

3.4 VEGETATION AND WETLANDS

3.4.1 Existing Vegetation Conditions

This section describes the vegetation resources, including rare plants and wetlands, of the Project area, assesses the potential impacts of the proposed Wild Horse Wind Power Project on these resources, and describes the mitigation planned for the Project. A complete report of the habitat characterization and rare plant investigation is provided as Exhibit 12, ‘Habitat Characterization and Rare Plant Resources Report’. The information presented below was gathered from published literature, resource management agencies, local biologists, and on-the-ground surveys.

3.4.1.1 Habitat Characterization

Habitat Characterization Methodology

Vegetation in the 8,600 acre Project area was mapped according to “habitat types,” which are considered to be the generally recognizable assemblages of plant species that occur in a pattern across the landscape. Habitat types were determined based on visual assessment of dominant plant species. Commercially available black and white digital aerial photography dated 2000 with a pixel size of 1 meter was used for the habitat mapping. The habitat types were mapped during late April – early May 2003, with follow-up visits in July, September, and October 2003. Initially, the roads in and around the Project site were driven in order to correlate habitat types with the signature (color, shading, texture) on the aerial photos. Each habitat type was then mapped based on either visual observation of the habitat from a road or high point, or by walking the boundaries of the habitat. Due to the scale of the aerial photos used, fine-scale intermingling in transition areas and small inclusions of one habitat type within another are not shown. The mapped boundaries of each habitat type were digitized using ArcView™. The habitat map is provided as part of Exhibit 12.

In addition to the habitat map that was developed for the Project area, a literature review was conducted to gain an understanding of previous work in similar habitats. Daubenmire (1970), in particular, is noteworthy for characterization of the vegetative communities of eastern Washington.

In accordance with guidelines developed by WDFW (August 2003) for baseline and monitoring studies for wind projects, an assessment of habitat quality was conducted. The guidelines state that “where a wind project will affect [shrub-steppe] habitat in “excellent” condition (based on federal methodologies for assessing range land), wind project developers will engage in additional consultation with WDFW regarding suitable mitigation requirements for such habitat”. The Applicant contacted a federal Bureau of Land Management (BLM) botanist specializing in shrub-steppe habitat to determine the federal methodology for classifying habitat (R. Rosentreter, BLM, pers. comm.). The BLM suggested using Natural Resource Conservation Service (NRCS) “Range Condition Classes”, which classify range condition as “excellent”, “good”, “fair”, or “poor”, based

on a comparison of the existing community composition to the climax community composition.

The Releve method (Braun-Blanquet 1932) was used to document the existing community composition. Sample points were taken at each turbine string. A data sheet was filled out at a sample location judged to be most representative of the habitat for each turbine string. Existing plant species were listed at each sample location. Climax community composition data was obtained from the NRCS. Although the Soil Survey for Kittitas County is currently out-of-print, the soil map and characteristic climax plant community data were available from the local NRCS office. The climax community composition data is provided by soil type. Comparison of the existing community composition to the climax community composition allows an assessment of habitat quality. Based on NRCS guidelines (USDA SCS 1973), rangeland with 75 to 100 percent of its climax vegetation is in “excellent” condition. Rangeland with 50 to 75 percent of its climax vegetation is in “good” condition. Rangeland with 25 to 50 percent of its climax vegetation is in “fair” condition, and less than 25 percent is in “poor” condition.

The steppe vegetation of eastern Washington has been characterized by Daubenmire (1970). Daubenmire’s classification includes nine vegetation zones; each zone is based on climate, vegetation structure, and floristics. The Project area is within the *Artemisia tridentata* – *Agropyron* zone. In an undisturbed condition, this zone is distinguished by big sagebrush (*Artemisia tridentata*) as the principal shrub and bluebunch wheatgrass (*Agropyron [Pseudoroegneria] spicata*) as the principal grass. The soils in this zone are mostly loams or stony loams. Grazing by domestic livestock in this zone tends to result in a decline in large perennial grasses and an increase in annual cheatgrass. Big sagebrush cover can vary from 5 to 26 percent, and does not seem to be correlated to grazing (Daubenmire 1970).

In addition to big sagebrush, a number of other shrub species may be present in the *Artemisia tridentata* – *Agropyron* zone in small numbers; these include rabbitbrushes (*Chrysothamnus* spp. and *Ericameria* spp.), threetip sagebrush (*Artemisia tripartita*), and spiny hopsage (*Grayia spinosa*). The bluebunch wheatgrass is supplemented by variable amounts of needle-and-thread grass (*Hesperostipa comata*), Thurber’s needlegrass (*Achnatherum thurberianum*), Cusick’s bluegrass (*Poa cusickii*), and bottlebrush (*Elymus elymoides*). A low layer of plants consisting of Sandberg’s bluegrass, cheatgrass, and flatspine stickseed (*Lappula occidentalis*) may also be present (Daubenmire 1970).

Within the steppe region, a variety of habitats occur that have soils sufficiently unusual in physical or chemical properties to develop unique climax communities that are not necessarily associated with a particular vegetation zone. Lithosol (shallow soils) habitats are one such habitat that commonly occurs on the ridgetops within the Project area. Daubenmire (1970) recognizes a variety of lithosolic plant associations. All are typically composed of a uniform layer of Sandberg’s bluegrass, over a crust of mosses and lichens, with a low shrub layer above. The primary difference in these communities is in the composition of the shrub layer. Within the Project area, the shrub layer on these lithosols

is principally composed of stiff sagebrush (*Artemisia rigida*) and/or several different buckwheat species (*Erigeron spp.*).

The above descriptions of generalized vegetation zones and associations are based on climax communities, which typically develop over time in the absence of anthropogenic disturbance. Within most of the shrub-steppe region, including the Project area, many of the plant communities have been modified due to numerous disturbance factors. Livestock grazing, introduction of exotic plant species, and ground disturbance from recreational activities have resulted in a shift in plant community composition in the Project area from the climax communities described above. Notable in the Project area is a lower percentage of native grass species and grass cover in general as compared to climax communities, attributable to livestock grazing (L. Stream, WDFW, pers. comm.). Additionally, the Project area does contain some non-native species and weedy species; however, native species overwhelmingly dominate the Project area.

