouse associated with the construction of Route Segment NNR-8 is anticipated to be low for the entire length of the route segment (2.7 miles).

Route Segment MR-1

This 12-mile subroute is a proposed option to the 4.5-mile NNR-4 route segment. Existing disturbance within the eight-mile- MR-1 analysis area is described in Section 6.5.

All of the short-term (45.2 acres) and long-term (34.0 acres) habitat disturbance associated with Route Segment MR-1 would be located within the Regularly Occupied Habitat MU for sage-grouse (Tables 4 and 7). Construction activities would disturb less than one percent of Regularly Occupied Habitat on a short-term or long-term basis (Tables 4 and 7). Anticipated ground disturbance includes 50 acres of suitable sage-grouse habitat, 13.3 acres of marginal habitat, and 16.4 acres of unsuitable habitat (Table 5). With the implementation of PDFs (Sections 7.2.1 and 7.2.3), habitat impact levels would be low for 4.3 miles and moderate for 7.6 miles.

Existing perching, roosting and nesting sites for avian predators are available along Route Segment MR-1 from buildings, trees, fences associated with developed areas and existing distribution and 230 kV H-frame transmission lines. Construction of Route Segment MR-1 would require an estimated 90 new structures; approximately 85 (94%) would be located greater than 0.25 mile from an existing transmission line (Table 7).

No active leks are known to occur within four miles of Route Segment MR-1 (Table 2). With the implementation of PDFs (Section 7.2.1 and 7.2.3), impacts to lekking sage-grouse associated with the construction of Route Segment MR-1 are anticipated to be low for the entire length of the route segment (11.9 miles).

8.0 COMPARISON OF IMPACTS BY ALTERNATIVE

Table 9 presents a comparison of the impacts to sage-grouse and impact levels (i.e., high, moderate, low) following the implementation of PDFs for the NNR Alternative - Overhead Design Option, NNR Alternative - MR Subroute, the NNR Alternative - Underground Design Option, and the DEIS Agency Preferred Alternative. A discussion of the impacts by alternative is presented below.

A portion of the proposed NNR Alternative would be located within the JBLM YTC PAC. Of the three NNR Alternative options and the DEIS Agency Preferred Alternative, the NNR Alternative - Overhead Design Option or the NNR - Underground Design Option would have the lowest number of miles within the PAC (38.2 miles each; 94.7% of their overall lengths). In addition, the location of the NNR Alternative - Overhead Design Option and the NNR Alternative - Underground Design Option are consolidated with an existing transmission line for the majority of their length within the PAC (36.4 miles; 95% of the length within the PAC). The NNR Alternative - MR Subroute has the most miles within the PAC (46.0 miles; 96.4% of its overall length). The DEIS Agency Preferred Alternative is within the PAC for 42.9 miles (64.7% of its overall length). All of the NNR Alternative options would be just within the boundary of the JBLM YTC Primary Sage-Grouse Protection Area for approximately one mile.

Overall, direct habitat loss to suitable sage-grouse habitat would be the greatest with the DEIS Agency Preferred Alternative (144.3 acres) and the NNR Alternative - Overhead Design Option would disturb the least amount of suitable habitat (85.3 acres). The NNR Alternative -Underground Design Option would disturb more suitable habitat than the NNR Alternative - Overhead Design Option (115.1 acres vs. 85.3 acres) because it would require more vegetation removal through the excavation of a continuous trench for underground portions and would require a permanent road to access underground locations. For all alternatives, disturbed areas would be restored following construction; however, because of the long recovery times for restoring sagebrush to a community (30 to 120 years), any direct disturbance to sage-grouse habitat would be considered a long-term impact.

Because the NNR Alternative -Overhead Design Option and the NNR Alternative -Underground Design Option closely parallel the existing Pomona-Wanapum 230 kV transmission line for the majority of their total length, utilizing nearby existing roads will reduce the need for new access roads, thus greatly decreasing the amount of direct habitat loss. Indirect habitat loss through the spread of noxious weeds and invasive species and potential increased fire frequency would occur for all alternatives. Ground disturbance and vegetation removal increase the potential for the introduction and spread of noxious and invasive weeds, with disturbed areas, such as roads and construction work areas, acting as conduits for weeds to become established in native habitats adjacent to the disturbed areas. Greater ground disturbance would occur with the construction of the NNR Alternative - MR Subroute and the NNR Alternative - Underground Design Option. The NNR Alternative - MR Subroute would require construction in areas that are not located adjacent to an existing line and in areas with few or no access roads. The NNR Alternative - Underground Design would require greater ground disturbance in underground construction locations through trenching and new, permanent access road construction.

The NNR Alternative - Overhead Design Option and the NNR Alternative -Underground Design Option closely parallel an existing 230 kV transmission line that primarily uses transmission structures similar to those proposed for the NNR Alternative options, with new structures located within approximately 200 feet of existing structures. Given the territorial nature of raptor and corvid species and density limitations imposed by food availability, it unlikely that the addition of a structure 200 to 300 feet from a similar existing structure would have much, if any, effect on the density of corvids or raptors. For the NNR Alternative - Overhead Design Option, the new perching opportunities would increase the amount of sage-grouse habitat that is within view of a perch and effectively widen the corridor of increased predation risk, by approximately 200 to 300 feet from the existing condition.

Construction of the NNR Alternative - MR Subroute would require new H-frame poles in areas largely devoid of tall structures; corvid species may be most likely to use the new structures along Manastash Ridge that are closest to disturbance and agriculture. The DEIS Agency Preferred Alternative would require considerably more structures (499) than the other three alternatives compared in this report and the majority of these new structures (67.9%; 339 structures) would be located greater than 0.25 mile from an existing transmission line. As the NNR Alternative - Overhead Design Option and the NNR Alternative -Underground Design Option parallel an existing transmission line for the majority of their length, both alternatives would require fewer new structures (not adjacent to an existing line) to be placed on the landscape (50 each). Overall, fewer new structures would be required for the NNR Alternative - Underground Design Option (251 structures compared with 328 for the NNR Alternative – Overhead Design Option); however, the number of new structures located greater than 0.25 mile from an existing line would be the same for both.

The ROW for the three NNR Alternative options would be located outside of the current JBLM YTC sage-grouse population range, where 95% of sage-grouse use is expected to occur (based on the kernel density analysis). The eight-mile-wide sage-grouse Project area for the three NNR Alternative options overlaps approximately 8% of the total estimated 95% population range (15,271 to 15,430 acres, depending on NNR Alternative option). The NNR Alternative options do not overlap the core range, where 80% of sage-grouse use is estimated to occur. Recent grouse use has been documented near the NNR Alternative - Overhead Design Option, NNR Alternative - Underground Design Option and the NNR Alternative - MR Subroute Alternative options indicating that these areas are used by grouse occasionally, but telemetry data indicates that use near the proposed route is much lighter than areas within the population range. The DEIS Agency Preferred Alternative ROW would be located outside of the JBLM YTC sage-grouse population range. The eight-mile-wide Project area for the DEIS Agency Preferred Alternative overlaps the core range for approximately 39,312 acres and the population range for approximately 47,082 acres (approximately 44% of the total estimated population range).

The three NNR Alternative options would be located within four miles of two active leks. The DEIS Agency Preferred Alternative would be closer to leks; within two miles of two active or inactive leks and within three miles of three additional active or inactive leks. The NNR Alternative - Overhead Design Option and the NNR Alternative - Underground Design Option would be in close proximity to more historic leks (three leks within 0.6 mile) compared with the NNR Alternative - MR Subroute and the DEIS Agency Preferred Alternative (one lek within 0.6 mile). Currently, sage-grouse use near all three of the NNR Alternative options appears to be minimal. The DEIS Agency Preferred Alternative is located in closer proximity to the current population range and core population range.

For the NNR Alternative options, habitat connectivity between the JBLM YTC sage-grouse population and the Mansfield Plateau/Moses Coulee sage-grouse population appears to have the greatest potential where Route Segments NNR-6 and NNR-7 (all three NNR Alternative options) are located. Local patterns of sage-grouse distribution suggest that NNR-6 is likely to be the most important connectivity zone, but the presence of wind development north of I-90 reduces the linkage value, according to the WHCWG model. In addition, the kernel density analysis shows a southeastward shift in the JBLM YTC sage-grouse population range and core population range since 1989. This shift in use could be associated with increased training at JBLM YTC or, as sage-grouse populations have declined, sage-grouse are shifting into core, suitable habitat locations. Nevertheless, it appears that the entire stretch between Badger Pocket and the Columbia River could serve as valuable linkage habitat. Because the proposed NNR Alternative options closely parallels an existing 230 kV transmission line as it crosses the identified linkage area, the magnitude of its effect on sage-grouse movement would depend on a number of unknown variables, including the perception of the vertical structures by sage-grouse, and the potential for the structures to attract avian predators. The NNR Alternative options may impede sage-grouse movement, but only to the extent that sage-grouse avoid the transmission line (refer to the Behavioral Avoidance of Infrastructure discussion above). The NNR Alternative - Underground Design Option could alleviate sage-grouse avoidance of the NNR; however, two existing 500 kV and two existing 230 kV transmission lines, I-90 and the two existing wind developments would still be present on the landscape. Based on information provided by the kernel density analysis, it appears that use of the area north of the proposed NNR alternative has been limited, even two decades ago when the JBLM YTC population was higher (over 400 birds). Of the three main sage-grouse connectivity zones identified by WHCWG, the one linking the JBLM YTC population with the reintroduced Yakama Reservation population was the weakest. That connectivity zone would cross the DEIS Agency Preferred Alternative, with the most valuable zone crossing Route Segment 2c, before detouring around far to the west (or to the east) in order to connect with the habitat on the Yakama Indian Reservation. But, according to Robb and Schroeder (2012), development along the I-82 corridor “essentially isolates” habitat on the Yakama Indian Reservation from the JBLM YTC population, and potential for movement between the two areas “looks dismal.” None of the proposed routes are likely to impact sage-grouse connectivity to the south; given the existing barriers, it is unlikely that movement would occur between the JBLM YTC and Yakama Indian Reservation populations with or without the proposed DEIS Agency Preferred Alternative or any of the NNR Alternative options.

TABLE 9 SUMMARY OF IMPACTS TO SAGE-GROUSE BY ALTERNATIVE

ALTERNATIVES	MILES WITHIN PAC	DISTURBANCE TO SAGE-GROUSE HABITAT (ACRES)[1]					ESTIMATED NUMBER OF NEW TRANSMISSION LINE STRUCTURES		SAGE-GROUSE POPULATION RANGE				ACTIVE OR INACTIVE LEKS (NUMBER)				PHS HISTORIC LEKS (NUMBER)				DIRECT IMPACT LEVELS (MILES)[3]		
		SUITABLE	MARGINAL	UNSUITABLE	TOTAL DISTURBANCE	TOTAL DISTURBANCE WITHIN THE PAC	TOTAL NUMBER OF NEW STRUCTURES	TOTAL NUMBER OF NEW STRUCTURES GREATER THAN 0.25 MILE FROM AN EXISTING TRANSMISSION LINE	ACRES WTIHIN ROW		ACRES WITHIN 4 MILES (195,248 ACRES TOTAL)		WITHIN 0-0.6 MILE	WITHIN 0-2 MILES	WITHIN 0-3 MILES	WITHIN 0-4 MILES (SDEIS ONLY)[2]	WITHIN 0-0.6 MILE	WITHIN 0-2 MILES	WITHIN 0-3 MILES	WITHIN 0-4 MILES (SDEIS ONLY)[2]	HIGH	MODERATE	LOW
									0-80% CORE POPULATION RANGE	95% POPULATION RANGE	0-80% CORE POPULATION RANGE	95% POPULATIO N RANGE											
NNR Alternative Overhead Design Option NNR-1, NNR-2, NNR-3, NNR-4o, NNR-5, NNR-6o, NNR-7, NNR-8 40.3 miles	38.2	85.3	54	64.7	204	193.3	328	50	0	0	0	15,430 (8%)	0	0	0	2	3	6	8	14	0	23.9	16.4
NNR Alternative MR Subroute NNR-1, NNR-2, NNR-3, NNR-5, NNR-6o, NNR-7, NNR-8, MR-1 47.7 miles	46.0	120.1	60.1	80	265.8	255.3	383	135	0	0	0	15,271 (8%)	0	0	0	2	1	5	8	14	0	28.5	19.2
NNR Alternative with Underground Design Option NNR-1, NNR-2, NNR-3, NNR-4u, NNR-5, NNR-6u, NNR-7, NNR-8 40.3 miles	38.2	115.1	69	81.7	260.2	249.5	251	50	0	0	0	15,430 (8%)	0	0	0	2	3	6	8	14	0	23.9	16.4
DEIS Agency Preferred Alternative 1a, 1b, 2a, 2c, 2d, 3a, 3c 66.3 miles	42.9	144.3	26.8	158.4	329.5	*	499	339	140.2	255.7	39,312	86,395 (44%)	0	2	5	*	1	2	4	*	0	28.7	37.6

Notes: PHS = Priority Habitats and Species [1]Sage-grouse habitat was assessed using the sage-grouse habitat survey data and, in locations not surveyed, through aerial interpretation using adjacent survey information, 2001 JBLM YTC vegetation data, GAP data and fire history data. Habitat was considered suitable if suitable breeding, late brood-rearing or winter habitat was present. [2]The DEIS assessed leks out to 3 miles. Based on input from wildlife management agencies, the SDEIS analysis was expanded to include leks out to 4 miles. [3] Impact levels are presented in linear miles. Impacts may be reduced further through site specific engineering and design in conjunction with mitigation. Items with an * indicate information that was not included in the DEIS, but will be added into the FEIS.

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9.0 CONSISTENCY WITH REGULATORY ENVIRONMENT

A regulatory overview for sage-grouse was provided above in Section 3.0. Table 10 summarizes each regulatory policy and guideline, identified conservation measures, and the proposed NNR Alternative's consistency with these regulatory requirements and guidelines.

10.0 PROPOSED MEASURES TO OFFSET PROJECT IMPACTS

The impact analysis presented above for the proposed NNR Alternative identified six categories of potential impacts to greater sage-grouse. These impact categories are described in detail in Section 7.2.3 and include:

- Habitat loss and degradation
- Predation
- Behavioral avoidance of infrastructure
- Disturbance and displacement from temporary human presence
- Habitat connectivity and linkage
- Collision

Section 7.2.1 presents Pacific Power committed PDFs and other conservation measures pertinent to greater sage-grouse. Additional mitigation measures may be developed following the identification of the Preferred Alternative and will be included in the Mitigation Framework Plan.

10.1 Framework for Implementing Mitigation for the Proposed Project

The BLM is in the process of developing a Greater Sage-Grouse Mitigation Framework Plan to minimize the amount and significance of impacts from the proposed Project. This Mitigation Framework Plan will be cooperatively developed by project stakeholders and is intended to be a living document that will undergo future revisions. This Greater Sage-Grouse Mitigation Framework Plan will provide the basis for developing Project-specific sage-grouse habitat mitigation that, when initially prepared, will provide an overview of mitigation opportunities.

10.2 Residual Impacts

Residual impacts will be added following the identification of the Preferred Alternative and mitigation options. An Agency Preferred Alternative was identified in the DEIS. Based on the analysis of the alternatives and options, a new Agency Preferred Alternative may or may not be identified.

TABLE 10 SUMMARY OF THE NNR ALTERNATIVE'S CONSISTENCY WITH SAGE-GROUSE REGULATORY POLICIES AND GUIDELINES

REGULATORY POLICY OR GUIDANCE DOCUMENT	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION STRATEGIES OR OBJECTIVES	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION MEASURES	PROPOSED NNR ALTERNATIVE'S CONSISTENCY WITH REGULATORY POLICY OR GUIDANCE
USFWS COT Report – Guidance document	Maintain and restore healthy native sagebrush plant communities.	Fire: • Restrict and contain fire. • Design, implement, and monitor restoration activities for burned sagebrush habitat. Invasive Species: • Reduce or eliminate disturbances that promote the spread of invasive species. • Monitor and control invasive vegetation post-wildfire for at least three years. • Require best management practices for construction projects in and adjacent to sagebrush habitats to prevent invasion. • Restore altered ecosystems so that non-native invasive plants are reduced to levels that do not put the area at risk of conversion if a catastrophic event were to occur.	• Committed PDF Gen-6, Committed PDF WF-1-4: Fire prevention training, fire suppression equipment, and developing a Fire Protection and Control Plan. • Project Description, Section 2.4.3.13 Fire Prevention and Suppression. • Committed PDF Bio-5: Noxious Weed and Invasive Plant Management Plan. • Committed PDF Bio-6: Limiting ground disturbance. • Committed PDF Bio-7: Reclamation, Revegetation and Monitoring Framework Plan. • Committed PDF Bio-9: Revegetating following construction. • Committed PDF Bio-11: Washing all equipment to prevent noxious weed introduction. • Committed PDF Bio-12: Minimizing blading of native plant communities during construction.
USFWS COT Report – Guidance document	Avoid development of infrastructure within PACs.	• Avoid infrastructure construction in sage-grouse habitat, both within and outside of PACs. • Power transmission corridors which cannot avoid PACs	• The COT Report which identified PACs became available in February 2013,

REGULATORY POLICY OR GUIDANCE DOCUMENT	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION STRATEGIES OR OBJECTIVES	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION MEASURES	PROPOSED NNR ALTERNATIVE'S CONSISTENCY WITH REGULATORY POLICY OR GUIDANCE
		should be buried (if technically feasible) and disturbed habitat should be restored. o If avoidance is not possible, consolidate new structures with existing features and/or preclude development of new structures within locally important sage-grouse habitats. ▪ Consolidation with existing features should not result in a cumulative corridor width of greater than 600 feet (ft) (200 meters [m]). ▪ Habitat function lost from placement of infrastructure should be replaced. o Infrastructure corridors should be designed and maintained to preclude introduction of invasive species. o Restrictions limiting use of roads should be enforced. o Remove transmission lines and roads that are duplicative or are not functional. o Transmission line towers should be constructed to severely reduce or eliminate nesting and perching by avian predators, most notably ravens, thereby reducing anthropogenic subsidies to those species. o Mitigate impacts to habitat. o Remove (or decommission) non-designated roads within sagebrush habitats.	after the publication of the DEIS. The NNR was sited to avoid JBLM YTC identified sage-grouse Primary Protection Areas. • An Underground Design Option is being considered and analyzed in the SDEIS to reduce impacts to sage-grouse. • Committed PDF Bio-21: Locations of new structures will match the spans of adjacent transmission lines. • Committed PDF Bio-20: The line will closely parallel an existing transmission line, with transmission centerline separations typically staying within 200-300 ft. With the NNR/Overhead Design Option's consolidation with existing structures, the cumulative corridor is not anticipated to be greater than 600 ft (200 m). • Committed PDF Bio-5: Noxious Weed and Invasive Plant Management Plan. • Committed PDF Bio-14: Close and rehabilitate all new access roads not needed for maintenance. • Committed PDF Bio-22: Perch

REGULATORY POLICY OR GUIDANCE DOCUMENT	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION STRATEGIES OR OBJECTIVES	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION MEASURES	PROPOSED NNR ALTERNATIVE'S CONSISTENCY WITH REGULATORY POLICY OR GUIDANCE
			deterrents will be installed on new transmission structures within 4 miles of an active lek. • Impacts to habitat will be mitigated. See Section 10.
Washington Sage-Grouse Recovery Plan	Protect sage-grouse populations	• Protect active sage-grouse leks from human disturbance. Recommends minimizing disturbance from construction and development activities, particularly within 0.6 mile (1.0 kilometer) of breeding habitat during February - June. • Protect nesting and brood rearing areas from disturbance. Wherever possible, prevent disturbance in sage-grouse nesting and brood rearing habitat between March 1 and June 15. • Reduce collision and predation hazards posed by poles, wires and fences. New power lines and utilities should use existing corridors or be located so as to minimize collision risk and damage to habitat; existing power lines should be buried or modified with perch guards to prevent use as a raptor perch site; and unneeded fences in sage-grouse use areas should be removed.	• There are no known active leks within 0.6 mile of any of the route segments. • Committed PDF Bio-13: Construction and maintenance activities will be avoided within 4 miles of active leks from Feb to June 15 to protect lekking, nesting and early brood-rearing. • Committed PDF Bio-18: Marking new fences to reduce collision risk; and • Committed PDF Bio-22: Perch deterrents will be installed on new transmission structures within 4 miles of an active lek.
Washington Sage-Grouse Recovery Plan	Protect sage-grouse habitat on public lands	• Protect habitat from fire. Fire management plans should be developed and implemented on public lands to prevent catastrophic destruction of sage-grouse habitat. • Protect important sage-grouse habitat on public lands from development and agricultural conversion. • Manage riparian habitats by promoting recovery of vegetation in riparian zones and avoiding road development and human disturbance in wet meadows. • Discourage expansion of road system on public lands in management units. New roads, trails or right-of-ways should be avoided; avoid improvements to existing, unused, and unpaved roads; promote closures of	• Committed PDF Gen-6, Committed PDF WF-1-4: Fire prevention training, fire suppression equipment, and developing a Fire Protection and Control Plan. • Project Description, Section 2.4.3.13 Fire Prevention and Suppression. • Committed PDF Bio-14: Close and rehabilitate all new access roads not needed for

REGULATORY POLICY OR GUIDANCE DOCUMENT	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION STRATEGIES OR OBJECTIVES	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION MEASURES	PROPOSED NNR ALTERNATIVE'S CONSISTENCY WITH REGULATORY POLICY OR GUIDANCE
		unnecessary roads or those that are negatively impacting habitat quality.	maintenance; • Committed PDF Bio-12: Minimizing blading of native plant communities during construction. • Committed PDF LU-7: Road access will be controlled in accordance with the management directives of the Agencies and landowners.
Washington Sage-Grouse Recovery Plan	Restore degraded habitat	• Shrub-steppe restoration projects should use native seed sources, suppress cheatgrass and weeds, restore bunchgrass and native forb understory, reestablish sagebrush, and restore degraded wet meadows or vegetation at developed streams.	• Committed PDF Bio-9: Use an Agency approved mixture of native and non-native species or seed for revegetation in areas where non-native species are already well established (i.e., disturbed grassland). Where possible, a mix of native species, especially native bunchgrasses and forbs, will be utilized for revegetation. • Committed PDF Bio-5: Noxious Weed and Invasive Plant Management Plan; • Committed PDF Bio-6: Limiting ground disturbance; • Committed PDF Bio-7: Reclamation, Revegetation and Monitoring Framework Plan. • Committed PDF Bio-9: Revegetating following construction.

REGULATORY POLICY OR GUIDANCE DOCUMENT	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION STRATEGIES OR OBJECTIVES	REGULATORY GUIDANCE DOCUMENT OR POLICY IDENTIFIED CONSERVATION MEASURES	PROPOSED NNR ALTERNATIVE'S CONSISTENCY WITH REGULATORY POLICY OR GUIDANCE
JBLM YTC Sage-Grouse Management Plan	Protect sage-grouse during breeding	• Buffer leks by 0.6 mile. These areas are closed to all training activities and other land use practices between midnight and 9:00 a.m. from February 1-May 15; and • Sage-grouse protection areas are off limits to all military training activities between February 1 and June 15, except for the use of existing ranges.	• Committed PDF Bio-13: Construction and maintenance activities will be avoided within 4 miles of active leks from Feb to June 15 to protect lekking, nesting and early brood-rearing. • The NNR was sited to avoid JBLM YTC identified sage-grouse Primary Protection Areas.

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APPENDIX B-6
DRAFT FRAMEWORK FOR DEVELOPMENT OF A SAGE-GROUSE HABITAT MITIGATION PLAN

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October 15, 2014

BUREAU OF LAND MANAGEMENT

Vantage to Pomona Heights 230 kV Transmission Line Project

Framework for Development of a Sage-Grouse Habitat Mitigation Plan

PROJECT NUMBER: 114809

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APPENDICES:

ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinances
COT	Conservation Objectives Team
DEIS	Draft Environmental Impact Statement
DPS	Distinct Population Segment
ESA	Endangered Species Act
GMA	Growth Management Act
HMP	Habitat Mitigation Plan
I-90	Interstate 90
IM	Instruction Memorandum
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
km	kilometer
kV	kilovolt
NEPA	National Environmental Policy Act
NNR	New Northern Route
PAC	Priority Area for Conservation
PDF	Project Design Feature
PHS	Priority Habitats and Species
Project	Vantage to Pomona Heights 230 kV Transmission Line Project
RMP	Resource Management Plan
ROW	Right-of-way
SDEIS	Supplemental Draft Environmental Impact Statement
SEPA	State Environmental Policy Act
SGMU	Sage-Grouse Management Unit
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAFWA	Western Association of Fish and Wildlife Agencies
WDFW	Washington Department of Fish and Wildlife
WWHCWG	Washington Wildlife Habitat Connectivity Working Group
WO	Washington Office (Bureau of Land Management)
YTC	Yakima Training Center

I. INTRODUCTION

Background

Pacific Power proposes to construct, operate and maintain the Vantage to Pomona Heights Project (Project), a new 230 kilovolt (kV) transmission line from Pacific Power's Pomona Heights Substation located just east of Selah, Washington in Yakima County to the Bonneville Power Administration (BPA) Vantage Substation located just east of the Wanapum Dam in Grant County, Washington. The existing affected environment and impact analysis for sage-grouse has been analyzed in a Draft Environmental Impact Statement (DEIS), a Supplemental DEIS (SDEIS), and a Sage-Grouse Technical Report (SDEIS, Appendix B-5).

Sage-grouse are listed as Threatened by the state of Washington, are a Bureau of Land Management (BLM) Sensitive species (ISSSSP 2012), and are a candidate for listing under the Endangered Species Act (ESA). In 2001, U.S. Fish and Wildlife Service (USFWS) determined that the western subspecies of sage-grouse (*Centrocercus urophasianus phaios*) met the requirements of a Distinct Population Segment (DPS); therefore, the USFWS is reanalyzing this designation since the eastern and western subspecies are no longer considered separate taxa. Petitions for listing sage-grouse range-wide were filed in 2002 and 2003; in 2005, the USFWS concluded that listing sage-grouse was not warranted (USFWS 2005). In 2008, a status review was initiated by the USFWS to address new information that had become available since 2005 (USFWS 2008). Based on new information available, the USFWS determined in March 2010 that the range-wide listing of sage-grouse under the ESA (including the original Columbia Basin DPS) was warranted, but the listing was precluded in order to complete higher priority listing actions. The USFWS is scheduled to make a final DPS analysis determination concurrent with the range-wide listing determination for sage-grouse expected in the fall of 2015.

The historical distribution of sage-grouse in Washington spanned the extent of shrub steppe and meadow steppe habitats of the Columbia Basin of eastern Washington in an area exceeding 22,000 square miles (Schroeder et al. 2004). Sage-grouse populations have declined dramatically due to habitat loss and fragmentation associated with conversion of native sagebrush landscapes for human land uses (principally agriculture) and widespread degradation of remaining habitat through poor land management practices and the invasion of aggressive exotic weeds (Stinson et al. 2004). The population size in Washington declined more than 50 percent between 1970 and 2011. The current range within Washington is now approximately eight percent of the presumed historic range and is limited to two native populations (Moses Coulee and Yakima Training Center [YTC]) and two reintroduced sites (Crab Creek and Yakama Nation) which constitute less than 1,000 sage-grouse (Schroeder et al. 2013). The Moses Coulee population, numbering approximately 700 birds, is found in Douglas and Grant Counties on mostly private land. The YTC population is located in Kittitas and Yakima counties on the Army's Joint Base - Lewis McChord (JBLM) YTC land which is used for combat readiness training. In 2013, the sage-grouse population at JBLM YTC was estimated to be 231 birds. Both populations and reintroduction sites in Washington are considered geographically isolated from each other, as well as the more distant populations in Oregon and Idaho (Stinson et al. 2004).

Federal and state regulatory requirements and guidance applicable to sage-grouse are discussed briefly below and are described in more detail in the Project's SDEIS, Appendix B-5 Sage-Grouse Analysis and Mitigation Report. In 2013, the USFWS Conservation Objectives Team (COT) published the Greater Sage-Grouse Conservation Objectives: Final Report (COT Report). The COT Report is a collaborative approach to develop rangewide conservation objectives for the sage-grouse, both to inform the upcoming 2015 decision under the ESA and to inform the collective conservation efforts of the many partners working to conserve the species. The main objective identified in the COT Report is to minimize habitat threats to the species so as to meet the objective of the 2006 Western Association of Fish and Wildlife Agencies' (WAFWA) Greater Sage-Grouse Comprehensive Conservation Strategy to reverse negative population trends and achieve a neutral or positive population trend. A key component of the COT Report is the identification of Priority Areas of Conservation (PACs), which are considered key habitats essential for sage-grouse conservation. The conservation framework within the COT Report consists of: 1) identifying sage-grouse populations and habitat status and threats; 2) defining a broad conservation goal; 3) identifying PACs; and 4) developing specific conservation objectives and measures. The COT Report identifies four PACs within the state of Washington, two of which have extant populations, the Moses Coulee and JBLM YTC PACs, and two historic populations undergoing reintroduction efforts with translocated birds. In general, the JBLM YTC PAC boundaries extend south of Interstate 90 (I-90), west of the Columbia River, north of State Highway 24, and east of the Yakima River (see Figure 2 in SDEIS Appendix B-5 Sage-Grouse Technical Report).

According to the COT Report, the use of JBLM YTC for military training activities and the risk of fire have reduced the overall suitability of the habitat supporting the JBLM YTC sage-grouse population. A substantial amount of the sage-grouse habitat in the area has been impacted directly and indirectly by military training activities and particularly due to wildfires both on and off of JBLM YTC. Despite efforts to manage wildfire risks, wildfires have continued to reduce the quality and quantity of habitat in the population. Other key factors impacting this population are two interstate highways (I-82 and I-90) which border the population on the north and west sides; power lines which border the population on the north, west, and south sides; the Columbia River Valley which reduces movement on the east side; and wind power development on the north side. The cumulative effect of these factors is that the JBLM YTC population is constricted with little opportunity for expansion (USFWS 2013).

In addition to the COT Report, the Washington Department of Fish and Wildlife (WDFW) published its Greater Sage-Grouse Recovery Plan (Recovery Plan) in 2004 to summarize the current knowledge of sage-grouse in Washington and to outline strategies to increase population size and distribution (Stinson et al. 2004). Currently, BLM is in the process of revising its Resource Management Plan (RMP) for public lands in Washington to incorporate conservation measures provided by the WDFW Recovery Plan. Sage-grouse in Washington are not covered by interim BLM policies and planning efforts that are applicable across the remainder of the species' range (i.e., Washington Office [WO] Instruction Memorandum [IM] 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures and WO IM 2012-044, BLM National Greater Sage-Grouse Land Use Planning Strategy).

