BIGLOW CANYON WIND FARM: HABITAT MITIGATION PLAN

[OCTOBER 31, 2008]

I. Introduction

This Habitat Mitigation Plan (plan) describes methods and standards for enhancement of an area of land near the Biglow Canyon Wind Farm (BCWF) to mitigate for certain impacts of the facility on wildlife habitat.[1] The applicant has proposed a habitat mitigation area of approximately 117 acres as described below. The certificate holder shall enhance the mitigation area as described in this plan and shall place the area into a conservation easement for the life of the facility.[2]

The objective of the enhancement methods is to improve the habitat value of the mitigation area and to protect the area for wildlife use for the life of the facility. This plan has been prepared to guide the habitat enhancement efforts within the mitigation area. The plan specifies the primary actions the certificate holder must undertake and the goals, monitoring procedures, and success criteria to evaluate enhancement success.

Prior to any construction of the BCWF, the site certificate holder shall acquire the legal right to create, maintain and protect the habitat mitigation area for the life of the facility by means of an outright purchase, conservation easement or similar conveyance and shall provide a copy of the documentation to the Oregon Department of Energy (Department). Prior to any construction of the BCWF, the site certificate holder shall complete an "Implementation Plan" approved by the Department that describes in detail how the Habitat Mitigation Plan will be carried out. During the first phase of construction of the BCWF, the site certificate holder shall begin to implement this plan so that all of the specific enhancement methods described in Section VII are in place by the end of construction of that first phase.

II. Description of the Permanent Impacts

The BCWF would permanently affect a maximum of about 190.5 acres. Most of the area of permanent impact (about 178 acres) would be within currently cultivated agricultural fields or other developed land. This area is lower-value habitat (Category 6). The BCWF would occupy – or have a permanent impact on – a maximum of about 12.66 acres of higher-value Category 3 or Category 4 habitat. The actual area of each habitat category that the BCWF will permanently occupy will depend on the final design layout of the facility after consideration of micrositing factors.

Data collected at other wind energy facilities indicate that the operation of wind turbines may adversely affect the quality of nearby habitat that is important or essential for grassland avian species. This is often referred to as a "displacement" impact. Conducting a study at the BCWF site to determine whether operation of the facility had a displacement effect on grassland birds would take several years. If the study concluded that an adverse impact had occurred, additional mitigation would be needed. In lieu of conducting a multi-year study, the certificate

[1] This plan is incorporated by reference in the site certificate for the BCWF and must be understood in that context. It is not a "stand-alone" document. This plan does not contain all mitigation required of the certificate holder.
[2] As used in this plan, "life of the facility" means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

holder has proposed to provide additional mitigation, based on the assumed likelihood that operation of the facility would reduce the quality of nearby habitat that is important or essential for grassland bird species. The affected habitat near the BCWF wind turbines includes grassland, Conservation Reserve Program (CRP) and shrub-steppe habitat in Categories 3 and 4.

As defined by the fish and wildlife habitat mitigation goals and standards of the Oregon Department of Fish and Wildlife (ODFW), the affected habitat and corresponding mitigation goals are as follows:

- **Category 3:** Essential habitat for fish and wildlife, or important habitat for fish and wildlife that is limited either on a physiographic province or site-specific basis, depending on the individual species or population.

  Mitigation Goal: No net loss of either habitat quantity or quality. Mitigation must be in-kind.

- **Category 4:** Important habitat for fish and wildlife species.

  Mitigation Goal: No net loss in either existing habitat quantity or quality. Mitigation may be either in-kind or out-of-kind.