Habitat Characterization Results

The following habitat types were mapped in the Project area and are described below:

- *Shrub-steppe* – 7,992 acres in the Project area (92 percent)
- *Herbaceous* – 469 acres in the Project area (5 percent)
- *Herbaceous/Rock outcrop* – 97 acres in the Project area (1.1 percent)
- *Pine Forest* - 31 acres in the Project area (0.4 percent)
- *Woody Riparian* – 54 acres in the Project area (0.6 percent)
- *Rock outcrop* – 5.6 acres in the Project area (0.1 percent)
- *Seasonal Water Body* – 1.7 acres in the Project area (0.02 percent)

The following habitat types occur along the BPA and PSE transmission feeder line routes within the 328-foot buffer that was surveyed for rare plants:

- *Shrub-steppe* – 438 acres (91 percent of the survey area)
- *Herbaceous* – 37.4 acres (7.5 percent of the survey area)
- *Pasture* – 3.6 acres (0.7 percent of the survey area)
- *Talus* – 2.4 acres (0.5 percent of the survey area)
- *Woody Riparian* – 1.3 acres (0.3 percent of the survey area)

Within the Project area, the primary habitat type is shrub-steppe. These upland sites are dominated by shrubs, primarily big sagebrush and stiff sagebrush. Threetip sagebrush (*Artemisia tripartita*), antelope bitterbrush (*Purshia tridentata*), and squaw current (*Ribes cereum*) occasionally dominate. A mix of grasses and forbs make up the understory. Big sagebrush is typically dominant in areas with deeper soils, while stiff sagebrush is dominant on exposed sites with shallow soils, including lithosols. The shrub-steppe habitat type can be further broken down into three categories based on relative spatial density of the shrub layer – dense (greater than 60 percent shrub cover), moderate (30 to 60 percent shrub cover), and sparse (less than 30 percent shrub cover). These categories are subjective and based on a qualitative assessment. In general, areas with a dense shrub layer are found on deep-soiled sites on slopes and dominated by big sagebrush, antelope bitterbrush, or squaw current. Areas with a moderate shrub layer are flat to gently

sloping, and typically dominated by big sagebrush or stiff sagebrush. Areas with sparse shrub cover are found on exposed ridgetops and knolls and dominated by low-growing stiff sagebrush, or in some areas, various buckwheats.

In the Project area, herbaceous habitats comprise 5 percent of the Project area and are generally limited to very steep slopes and exposed ridges that do not support shrubs, or only scattered individual shrubs (usually stiff sagebrush or buckwheats). The herbaceous habitat type includes a variety of plant associations dominated by grass species, particularly Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass, Hood's phlox (*Phlox hoodii*), Hooker's balsamroot (*Balsamorhiza hookeri*), and narrowleaf goldenweed (*Haplopappus stenophyllus*). Lithosols are common in this habitat type, especially on exposed ridgetops; Sandberg's bluegrass is the dominant grass on lithosols. On some steep slopes, fingers of exposed cobbles and rock are intermingled among the herbaceous habitat. This herbaceous/rock outcrop type makes up an additional 1.1 percent of the Project area. One 5.6 acre site at the top of Whiskey Dick Mountain is classified as simply rock outcrop.

While the shrub-steppe habitat type dominates the landscape in and around the Project area, a small amount of Ponderosa pine (*Pinus ponderosa*) forest occurs in a narrow strip along one of the main Project area drainages (31 acres or 0.4 percent of the Project area). This narrow strip of forest contains mature Ponderosa pine in the overstory, with a mix of grasses and forbs in the understory.

Riparian areas associated with creeks and springs are limited, but present in the Project area. All Project facilities will be located outside the designated buffers of any wetlands, as required by Section 17A.04.020 "Buffer width requirements" of the Kittitas County Code. A narrow woody riparian strip along Whiskey Dick Creek comprises approximately 0.6 percent of the Project area (54 acres). Small to medium sized trees dominate the overstory, including black hawthorn (*Crataegus douglasii*) and alder (*Alnus sp.*). Scattered shrubs occur in the understory (e.g., squaw current and big sagebrush), along with grasses and forbs such as bulbous bluegrass (*Poa bulbosa*) and fern-leaved lomatium (*Lomatium dissectum*). The riparian habitats associated with springs are degraded from livestock use, and much of the riparian vegetation has been removed. The weedy species, bur buttercup (*Ranunculus testiculatus*) was common around springs.

One seasonal water body occurs near 'String K' that is mapped as approximately 1.6 acres in size. Water was present during the April - May survey period, however this site was dry during visits to the site later in the year. Other on-site investigators report that this water body is generally dry by late May. This water body is located almost 250 feet outside the 100-foot buffer for 'String K'. The area appears to be heavily used by livestock and wildlife for water and the shore was mostly rocky with very little or no riparian vegetation.

A map showing the distribution of the habitat types in the Project area is included as part of Exhibit 12, 'Habitat Characterization and Rare Plant Resources Report'.

Both the BPA and PSE transmission feeder lines are routed along exposed ridge tops, where possible. The BPA transmission feeder line heads west out of the Project area for approximately 2.5 miles along a ridge with sparse to moderate sagebrush cover; lithosol is intermixed in the shrub-steppe habitat. The line is then routed down a narrow drainage and across Parke Creek and a dirt road. Woody riparian habitat occurs along Parke Creek at the proposed transmission line crossing location. The overstory consists of tree species including black hawthorn and aspen (*Populus tremuloides*). The shrub layer includes snowberry (*Symphoricarpos* sp.), Wood's rose (*Rosa woodsii*), golden current (*Ribes aureum*), and willow (*Salix* sp.). The understory consists of a variety of grasses and forbs. The riparian area is within a cattle pasture and the understory is heavily grazed by cattle. West of the Parke Creek and road crossings, the line once again enters shrub-steppe habitat for the remaining approximately 1.5 miles to the intersection with the existing BPA transmission line corridor.

The PSE transmission feeder line heads south out of the Project area along ridge tops dominated by sparse to moderate shrub-steppe habitat for approximately 2 miles where it then crosses the Vantage Highway. South of the Vantage Highway, the transmission line continues along ridge tops primarily in shrub-steppe habitat, although it passes through a few small areas of herbaceous habitat on some exposed knolls. The western-most half-mile of the PSE feeder line crosses a pasture, a small creek, a local road, and the Highline Canal and then interconnects with an existing PSE transmission line.

Results of the habitat quality assessment conducted at each turbine string show that habitat quality ranges from “fair” to “good” (see Exhibit 12, ‘Habitat Characterization and Rare Plant Resources Report’). Although the sample locations were at the turbine strings, the “fair” to “good” rating can be applied across the Project area based on general observations. No sample locations fell into the “excellent” category, due to the history of grazing at the site. Evidence of grazing was observed throughout the Project area. Grazing has resulted in fewer grasses and less grass cover than would be expected in the climax communities. Daubenmire (1970) also observed a decline in large perennial grasses due to grazing, although he could find no correlation among big sagebrush cover and grazing. Similarly, no sample locations fell into the “poor” category. Although the Project area appears to have experienced a minor shift in species composition with less grass cover than would be expected, native species dominate and no significant weedy invasions (e.g. cheatgrass) were observed that could alter species composition to such a degree as to result in a “poor” rating.