The Recovery Plan delineated distinct management units to focus recovery efforts in those areas most likely to contribute to reaching recovery goals and objectives (Stinson et al. 2004). The goal of the WDFW sage-grouse recovery program is to establish a viable population of sage-grouse in a substantial portion of the species' historic range in the state. An objective of the Recovery Plan is to down-list the species from State Threatened status by attaining a state breeding population averaging 3,200 birds in six or more management units. Within Washington, Sage-Grouse Management Units (SGMUs) are classified as:

- *Regularly Occupied Habitat* includes intact sagebrush communities known to be occupied by resident breeding populations of sage-grouse and are considered to be of highest conservation value.

- *Connectivity Habitat* includes areas important for providing habitat connections for movement corridors between breeding areas, between seasonally used areas, and between the northern and southern populations.
- *Occasionally Occupied Habitat* includes habitat that may be occupied on a seasonal or irregular basis.
- *Expansion Habitat* includes areas where expansion could occur through an improvement in habitat quality.

Prior plans, such as the Western Sage-Grouse Management Plan (Livingston 1998) have also described the threats facing sage-grouse on the JBLM YTC and outlined protection measures and procedures to be followed to ensure that the JBLM YTC sage-grouse population persists into the future.

To ensure the Project's conformance with both federal and state regulatory requirements for sage-grouse, the design of the Project and the development of Project Design Features (PDFs) followed standard hierarchy for mitigation (see Section II, C) and included avoidance, minimization and rehabilitation/restoration measures. Project design involved careful routing and siting of the proposed Project to avoid, reduce and minimize impacts to sage-grouse by: avoiding sage-grouse habitat and leks where possible; maximizing the use of existing utility corridors and roads; and closely paralleling existing transmission lines within these corridors. The COT Report guidance and identification of the PACs became available in February 2013, following the publication of the DEIS. The New Northern Route (NNR) Alternative was identified with wildlife agency (USFWS and WDFW) input and was sited to avoid JBLM YTC identified sage-grouse Primary Protection Areas, to utilize areas with existing roads and disturbance, and was located adjacent (generally within 200 feet) to the existing Pacific Power 230 kV transmission line. PDFs have been incorporated into the Project design and would be implemented by Pacific Power during construction, operation and maintenance of the proposed Project. PDFs applicable to sage-grouse include: minimizing disturbance in native plant communities; reseeding disturbed areas with native or other acceptable plant materials; reducing the introduction and spread of noxious weeds and invasive species; minimizing the potential for wildland fire; installing perch deterrents; and seasonal timing restrictions for construction and/or maintenance activities within four miles of active leks to minimize impacts to breeding and nesting sage-grouse. PDFs are presented in their entirety in Chapter 2 and Appendix B-5 of the SDEIS. The Project's conformance with regulatory requirements is discussed in more detail in Appendix B-5, Section 9.0.

A sage-grouse analysis area was defined in the DEIS and SDEIS to provide information on the existing conditions (e.g., current habitat, existing infrastructure and disturbance, sage-grouse leks, sage-grouse population range) and to provide context for the impact analysis. The analysis area was expanded from the two-mile-wide corridor used in the DEIS to an eight-mile-wide corridor in the SDEIS. The impact analysis for sage-grouse focused on impacts that could occur as a result of the construction, operation and maintenance of the proposed Project. These impacts included: habitat loss, degradation, and fragmentation; increased predation; behavioral avoidance; disturbance and displacement; impairment of habitat connectivity; and collision. The results of the impact analysis are presented in the DEIS, SDEIS and the Sage-Grouse Technical Report (SDEIS, Appendix B-5).

Purpose and Objectives

This Framework for Development of a Greater Sage-Grouse Habitat Mitigation Plan (Framework) was developed to minimize the amount and significance of impacts from the Project to sage-grouse. The Framework is intended to guide the proponent's (Pacific Power) development of a Sage-Grouse Habitat Mitigation Plan (HMP). With the development and implementation of the HMP, Pacific

Power would be taking voluntary, proactive steps to mitigate Project impacts, reduce threats and minimize or avoid contributing to the need to list sage-grouse under the ESA. If sage-grouse are listed, it is anticipated that the application of the mitigation measures in the HMP will be incorporated as part of the proposed action for any future Section 7 conference or consultation.

The overall objectives of this Framework are to:

1. Create a common understanding regarding HMP expectations between Pacific Power and the authorizing agencies on the principles, standards, methods, time frames and other considerations that will guide the development of the HMP; and
2. Provide clear expectations and methodology for assessing the adequacy of Pacific Power's HMP.

This Framework is an iterative document. It will assist Pacific Power in generating increasingly more specific versions of the HMP, which can be incorporated into subsequent National Environmental Policy Act (NEPA) documents. It is also anticipated that the final HMP may be utilized by federal and state agencies in their respective regulatory compliance processes and products, e.g., by making implementation of mitigation identified in the final HMP a condition of their respective rights-of-way (ROWs), permits, or other authorizations.

Pacific Power may include mitigation approaches in the HMP that are different than those described in this Framework; however, such approaches must be consistent with the law, and should be substantially consistent with agency policies and other relevant documents including, without limitation, the following: Washington's Sage-Grouse Recovery Plan (Stinson et al. 2004); Washington State's Growth Management Act (GMA; WAC 365-190-130); Washington's Priority Habitats and Species Program (PHS); Yakima, Kittitas, Benton and Grant Counties' Critical Areas Ordinances (CAO; Kittitas County 2013; Grant County 2006; Yakima County 2007; and Benton County 2006) ; JBLM YTC Sage-Grouse Management Plan (Livingston 1998) and annual memoranda (Memorandum IMLM-YTC-PWE 2013); USFWS COT Report (USFWS 2013); BLM resource management plans (BLM 1985; BLM 1992), BLM IMs (BLM 2013, 2011a, 2010, 2009, 2008); and applicable USFWS and U.S. Department of the Interior sage-grouse and mitigation-related guidance (USFWS 2014).

This Framework has been cooperatively developed by the Project's Sage-Grouse Subgroup (see Appendix A). It is intended to be a living document and may be updated periodically. The Framework and Pacific Power's HMP apply only to the Vantage to Pomona Heights Project.

This Framework is intended to be consistent with and build upon the impact analysis from the DEIS and SDEIS; provides guidance for Pacific Power on the selection of mitigation actions and service areas; and provides direction on how the HMP will be assessed for mitigation adequacy. Mitigation measures identified in the HMP will require an assessment of potential impacts to other resources (e.g., visual resources, existing and future land-uses such as military mission, proposed range projects, and private land) and may require NEPA/Washington State Environmental Policy Act (SEPA) analysis.

The HMP should include the following information, consistent with this Framework's guidance: an overview of Project impacts (as identified in the FEIS); proposed mitigation actions and service areas; calculation of the amount of mitigation for direct and indirect impacts; and the proposed methodology for the implementation, management and monitoring of the mitigation. The final HMP should address Project impacts and offsetting mitigation across all land ownerships. More information on each of these components is described in detail throughout the remainder of this Framework. However, additional guidance may be provided in future iterations of this Framework for use in drafting the HMP.

II. COMPENSATORY MITIGATION PRINCIPLES AND TECHNICAL ELEMENTS

The following general compensatory mitigation principles and technical elements provide an introduction to components that should be included in the HMP. More detailed, Project specific information is provided in the remainder of this Framework (Sections III, IV, V, and VI) and will assist in Pacific Power's development of the HMP. The following discussion provides technical elements Pacific Power should consider when developing an HMP: landscape planning; species benefit; mitigation hierarchy; governance; service areas; conservation actions and outcomes; baseline and additionality; timeliness, durability, ratios, and reversals; land ownership/management; metrics and accounting; and types of compensatory mitigation approaches.

A. Landscape Planning

Compensatory mitigation principles and technical elements in the HMP should be guided by landscape-level conservation plan(s) (e.g., Washington Sage-Grouse Recovery Plan, USFWS COT Report, BLM Resource Management Plans) to help protect sage-grouse and the habitat upon which it depends.

B. Species Benefit

Overall HMP mitigation should strive to achieve *no net loss* and a *net benefit* in habitat quantity and quality and/or impacts to the species at the population or landscape scale.

C. Mitigation Hierarchy

Project mitigation will be developed in accordance with the following general mitigation hierarchy:

1. *Avoidance*: Measures taken to avoid impacts to sage-grouse or its habitat, including preventing impacts from the Project's outset. Such measures include careful spatial or temporal placement of infrastructure outside of high quality sage-grouse habitat.
2. *Minimization*: Measures taken to reduce the duration, timing, intensity and/or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) which cannot be completely avoided, to the greatest extent feasible. Such measures include co-locating lines with existing infrastructure.
3. *Rehabilitation/Restoration/Rectification*: Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimized.
4. *Compensatory Mitigation (also referred to as "offset")*: Measures taken to compensate for any residual impacts that cannot be avoided, minimized and/or rehabilitated or restored, in order to achieve no net loss and a net gain of biodiversity and ecosystem services. Compensatory mitigation can include the restoration of degraded habitats, improvement of marginal habitats, creation of new habitats, acquisition and protection of threatened habitats, or a combination thereof. Offsets may include the following:
    a. "in-kind" involving replacement or substitution of resources that result in similar habitat structure and function that benefit the same species as those being impacted;

b. "out-of-kind" involving replacement or substitution of resources that result in different habitat structure and function that may benefit the species other than those existing at the site prior to disturbance;

c. "in proximity" means habitat mitigation measures undertaken within the home range or PAC of populations or areas affected by a development action that is most likely to provide the greatest benefit; and

d. "off-site" involving mitigation actions outside the boundary of or area impacted by the Project.

D. Governance

The HMP should clearly describe how the mitigation will be governed including: what mitigation will be implemented; by whom the mitigation will be accomplished; when the mitigation will be implemented; who and how it will be administered, financed, and enforced; and how compliance will be measured across multiple ownerships (private, state, federal, etc.).

How mitigation actions will be funded and how funds will be managed need to be clearly articulated in the HMP. The source(s) of adequate financing[1] for the interim and perpetual/long-term operation, management, monitoring and documentation associated with the HMP must be identified and secured. Plan(s) should be developed that explain how the funds will be spent, tracked and accounted for and include guidelines and responsibilities for those administering the funds.

The HMP should identify how mitigation compliance will be measured across all land ownerships and jurisdictions, and should propose enforcement provisions that dictate consequences if the mitigation fails to meet performance standards. There are several options for monitoring and measuring mitigation compliance. More information on HMP implementation, management and monitoring is described in Section VI.

E. Service Areas (Location)

The HMP should identify service areas within which the mitigation actions (credits) would be applied to offset Project impacts (debits). Mitigation actions are more likely to sufficiently compensate for sage-grouse-related Project impacts if they are aggregated. Service areas must be large enough so that they will, either in themselves or in conjunction with adjacent landscape conditions, provide the targeted biological benefits. Service areas should be of equal or greater ecological value than the Project impact site(s), otherwise the service area and its mitigation actions will receive reduced mitigation crediting.

Mitigation actions should not be located in areas directly impacted by the Project or areas already realizing management benefits for sage-grouse (e.g., land parcel under sage-steppe conservation easement) unless a mitigation action or strategy could provide a benefit to sage-grouse. Additionally, mitigation should not be located in areas where the success of the actions or maintenance of the required benefits are likely to be hindered over time by incompatible land-uses. For more information see Subsection I Land Ownership/Management below.

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[1] Adequacy is defined as funding necessary to carryout agreed to offset actions and perpetual/long-term operation, management, monitoring, remedial actions, permitting, planning and reporting, to ensure the mitigation uplift remains intact over the life of Project impacts.

The HMP must identify service areas where the mitigation will occur. It is recommended that service areas identified in the HMP include the four USFWS-identified PACs and SGMUs identified in the WDFW Recovery Plan (described in detail in Section I Introduction, Background), but that service areas be prioritized within the JBLM YTC PAC first and then the adjacent SGMUs, since these areas are closest to where the impacts are occurring. It is recommended that the majority of the mitigation actions are implemented within the JBLM YTC PAC, or in adjacent SGMUs, Arid Lands Initiative-identified areas, or connectivity/expansion habitat that supports the JBLM YTC PAC sage-grouse population. Mitigation actions in different PACs should comprise a smaller subset of the proposed mitigation and will likely receive a lower mitigation credit. More information on these service areas is presented in Sections I Background and IV Identification and Description of Mitigation Actions and Service Areas.

F. Mitigation Actions and Outcomes (Effectiveness)

The intent of the HMP is to develop and implement mitigation actions, within identified service areas, that redress threats to sage-grouse that were identified in the EIS, SDEIS, the USFWS, FEIS, COT Report, WA Recovery Plan and via additional analytical guidance contained in Sections III (Impact Assessment) and V (Calculation of the Amount of Required Mitigation). Proposed HMP mitigation actions must be measurable and proven to be reasonably likely (both ecologically and economically) to deliver expected conservation benefits (outcomes). In general, mitigation actions that are unproven, have extensive time-lags before providing conservation benefits, or are unachievable, should not be proposed as mitigation actions in the HMP by Pacific Power. To ensure mitigation actions are effective, monitoring and adaptive management are important components to include in the HMP. More information on mitigation actions is presented in Section IV Identification and Description of Mitigation Actions and Service Areas.

G. Baseline and Additionality

Mitigation actions proposed in the HMP should provide benefits in addition to those that would have been achieved if the mitigation action had not taken place. The additional benefits (additionality) must be measured against baseline conditions. Baseline conditions include conditions created by past and ongoing land management actions. Additionality would also include actions that are planned or required but not yet implemented. To ensure consistency, it is recommended that baseline conditions proposed in the HMP be assessed and measured using the same methodology employed in the EIS to predict future conditions following compensatory mitigation actions. Following the implementation of compensatory mitigation, the baseline conditions will be used to verify mitigation success and associated credits.

Corrective actions applied to lands with existing sage-grouse management requirements that are not being met, would not be considered additional to normal requirements or management. Merely maintaining existing conditions on proposed mitigation sites, even if such conditions support species needs, may not result in true offsets to Project impacts, as an overall net loss to the species might remain. For these reasons, acquisition and protection of a site as the sole conservation action will typically not result in adequate mitigation; additional restoration and enhancement actions on these acquired lands, over the life of Project impacts, will most often be necessary. Some temporal credit consideration may be appropriate for contributions to substantively accelerated management actions on a case-by-case basis where benefits can be quantified.

H. Timeliness, Durability, Ratios, and Reversals

Mitigation actions proposed in the HMP must: demonstrate timeliness (i.e., achieve targeted biological conditions in a timeframe that benefits sage-grouse); and durability (i.e., the length of time that the mitigation actions persist and influence the landscape should meet or exceed the length of time of projected impacts). In order to ensure that mitigation is durable, the HMP should include legal and financial assurances that secure and protect the conservation status of the mitigation site and mitigation actions for at least as long as Project impacts persist.

Mitigation actions proposed in the HMP must achieve targeted biological conditions in a timeframe commensurate with both the life of the Project and the life of the associated biological impacts. With respect to sage-grouse and their habitat, some impacts may persist beyond the operational life of the Project or there may be uncertainty as to the persistence of the impacts. Sagebrush-steppe habitat is considered a slow recovery ecological environment due to slow-growth lifecycles of the dominant flora and low precipitation regimes. Therefore, the HMP should consider that:

1. Most Project impacts to sagebrush habitat are long-term (see the impact assessment in the EIS).
2. The benefits derived from mitigation actions in sagebrush habitat must be long-term.

Because most impacts typically begin to occur in the very early stages of a project (i.e., during construction and initial operations), the benefits of the mitigation actions must also begin to accrue as early in the life of the Project as possible; implementation of mitigation actions proposed in the HMP should be heavily “front-loaded” to facilitate this. Any time-lags that exist between the occurrence of Project impacts and attainment of mitigation benefits, either due to the nature or schedule of the mitigation actions, must be accounted for via reduction in mitigation credits available from that action.

The HMP must include financial assurances to provide for mitigation implementation, operation, management, and monitoring (as well as provide for contingencies) to ensure that the target outcomes for each mitigation action will be achieved and maintained as necessary for a time period commensurate with Project impacts. The most critical issues regarding assurances of implementation are related to: retention of habitat conditions achieved through mitigation for a time period commensurate with Project impacts; and securing funding in amounts sufficient for establishment (including any necessary retreatments), long-term management and monitoring of the mitigation actions. On federal lands, mitigation actions should be proposed within land use designations or classifications that will provide the greatest ecological benefit for and reduce the greatest threats to sage-grouse. Mitigation actions proposed within federal land use areas that have management or uses that would degrade, delay, or otherwise undermine establishment and long-term maintenance of desired sage-grouse conservation may be considered in the HMP; however, mitigation actions in these areas may receive less credit for Project impact debits and will be handled on a case-by-case basis.

An otherwise-ecologically sound HMP offers limited value if the mitigation area may be affected by future disturbance or if mitigation success is uncertain. Lower mitigation credits may be used to address this risk and uncertainty as long as that risk and uncertainty of the mitigation action has not rendered it unsuitable for inclusion in the HMP. Strong projected ecological durability should therefore favorably influence mitigation credits available from a mitigation action. Lower levels of protective durability would result in less mitigation credits generated. Section V Calculation of the Amount of Required Mitigation discusses proposed Project mitigation crediting in more detail.

Unexpected loss of mitigation actions should be addressed in the HMP. Reversals of mitigation actions may be caused by natural disturbances (unintentional reversal; e.g., wildfire) or anthropogenic disturbances (intentional reversal; e.g., development), which shorten the intended duration of compensatory mitigation actions. Unintentional reversals could be addressed in the HMP by establishing an insurance or reserve pool (for funding, land, etc.) and intentional reversals could be addressed by requiring compensation for the reversal. The HMP must include policies and procedures that will prohibit intentional reversals to the extent possible, and, if unforeseen intentional reversals occur, ensure that any mitigation action replacements are timely and do not diminish the intended conservation benefits of the original mitigation action.

I. Land Ownership/Management

Compensatory mitigation for sage-grouse can occur on private, state or federally managed land. Generally, conservation actions used as compensatory mitigation should be limited to those identified as the most critical for sage-grouse conservation in the applicable geographic setting and that will yield the most substantial benefit, regardless of ownership.[2]

Actions proposed in the HMP as mitigation on state or federally managed land should not serve as the primary/dominant means of compensating for the Project's impacts on private lands. To the extent actions on state or federally managed land are proposed to mitigate for Project impacts on public or private lands, the actions should enhance the biological values of the state or federally managed land beyond those already provided by the existing state or federal land management programs (i.e., additionality) and that are expected to be implemented within a reasonable time frame (i.e., timeliness). In other words, the mitigation value assigned to the proposed mitigation actions should be based only on those biological conditions that are supplemental or additive to conditions that would be derived from existing, planned, or anticipated public programs if they are funded.

However, universal adherence to the above principles may not be practicable or advisable when: 1) appropriate mitigation opportunities on private lands are not available; 2) land management policies require that impacts incurred on state or federal lands are also mitigated on state or federally managed lands; and 3) some biological conditions associated with proposed mitigation actions on state or federally managed lands would otherwise be provided through planned or required public programs but actual attainment of the desired conditions is unlikely because of funding constraints or other obstacles[3].

Criteria related to additionality and durability present challenges with use of state or federally managed lands. Land exchanges and consolidation of ownership or management of land may overcome some of these challenges in the future; however, these programs are difficult to accomplish. For state or federally managed lands, if the biological values expected to result from state or federal land management programs are the same as those required for compensatory mitigation, those lands may not meet the additionality test. In addition, durability on state or federally managed lands may be difficult to guarantee because of agency multiple use requirements for those lands as well as rules and

[2] BLM's 2013 draft MS-1794 policy echoes this consideration: "Mitigation site, projects, and measures should be focused where the impacts of the use authorization can be best mitigated and BLM can achieve the most benefit to its resource and value objectives, regardless of land ownership. The most appropriate area for mitigation projects may be on Federal lands (the BLM or another agency) or on non-Federal lands."

[3] For example, in draft and final versions of the HMP, Pacific Power may propose funding mitigation actions that have been identified in state and or federal land management plans, but that do not have and are not expected to have, funding within a reasonable time frame.

policies (e.g., Federal Land Policy and Management Act) that preclude many legal land protection mechanisms that can assure protection and management commensurate with the life of Project impacts.

The HMP should clearly define how additionality and durability will be addressed on various land ownership types (private, county, state and federal). Close coordination with county, state, and federal agencies during the development of the HMP will be necessary so that federal, state, and local regional mitigation strategies and mitigation proposed in the HMP align.

J. Metrics and Accounting

The methodologies, or metrics, used to calculate Project impacts (debits) and the measures necessary to avoid, minimize, restore and/or offset those impacts (credits) must be based solely on biological conditions and upon reliable and repeatable methods, result in a common "currency" between credits and debits, and apply equally across all land ownerships. The methodology for determining these metrics must follow the DEIS and SDEIS analysis where applicable and new guidance provided herein (see Sections III Impact Assessment and V Calculation of the Amount of Required Mitigation for more information).

Metrics that are comparable (e.g., impact calculations [debits] and mitigation offset [credits]) or the same across jurisdictional boundaries will allow for more biologically meaningful exchanges in a landscape context. Section V Calculation of the Amount of Required Mitigation presents guidance on habitat classes, direct and indirect impacts, adjustments applied to indirect impacts to account for differing severity of these impacts (e.g., distance from disturbance [disturbance bands]), and metrics and accounting approaches such as habitat weighting and ratios.

Mitigation ratios should be identified to ensure that mitigation actions proposed in the HMP actually offset the impacts of the Project. Mitigation ratios also should provide an incentive to avoid impacts in high priority habitats. Mitigation ratios should be defined using habitat-based criteria, such as value and quality of habitat and associated ecological function. For example, habitats that have higher value to sage-grouse conservation and important habitats for sage-grouse dispersal would be assigned higher mitigation ratios. Section V Calculation of the Amount of Required Mitigation discusses mitigation ratios in more detail.

Mitigation credits must be reasonably likely to deliver expected conservation benefits (see Principles and Technical Elements, above). Mitigation credits may be adjusted based on each mitigation action's consistency with this Framework's mitigation principles and technical elements. Mitigation actions requiring large funding and risk commitments (such as undergrounding the proposed Project as well as adjacent transmission line[s]) may also be considered for greater Project credit values, as well as providing potential future credits related to similar impacts (e.g., on other projects impacting sage-grouse habitat that Pacific Power may undertake). Monitoring and adaptive management are also important components to include in the HMP to ensure mitigation success. Ultimately, the metrics included in the HMP must be tied back to the populations and clearly show the conservation benefit to the species.

The HMP should include an accounting system whereby mitigation effectiveness and compliance can be monitored, unexpected results can be addressed, mitigation reporting is accomplished, and debits and credits can be tracked. The accounting system should foster transparency, accountability, and credibility.

K. Types of Compensatory Mitigation Approaches

Compensatory mitigation may consist of one or a combination of the following four approaches:

1. *Permittee-Responsible Mitigation*
   In this approach, Pacific Power retains full responsibility for meeting all of the mitigation-related terms of the authorizations it receives. The HMP therefore includes all of the actions required for Pacific Power to meet the compensatory mitigation obligations specified by the authorizing agencies for grant of ROWs, permits and other authorizations.

2. *In-Lieu Fee*
   Pacific Power pays an in-lieu fee mitigation program administrator or sponsor to fulfill its obligation to provide compensatory mitigation (sometimes referred to as "debits") associated with Project. The operation and use of an in-lieu fee program is governed by an in-lieu fee program instrument (agreement). Once Pacific Power has paid the required fees, the administrator has the obligation to invest the funds in actions (i.e., restoration, establishment, enhancement, and/or preservation) under the terms of the program instrument.
3. *Habitat Credit Trading*
   Habitat credit trading mitigation programs or "marketplace programs" connect entities seeking an authorization to impact a regulated natural resource with those interested in committing to fulfill some or all of the permittee's compensatory mitigation obligations. As in an in-lieu fee program, a permittee makes a payment(s) or purchases "credits" to meet their compensatory mitigation requirements.
4. *Mitigation Banking*
   Under approaches 1 through 3 above, compensatory mitigation can be bundled into larger offset projects or "banks." Mitigation or conservation "banks" are sites, or suite of sites, where natural resources are restored, established, enhanced, and/or preserved for the purpose of providing compensatory mitigation for impacts to similar resources authorized by federal or state permits. Mitigation "bankers" are required to enter into a legal agreement with the regulatory agency based on a set of actions they will take on a given tract of land. The regulatory agency determines how many "credits" the activities will generate and sets conditions the banker must meet in order to sell the credits to offset adverse but authorized impacts (debits). The obligation to fulfill the compensatory offset obligations then transfers to the mitigation banker.

III. IMPACT ASSESSMENT

The Project-specific impact analysis and associated Pacific Power mitigation HMP (Section V Calculation of the Amount of Required Mitigation below) should focus on the direct and indirect impacts that could occur as a result of the construction, operation and maintenance of the Project. Impacts may occur directly via habitat loss through surface disturbance and mortality from construction activities or collision, or indirectly through the reduction in habitat quality or, sage-grouse survival and reproduction, or increased predation due to the addition of perching and nesting opportunities associated with new transmission structures. The assessment of impacts and mitigation development in the HMP should be based on the analysis completed in the DEIS and SDEIS as well as additional guidance provided herein. Cumulative and Project-level impacts used to analyze and define unavoidable Project-related impacts should include: habitat loss due to habitat degradation and fragmentation; direct mortality; increased predation; behavioral avoidance of infrastructure;

disturbance and displacement; reduced productivity, decreased survival, impairment of habitat connectivity and linkage; and loss due to cumulative effects. These impact types are discussed in more detail in the SDEIS, Appendix B-5 Sage-Grouse Technical Report, and herein.

The impact assessment for sage-grouse pertinent to the Project includes:

1. An analysis of existing habitat based on aerial photos, JBLM YTC vegetation data, U.S. Geological Survey (USGS) Gap Analysis Program data, fire history data, plant surveys, and a sage-grouse habitat assessment conducted for the proposed Project (see SDEIS Appendices B-2, B-3 and B-4).
2. Determining Project-related direct habitat loss using a disturbance model of typical disturbance types associated with construction, operation and maintenance (e.g., new access road construction, work areas for EIS action alternatives, subroutes, and design options).
3. Determining Project-related indirect impacts to sage-grouse from increased perching opportunities and potential habitat loss through behavioral avoidance of tall structures using the total number of structures per route segment, the anticipated number of new structures located greater than 0.25 mile from an existing line, through an analysis of JBLM YTC corvid (raven) data, and through other sage-grouse – avian predation literature.
4. Project-related indirect impacts to sage-grouse habitat connectivity determined through an analysis of the Washington Wildlife Habitat Connectivity Working Group (WWHCWG) habitat connectivity and linkage reports.
5. Determining Project-related direct and indirect impacts to sage-grouse active, inactive and historical lek locations using JBLM YTC and Washington PHS lek data and a lek survey conducted for the Project (see SDEIS Appendix B-1).
6. Determining Project-related indirect impacts due to sage-grouse avoidance of transmission lines.
7. Project-related indirect impacts to nesting and brood-rearing habitat, as measured by reductions in female survival and nest success within a four mile buffer around active sage-grouse leks.
8. Determining Project-related direct and indirect impacts to high-probability use areas of the JBLM YTC sage-grouse population through a fixed kernel density analysis using telemetry data.
9. Determining the amount of direct and indirect disturbance that would occur within WDFW SGMUs, USFWS Sage-Grouse PAC, and JBLM YTC Sage-Grouse Protection Zones.

It is expected that most direct habitat impacts will remove all functions from the affected habitats for a period of time (defined as short or long-term). Depending upon the type of indirect impact, not all functions would be removed from the impacted habitat. Therefore, for each kind of indirect impact, an adjustment (reduction) should be applied to the acres of indirectly affected habitats. Additional adjustments (reductions) to direct and indirect impacts may be credited for collocation of Project features and for undergrounding the Project in discrete, limited areas.

IV. IDENTIFICATION AND DESCRIPTION OF MITIGATION ACTIONS AND SERVICE AREAS

A. Mitigation Actions

The Final HMP must identify specific mitigation service areas and mitigation actions. The Final HMP will demonstrate that mitigation actions are:

1. Available and on a scale that is ecologically and economically meaningful to conservation.
2. An equitable offset (credits) for the identified impacts (debits).
3. Reasonably certain to be initiated within the time frames established through the federal and state permitting, ROWs, and other authorization processes.
4. Measurable and enforceable by the authorized agencies.
5. Mutually agreed upon between Pacific Power and the authorizing agencies with permitting, ROWs or other authorization authority.
6. Consistent with the Compensatory Mitigation Principles and Technical Elements, per Section II.

While Pacific Power's Final HMP's suite of sage-grouse mitigation is expected to clearly identify sage-grouse service areas and mitigation actions, it may not necessarily include them in their entirety (e.g., certain mitigation may occur outside the identified service areas if mutually agreed upon between Pacific Power and the agencies with permitting, ROWs, or other authorization authority). Pacific Power should consider establishment of a Technical Advisory Committee, which includes representatives of the authorizing agencies and wildlife regulatory agencies (USFWS and WDFW), to review and approve the HMP's final habitat mitigation actions.

Approved or credited mitigation actions that will be undertaken in the service area(s) (Section IV B Service Areas, below) will be designed to: a) enhance the baseline condition of the habitat within the service area commensurate with the types and amounts of residual impacts identified in the Project-specific impact assessment, and to attain no net loss or a net benefit to sage-grouse and sage-grouse habitat; b) protect and maintain the habitat and other ecological attributes required for mitigation within the service area for the life of the Project or the Project's impacts, whichever is greater; and c) enhance broader areas for sage-grouse (e.g., connectivity zones or expansion areas).

The following are examples of the types of mitigation actions or projects that can be considered. These mitigation action examples follow agency specific (Department of the Interior, JBLM YTC, USFWS and BLM) mitigation guidance, are consistent with current state and federal sage-grouse conservation policies and guidelines (e.g., USFWS COT Report, Washington Sage-Grouse Recovery Plan, and JBLM YTC Western Sage-Grouse Management Plan) and are not listed in order of preference:

1. Actions to avoid any new indirect impacts to sage-grouse, such as undergrounding new transmission lines or reducing existing threats by undergrounding existing transmission lines within the PAC.
2. Preserving habitat (nesting, brood-rearing, summer, winter and connectivity) through acquisition of habitat and/or conservation easements to protect habitat.