III. Calculation of Impacts and Size of Mitigation Area

The area needed to mitigate for the amount of higher-value habitat occupied by the BCWF turbines and related facilities is determined by the facility's permanent impact within each habitat category. The amount of additional area needed to mitigate for a displacement effect that is uncertain cannot be precisely calculated. To determine a reasonable area for displacement mitigation, the applicant has performed a rough calculation of potential displacement impact by assuming a 50-percent reduction in use by grassland birds within 50 meters of wind turbines in native grassland/shrub steppe habitat and a 25 percent reduction in use by grassland birds within 50 meters of wind turbines in CRP habitat.[3] The applicant further assumed that the final design locations of wind turbines within the micrositing corridors would be such that the maximum area of native grassland would be affected (the "worst case"). The area of impact within each affected habitat category and the corresponding mitigation area for each category are as follows:

- The permanent impact is about 12.66 acres, of which about 8.86 acres are Category 3 habitat (grassland, CRP and shrub-steppe combined) and about 3.8 acres are Category 4 habitat (grassland, CRP and shrub-steppe combined).
- The potential displacement impact is estimated to be about 35 acres.[4]
- The combined impacts equal about 48 acres. Mitigation must be sufficient to replace the quantity and quality of this combined impact in order to achieve "no net loss" in habitat quantity or quality. The mitigation area must be large enough to be capable of achieving this goal. The certificate holder has secured a 117-acre

[3] The method of determining a reasonable mitigation area as described in this plan is not intended to be a precise formula or a precedent for determining appropriate mitigation for any other facility.

[4] In the original Habitat Mitigation Plan (June 30, 2006), the area of displacement mitigation was calculated to be 33 acres, based on information from Wally Erickson, WEST, Inc. In Amendment #3, the area of permanent impact on Category 3 and 4 habitat increased from 11.93 acres to 12.66 acres, an increase of approximately 6 percent, and the displacement mitigation area was increased by the same percentage.

mitigation area, based on the understanding that mitigation acreage that exceeds the actual acreage of permanent and indirect impacts may be applied to any future mitigation requirements (this "mitigation banking" is discussed in Section IX).

If the data from transect surveys at the Stateline Wind Project demonstrates a statistically significant displacement effect on grassland bird species that is greater than the displacement effect described in the *Stateline Wind Project Wildlife Monitoring Final Report, July 2001-December 2003*, then the certificate holder shall assume that the BCWF is having a greater displacement effect on grassland species than was assumed when the site certificate was issued and shall propose additional mitigation. The Department shall recommend appropriate mitigation to the Council, and the certificate holder shall implement mitigation as approved by the Council.

IV. Description of the Mitigation Site

The mitigation site is located to the northeast of the BCWF, less than 0.5 miles from the John Day River and just more than 0.5 miles from the nearest wind turbine. The site contains an intermittent spring that forms a small tributary drainage immediately west of the Emigrant Springs tributary and watershed.

Thus, the mitigation site sits immediately adjacent to both the John Day River riparian corridor and the large Emigrant Springs watershed, which provides additional forage, thermal and security cover, and water. No road access exists to the site, which is relatively remote and infrequently disturbed by humans.

The site is predominantly steep-sloped with shallow rocky soils and has been both recently and historically grazed. Areas most degraded from livestock grazing include the deeper soiled areas and the spring and associated riparian draw in the southern end of the mitigation site. Horizontal and vertical vegetative structure is largely depleted because of exposed slopes and livestock grazing impacts, and large patches of cereal rye have out-competed native species in some areas. However, the higher elevation western border consists of deeper silt loam soils, with the potential to provide a more diverse vegetative community.

Adjacent property to the west is cultivated and managed for wheat production. Adjacent property to the north and east is rangeland managed for livestock production. A four-strand barbed wire fence exists along the east boundary of the mitigation site. No fence exists along the crop field boundary to the east or along the north boundary; this area is grazed when fallow or electric fence is used during the planting and harvest period to exclude livestock. The area around the spring source and downstream lacks a vegetative buffer or a diverse vegetative community because of intensive grazing. Some tall sagebrush cover exists near the stream area while cattails and aquatic succulents occur in the spring source area.

Given the current condition of the site and livestock practices, the entire mitigation site is generally characterized as Category 4 habitat, according to ODFW's Habitat Mitigation Standards.