Thirteen of the eighteen sample locations were rated as “good”, and five were rated as “fair”. The percentages that observed vegetation differed from climax vegetation ranged from 36 percent to 60 percent. A “fair” is defined as rangeland with 25 to 50 percent of its climax vegetation, and a “good” rangeland has 50 to 75 percent of its climax vegetation. Five sample locations were at 50 percent, and were “rounded up” to the “good” category. No spatial pattern was found for the sample locations rated as “good” verses “fair”, although the “good” locations are generally more isolated, away from the main roads (except String E), and the “fair” locations are closer to main roads (except String M). The “fair” to “good” ratings are indicative of past land uses and the relatively

isolated setting. Although the area has been grazed, no significant shifts in species composition were observed, such as conversion of native vegetation to cropland. It is assumed that the relatively isolated setting has minimized the introduction and spread of noxious and/or invasive species that occurred throughout much of the rangeland in the western US.

Noxious Weeds

The Kittitas County Noxious Weed Control Board publishes a list of noxious weeds presently known to exist within the boundaries of Kittitas County (<http://www.co.kittitas.wa.us/noxiousweeds/list.asp>). During surveys for rare plants, a list was made of all vascular plants encountered in the areas where project facilities will be located and a 164 foot (50 meter) buffer. Several species considered to be “weedy” (i.e., undesirable or non-native) were encountered including:

- Knapweed (*Centaurea sp*)
- Thistle (*Cirsium sp*)
- Yellow salsify (*Tragopogon dubius*)
- Blue mustard (*Chorispora tenalla*)
- Cheat grass (*Bromus tectorum*)
- Bulous bluegrass (*Poa bulbosa*)
- Hornseed buttercup (*Ranunculus testiculatus*)
- Russian thistle (*Salsola kali*)
- Common dandelion (*Taraxacum officinale*)
- Fiddleneck (*Amsinkia sp*)
- Bur chervil (*Anthriscus caulus*)
- Tumble mustard (*Sisymbrium altissimum*)
- Teasel (*Dipsacus sylvestris*)

Of these weedy species found at the Project area (including the main Project area and the proposed feeder line routes), knapweed and thistle are on the County noxious weed list (Class B weeds). These species were not common and were associated with areas of previous disturbance, such as the rocky area on top of Whiskey Dick peak previously explored for oil and gas, and areas along roads and livestock watering areas. None of the weedy species observed in the Project area were common; the Project area is dominated by native species.

3.4.1.2 Unique Species/Rare Plants

Rare Plant Investigation Methodology

Study Area:

For the purposes of the rare plant investigation, the survey area included all lands that would be occupied by proposed facilities and a 164-foot (50 meter) buffer. This included proposed turbine strings, underground and overhead electrical lines, access roads, staging areas, substation sites, potential quarry sites, and the two proposed transmission feeder line routes (BPA and PSE). In most cases, the resultant survey corridors were 328 feet

wide, although in some areas, several Project facilities are proposed to be located along side each other, resulting in a wider survey corridor.

Target Species:

For the rare plant investigation, the target species included all plant taxa listed as ‘Endangered’, or ‘Threatened’ by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act that potentially occur in the Project area. In addition, taxa that have been formally proposed, or are candidates for such federal listing, or taxa listed as “species of concern” that potentially occur in the Project area were also considered target species. The “species of concern” status is an unofficial status for species that appear to be in jeopardy, but for which information is insufficient to support listing. Target species also included all plant taxa defined as ‘Endangered’, ‘Threatened’, ‘Sensitive’, ‘Review’, or ‘Extirpated’ by the Washington Natural Heritage Program (WNHP) that potentially occur in the Project area. The WNHP, part of the WDNR, maintains the most complete database available for state-listed species. Taxa meeting the above criteria were targeted by the investigation to determine their presence or absence within the study area. Determinations of status for rare plant species were based on information provided by the USFWS and the WNHP’s list of tracked plant species (WNHP 2003a).

As per Section 7(c)(1) of the US Endangered Species Act of 1973 (16 USC 1531, *et seq.*, as amended), a letter was sent to the USFWS requesting a list of federally Threatened, Endangered, or Proposed taxa which have potential to occur within the Project area. The USFWS Section 7 response letter listed one federally threatened plant species and one candidate plant species with potential for occurrence in the Project area. The threatened species is Ute ladies’-tresses (*Spiranthes diluvialis*) and the candidate species is basalt daisy (*Erigeron basalticus*). No other plant species of concern to the USFWS were listed in the letter.

In addition, the WNHP was contacted to obtain element occurrence records for any known rare plant populations (federal and/or state listed) in the vicinity. The WNHP reported one element occurrence record for a tracked plant species in the area crossed by the proposed PSE transmission feeder line route (WNHP, 2003). This species occurrence, Hoover’s tauschia, was reported from portions of Sections 4 & 9, Township 17N, Range 21E. Additional element occurrences were reported by WNHP within a three-mile radius of the Project area and include 11 occurrences of Pauper milk-vetch, 12 occurrences of Hoover’s tauschia (including the one crossed by the PSE feeder line), six occurrences of hedgehog cactus, and one occurrence of a Wyoming big sagebrush/bluebunch wheatgrass community. The locational information for these populations is not precise and generally covers portions of several sections.

To supplement the information provided by the above agencies, a number of other resources were consulted. These sources provided additional information on the potential rare plant species for the Project, including critical information such as habitat preferences, morphological characteristics, phenologic development timelines, and species ranges. Sources included: taxonomic keys and species guides (WNHP, 1999; USFWS, 2001; Cronquist et al. 1977; Hitchcock and Cronquist, 1973); online databases

of common and rare plant species (Ilanga Inc. 2003; USDA, 2002); and Natural Resources Conservation Service (NRCS) soils data (USDA, 2002a).

Rare Plant Resource Investigation Results

Field Investigation:

All fieldwork was performed by trained botanists with experience performing rare plant surveys in the region. Exhibit 12, 'Habitat Characterization and Rare Plant Resources Report', contains a summary of each investigator's education and experience.

A pedestrian field survey was performed from April 21 – 27 and May 5 – 9, 2003 to locate rare plant species within the study area (defined above). Additional pedestrian field surveys were performed on July 25, September 24, and October 31, 2003 to search areas that were added or modified from the original Project layout. The survey was timed to locate as many target species as possible, particularly those most likely to occur in the affected habitats (sagebrush-steppe). The survey was accomplished by performing meander pedestrian transects, zigzagging back and forth across the survey corridor. The intensity of the pattern, and the speed at which the surveyor walked, was variable, and depended on the structural complexity of the habitat, the visibility of the target species, and the probability of species occurrence in a given area. In some high probability, low visibility habitats, a tight grid pattern was walked. Care was taken to thoroughly search all unique features and any high probability habitats encountered. A GPS unit showing the survey boundaries was used for navigation, supplemented by 7.5' U.S. topographic maps.

During all surveys a list of all vascular plants encountered was made (a complete species list is included in Exhibit 12, 'Habitat Characterization and Rare Plant Resources Report'). Informal collections of unknown species were taken for later identification. *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973) was the primary authority used for vascular plant species identification. Updated taxonomy referenced in the NRCS PLANTS database or Washington Flora Project database is noted where applicable (USDA, 2003; Ilanga Inc. 2003). Notes were also taken regarding general plant associations, land use patterns, unusual habitats, etc. Photographs of the habitat types and representative individual plants were taken using a digital camera.

The field surveys did not locate any USFWS Endangered, Threatened, Proposed, or Candidate plant species. No habitat for Ute ladies'-tresses occurs in the study area. Limited potential habitat was also found for the federal candidate species, basalt daisy. Although basalt daisy is typically restricted to the extensive cliffs along the Yakima River and Selah Creek, all rock outcrops within the project area were searched intensively for the presence of the species with negative results.

Potential habitat was also found within the study area for a number of federal 'Species of Concern'. These include Columbia milkvetch, Hoover's desert-parsley, least phacelia, Seely's silene, and Hoover's tauschia. In all cases, where potential habitat was found for these species, the area was searched carefully, with negative results.

Likewise, the field surveys did not locate any plants listed as Endangered, Threatened, or Sensitive by the State of Washington. Potential habitat, however, was found for a number of these species throughout the Project area. These habitats were searched thoroughly for the presence of the target species, but none was found.

One plant species on the Washington State ‘Review’ list, hedgehog cactus, was found within the study area. Much of the suitable habitat present in the Project area (lithosol including sparse shrub-steppe and herbaceous habitats) was found to contain scattered individuals. Most of the plants were in flower at the time of the survey. Since the populations were extensive and extended well beyond the edge of the study corridors, mapping of the entire extent was not undertaken.

Hedgehog cactus is currently a Washington State ‘Review 1’ species, indicating that, within the state, the species is a, “[p]lant taxon of potential concern, [but is] in need of additional field work before a status can be assigned” (WNHP 2002c). The Review designation carries no legal requirement for protection; however, WNHP personnel are interested in tracking occurrences of Review species to aid in the assignment of status. Hedgehog cactus is not currently regarded as Endangered, Threatened, or ‘Species of Concern’ by the USFWS.

The hedgehog cactus populations found within the Project area are all located in lithosolic habitats. These habitats are well represented within the Project area, intermingled among sagebrush steppe and herbaceous habitats. Much of the suitable habitat searched was found to contain the species. In addition, a large amount of suitable habitat exists nearby, adjacent to the survey corridors. Although areas outside of the corridors were typically not surveyed, it is reasonable to assume that much of this suitable habitat also contains hedgehog cactus.



Hedgehog cactus

Target Plant Species Within the Project Areas:

The final list of rare plant species thought to have potential for occurrence within the Wild Horse Wind Power Project area is presented in Table 3.4.1-1. It includes all of the species discussed above, as well as a number of others which were included based on references consulted during the prefield review. Although rare plant species other than those listed in Table 3.4.1-1 were not thought to have potential for occurrence within the project area, all rare plant species known or suspected to occur in Washington were considered during the field survey. The species listed in Table 3.4.1-1, however, received the most focus during the investigation. Habitat preferences and identification periods

were derived from the literature for each potential species. Using this information, along with topographic maps of the Project area, a field survey plan was developed to guide the timing and intensity of the field surveys.

Table 3.4.1-1: Rare Plant Species with Potential for Occurrence in the Wild Horse Wind Power Project Area

Common Name Scientific Name	Federal Status	State Status	Typical Habitat	ID Period
Tall agoseris <i>Agoseris elata</i>		S	Meadows, open woods, and exposed rocky ridgetops	June-August
Pasque flower <i>Anemone nuttalliana</i>		S	Prairies to mountain slopes, mostly on well-drained soil	May-August
Palouse milk-vetch <i>Astragalus arrectus</i>		S	Grassy hillsides, sagebrush flats, river bluffs, and openings in open ponderosa pine and Douglas fir forests	April-July
Columbia milk-vetch <i>Astragalus columbianus</i>	SOC	LT	Sagebrush-steppe	March-June
Pauper milk-vetch <i>Astragalus misellus</i> var. <i>pauper</i>		S	Open ridgetops and slopes	April-mid June
Dwarf evening-primrose <i>Camissonia pygmaea</i>		T	Unstable soil or gravel in steep talus, dry washes, banks and roadcuts	June-August
Naked-stemmed evening primrose <i>Camissonia scapoidea</i>		S	Sagebrush desert, mostly in sandy, gravelly areas	May-July
Bristle-flowered collomia <i>Collomia macrocalyx</i>		S	Dry, open habitats	late May-early June
Golden corydalis <i>Corydalis aurea</i>		R1	Varied habitats, moist to dry and well drained soil	May-July
Beaked cryptantha <i>Cryptantha rostellata</i>		S	Very dry microsities within sagebrush steppe	late April – mid June
Shining flatsedge <i>Cyperus bipartitus</i>		S	Streambanks and other wet, low places in valleys and lowlands	August-September
Wenatchee larkspur <i>Delphinium viridescens</i>	SOC	T	Moist meadows, moist microsities in open coniferous forest, springs, seeps, and riparian areas	July

Table 3.4.1-1: Rare Plant Species with Potential for Occurrence in the Wild Horse Wind Power Project Area