3. Actions that address habitat-related factors that may be limiting population growth and sustainability of sage-grouse in the service area(s) (e.g., fire management and/or habitat restoration).
4. Actions to improve habitat quality (not listed in order of preference), such as:
    a. General improvement of sage-grouse habitat condition through revegetation, particularly in habitats that appear to be limiting for sage-grouse populations; and
    b. Management agreements with private landowners to implement grazing management techniques that would improve sage-grouse habitat conditions on private lands or grazing operations managed on public lands.

B. Service Areas

The sage-grouse PACs and Washington SGMUs are considered key habitats essential for sage-grouse conservation and recovery. The proposed Project is within the JBLM YTC PAC and within or adjacent to the following SGMUs: JBLM YTC Regularly Occupied Habitat, Rattlesnake Hills Regularly Occupied and Occasionally Occupied Habitat, Umtanum Ridge Regularly Occupied and Occasionally Occupied Habitat, Saddle Mountains Occasionally Occupied Habitat, Colockum Connectivity Habitat, Hanford Expansion Habitat, Potholes Expansion Habitat, and Ahtanum Ridge Expansion Habitat.

Based on key sage-grouse management areas that are essential for sage-grouse conservation and recovery, mitigation sites within service areas (geographic area within which impacts to a species' habitat can be offset) should be selected that will contribute positively to the population and habitats that are being impacted (JBLM YTC PAC and SGMUs). The following service areas have been identified by the Project's Sage-Grouse Subgroup and are presented below in order of preference. Mitigation credits will be adjusted based on this prioritization (e.g., 100 percent credit for the highest priority service area [JBLM YTC PAC], with less credit assigned to mitigation actions proposed in lower priority service areas):

1. Within the JBLM YTC PAC;
2. Arid Lands Initiative Core Areas and Landscape Integrity Core Areas;
3. Connectivity Corridors; and
4. SGMUs, especially those containing non-public lands that may increase sage-grouse recovery and conservation efforts.

The guidance provided in Section II (Compensatory Mitigation Principles and Technical Elements) describes what criteria Pacific Power should use in its HMP to identify potential mitigation actions and site(s) within the sage-grouse service areas. The following are some examples of principles and technical elements that should be considered when identifying service areas and individual mitigation actions:

- Mitigation actions will result in improved sage-grouse habitat conditions for the life of the Project impacts (i.e., for the life of the transmission line and access roads, and any additional time to recover the impacted habitat to pre-disturbance habitat quality conditions, including use of restored habitats by sage-grouse).
- Preferred mitigation sites are sites within service areas that 1) can be geographically consolidated into a contiguous parcel at a landscape level are preferred to isolated parcels, 2)

can be managed for sage-grouse over the long-term, and 3) have a reasonable probability of attaining and maintaining the HMP requirements.

- Mitigation actions that are proposed on private lands within the service areas will only be pursued if the landowner is willing to sell or enter into a conservation easement/agreement. Pacific Power will not be expected to use eminent domain to acquire property.
- Mitigation actions should focus on sites outside of the JBLM YTC installation boundary but within the JBLM YTC PAC where no sage-grouse habitat protection and or management currently exist. It should be noted that while service areas within and adjacent to the JBLM YTC PAC are preferable, there are limited opportunities for mitigation to occur in these locations. This is due to the fact that sage-grouse management is already underway on much of the JBLM YTC PAC (and therefore makes it difficult to identify mitigation actions that are additional to these ongoing management activities), and there are limited areas available in the JBLM YTC PAC with sufficient ecological durability due to current land use practices.
- Mitigation actions should address habitat factors that may be limiting sage-grouse use and population growth within the service areas.
- Mitigation actions will provide new contributions to conservation and/or habitat quality and/or quantity relative to the existing conservation and/or habitat values, and consider the time lag to the conservation maturity of selected actions (i.e., a shorter time to provide habitat is preferred over a longer-time frame). This is evaluated as the length of time for a mitigation action to deliver conservation at a maturity level (or ecological state) similar to what was lost at the Project impact site.
- Mitigation actions should not occur in any location/site directly impacted (within the ground disturbance footprint) by the Project, except for undergrounding the existing line as a mitigation action. If mitigation is proposed within the zone of the Project's indirect impacts, the mitigation credits should be adjusted (reduced) to account for the reduced services that the already impacted habitat is providing.

Depending upon the consistency of each of the HMP's proposed mitigation actions with the Framework's Principles and Technical Elements, the mitigation credits may require adjustment. Multiplying the available credits from each HMP mitigation action with its adjusted credits will provide the final credits available to offset the Project's impacts.

C. Service Area and Mitigation Action Selection

The mitigation actions taken for the proposed Project should measurably offset the specific impacts, direct or indirect, for which they originate from. For example, marking fence lines will not adequately offset permanent, habitat-limiting impacts; however, acquisition and protection of suitable sage-grouse habitats or habitats with site potential that are currently insufficiently protected and could be used by sage-grouse in the reasonably foreseeable future would adequately offset those impacts. Only when similarly paired mitigation actions and impact type have been exhausted, should other mitigation types be considered. Similarly paired mitigation actions and impact types are included below as examples of potentially acceptable mitigation actions that may be appropriate for inclusion in the final HMP.

<u>Examples of Potential Mitigation Actions for Direct Impacts</u>

- Land acquisition or establishment of conservation easements in JBLM YTC PAC but outside of current federal or state management.

- Land acquisition or establishment of conservation easements outside of the JBLM YTC PAC or in adjacent SGMUs.

<u>Examples of Potential Mitigation Actions for Indirect Impacts</u>

1. Decreased Population Connectivity and Behavioral Avoidance
    - Actions that include repairing impaired connectivity by undergrounding portions of existing transmission lines.
    - Land acquisition or establishment of conservation easements inside JBLM YTC PAC or connectivity habitats.
    - Land acquisition or establishment of conservation easements outside of the JBLM YTC PAC or in adjacent SGMUs.
    - Funding and assurances for translocation efforts for the Washington population of sage-grouse.
    - Funding landscape restoration actions commensurate with the Project's impacts (e.g., fire suppression and restoration; control of invasive species).

2. Increased Predation
    - Actions that include reducing avian predation, which may include undergrounding portions of existing transmission lines.
    - Land acquisition or establishment of conservation easements with known nesting locations within the JBLM YTC PAC but outside of current federal or state management.
    - Actions that decrease avian predator impacts to sage-grouse populations.
    - Nesting habitat restoration/improvements.

3. Decreased Nest Success and Hen Survival
    - Actions that include reducing avian predation, which may include undergrounding portions of existing transmission lines.
    - Land acquisition or establishment of conservation easements with known nesting sites within the JBLM YTC PAC but outside of current federal or state management.
    - Funding and assurances for translocation efforts for the Washington population of sage-grouse.
    - Land acquisition or establishment of conservation easements with known nesting sites outside of the JBLM YTC PAC but outside of current federal or state management.
    - Funding landscape restoration actions commensurate with the Project's impacts (e.g., fire suppression and habitat restoration; control of invasive species).

V. CALCULATION OF THE AMOUNT OF REQUIRED MITIGATION

Mitigation debits will be calculated in a sequential fashion, based on the following steps:

- Calculate acres of direct impacts.
- Calculate acres of each type of indirect impact:
    - Apply percentage adjustments for habitat services lost to total indirect impact acres, based on type of indirect impact.
- Multiply direct and (adjusted) indirect acres by habitat-based mitigation ratio.
    - Apply increased ratio adjustments for important sage-grouse habitat attributes.

A. Mitigation Ratios based on Habitat Values and Ecological Functions

The Project's Sage-Grouse Subgroup identified the following habitat classes to identify areas where Project impacts would occur, to delineate and value various sage-grouse habitat attributes in those impact areas, and (for mitigation ratio calculations) to provide a relative scaling of the habitat area/attribute importance to sage-grouse conservation. The identified habitat classes were developed for and agreed upon by the Sage-Grouse Subgroup for the proposed Project only and are not intended to be used for any other projects. Mitigation ratios should be assigned to each impacted habitat area and should be scaled from a base ratio for habitat area/attribute of lowest importance (e.g., WDFW SGMUs). The base ratio assignment for lowest importance habitat should reflect the following considerations: net conservation offset; extremely limited habitat availability; high degree of current and projected disturbance to baseline conditions; importance of habitat to connectivity/dispersal; and high percentage of JBLM YTC PAC impacted by Project impacts. Additional ratios should be assigned to reflect the relatively greater importance of each of the higher quality habitat area/attributes.

1. Within the JBLM YTC PAC (including lands within the JBLM YTC boundary)
    a. Habitats in JBLM YTC PAC within four miles of an active lek.
    b. Habitats within JBLM YTC designated Sage-grouse Protection Areas
    c. Habitats in JBLM YTC PAC within four miles of inactive and historic leks.
2. Outside the JBLM YTC PAC
    a. Arid Lands Initiative Priority Core Areas and Landscape Integrity Core Areas.
    b. Connectivity Corridors.
    c. WDFW SGMUs.

B. Direct Impacts

Direct disturbance to sage-grouse habitat was determined through the DEIS and SDEIS impact analysis conducted for the proposed Project. Direct habitat loss would occur though the destructive trampling and removal of vegetation during construction of the transmission line, access roads and work areas. Vegetation removal would have a variety of effects on habitat, including changes in plant community structure and composition. The degree of impact would depend on the type and amount of vegetation affected and the rate at which vegetation would regenerate during post-construction restoration. While grasslands and herbaceous wetlands would generally recover within five to seven years, sagebrush steppe may require 30 to 120 years to recover, depending on the subspecies, size of disturbance, and precipitation (Olson et al. 2000; Lesica et al. 2005; Baker 2006; Knick and Connelly 2011). In the EIS impact analysis, direct disturbance to sagebrush/perennial and sagebrush/annual grassland was considered a long-term impact, regardless of disturbance type. For example, temporary work areas in sagebrush/perennial grasslands would be considered a temporary impact for some resources; however, because of the long recovery times for sagebrush, this disturbance was considered a long-term impact for sage-grouse.

C. Indirect Impacts

Indirect impacts are difficult to quantify, and often have been characterized as "unknown" or "uncertain" due to limited, direct research. However, given the extremely imperiled state of the JBLM YTC population, as well as information from several recent publications that better quantify various indirect impacts of transmission lines to sage-grouse, this Framework will define specific indirect impact "disturbance bands" for sage-grouse. The Project will accrue indirect impacts to sage-grouse via the following main categories of indirect impact: decreased population connectivity/avoidance of transmission line features, increased predation, and decreased nest success and hen survival. Habitat disturbance bands should be developed for the purposes of calculating compensatory mitigation for these indirect impacts. The following provides guidance on the three habitat disturbance bands that should be identified for the Project:

1. Decreased Population Connectivity/Avoidance Band: 0.4 mile (600 meters)
   JBLM YTC is surrounded by multiple large and smaller transmission lines on all boundaries. Four large transmission lines (greater than 115 kV) cross the northern portion of the JBLM YTC PAC; six large transmission lines are on the east side of the Columbia River and JBLM YTC PAC; and two large transmission lines cross the southern and western portions of the JBLM YTC PAC. In summary, movement of sage-grouse between populations and habitat is already limited in all directions. The area in the northern portion of the JBLM YTC appears to be most affected by the presence of the transmission lines, as there is suitable habitat present, but relatively little documented use by sage-grouse. Genetic analyses of Washington’s sage-grouse populations echo connectivity concerns, reflecting little gene flow between the JBLM YTC population and the other native populations (Oyler-McCance et al. 2005).

   In an effort to identify remaining connectivity corridors for many species within the Columbia Basin, the WHCWG analyzed multiple factors of movement resistance across the landscape. For sage-grouse, resistance factors included infrastructure such as roads, forested vegetation, and transmission lines. Relevant to the proposed Project, WWHCWG assigned resistance factors to transmission lines greater than 230 kV including single build and collocation. Bands of resistance were analyzed at the centerline, 0.3 mile (500 meters), and 0.6 mile (1,000 meters) with decreasing resistance further from the centerline. At 0.3 mile (500 meters) WWHCWG assigned a resistance value of one for collocated transmission line and zero for a single line. Therefore, it is extrapolated that the powerline, either collocated or single build, will have connectivity impacts out to 0.3 mile (500 meters).

   Anthropogenic features are known to impact ecological processes for many different species. In a study by Gillan et al. (2013), sage-grouse spatial data was analyzed to determine the zone of influence, or the distance at which sage-grouse may avoid transmission lines. Results indicated that sage-grouse were avoiding transmission lines by 0.4 mile (600 meters). Avoidance leads to a substantial loss of habitat available to sage-grouse, assuming that most habitat within 0.4 mile (600 meters) of a tower will be unused by sage-grouse, no matter the degree of habitat quality. Therefore, to account for this loss of habitat functionality and connectivity, a 0.4 mile (600 meters) disturbance band should be used to evaluate compensatory mitigation for these functions.

2. Increased Predation Band: 1.4 miles (2,200 meters)
   Corvids, particularly ravens, are the most common avian nest predators of sage-grouse range-wide (Lockyer et al. 2013) and within Washington (Vander Haegen et al. 2002). In sagebrush habitats, which are typically devoid of many natural vertical structures like trees, ravens have been shown to select transmission lines as nesting substrates (Howe et al. 2014). The introduction of anthropogenic structures into these habitats may unnaturally increase raven abundance (Boarman 1993) and also predation success on sage-grouse nests by providing taller hunting perches (Knight and Kawashima 1993).

Recent research conducted within a sagebrush steppe landscape indicated that raven occurrence during the sage-grouse nesting period was highest within 2.2 kilometers (km) of transmission lines regardless of raven breeding status (Coates et al. 2014). Because ravens are the primary avian nest predators of sage-grouse and their abundance is greatest near transmissions lines, it can be assumed that sage-grouse nest depredation risk is high for sage-grouse nesting within 1.4 mile (2,200 meters) of the proposed Project. Therefore, to account for decreased nest success that may occur due to ravens, a 1.4 mile (2,200 meters) disturbance band should be used to evaluate compensatory mitigation.

3. <u>Decreased nest success and hen survival band: 4.0 mile (6.4 km)</u>
Tall structures, such as transmission lines, are known to provide perches for avian predators higher than local vegetation and topography in certain locations (Ellis 1984; Braun 1998). It is hypothesized that avian predators of sage-grouse adults and nests may use transmission line towers to increase hunting efficiency, thereby reducing adult survival and nest success. A recent study in the sagebrush ecosystem of Wyoming indicated that nesting and brood-rearing sage-grouse avoided areas with increased densities of ravens (Dinkins et al. 2012). In Washington, 95 percent of leks located within 4.7 miles (7.5 km) of 500 kV transmission lines are now vacant compared with a vacancy rate of 59 percent with greater distances (Schroeder 2010).

   In 2003, the Falcon to Gondor 345 kV Transmission Line Project was constructed in central Nevada through sage-grouse habitat. Construction of the transmission line included a ten year study to assess the impacts of the transmission line on population demographics of nearby sage-grouse populations. Results from the Falcon to Gondor Project do not demonstrate an effect of the transmission line on nest site selection or female nesting propensity. However, the results do support a weak effect on male survival and, after accounting for heterogeneity in demographic rates among individuals and removing the transmission line itself from the model, substantial effects on nest and hen survival were observed as an effect of distance from the line. Results demonstrated that sage-grouse were not avoiding the transmission line itself, but those that nested closer to the line were more likely to demonstrate decreased nest success and hen survival.

   Results from the Falcon to Gondor Project line suggest that nest survival improves six percent for each 3.1 mile (5.0 km) between the nest and the transmission line (Gibson et al. 2013). Therefore, to account for decreased hen survival and decreased nest survival (and thus recruitment), a 4.0 mile (6.4 km) disturbance band should be used to evaluate compensatory mitigation. This distance is larger than the 3.1 miles (5.0 km) distance observed in the Falcon to Gondor Project to account for the imperiled status of the JBLM YTC PAC and to be consistent with the analysis area included within the SDEIS.

Depending upon the type of indirect Project impact, not all functions would be removed from the indirectly impacted habitat. Therefore, for each kind of indirect impact identified above, an adjustment (reduction) should be applied to the acres of indirectly affected habitats to reflect the reduced, but not complete loss of, services in that impacted habitat.

Co-locating proposed new transmission lines in existing utility corridors is identified in the COT Report and the Washington Sage-Grouse Recovery Plan as a method to reduce impacts to sage-grouse. For example, significant portions of the proposed Project could be within 200 feet of an existing transmission line. Due to the already-accruing impacts from existing transmission lines in the analysis areas, collocation of the proposed Project with existing transmission lines will result in a reduced indirect impact acreage assessed for the Project's indirect impacts. Similarly, undergrounding the Project in discrete, limited length sections of the Project would result in reduced indirect impacts to sage-grouse.

Indirectly impacted acres would include those areas that do not overlap already indirectly impacted acres of the existing transmission line (Appendix TBD, Figures TBD to be developed to visually illustrate acreages of indirect impacts that qualify for compensatory mitigation and those which do not). In addition, acreages of indirect impacts could be reduced based on existing attributes and feature that have already reduced ecological services or that screen areas from impacts on the landscape. For example existing roads, residential development, military infrastructure, etc., may have already reduced ecological services within the habitat disturbance buffer; terrain features such a ridgelines may limit or obscure the proposed transmission line visibility to leks or to sage-grouse within core use areas; or where raptor and or corvid perching and nesting opportunities available on the terrain (trees, cliffs, etc.) exceed those provided by new transmission line structures.

D. Metrics and Accounting

Accounting for the impacts of the proposed Project, adjusting indirect impacts to reflect lost services and increased concern for sage-grouse habitat area/attributes, and applying mitigation ratios will determine the Project's debits. The mitigation measures developed to avoid, minimize, restore and/or offset those direct and indirect Project impacts, as adjusted to reflect consistency with the Framework's Principles and Technical Elements, will determine the Project's credits. An accounting system that balances the Project's debits and mitigation credits is essential to the successful completion and implementation of an HMP prepared by Pacific Power. The accounting system for the proposed Project should foster transparency, accountability, credibility and facilitate mitigation opportunities to be realized by Pacific Power and eligible/approved mitigation providers.

For the proposed Project, common currency could include habitat area, linear distance, and/or structure(s). This currency provides a methodology for tracking debits and credits consistently across jurisdictional boundaries. Monitoring and adaptive management are important components of the HMP's accounting system to ensure success. Ultimately, the metrics used must tie back to populations and clearly show the conservation benefit to the species. Proposed mitigation that provides only no net loss will be evaluated more conservatively.

Successful accounting within the HMP for the proposed Project impacts will be evaluated based on: 1) proper debit (impact) metrics; 2) proper credit (mitigation) metrics; and 3) mitigation action compatibility with the Framework's Principles and Technical Elements, as well as regional and national sage-grouse management guidance from BLM, USFWS, and WDFW for "no net-loss" and "net-benefit" for sage-grouse. The proposed Project accounting and metrics must clearly articulate and demonstrate the resulting "no net-loss" and "net-benefit" for sage-grouse within the HMP accounting program.

VI. IMPLEMENTATION, MANAGEMENT, AND MONITORING

Preparation of the HMP by Pacific Power will involve discussions and collaboration with the Sage-Grouse Subgroup, Project Steering Committee and Cooperating Agencies.

The draft and final HMP should identify a schedule and sequence for implementing the restoration of temporarily and permanently impacted areas caused by the Project, as well as the compensatory mitigation actions and service areas. The HMP implementation schedule should identify timeframes for securing compensatory mitigation lands and for implementing mitigation actions on those lands.

The final HMP must identify the timeframes for each mitigation action to attain the full habitat attributes required to offset the Project's impacts. Specific success criteria must be developed that describe habitat attributes. The desired ecological outcomes will be based on the results of the impact assessment and ecological evaluation, both referenced earlier in this document, with an overall goal of achieving a "net benefit" for sage-grouse through implementation of the HMP.

The final HMP will identify an overall management plan for the compensatory mitigation actions that details how mitigation areas will be managed and how enhancement actions will be implemented and monitored.

Pacific Power will be responsible for monitoring whether mitigation and associated management actions are implemented as stated in the HMP ("implementation monitoring"), and immediately address any inconsistencies. Pacific Power will also be responsible for monitoring the response of vegetation to impact site restoration and mitigation site actions, to confirm the targeted ecological outcomes are being achieved ("effectiveness monitoring"). Monitoring will also be used to identify mitigation actions that are not achieving the desired result and remedial actions will be developed and implemented.

The final HMP will include scientifically accepted methods of monitoring vegetation and sage-grouse, and a detailed regime for monitoring and assessing attainment of targeted ecological outcomes, over the life of Project impacts.

Pacific Power will be responsible for reporting the monitoring findings and recommendations for a specified time period, as required by the state and federal permitting process for the duration of the mitigation effort(s) as determined by evaluated success of the mitigation. The report will describe all habitat mitigation and management actions carried out during the reporting year, and all remedial management work performed in response to monitoring actions. The report will include an evaluation of mitigation success in meeting ecological targets, and a description of the methods used to perform the evaluation.

Each state and federal agency with jurisdiction over the project will carefully track the monitoring reports to determine if actions and outcomes are consistent with applicable law, the final HMP, the FEIS, the Record of Decision, and their respective project authorizations including ROWs and permits. The agencies will work cooperatively to identify and address inconsistencies. Each agency will reserve the ability to take all measures available under law to ensure compliance with the terms and conditions of its respective authorization.

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APPENDIX A SAGE-GROUSE SUBGROUP FRAMEWORK CONTRIBUTORS

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APPENDIX C DEFINITIONS

Additionality: A property of compensatory mitigation where the conservation outcomes are demonstrably above and beyond results that would have occurred if the mitigation had not taken place.

Baseline: The pre-existing condition of a defined area of habitat that can be quantified by an appropriate metric to determine level of function or value and re-measured at a later time to determine if the same area of habitat has increased, decreased, or maintained the same level of function or value.

Connectivity Habitat: Habitat that provides areas important for movement between habitats and populations, including breeding areas and seasonally used areas and between existing populations.

Durability: Biological effectiveness (i.e., ecological durability) accompanied by legal and financial assurances that secure and protect the conservation status of the mitigation site and credits for at least as long as associated impacts persist (i.e., protective durability).

Expansion Habitat: Habitat that includes areas where expansion could occur through an improvement in habitat quality.

Mitigation Ratio: The relationship between compensatory offset for, and impacts to, individuals of species or habitat for species.

Net Benefit: Actions that result in a reduction of threats to the species and an uplift on the sage-grouse population and/or the associated habitats.

No Net Loss: The result of impacts caused by the project being balanced or outweighed by measures taken to avoid and minimize the project’s impacts and compensate for any residual impacts so that no loss of habitat or biological services remain.

Occasionally Occupied Habitat: Habitat that includes habitat that may be occupied on a seasonal or irregular basis.

Regularly Occupied Habitat: Habitat that includes intact sagebrush communities known to be occupied by resident breeding populations of sage-grouse and are considered to be of highest conservation value.

Service Area: The geographic area within which impacts to a species’ habitat can be offset at a particular habitat offset site as designated in an agreement or program.

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APPENDIX C
VISUAL RESOURCES SUPPORTING DATA

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APPENDIX C-1
SENSITIVE VIEWPOINTS: DEFINITIONS, CRITERIA, AND VIEWPOINT SUMMARY TABLE

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TABLE C-1.1 VISUAL SENSITIVITY DEFINITIONS

CRITERIA	HIGH	MODERATE	LOW
Use Volume	High Level of Use	Moderate Level of use	Low level of use
User Attitude	High expectations for maintaining scenic quality (i.e. residences)	Users are concerned for scenic quality but it is not the primary focus of their experiences (i.e., dispersed recreation areas and general travel routes)	Areas where the public has low expectations for maintaining scenic quality. Generally commercial or industrial areas where human caused modifications already exist in the landscape
Duration of View	Fixed or continuous views – Long	Intermediate views (i.e., open highway views)	Brief or intermittent views (i.e. highway views in rolling landscapes) - Short

TABLE C-1.2 VISUAL SENSITIVITY CRITERIA AND LEVELS

USER ATTITUDE	VIEW DURATION	USE VOLUME	VISUAL SENSITIVITY LEVEL
High	Long	High	High
High	Long	Moderate	High
High	Long	Low	High
High	Moderate	High	High
High	Moderate	Low	High
Moderate	Long	High	Moderate
Moderate	Moderate	Moderate	Moderate
Moderate	Long	Moderate	Moderate
Moderate	Long	Low	Moderate
Moderate	Moderate	High	Moderate
Moderate	Moderate	Low	Moderate
Low	Short	High	Low
Low	Long	Low	Low

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TABLE C-1.3 SENSITIVE VIEWER TABLE

Sensitive Viewer	Sensitive Viewer Type				Sensitivity					Jurisdiction											
	Recreation	Travel	Special Management	Dispersed Use[1]	Aesthetic Concern / User Attitude (High-H; Moderate-M; Low-L)	Use/View Duration (Long-L; Moderate -M; Short-S)	Use Volume (High-H; Moderate -M; Low-L)	Scenic / Historic	Overall Sensitivity	BLM	USFWS	BOR	State - WSDOT	State-Washington P& R Commission	State- WSDNR	State-WDFW	Grant Co. PUD	County	Municipal	Private	Other
Baldy Butte Hang Gliding Launch Area	●				M	L	L		M											●	
Interstate 82		●			L-M	S-M	H		L-M				●								
Interstate 82 Rest Areas/Viewpoints- Selah Creek Rest Area-East-bound (Overlook), Selah Creek Rest Area-West-bound, Manastash Ridge (East-bound and West-bound Viewpoints)		●			M-H	L	H		H				●								
John Wayne Pioneer Trail/Milwaukee Corridor/Beverly Railroad Bridge National Register of Historic Places (NRHP) Site	●				H-M	L	M-L	Historic*	M-H*					●			●				
Lower Wanapum Dam Boat Launch and Picnic Area	●				M	L	M		M								●				
Residences – All Occupied	-	-	-	-	H	L	L		H											●	
<u>Roads</u> – Collector Rural Roads (Huntzinger Rd. E. Selah Rd., Beverly Berke Rd., E. Pomona Rd., Thrall Rd.)		●			M	M	L-M		M												
<u>Roads</u> – Other Local Roads (Sage Trail Road, Firing Center Rd., Tipp Rd., Burbank Creek Road, 4th Parallel Rd.)		●			M	M	L-M		M												
Selah Butte Recreation Destination Route	●	●			M	L-M	L		M	●								●		●	
Selah Butte Watchable Wildflower Area[2]	●			●	H	L	L		H	●											
Selah Butte Watchable Wildflower Area Parking Area (KOP 6s)	●				H	L	L		H	●											
Selah Cliffs Natural Area Preserve Trail	●				H	L	L		H						●						

Sensitive Viewer	Sensitive Viewer Type				Sensitivity					Jurisdiction											
	Recreation	Travel	Special Management	Dispersed Use[1]	Aesthetic Concern / User Attitude (High-H; Moderate-M; Low-L)	Use/View Duration (Long-L; Moderate -M; Short-S)	Use Volume (High-H; Moderate -M; Low-L)	Scenic / Historic	Overall Sensitivity	BLM	USFWS	BOR	State - WSDOT	State-Washington P& R Commission	State- WSDNR	State-WDFW	Grant Co. PUD	County	Municipal	Private	Other
SR 243		●			M	M	M		M				●								
Upper Wanapum Dam Boat Launch	●				M	L	M		M					●			●				
Wanapum Dam Overlook	●				M	L	L-M		M								●				
Wanapum State Park/Boat Launch	●				M	L	M		M					●			●				
Wanapum Heritage Center Picnic Area	●				L-M	L	H-M		M								●				
Wanapum Lake	●			●	M	L	M		M			●									
Yakima Elks Golf & Country Club	●				M	L-M	H-M		M											●	
Yakima River Canyon Washington Tourism Route (SR 821)		●			H	M	M	Scenic	H				●								
Yakima Greenway Trail-Yakima River	●				H	L	H-M		H										●		

KEY
1 - Not Modeled in Viewshed Analysis
2- Sensitivity Identified During VRI

APPENDIX C-2
SCENIC QUALITY AND DEVELOPMENT CHARACTER PHOTOS

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FIGURE C-2.1 INVENTORY OBSERVATION POINT G- CLASS C SCENIC QUALITY

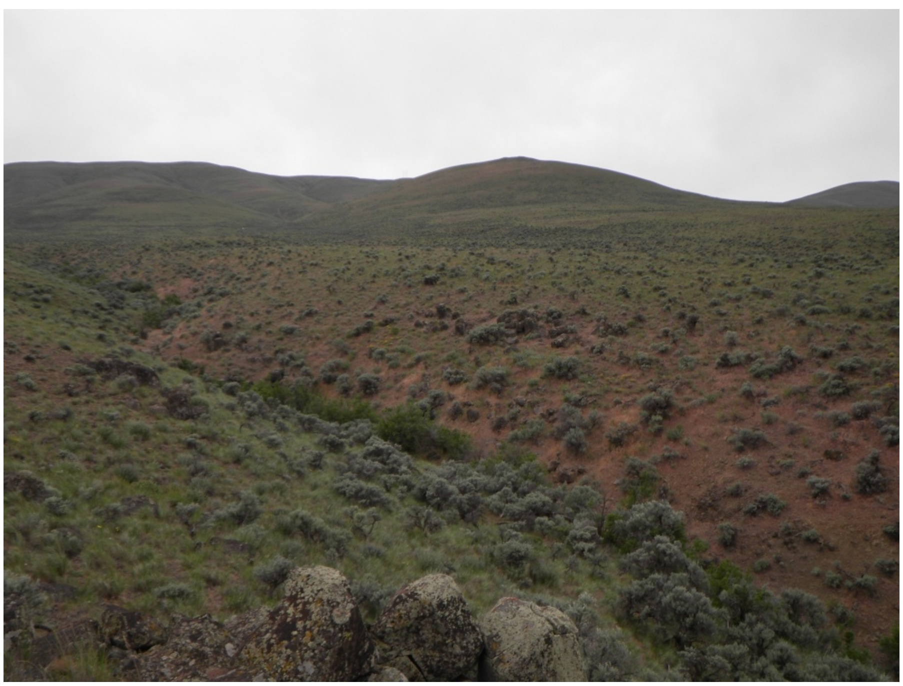

FIGURE C-2.2 INVENTORY OBSERVATION POINT H- CLASS C SCENIC QUALITY

FIGURE C-2.3 TYPICAL RESIDENTIAL DEVELOPMENT CHARACTER AREA

FIGURE C-2.4 TYPICAL RESIDENTIAL DEVELOPMENT CHARACTER AREA

FIGURE C-2.5 TYPICAL AGRICULTURAL DEVELOPMENT CHARACTER AREA

FIGURE C-2.6 TYPICAL TRANSPORTATION CORRIDOR DEVELOPMENT CHARACTER AREA

FIGURE C-2.7 TYPICAL INDUSTRIAL/UTILITY CORRIDOR DEVELOPMENT CHARACTER AREA

FIGURE C-2.8 TYPICAL INDUSTRIAL/UTILITY CORRIDOR DEVELOPMENT CHARACTER AREA

APPENDIX C-3
KEY OBSERVATION POINT PHOTOS

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FIGURE C-3.1 KOP 1S - SAGE TRAIL ROAD

FIGURE C-3.2 KOP 2S – TEMPLE LANE

FIGURE C-3.3 KOP 3S – YTC: FIRING CENTER ROAD

FIGURE C-3.4 KOP 4S – E. POMONA ROAD

FIGURE C-3.5 KOP 5S – WSDOT SELAH CLIFFS REST AREA OVERLOOK (NORTH VIEW)

FIGURE C-3.6 KOP 5S – WSDOT SELAH CLIFFS REST AREA OVERLOOK (WEST VIEW)

FIGURE C-3.7 KOP 6S - SELAH BUTTE WILDFLOWER PARKING AREA

FIGURE C-3.8 KOP 7S- BADGER POCKET: SILIKA ROAD

FIGURE C-3.9 KOP 8S – UPPER BADGER POCKET ROAD

FIGURE C-3.10 KOP 9S – JOHN WAYNE TRAIL

FIGURE C-3.11 KOP 10S – WANAPUM VILLAGE

APPENDIX C-4
VISUAL SIMULATIONS

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KOP 1
Sage Trail Road

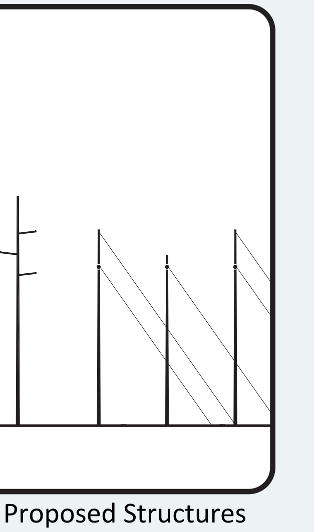
Existing Condition

View West on Sage Trail Road 0.1-mile West of JBLM-YTC

Simulated Condition

Proposed 230 kV transmission

Pomona Heights Substation



Proposed Structures

Date/Time: 5/9/2011 1:09pm PST

Wood monopole and heavy angle wood pole structures

Photo Simulations are for demonstration purposes only.
Final Design may change pending review.