V. Site Potential for Wildlife Habitat Enhancement

For mitigation, the applicant has proposed entering into a conservation easement or similar agreement with two landowners to enhance the mitigation site's existing grassland, shrub-steppe and riparian habitat for the life of the BCWF facility. The mitigation site presents

the opportunity to enhance grassland and shrub-steppe habitat quality and quantity that is limited in the area for wildlife. Properly managed, the mitigation site has the potential to provide more diverse grassland in greater quantity with greater horizontal and vertical structure. If enhanced with reseeding, deeper soiled areas would provide better nesting habitat for grassland bird species and provide higher quality forage for big game. Excluding livestock with fencing would provide better fall, winter and early spring rangeland for big game by allowing Sandberg bluegrass, bluebunch wheatgrass, and various forbs to grow undisturbed in shallow-soiled slopes. Removal of cattle grazing should improve the habitat quality of the entire site and especially the deeper-soiled, spring and riparian areas. The site's steeper areas also will see some benefit from reduced grazing, especially during early spring green-up. As well, livestock exclusion would enhance summer habitat for ground-nesting birds.

The mitigation site also has the potential to provide several different quality ecotones.[5] Grassland patches in the lower-elevation eastern portion of the site may be of greater suitability to long-billed curlews because of closer proximity to the John Day River, where observations of this species breeding have been documented.

VI. Proposed Enhancement

To mitigate for the permanent loss of 12.66 acres of Category 3 and Category 4 habitat as a result of BCWF turbines, roads and other facilities, the site certificate holder will reseed 12.66 acres of deep-soiled Category 4 habitat within the mitigation site along the upper, more level slopes adjacent to cultivated areas. Reseeding is expected to improve about 12.66 acres of deep-soiled Category 4 habitat to a quality of Category 2 or Category 3 grassland habitats.

To mitigate for the displacement effect, the site certificate holder will install fences to remove livestock grazing from the 117-acre mitigation site. In combination with other actions described below, fencing is expected to improve most of the portion of the mitigation site that is not reseeded (about 105 acres) from Category 4 to at least Category 3 habitat.

The acreages stated above for maximum permanent and indirect displacement habitat impacts (*i.e.*, 12.66 acres and 35 acres, respectively, or a total of about 48 acres) are based on construction of the entire BCWF facility as approved under the site certificate. If only a portion of the BCWF facility is constructed, the maximum permanent and indirect displacement habitat impacts are expected to be less than 48 acres. Nevertheless, as part of the first phase of construction, the certificate holder has proposed to secure the entire 117-acre mitigation site, install the guzzler, enhance the spring area, and have the fencing installed to exclude livestock on the entire mitigation site. If only a portion of the BCWF facility is constructed and full build-out does not occur, then any enhanced mitigation acreage that exceeds the actual acreage of permanent and indirect habitat impacts may be applied to any future mitigation requirements, as outlined in the Wildlife Mitigation and Monitoring Plan and subject to approval by the Department.

VII. Habitat Enhancement Methods

The goal of habitat enhancement is to improve the habitat quality of the mitigation site to achieve, over time, a Category 3 quality over most of the site and a mix of Category 2 and

[5] An "ecotone" is a transitional zone between ecological communities.

Category 3 on 12.66 reseeded acres. The site certificate holder will use the following five methods to enhance habitat quality and quantity on the site:

1. Reseeding

The site certificate holder shall prepare and seed at least 12.66 acres within two defined areas located along the western edge of the mitigation site.[6]

A. Seed Mixture: The site certificate holder developed a seed mixture in consultation with Mary Beth Smith at the local United States Department of Agriculture Natural Resources Conservation Service office based on anticipated high value to both big game and non-game wildlife and the historic vegetative climax community for the area (Table 1). Prior to seeding, the site certificate holder shall consult with the Department to determine if any mixture adjustments, either in species composition or ratio of seed quantity among species, would further benefit wildlife.