White eatonella <i>Eatonella nivea</i>		T	Dry, sandy, or volcanic areas within sagebrush-steppe	May
Basalt daisy <i>Erigeron basalticus</i>	C	T	Crevices in basalt cliffs on canyon walls	May-June
Piper's daisy <i>Erigeron piperianus</i>		S	Dry, open places, often with sagebrush	May-June
Sagebrush stickseed <i>Hackelia hispida</i> var. <i>disjuncta</i>		S	Rocky talus	May-June
Longsepal globemallow <i>Iliamna longisepala</i>		S	Sagebrush-steppe and open ponderosa pine and Douglas fir forest	June-August
Hoover's desert-parsley <i>Lomatium tuberosum</i>	SOC	T	Loose talus and drainage channels of open ridgetops within sagebrush-steppe	March-early April
Suksdorf's monkey-flower <i>Mimulus suksdorfii</i>		S	Open, moist to rather dry places within sagebrush-steppe	mid April-July
Coyote tobacco <i>Nicotiana attenuata</i>		S	Dry, sandy bottom lands, dry rocky washes, and other dry open places	June-September
Cespitose evening-primrose <i>Oenothera cespitosa</i> ssp. <i>cespitosa</i>		S	Open sites on talus or other rocky slopes, roadcuts, and the Columbia River terrace	Late April - mid June
Hedgehog cactus <i>Pediocactus simpsonii</i> var. <i>robustior</i>		R1	Desert valleys and low mountains	May-July
Brewer's cliff-brake <i>Pellaea breweri</i>		S	Rock crevices, ledges, talus slopes, and open rocky soil	April-August
Fuzzytongue penstemon <i>Penstemon eriantherus</i> var. <i>whitedii</i>		R1	Dry open places	May-July
Least phacelia <i>Phacelia minutissima</i>	SOC	S	Moist to fairly dry open places	July

Table 3.4.1-1: Rare Plant Species with Potential for Occurrence in the Wild Horse Wind Power Project Area

Sticky goldenweed <i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>		R1	Meadows and open or sparsely wooded slopes	July-August
Seely's silene <i>Silene seelyi</i>	SOC	T	Shaded crevices in ultramafic to basaltic cliffs and rock outcrops, and among boulders in talus	May-August
<i>Ute ladies'-tresses</i> <i>liluvialis</i>	LT	E	Broad low-elevation intermontane valley plains, with deltaic meandered wetland complexes; restricted to calcareous, temporarily inundated wet meadow zones and segments of channels and swales where there is stable subsurface moisture and relatively low vegetation cover.	Mid July - August
<i>Hoover's tauschia</i> <i>Tauschia hooveri</i>	SOC	T	Basalt lithosols within sagebrush-steppe	March-mid April

Federal Status:

LT = Listed Threatened. Likely to become endangered

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

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

State Status:

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

T = Threatened. Likely to become Endangered in Washington.

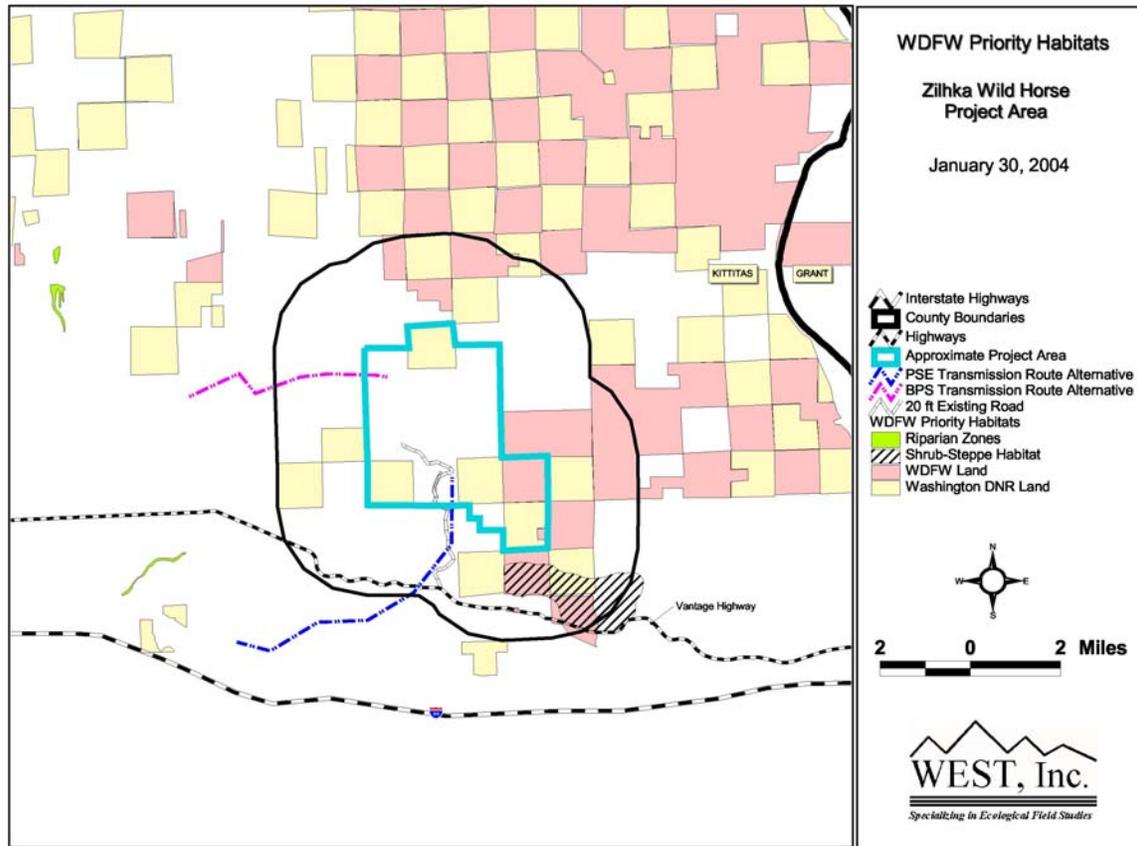
S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.

R1 = State Review Group 1. Taxa for which there is insufficient data to support listing in Washington as Threatened, Endangered, or Sensitive

3.4.1.3 Priority Habitats and Critical Areas

WDFW defines “priority habitats” as “those habitat types or elements with unique or significant value to a diverse assemblage of species.” WDFW has designated 18 priority habitats types, including shrub steppe and riparian areas. Not all shrub steppe or riparian habitat has been mapped as “priority habitat” by WDFW, and not all shrub steppe or riparian habitat would necessary qualify; for example, habitats in severely degraded condition may not be considered priority by WDFW (Clausing, WDFW, pers. comm.). Identifying and mapping priority habitat is an on-going process for WDFW. Currently, no priority habitat is mapped in the Project area itself, however an area of shrub-steppe habitat south of the Project area is mapped as priority shrub steppe habitat (Figure 3.4.1.3-1). Although not mapped as priority habitat, the WFDW would likely consider the shrub steppe habitat rated as “good” condition in the Project area as priority habitat.

Figure 3.4.1.3-1



The Kittitas County Code Title 17A defines “critical areas” as the following:

- (1) wetlands;
- (2) areas with a critical recharging effect on aquifers used for potable water;
- (3) fish and wildlife habitat conservation areas;
- (4) frequently flooded areas; and
- (5) geologically hazardous areas.

No wetlands occur in any areas where Project facilities will be located, including a 100-foot buffer around each facility. The BPA transmission feeder line route includes a crossing of Parke Creek; however, there are no wetlands associated with the proposed crossing area and no construction will take place within 200 feet of the stream bank. No areas with a critical recharging effect on aquifers used for potable water occur in the Project area. No frequently flooded areas occur in or near any areas where project facilities will be located (see Section 3.3, ‘Water’). Geologic issues are addressed in Section 3.1, ‘Earth’.

In the Kittitas County Code, the definition for “fish and wildlife habitat conservation areas” includes “riparian habitat”. The only riparian habitat potentially affected by the project is associated with, Parke Creek, which the BPA transmission feeder line crosses. This riparian habitat may be considered a critical area by Kittitas County, but the

transmission poles will be located at least 200 feet back from the stream bank on either side and there will be no heavy equipment used in the stream bed or riparian corridor for construction. WDFW has reviewed the proposed crossing site and construction techniques and have stated that no hydraulic permit is required. A copy of this letter is included as Exhibit 11.

3.4.2 Project Impacts

Both temporary and permanent impacts of the Project to vegetation will occur during construction. During operations, permanent impacts will remain for the life of the Project while temporary impacts will be restored over time as native vegetation recovers. Therefore the discussion of impacts is not divided into construction and operations for this section.

3.4.2.1 Project Impacts by Habitat Type

Tables 3.4.2-1 and 3.4.2-2 summarize the amount of permanent and temporary impacts expected to habitat types in the Project area. Six of the eight habitat types mapped in the main Project area would be affected; affected habitat types include herbaceous, herbaceous/rock outcrop, shrub-steppe dense, shrub-steppe medium, shrub-steppe sparse, and rock outcrop. Pine forest and woody riparian habitats would not be impacted by project facilities, either temporarily or permanently. Habitats along the BPA and PSE transmission lines that would be affected include herbaceous, pasture, shrub-steppe dense, shrub-steppe medium, shrub-steppe sparse, and rock outcrop. A total of approximately 165 acres would be permanently impacted, with the majority (approximately 139 acres or 84 percent) in shrub-steppe habitats. An additional approximately 356 acres would be temporarily disturbed; approximately 323 acres (91 percent) in shrub-steppe habitats. A breakdown of permanent and temporary impacts by habitat type is shown in Table 3.4.2-2.

Permanent impacts to vegetation would consist of replacement of existing vegetative cover with Project facilities such as wind turbines and access roads. Indirect permanent impacts could also occur such as a change in species composition (e.g., if shrub-steppe habitats are converted to cheatgrass), change in fire frequency of the area, and soil erosion.

Temporary impacts to vegetation include temporary removal of vegetation, crushing or breakage of vegetation, and possible disturbance to habitat (e.g. soil erosion). These impacts are expected to be short-term in nature (e.g., less than five years), depending on the success of revegetation efforts.

The primary habitat type affected is shrub-steppe and most of the shrub-steppe habitat in the Project area is considered good quality. This rating could be lowered to fair or poor if significant change in species composition (e.g., conversion to cheatgrass) results from the proposed Project. This is not expected to occur as the Applicant has proposed mitigation

measures, described below, to prevent such invasion of noxious weeds. Lithosolic soils occur only in the “shrub-steppe, sparse” and “herbaceous” habitat categories. Total permanent impacts to lithosols are estimated at approximately 61 acres, based on Table 3.4.2-2 below.

Very few trees occur in the Project area, and none are expected to be removed from the Project area. The BPA transmission feeder line crosses Parke Creek where deciduous trees are present, but the Applicant has indicated that a permanent maintenance trail will not be necessary in the Parke Creek riparian zone and it is expected that no trees will need to be removed.

Table 3.4.2-1: Summary of Impacts to Habitat Types by Project Facility				
Project Facility	Habitat Type	Area Impacted (acres)		
		Permanent	Temporary	
Wind Turbines	Herbaceous	0.8	25.3	
	Herbaceous/Rock			
	Outcrop		0.6	
	Shrub-steppe Dense	0.1	7.7	
	Shrub-steppe Medium	4.5	133.5	
	Shrub-steppe Sparse	4.0	111.6	
Permanent Meteorological Towers	Herbaceous	0.1		
	Shrub-steppe Medium	0.1		
	Shrub-steppe Sparse	0.1		
Substations	Shrub-steppe Medium	9.0		
Operations and Maintenance Facility	Shrub-steppe Medium	3.6		
	Herbaceous	0.4		
Quarry & Batch Plant	Herbaceous	6.9		
	Shrub-steppe Medium	10.1		
	Herbaceous/Rock outcrop	4.9		
Temporary Laydown Areas	Shrub-steppe Medium		6.0	
	Shrub-steppe Sparse		4.0	
Overhead Collection Lines (pole structures)	Herbaceous	0.0		
	Shrub-steppe Dense	0.0		
	Shrub-steppe Medium	0.0		
	Shrub-steppe Sparse	0.0		

Major Improvement Roads	Herbaceous	2.3	
	Shrub-steppe Dense	0.4	
	Shrub-steppe Medium	17.0	
	Shrub-steppe Sparse	11.5	
New Roads	Herbaceous	7.7	
	Shrub-steppe Dense	1.5	
	Shrub-steppe Medium	46.8	
	Shrub-steppe Sparse	26.8	
	Rock Outcrop	0.4	
Minor Improvement Road	Herbaceous	2.3	
	Shrub-steppe Medium	2.8	
Underground Trench	Herbaceous		1.6
	Shrub-steppe Dense		0.5
	Shrub-steppe Medium		10.1
	Shrub-steppe Sparse		5.7
Construction Trail - overhead feeder line	Herbaceous		2.0
	Pasture		0.1
	Shrub-steppe Dense		1.6
	Shrub-steppe Medium		11.6
	Shrub-steppe Sparse		5.0
	Rock Outcrop		0.1
Feeder line (pole structures & Pole Assembly)	Herbaceous	0.0	3.1
	Pasture	0.0	0.2
	Shrub-steppe Dense	0.0	2.5
	Shrub-steppe Medium	0.2	15.2
	Shrub-steppe Sparse	0.1	7.9
	Rock Outcrop	0.0	0.1
TOTAL		165	356

Table 3.4.2-2. Summary of Impacts by Habitat Type

Habitat Type	Impacted Area (acres)	
	Permanent	Temporary
Herbaceous	20.6	32.0
Herbaceous/Rock Outcrop	4.9	0.6
Pasture	0.0	0.3
Shrub-steppe Dense	2.1	12.3
Shrub-steppe Medium	94.2	176.4
Shrub-steppe Sparse	42.5	134.2
Rock Outcrop	0.4	0.2
Total	165	356

**Quantities listed are approximate.*

3.4.2.2 Sensitive Plant Species

Due to the absence of known populations within the Project area, no Project-related impacts are anticipated to any federally Endangered, Threatened, Proposed, or Candidate plant species. Since no impacts are anticipated, the appropriate determination of effect for the Project for federally-listed plant species is “no effect”. Preparation of a Biological Assessment is therefore not necessary. Likewise, no Project-related impacts are predicted for any Washington State Endangered, Threatened, or Sensitive plant species.