PACIFIC POWER
A DIVISION OF PACIFICORP

POWER ENGINEERS

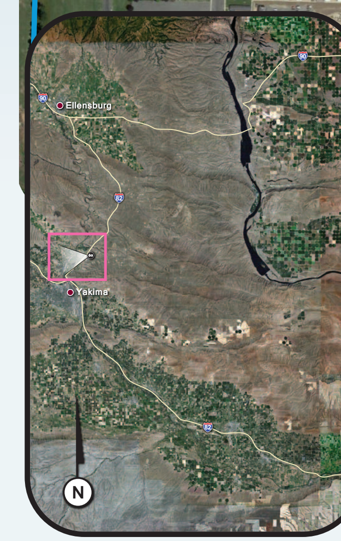
VANTAGE-PAMONA HEIGHTS TRANSMISSION PROJECT

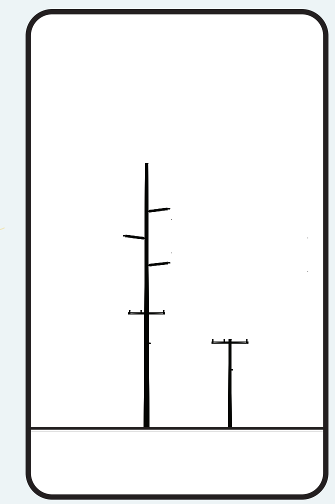
August, 1st 2012

View from Firing Center Road, looking west.

Proposed 230 kV transmission line

KOP 3s
JBLM YTC: Firing Center Road





Proposed Structures

Date/Time: 6/17/2013, 02:07PM PST.

Corten steel and wood monopole structures

Photo Simulations are for demonstration purposes only.
Final Design may change pending review.

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VANTAGE-PAMONA HEIGHTS TRANSMISSION PROJECT

March, 3rd 2014

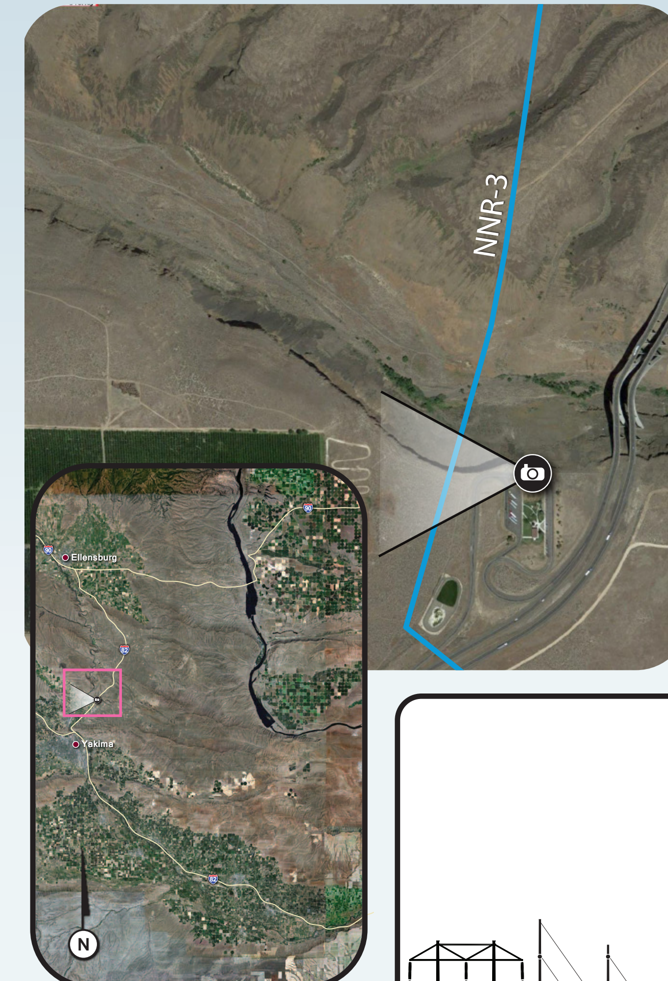
KOP 5s (West)
WSDOT Selah Cliffs Rest Area Overlook

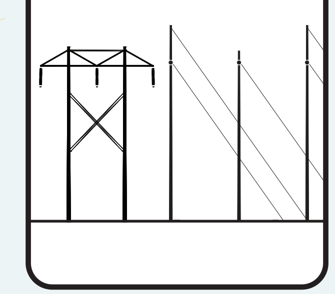
Existing Condition

View from Washington State Department of Transportation rest area scenic overlook, looking west.

Simulated Condition

Proposed 230 kV transmission line





Proposed Structures

Date/Time: 6/17/2013, 02:47PM PST.

Wood H-Frame and heavy angle wood pole structures

Photo Simulations are for demonstration purposes only.
Final Design may change pending review.

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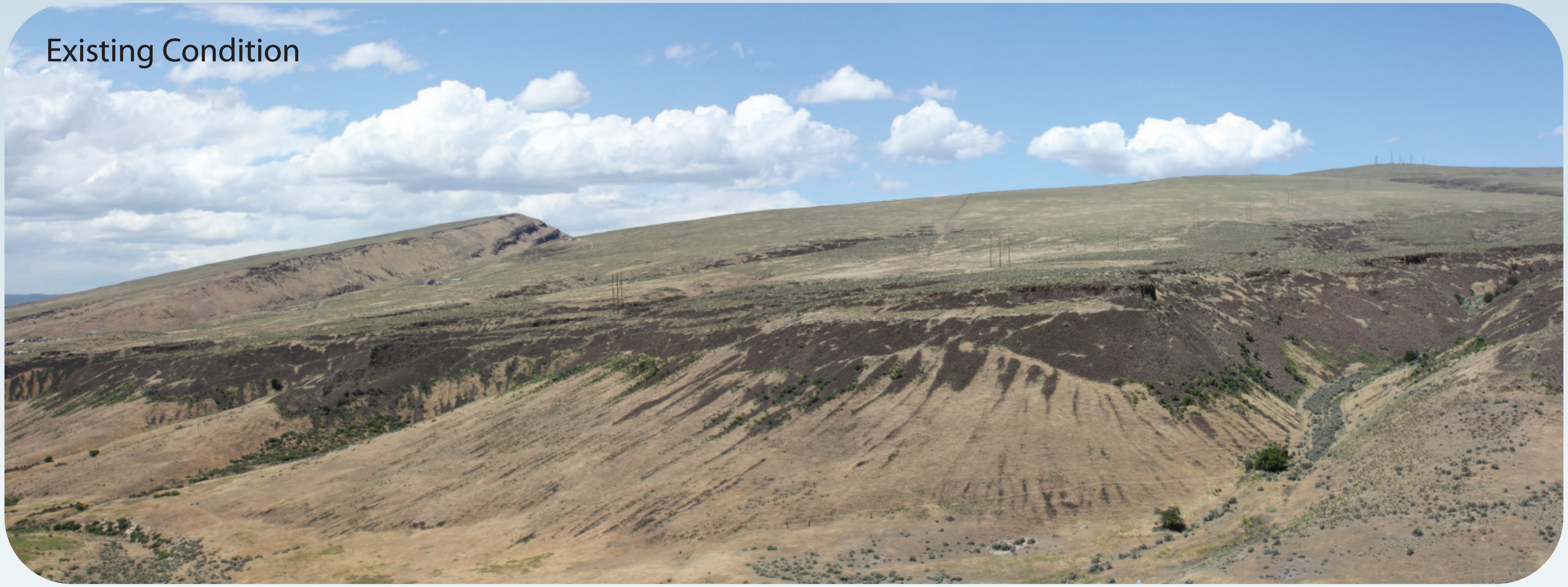
VANTAGE-PAMONA HEIGHTS TRANSMISSION PROJECT

March, 3rd 2014

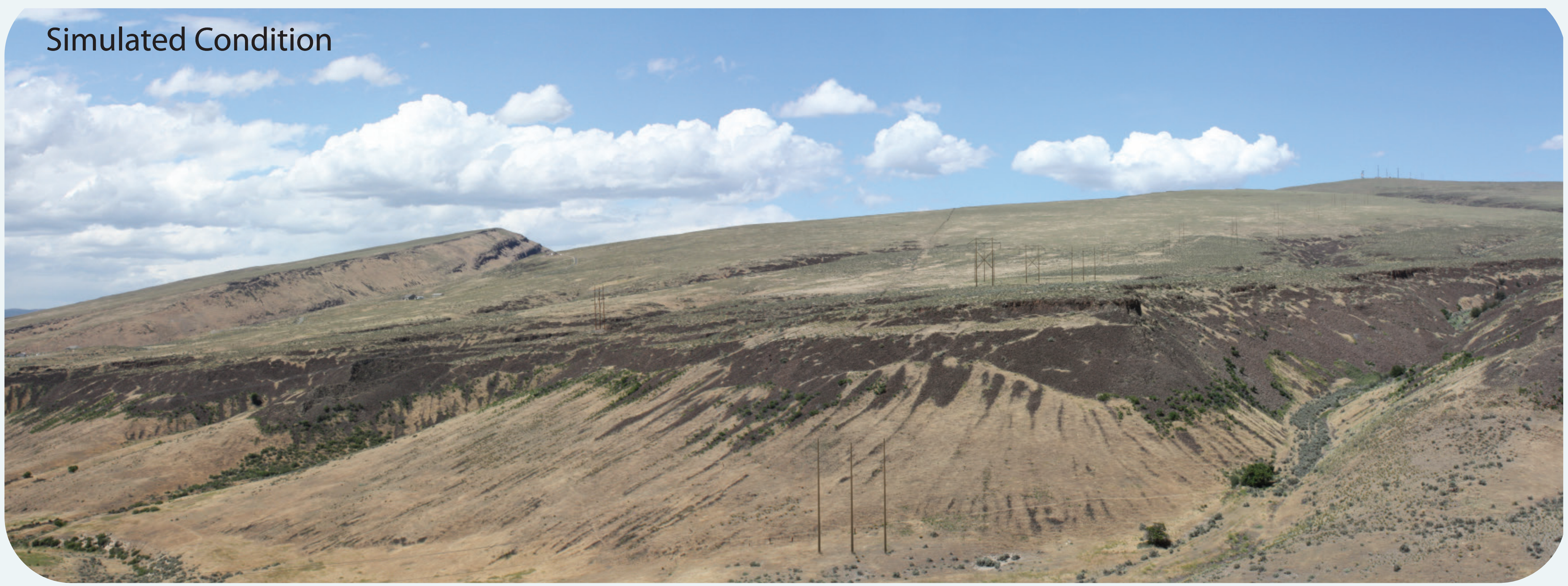
KOP 5s (Northwest)
WSDOT Selah Cliffs Rest Area Overlook

Existing Condition

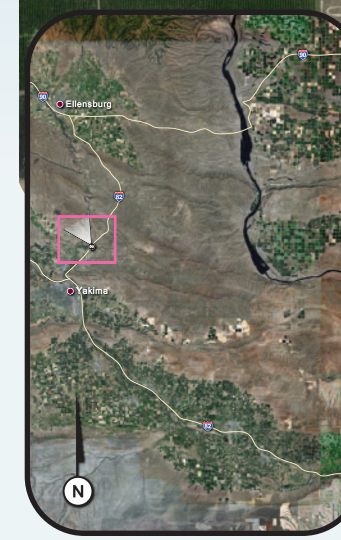


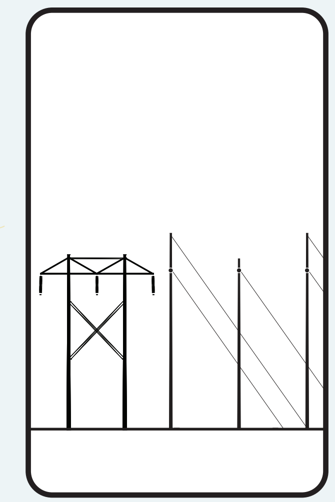
View from eastbound Washington State Department of Transportation rest area interpretive overlook, looking northwest.

Simulated Condition



Proposed 230 kV transmission line





Proposed Structures

Date/Time: 6/17/2013, 02:47PM PST.

Wood H-Frame and heavy angle wood pole structures

Photo Simulations are for demonstration purposes only.
Final Design may change pending review.

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VANTAGE-PAMONA HEIGHTS TRANSMISSION PROJECT

March, 3rd 2014

APPENDIX C-5
CONTRAST RATING FORMS

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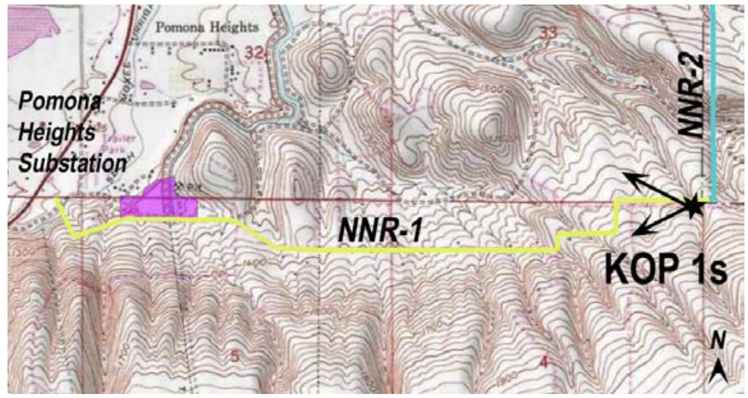
VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission	Location	Location Map
Date: May 9, 2011	Township 13N Range 19E Section 4 *GPS:* 46°38'59"N 120°26'53"W	
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV single pole transmission line		
Key Observation Point: KOP 1 –Sage Trail Road		
VRM Class: N/A		

Characteristic Landscape Description

	Landform/Water	**Vegetation**	**Structures**
Form	Moderately sloping	Low, clumping, rounded	Rectangular, weak
Line	Curved, generally horizontal	Jagged, simple	Angular, simple
Color	Brown, tan	Dark to medium green; tan, light gray;	Monotone, tan, white
Texture	smooth	Moderate-fine, dense	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	**Vegetation**	**Structures**
Form	Minimal grading, disturbance; use of existing road	Isolated linear, long, simple symmetrical perennial grass revegetation	Narrow (vertical); weakly horizontal, concave (horizontal)
Line	-	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	-	Tan to green	Tan
Texture	-	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term**☐ Long Term**X**

Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X			X		X			
	Line				X		X			X			
	Color				X		X				X		
	Texture				X		X				X		

Does project design meet visual resource management objectives?

N/A

Additional mitigating measures recommended?
Yes (see below)

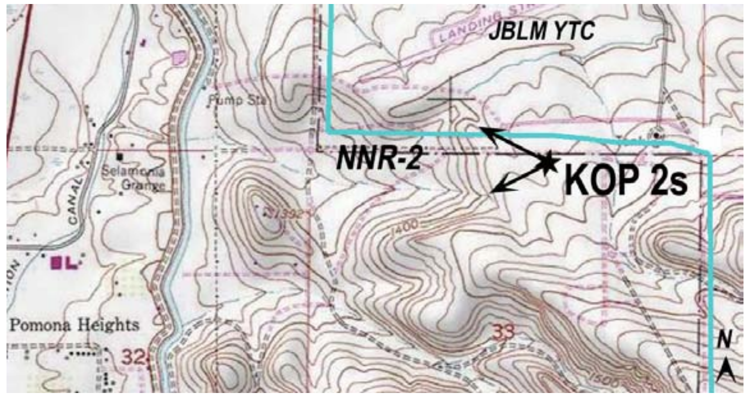
Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Line Project
Date: May 9, 2011
Key Observation Point: KOP 1 –Sage Trail Road
Strong to moderate structure contrasts and weak-moderate vegetation contrasts would result from the introduction of single wood pole structures in a landscape that contains rural residential development and panoramic views of the Selah Valley and Mt. Rainier. Sensitivity is moderate to high. The conductors and introduction of new wood poles would introduce strong form and line structure contrasts, and would moderately contrast with existing structure color and texture in the immediate foreground and foreground in the context of existing modifications in the landscape. Some vegetation clearing around the work areas of structures would cause moderate vegetation contrasts. Overall, project contrasts would be strong-moderate. Additional mitigation measures would include micro-siting of structures to avoid interference with prominent views.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission	Location Township 14N Range 19E Section 33 *GPS:* 46°39'51"N 120°27'20"W	Location Map
Date: June 18, 2013		
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 2s –Temple Lane		
VRM Class: N/A		



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Moderately sloping	Low, clumping, rounded, irregular	Narrow (vertical), repeating; horizontal, concave, directional (horizontal) Rectangular, weak;
Line	Curved, undulating, horizontal	Jagged, irregular, soft, simple	Straight, simple
Color	Brown, tan	Dark to medium green; tan, light gray; bisected	Monotone, tan, white, gray
Texture	smooth	Moderate-fine, dense	Moderate to smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	Minimal grading, disturbance; use of existing fire-break road	Isolated linear, long, simple symmetrical perennial grass revegetation	Narrow (vertical), repeating; weakly horizontal, concave (horizontal)
Line	-	Straight, soft, simple	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	-	Tan to green	Tan
Texture	-	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term**☐ Long Term**X**

Degree of Contrast	Landform/ Water Body: Strong	Moderate	Weak	None	Vegetation: Strong	Moderate	Weak	None	Structures: Strong	Moderate	Weak	None
Elements: Form				X			X				X	
Line				X			X				X	
Color				X			X				X	
Texture				X			X				X	

Features

Does project design meet visual resource management objectives?

N/A

Additional mitigating measures recommended?

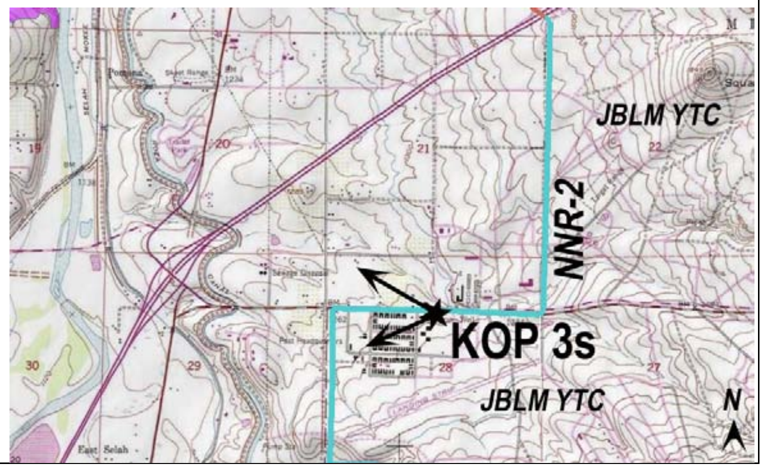
X No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission
Date: June 18, 2013
Key Observation Point: KOP 2s –Temple Lane
Weak structure contrasts and weak vegetation contrasts would result from the introduction of additional H-frame structures re-establishment of herbaceous perennial vegetation around the structures. Sensitivity is high. The conductors and structures would introduce weak form and line structure contrasts, and would weakly contrast with existing structure color and texture in the immediate foreground and foreground in the context of existing modifications in the landscape. Some vegetation clearing around the work areas of structures would cause weak vegetation contrasts. Overall, project contrasts would be weak, and impacts would be moderate.


VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project **Date:** June 17, 2013 **District/Field Office:** N/A **Resource Area:** N/A **Activity (program):** 230 kV single wood pole transmission line **Key Observation Point:** KOP 3s –YTC Firing Center Road **VRM Class:** N/A	**Location** Township 14N Range 19E Section 28 *GPS:* 46° 40' 32" N 120° 27' 24" W	**Location Map** 

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Level, geometric	Variable, vertical, irregular	Vertical, linear, rectangular, directional
Line	Straight, parallel	Irregular, jagged	Regular, vertical, simple
Color	Brown, tan, white, gray	Light to dark greens, tan	Monotone, tan, brown, white, gray
Texture	Fine to course	Fine to moderate	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	Minimal grading, disturbance; use of existing road	No vegetation clearing occurring	Vertical, linear, rectangular, directional
Line	N/A	N/A	Regular, vertical, simple
Color	N/A	N/A	Monotone, tan, brown, white, gray
Texture	N/A	N/A	Matte, uniform , smooth

Contrast Rating **Short Term☐** Long Term**X**

Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X				X		X			
	Line			X			X				X		
	Color			X			X				X		
	Texture			X			X					X	

Does project design meet visual resource management objectives?
N/A

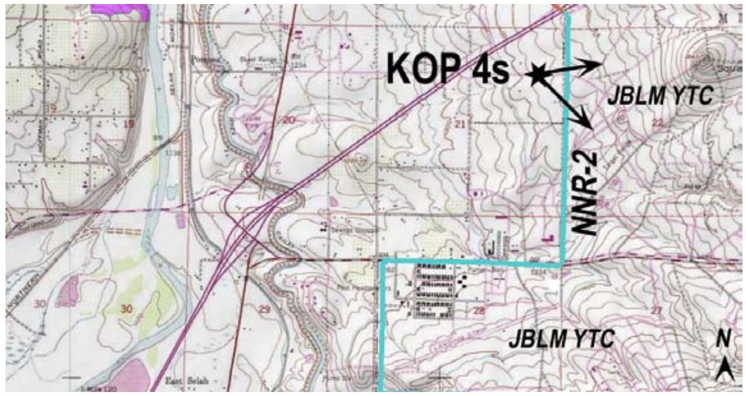
Additional mitigating measures recommended?
X No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project
Date: June 17, 2013
Key Observation Point: KOP 3s- YTC Firing Center Road
Moderate to strong structure contrasts and no vegetation or landform contrasts would result from the introduction of a single wood or Corten steel monopole structure in a landscape that contains existing, similar utility structures. Sensitivity is moderate. The conductors and structures are similar in form, line, color and texture from the existing utility features, but would be substantially different in scale. No vegetation clearing around the work areas would be expected because of the dominance of paved surfaces. Overall, project contrasts would be moderate to strong, and impacts would be moderate to high.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission	Location	Location Map
Date: June 18, 2013	Township 14N Range 19E Section 21 *GPS:* 46° 41' 23" N 120° 26' 54" W	
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 4s –East Pomona Road		
VRM Class: N/A		

Characteristic Landscape Description

	Landform/Water	**Vegetation**	**Structures**
Form	Moderately gentle, rounded, sloping	Low, clumping, rounded	Rectangular
Line	Curved, generally horizontal	Jagged, simple	Angular, simple
Color	Brown, tan	Dark to medium green; tan, light gray;	Monotone, brown, gray
Texture	smooth	Moderate-fine, dense	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	**Vegetation**	**Structures**
Form	Some grading, disturbance visible from this area; use of existing YTC perimeter road; Smooth, flat	Isolated linear, long, simple symmetrical perennial grass revegetation	Narrow (vertical), repeating; weakly horizontal, concave (horizontal)
Line	Minor improvements to YTC perimeter road and spur roads would be visible. Linear, directional, regular	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	tan	Tan to green	Tan
Texture	smooth	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term☐** Long Term**X**

Degree of Contrast		Features: Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X		X			X			
	Line			X			X			X			
	Color			X			X				X		
	Texture			X			X				X		

Does project design meet visual resource management objectives?

N/A

Additional mitigating measures recommended?

X Yes (see below)

☐No

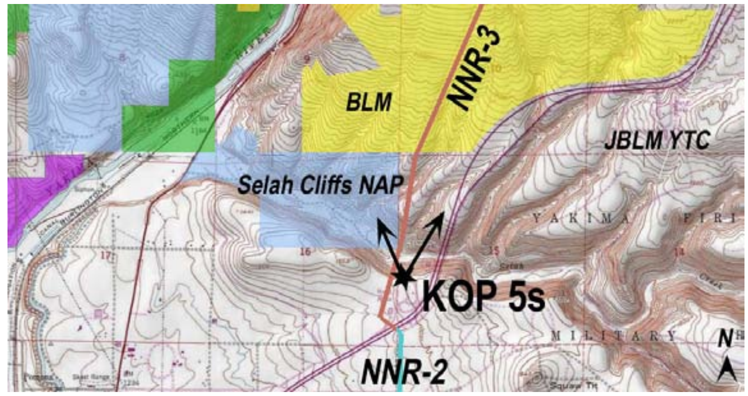
Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission	
Date: June 18, 2013	
Key Observation Point: KOP 4s –East Pomona Road	

Strong structure contrasts and moderate vegetation contrasts would result from the introduction of an H-frame wood pole structure in a landscape that has no existing transmission or similar structures and appears relatively intact. Views of nearby a nearby butte (Push-Ti) and to undeveloped areas of YTC provide a focal point and interest. Sensitivity is moderate to high. The conductors and structures would introduce strong form and line structure contrasts, but would moderately contrast with existing structure color and texture in the immediate foreground and foreground in the context of existing modifications in the landscape. Some vegetation clearing around the work areas of structures and for the construction of spur roads would cause moderate vegetation contrasts. Overall, project contrasts would be strong-moderate, and impacts would be high from adjacent residences.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project	Location	Location Map
Date: June 17, 2013	Township 14N Range 19E Section 15 *GPS:* 46° 41' 56" N 120° 26' 40" W	
District/Field Office: Wenatchee FO		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 5s –WSDOT Selah Cliffs Overlook (North)		
VRM Class: Interim Class III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Moderate to steeply sloping	Low, clumping, rounded Patchy, irregular	Simple, narrow, vertical
Line	Flowing and slightly curved, horizontal	Jagged, simple; Smooth, uniform	Straight, directional
Color	Brown, tan	Tan, dark to medium green	Monotone tan
Texture	smooth	Fine to moderate-fine, dense	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	Some grading, disturbance visible at building pads; existing transmission line road used; Smooth, flat	Isolated linear, long, simple symmetrical perennial grass revegetation	Narrow (vertical), repeating; weakly horizontal, concave (horizontal)
Line	Linear, directional, regular	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	tan	Tan to green	Tan
Texture	smooth	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term** ☐ Long Term **X**

Degree of Contrast		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X			X				X		
	Line			X			X				X		
	Color		X				X				X		
	Texture		X				X				X		

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

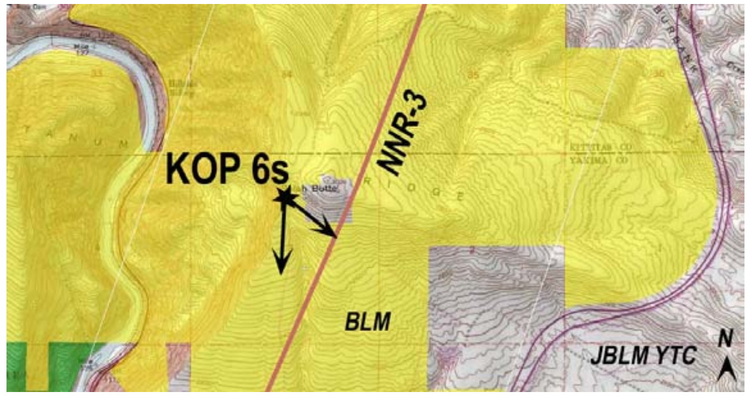
Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project
Date: June 17, 2013
Key Observation Point: KOP 5s –WSDOT Selah Cliffs Overlook (North)
Structure contrasts would be strong at the Selah Canyon crossing to the left of this view where a structure would be prominent. The terrain between the south rim of Selah Canyon and the north side of I-82 slopes at less than eight percent and new access roads would need to be constructed on shrub dominated land causing moderate landscape contrast. At the Selah Canyon crossing, dead-end structures would be used to span the canyon creating strong structure contrasts in these locations. Some new road construction from an existing road would be necessary on the north side (in this view), creating weak to moderate landscape contrast. As the Project joins the existing Pomona-Wanapum 230 kV transmission line, contrasts would be moderate to weak because the new line would be adjacent to the existing line and the existing access roads would be used. BLM Interim VRM Class III lands are crossed beyond the first three-pole structure in this view. From this KOP, moderate-weak and weak contrasts would be seen in the middleground or background, respectively, and the Project would be compliant with the Interim VRM Class III. Where strong contrasts are visible in the immediate foreground (KOP 5s, view west), VRM classes do not apply.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project	Location	Location Map
Date: June 19, 2013	Township 14N Range 19E Section 3	
District/Field Office: Wenatchee FO	*GPS:* 46° 44' 00" N 120° 26' 03" W	
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 6s – Selah Butte WWA Parking		
VRM Class: Interim Class III		