B. Seed Planting Methods: If enhancement efforts occur in the winter or spring, seeding should occur sometime in February through early April, after the average last frost date. If enhancement efforts occur after the spring seeding window, seeding should occur sometime in October through November. Disturbed, unseeded ground may require chemical or mechanical weed control in May or June before weeds go to seed. In general, a weed-free seedbed should be prepared using conventional tillage equipment. Herbicide should be sprayed to control weedy and/or noxious species, following Oregon Department of Agriculture's (ODOA) guidelines. Summer fallowing may be required. Areas to be seeded shall be disked as needed in early spring and spot-sprayed on the ground each time with an herbicide. In some instances, disking the site may not be needed prior to seeding. Simply preparing a weed-free site using herbicide treatments may be all that is necessary. The disked and sprayed areas must then be harrowed prior to seeding. A conventional seed drill must be used, except in areas where a rangeland drill is deemed more applicable, with a spacing less than 12 inches and at a depth of 1/8-1/4 inch. A packing type roller must be used to properly compact the soil over the planted seed. The prescribed seed mixture (Table 1) must be drilled at a rate of 12 pounds pure live seed per acre. If an area is to be fallowed to increase soil moisture content, then the same procedure must be followed, but without seeding. Seeding would then occur the following spring.

[6] These two areas are identified in PGE's Habitat Mitigation Implementation Plan, February 2007, Appendix A.

Table 1. Seed mixture to be used for reseeding deeper soiled areas of the mitigation site.		
Common Name	**Scientific Name**	**Pounds/Acre**[7]
Luna pubescent wheatgrass	*Thinopyrum intermedium*	1
Sherman big bluegrass	*Poa ampla*	1
Magnar basin wildrye	*Leymus cinereus*	1
Whitmar beardless wheatgrass	*Pseudoroegneria spicata* ssp. *Inermis*	2
Small burnett	*Sanguisorba minor*	0.5
Alfalfa	*Medicago sativa*	1
Sanfoin	*Psoralea onobrychis*	0.5
Sandberg bluegrass	*Poa secunda*	2
Idaho fescue	*Festuca idahoensis*	2
Basin big sagebrush	*Artemisia tridentata* ssp. *Tridentate*	1
TOTAL		12

2. Weed Control

Large patches of nuisance weed species have out-competed native species in some areas of the mitigation site. The site certificate holder shall conduct eradication or control of nuisance weed species with measures approved by the Department.

3. Livestock Control

The site certificate holder shall fence the entire unfenced portion of the mitigation site to control and remove cattle grazing on the mitigation site. Over 9,200 feet of new fence will be installed following ODFW livestock fence specifications. The existing fence (4-strand barbed wire) located on the eastern edge of the project area and along a small 600 feet section running east/west along a portion of the northern border of the agricultural field will continue in use to the extent it remains effective in keeping cattle out of the mitigation site.

4. Creation of a Water Source

The site certificate holder shall create a water source for wildlife use in the northern end of the project area where no water source now exists. The site certificate holder will build and install a 500-gallon capacity cistern or "guzzler" using a design approved by ODFW and the Department. The new source of water should increase wildlife density in the mitigation site.

5. Spring Enhancement

The site certificate holder shall plant appropriate native species of woody shrubs near the source of the intermittent spring in the southern part of the site. Browse protection shall be provided as long as necessary. Over time, the shrubs will provide cover for wildlife as well as protect soils around the spring source.

VIII. Habitat Mitigation Implementation

Prior to the commencement of construction of the BCWF facility, the site certificate holder shall complete a Department-approved detailed implementation plan to guide implementation of the enhancement methods. The implementation plan shall include maps and

[7] Pure live seed.

photographs at appropriate scale and detail that show the topography, vegetation, habitat and other site conditions of the mitigation site; the proposed locations of the primary actions required by the mitigation plan; a schedule showing when the primary actions required in the mitigation plan will occur; and a proposed monitoring plan including monitoring protocols, locations of monitoring stations, and a schedule of monitoring actions. The implementation plan will take into consideration the physical and biological features of the mitigation site such as slope, soil depth, and existing habitat conditions, the appropriate time of year to conduct actions, and the appropriate sequence of actions. The purpose of the implementation plan is to describe details of applying the enhancement methods. The implementation plan is subject to the conditions of the site certificate and the requirements contained in this Habitat Mitigation Plan as amended from time to time.

