

Chokecherry and Sierra Madre Wind Energy Project Rare Plant Survey Report

Phase I Wind Turbine Development

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the “checkerboard.” The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Wildlife Monitoring and Protection Plan for the CCSM Project that identifies measures to be completed for each site-specific plan of development, including wildlife field reviews (BLM 2012: Appendix G). Field reviews are intended to reduce impacts by identifying specific locations where impacts might occur and providing opportunities to avoid, minimize, or mitigate impacts. While not specifically identified in Appendix G of the ROD, rare plant habitat assessments are consistent with the BLM’s goal of avoiding or minimizing impacts to sensitive species.

Rare plant surveys were completed for the Phase I Wind Turbine Development Site during the 2012 through 2014 growing seasons. Surveys focused on potential occurrence of ESA-listed and BLM sensitive rare plant species or habitat. Surveys were completed for all planned disturbance associated with the Phase I Wind Turbine Development Site and a minimum 100 foot buffer (Figures 1 and 2).

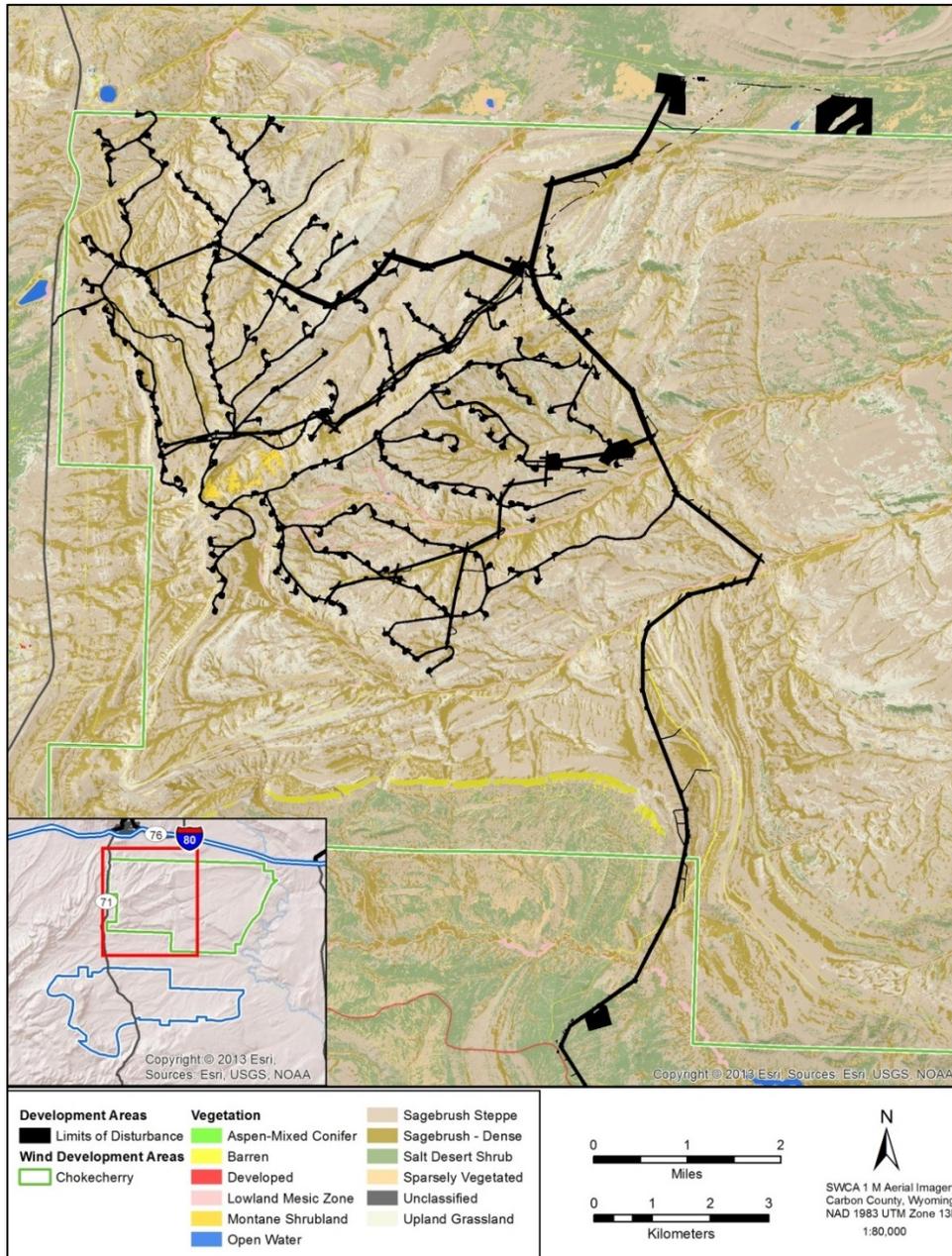


Figure 1. Phase I Wind Turbine Development Site within the Chokecherry Wind Development Area

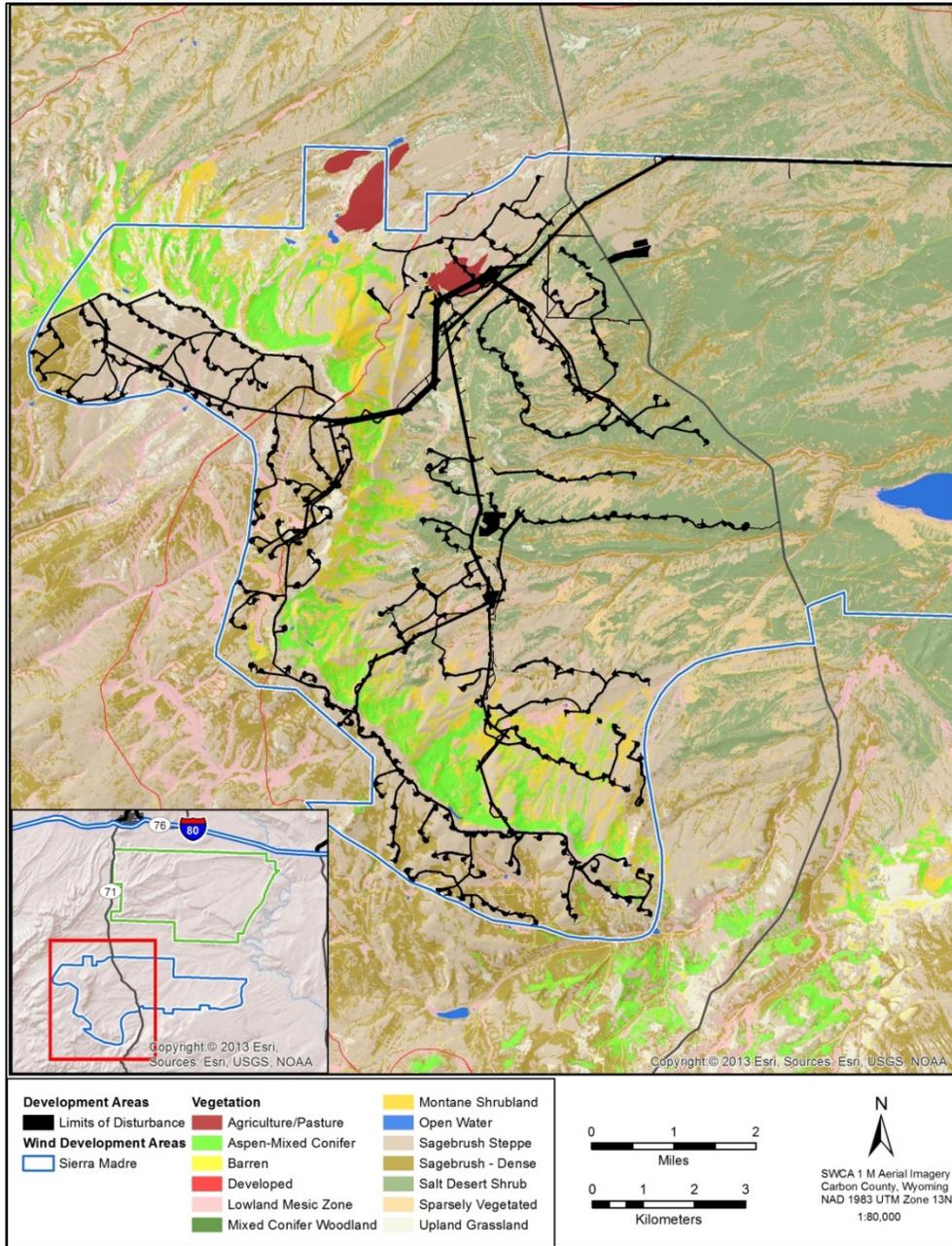


Figure 2. Phase I Wind Turbine Development Site within the Sierra Madre Wind Development Area

2.0 BACKGROUND AND METHODS

SWCA biologists conducted habitat assessments and surveys for BLM sensitive plant species and ESA-listed species within the Phase I Wind Turbine Development Site, in accordance with Appendix D and Appendix G of the ROD. Biologists were trained in the identification of each rare plant species and their habitats. Surveys for ESA-listed and BLM sensitive species plants were completed throughout the Phase I Wind Turbine Development Site between 2012 and 2014. Habitat assessments and surveys were conducted for two federally listed species and three BLM sensitive species (Table 1).

Table 1. Rare Plant Survey Species

Common Name	Scientific Name	Status	Habitat
Colorado butterfly plant	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	FT	Sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms; 5,000-6,400 feet
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	FT	Adapted to early-to mid-seral moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events; 4,200-7,000 feet
Persistent sepal yellowcress	<i>Rorippa calycina</i>	BLM-S	Riverbanks and shorelines, usually on sandy soils near high-water line; 5,400-6,600 feet
Meadow milkvetch	<i>Astragalus diversifolius</i>	BLM-S	Sagebrush valleys and closed-basin drainages in moist alkaline meadows; 6,500-6,620 feet
Gibbens' beardtongue	<i>Penstemon gibbensii</i>	BLM-S	Sparsely vegetated shale or sandy-clay slopes; 5,500-7,700 feet

BLM-S Bureau of Land Management sensitive
FT Federally threatened

2.1 COLORADO BUTTERFLY PLANT

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) is a member of the evening primrose family (Fertig 2008a). The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 5–15 cm (2–6 inches) long, while those on the stem are smaller and reduced in number. Flowers are arranged in a branched, elongate pattern above the leaves. Only a few flowers are open at any one time and these are located below the rounded buds and above the mature fruits. Individual flowers are 5–14 millimeters (1/4 - 1/2 inches) long with four reddish sepals (modified leaves surrounding the flower) and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk. Nonflowering plants consist of a stemless, basal rosette of oblong, hairless leaves 3–18 cm (1–7 inches) long. The Colorado butterfly plant is a perennial plant that typically lives from 2-6 years. Typical plants are 1.5 to 2 feet tall with leaves over 1.5 inches long. Blooming periods would range from July through October in higher elevation habitat.

The Colorado butterfly plant occurs primarily in southeastern Wyoming, north-central Colorado, and extreme western Nebraska (Fertig 2008a). It typically occurs in wetlands habitats along the meandering stream channels on the high plains. In undisturbed sites, it grows among native grasses. The Colorado butterfly plant prefers open habitat that is not substantially overgrown by other vegetation. Velvetweed (*Gaura parviflora*) is a similar species that is an annual with a narrow, elongate inflorescence and flowers less than 3 mm long.

A review of BLM and WYNDD records confirm that Colorado butterfly plant has not been documented in the vicinity of the CCSM Project.

2.2 UTE LADIES'-TRESSES ORCHID

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is a perennial herb with erect, glandular-pubescent stems 12-50 cm tall arising from tuberous-thickened roots (Fertig 2007). Basal leaves are narrowly linear, up to 1 cm wide and 28 cm long, and persist at the time of flowering. Leaves become progressively smaller up the stem and are alternate. The inflorescence is a sparsely pubescent 3-15 cm long spike of numerous small white or ivory-colored flowers arranged in a gradual spiral. Individual flowers are 7.5-15 mm long and faintly fragrant (with a vanilla-like scent). The lip petal is oval to lance-shaped, narrowed at the middle, and has crispy-wavy margins. Sepals are separate or fused only at the base (not fused into a hood-like structure) and are often spreading at their tips. Fruits are cylindrical capsules with numerous seeds. Blooming periods would range from August through September in higher elevation habitat. This species does not flower every year and portions of a population may remain dormant below ground each year.

In Wyoming, the species is found mostly on low, flat floodplain terraces or abandoned oxbows within 0.5-50 m of small perennial streams or rivers at 4,750-5,400 feet elevation (Fertig 2007) but can also be found in mesic areas fed by springs and seeps (Heidel 2007). These sites are sub-irrigated, often seasonally flooded, and remain moist into the summer. Soils are typically sandy loams, but also include sands, loams, and silt loams.

The wet meadows communities are dominated by creeping bentgrass (*Agrostis stolonifera*) or switchgrass (*Panicum virgatum*); sometimes with Baltic rush (*Juncus balticus*) or local dominance of fewflower spikerush (*Eleocharis quinqueflora*), in a narrow band between emergent aquatic vegetation and adjacent dry upland prairie. The associated stream channel typically supports submerged stonewort (*Chara* spp.) and emergent vegetation that includes either broadleaf cattail (*Typha latifolia*) or softstem bulrush (*Schoenoplectus tabernaemontanaei*). Hooded ladies'-tresses orchid (*S. romanzoffiana*) has deeply constricted lip petals, sepals fused for at least ½ their length into a hood-like tube, more densely congested and shorter inflorescence, and typically occurs in montane wetlands.

A review of BLM and WYNDD plant records confirm that Ute ladies'-tresses orchid has not been documented in the vicinity of the CCSM Project.

2.3 PERSISTENT SEPAL YELLOWCRESS

Persistent sepal yellowcress (*Rorippa calycina*) is a rhizomatous perennial herb with stems 10-40 cm tall (Fertig 2008b). The stems and foliage are pubescent throughout with stiff, unbranched hairs. Stem leaves are pinnately divided or wavy-lobed, sessile, and 2.5-5 cm long. The flowers are borne in terminal and axillary inflorescences and have 4 yellow petals 3-5 mm long and 4 sepals that persist in fruit. Fruits are ovoid to nearly globose, 2-4 mm long, and conspicuously pubescent with unbranched hairs that are broadest at the base. Styles in fruit are 1-2 mm long and glabrous. Persistent sepal yellowcress blooms from late May to August, although blooming may extend into October under favorable circumstances.

Persistent sepal yellowcress is found primarily along moist sandy to muddy banks of streams, stock ponds, and man-made reservoirs near the high-water line at 3,660-6,800 feet (Fertig 2008b). This species is also present in high plain swales that evaporate, and along creeks. Reservoir populations are often in semi-disturbed or recently flooded openings in small inlets or bays with scattered clumps of foxtail barley (*Hordeum jubatum*), Sandberg bluegrass (*Poa secunda*), western wheatgrass (*Pascopyrum smithii*) and a variety of native or exotic early successional forbs, occasionally on grassy shores or in openings amid narrowleaf willow (*Salix exigua*) or saltcedar (*Tamarix chinensis*) thickets.

A review of BLM and WYNDD plant records indicated that persistent sepal yellowcress has been documented within seven miles of the Phase I Wind Turbine Development Site.

2.4 MEADOW MILKVETCH

Meadow milkvetch (*Astragalus diversifolius*) is a perennial herb with few to many slender, prostrate or decumbent stems 20-50 cm long radiating from the root crown (Handley and Fertig 2008). The linear to narrowly oval leaf blades are 2-5.5 cm long, and are composed of 1-5 grass-like leaflets, which are 2-5 mm broad. The terminal leaflet is much longer than the lateral leaflets and continuous with the leaf stalk. The inflorescence is a loose raceme of 2-8 flowers. The flowers are white or cream-colored and often faintly lilac-tinged, with calyx tubes 3.2-5.4 mm long. The fruits are oblong (10-17 mm x 3-4 mm). Blooming period is May through June.

Meadow milkvetch occurs in moist, often alkaline meadows and swales in sagebrush valleys or closed drainage basins (Handley and Fertig 2008). In Wyoming, it grows in alkaline meadows at fringes of playa landscapes at 6500-6620 ft. Soils are sub-irrigated silt loams. Associated species include alkali sacaton (*Sporobolus airoides*), clustered field sedge (*Carex praegracilis*), alkali cordgrass (*Spartina gracilis*), lanceleaf goldenweed (*Pyrrocoma lanceolata*), and Colorado thistle (*Cirsium tioganum* var. *coloradense*).

A review of BLM and WYNDD plant records confirm that meadow milkvetch has not been documented within the vicinity of the CCSM Project.

2.5 GIBBENS' BEARDTONGUE

Gibbens' beardtongue is a perennial herb with several erect pubescent (rarely glabrous) stems 10-35 cm long (Fertig 2009). The leaves are linear to linear-lanceolate and often folded down the length of the midrib, opposite, smooth-margined, pubescent to glabrate, and mostly less than 5 mm wide. The inflorescence and flowers (including the sepals) are glandular-hairy. The bright blue corolla is tube-shaped and 15-20 mm long. Anthers sacs are dark purple, 1.2-1.5 mm long, and short hairy on the back. Fruits are oval, tawny-brownish capsules. Blooming period ranges from June to early September depending on spring and summer moisture conditions.

Found on barren shale or sandstone slopes of the Browns Park Formation or Laney member of the Green River shale, often located below caprock, on the steep, upper or middle slopes eroding out below the resistant layer (Fertig 2009). The sites are sparsely vegetated slopes of bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), and needleandthread (*Hesperostipa comata*) with scattered shrubs. The easternmost occurrence is found within alderleaf mountain mahogany (*Cercocarpus montanus*) openings.

A review of BLM and WYNDD plant records confirmed that Gibbens' beardtongue has not been documented within the immediate vicinity of the Phase I Wind Turbine Development Site. However, the species is known to occur in southern and central Carbon County (Fertig 2009).

3.0 RESULTS AND DISCUSSION

Surveys were completed in 2012 through 2014 within the Phase I Wind Turbine Development survey area for BLM-sensitive and ESA-listed plants and their habitats. Habitat evaluations for each species were completed following the species' habitat accounts described above. All areas of the Phase I Wind Turbine Development Site plus a minimum 100 foot buffer around all planned disturbances were surveyed. No BLM-sensitive or ESA-listed plants were identified in the Phase I Wind Turbine Development Site survey area. Suitable habitat is not present for Ute ladies'-tresses orchid or Colorado butterfly plant. Habitat for persistent sepal yellowcress, meadow milkvetch, and Gibbens' beardtongue was recorded as sub-marginal. Based on the occurrence of associated species, hydrology, and geology, it is unlikely that any of the three species occurs within the areas of the Phase I Wind Turbine Development Site. Rare plant species occurrence for the Phase I Wind Turbine Development Site is summarized in Table 2.

Table 2. Rare Plant Species Occurrence

Common Name	Scientific Name	Status	Habitat	Occurrence or Habitat in Phase I Wind Turbine Development Site
Colorado butterfly plant	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	FT	Sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms; 5,000-6,400 feet	No
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	FT	Adapted to early-to mid-seral moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events; 4,200-7,000 feet	No
Persistent sepal yellowcress	<i>Rorippa calycina</i>	BLM-S	Riverbanks and shorelines, usually on sandy soils near high-water line; 5,400-6,600 feet	Unlikely
Meadow milkvetch	<i>Astragalus diversifolius</i>	BLM-S	Sagebrush valleys and closed-basin drainages in moist alkaline meadows; 6,500-6,620 feet	Unlikely
Gibbens' beardtongue	<i>Penstemon gibbensii</i>	BLM-S	Sparsely vegetated shale or sandy-clay slopes; 5,500-7,700 feet	Unlikely

3.1 COLORADO BUTTERFLY PLANT

No suitable habitat was identified for Colorado butterfly plant during survey of the Phase I Wind Turbine Development Site. While some sub-irrigated alluvial soils are present in the Sierra Madre WDA, these areas are more than 1,000 feet higher than the known elevation range of the species and are outside of the USFWS-identified Area of Influence for the species.

3.2 UTE LADIES'-TRESSES ORCHID

No suitable habitat was identified for Ute ladies'-tresses orchid during survey of the Phase I Wind Turbine Development Site. Follow-up protocol surveys are not required for the Phase I Wind Turbine Development Site. Wetland and mesic sites within the Phase I Wind Turbine Development Site were evaluated for the hydrological, geomorphological, and vegetation indicators of suitable habitat. No areas within the Phase I Wind Turbine Development Site were found to have the necessary conditions or associated vegetation communities for the species. Additionally, the Phase I Wind Turbine Development Site is 1,000-2,500 feet higher than the known elevation range of the species in Wyoming and the majority of the site is higher than the known elevation range of the species rangewide.

3.3 PERSISTENT SEPAL YELLOWCRESS

No occurrences of persistent sepal yellowcress were identified during survey of the Phase I Wind Turbine Development Site. While suitable habitat may be present along several perennial creeks and in other wetland habitats, it is unlikely that persistent sepal yellowcress occurs within the Phase I Wind Turbine Development Site based on the occurrence of associated species, hydrology, and geology. Additionally, the majority of the Phase I Wind Turbine Development Site is outside of the known elevation range for the species.

3.4 MEADOW MILKVETCH

No occurrences of meadow milkvetch were identified during survey of the Phase I Wind Turbine Development Site. While habitat for meadow milkvetch could be present along the edges of saline lowland habitats, its presence is unlikely based on the occurrence of associated species, hydrology, and geology.

3.5 GIBBENS' BEARDTONGUE

No occurrences of Gibben's beardtongue were identified during survey of the Phase I Wind Turbine Development Site and no suitable habitat was encountered during survey efforts. Gibbens' beardtongue requires exposed barren shales and sandstone slopes of the Browns Park formation or the Laney member of the Green River shale. These geological formations are not present within the Phase I Wind Turbine Development Site.

4.0 REFERENCES

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