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping in FG; Moderate to steeply sloping in MG/BG	Low, clumping, rounded Patchy, irregular	Narrow (vertical), repeating; weakly horizontal, concave (horizontal)
Line	Flowing and slightly curved, irregular; generally horizontal	Jagged, simple; Smooth, uniform	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	Brown, tan	Tan, dark to medium green	Tan
Texture	Fine to medium	Fine to moderate-fine, dense	Uniform, moderate to smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	Some grading, disturbance visible at building pads; existing transmission line road used; Smooth, flat	Isolated linear, long, simple symmetrical perennial grass revegetation	Narrow (vertical), repeating; weakly horizontal, concave (horizontal)
Line	Linear, directional, regular	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	tan	Tan to green	Tan
Texture	smooth	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term** ☐ Long Term **X**

Degree of Contrast	Landform/ Water Body				Vegetation				Structures			
Elements	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form			X				X				X	
Line			X				X				X	
Color		X					X				X	
Texture		X					X				X	

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

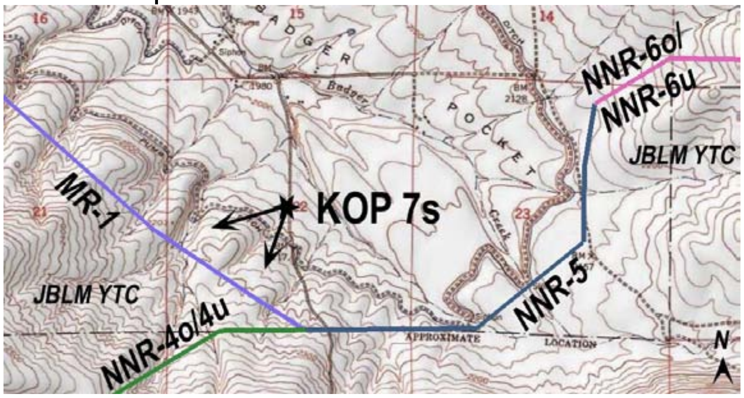
X No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project
Date: June 19, 2013
Key Observation Point: KOP 6s – Selah Butte WWA Parking
Weak structure contrasts and weak to moderate landform contrasts would result from the project. Weak structure contrasts would occur because the new transmission line would be visually similar to the existing transmission line, and moderate landform contrasts would occur due to some potential building pad grading and structure sites. Weak vegetation contrasts would occur because similar perennial grasses would be re-established. The project would be seen in the foreground beyond the existing 230kV transmission structures in from this recreational area that frames views to the southeast. Viewing orientation is generally toward Yakima Canyon (in the opposite direction of this view) and topography typically screens views of the Project. Because this is a dispersed recreation use area, views of the Project may occur depending on the viewer location within the area. The Project would be compliant with the Interim VRM Class III because moderate contrasts would be seen in the immediate foreground and foreground distance zones.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name	Location	Location Map
Project Name: Vantage-Pomona 230 kV Transmission Project	**Location** Township 16N Range 20E Section 22 *GPS:* 46° 51' 37" N 120° 18' 29" W	**Location Map** 
Date: June 18, 2013		
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 7s-Silka Road		
VRM Class: N/A		

Characteristic Landscape Description

	Landform/Water	**Vegetation**	**Structures**
Form	Gently sloping, rounded	Uniform, simple in FG; Low, clumping, rounded in MG/BG	Strongly, narrow (vertical); weakly horizontal, concave (horizontal)
Line	Simple, horizontal	Jagged, simple; Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	Tan, brown	Medium green; tan, light gray;	Tan
Texture	Smooth	Moderate-fine, dense Fine	Uniform, moderate to smooth

Proposed Activity Description

	Landform/Water	**Vegetation**	**Structures**
Form	New road and building pad construction; Exposed soils Moderately sloping	Cleared areas around structure building pads cleared create edges in sagebrush dominated areas	Strongly, narrow (vertical); weakly horizontal, concave (horizontal)
Line	Graded road parallel to line introduces ground plane, linear, directional element	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	Brown, tan	Brown, tan	Tan
Texture	Fine	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term** ☐ Long Term **X**

Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X		X					X		
	Line			X		X					X		
	Color			X			X				X		
	Texture			X			X				X		

Does project design meet visual resource management objectives?

N/A

Additional mitigating measures recommended?

X No

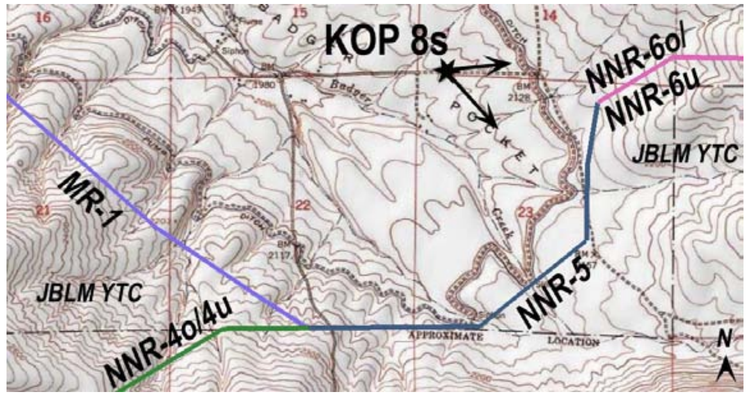
Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project
Date: June 18, 2013
Key Observation Point: KOP 7s-Silka Road
Structure contrasts would typically be strong in this area route segment because no existing transmission lines or similar infrastructure is located in the vicinity of the Project, except on the left from this view (to the south) where there an existing transmission line is currently in view from the rural residential and agricultural landscape. New access roads and vegetation clearing in an area generally without roads or other infrastructure would cause moderate to strong vegetation and landform contrasts.

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project	Location Township 16N Range 20E Section 14 *GPS:* 46° 52' 04" N 120° 17' 41" W	Location Map
Date: June 18, 2013		
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 8s-Upper Badger Pocket Rd		
VRM Class: N/A		



Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rounded	Uniform, simple in FG; Low, clumping, rounded in MG/BG	Strongly, narrow (vertical); weakly horizontal, concave (horizontal)
Line	Simple, horizontal	Jagged, simple; Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	Tan, brown	Medium green; tan, light gray;	Tan
Texture	Smooth	Moderate-fine, dense Fine	Uniform, moderate to smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	New road and building pad construction; Exposed soils Moderately sloping	Cleared areas around structure building pads cleared create edges in sagebrush dominated areas	Strongly, narrow (vertical); weakly horizontal, concave (horizontal)
Line	Graded road parallel to line introduces ground plane, linear, directional element	Straight, soft	Straight, directional, simple (vertical); weakly horizontal, concave (horizontal)
Color	Brown, tan	Brown, tan	Tan
Texture	Fine	Fine	Uniform, moderate to smooth

Contrast Rating **Short Term**☐ Long Term**X**

Degree of Contrast		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X				X				X	
	Line			X			X					X	
	Color			X			X					X	
	Texture			X			X					X	

Does project design meet visual resource management objectives?

N/A

Additional mitigating measures recommended?

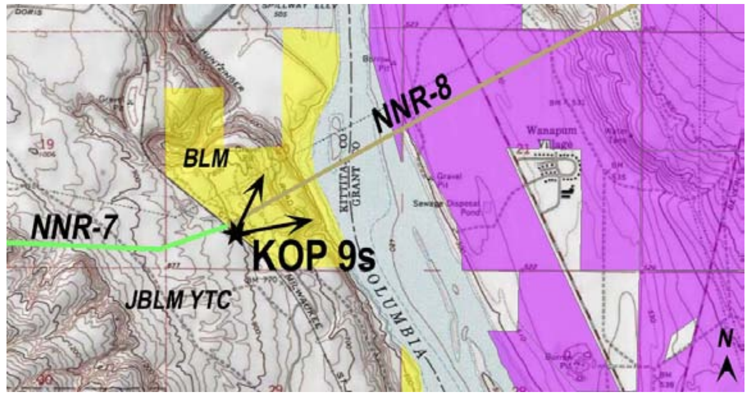
X No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Line Project
Date: June 18, 2013
Key Observation Point: KOP 8s-Upper Badger Pocket Rd
Overhead Design Option: Moderate to weak structure contrasts would be viewed in the middleground and background by rural residence in an agricultural landscape in the context of an existing transmission line. The existing transmission line road would be used, and are seen axially in this view, but spur roads and vegetation clearing would be introduced, causing moderate line and color contrasts at this distance. Skylining would occur as the project traverses a ridge within JBLM YTC, but this would not be readily apparent due to the distance it would occur.


VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project	Location	Location Map
Date: June 18, 2013	Township 16N Range 23E Section 21 *GPS:* 46° 51' 41" N 119° 56' 59" W	
District/Field Office: N/A		
Resource Area: N/A		
Activity (program): 230 kV H-frame wood pole transmission line		
Key Observation Point: KOP 9s- John Wayne Trail		
VRM Class: Interim Class III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat to moderately sloping; rough, rugged	Low, clumping, rounded	Vertical, bold, complex, angular, geometric
Line	Horizontal, angular	Jagged, simple	Angular, simple, thin, concave
Color	Brown, tan	Dark to medium green; tan, light gray;	Gray, white, red
Texture	Course, rough	Moderate-fine, dense	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, flat, geometric	Low, clumping	Vertical, bold, complex, angular, geometric
Line	Hard, angular	Simple, straight	Angular, simple, thin, concave
Color	Tan	Tan, brown	Gray
Texture	Smooth	Smooth, fine	Matte, uniform , smooth

Contrast Rating **Short Term**☐ Long Term**X**

		Features											
		Landform/ Water Body				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X					X				X	
	Line		X					X				X	
	Color			X				X				X	
	Texture			X				X				X	

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

X Yes (see below)

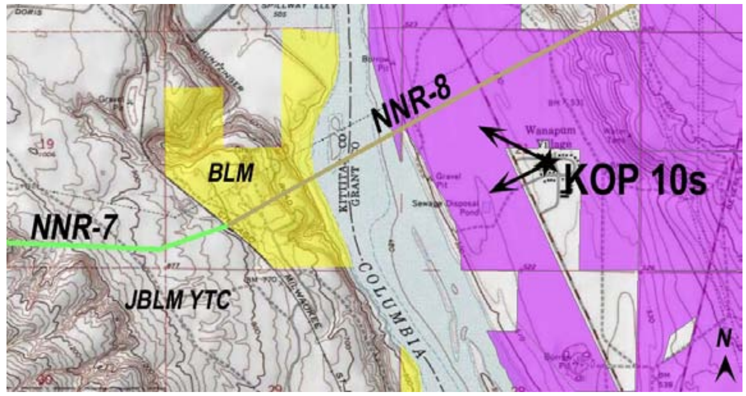
☐No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Line Project
Date: June 18, 2013
Key Observation Point: KOP 9s- John Wayne Trail
Weak contrasts would result from the introduction of lattice steel crossing structures in an industrial dominated landscape with panoramic views. Users of the John Wayne Trail view the Wanapum Dam and associated utility infrastructure, as well as the Columbia River, in a superior position. The building pad of the nearest crossing structure would create moderate contrasts in form and line. The project would be similar in scale, form, line color and texture as the existing crossing structures.


VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission Project	Location	Location Map
Date: May 11, 2011	Township 16N Range 23E Section 21	
District/Field Office: N/A	GPS: 46° 51' 41" N 119° 56' 56" W	
Resource Area: N/A		
Activity (program): 230 kV lattice steel transmission line structures		
Key Observation Point: KOP 10s –Wanapum Village		
VRM Class: N/A		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat in foreground; sloping,	Low, clumping, rounded	Vertical, bold, complex, angular, geometric
Line	Horizontal, angular	Jagged, simple	Angular, simple, thin, concave
Color	Brown, tan	Dark to medium green; tan, light gray;	Gray, white, red
Texture	Course, rough	Moderate-fine, dense	Matte, uniform , smooth

Proposed Activity Description

	Landform/Water	Vegetation	Structures
Form	N/A	N/A	Vertical, bold, complex, angular, geometric
Line	N/A	N/A	Angular, simple, thin, concave
Color	N/A	N/A	Gray
Texture	N/A	N/A	Matte, uniform , smooth

Contrast Rating **Short Term**☐ Long Term **X**

Degree of Contrast		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
N/A

Additional mitigating measures recommended?
X No

Evaluators Names: D. Gilbert

VISUAL CONTRAST RATING WORKSHEET (Form 8400-4)

Project Name: Vantage-Pomona 230 kV Transmission
Date: May 11, 2011
Key Observation Point: KOP 10s –Wanapum Village
Weak contrasts would result from the introduction of lattice steel crossing structures in an industrial dominated landscape with panoramic views. Residences in Wanapum Village have level or inferior views of the project, and the Columbia River is within the viewshed from this KOP. Building pads clearing and grading would not be visible from this KOP, and the project would be similar in scale, form, line color and texture as the existing crossing structures.


APPENDIX D
SEPA CROSSWALK

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DRAFT SEPA Environmental Checklist

Vantage to Pomona Heights 230kV Transmission Line

August 2014

Prepared for:

Washington State Department of Transportation

Washington State Department of Transportation
South Central Region
2809 Rudkin Road
Union Gap, WA 98903

and

Yakima County
Public Services
128 North 2nd Street
Yakima, WA 98901

Prepared by:

DAVID EVANS AND ASSOCIATES INC.

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Bellevue, WA 98005
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http://www.deainc.com

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LIST OF FIGURES

Environmental Checklist

A. Background [help]

1. Name of proposed project, if applicable: [help]

Vantage to Pomona Heights 230kV Transmission Line

2. Name of applicant: [help]

Pacific Power (part of PacifiCorp)

3. Address and phone number of applicant and contact person: [help]

John Aniello
Senior Project Manager, PMP
825 NE Multnomah Street
Portland, OR, 97232

4. Date checklist prepared: [help]

August 22, 2014

5. Agency requesting checklist: [help]

Washington State Department of Transportation and Yakima County

6. Proposed timing or schedule (including phasing, if applicable): [help]

Construction of the project will last approximately 9 months, and is anticipated to start within 4-8 months after the final SEPA determination has been made and after acquiring all necessary permits.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

None have been identified.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

Environmental documents prepared for this project include the following:

- Draft Environmental Impact Statement (published January 2013)
- Supplemental Draft EIS (comparing the new northern route with the preferred alternative identified in the Draft EIS) – published in the Federal Register on October 31, 2014. The SDEIS covered all environmental elements identified as important during the scoping process (see text below).

On January 4, 2013, the Bureau of Land Management (BLM) released the DEIS for public review and comment, identifying an Agency Preferred Route Alternative paralleling an existing transmission line in Yakima County and generally following Road N and crossing the Saddle Mountains in Grant County (Alternative D in the DEIS). Public meetings were held in Selah and Desert Aire in February 2013 to give the public an opportunity to provide their input on the DEIS and Agency Preferred Alternative. The BLM received letters and e-mails containing more than 250 comments during the comment period which ended on March 8, 2013.

As a result of public and agency comments received at the meetings and submitted in writing during the DEIS comment period, the BLM, Pacific Power, and Joint Base Lewis-McChord Yakima Training Center (JBLM YTC) met and identified a new northern route (NNR) that is located largely on JBLM YTC land. BLM determined that a SDEIS was required to analyze the new route.

This new route is similar to a northern JBLM YTC route that was eliminated from consideration in the DEIS because of Western Electricity Coordinating Council (WECC) line separation requirements in place at the time the alternative was being considered. Previously, the separation distance required the placement of the line in areas that would create conflicts with JBLM YTC's aerial operations and military training on the facility. Recently the separation standards were revised by the electrical regulating authorities (WECC and the North American Reliability Corporation). These revisions allow a much closer distance between existing lines and the proposed Vantage-Pomona Heights transmission line, which would minimize impacts to JBLM YTC operations and allow that option to be reconsidered.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

None have been identified.

10. List any government approvals or permits that will be needed for your proposal, if known. [help]

Numerous local, state, and federal permits and authorizations will be necessary for the proposed project. Those permits include, but are not limited to, the following: :

- Administrative Type II permit and SEPA Compliance – Yakima County
- Conditional Use Permit, SEPA Compliance, and County Road Franchise Agreement – Kittitas County
- Building permit and SEPA Compliance – Grant County
- Utility Franchise and/or Easements and SEPA Compliance – WSDOT and WDNR
- National Pollutant Discharge Elimination System (NPDES) – WDOE

Other local, state and federal permits are listed in **Table 1-1** of the SDEIS.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

Pacific Power proposes to construct, operate, and maintain a new 230 kV transmission line from Pacific Power's Pomona Heights substation located just east of Selah, Washington in Yakima County to BPA's Vantage Substation located just east of the Wanapum Dam in Grant County, Washington. **Figure 1-1** of the SDEIS shows the location of the proposed Project within the State of Washington. **Figure 1-2** of the SDEIS shows the Project Study Area and the location of the Pomona Heights and Vantage Substations.

The NNR considered in the SDEIS is 41.0 miles in length (**Figure 2-1** of the SDEIS). The route crosses federal land managed by the BLM, the JBLM YTC, Bureau of Reclamation, and state land managed by WSDOT. There are three counties that are crossed by the NNR: Yakima, Kittitas, and Grant Counties.

As proposed by Pacific Power, most of the transmission line would be constructed on H-frame wood structures between 65 and 90 feet tall. In developed areas, single wood or steel monopole structures between 80 and 110 feet tall would be used. The NNR transmission line route would cross the Columbia River below the Wanapum Dam on steel lattice structures approximately 200 feet tall. The existing Pacific Power Pomona Heights substation and the existing BPA Vantage substation would be upgraded with installation of new equipment to interconnect the new 230 kV transmission line to the regional electric grid.

Further details on the proposed project are provided in **Chapter 2 Proposed Action and Alternatives** of the SDEIS.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

See response to item 11., above.

B. Environmental Elements [help]

1. Earth

a. General description of the site [help]
(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____________

Topography in the Project area consists of gently rolling to moderate hilly plateaus and steep slopes from Umtanum Ridge, Manastash Ridge, and the Saddle Mountain Ridges to the Columbia River. Elevations in the Project area range from 490 to 3,400 feet above sea level.

See **Section 3.15.2.1** and **Section 3.15.2.2** of the SDEIS for more information.

b. What is the steepest slope on the site (approximate percent slope)? [help]

The steepest slopes on the site are along route segment NNR-8, which has some vertical cliffs dropping down to the Columbia River.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

The soil types present in the Project area can be generally divided into three groups:

- Soils found on alluvial fans;
- Soils found on uplands, hillslopes, ridgetops and benches; and
- Soils found on terraces, floodplains, escarpments and channeled scablands.

Table 3.15-1 in the SDEIS describes the soil units in more detail.

Prime and unique farmland and farmland of statewide importance are decribed in **Section 3.4 Land Jurisdiction and Land Use**. Acres of land managed for commercial crops in the project area are identified in **Table 3.4-2**. Miles of prime and unique farmland and farmland of statewide importance crossed by each proposed route segment are described in **Table 3.4-7**. Impacts of each project alternative on irrigated and dryland agriculture are described in **Table 4.4-3**.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

Yes. The NNR crosses two areas of moderate-to-high susceptibility to liquefaction – one large area along the Columbia River in route segment NNR-8 and one small area in NNR-2, as well as approximately seven documented landslide deposits (six along NNR-6 and one along NNR-7). See **Section 3.15.2.2** of the SDEIS for more information.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

Section 4.15 discusses impacts to soils based on area and length of route. Fill would be required for roads and underground design options. Excavation and grading quantities will not be available until a preferred alternative has been selected and final design has been conducted.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Potential soil-related impacts of the project would include the following:

- Increased soil erosion in areas where construction activities have disturbed or altered the land surface by exposing soils (temporary);
- Construction of permanent access roads potentially resulting in accelerated wind and water erosion rates (permanent); and
- Degradation of the land surface and loss of soils resulting from accelerated soil erosion (temporary to permanent).

See discussion in **Section 4.15** of the SDEIS for more information on soils and geologic hazards.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Impervious surface numbers are not available at this stage of design. However, a reasonable estimate can be made by considering long term disturbance from structure footprints combined with new and significantly improved roads. Most roads will not be paved, but instead will be compacted gravel. These surfaces will still be relatively impervious, however.

- 39.8 to 71.5 acres of long term disturbance due to new and improved roads between NNR and Manastash Ridge subroute
- 4.98 to 8.5 acres of long term disturbance from work pads and pole structures between the NNR overhead design option, underground design option, and Manastash Ridge subroute
- 0.17 acre of impervious surface due to the footings of the steel lattice structures

See **Table 2-7** and **Table 2-10** in the SDEIS for more information.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Section 2.5.9 of the SDEIS describes environmental protection measures committed to by the Project proponent that will help reduce/control erosion and other impacts to the earth. These measures include **SGW-11**, which calls for applying and maintaining standard erosion and sediment control methods to minimize erosion.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

The primary types of air pollution during construction would be:

- Combustion pollutants from equipment and vehicle exhaust;
- Fugitive dust particles from disturbed soil associated with auguring holes or foundations for structure installation (overhead design option);
- Fugitive dust particles from disturbed soil associated with land clearing, top soil removal, as well as trenching and backfilling (underground design option);
- Fugitive dust from grading and earth moving associated with access road construction; and
- Fugitive dust from construction vehicles traveling on unpaved roads becoming airborne.

Implementation of any of the alternatives would have similar emissions and impacts on air quality. Primary sources would be combustion pollutants from equipment and vehicle exhaust and fugitive dust from construction. Impacts to air quality from any of the build alternatives are expected to be short-term, localized, and low.

The primary emission sources associated with the operation and maintenance (O&M) phase of the Project include fugitive dust from vehicles using unpaved access roads and vehicle emissions during periodic maintenance or emergency repair activity. Quantities of emissions would be very small, temporary, and localized. Therefore, air quality impacts during O&M of the proposed Project would be low or none.

See **Section 4.13.3** of the SDEIS for more information.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

None have been identified.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

See **Section 2.5.8** in the SDEIS for proposed measures to avoid or minimize impacts to air quality.

3. Water

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

The primary surface water features found within the Project area include the Columbia River in the eastern portion of the Project area and the Yakima River in the western portion. In addition to the Columbia River, Lmuma, Burbank, Johnson, Foster, and Selah Creeks are present within the Project area and contain perennial flow for much of their length. Lmuma and Selah Creeks are crossed by the NNR and flow to the Yakima River, while Johnson and Foster Creeks, located outside of the ROW, flow to the Columbia River.

With the exception of the perennial streams and rivers mentioned above, water in the Project area is scarce. Streams are generally unnamed, small and intermittent, flowing for a short period of time in the spring or in response to a large storm event. Named intermittent drainages in the Project area include Scorpion Coulee Creek and Badger Creek, both of which are crossed by the NNR.

See **Section 3.14.4** in the SDEIS for more information on water resources by route segment.

Help Info: Water bodies include year round and seasonal streams, saltwater, lakes, ponds, wetlands, domestic water intakes, or any forested or un-forested wetlands on the site or down stream/down slope. Please identify possible fish bearing streams and note that an intermittent stream might have fish present for a few weeks or months of the year during periods of high flow.

Within the Project area, aside from the Yakima and Columbia Rivers, only Johnson and Lmuma Creeks (tributaries of the Yakima River) are known to support fish populations (see **Section 3.3.3.2**).

Help info: Also note the presence of seeps,springs, wetlands or manmade water bodies. The site may appear dry but include areas that are transitional between open water and uplands, or it may be periodically inundated or saturated.

Seeps, springs, wetlands, and manmade waterbodies are discussed in **Section 3.14.2.6** through **Section 3.14.2.9.**

Help info: Please note any water quality issues relevant to the surrounding watershed such as a Total Maximum Daily Load, or TMDL. This is a locally focused scientific study that calculates the pollution a waterbody can receive and still meet water quality standards. It provides information about the existing conditions and how sensitive the watershed is additional development impacts.

No water features within the Project area have been identified as impaired by the WDOE (see **Section 3.14.2.3)**.

Help Info: Describe any water-based invasive species known to exist in the area (e.g., water milfoil, New Zealand mud snails, yellow flag iris, Brazilian elodea) and steps taken to avoid their spread during the project. Describe any measures that will be taken to ensure that the equipment being used is not introducing or spreading invasive species. The Washington Invasive Species Council has developed prevention protocols to be used when working in or near water. For the removal or placement of in-water structures, describe how the material either to be removed or placed has been checked for invasive species and how any invasive species found will be removed and disposed of appropriately.

No water-based invasive animal species (e.g., New Zealand mud snail) are known to occur within the project area.

Plant invasive species known to occur within the Project area include purple loosestrife and reed canarygrass. See **Section 3.2 Vegetation** (**Table 3.2-2)**, **Section 3.2.4** (for occurences by route segment), and **Appendix B-4 Noxious Weed Report** for more information**.**

Preventative measures to avoid their spread are included in Project Design Features (PDFs) such as **BIO-5, BIO-10, BIO-11** in **Section 2.5.2 Biological Resources**. A Noxious Weed and Invasive Plant Management Plan will be developed and incorporated into the final Plan of Development.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Help info: Any part of the project, plan, or other proposal that impacts the shoreline of a water body is identified in this answer. Include grading, fill, or excavation; installation, construction, or demolition; paving; painting or maintenance activities; storage of materials; planting or removal of vegetation; etc. if it will occur within 200 feet of the water and describe where the activities will take place in relation to the waterbody.

You must identify the possibility of intentonal or inadvertent filling of, or runoff to streams, wetlands or other water bodies. Attach plans (or preliminary schematic drawing with all water bodies included), if appropriate for the type of activity. If the project involves impacts to aquatics lands, you may need a hydraulic project approval (HPA) from the state Department of Fish and Wildife, shoreline permits from the local government and possibly a use authorization from the Department of Natural Resources.

Direct impacts to water resources would be caused by access road construction and improvements, right-of-way (ROW) clearing, and site preparation for structures and other facilities such as pulling and tensioning sites, and potentially, maintenance activities. Transmission structures would not be located in intermittent or perennial streams or wetland areas. Depending upon final design, some access road improvements or new access roads may impact intermittent and perennial water courses; however, existing paved and unpaved roads and trails would be used where possible. No long-term impacts to water resources are anticipated to occur as a result of the proposed Project.

The possibility of intentional or inadvertent filling of or runoff to streams, wetland, and other waterbodies is discussed in **Section 4.14.1.3** and **Section 4.14.3**. Potential required permits are discussed in **Section 3.14.3**. Specific erosion and sediment control measures and locations will be specified in a Stormwater Pollution Prevention Plan (SWPPP) as part of the Plan of Development (POD).

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

Help Info: Describe the quantity, type of material, and the location including the size of the area to be filled or dredged. Include the results of toxicity tests or other information about the fill or dredge material. Fill is any material that will change the bottom elevation of an aquatic area, wetland, or water body.

Water bodies include year round and seasonal streams, saltwater, lakes, ponds, wetlands, domestic water intakes, or any forested or un-forested wetlands on the site or down stream/down slope.

Example: Remove 4,000 cubic yards of silt and gravel from Big River to maintain navigational channel between river mile (RM) 3.5 and RM 6.2. Results of toxicity tests are attached.

As stated previously, the Project is not anticipated to result in any long term impacts to perennial waterbodies. However, quantified fill and dredge amounts will not be available until a preferred alternative is selected and design is advanced.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

Help info: Describe the quantity and location of any surface water withdrawal or use even if for a nonconsumptive use (meaning that the same quantity of water is returned to the waterbody). This includes temporary or long-term use.

Diversions refer to changes in flow patterns, such as diverting a stream away from a building site or the creation of ponds or inlets.

Ecology regulates the withdrawal of water from surface and underground sources. A permit is not required if the withdrawal is less than 5,000 gallons per day for industrial or domestic use, or for stock watering.

Any work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state may require a Hydraulic Project Approval from the Washington Department of Fish and Wildlife.

For projects involving State-Owned Aquatic Lands, a use authorization from Department of Natural Resources may be needed.

Also consider the connectivity between water bodies for situations of water diversion. Does diversion source contain invasive species that could spread to a new water body?

The Project would not permanently alter the flow in any streams or rivers. The transmission line would span all streams, drainage courses, and rivers; and no structures would be placed in active channels, nor would any specific surface water withdrawals or diversions be required. See **Section 4.14 Water Resources**. However, depending upon final design, some access road improvements or new access roads may temporarily impact intermittent and perennial water courses; however, existing public paved and unpaved roads and trails would be used where possible. A total of 4.5 miles of intermittent streams/gullies will be crossed by all the route segments. See **Section 4.14**, **Table 4.14-2**, and **Table 4.14-3** for more information**.**

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

The NNR crosses 100-year floodplains associated with Lmuma Creek as well Selah Creek. Transmission structures would not be located in intermittent or perennial streams or wetland areas. Transmission line structures may be placed within the 100-year floodplain; however, placement of structures within the floodplain and constructing access roads to these structures is not expected to affect the function and flood storage of the floodplain, or impede or redirect flood flows.

Refer to **Appendix A**, **Water Resources** map for the identified 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

Help Info: Include waste or contaminates associated with industrial wastewater; domestic sewerage; agricultural runoff; stormwater drainage from parking lots, equipment storage areas, chemically-treated lawns and landscaping; etc. Describe the source, the likely contaminates, and quantities if known.

Waste materials means hot or very cold water, sediments, chemical by-products, wash water, sewage, stormwater and other pollutants.

Discharge includes seeping or dripping of hot or very cold water; sediment filled water, controlled runoff, or liquid by-products of an activity, such as bore hole drilling waste products.

Water bodies include year round and seasonal streams, saltwater, lakes, ponds, wetlands, domestic water intakes, or any forested or un-forested wetlands on the site or down stream/down slope. Please identify possible fish bearing streams and note that an intermittent stream might have fish present for a few weeks or months of the year during periods of high flow.

To reduce impacts to water resources, standard erosion and sediment control measures would be implemented. These measures may include using certified weed-free straw wattles and bale barriers, and silt fencing placed at construction boundaries and where soil would be disturbed near a wetland or waterbody. Temporary culverts of appropriate size or temporary work bridges would be installed where needed to minimize stream bank degradation, erosion, and sediment deposition into the waterway. These temporary structures would be removed following completion of construction. Specific erosion and sediment control measures and locations will be specified in a Stormwater Pollution Prevention Plan (SWPPP) as part of the Plan of Development (POD).