Limited impacts are anticipated, however, to one species on the Washington State Review list, hedgehog cactus. Ground disturbance related to construction and operation of the proposed Project could cause direct adverse impacts to individuals if they are located within the impact footprint. However, due to the large number of individuals observed, their frequency in preferred habitats, and the high likelihood that many more individuals occur in the area adjacent to the survey corridors, the Project is not expected to significantly impact the species’ viability in the Project area. An estimated 10 percent of the individuals in the Project area could be directly impacted by the Project. This level of direct impact is not anticipated to jeopardize the continued existence of the local population, or lead to the need for state or federal listing.

In addition to direct impacts from ground disturbing activities, the Project also has the potential to impact hedgehog cactus indirectly if the Project leads to the degradation of habitat in the area through the introduction and spread of noxious weeds or the increase of human presence in the area. Although little is known about how hedgehog cactus responds to competition from non-native species, it is safe to assume that significant increases in noxious weeds in the area could adversely impact the species. At the present time, the lithosolic habitat where hedgehog cactus is found is relatively intact. If the Project led to the degradation of these habitats by increasing noxious weed densities, it is likely that some level of adverse impact to hedgehog cactus populations would occur.

This is not expected to occur as the Applicant has proposed mitigation measures to prevent and minimize the spread of noxious weeds. Furthermore, uncontrolled access to the Project area could increase the possibility of cactus collectors on-site. Collection of hedgehog cactus for gardens has been cited as a reason for decline of the species (Taylor 1992). Access to the Project area will be controlled during construction and operations and will likely result in a lower level of human activity within the Project area than is currently occurring.

3.4.2.3 Priority Habitats and Critical Areas

No mapped WDFW priority habitats occur in the Project area, therefore no project-related impacts will occur to mapped priority habitats.

Since none of the following Kittitas County “critical areas” are found in or near any areas where Project facilities will be located, no impacts are anticipated to: wetlands, areas with a critical recharging effect on aquifers used for potable water, or to frequently flooded areas.

Other Kittitas County critical areas are addressed elsewhere in the application, including fish and wildlife habitat conservation areas (Section 3.6, 'Wildlife') and geologically hazardous areas (Section 3.1, 'Earth').

3.4.2.4 Noxious Weeds

Most noxious and invasive species are aggressive pioneer species that have a competitive advantage over other species on disturbed sites. Therefore, all areas disturbed by the Project are potential habitat for noxious and invasive species, particularly for those species previously observed or known to occur in the Project area. The introduction of new noxious species from other areas can occur from construction equipment and other vehicles transporting seeds onto the Project site. Once established in an area, negative impacts can include one or more of the following, depending on the species, degree of invasion, and control measures:

- loss of wildlife habitat;
- alteration of wetland and riparian functions;
- reduction in livestock forage;
- displacement of native plant species;
- reduction in plant diversity;
- changes in plant community functions;
- changes in fire frequency
- increased soil erosion and sedimentation;
- reduced recreational value and use;
- increased control and eradication costs to local communities; and/or
- reduction in land value

3.4.2.5 Wetlands

No wetlands occur in or near areas designated for Project facilities or construction impacts; therefore, no construction or operation impacts to wetlands are expected.

3.4.2.6 Comparison of Impacts of Proposed Scenarios

Under the different design scenarios, there is no significant change to the potential impacts of the Project. This is because under each scenario, there is no change to the length or width of Project components, including roads, substations, O&M facilities, rock quarries, underground or overhead lines, permanent met towers, batch plant, or rock crusher. These components comprise the vast majority of acreage impacted by the Project, and because they remain unchanged under all scenarios, the total acreage and construction quantities are very similar under all scenarios.

The total acreage and construction quantities are very similar under all scenarios because the scenarios utilize a similar layout, with greater or fewer WTGs along each string, but with the same beginning and end points for each string. The “permanently disturbed” acreage differs only by the different number of WTG foundations required, which is a very small percentage of the overall Project acreage. The Large WTG Scenario utilizes larger foundations for a smaller number of WTGs while the Small WTG Scenario utilizes smaller foundations for a larger number of WTGs, yielding similar acreage requirements. The different acreages permanently disturbed under each scenario are therefore the same as presented in Table 3.4.2-2. The acreages of temporary disturbance under the different scenarios are presented below, and increase by 13% or decrease by 18% depending on the number of laydown areas required for each scenario. Because the Small WTG scenario would install more WTGs, it would require a larger temporary impact area for WTG laydown and assembly than the other scenarios.

Table 3.4.2-3: Summary of Temporary Disturbance by Habitat Type

Habitat Type	Temporarily Impacted Area (acres)		
	Large WTG Scenario	Most Likely Scenario	Small WTG Scenario
Herbaceous	26	32	36
Herbaceous/Rock Outcrop	0.5	0.6	0.7
Pasture	0.2	0.3	0.3
Shrub-steppe Dense	10.0	12.3	13.9
Shrub-steppe Medium	143.2	176.4	198.7
Shrub-steppe Sparse	108.9	134.2	151.2
Rock Outcrop	0.2	0.2	0.2
Total	289	356	401

Note: Estimates are extrapolated from Table 3.4.2-2 data.

3.4.3 Impacts of No Action Alternative

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this ASC would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the Project area, which is zoned Commercial Agriculture and Forest and Range. According to the County's zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses (Kittitas County 1991). However, if the proposed Project is not constructed, it is likely that the region's need for power would be addressed by user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Baseload demand would likely be filled through expansion of existing, or development of new, thermal generation such as gas-fired combustion turbine technology. Such development could occur at conducive locations throughout the state of Washington.

A baseload natural gas-fired combustion turbine would have to generate 67 average MW of energy to replace an equivalent amount of power generated by the project (204 MW at 33% net capacity). (An average MW or "aMW" is the average amount of energy supplied over a specified period of time, in contrast to "MW," which indicates the maximum or peak output [capacity] that can be supplied for a short period.) See Section 2.3, 'Alternatives'.

3.4.4 Wetlands

Wetlands are of concern at the federal, state, and county levels. At the federal level, filling of wetlands is regulated under Section 404 of the Clean Water Act. The Army Corps of Engineers is responsible for the regulation of wetlands and the Corps has prepared a manual for the delineation of wetlands (Environmental Laboratory, 1987). At the state level, the Washington Department of Ecology regulates wetlands within the state. The Department of Ecology provides guidelines on the delineation of wetlands, wetland characterization and function assessments, and mitigation. At the county level, wetlands are designated as "critical areas".

All areas where proposed Project facilities will be located were searched for the presence of wetlands by a qualified wetland delineator. The wetland searches included a 164 foot (50 meter) buffer around each proposed Project facility. No wetlands occur in areas designated for Project facilities or construction impacts, nor do wetlands occur within the buffer zone. Several springs are scattered throughout the Project area, but none are in close proximity to any Project facility. Whiskey Dick Creek, an intermittent stream, flows through the Project area, but again, not in close proximity to any Project facility. The proposed BPA feeder line crosses Parke Creek, an intermittent stream, east of the main Project area. The crossing location was investigated and no wetlands are associated

with Parke Creek at this location. The area supports a woody riparian zone with trees such as alder (*Alnus incana*) and aspen (*Populus tremuloides*) in the overstory and mixed shrubs (e.g., snowberry [*Symphoricarpos sp.*], golden current [*Ribes aureum*], willow [*Salix sp.*]) and forbs in the understory. The vegetation did not meet the criteria for a wetland and no hydrology indicators were observed. Parke Creek is somewhat channelized at this location and there was no evidence of periodic flooding or a high water table. The location is within a pasture and the area is heavily grazed by livestock.

Due to the nature of wind power projects, most facilities are located in upland habitats. During the design of the Project, all Project facilities, including access roads, electric lines, and turbine strings, were intentionally laid-out to avoid the limited water features in the Project area (particularly springs).

3.4.5 Mitigation Measures

3.4.5.1 Mitigation for Impacts to Project Area Habitats

The Applicant has proposed to mitigate for all permanent and temporary impacts to habitat caused by the Project in accordance with the ratios outlined in the WDFW Wind Power Guidelines (WDFW, August 2003). A mitigation parcel has been identified within the 8,600-acre Project area. The mitigation parcel is T18N, R21E, Section 27, except for the portion of this section that will be developed as part of the Project. String 'L' follows a ridgeline that dissects Section 27 from north to south. The area set aside for Project mitigation is estimated at approximately 600 acres. This is more than the required replacement habitat under the WDFW Wind Power Guidelines. The Applicant has agreed to fence this parcel to eliminate livestock grazing if the grazing practices of adjacent properties at the time the Project goes into operation will require fencing to ensure that cattle are excluded from this parcel. In addition to Section 27, the Applicant is proposing to fence several springs within the Project area to eliminate livestock degradation. Fencing used for the mitigation parcel and the springs will be designed to keep livestock out but allow game species to cross. The Applicant intends to coordinate with Washington Department of Fish and Wildlife (WDFW) regarding fence specifications.

As noted above, WDFW has prepared a set of guidelines for wind power projects east of the Cascades to provide guidance for siting and mitigation. These guidelines were followed during selection of Section 27 as a mitigation site for the Project. Section 27 provides opportunity for "like-kind" replacement habitat of equal or higher habitat value than the impacted area and it occurs in the same geographical region as the impacted habitat. Furthermore, since the Applicant has an option to purchase the property if the Project goes forward, the Applicant can provide legal protection and protection from degradation for the life of the Project. Consistent with WDFW's guidelines, permanent impacts to habitat would be replaced at a ratio equal to or greater than 1:1 for grassland and 2:1 for shrub-steppe.

Additional benefits of Section 27 as a mitigation parcel for the Project include:

- Protection of a segment of Whiskey Dick Creek
- Continuity of habitat with adjacent state lands
- Preservation of a diversity of habitats

Use of Section 27 as a mitigation parcel would result in protection of an approximately 1-mile segment of Whiskey Dick Creek near its headwaters. Protection of waterways and their adjacent riparian habitat provide significant benefits above and beyond replacement of “like-kind” habitat at agreed upon ratios. Protection of this segment of Whiskey Dick Creek provides benefits for water quality, wildlife, and species diversity. In addition, Section 27 is adjacent to state-owned lands. WDNR administers Section 34 to the south and WDFW administers Section 26 to the east. Use of Section 27 for mitigation will provide continuity of habitat with these adjacent state-owned sections. Finally, a variety of habitat types that occur in the general Project area are found in Section 27, so a diversity of habitat types would be preserved. These include shrub-steppe (moderate and dense), herbaceous, herbaceous/rock outcrop, and woody riparian.

3.4.5.2 Mitigation for Impacts to Unique Species/Rare Plants

The only unique species or rare plant that may be impacted by the project is hedgehog cactus, a Washington State Review list species. Access to the site will be controlled during both construction and operations, which should provide greater protection than is currently afforded to this species. As collection of this species for gardens has been cited as a reason for its decline, if such collection becomes a problem at the Project site despite the controlled access, the Applicant will additionally post signage indicating that collection of any plants in the Project area is prohibited.

3.4.5.3 Mitigation for Impacts to Critical Areas/Priority Habitats

Since no Kittitas County critical areas will be impacted by the Project, no mitigation is proposed.

Shrub steppe is considered a priority habitat by WDFW. The Applicant has selected a mitigation site that meets or exceeds the WDFW’s guidelines for mitigation of shrub steppe for wind power projects east of the Cascades. This mitigation site is described above in Section 3.4.5.1.

3.4.5.4 Wetlands

Since no impacts to wetlands are expected, no mitigation is proposed.

3.4.5.5 Noxious Weeds

To avoid, minimize, or reduce the impacts of noxious weeds, the following mitigation measures will be implemented:

- The contractor will clean construction vehicles prior to bringing them in to the project area from outside areas.
- Disturbed areas will be reseeded as quickly as possible with native species.
- Seed mixes will be selected in consultation with WDFW and Kittitas County Weed Control Board.
- If hay is used for sediment control or other purposes, hay bales will be certified weed free.
- Access to the site will be controlled which may result in a lower level of disturbance and fewer opportunities for noxious weeds to be introduced and/or spread.
- Noxious weeds that may establish themselves as a result of the Project will be actively controlled in consultation with the Kittitas County Weed Control Board.

3.4.6 Significant Unavoidable Adverse Impacts

With mitigation, no significant unavoidable adverse impacts are anticipated to vegetation resources in the Project.