The certificate holder shall not begin enhancement efforts until the Department has reviewed and approved the implementation plan. Enhancement methods must be carried out according to the schedule included in the implementation plan. The certificate holder shall take all actions necessary to implement the Habitat Mitigation Plan, including ongoing maintenance of the guzzler and fencing.

IX. Monitoring

1. Qualifications

For all components of this plan, the site certificate holder shall direct a qualified biologist, approved by the Department, to perform monitoring tasks (the "investigator"). The Department has approved the qualifications of the four biologists identified in the Final Order on Amendment #2. The certificate holder may select other qualified biologists to perform the monitoring tasks, subject to Department approval.

2. Reporting Schedule and Duration/Type of Monitoring

The site certificate holder shall provide an annual report discussing the investigator's findings and recommendations regarding habitat mitigation progress and success to the Department and ODFW. The site certificate holder shall include this report as part of the annual report on the BCWF or as otherwise agreed between the site certificate holder and the Department. The site certificate holder shall monitor the mitigation site for the life of the Biglow facility.

For the reseeded areas, the investigator will monitor every year for the first five years after the first seeding or until the area is determined by the Department to be trending toward successful habitat enhancement. Thereafter, the investigator shall revisit the reseeded areas every five years for the life of the BCWF facility. The certificate holder shall report the investigator's findings to the Department.

The investigator also shall monitor as necessary:

- Once a year for the life of the project: The effectiveness of weed eradication and control efforts throughout the mitigation site;
- Minimum of once a year for the life of the project and within one week of livestock turn-out on adjacent property: The effectiveness of fencing in excluding livestock from and allowing big game access to the mitigation site;

- Minimum of annual monitoring for the life of the project: The effectiveness of the new water source in providing water;
- Once a year for the life of the project: The effectiveness of enhancement actions for the spring area in providing improved cover for wildlife and reducing erosion near the spring source;
- Once a year for the life of the project: The overall condition of the mitigation site (including, for example, the degree of erosion, the occurrence of weed concentrations and changes in habitat quality); and
- Once a year for the life of the project: The general level of wildlife use, especially grassland birds, within the mitigation site.

In addition, the inspector shall periodically categorize the entire mitigation site in terms of ODFW habitat categories. The certificate holder shall propose a schedule for monitoring to the Department and shall conduct monitoring as approved by the Department.

3. Success Criteria

Permanent Impacts

The enhancement goal for the permanent impact of the BCWF facility is met when 70 percent of the 12.66-acre reseeded area (about 8.9 acres) is Category 2 habitat, the remaining 30 percent is Category 3 habitat and undesirable plant species (weeds) and erosion are under control and do not pose concern. If more than 8.9 acres of the reseeded area has been improved to Category 2 quality, those additional acres may be "credited" toward mitigation for other impacts upon Department approval.

Displacement Effects

Within the remainder of the mitigation area, consisting of 104.34 acres (117 acres less the 12.66 acres needed to mitigate for permanent impacts), the certificate holder shall provide mitigation for displacement effects. The enhancement goal for the displacement effects is met when:

- The habitat quality within at least 35 acres has been improved from Category 4 to Category 3 habitat or better and at least 24.5 acres (70 percent) of this improved area has the characteristics of established grassland and shrub-steppe plant communities.
- The condition of the rest of the land within the mitigation area does not pose a threat to maintaining habitat quality of the improved area.

Mitigation Banking

Within the remainder of the mitigation area, consisting of 69.34 acres (117 acres less 47.66 acres needed to mitigate for permanent impacts and displacement effects), the acres that the certificate holder improves from Category 4 to Category 3 habitat or better may be "credited" toward mitigation for other impacts, as outlined in the Wildlife Monitoring and Mitigation Plan, upon Department approval. To use any of the improved acres for mitigation, at least 70 percent of the area used must have the characteristics of established grassland and shrub-steppe plant communities.

Specific Success Criteria

Specific success criteria are as follows:

A. **Reseeded Areas:** A reseeded area is successfully enhanced when total canopy cover of all vegetation exceeds 30 percent and at least 25 percent of the ground surface is covered by desirable plant species. Desirable plant species are native species or desirable non-native species in the approved mitigation seed mix. After the above success criteria have been met (predominantly desirable vegetation has been established), the investigator shall verify, during subsequent visits, that the site continues to meet the success criteria for habitat enhancement. In addition, the investigator, in consultation with ODFW, shall evaluate the percentage of the reseeded site that has been enhanced to Category 2 and Category 3 quality.

   If all or part of the habitat within the reseeded area falls below the enhancement success criteria levels, the investigator shall recommend corrective measures. The Department may require reseeding or other corrective measures in those areas that do not meet the success criteria.

B. **Weed control:** Weed control is successful when weed species are eliminated or reduced to a level (based on considerations such as number, size and health of plants, and percent ground cover) that does not interfere with the goals of the mitigation plan. To meet success criteria, reseeding with seed approved by the Department may be necessary.

C. **Fencing**: Fencing is successful when the Department deems that fencing has been properly constructed according to ODFW specifications and continues to be effective at excluding livestock from entering the mitigation site. This criterion includes existing fencing.

D. **New Water Source**: The new water source is successful when the Department deems that the water source has been properly constructed according to ODFW specifications and continues to provide a reasonably reliable source of water for wildlife.

E. **Spring Area Enhancement**: Enhancement of the spring area is successful when appropriate native species of woody shrubs are planted, continue to grow, and provide cover for wildlife.

4. Corrective Measures

If mitigation and enhancement actions fail to meet the success criteria, the investigator shall recommend corrective measures for Department approval. The Department may require reseeding or other corrective measures for those areas and for those actions that do not meet the success criteria.

5. Success Criteria Rationale

The direct ("footprint") habitat impact of the BCWF is about 13 acres (12.66 acres). The proportion of the impact is about 70 percent Category 3 habitat and about 30 percent Category 4 habitat. To mitigate for this habitat loss requires the improvement of about 13 acres of Category 4 grassland within the mitigation area so that 70 percent becomes Category 2 grassland and 30

percent becomes Category 3 grassland. In addition, successful mitigation requires the protection of the improved habitat for the life of the facility.

The potential grassland bird displacement impact is estimated to be about 35 acres. The proportion of the impact is about 70 percent Category 3 habitat (about 24.5 acres) and about 30 percent Category 4 habitat (about 10.5 acres). To mitigate for the Category 3 component of this habitat impact requires enhancing about 24.5 acres of current Category 4 habitat to Category 3 grassland habitat. To mitigate for the Category 4 component requires enhancing about 10.5 acres from Category 4 to Category 3 (this area need not be grassland habitat).

The total size of the mitigation area is 117 acres. Mitigation for the footprint impact requires about 13 acres, which leaves about 104 acres in the habitat mitigation site. Mitigation for the displacement impact requires about 35 acres, which leaves about 69 acres beyond the minimum land area needed to achieve successful mitigation for the impacts described in this plan. This 69 acres may be used for additional mitigation in the future, if the success criteria described above in Section 3 are met.

X. Amendment of the Plan

This Habitat Mitigation Plan may be amended from time to time by agreement of the certificate holder and the Oregon Energy Facility Siting Council ("Council"). Such amendments may be made without amendment of the site certificate. The Council authorizes the Department to agree to amendments to this plan. The Department shall notify the Council of all amendments, and the Council retains the authority to approve, reject or modify any amendment of this plan agreed to by the Department.