See **Section 4.14.3** and **Section 4.14.4** for more discussion of impacts to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

Help info: Describe any new or increased groundwater extractions, including use or purpose and approximate quantities if known. For water discharges to ground, remember to consider how stormwater runoff collected from impervious surfaces is managed onsite. The water resources web map may be a helpful tool.

Excavation for transmission line foundations could encounter groundwater that is close to the surface. Foundation excavation could temporarily alter groundwater flows and could require dewatering to remove excess water from the construction worksite. Dewatering could impact the level of the water table, increase soil erosion, and increase the presence of surface water down slope from foundation excavation areas. If groundwater is encountered, dewatering would be performed in accordance with authorizations from applicable regulatory agencies and as detailed in the SWPPP. Dewatering procedures may involve discharge to catch basins, temporary settling basins, temporary holding tanks, or vacuum trucks. Soil compaction from access roads and work areas could alter ground surface percolation rates which would alter groundwater recharge to underlying aquifers. Impacts to groundwater are anticipated to be short-term and would be minimized by erosion and sediment control measures, tilling to reduce soil compaction, and restricting construction vehicle movement to pre-designated access locations. Water will not be discharged to surface water.

See **Section 4.14 Water Resources** for more information.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, thenumber of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

Help info: "Waste material" includes chemicals, sediments, agricultural (pesticides, herbicides, and fertilizer) runoff, wash water, logging slash, log booming or storage debris, treated wood pilings, <u>oil or other fuels from equipment used for construction and/or operational activities</u>.

Short-term impacts to groundwater could result from spills of fuel, oils, hydraulic fluid, or other substances. For example, pollutants could be introduced from improper equipment use. Contamination of water resources through spills would be minimized by project design features (PDF) identified in **Section 2.5** such as: providing spill prevention kits and other practices described in the Spill Prevention, Control, and Countermeasure Plan. If refueling and maintaining equipment must occur onsite, these activities will occur outside a 100-foot radius of a waterbody, a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water supply wells. In addition, for route segments on the JBLM YTC, refueling would not occur within 656 feet of any drainage, wet or dry, and parking or staging of vehicles would be at least 328 feet from drainages. Impacts to groundwater from the application of herbicide for weed control would be avoided by following procedures outlined in the Noxious Weed Control Plan, a part of the POD, including applying herbicides according to the label instructions, using certified pesticide applicators, and maintaining no-spray buffer zones along streams.

In addition to these materials, there is a potential for release of drilling fluid to groundwater during horizontal directional drilling, which can occur when pressure in the drill hole is not maintained and a loss of circulation of drilling fluid occurs. This is typically caused by pressurization of the drill hole beyond the containment capability of the overburden soil material, which allows the drilling fluid to flow to the ground surface. Releases can be caused by fractures in bedrock or other voids in the geologic strata that allow the fluid to surface even if down hole pressures are low.

See **Section 4.14 Water Resources** for more information.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

Help info: Describe the following:

1. Source of runoff

2. Intended management systems

3. Where and how the runoff will be discharged off the project site

4. Where and how the runoff will flow to ground or suface waters

Water runoff in the project area originates primarily as precipitation that falls onto various natural and artificial surfaces, and either infiltrates or collects and discharges at natural low points. During construction, water runoff would be minimized by applying and maintaining standard erosion and sediment control methods (specified in the SWPPP). Most water runoff will follow existing drainage patterns. Culverts of appropriate size would be installed where needed and disturbed areas would be reseeded. In addition, all construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and stream banks. See **Section 4.14 Water Resources** and **Section 2.5.9** for PDFs related to water resources.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Help Info: In considering whether waste could be carried to ground or surface waters, consider potential sources of contamination (such as parking lots, equipment storage, agricultural practices, lawn and landscaping maintenance, animal waste, treated wood, eroding soils, etc.), any treatment provided, and where the runoff will flow or be discharged. Describe the type/source of potential contamination and the waterbody or aquifer it is likely to end up in.

See response to b.2) above.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The Project would not permanently alter the flow in any streams or rivers. The transmission line would span all streams, drainage courses, and rivers; and no structures would be placed in active channels, nor would any specific surface water withdrawals or diversions be required. See **Section 4.14 Water Resources**. However, depending upon final design, some access road improvements or new access roads may temporarily impact intermittent and perennial water courses, although, existing public paved and unpaved roads and trails would be used where possible. A total of

4.5 miles of intermittent streams/gullies will be crossed by all the route segments. See **Section 4.14**, **Table 4.14-2**, and **Table 4.14-3** for more information.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

See PDFs in **Section 2.5**, including **SGW-1, SGW-7, SGW-8, SGW-9, SGW-11,** and **SGW-12**. Erosion and sediment control measures and locations will be specified in a SWPPP as part of the POD.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____orchards, vineyards or other permanent crops.
____wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

Help info: Describe if plant species present on site or used in the project are listed as noxious or invasive.

Vegetation within the Project area is described in detail in **Section 3.2.2.1**. Generally, vegetation consists primarily of annual grassland, sagebrush, perennial grassland and agriculture.

b. What kind and amount of vegetation will be removed or altered? [help]

The amount and type of vegetation disturbed is presented in **Table 4.2-4**.

c. List threatened and endangered species known to be on or near the site. [help]

Special status plants (including ESA listed Endangered and Threatened Species) are discussed in detail in **Section 3.2.2.3** and in **Appendix B-3 Special Status Plants Report.**

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

See **Biological Resources** PDFs (such as **BIO-5**, **BIO-7**, and **BIO-12**) in **Section 2.5.2**.

e. List all noxious weeds and invasive species known to be on or near the site.

Noxious weeds and invasive species are described in **Section 3.2.2.2** and in **Appendix B-4 Noxious Weed Report.**

5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include: [help]

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other ________

Representative wildlife species for the Project area are presented in **Table 3.3-1** and are described by habitat type in **Section 3.3.3.1**.

b. List any threatened and endangered species known to be on or near the site. [help]

Federally threatened, endangered, and candidate species known to occur or which are likely to occur within the Project area are discussed in **Section 3.3.3.2**.

c. Is the site part of a migration route? If so, explain. [help]

Migration routes and corridors are discussed by special status species, where applicable, in **Section 4.3 Wildlife and Special Status Wildlife Species**.

Several special status fish species, such as bull trout, Chinook salmon, and Pacific lamprey, use the Columbia River as a migratory corridor to and from their freshwater breeding sites to the ocean. Similarly, the Columbia River is an important migratory pathway for waterfowl and other birds as they move north and south along the Pacific Flyway. Also, the proposed northern route crosses an area identified as an important linkage corridor between extant populations of greater sage grouse (see **Appendix B-5** of the SDEIS for more information).

d. Proposed measures to preserve or enhance wildlife, if any: [help]

See **Biological Resources** PDFs in **Section 2.5.2.**

e. List any invasive animal species known to be on or near the site.

No water-based invasive animal species (e.g., New Zealand mud snails) are known to occur within the project area.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

Gasoline, diesel fuel, and helicopter fuel will be used for construction, operation, and maintenance equipment. The Project is an electric transmission line and therefore will be a source of electric energy for a variety of consumer uses.

f. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

The proposed Project does not cross any lands known to be planned for solar power development. The proposed route does pass through a portion of the state with the second highest potential for solar output (4.1 kilowatt hours/m^2/day). Land occupied by the new 230 kV ROW would not be available for solar power development.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

None that have been identified.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, riskof fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

1) **Describe any known or possible contamination at the site from present or past uses.**

See **Section 4.16 Public Health and Safety** for a discussion of potential Project impacts.

2) **Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.**

None that have been identified.

3) **Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.**

None that have been identified.

4) **Describe special emergency services that might be required.**

Due to the remote nature of the Project area, medical emergencies could require airlifting of victims. Any use of helicopters or other aircraft during Project construction will require close coordination with JBLM YTC because this federal facility is restricted air space.

5) **Proposed measures to reduce or control environmental health hazards, if any:**

See PDFs in **Section 2.5.7 Wildland Fire** and **Section 2.5.10 Public Health and Safety** for more information.

b. Noise

1) **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]**

The Project area has relatively low ambient noise levels due to its rural setting. Higher noise levels occur primarily near highway crossings and in agricultural areas. Additional noise is also created by military operations occasionally occurring at the JBLM YTC, and noise levels are somewhat higher near the I-82 corridor and the more urbanized areas of Yakima and Selah. Overall, the Project area typically ranges from very quiet with natural sounds such as birds, insects, and wind dominating, to noisy in localized areas during periods of military operations at JBLM YTC, agricultural operations, shooting, and other outdoor activities generating isolated and periodic peaks of higher levels of noise.

See **Section 4.16.3.1** for more information.

2) **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [help]**

Noise from the proposed Project can be classified into several types: corona noise (i.e., line crackling), construction noise, and radio noise. Corona and radio noise are more likely in higher voltage lines (more than 230kV). Corona noise would only occur during inclement weather and would likely fall below 60 decibels (dBA). Construction noise would be generated by a wide range of on-site and off-site equipment. The loudest sources of on-site construction noise would include helicopters and blasting. These activities could generate short term intermittent noise levels of 90 to 100 dBA for helicopters and up to 125 dBA for blasting. Off-site sources of noise would be produced primarily by traffic of equipment and personnel, with peak noise levels of between 70 to 75 dBA. Overall, construction noise would extend over a period of approximately 12 months, but work would progress along the selected route, and would seldom be generated from one location for very long.

See **Section 4.16.3.3** for more information.

3) Proposed measures to reduce or control noise impacts, if any: [help]

The following PDFs address noise impacts: **LU-10, PHS-7, PHS-8,** and **PHS-11**.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed project passes through mostly undeveloped land in south-central Washington. Land ownership is mostly on public land, with between 70 and 75 percent of the routes crossing federal land (mostly on the JBLM YTC) , between 2 and 5 percent on state land, and between 23 and 25 percent on private land. Land use in these areas includes residential near communities like Yakima and Vantage, grazing, irrigated agriculture, military, existing utilities, recreation, conservation, and transportation.

The proposed route will have generally low to moderate levels of impact to existing and future land uses, resulting primarily from short term displacement of land uses during construction and long term displacement of some land uses that are incompatible with transmission (e.g., residences under the lines). The largest long term disturbance will be to military uses on the JBLM YTC.

See **Section 4.4.3** and **Section 4.4.4** for more information.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

The various route segments cross a total of 11.8 miles of Farmlands of Unique Importance and 3.6 miles of Prime Farmland. More than 3,800 acres of active croplands have been identified in the Project area (two-mile corridor around and adjacent to proposed route alignment). However, none of these active croplands are actually crossed by the proposed route. No forest land of long-term commercial significance will be converted or affected.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

There will be short-term disturbance to some agricultural land uses, mostly grazing, during construction, but these land uses are generally compatible with transmission so they should resume immediately upon completion of construction. There is no working forest land within the project area.

c. Describe any structures on the site. [help]

Structures along the proposed route are limited to existing utility infrastructure (e.g., poles, substations, existing distribution lines, etc.).

d. Will any structures be demolished? If so, what? [help]

Existing distribution lines (and some of the poles that support them), will be replaced with transmission underbuild, particularly in route segments NNR-1 and NNR-2.

e. What is the current zoning classification of the site? [help]

Zoning classifications are only applicable on private land or land owned by the local agencies. In Grant County, zoning along those private portions of route segment NNR-8 are zoned Rural Remote. In Kittitas County, zoning along those private portions of route segment MR-1 are Agriculture and Commercial Agriculture. Along route segments NNR-3 and NNR-4, zoning is mostly Forest and Range. Within Yakima County, zoning along route segments NNR-1, NNR-2, and NNR-3 include Remote/Extremely Limited Development Potential, Agriculture, and Valley Rural.

See **Appendix A, Zoning Map** in the SDEIS.

f. What is the current comprehensive plan designation of the site? [help]

In Kittitas County, the NNR passes through areas designated as Rural Working near the Columbia River and Badger Pocket, with the remainder of the County's portion of the NNR in Commercial Agriculture. In Yakima County, the Plan 2015 designations crossed by the NNR include Rural Remote, Agriculture Resource, Rural Self-Sufficient, and Federal Land. In the short section of Grant County near the Vantage Substation, the NNR is located within a comprehensive plan designation of Rural Remote.

g. If applicable, what is the current shoreline master program designation of the site? [help]

In Grant and Kittitas Counties, the shoreline of the Columbia River is designated as Rural Conservancy under the Counties' respective Shoreline Management Acts. The proposed Project does not cross any areas in Yakima County that fall under shoreline jurisdiction.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

In general, Grant, Kittitas, and Yakima Counties identify the following as critical areas:

- Wetlands
- Critical Aquifer Recharge Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas
- Fish and Wildlife Conservation Areas

The presence of these various critical areas and potential impacts to them are addressed in various sections of the SDEIS, according to the following chart:

Critical Area	Location in SDEIS for Information
Wetlands	Section 3.14; Section 4.14
Critical Aquifer Recharge Areas	Section 3.14; Section 4.14
Frequently Flooded Areas	Section 3.14; Section 4.14
Geologically Hazardous Areas	Section 3.15.2.2; Section 3.15.4; Section 4.15 (Table 4.15-2 and Table 4.15-3)
Fish and Wildlife Conservation Areas	
Streams, Lakes, Ponds, and Riparian Areas	Section 3.14; Section 4.14
Big Game Winter Range (Kittitas County)	Section 3.3; Section 4.3
Upland Wildlife Habitat (Yakima County)	Section 3.3; Section 4.3
Priority Habitats and Species	Section 3.3; Section 4.3
Species of Local Importance	Section 3.2, Section 3.3; Section 4.2, Section 4.3

i. Approximately how many people would reside or work in the completed project? [help]

None.

j. Approximately how many people would the completed project displace? [help]

The proposed project would result in no displacements.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

Not applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

See **Section 2.5.3** for PDFs related to land use.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

Project impacts are limited primarily to dispersed grazing. No active croplands will be affected. See **Section 4.4 Land Use** for more information.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

No housing would be provided by the proposed project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

No housing would be eliminated by the proposed project.

c. Proposed measures to reduce or control housing impacts, if any: [help]

Not applicable.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

The steel lattice towers proposed for crossing the Columbia River will be approximately 200 feet tall. Poles will be made of wood or steel. The conductor (the wire cable strung between transmission line structures through which the electric current flows) would be aluminum stranded with a steel stranded reinforced core. See **Section 2.4.2** for more information.

b. What views in the immediate vicinity would be altered or obstructed? [help]

Section 4.8 Visual Resources in the SDEIS analyzes the visual impact of the proposed Project in detail. Specifically, **Table 4.8-11** summarizes the residual visual impacts (after application of mitigation meaures) of the proposed Project. Most of these impacts are considered low. Between 4.8 and 14.1 miles of the proposed Project area will have high residual impacts, compared to 16.5 miles in the DEIS Preferred Alternative.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

See **Section 2.5.5** for PDFs related to visual impacts.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

No lights are proposed on any of the transmission structures. Lighting at the existing substations would be unchanged. FAA may require lights on the steel lattice structures that will be used at the crossing of the Columbia River (see **LU-20** in **Section 2.5.3**). Depending on the material used for the conductors, the transmission lines may produce glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

To reduce visual contrasts caused by glare created by standard aluminum conductors (wires), non-specular conductors will be used. See **Section 4.8 Visual** for more information.

c. What existing off-site sources of light or glare may affect your proposal? [help]

None have been identified.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

PDF **VIS-6** in **Section 2.5.5** would minimize light and glare impacts from the proposed Project.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Recreational opportunities in the project area include the following:

- Yakima River Canyon Management Area – hiking, hunting, camping, fishing, rafting
- Selah Butte Watchable Wildflower Area
- John Wayne Pioneer Trail/Iron Horse State Park – walking, hiking, biking, cross-country skiing, snow shoeing, dog sledding
- Selah Cliffs Natural Area Preserve
- Wanapum Heritage Center and Picnic Area
- Wanapum Lake (Columbia River) – fishing, boating, jet skiing, water skiing
- WDFW Game Management Units 278, 340, 371, and 372

See **Section 3.5 Recreation** for more information on recreational resources in the project area.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

Most impacts to recreation in the Project area will consist of short term displacement of dispersed hunting activities during construction. In route segments NNR-7 and NNR-8, impacts to users of the John Wayne Pioneer Trail from dust and noise disturbance are possible during construction. It is also possible that part of that trail would need to be permanently realigned or temporarily closed during construction.

See **Section 4.5 Recreation** for more information on the effects of the proposed project on recreation.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

Implementation of mitigation measure REC-1 (see **Table 4.5-2**) will minimize the effects of Project construction with ongoing recreation. This measure states that within the standard limits of structure design, single pole and

H-frame structures will be located so as to span or avoid sensitive features, and to preserve recreational uses. Avoidance measures may include structure micro-siting, placing access roads and structures at the edge of park boundaries, spanning features, placing structures outside of use areas, or realigning access roads and ROW centerline.

See **Section 4.5** for more information on the effects of the proposed project on recreation.

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe. [help]

NNR Alternative - Overhead Design Option

A total of 63 cultural resources have been recorded within 75 feet of the NNR Alternative centerline. These include four Traditional Cultural Properties (TCPs), one culturally sensitive area, 38 archaeological sites, 20 isolated finds, and one architectural resource. Forty-four of these resources have either been determined eligible to the National Register of Historic Places (NRHP) or are unevaluated but are assumed to be eligible. Over 67 percent of the land within 75 feet of the centerline has been previously surveyed for cultural resources and it is likely that additional cultural resources that could be determined eligible for the NRHP may be found in the unsurveyed areas and possibly in areas that are resurveyed prior to construction.

NNR Alternative - Underground Design Option

A total of 63 cultural resources have been recorded within 75 feet of the NNR Alternative centerline. These include the same resources mentioned above for the Overhead Design Option. Over 67 percent of the land within the corridor has been previously surveyed for cultural resources and it is likely that additional cultural resources that could be determined eligible to the NRHP may be found in the unsurveyed areas and possibly in areas that are resurveyed prior to construction. Nine known archaeological sites, nine isolated finds and two TCPsare within the route segments (NNR-4, NNR-6) in which the Underground Design Option would be used. Nearly 90 percent of the land within these two segments has been previously surveyed for cultural resources.

NNR Alternative with MR Subroute

A total of 59 cultural resources have been recorded within 75 feet of the NNR Alternative with MR Subroute centerline. These include four TCPs, one culturally sensitive area, 38 archaeological sites, 15 isolated finds, and one architectural resource. Forty-three of these resources have either been determined eligible to the NRHP or are unevaluated but assumed to be eligible for this analysis. Over 64 percent of the land within 75 feet of the centerline has been previously surveyed for cultural resources and it is likely that additional cultural resources that could be determined eligible to the NRHP may be found in the unsurveyed areas and possibly in areas that are resurveyed prior to construction.

See **Table 4.11-2, Table 4.11-3,** and **Table 4.11-4** for more information.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

Excluding TCPs, there are 53 previously documented cultural resources within the 150-foot survey corridor and 73 cultural resources within the 500-foot survey corridor around route segments NNRs 1-8 and MR-1 (see **Table 3.11-2** and **Table 3.11-3**), including those in DAHP records and sites recently recorded by the Yakama Nation Cultural Resources Program (YNCRP). Also, four TCPs and one culturally sensitive area have been reported within the 150-foot or 500-foot survey corridors of the nine route segments. An ongoing TCP study for the Project may reveal additional TCPs along the NNR.

The current findings indicate the NNR crosses four TCPs and a culturally sensitive area. The TCPs include ceremonial sites, traditional use sites, legendary sites, and other culturally sensitive properties.

Cultural resources surveys have been conducted by YNCRP staff as well as the Confederated Tribes of the Colville Reservation.

See **Section 3.11.4,** and **Table 3.11-2** and **Table 3.11-3** for more information.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The YNCRP conducted cultural resource surveys on federal land along some route segments (see **Section 3.11 Cultural Resources and Native American Concerns**). The Cultural Resources Program of the Confederated Tribes and Bands of the Yakama Nation (under contract with Pacific Power) collected oral histories and conducted a TCP study for the Project area, and conducted a second study for the NNR and portions of Alternative D. Also, because the NNR lies within the traditional territory of the Moses Columbia Tribe, the Confederated Tribes of the Colville Reservation History and Archaeology Program (under contract with Pacific Power) will conduct further TCP studies in the area and prepare a report.

Locations of all previously recorded prehistoric and historic resources, including isolated finds, and of previously conducted cultural resource investigations within one mile of one or more of the alternative route segment centerlines were entered into a geographic information system (GIS) database. Over 2,750 cultural resources have been previously recorded within one mile of the centerline of each alternative including the NNR. Only 190 of these are located within 250 feet of the centerlines. It is acknowledged that:

- Site boundaries are sometimes not well defined; and
- Site data may change as nearby projects increase the number of known sites in the Project vicinity.

Also, the record search identified 31 cultural resource surveys that have been conducted within 75 feet of either side of the alternative centerlines, including the NNR. As a result of previous and recent surveys of federal land along some segments by the YNCRP, the proportion of surveyed land is 67 percent within the 150-foot corridor and 65 percent within the 500-foot corridor.

See **Section 3.11.1** and **Section 4.11.1.1** for more information.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

To ensure compliance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 Code of Federal Regulations (CFR) Part 800, Pacific Power will implement stipulations of a Programmatic Agreement (PA) prepared and signed by the BLM, the lead federal agency for Section 106 compliance, JBLM YTC, Reclamation, BPA, Washington State Historic Preservation Officer (SHPO), and other parties. The PA will define the Area of Potential Effects (APE) and will stipulate procedures for:

- identifying cultural resources within the APE;
- evaluating their significance;
- assessing effects;
- avoiding or mitigating adverse effects;
- emergency discoveries;
- reporting; and

- Native American consultation.

Before construction, Pacific Power would arrange for an intensive pedestrian cultural resource survey on all federal and state lands, and on private lands where permission of the land owner has been granted prior to survey. Survey would be conducted within all areas of possible physical disturbance within the APE of the selected alternative following BLM manual guidelines. The APE for the undertaking includes all involved federal, state, and private lands and will include:

- The transmission line ROW along the centerline;
- Any existing unpaved access roads/existing roads that may require improvement and new roads;
- Staging areas, laydown areas, pulling and tensioning areas, and any other temporary use areas; and
- Geotechnical drilling boring locations and new or improved access roads to the drill sites.

APE dimensions will be determined by the BLM and appropriate land managing agencies. The APE for assessing visual effects on cultural resources will be land within a specific distance of the transmission line as determined by the parties to the PA.

The BLM, in consultation with other parties to the PA, will develop and implement specific measures to mitigate adverse effects. These may include Project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies. By finalizing and implementing the PA, the Section 106 process would be complete, although specific activities would still need to be carried out by the BLM and Pacific Power. Procedures for evaluating NRHP eligibility, assessing effects, and mitigating adverse effects at specific cultural resources will be addressed in a Historic Properties Treatment Plan prepared after the cultural resource survey has been completed.

See **Section 4.11.5** for more information.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

The main roadways in Grant, Kittitas, and Yakima Counties in the Project area include Interstate (I) 82, Washington State Route (SR) 821 and SR 243. Highways just outside the Project area include I-90 to the north, US Highway 12 to the west, SR 24 to the south, and SR 26 to the northeast. The only county road in the Project area is the Beverly-Burke Road.

In Kittitas County, the major roads in the Project area include:

- Huntzinger Road, a Rural Road running along the eastern boundary of the JBLM YTC in a north-south direction. The road provides access to residences and agricultural operations which also border the western shore of the Columbia River, as well as providing access to the Wanapum Reservoir and the Columbia River/Priest Rapids Reservoir. The road travels from the north, out of the Project area and into the town of Vantage. To the south, the road changes surfaces from paved to gravel adjacent to the Auvil Fruit Company agricultural area.
- Burbank Creek Road is a private road, and intersects with SR 821 on its east side south of the Roza Recreation Site.

In Yakima County, the major roads followed by and adjacent to the Project area include:

- Sage Trail Road, a Rural Road extending east from its western access point at East Selah Road. Sage Trail Road is a county maintained, paved road to Pomona Heights Substation. East of the substation as the road crosses Selah-Moxee Canal, the road is private and becomes gravel.
- East Selah Road accesses I-82, as well as the Pomona Heights Substation. The road serves residences in the Yakima Ridge foothills. The road is primarily chip-sealed, but becomes gravel layered further west as

it turns into John Street and a network of gravel and dirt meandering roads mainly used to access homes or the JBLM YTC.

- Temple Lane is an Urban Local road located south of the JBLM YTC boundary between Sage Trail Road and Firing Center Road.
- Shotgun Lane is a private road extending between Firing Center Road and Temple Road.
- Pomona Heights Road is an Urban Local Road that is the northern extension of Shotgun Lane north of Firing Center Road.
- Firing Center Road is an Urban Collector Road connecting I-82 with JBLM YTC.
- Selah Creek Drive is a local road used by residences that is located east of SR 821 and just north of the Selah Creek crossing. This road also provides access to BLM lands located around Selah Butte.

See **Section 3.7 Transportation** for more information on federal, state, and local roads in the project area.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

Public transit does not serve any portion of the Project area.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Not applicable.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Transmission line ROW access would be via a combination of new access roads, overland access, improvement to existing roads, or roads. Roads would be upgraded or constructed in accordance with the Proponent's standards for road construction, or according to land management agency requirements (such as BLM Manual 9113, 1985). However, existing paved and unpaved roads and trails would be used, where possible, to transport materials and equipment from the storage yards to the areas where they would be needed along the transmission line ROW.

See **Section 2.4.3.2** for more information.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

Yes. Helicopters will be used during construction. Construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire stringing operations. Helicopters may also be used to support the administration and management of the Project. The Project will cross the Columbia River, a major navigable waterway. The Project does not cross any active railroads. Other air transportation activities that occur in the Project area include intermittent crop-dusting throughout commericial agricultural lands and military air equipment movements on the JBLM YTC. A review by the Federal Aviation Administration (FAA), and JBLM YTC aviation operations as part of the permitting process would further minimize any potential conflicts created by the project.

See **Section 2.4.3.7** for more information.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

Impacts associated with the proposed Project would be short-term and related to the movement of personnel and equipment during construction of the transmission line. Traffic associated with operations would involve a limited number of vehicle trips during routine inspection and maintenance activities. Transmission line inspection and maintenance traffic would occur infrequently and would not involve large numbers of vehicles or workers. A project-specific traffic model has not been developed.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

Movement of agricultural and forest products will not be affected by or affect the project.

h. Proposed measures to reduce or control transportation impacts, if any: [help]

PDFs described in **Chapter 2** are designed to reduce effects from the proposed NNR Alternative and design options; therefore, no additional mitigation would be required. Along with the PDFs detailed in **Section 2.5**, the **Traffic Management Plan** would reduce impacts on transportation resources in the Project area. PDFs applicable to transportation resources include: **GEN-1, GEN-4, BIO-14, LU-1, LU-3, LU-5, LU-8, LU-11, LU-12, LU-13, LU-20, VIS-4, SGW-1, PHS-5,** and **TR-1** through **TR-8**.

See **Section 4.7.5** and **Section 2.5.4** for more information.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

The Project will not provide housing, additional transportation, or new population centers that will require increased public services. Construction will create additional risk of fire in the Project area. See discussion below.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

Wildland fire during construction presents the greatest risk of impact to public services from the proposed Project. The applicant will develop a Fire Protection and Control Plan to reduce risk of wildland fire. Pacific Power would coordinate with federal, state, and local fire agencies at the onset of construction activities. The purpose of this coordination is to ensure that construction sites and personnel are equipped and trained to recognize and minimize fire hazards, to suppress a fire until firefighters can respond, and to locate suitable water sources.

The construction contractor would be responsible for any fire started, either in or out of the Project area, by its employees or operations during construction. The construction contractor would be responsible for notifying emergency response officials and initial attempts at fire suppression. The construction contractor would take aggressive action to prevent and suppress fires on and adjacent to the Project area, and would rehabilitate burned areas as directed by the appropriate land management agency.

Specific construction-related activities and safety measures would be implemented during construction of the transmission line in order to prevent fires, and to ensure quick response and suppression in the event a fire occurs.

See **Section 2.4.3.13** and **Section 2.5.7** for more information.

16. Utilities

a. Circle utilities currently available at the site: [help]

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,
other ___________

The Project parallels existing transmission lines (see 16.b.). All appropriate utilities are available at the existing substations.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

The proposed Project will construct a new 230kV transmission line between two existing substations. Between 26.9 and 31.1 miles of the proposed line (depending on whether the MR subroute is selected) parallel existing utility lines. Other than the proposed Project itself, no new utilities will be constructed to support the Project. See **Chapter 2** for a detailed Project description.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: **(The SEPA checklist will be signed after the NEPA process is finalized)**

Name of signee ____

Position and Agency/Organization ___________________________________

Date Submitted: ____________

Vantage - Pomona Heights 230kV Transmission Line Project

Figure 1 Project Location

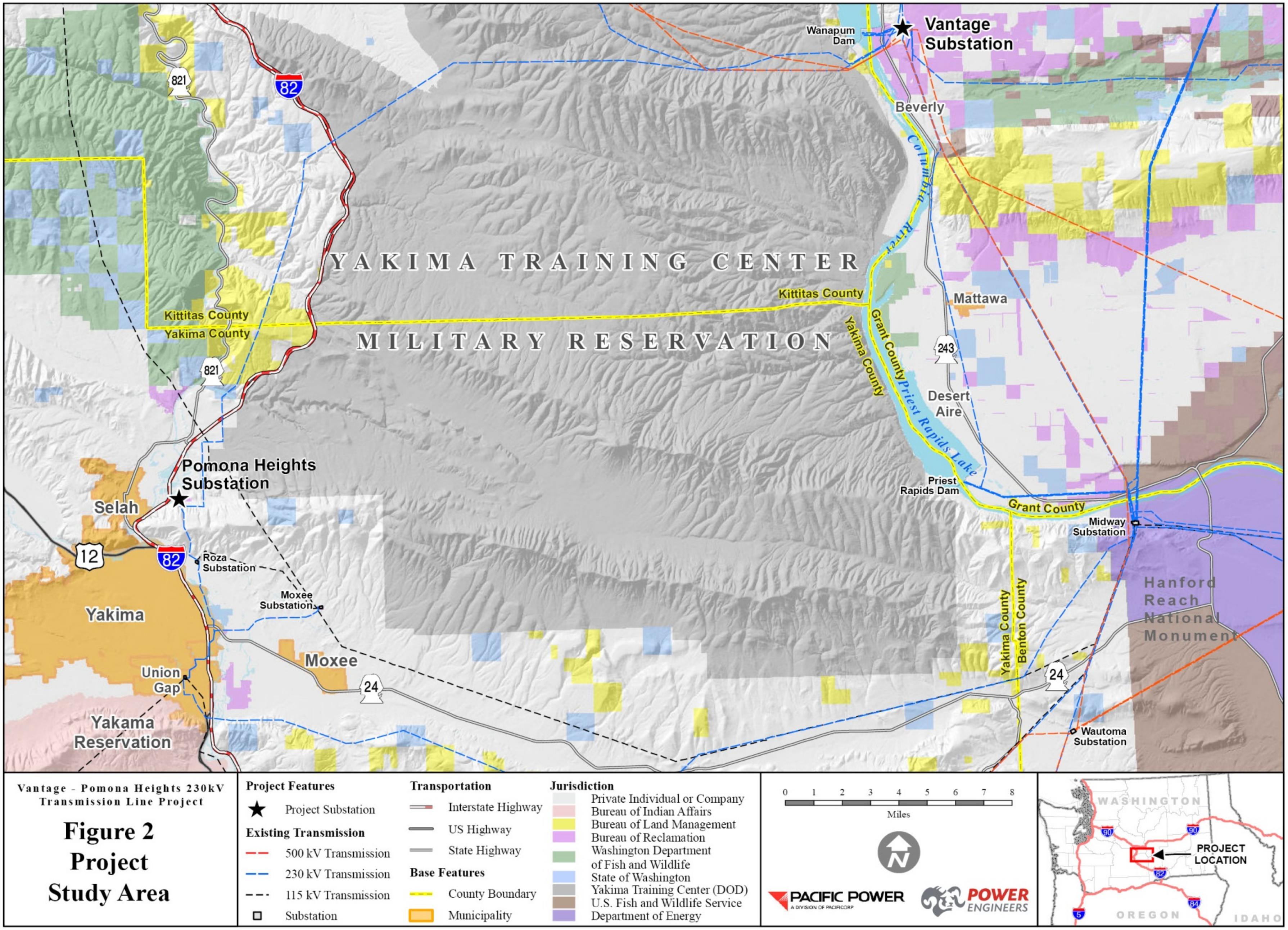
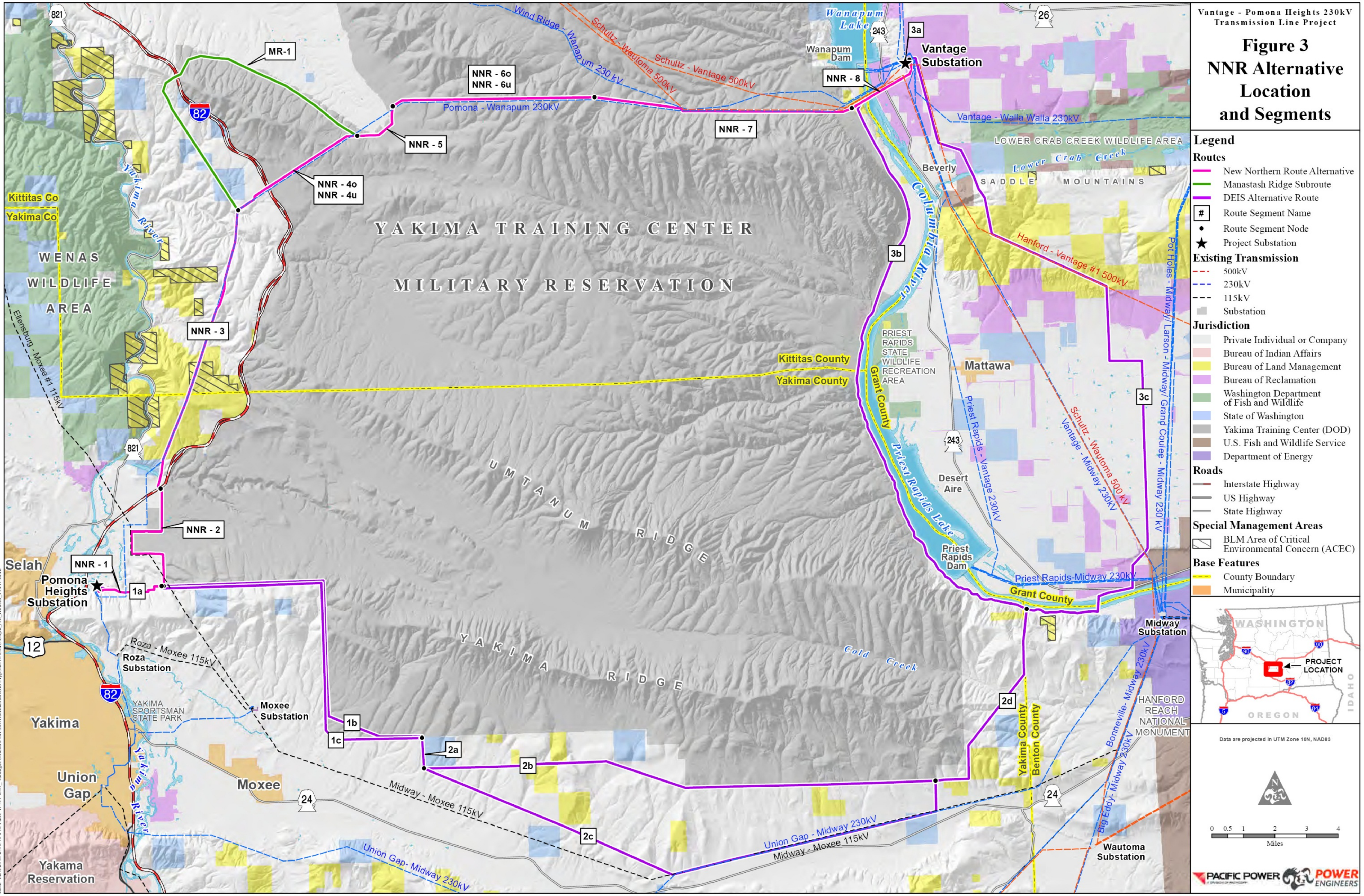


Figure 2
Project Study Area


Vantage - Pomona Heights 230kV Transmission Line Project
Figure 3
NNR Alternative Location and Segments
Legend
Routes
New Northern Route Alternative
Manastash Ridge Subroute
DEIS Alternative Route
Route Segment Name
Route Segment Node
Project Substation
Existing Transmission
500kV
230kV
115kV
Substation
Jurisdiction
Private Individual or Company
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Washington Department of Fish and Wildlife
State of Washington
Yakima Training Center (DOD)
U.S. Fish and Wildlife Service
Department of Energy
Roads
Interstate Highway
US Highway
State Highway
Special Management Areas
BLM Area of Critical Environmental Concern (ACEC)
Base Features
County Boundary
Municipality
WASHINGTON
PROJECT LOCATION
OREGON
IDAHO
Data are projected in UTM Zone 10N, NAD83
0 0.5 1 2 3 4
Miles
PACIFIC POWER
POWER ENGINEERS
YAKIMA TRAINING CENTER
MILITARY RESERVATION
UMTANUM RIDGE
YAKIMA RIDGE
WENAS WILDLIFE AREA
LOWER CRAB CREEK WILDLIFE AREA
SADDLE MOUNTAINS
PRIEST RAPIDS STATE WILDLIFE RECREATION AREA
HANFORD REACH NATIONAL MONUMENT
YAKIMA SPORTSMAN STATE PARK
Kittitas Co
Yakima Co
Kittitas County
Yakima County
Grant County
Benton County
Vantage Substation
Pomona Heights Substation
Midway Substation
Roza Substation
Moxee Substation
Wautoma Substation
Wanapum Dam
Wanapum Lake
Priest Rapids Dam
Priest Rapids Lake
Columbia River
Yakima River
Lower Crab Creek
Cold Creek
Selah
Yakima
Union Gap
Moxee
Yakama Reservation
Beverly
Mattawa
Desert Aire
MR-1
NNR - 1
NNR - 2
NNR - 3
NNR - 4o
NNR - 4u
NNR - 5
NNR - 6o
NNR - 6u
NNR - 7
NNR - 8
1a
1b
1c
2a
2b
2c
2d
3a
3b
3c
Pomona - Wanapum 230kV
Wind Ridge - Wanapum 230 kV
Schultz - Wautoma 500kV
Schultz - Vantage 500kV
Vantage - Walla Walla 230kV
Hanford - Vantage #1 500kV
Vantage - Midway 230kV
Priest Rapids - Vantage 230kV
Priest Rapids-Midway 230kV
Midway - Moxee 115kV
Roza - Moxee 115kV
Union Gap - Midway 230kV
Union Gap- Midway 230kV
Ellensburg - Moxee #1 115kV
Big Eddy- Midway 230kV
Bonneville- Midway 230kV
Pot Holes - Midway/ Larson - Midway/ Grand Coulee - Midway 230 kV
821
82
12
24
26
243

APPENDIX E
DRAFT PROGRAMMATIC AGREEMENT

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DRAFT

PROGRAMMATIC AGREEMENT

AMONG

BUREAU OF LAND MANAGEMENT;
JOINT BASE LEWIS-MCCHORD YAKIMA TRAINING CENTER;
BUREAU OF RECLAMATION;
BONNEVILLE POWER ADMINISTRATION;
WASHINGTON STATE HISTORIC PRESERVATION OFFICE;
AND
PACIFIC POWER

REGARDING THE CONSTRUCTION OF THE

VANTAGE TO POMONA HEIGHTS 230 KV TRANSMISSION LINE PROJECT

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WHEREAS, Pacific Power proposes to construct, operate and maintain the Vantage to Pomona Heights 230 kilovolt (kV) Transmission Line Project (hereafter referred to as "Undertaking") from its Pomona Heights Substation east of Selah in Yakima County, Washington to the Bonneville Power Administration (BPA) Vantage Substation east of Wanapum Dam in Grant County, Washington (see Appendix A); and

WHEREAS, Pacific Power has applied for rights-of-way (ROWs) from the Bureau of Land Management (BLM), Joint Base Lewis-McChord Yakima Training Center (JBLM YTC), U.S. Bureau of Reclamation (Reclamation), and BPA for construction and operation of the proposed transmission line and related facilities; and

WHEREAS, Pacific Power intends to construct, operate and maintain the Vantage to Pomona Heights 230 kV Transmission Line Project according to general parameters contained in the project Plan of Development (POD) for the Undertaking, and the final BLM approved POD will be appended to and made part of the Record of Decision (ROD) authorizing the ROW; and

WHEREAS, the BLM is considering the issuance of the ROW grant for the construction, operation and maintenance of the Undertaking, and the ROW will incorporate this Programmatic Agreement (PA) by reference; and

WHEREAS, this PA, and the Historic Properties Management Plan (HPMP) that will be developed pursuant to this PA, will be incorporated into the approved project POD; and

WHEREAS, the BLM is a multiple use agency responsible for the permitting and issuing of ROWs as well as the protection of cultural resources as authorized under the Federal Land Policy and Management Act (FLPMA) of 1976 (43 United States Code [U.S.C.] §1701); the BLM has been requested to issue ROWs on its land for this Undertaking by Pacific Power; and the BLM is a Signatory of this PA; and

WHEREAS, JBLM YTC is responsible for processing Pacific Power's application on federal lands managed by the U.S. Army; the U.S. Army has established procedures to permit third parties to use Army-managed lands for purposes that do not conflict with its mission as a military training area; environmental stewardship and sustainability are integral parts of the Army's mission; the Army must analyze and minimize impacts to cultural resources that would result from decisions to grant ROWs for third party uses; and JBLM YTC is a Signatory of this PA; and

WHEREAS, Reclamation is responsible for processing Pacific Power's application filed on April 17, 2011 requesting a grant of ROW across federal lands managed by Reclamation; cultural resource investigations and construction activities on Reclamation lands fall under jurisdiction of Reclamation; and Reclamation is a Signatory of this PA; and

WHEREAS, the BPA is responsible for processing Pacific Power's interconnection request submitted in April 2008 to interconnect the proposed new Vantage to Pomona Heights 230 kV transmission line into BPA's Vantage Substation and the Mid-Columbia transmission system; and BPA is a Signatory of this PA; and

WHEREAS, the BLM will serve as lead federal agency for compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. §470f), pursuant to 36 Code of Federal Regulations (CFR) Part 800, the regulations implementing Section 106 of the NHPA; and

WHEREAS, the federal agencies (i.e., BLM, JBLM YTC, Reclamation, and BPA) shall comply with applicable requirements of the Archaeological Resources Protection Act (ARPA) (16 U.S.C. §470), American Indian Religious Freedom Act (AIRFA) (42 U.S.C. §1996), Section 3(c) of the Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. §3001-13), and pertinent treaties during the implementation of this PA; and

WHEREAS, the BLM Spokane District Manager, the "agency official" pursuant to 36 CFR Part 800.2(a), has determined that this project is an Undertaking as defined under 36 CFR Part 800.16(y), and is responsible for signing this PA; and

WHEREAS, the BLM notified the Advisory Council on Historic Preservation (ACHP) of the Undertaking on May 17, 2012 and the ACHP has elected not to participate in the consultation; and

WHEREAS, the BLM, as the lead federal agency, has determined that the Undertaking may have adverse effects on properties included in or eligible for inclusion in the National Register of Historic Places (National Register), and has initiated consultation with the ACHP, Washington State Historic Preservation Officer (SHPO), and other Consulting Parties pursuant to 36 CFR Part 800; and

WHEREAS, the BLM, in consultation with the ACHP and SHPO, has determined that a phased approach to Section 106 compliance is appropriate, pursuant to 36 CFR Part 800.4(b)(2) for the Undertaking; intensive Class III cultural resource surveys and evaluations of National Register eligibility for some portions of the selected alternative will not be possible until easements are acquired by Pacific Power; under the phased approach intensive Class III surveys and evaluations will be performed only for these portions of the selected alternative following issuance of the ROD; and the identification and evaluation of historic properties and effect determinations, as well as mitigation plans for any adverse effects, will be conducted in accordance with this PA prior to any Notice to Proceed (NTP) and project implementation; and

WHEREAS, the Washington SHPO (Department of Archaeology and Historic Preservation) is authorized to enter into this PA in order to fulfill its role of advising and assisting federal agencies in carrying out their Section 106 responsibilities at 36 CFR Part 800.2(c)(1)(i) and 800.6(b) and to comply with the mandates of the Washington State Environmental Policy Act (SEPA), Washington State Archaeological Sites and Resources RCW 27.53, Indian Graves and Records RCW 27.44, and Human Remains RCW 68.50 Acts; and is a Signatory to this PA; and

WHEREAS**,** Pacific Power, as potential grantee of the ROW, has participated in consultation per 36 CFR Part 800.2(c)(4) and will carry out and fund the stipulations of this PA under the oversight of the BLM; and is an invited Signatory to this PA; and

WHEREAS, the BLM, as the lead federal agency for all Native American consultation and coordination, is responsible for government-to-government consultation with federally recognized Indian Tribes for this Undertaking; will conduct Native American consultation in accordance with 36 CFR Part 800 and will implement tribal consultation; and has invited the federally-recognized Confederated Tribes and Bands of the Yakama Nation and the Confederated Tribes of the Colville Reservation to participate in consultation and be Concurring Parties to this PA; and has invited the non-federally recognized Wanapum Band of Indians to participate in consultation and be a Concurring Party to this PA; and

WHEREAS, the Washington Department of Archaeology and Historic Preservation (DAHP) is responsible for reviewing cultural resource documents and issuing Archaeological Excavation and Removal Permits under RCW 27.44 and RCW 27.53 and WAC 25-48 on state and private lands in Washington; and

WHEREAS, the BLM has invited the Washington State Department of Natural Resources (WDNR), Washington State Department of Transportation (WSDOT), Yakima County, Grant County, and Kittitas County to participate in consultation due to their interest in the Undertaking and its potential effects and to be Concurring Parties to this PA; and

WHEREAS, the BLM will consult with and document the comments and views of the public on the proposed Undertaking through the National Environmental Policy Act (NEPA) process, pursuant to 36 CFR Part 800.8(c)(1)(iv); and

WHEREAS**,** this PA shall be appended to and made part of BLM's ROD and any other federal decisions authorizing this Undertaking; and

NOW, THEREFORE, BLM and the other Signatories to this PA agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

DEFINITIONS

Terms used in this PA are defined in Appendix B. All other terms not defined have the same meaning as set forth in ACHP's regulations at 36 CFR Part 800.16, Section 301 of the NHPA, and the BLM 8110 Manual.

STIPULATIONS

BLM, in cooperation with JBLM YTC, Reclamation, BPA, Washington SHPO, and other parties to this PA, shall ensure that the following stipulations are met and carried out:

I. AREA OF POTENTIAL EFFECTS

The Undertaking is described in Appendix A. Because the route for the Undertaking is not yet selected, a final area of potential effects (APE) will be established after the selected transmission line route is identified in the Final Environmental Impact Statement (FEIS) and will include the areas where the Undertaking may directly or indirectly affect historic properties. Additional adjustments in the APE may be required during final design. For the Draft Environmental Impact Statement (DEIS), Supplemental Draft Environmental Impact Statement (SDEIS), and Class I Inventory Report/Cultural Resource Technical Report (Stipulation III.A.1), the study area will be equivalent to an APE for each alternative considered for analysis. The APE for the Undertaking includes federal, state, and private lands and is defined as follows:

A. Direct APE. The APE for direct effects is limited to the area of potential ground disturbance by activities related to the Undertaking that may directly cause alterations in the character or use of historic properties located within or partially within the APE. In addition, unless specified otherwise below, the APE for direct effects will include a buffer of no less than 50 feet from the construction footprint. The buffer may need to be larger depending on the characteristics of the affected cultural resources, the nature of the adverse effects, local environmental conditions, and topography. The following are the types of ground disturbance anticipated by the Undertaking:

1. Transmission Line

   The ROW for the transmission line will be 125 to 150 feet wide for H-frame structures and 75 to 100 feet wide of single poles. The transmission line's direct APE shall be a 500-foot-wide corridor, 250 feet on both sides of the transmission line's centerline.

2. Access Roads

   The direct APE for any existing access roads in their current condition, existing roads that will be improved as part of the Undertaking, and newly built roads shall be a 100-foot-wide corridor, 50 feet on both sides of the existing road or proposed road centerline, plus a turning radius of 60 feet where specified. The 100-foot corridor may be wider in some locations to allow cut-and-fill disturbance areas on a hillside, as required for safe construction access. These locations will be identified by the BLM, Pacific Power, and the appropriate land-managing agency and will be provided to all Consulting Parties once the POD has been finalized.

3. Pulling and Tensioning Sites, Staging Areas, and Other Temporary Use Areas

   The direct APE for material staging areas, pulling and tensioning sites, splicing sites, concrete batch plants, and other temporary use areas shall be the footprint of these areas, plus a buffer as described in Stipulation I.A above. Wherever and whenever feasible, areas of prior disturbance will be used for staging and construction.

4. Vantage Substation

   No construction will occur outside the existing facility. All construction and installation of new equipment will occur within the existing substation fence. The APE for the Vantage Substation will be limited to the existing facility and there would be no buffer.

5. Pomona Heights Substation

   No construction will occur outside the existing facility. All construction and installation of new equipment will occur within the existing substation fence. The APE for the Pomona Heights Substation will be limited to the existing facility and there would be no buffer.

6. Geotechnical Drilling

   The APE for geotechnical drill sites shall be the boring location footprint, plus a buffer, no less than 50 feet, extending from the perimeter of the footprint as described in Stipulation I.A above. Access roads leading to drill sites will have the same APE as defined under Stipulation I.A.2.

7. Other Work Elements that May Occur but Not Yet Identified

   For any other elements related to the Undertaking that are not yet identified, including but not limited to mitigation-related projects, that may directly cause alterations in the character or use of historic properties, the APE for direct effects is limited to the area of potential ground disturbance plus, unless specified otherwise below, a buffer of no less than 50 feet from the construction footprint. The buffer may need to be larger depending on the characteristics of the affected cultural resources, the nature of the adverse effects, local environmental conditions, and topography.

B. Indirect APE. The APE for indirect effects is larger than the direct APE and extends beyond the project's footprint to encompass additional historic properties that could be affected by the Undertaking. For the proposed Undertaking, indirect effects include visual intrusions and changes in access or use.

1. The APE for indirect effects will extend no farther than 3.0 miles from the centerline of proposed transmission line ROW for the selected route.

2. Certain classes of visually sensitive cultural resources, such as traditional cultural properties (TCPs), beyond the 3.0-mile indirect APE may require analyses to assess visual effects. The BLM will consult with the Tribes, SHPO, and other Signatories to determine whether a change in the visual APE is necessary for these cultural resources.

C. The APEs established above may be modified through consultation with the Signatories and the other Consulting Parties without amending the PA. The BLM shall initiate such consultation as necessary either upon the request of a Consulting Party or Signatory or upon determination that a larger area is necessary to avoid impacts to historic properties. Any modification of the APE will not be implemented without the agreement of all Signatories.

II. STANDARDS

A. Professional Qualifications and Cultural Resources Permitting.

1. All actions prescribed by this PA that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition of historic properties, and involve the reporting and documentation of such actions in the form of reports, forms, or other records, shall be carried out by or under the direct supervision of a person or persons meeting at a minimum, the Secretary of the Interior's Professional Qualifications Standards [PQS] for archaeology, history, historic architecture, or architectural history, as appropriate (48 Federal Register [FR] 44738- 44739).

2. Cultural resources investigations on BLM land will be performed under a FLPMA/ARPA Permit for Archaeological Investigations issued by the BLM. Cultural resources investigations on JBLM YTC land will be performed under a permit issued by JBLM YTC. Cultural resources investigations on Reclamation land will be performed under a permit issued by Reclamation. Cultural resources investigations on BPA land will be performed under a FLPMA/ARPA Cultural Resources Use Permit issued by the BPA.

3. All cultural resource investigations will be consistent with Stipulation II.A.1 and will be performed in accordance with the DAHP's *Washington State Standards for Cultural Resource Reporting*. All excavation on state and private lands will be performed under the Stipulations of this Agreement and in conformance with or under a DAHP Archaeological Excavation permit (WAC 25-48).

B. Documentation Standards.

1. Report and documentation of cultural resources investigations shall conform with the Secretary of the Interior's Professional Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44740), as well as with all applicable standards, guidelines, and forms for historic preservation, including National Register Bulletin 15 (*How to Apply the National Register Criteria for Evaluation*), National Register Bulletin 30

(*Guidelines for Evaluating and Documenting Rural Historic Landscapes*), National Register Bulletin 38 (*Traditional Cultural Properties: Guidelines for Evaluation*), Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey (HABS/HAER/HALS) guidance, and guidance established by the Washington DAHP.

2. Technical reports documenting the results of cultural resource investigations shall be prepared for each phase of work, and will distinguish between cultural resources on federal (BLM, JBLM YTC, Reclamation, and BPA) lands, state lands, and private lands.

3. Documentation of sites and isolated finds on federal, state, and private lands shall conform to formats and standards required by the Washington DAHP.

C. Curation and Curation Standards.

1. The materials and records resulting from cultural resources investigations shall be curated in the State of Washington in accordance with 36 CFR Part 79 and the provisions of NAGPRA (43 CFR Part 10).

2. Cultural materials and records obtained from BLM lands in Washington will be curated at the Museum of Anthropology, Washington State University. For JBLM YTC, Reclamation, and BPA, cultural materials and records will be curated at the Wanapum Heritage Center, Grant County Public Utility District (PUD). For state lands in Washington, cultural materials and records will be curated at a repository approved by the DAHP and meeting the professional standards of the National Park Service (36 CFR Part 79). Pacific Power will bear all costs associated with federal and state repository curation and long-term care of such materials and records.

3. Cultural materials recovered from private lands are the property of the landowner. Pacific Power shall encourage any collections from private lands to be curated with collections at II.C.2. Documentation of any items retained by the landowner shall be included in the technical documentation curated above. If the landowner does not want to retain the cultural materials, then Pacific Power will have the materials donated, through a written donation agreement, and curated at the facilities identified in II.C.2. Pacific Power will not be obligated to compensate owners for such donations.

III. IDENTIFICATION AND NATIONAL REGISTER EVALUATION

A. Preliminary Identification of Cultural Resources.

1. Pacific Power has prepared a Class I Inventory Report/Cultural Resource Technical Report for all analyzed alternatives for inclusion as confidential appendices in the DEIS, SDEIS and FEIS for the Undertaking. The Class I Inventory area includes cultural resources within a 2-mile corridor (one mile either side of centerline) for each alternative as well as the other components of the undertaking identified in Stipulation I.A. The primary data source is the State of Washington's Information System for Architectural and Archaeological Records Data (WISAARD) database.

2. Pacific Power also conferred with BLM, JBLM YTC, Reclamation, BPA, Washington SHPO, WDNR, the Tribes, and the counties to identify additional cultural resources within the APE prior to the DEIS and SDEIS and in preparing the Class I Inventory Report.

Consulting Parties will be afforded an opportunity to provide input on the identification and evaluation of cultural resources.

3. BLM will consult with the Tribes, and when appropriate other Consulting Parties, to identify, record, and evaluate TCPs and properties of religious or cultural concern. Pacific Power arranged for a TCP study to be completed by the Cultural Resource Program of the Yakama Nation prior to completion of the DEIS and SDEIS. Following identification of the New Northern Route (NNR) Alternative, Pacific Power arranged for a TCP assessment to be completed by the History and Archaeology Program of the Confederated Tribes of the Colville Reservation prior to completion of the FEIS. These confidential studies have been or will be provided to the BLM. The BLM will work with the Tribes to identify which organizations and which persons or offices will be provided copies of the TCP studies (refer to Stipulation III.D.2). BLM shall notify the other signatories to this PA if TCPs occur on their lands and shall notify DAHP of the results of BLM consultations.

B. Intensive Pedestrian Survey of Cultural Resources (Class III Inventory).

1. The route of the preferred alternative identified in the DEIS and a sample of locations along each alternative analyzed in the DEIS and SDEIS where inventory information is not sufficient for comparative analysis, will be targeted for pedestrian cultural resource surveys prior to completion of the FEIS. The sample survey will be conducted in accordance with BLM standards for Class II probabilistic survey (BLM Manual 8110.21B). Private lands along the selected alternative for which owner permission for cultural resources inventory cannot be obtained will, if possible, be inventoried following easement acquisition, subject to landowner permission. Data resulting from the targeted surveys will supplement the Class I data in the route selection process and preliminary engineering.

2. Following issuance of the ROD by the BLM and prior to Pacific Power's receipt of the NTP for construction, Pacific Power will complete the Class III Inventory of the selected alternative, including private land, as defined in the FEIS and associated undertaking components as defined in Stipulation I.A where previous inventory is lacking or inadequate, and in a manner consistent with Stipulation II and the BLM 8100 Manual.

3. If site boundaries for cultural resources extend outside the direct APE, Class III Inventory of the entire site area will occur to fully document any associated artifacts, features, or structures that are included within the identified site boundary even though they may occur outside the direct APE. Certain classes of properties, including districts and linear historic properties, may extend appreciably outside the direct APE. For these classes of properties, field documentation generally will be limited to 0.25 mile outside of the direct APE, but the documentation will be sufficient to characterize the site and to understand how those portions of the site within the APE do or do not contribute to the National Register eligibility of the site as a whole. This documentation may entail recording cultural resources over multiple land jurisdictions. Where private land is involved, landowner consent will be secured by written documentation if cultural resources extend beyond the easement.

C. Inventory of Indirect APE.

1. Pacific Power may be required by the BLM to conduct a viewshed analysis to determine the area from which the proposed Undertaking may be visible. The viewshed analysis, if required, will use GIS analyses to determine the geographic area that may be visually

affected by the Undertaking.

2. Pacific Power may be required by the BLM to conduct an additional Class I Inventory, if needed, to identify historic properties within the indirect APE as defined by the viewshed analyses. Pacific Power may also seek additional information regarding potential historic properties, including cultural landscapes, buildings, and structures, that may not have been recorded but that are within the indirect APE.

3. Cultural resources within the indirect APE that are eligible or potentially eligible to the National Register under Criteria A, B, and/or C will be assessed for potential visual effects. Cultural resources within the indirect APE that are eligible or potentially eligible to the National Register only under Criterion D will not be assessed for potential visual effects, because changes in visual setting would not be expected to reduce the resource's potential to yield information important in prehistory or history.

D. Confidentiality of Site Information.

1. Pacific Power will not retain confidential and sensitive information, including but not limited to ethnographic data and site-specific information (e.g., on the locations and contents of archaeological sites), obtained beyond the time that is needed to inform the decision-makers and complete measures identified in this PA related to compliance with Section 106 of the NHPA. All reports containing confidential information shall be exempt from the Freedom of Information Act (FOIA); applicable laws will be observed; sensitive information will be returned to the appropriate parties and will not become part of Pacific Power's official records.

2. Reports or other documents containing confidential and sensitive information regarding places of cultural or religious value to Native Americans (e.g., maps, photographs, site descriptions, WISAARD data) will be reviewed only by BLM, SHPO, Tribes and the appropriate federal or state land managing agency (36 CFR Part 800.2(d)(2)). Redacted versions of reports may be distributed to the BLM and to other Concurring Parties. Information regarding archaeological resources is confidential and will not be disclosed to the public (Section 304 of the NHPA). All reports containing confidential data shall be stamped "Not for Public Release." Information regarding TCPs will not be disclosed to the public or to any federal, state, or local agency without explicit written permission from the Tribes.

E. Determinations of National Register Eligibility.

1. The BLM will coordinate the National Register eligibility determination process for this Undertaking. The BLM, as lead agency, will ensure that determinations of eligibility (DOEs) are prepared for all resources that cannot be avoided through project redesign whether on federal, state, or private lands employing National Park Service (NPS) Standard Form 10-900.

   a. For cultural resources identified on state and private land that require additional information to determine National Register eligibility and that cannot be avoided through project redesign, a site-specific evaluation plan shall be prepared in consultation with the Tribe(s) and SHPO in accordance with the BLM 8100 Manual (8110.22 B and C). Development and review of evaluation plans will be coordinated by the BLM. These plans will be reviewed by the appropriate state agency, SHPO, and consulting Tribes.

DOEs will be finalized only after implementation of the evaluation plans.

2. Draft DOEs will be provided to the BLM by Pacific Power. BLM will distribute National Register eligibility recommendations to the appropriate land managing agency and Tribes for review and comment. After a 30-day comment period, each land managing agency will submit the Final Signed DOEs for those cultural resources under its jurisdiction to the SHPO for concurrence. The BLM will submit the DOEs for cultural resources under other jurisdictions or on private lands.

   a. If a DOE concludes and the SHPO concurs that a cultural resource does not meet any of the criteria for National Register eligibility, the resource will be considered ineligible for listing in the National Register. No further review or consideration under this PA will be required for such cultural resources.

   b. If a DOE concludes and the SHPO concurs that a cultural resource meets one or more of the criteria for National Register eligibility, the resource will be considered eligible for listing in the National Register. These resources will be included in the Historic Properties Treatment Plan (HPTP) described in Stipulation V.

   c. If the SHPO and the federal agency submitting a DOE do not agree on National Register eligibility, and cannot reach agreement within 30 days, the agency submitting the DOE will obtain a DOE from the Keeper of the National Register (Keeper), pursuant to 36 CFR Part 800.4(c)(2) and 36 CFR Part 63.

   d. The Keeper's determination will be final. Cultural resources determined by the Keeper to be ineligible for inclusion in the National Register will receive no further consideration under this PA. Cultural resources determined by the Keeper to be eligible for inclusion in the National Register will be addressed in the HPTP.

F. Report Distribution, Review Periods, and Comment.

1. All draft reports will be distributed by the BLM to the federal and state land managing agencies and the Tribes for review and comment. Redacted versions of draft reports may be distributed by the BLM to other Concurring Parties for review and comment. All draft reports, with comments, will then be distributed to the SHPO for review and comment.

2. Supplemental, evaluation, or addendum reports may be necessary. Cultural resource reports involving land that does not fall under co-management, i.e., from a single jurisdiction, such as the JBLM YTC, will be distributed to the appropriate land managing agencies and SHPO for comment.

3. Unless specified otherwise, review time for cultural resources reports shall be 30 days. Requests for extensions of review times shall be provided to the BLM no less than three days prior to the deadline via email or telephone. Reasonable extension, not to exceed 10 days, will be negotiated between the BLM and the reviewer.

4. Should any reviewer fail to provide notice of delayed review or fail to respond to a request for comment within the specified time limit of review, BLM will assume the reviewer concurs with the adequacy of the report and any recommendations made therein.

5. BLM, in consultation with the SHPO, will determine if the reports are satisfactory. Satisfactory reports will follow the standards outlined in the BLM 8110 Manual and the DAHP's *Washington State Standards for Cultural Resource Reporting* and will take into

consideration the comments provided by the appropriate land managing agency, Tribes, and other Consulting Parties.

6. Pacific Power shall provide BLM with monthly status reports containing information necessary for notifying the Consulting Parties of the progress of the implementation of this PA, including notification of actual construction start dates, efforts, inventory, evaluations, and monitoring. Monthly status reports shall be by email supplemented with photographs or video as appropriate and with monthly conference calls if requested by any party.

7. BLM shall with other state and federal agencies develop and implement a public presentation on the results of the cultural resource efforts at a local venue(s). BLM shall present the results of the archaeological efforts at a regional professional conference.

IV. DETERMINATIONS OF EFFECTS

A. The BLM shall make determinations of effect consistent with 36 CFR Part 800.4 (d) and identify the type of adverse effect for each affected property in accordance with the criteria established in 36 CFR Part 800.5(a)(1) and (2)(i)-(vii) on those cultural resources within the APE that are listed or determined eligible for the National Register, and provide the SHPO, Tribes, and other Consulting Parties with the results of the finding.

Pacific Power shall submit to the BLM:

1. A list of the historic properties by land ownership that the Undertaking appears likely to affect and that will need to be treated by implementing prescriptions of the HPTP required in Stipulation V;

2. A list of the historic properties by land ownership within the APE that the Undertaking has no potential to affect; and

3. A list of the historic properties by land ownership that Pacific Power commits to avoiding through the implementation of formal avoidance measures.

B. The BLM shall issue a finding of effect, based on BLM's own evaluation of Pacific Power's analysis, and provide all Signatories and other Consulting Parties an opportunity to review the BLM's finding and analysis to support its finding.

C. The BLM will forward to the SHPO all comments regarding its findings of effect received during the comment period.

D. If a Consulting Party objects to the BLM's findings, the BLM shall consult with the objecting party and the SHPO regarding the nature of the objection and reconsider its findings. The time frame for consultation shall be 30 days. If the objection is not resolved, the BLM shall further consult with the SHPO. If the SHPO and BLM are not able to resolve the disagreement, BLM will request that ACHP review the finding pursuant to 36 CFR Part 800.5(c)(3)(i).

E. Visual effects analyses will be conducted on historic properties eligible under Criteria A, B, and/or C to determine if the Undertaking will have an adverse effect on the integrity of the historic property. BLM, in consultation with the SHPO, will determine if the visual effects analyses are satisfactory.

F. If an adverse effect to a historic property on state or federal land will not be avoided, the BLM and the land-managing agency must resolve the adverse effect by implementing the prescriptions of the HPTP as described in Stipulation V. If an adverse effect to a historic property on private land will not be avoided, the BLM will work with the property owner and Pacific Power to resolve the adverse effect according to the prescriptions of the HPTP.

G. Determinations of effect may be subject to change due to changes in the scope and APE of the Undertaking. BLM will conduct additional consultation with all Consulting Parties to this PA regarding proposed changes in any determinations of effect.

V. HISTORIC PROPERTIES TREATMENT PLAN

A. Pacific Power will develop a comprehensive HPTP based upon the results of the Class I and Class III Inventories and preliminary engineering data. The HPTP will be completed before the NTP in consultation with the Consulting Parties. The HPTP will identify all historic properties recorded as a result of the Class I and Class III Inventories by land ownership and will provide a detailed description of the potential direct, indirect, and cumulative effects of the Undertaking on each historic property. The HPTP will identify the specific mitigation strategies proposed to address the direct, indirect, and cumulative effects of the Undertaking for each historic property.

B. The HPTP developed for individual historic properties will be designed to mitigate adverse effects to the qualities of the historic property that make it eligible for listing in the National Register. Both the manner in which these National Register qualities will be lessened, and how proposed mitigation efforts will offset the effects, will be clearly defined in the treatment plan for each historic property.

C. Avoidance is the preferred mitigation measure and may involve redesign of the Undertaking or relocation of specific components of the Undertaking. The HPTP will describe the specific measures that will be implemented to ensure sites are protected and/or avoided. A site-specific Avoidance and Treatment Plan shall be created for each site and shall detail the specific buffer, fencing/barrier and photo-documentation points for photographs before, during and after construction. In addition, topography may be used where possible to reduce the visibility of the transmission line route from visually sensitive historic properties. Other treatment measures could include, but will not be limited to, completion of National Register nomination forms, and HABS/HAER/HALS documentation. The HPTP will adhere to the guidance provided by the ACHP (http://www.achp.gov/archguide/), the Secretary of the Interior's Professional Standards, HABS/HAER/HALS guidance, and appropriate state guidelines.

D. Treatment plans for specific historic properties on Washington State-owned lands will be developed by Pacific Power in accordance with the above planning process. The Washington State-owned property-specific HPTP will be submitted for review and comment in accordance with Stipulation III.F, prior to being incorporated into the comprehensive HPTP.

E. The BLM will submit the draft HPTP to the Consulting Parties for review and comment in accordance with Stipulation III.F. BLM will incorporate the comments, as appropriate, into a revised document and will submit the HPTP to all Consulting Parties for a second review. All Consulting Parties will respond to the second review of the HPTP within 20 days. The final HPTP with comments will then be submitted to the SHPO for review and comment.

F. The BLM, in consultation with the SHPO, will determine if the HPTP is satisfactory. Satisfactory HPTP plans will follow the Secretary of Interior's Standards for Archaeology and Historic Preservation (48 FR 44716), and will take into consideration the comments provided by the appropriate land managing agency, Tribes, and other Consulting Parties.

VI. CULTURAL RESOURCES MONITORING AND TRAINING PLAN

A. Prior to the NTP, Pacific Power shall prepare and submit a Undertaking-wide Cultural Resources Monitoring and Training Plan (CRMTP) for review and approval. After BLM receives and reviews the plan, the BLM shall make the CRMTP available to the Consulting Parties for a 30-day review period. The BLM shall take into account comments received prior to approving the NTP.

B. A professional, who meets the qualification standard as set forth in Section II.A.1, will perform the training, and if any of the Consulting Parties request, a member of their staff shall be allowed to participate in the training. The training shall cover the importance of cultural resources, protection efforts, monitoring protocols and stop work procedures.

C. A professional, who meets the qualification standard as set forth in Section II.A.1, or who is supervised by someone meeting that standard, will perform construction monitoring. Other types of experience with construction monitoring and/or traditional cultural knowledge may be substituted for degrees required by the Standards at the discretion of the BLM.

D. The CRMTP shall outline the criteria used to select areas for monitoring, identify opportunities for Tribes to participate as monitors during project construction, outline the protocols for monitor participation, and include the appropriate Unanticipated Discovery of Cultural Resources documentation (Appendix C). The CRMTP shall include maps clearly delineating areas to be monitored.

E. Pacific Power will implement the final CRMTP for the Undertaking as approved by the BLM.

F. The BLM, in consultation with the SHPO, will determine if the monitoring plan is satisfactory. A satisfactory monitoring plan will conform to accepted practices in archaeology and will take into consideration the comments provided by the appropriate land managing agency, Tribes, and other Consulting Parties. Monitoring will be supervised by an individual meeting DAHP standards as well as the Secretary of the Interior's Professional Qualifications Standards for archaeology (48 FR 44738-44739) (see Stipulation II.A.1). Individual monitors who do not meet these standards shall be supervised by someone who does.

VII. PLAN FOR THE UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES

A. The BLM, in consultation with the Consulting Parties, will develop and implement a Plan for the Unanticipated Discovery of Cultural Resources (Appendix C) in the event that Undertaking activities bring to light previously unknown cultural resources, or if project activities directly or indirectly affect a known cultural resource in an unanticipated manner.

B. Design changes and initiation of data recovery or other mitigation measures will be implemented as expeditiously as possible. If data recovery is deemed necessary, it will be based upon a Data Recovery Plan developed according to the provisions of the HPTP. In the event a dispute arises with regard to appropriate mitigation measures, the BLM will consult with ACHP in accordance with Stipulation XI to resolve the issue.

C. While this PA provides for the avoidance of cultural resources, should such efforts fail, the BLM shall immediately notify the Consulting Parties, secure the area, and conduct a Damage Assessment of the incident of disturbance. The Damage Assessment shall be conducted by an independent third party professional, experienced in ARPA Damage Assessment, and selected following consultation among the parties. The Damage Assessment shall follow ARPA or, for cultural resources on private and state land, Washington State regulations.

VIII. INADVERTENT DISCOVERY OF HUMAN REMAINS

A. If human remains are inadvertently discovered during any cultural resource investigations for the Undertaking, inventory or excavation activities will immediately cease in the vicinity. The cultural resource field director will secure the area and follow the procedures outlined in Stipulation VIII.C-D.

B. If construction or other Undertaking personnel identify what they believe to be human remains, they will immediately halt construction at that location and notify a construction or environmental inspector of the discovery. The environmental inspector will immediately notify the cultural resources field director or cultural resources monitor of the discovery, and then proceed to secure the area and ensure that further construction or related activities do not occur within a 100-foot buffer. The inspector will also secure the area to ensure no further disturbance or removal of those remains and associated material. The inspector will also ensure that vehicular traffic across the area is restricted to a location removed from the discovery. A cultural resources specialist will examine and evaluate the discovery. If it appears to consist of human remains, the cultural resources specialist will follow the procedures outlined in Stipulation VIII.C- D.

C. If human remains, or possible human remains, are encountered, Pacific Power will immediately notify both the county coroner and local or agency law enforcement. On federal land, Pacific Power will also notify the BLM and the appropriate land managing agency. On state or private lands, Pacific Power will also notify the BLM and appropriate state agency. The BLM and the county coroner will notify the SHPO’s State Physical Anthropologist for all non-forensic human skeletal remains finds. In cases of non-forensic human skeletal remains, the SHPO’s State Physical Anthropologist will make a determination of whether the remains are Native American or not. On federal land and in the case of Native American remains, the BLM or other appropriate federal land managing agency would then implement internal procedures for consulting with Tribes and complying with NAGPRA. On state or private land, the SHPO will implement the notification process as outlined under RCW, Title 27 Chapter 27.44, Indian Graves and Records and conduct all further consultation with the affected parties.

D. Discoveries will be recorded and evaluated following the standards and format used for recording cultural resources during the Class III Inventory of the project (see Stipulation III.B).

IX. UNDERTAKING MODIFICATIONS

A. It is anticipated that after the HPTP is finalized, minor modifications to the Undertaking may be necessary. Examples of these modifications include rerouting to avoid other environmental impacts, addition of temporary construction or staging areas, minor changes in access routes or ROW, borrow areas, and other construction contractor-dependent actions. Pacific Power and the BLM will ensure that any area scheduled for ground disturbance will be inventoried for cultural resources prior to any disturbance of the area, as outlined in Stipulation III.B, and a separate addendum report prepared. Review and comment on these reports would follow guidelines described in Stipulation III.F. Should cultural resources be recorded, the BLM would follow the provisions of Stipulations III and IV for determinations of National Register eligibility and project effect. All Undertaking modifications will be discussed with the Consulting Parties. Construction in that location will not occur until the BLM issues a NTP for that specific location.

B. Should historic properties be identified during any additional cultural resources inventory, Pacific Power, in consultation with BLM, appropriate land managing agency and private landowners, will attempt to relocate or modify the impacting activity to avoid or minimize adverse effects, or if possible, forego the activity. If none of these options are possible, Pacific Power, in consultation with the BLM and Consulting Parties, will prepare a site-specific treatment plan following the guidance provided in the HPTP. Review of the plan would be in accordance with Stipulation III.F. Any modification of the Undertaking's plans, where state lands are concerned, must be reviewed by the state land management agency and SHPO prior to implementation.

C. Addendum reports generated as a result of modifications to the Undertaking on a single land jurisdiction shall be submitted by BLM to the appropriate land managing agency or private landowner, ACHP, SHPO, and Tribes for comment. Review times will follow those established in Stipulation III.F.

X. AMENDMENTS TO THE PROGRAMMATIC AGREEMENT

A. Any Consulting Party to this PA, through consultation, may request an amendment to its terms and the provisions of any attachment. The Consulting Party wishing to amend the PA will initiate consultation by completing the form provided as Appendix D and submitting it to the BLM.

B. BLM will consult with the Consulting Party submitting the suggested amendment, and if there is agreement between BLM and the Consulting Party, submit the form to all other Consulting Parties for concurrent review and signature. After review and signature, each required Signatory will return the form to BLM, who will prepare a final copy with a compiled signature page and then send it to all Consulting Parties.

C. Upon execution of the amendment, each Consulting Party will attach a copy of the executed amendment request form to its copy of the PA, and will enter the amendment number and date on the upper-right-hand corner of the first page of the PA.

D. Should a dispute arise concerning an amendment, the procedures in Stipulation XI will be followed to resolve the dispute.

E. No proposed amendment to this PA will take effect until all Signatories to this PA have signed the form.

XI. DISPUTE RESOLUTION

Should any Consulting Party to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the BLM shall consult with such party to resolve the objection. The BLM shall notify the other Parties of the objection and the timeline for resolution. If the BLM determines that such objection cannot be resolved, the BLM will:

A. Forward all documentation relevant to the dispute, including the BLM's proposed resolution, to the ACHP. The ACHP shall provide BLM with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the BLM shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories and Concurring Parties, and provide them with a copy of this written response. BLM will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the 30-day time period, the BLM may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the BLM shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and Concurring Parties to the PA, and provide them and the ACHP with a copy of such written response.

C. The BLM's responsibilities to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

XII. REVIEW OF PUBLIC OBJECTIONS

At any time during implementation of the measures stipulated in this PA, should an objection to any such measure or its manner of implementation be raised by a member of the public, the BLM will take the objection into account and consult as needed with the objecting party and the Consulting Parties to this PA to resolve the objection.

XIII. TERMINATION

If any Signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation X, above. If within 30 days an amendment cannot be reached, any Signatory may terminate the PA upon written notification to the other Signatories.

Once the PA is terminated, and prior to work continuing on the Undertaking, the BLM must either (a) execute a PA pursuant to 36 CFR Part 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR Part 800.7. The BLM shall notify the Signatories as to the course of action it will pursue.

XIV. DURATION OF THIS PA

Unless the PA is terminated pursuant to Stipulation XIII; or superseded by another PA executed for the Undertaking; or construction of the Undertaking has not been initiated within five years of execution of this PA; or the Undertaking has been terminated, this PA will remain in effect until BLM, in consultation with the Consulting Parties, determines that construction of all aspects of the Undertaking has been completed and that all terms of this PA have been fulfilled in a satisfactory manner, for no longer than 10 years. At that time, the BLM will notify the other Signatories of this determination in writing, whereupon this PA will be null and void. The Consulting Parties to this PA will consult annually, or more frequently if agreed upon, on the need to amend, change, or terminate this PA until completion of the Undertaking.

EXECUTION of this PA by the BLM, JBLM YTC, BPA, Reclamation, and Washington SHPO, and implementation of its terms evidence that BLM has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES

BUREAU OF LAND MANAGEMENT

Signature:____Date:________

Daniel Picard, Spokane District Manager

JOINT BASE LEWIS-MCCHORD YAKIMA TRAINING CENTER

Signature:____Date:________

Jason A. Evers, Lieutenant Colonel, U.S. Army

Commanding Yakima Training Center

BUREAU OF RECLAMATION

Signature:____Date:________

Dawn Wiedmeier, Columbia Cascades Area Manager

BONNEVILLE POWER ADMINISTRATION

Signature:____Date:________

F. Lorraine Bodi, VP of Environment, Fish & Wildlife

WASHINGTON STATE HISTORIC PRESERVATION OFFICER

Signature:____Date:________

Alyson Brooks, State Historic Preservation Officer

INVITED SIGNATORIES

PACIFIC POWER

Signature:____Date:________

CONCURRING PARTIES

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION

Signature:____Date:_________

CONFEDERATED TRIBES OF THE COLVILLE RESERVATION

Signature:____Date:_________

WANAPUM BAND OF INDIANS

Signature:____Date:_________

YAKIMA COUNTY, WASHINGTON

Signature:____Date:_________

GRANT COUNTY, WASHINGTON

Signature:____Date:_________

KITTITAS COUNTY, WASHINGTON

Signature:____Date:_________

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Signature:____Date:_________

Don Whitehouse, PE, South Central Regional Administrator

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APPENDIX A

TO THE PROGRAMMATIC AGREEMENT
REGARDING THE CONSTRUCTION OF THE
VANTAGE TO POMONA HEIGHTS 230 kV TRANSMISSION LINE PROJECT

Background and Description

DESCRIPTION OF THE PROJECT

Pacific Power proposes to construct, operate and maintain the Vantage to Pomona Heights 230 kV Transmission Line Project (or Undertaking) from its Pomona Heights Substation east of Selah in Yakima County, Washington to the BPA, Vantage Substation east of the Wanapum Dam in Grant County, Washington. The route alternatives considered in the Environmental Impact Statement (EIS) range from 40.4 to 67 miles long.

As proposed by Pacific Power, most of the proposed transmission line would be constructed on H-Frame wood pole structures between 65 and 90 feet tall and spaced 650 to 1,000 feet apart depending on terrain. The H-Frame structures would typically be used in open flat to gently rolling terrain. In developed and agricultural areas, single wood or steel monopole structures would be used. The single pole structures would be between 80 and 110 feet tall and spaced 400 to 700 feet apart. The ROW width for the H-Frame structure type would be 125 to 150 feet and for the single pole structure type, 75 to 100 feet. Dead-end or angle structures would require additional ROW to accommodate guy wires and anchors. For the Columbia River crossing, either near the Midway Substation or below the Wanapum Dam, steel lattice structures approximately 200 feet tall would be used to safely span the up-to-2,800-foot crossing.

Construction of the transmission line would require vehicle, truck, and crane access to each new structure site for construction crews, materials and equipment. Access along the transmission line ROW would include existing roads in their current condition, existing roads that would be improved as part of this Undertaking, and new access roads. The Undertaking would use existing roads and trails wherever feasible to minimize the construction of new access roads. In the event that terrain could not be traversed, permanent new roads would be graded to a total width of between 14 and 24 feet (including both the travel surface and shoulders) depending on location and terrain.

During construction of the transmission line, there would be temporary work areas at each structure site to facilitate the safe operation of equipment and construction operations; pulling and tensioning sites; material staging sites and turn-around areas.

Work areas would require a temporary disturbance area of 150 feet by 125 feet (18,750 square feet [0.4 acre]) for H-Frame structures and 150 feet by 80 feet (12,000 square feet [0.3 acre]) for single pole structures.

Pulling and tensioning sites for stringing the conductor would require a temporary disturbance area of 125 feet by 400 feet (50,000 square feet [1.1 acres]). Sites for pulling and tensioning would be located approximately every 11,000 feet or less.

Turn-around areas may be required where construction travel would be restricted by rock outcrops, washes, ravines or sensitive areas. Turn-around areas would typically require a temporary disturbance area of 60 feet by 60 feet or 3,600 square feet (0.1 acre).

Several material staging areas, roughly five acres each, would be required for material and equipment storage and for staging construction activities. Sites for material staging areas would be located on existing disturbed areas and would be determined during detail design.

The new 230 kV transmission line would enter Pacific Power's Pomona Heights Substation on the northwest edge of the substation. All new equipment would be installed within the existing substation fence. A new steel H-Frame terminal structure would be required. New line breakers, new switches, various bus connections and other minor equipment and wiring would be installed to incorporate the new line into the interconnected regional electric transmission grid.

The Vantage Substation is owned by BPA. The new line would enter the east area of the substation. BPA would design and install the new equipment to interconnect the new 230 kV transmission line to the regional electric transmission grid. All new equipment would be installed within the existing Vantage Substation fence.

APPENDIX B

DEFINITIONS

Adverse Effect. When an Undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the Undertaking that may occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5 and 800.10a). Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, which is not consistent with the Secretary of the Interior’s Professional Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
- Removal of the property from its historic location.
- Change of the character of the property’s use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian Tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Area of Potential Effects (APE). The geographic area or areas within which an Undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (36 CFR Part 800.16).

Class I Inventory. A Class I Inventory is a professionally prepared study that includes a compilation and analysis of all reasonably available cultural resource data and literature, and a management-focused, interpretive, narrative overview, and synthesis of the data. The inventory is primarily used for land use planning and environmental evaluations, such as Environmental Assessments (EA) and Environmental Impact Statements (EIS). Existing cultural resource data are obtained from published and unpublished documents, BLM cultural resource inventory records, institutional site files, state and National Registers, interviews, and other information sources. Class I Inventories, which should have prehistoric, historic, and ethnographic elements, are in large part chronicles of past land uses, and as such they should be relevant to current land use decisions. General information about sacred sites and other places of traditional cultural or religious importance to Native Americans or other cultural groups (including "traditional cultural properties" as discussed in National Register Bulletin No. 38) should as much as possible be included in the inventory (BLM Manual 8110).

Class II Inventory/Probabilistic Field Survey. A class II probabilistic field survey is a statistically based sample survey, designed to aid in characterizing the probable density, diversity, and distribution of cultural properties in an area, to develop and test predictive models, and to answer certain kinds of research questions. Within individual sample units, survey aims, methods, and intensity are the same as those applied in a Class III survey (BLM Manual 8110).

Class III Inventory/Intensive Field Survey. A Class III intensive survey determines the distribution, number, location, and condition of historic properties in an area in order to determine effects and potential mitigation methods. A Class III is used when it is necessary to know precisely what historic properties exist in a given area or when information sufficient for later evaluation and treatment decisions is needed on individual historic properties (BLM Manual 8110).

Cultural Resource. A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups (cf. "traditional cultural property"). Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit described in the BLM 8110 Manual series. They may be but are not necessarily eligible for listing in the National Register (BLM Manual 8110).

Consulting Parties. All Signatories, invited Signatories, and Concurring Parties.

Concurring Parties. Concurring parties are Consulting Parties who have participated in the consultations and may be invited to concur in the agreement. Concurring parties who refuse to concur in the agreement do not invalidate the agreement (36 CFR Part 800.6(c)(3)).

Cultural Landscape. A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Cumulative Effects. The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes other actions (40 CFR Part 1508.7).

Day(s). For the calculation of time periods under this PA, "days" means calendar days. Any time period specified in this PA that ends on a weekend or a state or federal holiday is extended until the close of the following business day.

Effect. An alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register (36 CFR Part 800.16).

Historic property. Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. The term also refers to artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe and that meet the National Register criteria (36 CFR Part 800.15(1)). The phrase ‘eligible for inclusion in the National Register’ is used to refer to both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria (36 CFR Part 800.15(2)).

Phased Approach. ACHP regulations at 36 CFR Part 800.4(b)(2) states that where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to 36 CFR Part 800.6, a programmatic agreement executed pursuant to 36 CFR Part 800.14(b), or the documents used by an agency official to comply with the National Environmental Policy Act pursuant to 36 CFR Part 800.8.

Signatories. Signatories execute, may amend, and may terminate an Agreement. *Invited Signatories* may propose amendments to this Agreement and may terminate the agreement per Section Part 800.6(c)(2). Invited Signatories who wish to do so must have participated in the Agreement’s execution as evidenced by signature.

Traditional cultural property (TCP). A property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history, and (b) are important in maintaining the continuing cultural identity of the community (National Register Bulletin 38).

Undertaking. An undertaking is a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license or approval (36 CFR Part 800.16(y)).

Visual effect. A visual effect is present when the proposed project is viewable from a historic property. A visual effect may be beneficial or adverse and may affect the historic property in an aesthetic or obstructive manner. An adverse visual effect diminishes the integrity of the historic property’s significant historic features (36 CFR Part 800.5(a)(2)(v)). An adverse visual impact is any modification in landforms, water bodies, or vegetation, or any introduction of structures, which negatively interrupts the visual character of the landscape and disrupts the harmony of the basic elements (i.e., form, line, color, and texture). The determination is made from the historic property towards the proposed Undertaking.

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APPENDIX C

TO THE PROGRAMMATIC AGREEMENT
REGARDING THE CONSTRUCTION OF THE
VANTAGE TO POMONA HEIGHTS 230 kV TRANSMISSION LINE PROJECT

PLAN FOR UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES

In the event that previously unknown cultural resources are discovered within the APE from construction activities of the Pacific Power 230 kV Project, or should those activities directly or indirectly impact known resources in an unanticipated manner, the following actions, at a minimum, will be initiated by Pacific Power or the agency having jurisdiction over the land involved, or a representative duly authorized to perform these tasks:

1. Archaeological monitoring by a professional archaeologist who meets, or who is under the supervision of someone who meets, the Secretary of the Interior's qualifications (36 CFR Part 61) and has specialized experience and expertise necessary to monitor construction activities that will take place during all ground disturbing activities which have the potential to penetrate native deposits within the permit area.

2. All activities will halt in the immediate vicinity of the discovery and all actions that might adversely affect the cultural resource will be redirected to an area at least 100 feet from the point of discovery.

3. Pacific Power, BLM, the appropriate land manager, SHPO, and concerned tribes will be notified immediately (within 24 hours).

    a. A cultural resource specialist will be called in to assess the discovery. The cultural resource specialist shall meet the Secretary of the Interior's Professional Standards for archaeology.

    b. In the event that a cultural resource specialist or other necessary persons are not immediately available, Pacific Power will cover or otherwise protect the discovery until such time that the appropriate parties can be present for inspection and evaluation.

4. Upon arriving at the site of the discovery, the cultural resource specialist shall assess the resource. The assessment shall include:

    a. The nature of the resource (e.g., number and kinds of artifacts, presence/absence of features). This may require screening of already disturbed deposits, photographs of the discovery, collection of Global Positioning System (GPS) data, and other necessary documentation. The specialist will have basic archaeological excavation tools on hand.

    b. The spatial extent of the resource. This may require additional subsurface examination, mapping or inspection, as is appropriate to the resource.

c. The nature of deposition/exposure. This may require interviews with construction personnel and with other persons having knowledge about the resource or the expansion of existing disturbance to establish the characteristics of the deposits.

5. The cultural resource specialist will complete the appropriate inventory form for the land managing agency. BLM will distribute inventory forms to appropriate parties for review and comment.

6. Resources will be considered a "site" should they meet the criteria established by the SHPO and BLM, JBLM YTC, or other agency that has jurisdiction over the land.

7. The site will be evaluated in terms of the criteria of eligibility for the National Register established under 36 CFR Part 60.4. The BLM shall consult with the appropriate land managing agency, SHPO and Tribes prior to making the eligibility determination. If the site is eligible for listing, BLM shall consult with the appropriate land managing agency, SHPO, Tribes, and other Consulting Parties to determine mitigation efforts necessary to lessen or remove further impacts. If necessary, Pacific Power shall prepare a site-specific treatment plan following the guidance provided in the HPTP, as defined in Stipulation V of the PA. For state managed lands in Washington, the SHPO will prepare the site-specific HPTP.

8. Any items found on federal land meeting the definition provided for in NAGPRA of human remains or cultural items encountered in a discovery situation will be handled according to the provisions of NHPA, ARPA, NAGPRA and Washington State laws provided for within Stipulations II.B and VIII of the PA.

9. If the site is determined to be damaged, according to Stipulation VII, a site damage assessment will be conducted by an approved cultural resources specialist. A report will be written and sent to the appropriate land managing agency and the SHPO for review and comments, following Stipulation III.F.

10. Pacific Power will consult with the BLM, and the BLM will consult with the appropriate federal land managing agency, SHPO, Tribes, the appropriate state land managing agency, or, when private land is involved, the property owner, to determine if and when construction activities in the location of the discovery may resume.

11. A technical report will be written at the end of the project by Pacific Power describing any discoveries made or, if appropriate, the lack of discoveries, and will be distributed in accordance with the protocol defined under Stipulation III.F.

APPENDIX D

TO THE PROGRAMMATIC AGREEMENT REGARDING THE CONSTRUCTION OF THE PACIFIC POWER VANTAGE TO POMONA HEIGHTS 230 KV TRANSMISSION LINE PROJECT

AMENDMENT FORM

AMENDMENT #:
DATE:

1. NEED FOR AMENDMENT:

2. AMENDMENT: