Wild Horse Wind Power Expansion Project

Final Supplemental Environmental Impact Statement

Lead Agency:

Energy Facility Site Evaluation Council

January 2009

WILD HORSE WIND POWER EXPANSION PROJECT

Final Supplemental Environmental Impact Statement (SEIS)

Prepared by:

DAVID EVANS AND ASSOCIATES, INC.
415 – 118th Avenue Southeast
Bellevue, WA 98005

January 2009

FACT SHEET

Wild Horse Wind Power Expansion Project
Supplemental Environmental Impact Statement (SEIS)

Lead Agency and Responsible Official: Washington Energy Facility Site Evaluation Council (EFSEC); Allen Fiksdal, EFSEC Manager, 905 Plum Street, PO Box 43172, Olympia, WA 98504-3172; (360) 956-2152.

Abstract: On July 2, 2008, Puget Sound Energy (PSE) submitted a request to amend the Site Certification Agreement (SCA) for the Wild Horse Wind Power Project (WHWPP), as recommended by EFSEC in Council Order No. 814, and approved by Governor Gregoire on July 26, 2005. The WHWPP was approved along with EFSEC's issuance and approval of a Final Environmental Impact Statement (FEIS) dated May 16, 2005. The WHWPP is fully constructed and operational and includes 127 wind turbine generators, along with related and supporting facilities, with generation of 229 MW of electricity. The Site Certificate Agreement and FEIS document EFSEC's and Governor Gregoire's review and approval of a maximum project of 158 wind turbine generators and 312 MW of electrical generation.

The purpose of the requested Amendment is to develop and operate 22 new wind turbine generators, adding 960 acres to the 8,600-acre Wild Horse Project, with generation capacity of approximately 44 MW of electricity. The Project proposes related and supporting facilities as described fully in the Request for Amendment and in the Draft Supplemental EIS (SEIS), including without limitation: access roads, underground electrical collection cables, and expansion to the existing substation. The total output and number of turbines will remain within the limits allowed under the existing SCA. The Draft SEIS analyzed existing conditions and impacts of these additional facilities, which are located outside the project footprint analyzed in the FEIS. The project will be constructed on the high open ridges in the vicinity of Whiskey Dick Mountain, located approximately 10 miles east of Kittitas and approximately 5 miles north of the Old Vantage Highway. The project will be adjacent to the WHWPP. Specifically, the project will be located in Section 8 and the North Half of Section 17, all in Township 18 North, Range 21 East, W.M., in Kittitas County.

This abbreviated form Final SEIS is designed to supplement or correct information provided in the Draft SEIS. This Final SEIS was prepared from information received from agencies, organizations, and individuals who submitted written comments on the Draft SEIS. This Final SEIS includes comments submitted on the Draft SEIS and responses to those submitted comments.

Proposal's Sponsor: Puget Sound Energy, 10885 NE 4th Street, Bellevue, WA 98009

Date of Implementation: Construction activities are anticipated to begin in early 2009 and last approximately nine months. The start of construction depends on the date of approval of the SCA amendment.

List of Possible Permits, Approvals, and Licenses: EFSEC is the sole non-federal agency authorized to permit the proposed project. For informational purposes, Table 2-10 of the August 2004 Draft EIS lists the major state and local permitting requirements preempted by EFSEC, as well as federal requirements. Not all listed permits and approvals may be required. The original SCA provides construction and operational requirements and all other relevant local and Washington state permits and approvals for the Wild Horse Wind Power Facility as a whole.

Authors and Principal Contributors to SEIS: David Evans and Associates, Inc., consultant to the project sponsor, is the principal author of the SEIS. The primary sources of information used to prepare the SEIS are the DEIS and FEIS prepared by Jones & Stokes, as well as supporting documentation prepared by Puget Sound Energy and its consultants: WEST, Inc.; Lithic Analysts, and WildLands. The document was reviewed by EFSEC staff.

Subsequent Environmental Review: None anticipated.

SEPA Checklist

Date of Final Lead Agency Action: After EFSEC deliberates on the facts, testimony, and SEIS contents, it will make a decision to approve, conditionally approve, or deny the project (expected in early 2009).

Contact for Additional Information:

Allen Fiksdal, EFSEC Manager
905 Plum Street SE, Building 4
P.O. Box 43172
Olympia, WA 98504-3172
(360) 956-2047
allenf@cted.wa.gov

Location of Background Information: You may access this SEIS and find additional information about the project on the EFSEC Web site at www.efsec.wa.gov. Copies of the Wild Horse Wind Power Project SCA, EFSEC No. 2004-01, and this SEIS, also are available for public review at the following locations:

Washington State Energy Facility Site Evaluation Council
905 Plum Street SE, Building 4
Olympia, WA 98504-3172
(360) 956-2121

Washington State Library
Joel M. Pritchard Branch
Point Plaza East
6880 Capital Blvd.
Olympia, WA 98504-2460
(360) 704-5200

Ellensburg Public Library
209 North Ruby Street
Ellensburg, WA 98926
(509) 962-7250

Kittitas Public Library
NE 2nd and Pierce Streets
Kittitas, WA 98934
(509) 968-0226

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Abbreviations and Acronyms

CRM	Coordinated Resource Management
DEIS	Draft Environmental Impact Statement
dBA	decibels
Ecology	Washington State Department of Ecology
EFSEC	Energy Facility Site Evaluation Council
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
met	meteorological
MW	megawatts
PSE	Puget Sound Energy
SCA	Site Certification Agreement
SEIS	Supplemental Environmental Impact Statement
SEPA	State Environmental Policy Act
TAC	Technical Advisory Committee
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
Wild Horse	Wild Horse Wind Power Project
WTG	wind turbine generator

1 INTRODUCTION

1.1 Project Overview

Wild Horse Wind Power Project (Wild Horse) is located six miles west of Vantage in eastern Kittitas County (**Figure 1**). The Final EIS (FEIS) for Wild Horse was published by the Washington Energy Facility Site Evaluation Council (EFSEC) on May 16, 2005. On July 26, 2005, Governor Gregoire approved the Site Certification Agreement (SCA) for the project. Construction of 127 wind turbine generators (WTGs) and related facilities (**Figure 2**) was substantially completed in December 2006. Since then, Puget Sound Energy (PSE) has operated Wild Horse, which currently has a gross nominal generating capacity of 229 megawatts (MW) of electricity.

The original Wild Horse SCA authorized a facility of up to 158 WTGs with a maximum nameplate capacity of 312 MW on an approximately 8,600-acre site. This is a significantly larger number of turbines and total output than installed to date. PSE has requested an amendment to the SCA in order to add approximately 960 acres immediately adjacent to the northwest corner of the existing site. These additional acres comprise Section 8 and the north half of Section 17, all in Township 18 North, Range 21 East, Willamette Meridian.

The expansion project would install 22 new WTGs, associated roads, and an electrical collection system delivering generated electricity to the existing Wild Horse substation, which will be expanded slightly (**Figure 3**). Three of the WTGs would be installed within the Wild Horse site, and 19 are proposed within the new expansion area. The power would be transported off the site on the existing transmission line. The expansion project will result in a total of 149 WTGs at Wild Horse with a generating capacity of 273 MW, both of which are below the respective limits authorized by the SCA.

EFSEC is evaluating the siting of the additional 22 turbines pursuant to the requirements of Chapter 80.50 RCW. In accordance with the Washington State Environmental Policy Act (SEPA) (RCW 43.21C), EFSEC is conducting an environmental review with this Supplemental Environmental Impact Statement (SEIS) (WAC 463-47). Information and resulting analysis presented in this SEIS are based primarily on information provided in the FEIS for Wild Horse, which incorporates the Draft EIS (DEIS), and in a SEPA Checklist submitted as part of the SCA amendment request. The SCA, DEIS, FEIS, and SEPA Checklist are available on the internet at EFSEC's website (www.efsec.wa.gov) and are incorporated by reference into this SEIS.

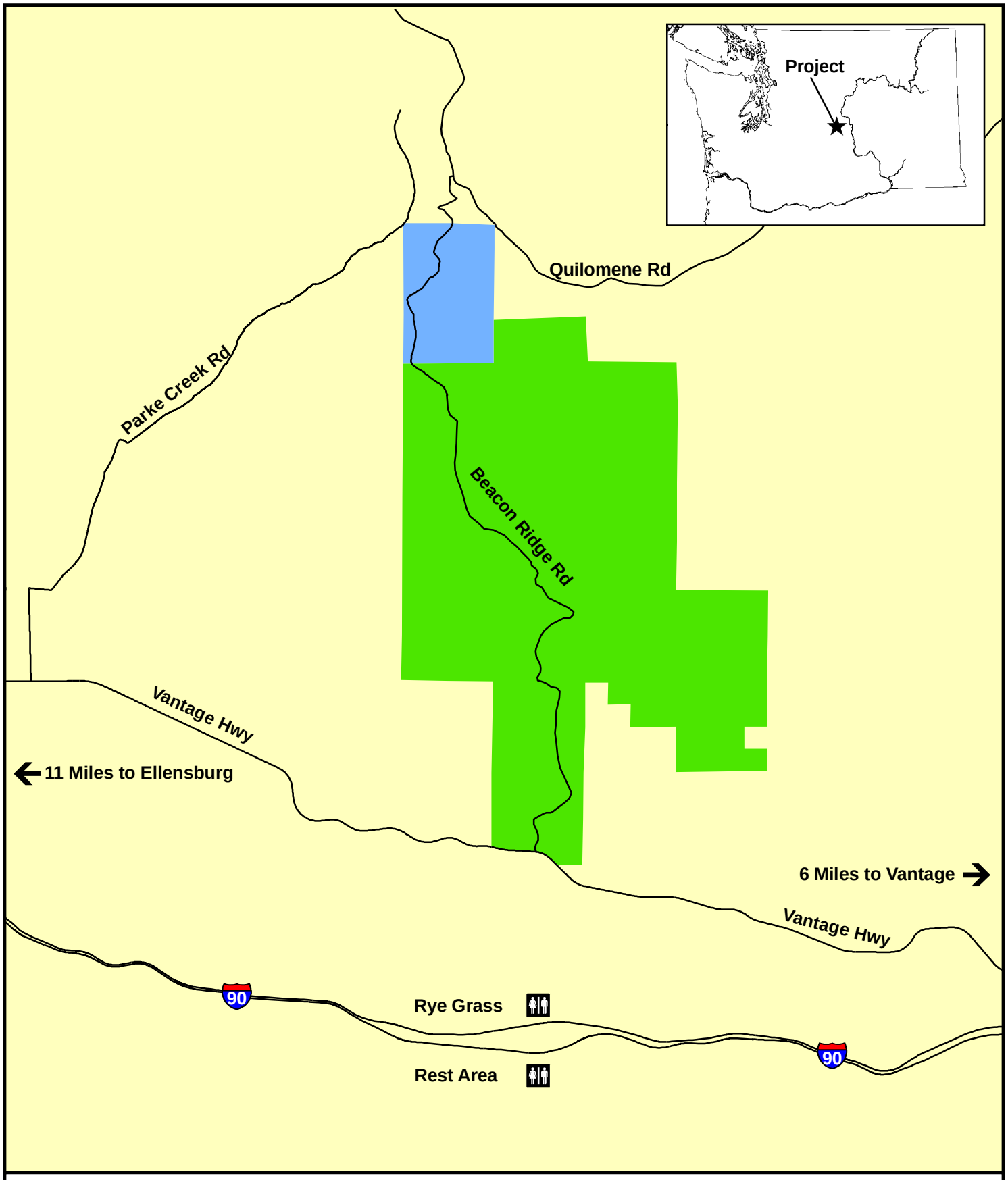

Figure 1 - Vicinity Map
Wild Horse Supplemental EIS

PUGET SOUND ENERGY
The Energy To Do Great Things

DAVID EVANS AND ASSOCIATES INC.

N W E S

Road
Expansion Area
Existing Facility

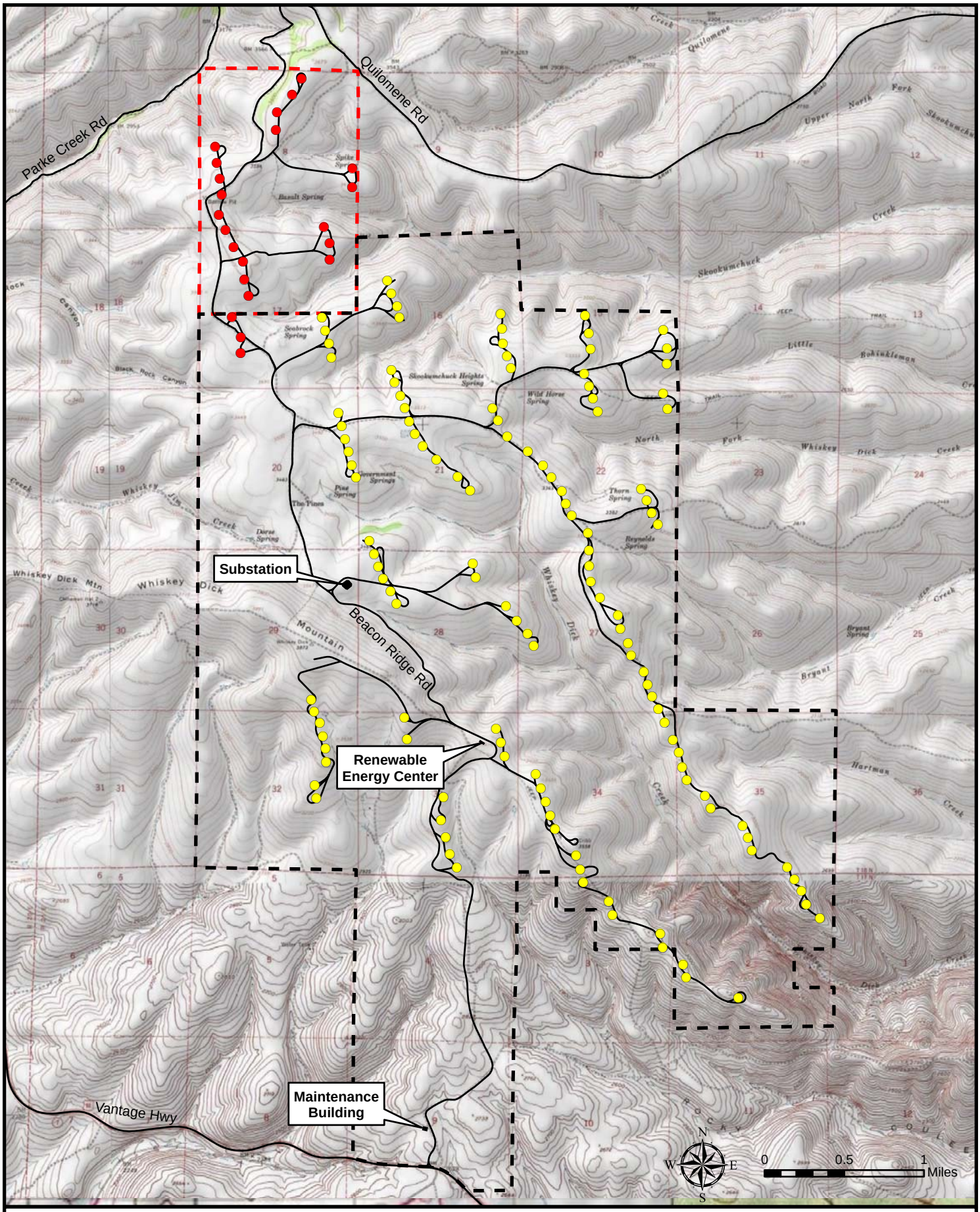

Figure 2 - Expanded Wind Facility
Wild Horse Supplemental EIS

PSE PUGET SOUND ENERGY
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DAVID EVANS AND ASSOCIATES INC.

- Proposed Wind Turbine
- Existing Wind Turbine
- Road
- Existing Facility
- Expansion Area

1.2 Purpose and Need

The purpose of the expansion is to allow PSE to approach its previously-approved generation capacity for Wild Horse. The additional electricity that would be generated is needed to help meet the growing regional demand for renewable, wind-generated electricity. PSE has indicated that adding this and other wind power projects to the utility's portfolio of electric resources will help provide more control over PSE's power supply and minimize the risk to their customers from a volatile short-term energy market. The expansion is also needed to help PSE meet its own goal of supplying 10 percent of its customers' total electricity needs with cost-effective renewable resources by 2013. This goal exceeds the target established by Washington's renewable portfolio standard, which requires a qualifying utility (such as PSE) to generate 3 percent of their total electricity from renewable sources other than hydroelectric facilities by 2012, escalating to 15 percent by 2020.

1.3 Background

Early in 2008, PSE acquired rights to a potential wind energy site named Whiskey Ridge and located immediately north of Wild Horse. This acquisition offered PSE the potential to expand the generating capacity of Wild Horse closer to the level authorized in the SCA. By taking advantage of the infrastructure already in place, PSE could avoid impacts of constructing new facilities such as a transmission line, substations, and operations and maintenance building, which a stand-alone project would need. Preliminary biological and cultural studies of Whiskey Ridge showed many similarities to Wild Horse, so PSE could apply their experience constructing and operating Wild Horse to the adjacent site.

In spring of 2008, PSE commissioned additional studies of the potential expansion area to better understand existing conditions and optimize a preliminary site layout that included 26 WTGs. On July 2, 2008, PSE submitted a request to EFSEC, accompanied by a SEPA checklist and supporting studies, to amend the Wild Horse SCA by adding 1,280 acres and 26 additional WTGs to the operating facility. The requested amendment proposed related and supporting facilities, including without limitation: access and crane roads, temporary concrete batch plant and rock quarry, turbine pads, laydown area, electric cable system proposed primarily underground, and an addition to the existing substation. These facilities are described fully in the Request for Amendment and the SEPA Checklist.

On August 6, 2008, during the public comment period on the SEPA Checklist, EFSEC conducted a public hearing in Ellensburg to accept verbal and written comments on the proposal. This comment period served as an opportunity for the public to comment on the environmental checklist and studies prepared for the project, and as a "scoping" opportunity for agencies and the public. The process also allowed EFSEC to evaluate issues and concerns for ongoing SEPA

review. Written and oral comments received by EFSEC, and responses by the applicant to concerns that were raised, are provided in Appendices A and B of the Draft SEIS. Primary issues and concerns raised during the initial comment period included the following:

- Potential impacts to greater sage habitat and regional populations
- Placement of "V" and "W" strings
- Potential impacts of the overhead collector line
- Status of the mitigation parcel
- Alternative mitigation
- Landscape restoration
- Potential impacts to bats from proximity to forested areas
- Potential impacts to water resources (i.e., springs)
- Temporary versus permanent fencing
- Potential loss of shrub-steppe habitat

Some comments suggested that a SEIS be prepared to analyze the potential impacts related to issues and concerns related primarily to the "V" and "W" strings. PSE revised the proposed expansion to mitigate potential impacts by dropping four WTGs (i.e., the "V" and "W" strings) from this proposal and the supporting facilities, including the overhead collector line, associated with them. PSE also elected to prepare a SEIS on the revised project with 22 WTGs and a 960-acre expansion of the existing Wild Horse facility, as described in Chapter 2. EFSEC SEPA rules allow the applicant to prepare EISs and addenda with oversight from the responsible official (WAC 463-47-090).

The Draft SEIS was issued on November 12, 2008 for public comment. The comment period for the Draft SEIS closed on December 15, 2008. During the comment period, EFSEC received comments from agencies, organizations, and individuals. Comments were submitted in emails and letters. This abbreviated form Final SEIS is designed to supplement or correct information provided in the Draft SEIS. The Final SEIS was prepared from information received from agencies, organizations, and individuals who submitted written and oral comments on the Draft SEIS. This Final SEIS also includes comments submitted on the Draft SEIS and responses to those submitted comments.

1.4 Summary Table

Table 1. Summary of Project Impacts

Resource	Construction Impacts	Operation and Maintenance Impacts	Mitigation Measures
Earth	• 72 total acres disturbance • 49,922 cubic yards cut/85,917 cubic yards fill • 98,000 cubic yards quarry/borrow material • No off-site spoils disposal	Low potential for earthquakes, volcanic hazard, or landslides.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.1.3.
Biological Resources	• 25.1 acres permanent vegetation removal and habitat loss • 44.6 acres temporary vegetation removal and habitat loss • 6.6 acres permanent impact to lithosols • 0 acres impact to wetlands • No impacts to federal or state listed endangered, threatened, proposed, candidate, or species of concern plant species • 0.4 acres permanent impact to rock habitat that supports state "Review" plant species – hedgehog cactus • Temporary construction disturbance to wildlife using project area, including big game, small mammals, raptors, and songbirds • No impacts to identified raptor nests • No impacts to fish or fish-bearing waters	• Potential colonization of 72 acres of disturbed area by invasive species • Raptor mortality, 1-4 year • Songbird mortality, 50-120/year • Most likely birds to be killed include American kestrel, red-tailed hawk, and horned lark • Bat mortality, approximately 15/year, mostly migratory bats • Possible avoidance behavior by big game	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.2.3.

Resource	Construction Impacts	Operation and Maintenance Impacts	Mitigation Measures
Water Resources	• No impacts to surface water or ground water • Project footprint located at least 150 meters from all springs • 72 acres of ground disturbance/potential area for erosion and stormwater runoff • No groundwater withdrawals • No floodplain impacts	25 acres of permanent ground disturbance/ potential area for erosion and stormwater runoff.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.3.3.
Visual Resources	Construction activity will be visible from nearby areas, including several seasonal residences.	Minor visual change; levels of impact will be the same as described in the FEIS. Seasonal residences to the north will have more turbines in their view, but they will blend in to the existing turbines on the facility.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.4.3.
Energy and Natural Resources	Project will consume resources, including electricity, diesel fuel, gasoline, sand, gravel, water, cement, and steel. Over time, energy produced by the completed project will be significantly greater than that expended by the facility's construction.	During periods of low wind, the proposed turbines will consume electricity provided by the Wild Horse solar facility and the transmission grid. Other materials, such as diesel and unleaded gasoline, would be consumed by on-site vehicles.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.5.3.
Noise	Short-term noise sources include construction traffic, blasting, and operation of equipment. Blasting will occur more than 1 mile away from nearest residence. No impacts to Town of Kittitas. Minor impacts to local residents immediately adjacent to roads.	Noise from wind turbines may be detectable at one seasonal residence north of the project, but will be below permissible levels per WAC 173-60-040.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.6.3.
Land Use and Recreation	• Temporary disturbance to 45 acres of open space and grazing land • Construction may require short-term, intermittent closures of project area to recreational users	• Permanent removal of 25 acres of open space and grazing land • No agricultural land will be removed from production • Public access through the wind farm facility via Beacon Ridge Road • No public access to turbine strings • Controlled hunting to be allowed in accordance with hunting plan	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.7.3.

Resource	Construction Impacts	Operation and Maintenance Impacts	Mitigation Measures
Cultural Resources	Project footprint avoids all identified sites.	No impacts.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.8.3.
Transportation	• 3.8 miles of new roads constructed • 1.8 miles of existing roads improved • 0.7 miles of existing roads abandoned and restored	• 5 to 10 additional vehicle trips per day • No new parking required	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.9.3.
Health and Safety	Health and safety risks would the same as those described in the Wild Horse FEIS.	Health and safety risks would the same as those described in the Wild Horse FEIS.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.10.3.
Air Quality	Temporary, localized impacts from fugitive dust and tailpipe emissions. Potential air quality impacts from operation of the batch plant and rock crushers will be managed under the auspices of Ecology's air quality permit program.	Negligible impacts from fugitive dust and tailpipe emissions from commuter vehicles and onsite operational equipment.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.11.3.
Public Services and Utilities	Public services and utilities impacts are generally the same as described in the Wild Horse FEIS. Less construction personnel would be required, minimizing the need for public services, including emergency services.	Public services and utilities impacts from operation are generally the same as described in the Wild Horse FEIS.	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.12.3.
Socioeconomics	Temporary increase in local construction force and associated spending for nine months.	• Operation will employ approximately 2 to 5 additional full-time staff • Expansion will contribute an additional estimated $500,000 annually to local economy	All mitigation measures identified in the Wild Horse FEIS and required by the SCA will be implemented. Additional mitigation measures are described in Section 3.13.3.

2 PROJECT DESCRIPTION

No changes to the project description are proposed based on comments received during the public comment period. However, Figure 3 from Chapter 2 of the Draft SEIS has been revised to show the location of the proposed mitigation parcel in the south half of the south half of the north half of Section 15, Township 18 North, Range 21 East, W.M., Kittitas County, Washington.

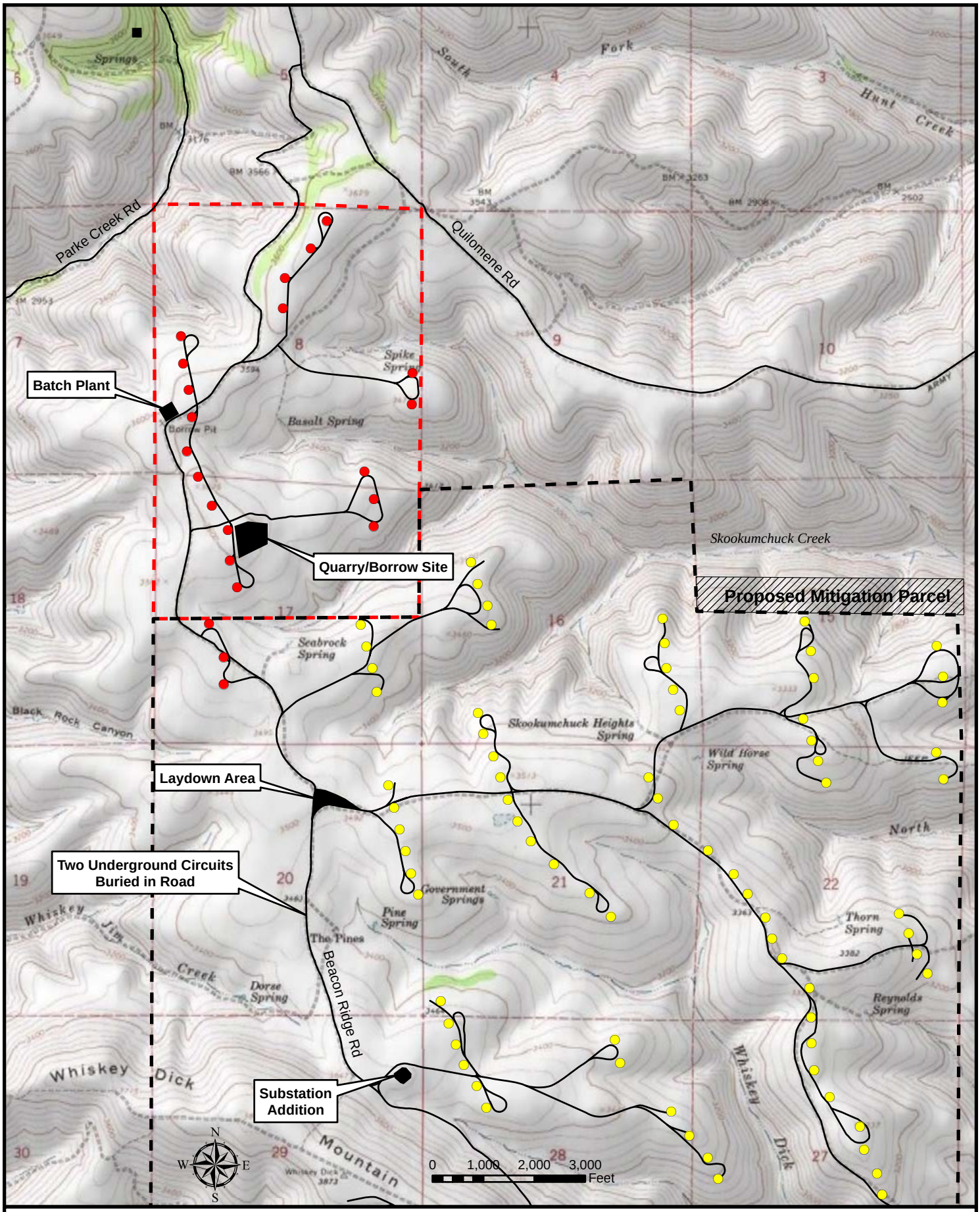

Figure 3 - Expansion Features
Wild Horse Supplemental EIS

PSE PUGET SOUND ENERGY
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- Proposed Wind Turbine
- Existing Wind Turbine
- Seasonal Residence
- Road
- Existing Facility
- Expansion Area

3 REVISIONS TO THE DRAFT SEIS

No text-specific edits or comments on Chapter 3 of the Draft SEIS were submitted during the public comment period. Minor changes and additional information are listed below in errata format.

3.1 Errata

Section 3.2 – Biological Resources

One comment requested a map and additional information about the habitat condition of the proposed mitigation parcel. A map is provided in Chapter 2. The mitigation parcel is an approximately 80-acre rectangle immediately adjacent to the northeast corner of the existing wind power facility (**Figure 3**). It is in the same basin, Skookumchuck Creek, as the majority of the expansion area. Located on a north-facing slope south of Skookumchuck Creek, elevation of the mitigation parcel varies between 2800 and 3200 feet. Habitat types are similar to those found in the expansion area, with a combination of mixed scrub, shrub-steppe, and bare rock habitats. Several of the draws on the mitigation parcel support relatively dense stands of sagebrush and other shrub species, with rocky and more open habitats on the ridge tops. Habitat condition in the mitigation parcel is generally less disturbed than in the expansion area, with no roads and less human disturbance. There are no documented springs on the mitigation parcel.

Several comments also expressed concern that the proposed project would negatively affect future use of the project as either a migratory corridor or nesting habitat for greater sage-grouse. Comments point out sources which suggest that sage-grouse demonstrate behavioral avoidance of wind turbines and that the proposed project would create a potential population sink that could interfere with recovery of this species. However, all available research is either anecdotal or based on comparisons with dissimilar activities such as an interstate (Connelly et al. 2004) or a coal-fired generation plant (Stinson et al. 2004). Other studies show avoidance of transmission lines, but all electrical transmission facilities on the expansion area are under ground. Furthermore, evidence of sage-grouse nesting in close proximity to wind turbines at both Foote Creek Rim and Wild Horse wind facilities belies the conclusion that the birds avoid turbines (WEST 2007, 2008). Lastly, the Final Sage Grouse Recovery Plan states that existing rugged topography and past habitat degradation are the primary factors that have influenced the suitability of the Colockum Management Unit to provide connectivity between the extant populations of greater sage-grouse. Also, in a recent review of all wind projects in the Columbia Plateau Ecoregion, no sage-grouse fatalities have been reported from wind turbines (Johnson and Erickson 2008).

Section 3.6 - Noise

Section 3.6.1 of the Draft SEIS, page 38. Second sentence of the first full paragraph is revised as follows: Per WAC 173-60-040, the maximum permissible *daytime* noise level at a Class A site such as a residence from a Class C noise source such as wind turbine is 60 decibels (dBA), *while the maximum permissible nighttime noise level is 50 dBA.*

4 COMMENTS ON DRAFT SEIS AND RESPONSES

The Draft SEIS was issued on November 12, 2008 for public comment. During the comment period that closed on December 15, 2008, EFSEC received comments in emails and letters from agencies, organizations, and individuals. This section contains the comments and corresponding responses. Each comment email or letter has been assigned a number according to the order in which they were received by EFSEC (**Table 2**). Within each submission, comments on specific issues have been designated using a line and secondary number shown in the margin of the email or letter.

Table 2. Comments Received on the Draft SEIS

Assigned Number	Commenter
1	Mike Marsh
2	David Crane
3	Cindy Huwe, Washington Department of Ecology (Ecology)
4	Janet Nelson
5	Kirk Holmes, Kittitas County Dept. of Public Works
6	Aaron Robins, Cascade Chapter of the Sierra Club
7	Travis Nelson, Washington Department of Fish and Wildlife (WDFW)
8	Robert Kruse, Friends of Wildlife and Wind Power
9	Tom Gauron, Kittitas Audubon Society
10	Tom Gauron and Janet Nelson, Kittitas Audubon Society

As described in Washington Administrative Code (WAC) 197-11-560, possible options for responding to comments on a DEIS or Draft SEIS include modifying the alternatives or developing new alternatives, improving or modifying the analysis, making factual corrections, or explaining why the comments do not warrant further agency response. In this regard, for each numbered comment, this chapter either:

- provides additional information or elaboration on a topic previously discussed in the Draft SEIS;

- notes how the Draft SEIS text has been revised to incorporate new information or factual corrections;
- refers the reader, when appropriate, to another comment response;
- explains why the comment does not warrant further response; or
- simply thanks the commenter for stating an opinion.

The rest of this chapter presents the comments submitted on the Draft SEIS and responses to these comments. Each comment email or letter appears first, followed by the corresponding responses to the numbered comments.

From: Mike Marsh [mailto:swamp@blarg.net]
Sent: Thursday, November 13, 2008 5:03 PM
To: CTED EFSEC
Cc: Mike Marsh
Subject: comment: proposed amendment to the Wild Horse Wind Power project

I am Conservation Co-Chair for the Washington Native Plant Society, and I sit on the Wildlife Diversity Advisory Council of the Washington Department of Fish and Wildlife (WDFW).
The Whiskey Dick ridge and adjacent land currently occupied by the Wild Horse Wind Farm is the centerpiece of a unique expanse of public wildlife land extending from near Wenachee to Richland in Benton County.

Elk, mule deer, mountain sheep and greater sage grouse are only a few of the wildlife species occupying this land.
I am concerned that the extension of the Wild Horse Wind Farm will extend the fencing already present (which we encountered while measuring vegetation on the Quilomene Wildlife Area) which acts as a barrier to free passage of wildlife on adjacent State lands managed by WDFW. Replacement of the current fences surrounding the Wind Farm by "let-down" fences which would be erected only as needed to control domestic livestock would be a great improvement. Northwestern Elk have been shown to avoid land within 500 meters of a road, and . Scientists and managers of the Wind Farm must continuously review their options for making this area more wildlife friendly. 1-1

Michael Marsh
3434 14th Ave. W.
Seattle, WA 98119

206-281-8976
swamap@blarg.net

Responses to Comment Email 1 from Mike Marsh, Individual.

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

1-1. Neither extending nor replacing existing fences is proposed as part of the Wild Horse Expansion Project. Existing fencing that will not interfere with construction activities will be left in its current condition. The applicant intends to use temporary electric fencing for protection of the springs and mitigation parcel when grazing occurs on the site. Potential impacts of the proposed project to elk and other wildlife species, as well as proposed mitigation measures to avoid, minimize, and mitigate impacts, are provided in Section 3.2 of the Draft SEIS.

11-16-08

David Crane
1201 N. Vista Rd.
Ellensburg, Wa. 98926

Allen Fiksdal, Manager
Energy Facility Site Evaluation Council
P.O. Box 43172
905 Plum St., SE
Olympia, WA 98504-3172

Dear Allen,

It will be evident to any thinking person who has visited the Wild Horse Wind Power site that they have done an excellent job with the project, in spite of the nonsensical comments some have made that they didn't know what they were doing.

There is no longer any room for sensible debate regarding the fact that we need more renewable electric power. Wind power is safe, clean and the least intrusive of many remaining options. Anything we do changes the environment.

Those who have opposed all of these projects here in Kittitas County, are an insignificant, self-serving, and misinformed minority. They are not bad people, for sure, but terribly mistaken. All this stuff about "my property rights" and "view shed" and "environment" and "birds" and "noise" and "blinking red lights" is nothing more than "the spoiled child--me first and the devil take the hindmost" syndrome. I frankly think that most of us up here in the Kittitas Valley are tired of the obstructionism. Some of these people will never be really happy with anything they didn't think of, even if it does benefit our community. After all, it took more than 23 years to get approval to build Grand Coulee Dam. 2-1

Personally, I like Wild Horse very much and I think it is a winner in every way. It is definitely a popular tourist attraction, contrary to what the opposition tried to say. The wind farm people should definitely be granted the extension they are requesting.

Thank you for the quality of your council and your work. Let us know how we can be of help.

Respectfully,

David Crane

David Crane, and extended family
(509) 962-1431

Responses to Comment Letter 2 from David Crane, Individual.

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

2-1. Thank you for your comment.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
15 W Yakima Ave, Ste 200 • Yakima, WA 98902-3452 • (509) 575-2490

December 10, 2008

Allen Fiksdal
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA 98504-3172

Dear Mr. Fiksdal:

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Statement for Wild Horse Wind Power expansion. We have reviewed the documents and have the following comments.

Water Quality

Sand and Gravel Operations: All concrete products manufacturers and property owners (or operators) of sand and gravel pits, rock quarries, asphalt and concrete batch plants are required to apply for permit coverage under the Sand & Gravel General Permit. In addition, owners of *portable* crushers, operating at sites that are not permitted for crushing under the Sand & Gravel General Permit, are required to apply for coverage. You may download the application form and instructions from the internet at http://www.ecy.wa.gov/programs/wq/sand/index.html. If you do not have internet access call Cindy Huwe at (509) 457-7105 for application materials. Ecology must receive your application at least 180 days before the proposed date for starting operations. Mail your completed application to: 3-1

Cindy Huwe, Water Quality Permit Coordinator
Washington Department of Ecology
15 West Yakima Avenue #200
Yakima, WA 98902

Responses to Comment Letter 3 from Cindy Huwe, Washington Department of Ecology.

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

3-1. Thank you for your comment. The existing NPDES Sand and Gravel permit for the overall Wild Horse Wind Power Project will be amended to cover the rock quarry, portable rock crusher, and concrete batch plant needed for construction of the Wild Horse Expansion.

Janet Nelson comments 12-9-08

From: Janet Nelson [mjanet2001@yahoo.com]
Sent: Tuesday, December 09, 2008 10:35 AM
To: Posner, Stephen (CTED)
Subject: Wild Horse SEIS

Hello Stephen,

As I mentioned on the phone I could not find several items referenced to in the SEIS in the appropriate appendices on the website.

1. page 22 of the SEIS states that in Appendix B searches for Hoovers tauschia were done. In appendix B I believe I found a reference to table one on page 28 of the special plant survey being corrected to reflect this survey. I did not see Hoovers tauschia on that list. 4-1

2. More importantly on page 23 of the SEIS there is a discussion of a supplemental acoustic study done in 2007 to determine relative level of bat use in the expansion area. I have been unable to locate this study on the website. 4-2

3. Since these things appeared to be missing I looked on page 95 on the website at the letter sent by Scott Williams of PSE with a list of the things he included with his letter. I looked at it to see if there were other items missing.
I do not see item 3 (perhaps its somewhere else?), item 6- the post construction habitat restoration monitoring, or items 8 and 9 on the website. Perhaps the printed document has them? 4-3

I would like to see these items before submitting our comments, as well may others.

Thanks,

Janet Nelson
Kittitas Audubon

Responses to Comment Email 4 from Janet Nelson, Individual

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

4-1. The final version of the 2007 Baseline Wildlife and Habitat Study (Appendix C to the Draft SEIS) including Hoover's tauschia was posted to EFSEC's internet site for Wild Horse. Appendix C of this Final SEIS includes the final version.

4-2. The supplemental bat acoustic study was inadvertently left out of Appendix C to the Draft SEIS. It was subsequently posted to EFSEC's internet site for Wild Horse. Appendix C of this Final SEIS includes this supplemental study.

4-3. Attachments to the September 8, 2008 letter from PSE to EFSEC were posted to EFSEC's internet site for Wild Horse. Appendix B of this Final SEIS provides a cross index between the attachments and SEIS appendices. Please note that most of the attachments to that letter are duplicated in other appendices of the Draft SEIS.

KITTITAS COUNTY
DEPARTMENT OF PUBLIC WORKS

December 5, 2008

Allen Fiksdal, Manager
Energy Facility Site Evaluation Council
PO Box 43172
905 Plum Street, SE
Olympia, WA 98504-3172

RE: Draft SEIS for the proposed amendment to the Wildhorse Wind Power Project.

Dear Mr. Fiksdal:

Kittitas County Public Works has reviewed the Draft SEIS for the proposed amendment to the Wild Horse Wind Power Project Site Certification Agreement and has the following comments.

KCPW has jurisdiction on the access roads leading from Interstate 90 to the site. Based on the information provided, KCPW expects the expansion project will have similar impacts to county roads as the original project. Section 3.9.3 Mitigation Measures of the Draft SEIS addresses this concern by requiring the expansion project to follow all mitigation measures identified in the Wildhorse FEIS. Specifically, this includes Section 3.14.4.1 Construction Mitigation Measures of the Wildhorse FEIS. KCPW agrees with this requirement. 5-1

Kittitas County recently approved a wind power project in a nearby location that will utilize the same county roads for site access. In the event that construction activities occur at the same time, KCPW recommends the Wildhorse expansion project take additional measures to document pavement conditions to avoid disparity between projects if road restoration is required.

Thank you for the opportunity to comment on the Draft SEIS.

Sincerely,

Kirk Holmes, Director

KH:cw

411 North Ruby Street, Suite 1
Ellensburg, WA 98926

TEL (509) 962-7523
FAX (509) 962-7663

Responses to Comment Letter 5 from Kirk Holmes, Kittitas County Department of Public Works

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

5-1. Thank you for your comment. The applicant will be required to implement all applicable measures listed in Section 3.14.4.1 of the Wild Horse FEIS. PSE will document pavement conditions on nearby county roads prior to beginning of construction of the expansion area.

Allen Fiksdal, Manager
Energy Facility Site Evaluation Council
P.O. Box 43172
905 Plum Street, SE
Olympia, WA 98504-3172
allenf@cted.wa.gov

Re: Wild Horse Expansion Project

Thank you for the opportunity to comment on the Wild Horse Wind Power Expansion project and Draft Supplemental Environmental Impact Statement (DSEIS).

The Sierra Club considers action to combat global warming a top priority. Washington State has been a leader in this effort, including net metering and other distributed energy incentives, our Renewable Portfolio Standard (I-937), and Washington's leadership in regional and national efforts to cap carbon emissions. The Sierra Club actively supports well sited renewable energy projects as a means of reducing our dependence on fossil fuels, creating sustainable local jobs, and ameliorating the environmental justice concerns often associated with fossil fuel-based energy development.

The history of the Wild Horse project has shown it to be an appropriately sited and well managed wind farm, as evidenced by the minimal impact to wildlife observed to date, including low avian and bat mortality rates and Puget Sound Energy's constructive participation in the Coordinated Resource Management (CRM) group. In light of the above assessment, the Cascade Chapter of the Sierra Club supports the proposed expansion of the Wild Horse Wind Farm under the conditions outlined in the DSEIS. 6-1

The mitigation measures described in the DSEIS and Puget Sound Energy's response to public comments (September 8th, 2008) should offer real protection of conservation values on the project site. Nevertheless, PSE's interpretation of various requirements of the existing SCA as voluntary, conditional, or interchangeable does raise some concerns. This includes the size and scope of the conservation easement, management of the mitigation parcel, and restoration of disturbed areas during the operational phase of the project.

The proposal includes certain mitigation measures which the Sierra Club considers critical to minimizing the environmental footprint of the expansion. These measures must be codified in the amended SCA such that all requirements are clearly mandatory, independent, and severable.

1. The conservation easement allows for potential development of solar and geothermal resources at the site. The inclusion of these uses in the easement must not be interpreted as evidence that the site is appropriate for such development or proof that solar and geothermal projects can be completed without unacceptable degradation of conservation values. 6-2

2. PSE has committed to a two year post-construction monitoring study on the expansion site. Given that only one year of the original two year study in the SCA has been completed, we interpret this as a commitment to a total of *three additional years* of post-construction monitoring. The amended SCA should make this requirement clear, specify whether or not three consecutive years are required, and provide a deadline by which such studied should be completed. Given the relatively low mortality rate observed in the first year of monitoring, four total years of data will be needed in order to conduct a statistically meaningful assessment of seasonality and the relationship between turbine placement and avian / bat mortality. 6-3

3. In light of the removal of a requirement for permanent fencing at the mitigation parcel (Section 27) PSE has committed to provide protection of water resources by some alternate means. PSE has also committed to other restoration efforts (reseeding, weed control) within the project site. Given the lack of specificity in the application, the amended SCA should include requirements that PSE design and publish detailed post-construction conservation plans in coordination the CRM and the TAC. Vagaries in these areas could lead to incomplete actions, significant degradation of habitat, and effectively nullify the commitments PSE has made in its application. 6-4

In addition to the mitigation measures described in the DSEIS, two additional steps should be considered in the amended SCA, which would provide enhanced environmental protection at minimal cost:

1. A longer time frame, along with intended outcomes, for restoration of temporarily disturbed areas, as opposed to the fixed two-year window proposed by PSE. Preliminary data has shown strong success in controlling invasive weeds, but no data has been presented to show the success of reseeding efforts. There seems to be a significant danger that restoration efforts will be terminated prematurely. While highly specific 6-5

targets are probably unrealistic, adaptive management should allow for broad-based goals designed to fit within a 3 – 5 year time frame. 6-5 cont.

2. Additional monitoring and mitigation measures to be negotiated with WDFW and the TAC if observed avian and/or bat mortality rates are significantly higher than predicted in the DSEIS, or if geographic trending does show a correlation between turbine placement and mortality. Generating these data in the absence of a requirement for additional mitigation under certain circumstances is pointless. In short, why do we need to know how many birds are being killed if we are not prepared to do anything about it? 6-6

Finally, the DSEIS presents excellent technical data for evaluating the impacts of the Wild Horse expansion, but the Cumulative Impacts section is limited to this project and other wind farms in the immediate area. Given that well over half of the shrub-steppe habitat in Washington State has already been converted to agricultural and residential uses, it seems appropriate to evaluate cumulative impacts in a broader context. The DSEIS recognizes that "Impacts from ongoing agricultural and residential development are also contributing to cumulative loss of native vegetation in the project vicinity", but fails to explain how this project is acceptable in light of the multiple kinds of conversion and fragmentation that are threatening the small percentage of remaining shrub-steppe habitat. 6-7

We believe the Wild Horse project has contributed positively to Washington's greenhouse gas reduction goals and the proposed expansion should continue to reduce our need for fossil fuel-based electricity as well as helping Puget Sound Energy meet its requirements under Washington's Renewable Portfolio Standard. The measures described above would allow us to capture these benefits without sacrificing the conservation values of the surrounding habitat.

Thank you for your time and consideration,

Aaron Robins
Sierra Club Cascade Chapter

Responses to Comment Letter 6 from Aaron Robins, Cascade Chapter of the Sierra Club

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

6-1. Thank you for your comment.

6-2. The conservation easement between PSE and WDFW was a voluntary measure and is not part of this proposal. The conservation easement is complete, and has been accepted by WDFW and PSE. Neither the conservation easement nor any action on this amendment will make any regulatory predetermination about the suitability or environmental impacts concerning any potential, unplanned future development of the property. Appendix K contains correspondence from WDFW regarding the conservation easement.

6-3. PSE has agreed to a total of three years of avian and bat monitoring on the original Wild Horse facility (one more year than originally required) and two years on the expansion area. WDFW has previously agreed to this study protocol. The second year of monitoring on the existing facility was postponed per direction from the Technical Advisory Committee (TAC) so that it could be conducted simultaneously on the entire facility, including the expansion area. Timing of completion of avian and bat monitoring will be determined by the TAC. It should be noted that bat monitoring is not required under the 2003 WDFW Wind Power Guidelines and has been voluntarily offered by the applicant.

6-4. The request to waive the requirement for fencing was removed from the proposal by the applicant. The post-construction restoration plan for the expansion area is under development, includes recommendations by WDFW, and will be reviewed by the TAC in early 2009. Participation in the Coordinated Resource Management (CRM) is not a requirement of the SCA but a voluntary commitment made by the applicant to help manage important habitat and wildlife resources in a coordinated effort on Wild Horse. The applicant intends to use temporary electric fencing for protection of the mitigation parcel and springs when grazing occurs on the site.

6-5. The Wind Power Guidelines (WDFW 2003) specifically state that a "good faith effort should be made to restore the impacted area" but that long-term performance targets should not be imposed since temporal losses and the possibility of restoration failure are incorporated into the acquisition and improvement of replacement habitat. The applicant voluntarily proposed a three-year monitoring effort, which was approved by the TAC and by qualified WDFW habitat biologists. Nevertheless, the applicant has already agreed in their September 8, 2008 letter to EFSEC to extend restoration monitoring on the existing facility for an additional two years (through 2012) to maintain consistency with the monitoring on the expansion area. Thus, the existing wind power facility will be monitored for a total of five years, and the expansion area for three years.

6-6. One of the express purposes of the TAC as described in the 2003 Wind Power Guidelines is to make adjustments if unanticipated impacts become apparent from

monitoring data, which could include additional monitoring or research and creation of raptor nesting structures. Also, as stated in their September 8, 2008 letter to EFSEC, PSE will make adjustments to operational monitoring if significant and unanticipated impacts become apparent from monitoring data. However, based on the results of the first year of monitoring data from the operating facility, avian and bat fatalities are within and somewhat lower than anticipated rates. In addition, the applicant has agreed to report all avian and bat fatalities found by wind project personnel over the entire life of the project in accordance with the Wildlife Incident Reporting and Handling System reviewed by the TAC and approved by EFSEC as part of project operations and monitoring efforts to help detect any significant or unanticipated impacts.

6-7. Cumulative impacts of the proposed project have been previously analyzed in Section 3.16 of the DEIS and FEIS as well as Section 3.14 of the Draft SEIS. Under SEPA, the nature of cumulative impacts is prospective and not retrospective. A cumulative impact analysis need only occur when there is some evidence that the project under review will facilitate future action that will result in additional impacts. Where cumulative impacts are merely speculative, they need not be considered. No future actions have been identified that would occur because of the proposed project that would have further impacts to regional sage-grouse habitat. It is generally understood that the proposed project would provide a much higher level of protection to shrub-steppe habitat on the property than would conversion to agricultural or residential uses, or unmanaged, heavy cattle grazing. The original EIS and the Draft SEIS thoroughly document the applicant's and EFSEC's consideration of appropriate environmental factors in analyzing the project's probable environmental consequences. A thorough consideration of environmental factors related to the potential non-speculative impacts of the proposed project on sage-grouse has been undertaken in accordance with protocols previously discussed and confirmed with WDFW (see SEIS Response 7-2). Impacts of wind power development on sage-grouse breeding and movement in the Colockum Management Unit has been addressed in detail previously in several locations, including Section 3.5.2 of the original FEIS for the WHWPP; PSE September 8, 2008 responses to WDFW comments on the SEPA Checklist; and the Wildlife Baseline Study for the Expansion Area (Appendix C of the Draft SEIS). Analyzing impacts of wind power development in general on the entire sage-grouse population is outside the scope of this project.

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State of Washington
Department of Fish and Wildlife
201 North Pearl Street, Ellensburg, Washington 98926

December 15, 2008

Mr. Allen Fiksdal, Manager
Energy Facility Site Evaluation Council
P.O. Box 43172
905 Plum Street, SE
Olympia, WA 98504-3172

Subject: State Environmental Policy Act (SEPA) Document; Expansion to the Wild Horse Wind Power Project, Draft Supplemental Environmental Impact Statement for the proposed amendment to the Site Certification Agreement Document, in Section 8 and the North Half of Section 17, all in Township 18 North, Range 21 East, W.M., in Kittitas County.

Dear Mr. Fiksdal:

Thank you for the opportunity to review the Draft Supplemental Environmental Impact Statement (DSEIS) for the Expansion to the Wild Horse Wind Power Project (EWHWPP). The Washington Department of Fish and Wildlife (WDFW) reviewed the above referenced SEPA document received on November 12, 2008. WDFW offers the following comments to the information provided by the Energy Facility Siting Evaluation Council (EFSEC) and Puget Sound Energy (PSE).

It is evident that PSE has made some significant modifications to the preliminary turbine layout. Most notably, the four northernmost turbine locations adjacent to the Wildlife Area and straddling Quilomene Ridge, have been removed from consideration. Thus, our concerns for fish and wildlife related impacts associated with those turbines, associated access roads, and overhead transmission lines no longer exist. PSE also agreed that if they ever sell the Quilomene Ridge property they intend to sell it to WDFW. 7-1

We have also worked closely with PSE in negotiating a conservation easement on approximately 7,500 acres of PSE lands, including about 2,000 acres that were not owned by PSE at the time the original project was permitted. The expansion area will be included in the conservation easement when permitted. This provides important protection for the headwaters of Skookumchuck Creek, and parts of Quilomene and Skookumchuck Ridges. This conservation easement addresses many of the threats to shrub steppe habitat, and we wish to note that PSE made significant concessions on these lands, and is a participant in the Coordinated Resource Management plan (CRM) to

ensure that grazing on their lands occurs in a science based, fish and wildlife friendly manner, and was a key participant with efforts to obtained funding for the Skookumchuck acquisition.

After reviewing the information, database, and maps related to this proposal, it is apparent that some bat concerns remain in the northern end of the expansion area that contains pine forest habitat types. The south end of the expansion areas does not contain pine forest habitat. Due to the dissimilarity of this habitat type compared to the original project proposal and the frequency of bat detections found, we wish to collaborate with PSE to conduct additional bat surveys around the proposed S-String of turbines.

The conclusions and identification of impacts were based on results and studies from the original Wild Horse Wind Power Project (WHWPP). However, differences exist in vegetation between the WHWPP and the EWHWPP. The differences between the original project and new expansion include the siting of a string of turbines along a stand of ponderosa pines. The Technical Addendum for bat acoustic studies indicates possible higher mortality for bats than most eastern Washington wind power projects (Jeffrey and Erickson 2007).

It appears that bat mortality predictions for the expansion area were based on current mortality rate in the original Wild Horse Wind Power Project. In general, the habitat in the north end of the EWHWPP is a little wetter and contains more trees and shrubs with potential for greater diversity of habitat and bat and avian species and therefore larger avian/bat populations. WDFW has concerns for the S-string of turbines along the ponderosa pine woodland and the additional bat mortality associated with it.

7-2

WDFW requests that the Technical Addendum for Bat Acoustical Study -- 2007 (Jeffrey and Erickson 2007) be added to the appendices for the Final Supplemental Environmental Impact Statement (FSEIS) because of its importance in predicting bat mortality. The DSEIS refers to the Technical Addendum (Jeffrey and Erickson 2007) in the bat impact sections. From this document, we understand that number of detections per detector per night correlates with bat mortality predicted on a wind power project. This study shows a higher than normal amount, 14.97 detections per detector per night (hence forth just detections), for the EWHWPP. Approximately 15 detections rate higher than a project with low bat mortality. The detection average remains below the highest bat mortality wind power projects (around 35 detections) but stays well above the low bat mortality projects (around 2 detections). Although 15 detections looks like a moderate average number of detections when comparing projects nationally, it is relatively high for Eastern Washington. Higher bat mortalities for an eastern Washington wind power project warrant more attention and additional surveys.

Additional assumptions made by the Technical Addendum (Jeffrey and Erickson 2007) also concern WDFW. Although a few mass mortalities of smaller residential bats have occurred in the Western United States and Canada, larger, migrating bats have made up the largest part of the mortalities in the Pacific Northwest (Erickson et al. 2000, 2003, 2004; Young et al. 2006, 2007). When recorded by the Anabat detectors, small residential bats register as high frequency calls and the larger, migrating bats register as low frequency calls. The Technical Addendum (Jeffrey and

Erickson 2007) postulates in the Results Section that a large number of detections from high frequency bats will lead to less mortality, because usually the smaller residential bats receive less mortality from wind turbines. However, the Technical Addendum also acknowledges, "The placement of Anabats [bat detector] in this study at ground level (l meter above ground) may be biased against detecting low frequency migratory bats that are commonly found as fatalities in the Pacific Northwest," (Jeffrey and Erickson 2007). The Technical Addendum (Jeffrey and Erickson 2007) leads WDFW to believe that we may know little about migratory bat use of the area or that the project may kill more bats than the average wind power project in eastern Washington. Either finding leads WDFW to desire more bat surveys with Anabat detectors placed at elevation in the EWHWPP, especially along the S-string.

The DSEIS reports that the Anabats detected more bats on the "forested" station than the S-string meteorological (MET) tower location, but the S-string MET tower resided closer to the ponderosa pine forest. On a field visit, We noted however that the "forested" station lies among ponderosa pines as well. We would expect that bats travel between the ponderosa pines at the "forested" station with many detections and the larger ponderosa woodland with the S-string of wind turbines located between the two habitats.

In conclusion, we recommend addition bat surveys beginning in April 2009 and timed to capture bat presence during the spring-fall migration periods. WDFW would recommend another year of bat surveys during the spring and fall migration to gain additional knowledge of bat life histories and migration and to assist PSE in micrositing the S-String turbines. We recommend that the bat surveys be conducted at rotor sweep elevation to record activity. We believe that construction can occur while the PSE conducts that bat surveys at night. We would encourage PSE to construct the S-string of turbines last to accommodate the survey and a provide opportunity for micrositing.

7-2 cont.

The Technical Addendum (Jeffrey and Erickson 2007) showed a relatively high detection of bats for eastern Washington as compared to other eastern Washington and Western United States wind power projects. The survey methods likely did not totally capture the full use by migratory bat species. PSE should differentiate between the bat detection surveys in the ponderosa pine stand and the rest of the project because of the more suitable habitat. WDFW would like to collaborate in additional bat studies.

We recommend that PSE incorporate some of the lessons we have learned about wind development in sensitive shrub-steppe habitats during the construction of the WHWPP into the amendment of the Site Certification Agreement, especially with regard to minimizing the disturbance footprint and restoring and revegetating native plant species. We recommend hiring an independent, qualified environmental monitor.

7-3

We would like to emphasize the differences between the EWHWPP and the rest of WHWPP. PSE should redesign the post-construction monitoring to better account for these differences. This study design should be discussed and approved by the Technical Advisory Committee (TAC) prior to submission to EFSEC for final consideration and approval.

7-4

PSE should revise the Site Certification Agreement (SCA) and attachments/submittals accordingly in collaboration with WDFW. WDFW looks forward to continue to work collaboratively with the EFSEC and PSE during the design, assessment, and construction phases of the proposed project. Please keep us apprised of the status of the Amendment of the SCA. If you have any questions or need more information, please feel free to call me at (360) 902-2390.

Sincerely,

Travis Nelson
Wind Power Mitigation Biologist

Cc: Brock Applegate, WDFW Ellensburg
Cindi Confer, WDFW Yakima
Ted Clausing, WDFW Yakima
Perry Harvester, WDFW Yakima
Mike Livingston, WDFW Pasco
Brent Renfrow, WDFW Ellensburg
Mike Schroeder, WDFW Bridgeport
Jeff Tayer, WDFW Yakima

SPECIFIC COMMENTS CONCERNING THE AMENDMENT TO THE SCA:

Recommended Post-Construction Raptor Nest Surveys: WDFW noticed that PSE predicted that the ESHWPP would not impact raptor nests or have significant adverse impacts to wildlife, (David Evans And Associates, Inc 2008). In 2003, the DSEIS reported twice as many active red-tailed hawk (*Buteo jamaicensis*) nests as during the 2008 survey. Raptors often become agitated with disturbances higher than their nests. The project area contained no active red-tailed hawk nests closer than 2 miles downhill or side-slope from the project area. Although red-tailed hawks remain very common, post-construction monitoring of active nests may support the claim of no impacts by the project to raptor nests by the DSEIS. WDFW would be willing to offer help with the monitoring effort of active nests. 7-5

Batch Plant Location: WDFW recommends moving the batch plant to the southwest and centering it on the old ¾ of an acre borrow pit. WDFW suggests minimizing the amount of shrub-steppe disturbed during construction. 7-6

MET Towers (2.2): WDFW recommends erecting permanent MET tower with no guy lines. Please mark the guy lines on temporary MET towers with bird markers. We recommend removing the guy-lined MET tower on the Quilomene Ridge around the old V- and W- strings. 7-7

Construction Sequencing (2.3): We recommend that PSE not schedule trenching during turbine construction in the same area so that the construction crew can place the trenches as close to the road as possible without blocking the flow of construction traffic. To minimize habitat disturbance, WDFW recommends burying cables in the road, if possible. 7-8

Impacts of the Proposed Action (3.1.2): The DSEIS described the batch plant and the quarry as a temporary option. To minimize disturbance to shrub-steppe, we ask that PSE does not grade, blade, or disturb the areas for the batch plant and quarry until PSE has decided it needs these structures for construction. 7-9

Cumulative Impacts and Greater Sage-Grouse Habitat (3.1.4): WDFW recommends that EFSEC have PSE consider a cumulative impact analysis for sage grouse habitat, especially with in the Greater Sage-Grouse Recovery Area. In consideration of leks, both the Management Recommendations for Washington's Priority Species, Volume IV: Birds (greater sage-grouse) (Schroeder et al. 2004) and the U.S. Fish and Wildlife Service's Interim Guidelines To Avoid And Minimize Wildlife Impacts From Wind Turbines (2003) both ask for a 5-mile disturbance buffer for sage-grouse leks to minimize disturbances. PSE searched for a 2-mile buffer outside their project footprint. PSE should describe the impacts to sage-grouse habitats by the EWHWPP including leks, nesting, brooding, wintering, and migration. PSE could complete this analysis by using GIS and information databases. 7-10

Manes et al. (2002) found an instinctive avoidance of tall structures, even those with perch deterrents by prairie grouse. In California, sage-grouse abandoned leks and attended leks less within three miles of power lines (Rodgers 2003). In Washington, Sage-grouse vacated 95% of

their leks (19 out of 20) within 7.5 km (4.7 miles) of 500 kV power lines and abandoned another 59% (22 out of 37 leks) beyond 4.7miles (WDFW 2008).

Sage-grouse's aversion to development includes avoiding roads, highways, drilling rigs, gas wells, etc. Hollaran (2005) noted a decrease in sage-grouse activity close to drilling rigs, gas wells, and haul roads. He noted an overall negative effect on sage-grouse by energy development. With many other studies noting the effects of development on sage-grouse, we think that oil and gas drilling would act as a surrogate for wind power development. Connelly et al. (2004) noted a negative effect of Interstate 80 with a sample size of 802 leks within 100 km. No leks existed within 2 km of the highway, very few within 4 km, and outside 4 km, leks were evenly distributed. In addition, sage-grouse attendance decreased from 44% of the leks within 7.5 km of the highway to 67% beyond 7.5 km beyond the highway. Sage-grouse may avoid areas with regular sound, disturbance, and/or development along with the avoidance of tall vertical structures. 7-10 cont.

The entire project area resides in the Greater Sage-Grouse Recovery Area. Construction of additional turbines in the migration habitat further degrades the sage-grouse habitat for other life activities like nesting, brooding, wintering, and migrating because of their possible aversion to vertical structures. Sage-grouse show high nest fidelity and may nest in unsuitable areas that can lead to nest failure. Degradation of habitat may turn once suitable habitat into a population sink area because of nest failures.

The EWHWPP area remains important migration corridor between two remnant populations of greater sage-grouse at approximately 30 miles apart (Schroeder et al. 2000). The best opportunity to reconnect these two populations lies with the Colockum, Quilomene, and Whiskey Dick Wildlife Areas, so we must maintain the habitat quality and integrity for sage-grouse to guarantee a chance of recovery (Stinson et al. 2004). The Whiskey Dick and Skookumchuck watershed reflect some of the best sage-grouse habitat around because 1) the area contains an upper bench separating multiple drainages, 2) sage-grouse tend to move uphill as summer desiccates the vegetation at lower elevations, and 3) before the project, the area contained some of the most suitable habitat in the region. With that in mind, we would like to minimize the impacts of the surrounding area for sage-grouse and consider a cumulative impact analysis on the sage-grouse population as a whole. WDFW would like to see an overall analysis on greater sage-grouse, so that we can understand the impacts of wind power development on the population as a whole

Calculation of Permanent Impacts: WDFW recommends counting temporary impacts on lithosol soils as a permanent impact when calculating mitigation acreage. The Wind Power Guidelines Update group will more than likely make this a condition in the new guidelines. As a stakeholder to this group, we know PSE knows and understands the impact of wind power development on lithosol soils. 7-11

The construction of the entire EWHWPP is greater than the extent of the project footprint (permanent impacts) due to disturbance and habitat fragmentation related impacts. The construction degrades nesting/brooding/wintering/migration habitat for sage-grouse and other

species requiring large blocks of shrub-steppe habitat through habitat fragmentation. Ultimately, we would like to work with PSE on addressing all the permanent impacts, including those through disturbance and habitat degradation, so that the acreage can properly reflect impact to species that require large blocks of contiguous, unfragmented shrub-steppe. PSE had addressed these sorts of issues with the mitigation of the WHWPP in the past and we know that we can work with PSE to do the same on the EWHWPP. 7-11 cont.

Compensatory Mitigation: The DSEIS proposes either replacing (protecting from development) additional shrub steppe habitat or payment of an annual alternative mitigation fee in accordance with the 2003 WDFW Wind Power Guidelines. An 80 acre parcel in Section 15 is proposed if the replacement habitat option is selected. WDFW would like to further research the habitat of the proposed parcel as compared to the habitat impacts from the project. WDFW and PSE should then report to EFSEC as to the suitability of the proposed parcel and any other parcels considered by PSE and WDFW. WDFW requests that EFSEC require that the final mitigation transactions be completed prior to the start of construction (or prior to start of operation). 7-12

Direct Loss of Wildlife Habitat Due to Construction and Siting of Facilities: Construction impacts to wildlife habitat will include clearing, excavation, fill and grading associated with construction of towers, power lines, roads, and utilities. A temporary loss of habitat will occur throughout the broad area required for construction activities, a permanent loss of habitat from the footprint of the completed project, and general reduction in habitat value of the site. The project will have both permanent and temporary negative impacts on native plant communities important to wildlife. 7-13

To minimize construction damage, the PSE should conduct construction during the time of year when the site contains dry soils. PSE should address the construction schedule in relation to the minimization of impacts to soils and habitat.

Carcass Removal: WDFW recommends a program or plan to remove any large carcasses from the project site around the turbines. Large carcasses can attract vultures and raptors to the site, which inadvertently could lead to a collision with turbines and other project structures. 7-14

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Responses to Comment Letter 7 from Travis Nelson, WDFW

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

7-1. Thank you for your comment.

7-2. The 2007 bat study was inadvertently left out of Appendix C of the Draft SEIS. EFSEC subsequently posted it on their website. It is provided in an updated Appendix C to this Final SEIS. WDFW concurred in writing and agreed with the study protocols proposed by Whiskey Ridge Wind Partners LLC in 2006. The documentation of confirmation of all protocols is attached in Appendix I.

Ongoing avian and bat monitoring has been conducted to meet all of the requirements of the 2003 WDFW Wind Power Guidelines. These guidelines recommend and encourage use of existing information from projects in comparable habitat types in locations close to proposed projects. Both the expansion area and the existing facility support ponderosa pine habitat in proximity to wind turbines. Similarly, the existing wind facility contains nine springs and the expansion area contains two springs. Both projects support similar habitat types in similar amounts, with shrub-steppe habitat dominating the landscape intermixed with minor amounts of pine forest and exposed rock. A full year of post-project bat fatality monitoring is available from the operating facility to provide information on bat occurrence in the project area, including one search plot located within 1/8 mile of a ponderosa pine stand and five plots within 1/8 mile of springs.

Also, a voluntary bat acoustical study was conducted in the expansion area in 2007 to provide more site-specific information on bat use. It reported that the mean number of bat calls per detector per night across the entire expansion site was higher than similar numbers reported for wind farms at Buffalo Ridge, Minnesota, and Foote Creek Rim, Wyoming. No results were reported from other projects in Eastern Washington. The report also explains that the majority of detected bat calls were from high-frequency species such as *Myotis* bats, which have been shown to not be particularly susceptible to mortality from wind turbines. A recent study compared bat mortality at all existing wind energy projects in the Columbia Plateau Eco-region, including Washington. Wild Horse had the lowest reported number of bats killed annually per turbine of any of the eleven projects with data (Johnson and Erickson 2008).

The comment also suggests that we know little about migratory bat use of the area. However, the first year of actual bat fatality monitoring data from the existing facility, which is immediately adjacent to the expansion area, strongly supports the conclusion that migratory bats are most susceptible to mortality from wind turbines (i.e., thirteen of seventeen bat fatalities were migrating bats). Therefore, the applicant believes that no further pre-construction surveys for bats are warranted. Both the pre-project survey work and the post-construction fatality monitoring data (including the S-String area in close proximity to the forested area) support the prior assessments and mitigation measures documented in the Wild Horse EIS, and validate that information and its

applicability to the expansion. There is no environmental information that would require additional pre-construction surveys or delaying the construction of the S-String turbines for this purpose.

7-3. The applicant has proposed additional mitigation measures to incorporate lessons learned in the original project, including erosion control measures, into the design of the Expansion Project. A qualified environmental monitor will be present on site during construction.

7-4. The post-construction monitoring plans for the expansion area, including both the restoration plan and the wildlife plan, will include a rigorous sampling across all soil and habitat types as well as a statistically valid subset of turbines. All monitoring plans will be reviewed by the TAC and WDFW.

7-5. Post-construction monitoring will include monitoring active red-tailed hawk nests.

7-6. The proposed batch plant has been located on an area of previous disturbance as much as possible while remaining on PSE property. There is insufficient room at the old borrow site to adequately meet the needs of the project. Also, the old borrow site has standing water during part of the year, which is beneficial to wildlife.

7-7. No permanent meteorological (met) towers are proposed. The existing temporary met towers will be needed for turbine testing after construction is completed but will be removed as soon as practicable.

7-8. Cables will be installed in the existing road between the substation and beginning of the new road improvements (approximately 1.5 miles). Remaining cable trenches will be located immediately adjacent to newly improved roads with minimum clearance between each conduit as required by the electrical resistivity and thermal conductivity of the soil.

7-9. The batch plant and quarry areas will not be disturbed until deemed necessary for construction.

7-10. See Response 6-7 on cumulative impacts and additional information provided in Chapter 3 of the Final SEIS. The comment states that the U.S. Fish and Wildlife Service (USFWS) 2003 Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines asks for a 5-mile disturbance buffer around sage-grouse leks. That document actually states that turbines should not be placed within 5 miles of known leks "in known prairie grouse habitat." As stated in earlier correspondence, and in the Greater Sage Grouse Recovery Plan, the Colockum Recovery Unit is not considered occupied sage-grouse habitat. Mitigation measures in the SCA along with voluntary conservation measures implemented by the applicant may improve the long-term likelihood of the area supporting an active sage-grouse population. Further information on presence of sage-grouse in the project area will be gathered for the life of the project through the Wildlife Incident Reporting and Handling System. WDFW was consulted prior to completing all surveys for sage-grouse, with confirmation of the agreed protocols (see attached correspondence in Appendix I).

7-11. Proposed mitigation for temporary impacts meets and exceeds the requirements of the 2003 Wind Power Guidelines, which were intended to address impacts to all species. Assuming replacement habitat is selected as the mitigation, the guidelines would require approximately 72.5 acres (25.1 acres permanent disturbance @ 2:1 plus 44.6 acres temporary disturbance @ 0.5:1). PSE proposed to offer an approximately 80-acre parcel owned by PSE as mitigation (the south half of the south half of the north half of Section 15, Township 18 North, Range 21 East W.M., Kittitas County, Washington). Furthermore, the revised post-construction restoration plan for the expansion area has been developed in concert with WDFW habitat biologists to develop site-specific seed mixes for lithosol soils that will maximize the recovery of these disturbed areas.

7-12. More information on the habitat status of the 80-acre mitigation parcel has been provided in Chapter 3 of the Final SEIS. If the proposed parcel is not acceptable to WDFW, the applicant has proposed to mitigate per the alternative mitigation section in the 2003 WDFW Wind Power Guidelines.

7-13. The applicant will comply with the same construction timing requirements as the original SCA for Wild Horse, which state that "the Certificate Holder shall avoid, to the greatest extent possible, construction activities outside areas that will be permanently disturbed except during the months of May through October when soil moisture is low. Trenching of underground electric collection cables may be performed outside this time window, as the soil cover in those areas will be disturbed regardless of the season and will need to be restored and reseeded."

7-14. The applicant is already committed to identification and removal of animal carcasses that may attract foraging raptors, as stated in Section 3.5.4.3 of the Wild Horse Final EIS.

Friends of Wildlife & Wind Power

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12/15/08

Mr. Allen Fisksdal
EFSEC Manager
905 Plum Street
Olympia WA 98504
allenf@cted.wa.gov

Re: Wild Horse Expansion Request
Draft SEIS

Dear Mr. Fiksdal

We write to recommend approval of Puget Sound Energy's request to expand the existing project with 22 new turbines.

Friend's supports successful and properly managed wind and alternative energy projects with appropriate protections for habitat and wildlife.
We are members of the Wild Horse Technical Advisory Committee (TAC), the Wild Horse Coordinated Resource Management committee (CRM) and the Washington Department of Fish and Wildlife Wind Power Guidelines Renewal Committee.
For the CRM grazing plan we assembled the construction cost estimates for the springs reconstruction and water development and participated in the successful lobbying effort for legislative funding of the water development plan.

Friends joined with the Kittitas Audubon Chapter and Kittitas Field and Stream Club in the submission of recent public comments to the EFSEC Council in letters of August 6, 2008 and to the Fish and Wildlife Commission of September 17, 2008. The joint participants also commented at the public hearing on August 6th. Discussions herein follow those prior comments, the draft SEIS, Puget Sound Energy's responses to public comments of September 8 2008 and the Fish and Wildlife Commissioners responses dated November 7 2008 attached.

Remarks following are the opinions of Friends of Wildlife and Wind Power.

Herein we discuss incomplete mitigation for the original project, proposed expansion mitigation, wildlife and environmental concerns.

We wish to extend our heartfelt thanks and congratulations to Puget Sound Energy and the Department of Fish and Wildlife Commissioners for recently formalizing a conservation easement for the Wild Horse project. Completion of the easement was very important to many supporters of conservation and wind energy. The easement provides vital and important protections for wind and alternative energy development as well as conservation values.

Incomplete Mitigation for the Original Project

Fencing of the Mitigation Parcel and Springs

The Site Certification Agreement requires the mitigation parcel and springs to be fenced and protected **"for the life of the project."** This requirement was intended to protect against the affects of grazing, to promote the restoration of plant material cover and provide protections for ground nesting birds such as Sage Grouse.

The recently completed conservation easement now provides for well managed grazing on the project lands.

We sincerely appreciate the measures undertaken by PSE and the current grazer Russ Stingley to implement the protections outlined in the SCA with the installation of electric fencing at the springs and mitigation parcel during the first years grazing in 2008.

During the "life of the project" other grazers may utilize the landscape. A permanent yet adaptive guidance formula is requested in the amendment to the SCA outlining specifically the measures to be undertaken to maintain compliance with required protections for the mitigation parcel and springs. 8-1

WDFW, in its response letter to joint concerns of Audubon, Field and Stream and Friends regarding PSE proposals to waive requirements for fencing, dated November 7 2008 states:

"We view the fencing provision of the EFSEC permit for PSE as a safety net in the event that our best efforts for implementing a wildlife friendly grazing program were not fruitful. Fortunately, a landscape level, wildlife friendly grazing plan has been developed. The section 27 fencing provision was specific to grazing management, and the CRM is achieving what was intended regarding wildlife habitat protection. Building permanent fences where they are not needed can be harmful to wildlife. Fences can pose a significant hazard to sage grouse and should be avoided where possible, and since the agreed upon grazing performance standards will now be applied to section 27, we no longer need to fence it. **We do concur that protection of the springs and riparian area's with fencing is necessary, but temporary electric fences that are only up when they are needed, and are the least intrusive method consistent with our range management performance standards."**

We appreciate WDFW's acknowledgement that "fencing is necessary" to protect the springs.
With respect to the mitigation parcel we are interested in WDFW's confirming assessment that "since the agreed upon performance standards [of the CRM] will now be applied to section 27, we no longer need to fence it".
Following are comments from Friends letter to the Council of 10/9/08 regarding fencing of the mitigation parcel:
"The mitigation parcel fencing would create a test plot to compare grazed and ungrazed landscapes.
If the parcel is fenced during times when grazing animals are present and monitoring indicates deterioration in rangeland health on the adjacent grazed lands, adaptive management should be used to modify grazing on the adjacent lands. Conversely, if monitoring reveals that grazing is beneficial to the wildlife habitat, then the fencing might be removed. But in that instance, it must be remembered that the mitigation parcel was created to offset the wind projects adverse wildlife impacts. If fencing the mitigation parcel does not create those compensatory benefits, then some other mitigation measures will be needed to produce a like quantum of compensatory mitigation for the wind projects impacts."
It is apparent a change in the requirement for PSE to install permanent wildlife friendly post and wire fencing at the mitigation parcel is forthcoming. In the process of implementing alternative measures we request, in addition to recognition of the conservation values originally intended with the fencing, that the fiscal magnitude of the fencing requirement be acknowledged in the resolution of alternative measures. 8-1 cont.
Permanent post and wire fencing surrounding the mitigation parcel including sales taxes, survey, procurement, management, inspections and maintenance for the life of the project (30 years), we estimate to fall within the range of$250,00 - $400,000.
In Conclusion:

- We request clarification whether WDFW intends to allow grazing on the mitigation parcel lands.
- Adherence to the SCA for fencing protections of the mitigation parcel and springs could be met with **permanent installation and maintenance, for the life of the project**, of electric fencing that is used only when needed. The hot wire would be installed and electrified only during grazing periods. The wire would be rolled up and removed or laid on the ground at other times. These actions were implemented with measured success by the grazing leaseholder during the first grazing season this year. This technique could be memorialized in the SCA amendment for the expansion. Recognizing that the grazing plan is "adaptive," it could be later amended pending the results of monitoring and data over a period of time appropriate to determine if grazing benefits the mitigation parcel, or not.
- If conservation measures for the mitigation parcel alternative to the original requirements for permanent wire fencing, which are now of

questionable benefit, are undertaken, the conservation and fiscal values of the original SCA requirements should be considered.

8-1 cont.

We are not biologists and will rely on the decisions of WDFW and local agricultural knowledge for judgments on protections for the parcel. We thought it beneficial however that a comparison control plot would be created with fencing.

Raptor Perch Deterrents

The SCA and FEIS call for the use of raptor perch deterrents at all overhead lines. The deterrents were not installed during the construction phase. The deterrents were meant to control raptor electrocution and prevent raptor predation with emphasis on sage grouse.

The deficiency in compliance has been brought to the TAC committee by WDFW and Friends and reviewed in committee meetings.

As a consolation, PSE proposed installation of deterrents on five overhead transmission towers which was approved unanimously by the TAC committee and they were installed. Monitoring of the results was undertaken by PSE employees when on site. Results from May to October were reviewed in November. Raptors did not occupy poles where deterrents were placed but did where they were not installed. Additional monitoring is to be performed by one PSE employee while on site undertaking unrelated tasks. The WDFW representative on the TAC recommended one years monitoring.

8-2

As stated in the TAC committee forum; Friends objects to the circumstance of overhead lines in place and the project in operation with only five deterrents installed. We have stated in the TAC committee that the deterrents should be installed in accordance with the SCA and FEIS. We consider it inappropriate for the TAC committee to be utilized as a forum to explore omission or dilution of SCA mitigation requirements benefiting wildlife.

We request the Council and WDFW require installation of deterrents on all overhead lines as required by the SCA and FEIS.

Proposed Expansion Mitigation

Mitigation Lands or Alternative Mitigation Fee

Following the WDFW Wind Power Guidelines, mitigation proposed is 80 acres of land contiguous to the project apparently in the headwaters of Skookumchuck Canyon, or an annual fee of $3850 to be paid to WDFW.

8-3

Unless an escalation factor for inflation was negotiated the annual fee would diminish in benefit over the life of the project.

If the 80 acre parcel is selected a stipulation that the lands would remain protected and undeveloped for the life of the project should be implemented.

We request a map of the mitigation area be provided.

8-4

Landscape Restoration

The restoration efforts PSE proposes are greater than required according to the 2003 WDFW Wind Power Guidelines. The topsoil management strategy and experience developed during the first phase will be implemented. Extended monitoring of the original project site has been offered. Reseeding of select areas within the original project site where germination has not occurred has been promised and use of locally adapted native seed prescriptions will be used in the expansion area. The proposed efforts are appreciated. The procedures will improve the prospect of a successful long term restoration. 8-5

The DSEIS however seems to downplay possible adverse impacts on sage grouse, noting the limited extent of suitable habitat in the expansion area. DSEIS at 24. But the DSEIS also notes that this lack of habitat may be due to past poor grazing practices. Given that multiple efforts are underway to rectify that problem, the SEIS should consider the projects impacts on the ability of those restorative mitigation efforts to succeed. A project has significant impacts both when it damages existing habitat and when it adversely impacts the ability of previously damaged habitat to be restored. 8-6

Environmental and Wildlife Concerns

Spring Preservation and Enhancement

In the joint letter of August 6th, we discussed the importance of water resources in the arid environment and the prospect of supportive community involvement in on going spring enhancement program. We hope PSE and WDFW will promote assistance from the community to protect and maintain the water resources on the original and expansion project site. The long term volunteer effort could include planting of native grasses, forbs and shrub materials and noxious weed control. The DSEIS does not adequately acknowledge the projects adverse impacts to the springs nor identify an adequate range of measures to mitigate those impacts. 8-7

Turbine Placement and Avian Monitoring

Avian and bat mortality studies comparing **turbines close to water sources** and turbines further away were reported to be unavailable at the time of permitting for the project. This lack of study data would appropriately be remedied with bat and avian monitoring data contributions from the Wild Horse project for both the original project and the expansion. Turbines in the original project and the expansion are designed and installed close to vital water sources for bats, avian and terrestrial species. Friends expressed concern regarding the lack of data beginning with the EFSEC Adjudicative Hearings process in 2004. As TAC committee participants we also have brought our concerns since that time before WDFW, PSE, and EFSEC Council and TAC committee members. 8-8

Requests have been made in the TAC forum to conduct the post construction avian surveys with protocols which identify turbines in close proximity to water resources.

The first year Bat and Avian Monitoring report for 2007 records 77 avian fatalities at 64 turbines which were monitored, on average a rate of 1.2 deaths per turbine. The project has 127 turbines. At a single turbine J-3, five fatalities occurred. This is four times the average rate and higher than the rate at any other turbine location. Is the high mortality rate at this turbine a statistical fluke or the tip of a larger problem? Notably, turbine J-3 lies between two springs: Thorn Spring and Reynolds Spring. Is the turbines proximity to those water sources related to a higher mortality rate? The data sampling is too small to indicate a trend. Additional monitoring is necessary for this location and other turbines close to water as well as further away, in order to discern trends if they exist.

The FEIS should discuss this issue and discuss the extent to which additional data should be gathered to adequately inform the final permit decision. See WAC 197-11-080 (1) (duty to fill gaps). See also WAC 197-11-080 (3) (duty to make worst case assessment if important gaps cannot be filled.)

Given the number and importance of the water resources in the arid shrub steppe region and the need for mortality rate comparisons at turbines close to water as well as further away, to discern trends if they exist, we believe three years monitoring for the original project and the expansion should be undertaken with particular emphasis on turbine proximity to water resources. Avian mortality data would be useful for design considerations on this and other future projects in similar habitat.

8-8 cont.

Project Road Widths

In prior correspondence and public comment Friends has expressed concern that the Wild Horse project road widths are wider than necessary. They also seem likely to be wider than the roads contemplated when the FEIS was prepared. Given that the roads are wider than originally contemplated, the DEIS cannot adopt by reference the assessment of wildlife and habitat impacts from the FEIS.

A new analysis based on the wider than expected roads must be undertaken. Alternatively, the project could incorporate enforceable standards for narrower roads. Our understanding is that the existing project roads were based in part on a desire to allow vehicles transporting wide loads to pass one another on the roadways for construction efficiency and timing reasons. It seems like with some minor effort to better time transport, road widths could be narrowed considerably and impacts to habitat and restoration costs may be reduced. It seems quite wasteful to permanently destroy wide strips of habitat for a road width that is needed very infrequently, if at all.

8-9

Recent tours of operating wind energy projects in Oregon at the Klondike and Bigelow Canyon project sites indicate the project road widths are significantly narrower (approximately 40%), than roads of the Wild Horse site.

We request this aspect of the project be reviewed by WDFW and EFSEC prior to construction start and a plan for keeping road widths and their resultant permanent impacts to a minimum be implemented.

8-9 cont.

Enforceable Commitments

Throughout the amendment application and the DEIS, reference is made to conditions that PSE has agreed to incorporate into its project. We request that the ultimate approval of the expansion clearly identify terms like these as conditions of the approval (to avoid later controversy as to whether they are "voluntary measurers" or enforceable commitments).

8-10

Cumulative Effects

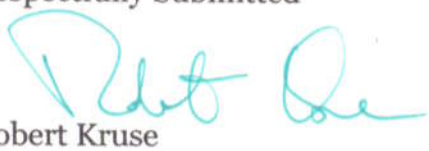
The DEIS acknowledges the need for a cumulative effects analysis and recognizes that the prior cumulative analysis is inadequate for wildlife and vegetation impacts (among others). See DEIS at 49-50. Surprisingly though, the DEIS does not discuss the cumulative impact for sage grouse. This oversight should be corrected.

8-11

Thank you, for the opportunity to submit these comments on the Draft SEIS.

We look forward to continuing work with the EFSEC Council, WDFW and PSE in pursuit of successful clean energy production with appropriate protections for habitat and wildlife.

Respectfully Submitted



Robert Kruse

Responses to Comment Letter 8 from Robert Kruse, Friends of Wildlife and Wind Power

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

8-1. See PSE's response to SEPA Checklist comments on spring preservation and enhancement (**Appendix B**, pages 5 and 12).

8-2. This comment about raptor perch guards at the operating Wild Horse facility pertains to a unanimous recommendation made by the TAC, on which Kittitas Audubon Society is represented, and thus it is not relevant to the Draft SEIS. No overhead transmission lines are proposed as part of the expansion project.

8-3. Thank you for your comment.

8-4. Location of the proposed 80-acre mitigation parcel is provided on a revised version of **Figure 3** in Chapter 2 of this Final SEIS. If the proposed parcel is not acceptable to WDFW, the applicant has proposed to mitigate per the alternative mitigation section in the 2003 WDFW Wind Power Guidelines.

8-5. Thank you for your comment.

8-6. The proposed expansion project will have no effect on ongoing restoration efforts on the existing Wild Horse facility. One area of the existing facility, the old laydown area, is proposed to be re-used because restoration efforts in that location have not been successful. Also, a new restoration plan is being prepared for the expansion area that takes into account lessons learned on the existing facility, as well as incorporating site-specific concerns for the expansion area including installing plant communities that are more appropriate for lithosol and other very rocky soils.

8-7. See PSE's response to SEPA Checklist comments on spring preservation and enhancement (**Appendix B**, pages 5 and 12). Potential impacts of the proposed project to water resources are addressed in Section 3.3.2 of the Draft SEIS.

8-8. Three years of avian and bat monitoring will occur on the original Wild Horse project, and two years of concurrent monitoring on the expansion area, as agreed upon by WDFW and the applicant. The monitoring program includes several search plots in close proximity to the nine springs on the existing facility. The monitoring program and associated plot locations have been established to avoid observer bias. It would not be statistically valid to arbitrarily locate plots close to springs. Statistical tests of geographic patterns of fatality locations on the facility will be conducted following the second full year of monitoring, because, as the commenter points out, the data sample from the first year of monitoring is too small to detect trends.

8-9. The proposed roads on the expansion site are as narrow as is practicable to allow safe and efficient construction. Project crane roads are the minimum width necessary to

allow passage of the large crane used to erect turbines, which also has specific horizontal curve and vertical slope road design criteria based on WSDOT specified multi-axle trailers used to transport equipment. These are the same criteria that controlled road design on the original Wild Horse project. Narrower roads would require multiple episodes of dismantling and reassembly, which would extend construction and increase costs significantly. The permanent road width discussed in the Draft SEIS includes the shoulders and drainage ditches, which are assumed not to be revegetated, although in reality vegetation in these areas will reestablish over time.

8-10. Thank you for your comment.

8-11. See Responses 6-7 and 7-10.

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December 13, 2008

Alan Fiksdal
EFSEC Manager
905 Plum St
Olympia, WA 98504 – 3172

R.E. the matter of hawk perch guards at Wild Horse wind farm

Dear Mr. Fiksdal,

One of Kittitas Audubon Society's concerns expressed in previous public and written comments about the wind farms in the Kittitas Valley regards potential avian impacts. Our comments in part profit from experience gained from the operation of existing wind farms across the U.S and abroad. Increasingly clear, and coupled with the relative newness of the wind power enterprise, is the lack of scientific research upon which to base plans. The consequence is something of a learn-as-you-go approach with wind farms being installed and made operational only to discover problems needing correction that include unanticipated wildlife impacts – some extraordinarily so. Once an installation is in place and functioning, it is near impossible to make changes to rectify a problem – largely because of the expense, however there are other impediments including the lack of precision in contracts that make it difficult to mandate changes once the installation is in place.

It is with the above in mind that KAS comments here on the issue of hawk perch guards at Wild Horse. The Site Certification Agreement (SCA) and even the application for the SCA, along with other documentation calls for hawk perch guards to be on transmission poles. They are required – that's the way we read it. Yet they haven't been installed.

We understand that the TAC for Wild Horse, after listening to representatives of Puget Sound Energy and through discussions that followed, decided on a different path that called for installation of hawk perch guards on five strategically-placed transmission poles to serve as test sites. One question we have is this: Does the TAC have authority to make this decision to change, and/or, if it does, what constraints or qualifications should accompany such a departure from a written contract - one that is public information and assumed to be part of the project? 9-1

Kittitas Audubon is not necessarily opposed to this adaptive management route if the five test transmission poles were well selected, and there is a competent plan for monitoring. We have reasonable confidence in the site selections made from consultation that included Mel Waters of PSE and Brent Renfrow of DFW. We don't have confidence in what we understand is the monitoring arrangement that appears to be not more than having PSE workers occasionally taking a look as they go about their other jobs on the site. We recognize the expense of an 'up-to-snuff' scientific monitoring effort, but how else can future plans regarding hawk perch installations be made and defended. Unless a scientifically defensible monitoring of the test site is established, KAS feels the 5-transmission pole test arrangement cannot be used to alter what is called for in the SCA – namely, hawk perch guards on all transmission poles.

With the assumption of continuing improvement in the quality and amount of ground cover on the project, transmission poles will eventually be in areas that afford adequate cover for ground nesting birds including sage grouse. While current models for hawk perch guards have had mixed or indeterminate results, further study can be expected to provide better models. The eventual re-introduction of Northern Sage Grouse is an established goal, and efforts to minimize predation should continue in order to help make that happen.

Tom Gauron, President
Kittitas Audubon
P.O. Box 1443
Ellensburg, WA 98926

Responses to Comment Letter 9 from Tom Gauron, Kittitas Audubon Society

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

9-1. See Response 8-2.

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Kittitas Audubon Society • P.O. Box 1443 • Ellensburg, WA 98926

December 14, 2008

Allen Fiksdahl, Manager
Energy Facilities Evaluation Council
P.O. Box 43172
905 Plum St. SE
Olympia, WA 98504-3172

RE: The Wild Horse Wind Power Expansion Project Draft Supplemental Impact Statement

Dear Mr. Fiksdal,

We have reviewed the DEIS and the supplemental information from the hearings, letters submitted, and information and letters supplied by PSE.

First, we would like to say that the photo of the Sage Grouse nest with eggs found during post construction monitoring under grass near one of the turbines on WHWPP is a clear and exciting demonstration of the value of this area of Sagebrush Steppe habitat for recovery of the Sage Grouse. In addition, it demonstrates the value of the monitoring program.

Also, we are so pleased to see that the Conservation Easement between WDFW and PSE has at last been finalized, and that it will be applied to the expansion area. Congratulations to all involved!

We greatly appreciate the number of changes that have been made to the project which should benefit wildlife and the environment in general for years to come. Some of them are:

1. PSE's volunteering to remove the four turbines on strings V and W from the project, and subsequent reduction of the size of the project to 960 acres, is the most significant change. It is huge. There will be no negative impact on the Quilomene, no habitat lost, no overhead wires and poles built, and no road upgrading in the area of raptor nests. These are a few of the benefits from this move. 10-1

2. The connection of the yard lights at the substation to motion detectors is a bird friendly move, since it is thought that lights attract migrating birds at night. (page 3

of Sept 8, 2008 letter from PSE to EFSEC.) Bats have been observed feeding on the insects which have been attracted to the lights in Kittitas County (personal comm. J. Nelson) and would be attracted to the lights also.

3. Bat studies were done on the project, which is a first in Kittitas County, PSE and others involved are to be commended. This will help to establish at least some knowledge of the bat populations in the area. Previously there has been little or no knowledge. This is an important step and we hope to see it continued. Finding greater bat activity at the forested area and springs was an important finding (page 23 SDEIS 3.2.1.4 Wildlife, second paragraph). Bats may roost in the trees and certainly would use the nearby springs for feeding and water. It would make sense that bats would travel from the trees through the turbines on string S to the water at Basalt and Spike Springs, the closest water.

10-1 cont.

4. On page 6 of the letter from PSE to EFSEC under Landscape Restoration additional mitigation will involve reseeding certain areas within the existing site where native seeds have not germinated. PSE will also extend restoration monitoring requirements on the existing site for an additional 2 years so that comparisons can be made.

5. There was also mention of extending the 2 year post construction avian bat monitoring to the original Wild Horse site. KAS would definitely encourage this extension. A further Extension to 3 years on both projects would be a good idea due to the proximity of the springs to the turbines.

We still have some concerns about this expansion:

1. There is the possible increased risk of bat and avian mortality in the vicinity of string S. Both the Basalt Spring and forested stations had greater bat activity than the one on S string. Bat/turbine interaction is poorly understood and it may be that bats are attracted to turbine blades for some reason. If blades are an attractant it would appear possible that there would be a greater interaction with turbine blades than meteorological towers. Several others including Attorney General for the Environment Bruce Martin had similar concerns. He requested supplemental avian studies be done. <u>This does not appear to have been done</u>.

10-2

2. Under the cumulative impact section 3.14.2 Wildlife paragraph 3, KAS would take issue with the statement that "this level of mortality is not expected to have any population-level consequences for individual species because of the expected low fatality rates for most species and high population sizes of the commonly killed species such as horned lark, European starling, American robin, and western meadowlark. Some species documented at these facilities (including horned lark and western meadowlark) have declining populations in the Columbia Basin, so may be more sensitive to declines in local populations."
This represents a view from the past.

10-3

The 2007 Audubon State of the Birds Report makes it clear that the Western meadowlark is one of our common birds in decline in Washington and the whole country. It is down 60% from 40 years ago. National Audubon states " A quarter of U.S. birds need our help to keep them from slipping toward extinction." Other birds in our area such as the evening grosbeak (down 93%), yellow headed blackbird (down 72%), white breasted nuthatch, prairie falcon, and even our beloved western bluebird are also birds of concern on a national watchlist. Information is listed on the Audubon Washington website www.wa.audubon.org under June 2007 State of the Birds report. The watch list is at the Seattle Audubon website: www.birdweb.org under Species of Special Concern.

Predictions of no cumulative effect cannot be made absent cumulative impact studies. These studies are a part of the Oregon Wind Energy Guidelines and perhaps the pending Washington's Guidelines . Each windfarm represents hundreds, even thousands of acres of habitat impacted and that is one of the prime reasons for these population declines. Combined with turbine mortality the effect will be greater. This is another form of cumulative effect which has not been considered. With the recent overruling of the Kittitas County Board of Commissioners decision by the Supreme Court on the Kittitas Valley Wind Farm, the specter of mass building of windfarms over the whole eastern part of Kittitas County, as well as other counties, is raising its head. Combined with the dramatically increased residential development, increased roads, and more people, it would seem the potential exists for cumulative effects on the entire valley to reach huge proportions. The valley as we know it may be changed forever. Cumulative Impact Studies need to be done before any new wind farm is built.

10-3 cont.

3. Setting aside areas for mitigation parcels and minimizing impact to habitat on this project are critical. For this reason we support a new mitigation parcel, if of appropriate value, for the expansion project. We also support fencing of the original mitigation parcel and springs and the new parcel, if grazing is to be allowed. The new parcel should be of equal or higher value than land already impacted. Movable fencing could be appropriate if it is deemed best for wildlife and the SCA is amended. Fencing should be the responsibility of PSE. The SCA of the original WHPPP calls for permanent fencing of the mitigation parcel as well as springs.

10-4

Due to the large size of the roads that resulted on the original WHPP, we recommend that road size be kept to a minimum.

10-5

4. Another aspect is habitat restoration which has been started, and planned to be worked on for at least a couple of years. We hope habitat restoration will be worked on for the life of the project. It would be an opportunity to research methods, as was demonstrated by the new topsoils management protocol which resulted in superior re-growth of volunteer plants. "They are not making any new sage brush steppe" might be said but perhaps that's not true.
This is an opportunity to find out.

10-6

The restoration of the springs and surrounding plant cover and fencing is another habitat endeavor that will benefit wildlife, including sage grouse which do seem to be using the area. The SCA for Wild Horse requires it. We encourage it being done. Community help is available for this we are sure. 10-7

5. We also would like to see the post construction avian and bat monitoring on the original project continued to 2 years as proposed by PSE. The expansion to 3 years post construction monitoring on both projects would be even better. Precedent is being set at the Maple Ridge WPP where 4 years post construction monitoring is being done. (From internet) This would likely provide meaningful data upon which to base future expansion and windfarm decisions. 10-8

We thank you for the opportunity to comment on this project.

Sincerely,

Tom Gauron
President, Kittitas Audubon Society

Janet Nelson
Conservation Committee

Responses to Comment Letter 10 from Tom Gauron and Janet Nelson, Kittitas Audubon Society

Note: The responses listed below are numbered to correspond to the numbers shown in the right-hand margin of the preceding comment letter.

10-1. Thank you for your comment.

10-2. See Response 6-3 on avian and bat studies, PSE's response to the letter from CFE on the SEPA Checklist (**Appendix B**, page 3), and Response 7-2.

10-3. See Response 6-7 on cumulative impacts.

10-4. The applicant's request to amend the SCA so that fencing requirements for the mitigation partial are consistent with TAC recommendations generated considerable controversy in comments on the SEPA Checklist, including those by Kittitas Audubon Society. Therefore, the request was withdrawn. The applicant's current intent is to fence these areas with temporary electric fence when grazing occurs on site. In any case, the applicant will comply with the existing language in the SCA.

10-5. See Response 8-4 on road widths.

10-6. The applicant has consistently undertaken voluntary measures to improve restoration of areas disturbed by construction at Wild Horse, and plans to continue its commitment to good stewardship on the expansion area.

10-7. See PSE's response to SEPA Checklist comments of spring preservation and enhancement (**Appendix B**, pages 5 and 12).

10-8. See Response 6-3 on avian and bat monitoring.

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5 ADDITIONAL REFERENCES

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Kurz, Gregg U.S. Fish and Wildlife Service
Miller, Mark U.S. Fish and Wildlife Service
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Rogalski, Floyd U.S. Forest Service, Cle Elum Ranger District
Wittpen, Nancy Bonneville Power Administration

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Moses Jr., Harvey Hon Confederated Tribes of the Colville Reservation – Tribal Chair
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Clear, Gwen Ecology, Central Regional Office
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Holmquist, Janea Rep. Washington State House of Representatives
Holmstrom, Rick Washington State Department of Transportation, South Central Region
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Lindley, Deborah Washington Department of Natural Resources
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Mattson, Larry Washington State Department of Transportation, South Central Region
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Davis, Todd Kittitas County Noxious Weed Control Board
Holmes, Kirk Kittitas County Public Works Department
Huber, Linda Kittitas County Board of Commissioners
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Erickson, Wally WEST Inc.
Forster, David
Freeborn, Phelps Washington Native Plant Society, Central WA
Gagliano, Troy enXco
Garrett, Ed Residents Opposed to Kittitas Turbines
Henn, Patrick HeliMax
Hillis, Judith Jones & Stokes
Hochstatter, Harold
Horton, Denise
Huckabay, James
Johnson, Keith Kittitas Audubon Society
Kahn, Robert Robert D. Kahn & Company
Knudson, Desmond DPK Consultants
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Trautman, Pam Lithic Analysts
Verhey, Steven
Wise, Helen
Williams, Scott Puget Sound Energy

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APPENDICES

Provided on CD

Appendix A
Comments on the SEPA Checklist

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BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

In the matter of:	)	
	)	
WILD HORSE WIND POWER PROJECT	)	
	)	Public Hearing
SITE CERTIFICATION AGREEMENT	)	
AMENDMENT REQUEST	)	Pages 1 - 41
_____	)	

A Public Hearing in the above matter was held in the presence of a court reporter on August 6, 2008, at 7:00 p.m., at 400 East University Way, in Ellensburg, Washington before Energy Facility Site Evaluation Councilmembers.

* * * * *

CHAIR LUCE: Good evening. My name is Jim Luce. I'm the Chair of the Washington State Energy Facility Siting Council. I want to welcome you here tonight. You all picked up a green sheet to tell you what we're going to do here tonight. If you haven't, they're available in the back. The purpose of tonight's meeting is a public meeting to hear from the public, public comments on the request of amendment to the Wild Horse Wind Power Project Site Certificate Agreement.

Tonight's meeting is being recorded by a court reporter, and as I said, my name is Jim Luce, and the process will be that Puget Sound Energy will make a presentation briefly with respect to their proposal. Mr. Fiksdal, our Energy Siting Manager to my right, will explain in more detail the process, we will then receive

public comment, and adjourn.

I would ask at this time that Councilmembers introduce themselves and we'll begin from the left with Hedia.

MS. ADELSMAN: Hedia Adelsman representing the Department of Ecology.

MR. FRYHLING: Dick Fryhling. I represent the Department of Community Trade and Economic Development.

CHAIR LUCE: I'm Jim Luce.

MR. TAYER: I'm Jeff Tayer. I'm with the Washington Department of Fish and Wildlife.

MR. FIKSDAL: Allen Fiksdal, EFSEC staff.

MR. LA SPINA: Jim La Spina, EFSEC staff.

CHAIR LUCE: And in the back?

MS. TALBURT: Tammy Talburt, EFSEC Staff.

CHAIR LUCE: Tammy is indispensable. So if you need any help with anything, documents or otherwise, see Tammy. The rest of us up here we're just face. Okay? The work gets done back there.

All right. Scott, you have a presentation to make.

MR. WILLIAMS: A brief one, yes. Thank you, Chairman Luce, Councilmembers. My name is Scott Williams with Puget Sound Energy. Thanks for making the trip

tonight, and I just want to take a few minutes and brief the folks here as well as the Council about our request and a little bit about who we are.

So, again, Scott Williams with Puget Sound Energy. First, I'm just going to tell you a little bit about the company. PSE is the largest private utility in the state of Washington. We have over a million electric customers. I think about 16,000 roughly right here in Kittitas County. Part of our mission, a big part of our mission is to provide reliable low cost power for our customers. We also take very seriously the will of the voters as expressed in I-937 and are working diligently to meet those requirements in an environmentally responsible manner.

A little bit about the Wild Horse Project. The existing Wild Horse Project went on line in December of 2006, and so it's well into its second year of operation, and it's proven to be a very high quality wind site as the Council hears every month from Jennifer Diaz.

The project enjoys excellent support from the community and provides positive impacts, economic impacts, and we believe that the project is complying with the conditions of the SCA, including formation of a Technical Advisory Committee that includes membership from the Department of Fish and Wildlife, the State Department

of Fish and Wildlife, U.S. Fish and Wildlife, Department of Natural Resources, the local chapter of the Audubon Society, Kittitas County, the Farm Bureau, Friends of Wildlife and Wind Power, Field and Stream Club, and the Economic Development Group of Kittitas County. We feel this has been a great process and is doing what it's suppose to do which is to adapt to changes in the field and respond to them.

PSE has also funded and participated rather actively in the Coordinated Resource Management Plan for about the past two years that's intended to provide for sustainable grazing practice not only on the wind farm site but in a much larger area, about 60,000 acres.

We've helped to manage wildlife and hunting and recreation and an access to and through or site with DFW and DNR and the TAC and Big Game Management Round Table, and lots of other folks in the community.

We're also very pleased that many of the intervenors in the original application are still very active in all these groups, the TAC and the CRM, and we very much appreciate that and welcome that.

We are working with DFW, PSE is, to finalize the conservation easement on the lands that we own, and as stated in the application we will do that prior to the approval of the amendment for this expansion. We also

constructed a renewable energy center up on the site which is visited by thousands of people since it opened in April and we're very pleased about that.

A little bit about the expansion. Some of the maps in the back depict the proposal, but in short, it's 26 new turbines on 1,280 contiguous acres just north of the existing project site. This land is now owned in fee by Puget Sound Energy. The number of turbine total output will be within what was allowed in the existing SCA but will result in an amendment to the boundary of the project and additional disturbance, approximately 59 acres of temporary and 29 acres of permanent disturbance. All of the requirements of the existing SCA will, of course, apply to the expansion.

Power from the new turbines will flow to the existing project substation which will be expanded and will flow out onto the grid on the existing transmission line without any alteration.

We have also in the application proposed some additional mitigation measures in addition to the requirements in the existing SCA to apply lessons that we learned, that we all learned I think during construction of the Wild Horse Project and which will minimize the impacts of construction which we're trying very hard to do.

We've also asked for an amendment to the requirements of the existing SCA that relate to fencing of the springs and of the mitigation parcel which is Section 27. We're asking for this change really at the request of the CRM group to allow for some flexibility in how these measures are implemented and really I think to reflect the collective wisdom of the group. And I think when the original SCA was approved not a lot was known about how grazing was going to be managed and now we know a lot more about that to the extent that this group goes forward. There are different ideas about the best way to achieve the intent of the mitigation measures. We certainly aren't asking or I should say we're very willing to implement comparable mitigation measures in lieu of what's in the SCA, just asking for the flexibility so the group can decide what's the best thing to do.

In short, we believe that this proposed expansion will produce low risk and low cost power for our customers compared to other things that we can do, and that's a big part of what we're about. I'm certainly happy to try and answer any questions the Council has, but that's all I have.

CHAIR LUCE: Thank you.

Mr. Fiksdal, I believe you are going to explain to everyone who is here the provisions of Chapter

463-66 Washington Administrative Code that pertain to the amending of site certificate agreements, and so I'd appreciate you doing so at this point in time.

MR. FIKSDAL: Thank you, Mr. Chairman. Correct, under the Washington Administrative Code Chapter 463-66 entitled Amending, Transferring, and Terminating a Site Certification Agreement lays out the procedures and the process for the Council to review a request for amendment to the site certification agreement among other things. There's, oh, probably four or five different sections of that chapter that deal with this amendment, and I'm going to paraphrase quite a bit of what it says. If you want to read it in its entirety, I highly encourage you to do that. You can go to almost any website and type in search engine and get that or go to our website at www.efsec and you can get a link to our laws and rules as with the application for the amendment and many other things that the Council does.

The Council upon receiving an amendment or a request for amendment to a site certification agreement can if it wishes for further understanding hire a consultant to review any of the information that it receives. If it deems necessary that it's such a nature that either staff or the Council can't or feel it's appropriate, they can go out for an outside third-party

consultant to help them review the application.

Also, the Council is required to hold at least one public meeting and thus we are here. Not that we have to but it's always nice to come to Ellensburg to the dry side of the mountains and enjoy your country over here. The Council can hold other meetings if they feel it is appropriate.

Under the amendment review under WAC 463-66-040 the Council in their consideration shall look at whether the proposed amendment is consistent with the intention of the original site certification agreement, applicable laws and rules, the public health and safety and welfare, and whether the provisions of our chapter on site restoration preservation continue to be part of the project in its site restoration.

If you don't know, the Council not only goes through a siting process, it also regulates the facility for the life of the facility through site restoration. There's a requirement in our rules that the project submit site restoration plans and at the end of the project will restore the site or restore the site to a condition that the Council approves.

Not only do they have to consider the intent of the original SCA and all the laws and rules and public health and safety, there's some other specific ones in

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environmental conditions.

Another process that the Council has to go through is the State Environmental Policy Act Review or SEPA. The applicant filed a SEPA checklist with the Council. We will be looking through that checklist plus any additional information we deem necessary, and the Council will issue either a determination of nonsignificance, a mitigated determination of nonsignificance, or a determination of significance.

If there is a determination of significance, that would require an amendment to the existing environmental impact statement. The Council hasn't issued that yet. I think they will be doing that soon. I am the lead SEPA official for the Council. I will be offering my recommendation before too long to the Council on my determination.

The Council has to also look at are there other reasonable alternative means by which the purpose of the proposal might be achieved and the availability of funding to implement the proposal. Under the Council Determinations WAC 463-66-060 based on all the information that they have received through the application, through any additional studies, all the public comments that they receive both orally and written the Council may accept the amendment, reject the amendment, or reject the amendment

and state conditions or terms under which the amendment might be reconsidered.

The Council if they're going to approve the application or the request for amendment can approve it if it does not substantially alter any substance of any provision of the SCA or which is determined not to have significant detrimental effect upon the environment. And if this is the case the Council itself can approve the amendment. However, if the amendment substantially alters the substance of any provision of the SCA or which is determined to have a significant detrimental effect upon the environment, the Governor of the State of Washington has to approve the amendment. So it's up to the Council to determine what conditions apply and whether it's approved by the Council or would be recommended up to the Governor for the Governor to approve.

Those are the conditions of that chapter, Mr. Chairman and Councilmembers, that apply for a site certification agreement amendment.

CHAIR LUCE: That's correct, Mr. Fiksdal, and I'd just note for the record that, Mr. Fiksdal, the SEPA determination will be based in part on what we hear here tonight.

So we would hope that any comments you had that would affect that determination would be offered here

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and I believe there is a time frame.

Mr. La Spina, is there a time frame within which public comments are stopped by?

MR. LA SPINA: Yes. Public comment will be accepted up until Friday, August 8, at 5:00 p.m., and your written comments can be postmarked that late also.

CHAIR LUCE: Are comments accepted by e-mail as well?

MR. LA SPINA: Yes, yes.

CHAIR LUCE: So thank you very much.

We will now move to the public comment portion of tonight's meeting. I have seven people who have signed up to speak.

Tammy, do you have others in the back?

MS. TALBURT: Another one.

CHAIR LUCE: Another one.

The first speaker tonight will be Helen Wise. Helen, welcome. We can probably get the mic to you if you want to just--

MS. WISE: This is all right?

CHAIR LUCE: Yes.

COMMENTS BY HELEN WISE

I am Helen Wise, 1106 East Third, Ellensburg. I've been here a long time. I have followed the process of permitting wind farms from June 2002. As

an environmentalist by nature I've been very concerned. I've studied all the things, the papers and SEPAs and all that. I am impressed. And I have been a very strong supporter of wind power, alternative power, and could go on and on about that but I won't.

What I want to say is that here we have Wild Horse. Have you been there? Of course, you have. Have you been impressed? My God, to see it and it's working, and those people, that Puget Sound Energy Company has been carrying through with what you've said should be done. I'm proud of what I see up there. I'm proud of the fact that finally we are harvesting one of our great resources of this county, the wind.

I urge you to approve the expansion of this site and the construction of the requested 26 more turbines. Please support this amendment.

CHAIR LUCE: Thank you very much, Helen. Appreciate your comments.

The next commenter we have is Milt Johnson from the Department of Natural Resources. Milt.

COMMENTS BY MILT JOHNSON

Good evening. Again, I'm Milt Johnson with the Department of Natural Resources. The Department of Natural Resources would like to provide comments on the Puget Sound Energy request to amend the Wild Horse Wind

Power Project Site Certification Agreement.

DNR leases state lands for both wind power and grazing within this area, and our comments are based upon our perspective as a land manager. Specifically DNR urges EFSEC to amend the existing site certification agreement, to waive the requirement for permanent fencing at springs and mitigation parcel. The water developments do need to be protected; however, the landowners should be encouraged to develop site-specific plans to protect the water developments in order to protect the resource while providing benefits to wildlife and livestock. This may or may not include fencing but should be based upon a site-specific plan developed by the landowners.

PSE is an active member of the Wild Horse Coordinated Resource Management Planning Group. The CRM group is implementing a new grazing plan for the area designed to maintain and improve wildlife habitat and resource conditions. The CRM also monitors these conditions prior to and following each grazing season. This plan for livestock grazing is significantly different than the grazing plan in place at the time the SCA was written. Participation in the CRM process provides superior habitat mitigation across the larger landscape without the need for permanent fencing of the mitigation parcel. Thank you for your consideration.

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CHAIR LUCE: Thank you, Mr. Johnson. Appreciate that and we'll take that letter and put that into the record. We have another spokesman here from DNR Brent Billingsley.

COMMENTS BY BRENT BILLINGSLEY

Thank you. My name is Brent Billingsley. I'm the Department of Natural Resources Representative on the TAC, and I'd also like to urge the Council to approve the proposed amendment to the site certification agreement.

As DNR's member on the TAC I'd also like to make several comments regarding the performance of the TAC and our ability to work with the certificate holder, Puget Sound Energy. First of all, I believe the TAC is functioning well. We are kept well informed by PSE staff, and it's been a productive process.

Secondly, the TAC has reviewed and unanimously recommended for approval the following plans: the post-construction management and grazing plan, the hunting plan, the post-construction avian monitoring plan, and we're in the process of reviewing the implementation of the post-construction restoration plan.

The TAC has and continues to successfully address wildlife habitat issues. For example, we encouraged PSE to aggressively control the Cheatgrass in

their native restoration seeding and they stepped up to do that. Another example is the time and resource they have contributed to the CRM process on a much larger area than just the power project area itself. Through this process we have worked on wildlife habitats on like a 60,000 acre area, and finally the TAC has been able to reach consensus on each of these recommendations that we've made to EFSEC which is I think an accomplishment with a fairly diverse group.

So based on PSE's performance in complying with the conditions of the permit and their commitment to improving habitat and their active participation in the CRM we would like to urge EFSEC to approve their request.

CHAIR LUCE: Thank you. Appreciate your comments. Do you have something in writing that you're going to hand that we can include in the record? If you do, that would be helpful. If you don't, that's all right to.

The next commenter we have is Marc Eylar. Marc it sounds like Kittitas County Noxious Weed. Welcome, Marc. Just state your name, spell it, and your address for the record.

COMMENTS BY MARC EYLAR

Good evening. My name is Marc Eylar, M-a-r-c E-y-l-a-r. I'm the assistant coordinator for the

Kittitas County Noxious Weed Control Board and a member of the CRM involving the Wild Horse Wind Power Project.

I've currently worked in the Wild Horse Wind Power Site for last eight years and also with the previous landowner in the area for proposed expansion for noxious weed management, and I just would like to take this time and the Noxious Weed Control Board would like to take this time to acknowledge the fact that the implementation of PSE's noxious weed management plan in that area has been a very successful one in our opinion. They have been very devoted and committed to noxious weed management, and I also think they kind of took it a step further. Brent mentioned it. The cheatgrass control that's something that very few landowners of that size will endeavor. It's a tough commitment and it's actually been a pretty successful one.

Based on the surveys that we've done this year it looks like they have pretty successful control, but we also, the Noxious Weed Control Board would also like to stress the fact that the implementation of this noxious weed control plan that they have be even more strongly in place for the expansion areas because this is a little more of a weedier area. There's a lot more invasive species presently located at that site. It was an area that burned a few years ago and because of this

there's a little bit more stress; and we strongly urge that the implementation of a noxious weed management plan in that area be a little more aggressive to control some of the musk thistle and cheatgrass in that area.

We also would like to stress that the continuation of this implementation continue for the long term in the future. Noxious weed management isn't something that can happen in just two years and you can walk away from it. Even if it looks good, you always get more disturbance and you get reseeding from vehicles. So that is something that we strongly encourage that the commitment be there for as long as the project lasts and as long as PSE is a landowner.

CHAIR LUCE: Thank you. Do you have any specific recommendations that you're going provide to the Council in terms of the plan which you just told us?

MR. EYLAR: I would just stress that PSE staff Jennifer just meet with us and she has done that.

CHAIR LUCE: Appreciate that. Thank you very much.

Mr. Robert Kruse, Friends of Wildlife and Wind Power. Good Evening, Mr. Kruse.

MR. KRUSE: Good evening, Chairman.

CHAIR LUCE: Name, address, spelling, all the usual.

COMMENTS BY ROBERT KRUSE

Robert Kruse, 8885 42nd Avenue S.W., Seattle, 98136. I'm Chairman of the group known as Friends of Wildlife and Wind Power, and I'm a member of the TAC committee and the CRM and also the Washington State Department of Fish and Wildlife Wind Power Guidelines Renewal Committee.

I'm here tonight representing our group Friends of Wildlife and Wind Power but also am collaborating in communication with the Council this evening along with the Kittitas Audubon group and the Kittitas Field and Stream Club. We have assembled a communication letter here to the Council, and we'd like to present that to you.

CHAIR LUCE: Thank you. That would be helpful if you want to read the letter into the record or if you just want to submit it for the record.

MR. KRUSE: No, I'm sorry. It's too lengthy for that, but I would like to touch on the high points.

CHAIR LUCE: We will pay very careful attention to it.

MR. KRUSE: Okay. Thank you.

We endorse and support the expansion project conditionally. Under the current circumstances we do not endorse the approval of the project, and I'd like to touch

on the reasons why and some of the elements of hope for our ultimate approval for the project because we do think that ultimately that will come to pass.

Our concerns fall into three categories. First, mitigation for the original project, the original Wild Horse Wind Power Project that have not been met yet. The second category is the mitigation for the new project, and the third category is concerns that have developed over witnessing the operation of the existing Wild Horse project so far.

In the first category of mitigation not yet satisfied the principal item is a conservation easement for the lands of the project area its present configuration. The SCA and the EFSEC Council promised the public via the SCA and through other communication elements that a viable conservation easement would be placed on the lands of the project and that has not happened yet. We congratulate the Department of Fish and Wildlife on their efforts in the endeavor thus far, but we're still not there. There is work ongoing with the conservation easement presently. We are yet hopeful that ultimately an easement that embraces the meaning of the intention of the agreement between the public and the EFSEC Council and the developer will ultimately be reached, but right now we fall short of that.

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The easement being circulated presently allows for expansion of the Wild Horse Wind Power Project far beyond wind energy development. Wind energy development was suppose to be what the project was all about initially, and now it appears that there is an interest in wanting to predispose future industrial expansion of the project area far beyond wind energy development and we're concerned about that. We don't feel that that element of the conservation easement at this time is what we bargained for initially, and we'd like to have that problem corrected.

We do, however, appreciate that Puget Sound Energy has presented by this amendment that's before you now the recognition that a conservation easement needs to be in place before approval of this project is given and we appreciate that.

The second important mitigation item was fencing of the mitigation parcel and the springs. We have heard comments from the others so far this evening. We appreciate them. We do recognize that the science and the data and the information related to the concepts for fencing the mitigation parcel and the springs was different at the time of original approval of the project than it is now. There's better ideas out there and fencing apparently does not fall into that category. So

based on good information we recently received from the Department of Fish and Wildlife our views have changed. We don't sanction the use of fencing necessarily, but, however, the mitigation parcel was presented to the public as a very significant mitigation item under the original SCA. The mitigation parcel also, however, is part of the project. There's 12 turbines on the one square mile landscape. If the parcel is not fenced and it is presently part of the project and it doesn't become the sanctuary for ground nesting birds and for prevention of hazards as a result of that migration, then actually it is no longer a mitigation parcel. It has become something different. And so part of our proposed mitigation remedies is to identify ideas for a new or different mitigation parcel that satisfies the intent of the benefits for wildlife under the original project proposal.

In the case of the springs we agree that individual designs go for each individual spring circumstance is necessary that likely does not include fencing, and also we appreciate Puget Sound Energy's apparent willingness to provide mitigative benefits in a form different than the fencing that was originally intended that could take the form of native plant material restoration and vegetation restoration in lieu of the fencing, and ideas along those lines are something we

would promote and we would hope for in order to provide the mitigative benefit that was originally intended under the SCA.

Our schedule proposed expansion mitigation principally it includes the restoration of the springs themselves and the water development capability for the springs. We feel that the acknowledgment in the original SCA of the importance of the springs in the overall project development and the health of the project and the landscapes that were suppose to be cared for fell far short of recognition of the value of the water resource contained in the existing Wild Horse area, and we feel that an element of mitigation for the impacts that are going to be felt as a result of the project expansion that Puget Sound Energy should undertake the responsibility for restoring the springs in the existing project area, as well as the two springs that are in the expansion area, the Basalt spring and Spike Spring; and those water resources need to be preserved in a way that they will be available long term for wildlife and for the grazing program should it continue to go ahead.

Landscape restoration we now have the benefit of two years of restoration efforts. We applaud Puget Sound Energy's efforts in restoration. They've really tried to go the extra mile to restore this landscape under

the intention of the original intentions. Regrettably after two years the restoration effort is not what everyone would have hoped, but it was recognized going in that restoration of shrub steppe habitat is a very difficult prospect. I think we need to learn from the restoration effort thus far, but more importantly we need to recognize that the SCA does not require Puget Sound Energy to carry the restoration effort beyond three years. And clearly if restoration of the areas, particularly the areas that were suppose to be temporary impact areas, does not go beyond three years, those areas will not be restored. It's clearly that that's the case.

So as perhaps a mitigation element we believe that continued ongoing restoration efforts in the original project area to restore the landscape at least to some median level of shrub steppe restoration should be requested by the Council of Puget Sound Energy and for restoration effort to carry forward. What has been learned in the restoration effort of the original project should be translated into the expansion area and a different specification for the expansion area should become part of the approval process. The restoration effort for the original area it was not a performance-based specification. There was no target for what we were trying to achieve. There needs to be a

target for the expansion area. There's enough known about what to do to make it right and that needs to be part of the approval of the new project.

Other environmental impacts and concerns that we have based on the experience of the project thus far, turbine placement. In the original project we expressed concern about the close proximity of turbine placement to water. Regrettably our concerns weren't acknowledged and acted upon under the original project proposal. We'd like to have them revisited in the new project proposal recognizing the turbines have been designed close to water forces and we'd like to have the expert commentary on what that means to us at this point.

For this project, but apparently for all projects nationwide there isn't a lot of science on what the impact of turbine placement close to water resources for wildlife is. Whatever the information is that's available it needs to be studied carefully and we don't think it was studied carefully enough in the original project. We'd like to have that addressed now.

There is a small element of information available for the Wild Horse project now, and they've had one year of avian monitoring for the Wild Horse project. The second year is required by the SCA, but when that will begin has not yet been decided by the TAC committee. The

first year's information indicates that there might be a difference in avian mortality in turbines or with turbines closer to water than further away. There's a small increase in avian mortality at Reynolds Spring and Thorn Spring turbines. The sampling is very small. It's much too small to lend any scientific weight to, but there is an indication that there are more birds being killed at turbines closer to water, and we'd like to have that recognized and taken into consideration in the expansion proposal.

There is new science or at least commentary involving concern about the relationship of bat mortality and turbine blades. It's been written in scientific forum reports that there may be an attraction of bats to turbine blades, and at the minimum we would like to have all that is known presented in a supplemental EIS for the expansion area so that if nothing else the public knows what is known by the scientific community right now about that particular problem.

The layout for the new project includes overhead wires. In the original project the use of overhead wires was shunned and it was discussed rather heavily in the application for site certification, the certification agreement, the draft and final environmental impact statement. There are good reasons not to have

overhead wires, and there's overhead wires designed into the project now. We understand that it may be because of leasehold or access or right-of-way problems might exist in property ownership between the Department of Fish and Wildlife and Puget Sound Energy. We would like to try to promote a resolution of that so that feeder lines from the turbines could be placed underground as opposed to overhead. The overhead lines are right across the end of the Skookumchuck Canyon, and I for one would appreciate not walking up Skookumchuck Canyon to the end and witnessing overhead lines across the end when it's not necessary, and I don't think it is. We hope the property ownership elements could be taken care of, if that's what the problem was that precipitated that design element.

I think that the greatest problem so far with the existing project, and this may be perhaps more of a personal feeling on my part than widely held in the community, although I do think it is widely held in the community, and that is the width of the roads that were constructed for the original project. We feel that the width of the roads and the amount of destruction that the landscape was subjected to as a result of the width of the roads is actually shameful, and we think we may understand some of the reasons why the roads had to be so wide. Maybe it was because the passage of two large pieces of

equipment at the same time in order to save time on the project to haul turbines or bring cranes out. Time saving mechanisms may have been a big part of why the roads are so wide. If so, on the new project we'd like to slow the construction of the project down so we don't have to have roads that are just as wide as Interstate 90 through a shrub steppe landscape. So it's actually rather pathetic. We'd like to have what caused that problem in the first place addressed in a supplemental EIS in some form.

To conclude, a supplemental environmental review of the importance appropriate to the expansion project should be undertaken. A supplemental EIS or some method of review of the project given the gravity of the impacts that are going to be undertaken there would be appropriate, but it would also greatly facilitate the basis to have the necessary discussions for mitigation and ultimately the final design for the project. We appreciate the Council's consideration in all of these matters. Thank you.

CHAIR LUCE: Thank you so much, Mr. Kruse. We appreciate your comments.

It's public comment. You want to engage in some dialogue now?

MR. TAYER: No, I just want to ask a question.

Robert, I wanted to clarify. I thought I heard you say at the beginning of your comments that this was a consensus statement with your group, Kittitas Audubon, and Kittitas Field and Stream.

MR. KRUSE: That's correct.

MR. TAYER: Did I hear that correctly?

MR. KRUSE: Yes, you did.

In addition to the letter that I have submitted to you a supplemental commentary from our Counsel David Bricklin is attached.

CHAIR LUCE: Thank you. We appreciate your comments, Mr. Kruse.

Mr. Piercy, I seem to remember that name. Mr. Piercy, good evening. Would you state your name and spell it and give your address for the record, please.

COMMENTS BY DARRYL PIERCY

Thank you, Mr. Chairman, Members of the Board. For the record, Darryl Piercy. I'm Director of Community Development Services for Kittitas County. My address is 411 North Ruby Street, Ellensburg, 98926.

I'd like to preface my remarks to the Council this evening by complimenting Puget Sound Energy on the achievement that they've undertaken at Wild Horse Energy Facility. They have been a wonderful working partner with Kittitas County. They have demonstrated that

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they do what they say, and in our relationship in working with Puget Sound Energy at the Wild Horse site it's been one of mutual cooperation and respect and we do appreciate the attitude and the process that they've brought to the development of the Wild Horse site. And we recognize that that is a facility that should appear and show as an example of how public and private facilities can work together to create something that truly has benefit to the community. So we would like to express our thanks and our appreciation to Puget Sound Energy for their efforts and their cooperation with Kittitas County.

The EFSEC Board may recall you found that the Wild Horse Wind Power Project was consistent with local land use requirements of Kittitas County, and in fact as part of that process in developing consistency with the rules and regulations of Kittitas County, Puget Sound Energy entered into a development agreement among other things with Kittitas County to be consistent with the requirements found both in our comprehensive plan and within our development code.

Since the time of approval for the Wild Horse Facility we have had some modifications to our development code which actually allows for an expedited process for local review of wind power projects that are located in the preidentified areas for siting. What I

have passed out to the Council this evening is the amendments to our code that shows where those preidentified sites and locations are and the process for review at the local level of those preidentified sites, and you can find that in Kittitas County Code 17.61A.035.

The process of that we review now within these preidentified sites, and I think it's important to note that the proposed expansion area for the Wild Horse Wind Farm is in one of these preidentified sites for wind power projects so it would be subject to that code citation that I just mentioned. Our local process requires that Puget Sound Energy would enter into a development agreement. In this case since one already exists we would look for an amendment to that development agreement, and with that amendment and the environmental review that's being conducted by EFSEC that would lead towards approval of the project if that in fact was the case for Kittitas County and it met the requirements that are outlined in our code.

We have been assured by a representative of Puget Sound Energy that they intend to come to the county and ask that the project and expansion be reviewed through our local process to ensure consistency with Kittitas County code and our comprehensive plan. We would ask the EFSEC Board to make that a requirement of your approval

that you seek local consistency with our code. We have an applicant that appears to be very willing to do that, and we believe that you have an obligation to ensure that it's consistent with those local requirements. We ask that you would do that.

We also would like to identify within the SEPA documentation there is a lack of indication that a local process is required into the SEPA documents and that amendment to our development code would be one of those requirements in terms of the permitting process for this applicant. So we would like that to be noted within the SEPA documentation that in fact that it is a local process and an amendment to the existing development agreement with Kittitas County that would be required for this project to move forward.

But, again, we believe that Puget Sound Energy has the ability and the direction to come into compliance with the local requirements. You'll note within our code that the local requirements are a much expedited process from those in the past, particularly for this site. There are few requirements that are asked of the applicant in order to be in compliance with our code, but we believe that those are very reasonable expectations, and again I believe that that's also the sense from the applicant in this case, and they appear to

be very willing to work with Kittitas County.

So I thank you for the opportunity to speak to the Council and would be happy to respond to any questions if you so have them.

CHAIR LUCE: Thank you for coming here, Mr. Piercy.

MS. ADELSMAN: I have a question.

CHAIR LUCE: Yes, Hedia.

MS. ADELSMAN: When you say expedited can you give us a range of what time frame it would be?

MR. PIERCY: For example, we just recently approved a siting of a wind energy facility directly south and to the east of the Wild Horse site by a company named Invenergy. That was a 60-plus turbine site. We received the application for that in October. I believe our approvals came sometime in March the following year so within a six-month period, and keep in mind that that also spanned the process of the holidays. So we believe that that demonstrated a real ability within our code to look at a project critically and to have it meet substantial requirements under that review and yet be done in a very expedited period of time.

CHAIR LUCE: Thank you, Mr. Piercy.

MR. PIERCY: Thank you.

CHAIR LUCE: The next commenter I have is

Bill Essman, Kittitas County Field and Stream. Bill, you want to come forward and tell us what's on your mind.

COMMENTS BY BILL ESSMAN

Mr. Chair, Councilmembers, my name is Bill Essman, E-s-s-m-a-n. I'm president of the Kittitas County Field and Stream Club. I'm also a member of the Wild Horse TAC, and I'd like to say that I think our TAC is very productive. We have a good group of folks, and we seem to get things done without very much effort. I'd also like to say that I wish that the process was a little more adaptive, but I think time will go on. This is a learning process for everything.

Our club would like to have a little bit more than what's offered right now by PSE, but I think eventually that will come, and I would like to without going into a whole lot of detail just affirm that we have joined with Robert Kruse's organization and the Kittitas Audubon Society in drafting this letter that you have before you. Thank you.

CHAIR LUCE: Thank you very much.

Catherine Clerf. Good evening, Ms. Clerf.

COMMENTS BY CATHERINE CLERF

Good evening. Catherine Clerf, C-a-t-h-e-r-i-n-e, last name C-l-e-r-f. Address is 60 Moe, M-o-e, Road, Ellensburg, Washington 98926. Speaking

on behalf of myself as a long time fourth generation cattle ranching and farming member family of Kittitas County.

Not too many citizens came forward, just Helen. Everyone else spoke on behalf of an institution or an organization so I guess I'll speak for the generation of the baby boomer I represent and that of my daughter, a generation behind me, and grandkids I hope to have someday.

It's about time America got up and realized the fact that we have allowed all the infrastructure that was built as far back as 120 years ago. People need to realize that the original oil impregnated a line laid by Westinghouse and Edison is still in the ground serving all the major municipalities in the United States of America 120 years. This is advent of a paradigm shift that needs to take place in our country as well as the world. For all the people who harbor either resentment or concerns or fears about what happens to large expensive hundreds if not thousands of acres of land with regard to energy production had just better be mindful that we fly in airplanes now and thinking of it think about what the very first people did and the same way with every other technology that has come along. How many speakers has said this was a learning process? It was.

We are a shrub-steppe terrain in Eastern Washington from our borders to our foreign country above all the way down to the spine of the Cascades. More will be in place. I am in the renewable energy business, but I'm speaking here just for myself, and this is going to be a global phenomenon. We're not going to be able to attack any of our transportation problems which require energy. If you're going to switch to hybrid electrical, you're going to have to have energy production. We can no longer bank or count on the hydroelectric system. We can't add anymore. There are people who would like to reduce them in fact.

You can create water in the desert believe it or not chemically, but you do need cheap power. The only way we're going to allow any offset of huge population growth on the other side of the state is to solve the water problems on this side of the state without robbing the in-stream flows. And, of course, having to work around the fact it doesn't snow at 125 percent snow pack every year. We are totally at the whims of mother nature.

Again, as a 54-year-old, I'm excited that my state is going to be leading the charge of the 50 states that need to address what needs to be done, and the bottom line is we do not have a civilization nor do we have an

economy, whether it's local county, state, or federal, unless we have energy. Thank you.

CHAIR LUCE: Thank you very much. Appreciate your comments.

The last commenter I have listed--it doesn't mean it's the last commenter--is Steve--I'm going to struggle with Verhey.

MR. VERHEY: I can do that for you.

CHAIR LUCE: Thanks, Steve.

COMMENTS BY STEVE VERHEY

My name is Steve Verhey. That's spelled V-e-r-h-e-y, and my address is 1801 North B Street, Ellensburg, 98926.

I'd like to start with a really practical comment. I note here that the modification of the SCA calls for alterations of the existing substation. I'm a very strong supporter of alternative energy, but half the time up at the Wild Horse site it's dark, and there's only one thing that bothers me about looking at that site day or night, and it's lighting on the substation. I like the look of the turbines in the daytime. I think they're magnificent. I like the cool, synchronized red strobes on the turbines at night. I think that's very cool, but the lighting at the substation bugs the heck out of me. The hillside that used to be completely dark now has this

substation. I understand that it's probably required by code to light the substation. I'm hoping that it's not necessary that the light be visible off site. If there is something that could be done about that as part of this expansion, that would be a wonderful thing. That was the main thing that I wanted to say.

I also wanted to echo the comments of Mr. Kruse. I think that he exhibited very well that it's possible to be a strong supporter of alternative energy but not be willing to throw the baby out with the bath water. As we go to do this expansion of energy we need to, of course, remember conservation, and we need to be careful as we go along and not simply grasp at any form of energy just because it's energy. We need to think about what we're doing and do it as carefully as we possibly can. Wild Horse has done an admirable job and it's time to take it to the next level.

I was actually surprised to hear that some of the requirements of the earlier permit hadn't been completed and particularly the mitigation on the section that Mr. Kruse is talking about. It would surprise me if this expansion were approved without the initial project being completed, but maybe I don't understand the process very well.

Finally, to return to my original point, can

we please do something about the lights on the substation. Thank you.

CHAIR LUCE: Thank you. Appreciate your comments.

Are there other commenters here this evening? Are there other commenters here this evening?

MR. FIKSDAL: Mr. Chairman, I just want to reiterate there are sheets up there for written comments if you want to submit those tonight, and we again as Jim La Spina mentioned we'll accept written comments until 5:00 p.m. Friday.

MR. LA SPINA: Or e-mail.

MR. FIKSDAL: Or e-mail and I think the e-mail address is listed in the information sheet.

CHAIR LUCE: So public meeting requesting amendment to the Wild Horse Wind Power Project Site Certification Agreement No. 5 is hereby concluded.

MR. KRUSE: I just wanted to mention there will be copies of our letter on the back table for anyone who is interested.

CHAIR LUCE: Thank you, again.

Tammy is the person who makes things happen around here so if you need help with any documents or anything else or if you need to get a hold of EFSEC get a hold of Tammy. Thank you. We stand adjourned.

* * * * *

(Whereupon, the public hearing was adjourned at 7:53 p.m.)

I N D E X

A F F I D A V I T

I, Shaun Linse, CCR, Certified Court Reporter, do hereby certify that the foregoing transcript prepared under my direction is a true and accurate record of the proceedings taken on August 6, 2008, in Ellensburg, Washington.

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Shaun Linse, CCR

CCR NO. 2029

Wild Horse Wind PP
Aug 6, 2008 Comment- 1

RECEIVED
AUG 0 5 2008
ENERGY FACILITY SITE
EVALUATION COUNCIL

Chem A Shaloch
315 Lincoln St
Ellensburg, WA
7-31-08

WASH STATE E.F.S.E.C.
Evaluation Council
ATTN: Allen Fiskdahl
Sub: Wild Horse Wind Proj

I for one am not a advocate of wind generating facilities as a solution for reliable source of electric energy. I believe after roughly 40 yrs & 20 yrs observing the growth demand of this energy. We cannot put our faith in wind-gen. Looking at the broad consumption picture, who in the industrial use picture, could rely or operate a business on wind energy. The critical time of year here is from mid-Sept to mid-Apr. This is when a crises could occur, and it seem those in power-gen are lending a blind eye or absent mind as to the reliable source of generation we should be putting our investment in. Puget is wheeling & dealing with a consortum to sell. This addition as proposed simply is promotion material. I for one dont object to this expansion, but its just another move in the wrong solution. In tracking other power co., they are seriously considering ~~#~~ atomic + new coal fired tech to meet ~~that~~ their ~~fut~~ future demands. Also the gov. of Cal., Florida, Ohio and energy advocates ~~are~~ becoming springs on atomic

In a sense its tragic that the decision makers were not service workers during times when customers were desperate for electric heat or getting their production facilities operating in cold weather or times of emergency. Only then would our efforts be placed in developing a Reliably along range plan for electrical energy

As Ever.
Glen A Hladek

8/6/08

Jim Luce, Chair
Washington State Energy Facilities
925 Plum Street SE
Building 4
PO Box 43172
Olympia WA 98504 – 317

Re: Wild Horse Expansion Request

Dear Chairman Luce and Members of the Council:

We write in response to the application submitted by Puget Sound Energy to expand the Wild Horse Wind Power project development.
Citizens of our groups support the EFSEC Council and PSE in their quest for the development of properly sited renewable energy projects. We accepted the development of wind energy at the Wild Horse site as originally proposed by the applicant and approved by the Governor and EFSEC Council even though there were significant adverse impacts.
Our acceptance was based on assurances that the project would provide opportunities for conservation and enhancement of shrub steppe lands and that the adverse temporary and permanent impacts would be fully mitigated. While some requirements for mitigation described in the Site Certification Agreement are well along in their development, important and vital mitigation components promised by Puget Sound Energy and the EFSEC Council remain incomplete at this time.

We oppose approval of the project expansion under the present circumstances.

Herein we summarize mitigation yet to be implemented as promised for the original project, suggest proposed additional mitigation for the new project and outline our concerns regarding the expansion proposal. Agreement on resolution of these concerns would be necessary for our endorsement of the expansion proposal.
The lands in and surrounding the Wild Horse site are high value shrub steppe habitat possessing a diverse and dense wildlife population. We solicit the Councils undivided attention to the care of these treasured landscapes as promised in the original proposal documents and the Site Certification Agreement.
Adverse impacts will be part of the project expansion. We request additional mitigation measures be approved to offset those impacts as part of the expansion proposal approval.

We are grateful Puget Sound Energy has expressed in its application acknowledgment that the Conservation Easement promised by the utility under the original proposal must be placed on the lands of the project before approval by EFSEC of the expansion.
Good faith effort on PSE's part has been demonstrated in their work organizing and participating in the Technical Advisory Committee responsible for monitoring the impacts of the project. PSE's obligation to develop a plan for grazing of lands within and surrounding the Wild Horse project has made significant progress.

A Coordinated Resources Management committee has been organized and facilitated by PSE to meet its obligation to implement a grazing plan. Volunteer community participation and skilled guidance by the Department of Fish and Wildlife, Department of Natural Resources, WSU Extension, Natural Resources Conservation Service, Kittitas Conservation District, Kittitas Farm Bureau and many others, provides much support for helping PSE meet its obligations. Citizen's state wide are expecting a well managed landscape.

Much work remains to be accomplished for this Adaptive Management plan. Community concern exists regarding grazing of public lands. Collaborative oversight and monitoring of grazing and water resource preservation will help to assure sufficient data gathering and communication mechanisms are in place to improve the prospect of success. Successes and failures must be recorded and the adaptive plan amended as required. The CRM and TAC Committees participating in management and oversight working in collaboration with the Department of Fish and Wildlife need the continued and long term support of the EFSEC Council and PSE in order to assure success for the long term goals for preservation and improvement of the landscape.

Incomplete Mitigation for the Original Project:

Conservation Easement:

The Site Certification Agreement signed by the Governor and endorsed by the EFSEC council sets forth that "The **Council acknowledges the Applicants commitment to voluntarily place the entire 8600 acre project area into a conservation easement with a local land conservancy organization."** This commitment has not been satisfied. Drafts of the easement circulating for approval do not include protections for lands within the project boundaries owned by The Department of Natural Resources. Additionally the proposed drafts include provisions for allowing further industrial expansion of the original **"wind energy facility"** to now include additional forms of energy development such as solar and gas, in addition to allowing PSE rights to mine for minerals. None of these uses were contemplated at the time of permitting and approval of the original project by EFSEC or the public and should not now be included as part of the promised Conservation Easement.

If and when solar or other forms of energy production are contemplated for this site, which we do not welcome, new analysis of overall impacts to habitat and wildlife and additional mitigation should be reviewed at that time. Making provisions now in the promised easement for additional future industrial expansion is wholly inappropriate and unacceptable.

Fencing of the Mitigation Parcel and Springs:

Protection from grazing with permanent fencing of the Mitigation Parcel section 27 and 11 naturally occurring springs which are important water resources for wildlife and livestock is required by SCA. The springs have suffered from overgrazing in the past. Vegetative cover restoration is needed to protect the water resource ecosystems. Reference to restoration of the landscape with native materials is made in the SCA.

PSE, in its application for expansion, requested EFSEC waive requirements for fencing. Recently PSE has clarified it is not their intention seek relief from obligation to provide a mitigative benefit if fencing is not installed, but requests instead permission to provide alternative mitigation in lieu of fencing, to be determined by WDFW, if it will provide equal or perhaps greater benefit. A review of recent science and publications on the impacts of barbed wire stock fence on Sage Grouse by the Department of Fish and Wildlife indicates the proliferation of fencing "is a range wide cause of sage grouse mortality".
Fencing exposes birds to direct collisions and provides perching opportunities for raptors.
Fencing also is a hazard to migrating wildlife such as elk. Large animals often become entangled and maimed or suffer death. Temporary electric fence and removal of existing unnecessary fence are reported to be better choices.
Based on current science and WDFW's conclusions we support the omission of permanent barbed fencing except in select locations where required to exclude livestock and use of temporary electric or other wildlife compatible methods which are better for wildlife.

Proposed Expansion Mitigation:

Spring Preservation and Enhancement
Availability of water for wildlife and grazing is vital to the function of the shrub steppe ecosystems. Preservation of water resources was inadequately addressed in the SCA for the original project. The naturally occurring water sources on the project site require restoration for permanent and reliable water availability. Vegetative cover is highly degraded at the spring locations.
Restoration and maintenance for the life the project of these important attributes of the habitat of the entire project, is appropriate mitigation for the impacts of the project expansion. Natural springs exist also in the expansion area which will require restoration and long term care.
Collaborative community involvement in the development of the work scope and long term maintenance of the water resources will promote a spirit of community ownership and help to reduce PSE's long term maintenance costs. Community groups and agencies such as the Big Game Management Roundtable, Kittitas Field and Stream Club, Kittitas Conservation District, The Farm Bureau, Friends of Wildlife and Wind Power, The Cattlemen's Association, WDFW, PSE staff, The Rocky Mountain Elk foundation and local citizens would willingly participate in maintenance support and a community endeavor to preserve the valuable resource and habitat. Annual inspections with recommended maintenance to be undertaken annually would facilitate on going participation by the community. The restoration work scope for each water source location should be developed individually based on the unique qualities of each site. Select use of temporary and permanent fencing would be utilized where required.
Funding for restoration, fencing and maintenance for the life of the project should be provided by PSE.

Mitigation Parcel

Section 27 was offered as mitigation for the adverse impacts of the original project including the permanent disturbance of 165 acres of shrub steppe land. Fencing of the parcel to protect against grazing was thought at the time of the SCA to provide a sanctuary for ground nesting birds including Sage Grouse. Recent data indicate fencing is detrimental to Sage Grouse and migrating wildlife which suffer from entanglement in fences. Section 27 as originally conceived with wildlife passable fencing would have created an effective control plot to compare grazed and ungrazed landscape.
At present, the section is part of the existing industrial wind energy development. Twelve turbines occupy the landscape and it is now permanently disturbed.
The parcel in its present form has no inherent value as a mitigation parcel.
This leaves the original project without one of the significant mitigation compensation components and precludes discussion of section 27 as having value as mitigation left over from the original SCA for application to the expansion. An alternate mitigation parcel must be proposed and memorialized in an SCA amendment authorizing the expansion, or alternative mitigation should be proposed.

Landscape Restoration

Under the present SCA the requirement to restore disturbed landscape is limited. The restoration is not required to be Performance Based. If PSE has not succeeded in converting temporary disturbance into restored landscape, they are not required to continue restorative efforts beyond three years. Restoration of "temporary impact" areas now in the second year has achieved low success. If restoration efforts cease after three years, there will be significant added permanent impacts. The restoration effort for the original project needs to be extended and updated to meet Performance Based objectives for the expansion, without time limits, and include "Source Identified Local Native" plant materials as opposed to "Native" materials which could come from anywhere in the US.

Environmental Impacts

An environmental review of appropriate breadth must be conducted for the project expansion as part of the approval process. A supplemental EIS for the expansion area would serve to provide clarity to form basis for final project configuration and mitigation of the adverse impacts.
Following are concerns developed from construction and operation of the project thus far and elements of the proposal for expansion in need of specific review in the environmental analysis.

Turbine Placement

Concern lingers over the placement of turbines in close proximity to water resources for wildlife, particularly avian species. Insufficient science is available to distinguish whether turbines placed close to water resources are a greater hazard to avian species than turbines placed further away. Layouts for the expansion indicate turbines close to Spike Spring and Basalt Spring.

Avian mortality data assembled for the Wild Horse project thus far indicate a higher mortality for turbines in close proximity to water. Reynolds and Thorn Springs turbine mortality rates are higher than other turbines.
The sampling thus far however is for one year only and too small to make scientific conclusions. Under the circumstance, turbines for the expansion should be placed as far from water resources as possible. The WDFW Wind Power Guidelines at present do not allow permanent or seasonal shutdown if higher rates of mortality are experienced at specific turbines.
Post construction avian monitoring studies should be conducted for a three year period for the expansion area in order to obtain scientific sampling from which conclusions can be interpreted. Two years monitoring for the original project were required. An additional year of monitoring should be added to the original project in order to obtain more reliable data, with particular emphasis on proximity to water resources.
Within the environmental review specific analysis of turbine locations which are closer to forested lands under the expansion proposal should be addressed. Bat mortality may be predicted to be higher than mortality rates for bats recorded thus far in the Wild Horse study.

New Science in Bat Mortality

As part of the environmental analysis a review of new data regarding the possible attraction of bats to turbine blades should be undertaken.

Overhead Wires

The conceptual layout includes overhead wires crossing the upper end of Skookumchuck Canyon. The hazards associated with overhead lines and the reasons to avoid them if possible were identified in the original Application for Site Certification, the SCA, draft and final EIS. They are a hazard to avian species, aviation, and degrade the landscape visually. We understand the configuration as shown was driven in part by property leasehold or ownership concerns on PSE's part. Access to the easterly turbines is provided by the existing Quilomene Road apparently owned by WDFW. The burial of feeder lines along the road may have been a concern precipitating a design calling for overhead lines.
If buried feeders can be placed adjacent to roads as most lines in the original project were, the environmental impacts and hazards of an overhead configuration could be avoided.

Project Road Widths

The blatant, unnecessary and permanent destruction of huge swaths of shrub steppe landscape as a result of the road construction for the Wild Horse project will forever leave a scar not only in the landscape, but also in hearts and minds of agency representatives and citizens vying for collaborative wind and alternative energy development.
The public was not made aware that feeder roads for the project would assume permanent occupation of the landscape in widths comparable to and exceeding two lanes plus shoulders of Interstate 90.

The history of the decisions made which precipitated the destruction should be chronicled in the supplemental EIS for agency and citizen review. Alternative proposed techniques to implement a more civil respect for the landscape will be of interest.
Destruction on the level forced upon the public in the original project construction should not be forecast to be met with approval for the expansion.

The Councils efforts to allow the public opportunities to express views and concerns related to the Wild Horse project and the expansion are appreciated.
We look forward to working with the Council, Puget Sound Energy and all collaborative participants in the pursuit of successful and well managed wind energy development.

Sincerely,

Kittitas Field and Stream Club

Audubon Society Kittitas Chapter

Friends of Wildlife and Wind Power

Bricklin ❖Newman ❖Dold, LLP

DAVID A. BRICKLIN
CLAUDIA M. NEWMAN
JENNIFER A. DOLD
DEVON N. SHANNON

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SEATTLE, WA 98154
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August 6, 2008

Jim Luce, Chair
Washington State Energy Facilities
Site Evaluation Council
925 Plum Street SE
Building 4
PO Box 43172
Olympia, WA 98504-317

Re: Wild Horse Expansion Request

Dear Mr. Luce and Members of the Council:

I write on behalf of my client, Friends of Wildlife and Wind Power, and other concerned individuals and groups including Kittitas Audubon and the Kittitas Field and Stream Club to oppose the expansion **at this time** of Puget Sound Energy's Wild Horse Wind Power Project. We are opposed to the expansion at this time because PSE has not yet completed mitigation requirements associated with the original project. In particular, PSE still has not recorded the Conservation Easement that was an integral part of the original project approval (and which formed the major basis for my client's settlement agreement with PSE's predecessor).

For most of the last several years, PSE has had little incentive to move quickly to get the Conservation Easement in place. The matter laid dormant for a long time. When we brought this matter to your attention a year ago, you directed the Department of Fish and Wildlife (Jeff Tayer) to work on the issue and get a Conservation Easement in place. While some progress has been made in the last year and drafts are now circulating, the goal of finalizing and recording the Conservation Easement still has not been achieved. No firm date for accomplishing that goal is on the horizon.

While to this point PSE has had little incentive to complete the negotiation process (and could hold out for terms extremely unfavorable to protection of conservation values), PSE's new application for expansion changes the situation considerably. If PSE wants to expand the project, they should first demonstrate that they can accomplish mitigation requirements in a timely and good faith manner. To date, the work on the Conservation Easement does not demonstrate that to be the case.

An expansion of the site will increase the adverse impacts on wildlife. It is unfair to wildlife (and unfair to the parties who negotiated settlement agreements with PSE's predecessors several years ago) for additional adverse impacts to be sanctioned before mitigation is in place for the original set of impacts.

Even PSE recognizes that it should not be allowed to move forward with an expansion until the conservation easement for the original project is in place. We are happy to see that acknowledgment, but still, a caution exists. We now have seen the consequences of allowing the original project to go forward without all mitigation secured and no deadline for completion of the mitigation. If the expansion is approved and additional mitigation required, let's not make that mistake again. A specific mitigation package -- not one subject to subsequent negotiation and drafting -- should be included as part of any expansion approval.

We acknowledge and appreciate the effort that Jeff Tayer and his staff at WDFW have made to negotiate the Conservation Easement in a timely manner. But until and unless an adequate Conservation Easement is in place, we cannot accept an expansion of the project and neither should the Council.

A second reason for not approving the expansion at this time relates to the environmental review requirements of the State Environmental Policy Act. The expansion should not even be considered at this time because there has been no environmental review conducted. As noted above, expanding the project footprint will, undoubtedly, cause additional adverse impacts to wildlife (and perhaps other elements of the environment). This requires additional environmental review, perhaps in the form of a Supplemental EIS. The public and agencies with expertise should be given an opportunity to review that impact analysis before decisions are made on the expansion. While we expect that, in the end, the expansion will be authorized, that approval should be accompanied by an adequate environmental analysis and imposition of conditions to assure that adverse impacts are fully mitigated.

Thank you for your attention to these matters.

Very truly yours,

BRICKLIN NEWMAN DOLD, LLP

David A. Bricklin

DAB:psc

cc: Friends of Wildlife and Wind Power
Kittitas Audubon
Kittitas Field and Stream Club

KITTITAS COUNTY COMMUNITY DEVELOPMENT SERVICES
411 N. Ruby St., Suite 2, Ellensburg, WA 98926
CDS@CO.KITTITAS.WA.US
Office (509) 962-7506
Fax (509) 962-7682
"Building Partnerships – Building Communities"

Chapter 17.61A
WIND FARM RESOURCE OVERLAY ZONE

Sections

17.61A.010 Legislative findings, purpose and intent.
The purpose and intent of this chapter is to establish a process for recognition and designation of properties located in areas of Kittitas County suitable for the location of wind farms, to protect the health, welfare, safety, and quality of life of the general public, and to ensure compatible land uses in the vicinity of the areas affected by wind farms. (Ord. 2002-19 (part), 2002)

17.61A.020 Definitions.
The following definitions shall be used in conjunction with the administration of this chapter:

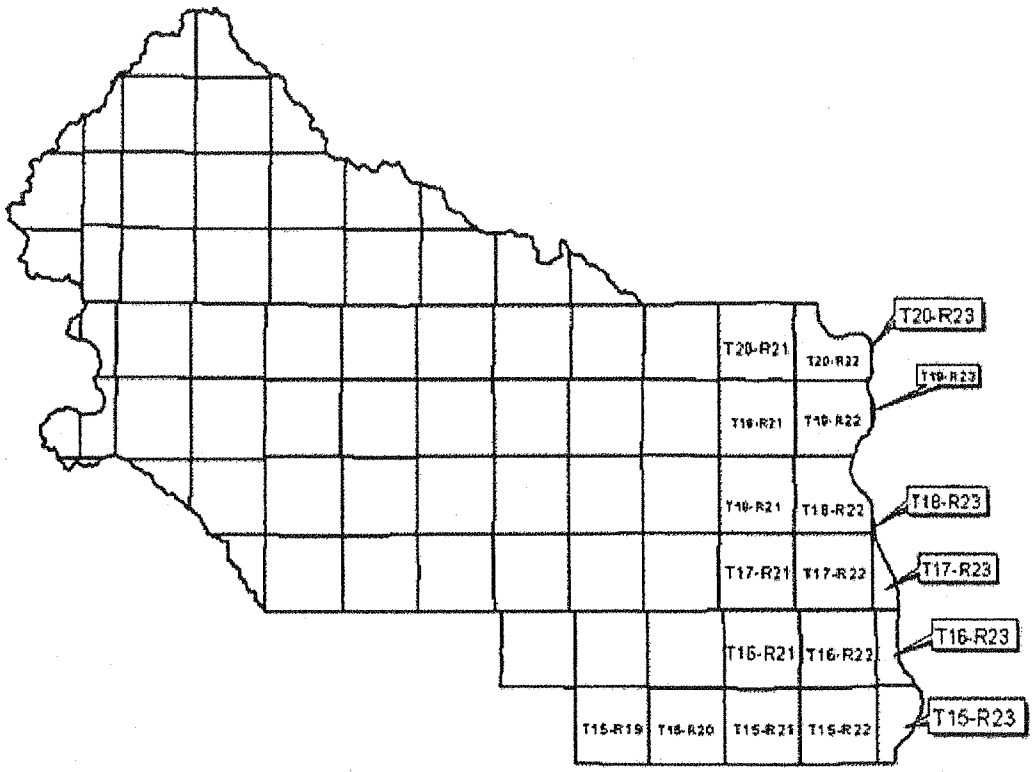
1. "Wind farm" means a single wind turbine exceeding 120 feet in height above grade or more than one wind turbine of any size proposed and/or constructed by the same person or group of persons on the same or adjoining parcels.
2. "Wind turbine" means any machine used to produce electricity by converting the kinetic energy of wind to electrical energy. Wind turbines consist of the turbine apparatus and any other buildings, support structures or other related improvements necessary for the generation of electric power. (Ord. 2002-19 (part), 2002)

17.61A.030 Development uses, requirements, and restrictions.
Development uses, requirements, and restrictions. All listed permitted uses in the underlying zoning district of this overlay zone are permitted. All listed conditional uses in the underlying zoning district of this overlay zone are subject to conditional use permit process and review. Wind farms are a permitted use in a wind farm resource overlay zoning district, subject to the additional approval requirements and restrictions set forth in KCC 17.61A.040. (Ord. 2002-19 (part), 2002)

17.61A.035 Pre-identified areas for siting.
For proposed wind farms located in identified areas in Kittitas County meeting specific siting standards as identified in this code, a process separate from the requirement for wind farm resource overlay zone as identified in Kittitas County Code 17.61A.40 can be undertaken.

The purpose of this code is to identify areas where environmental review and public process has already occurred, expediting the siting of proposed wind farm facilities. The intent of this code is to streamline the development process for such applications, separate from the process already allowed in 17.61A.40. It is recognized that lands contained within this area may be under federal, state and local ownership and may be subject to additional requirements per jurisdiction.

A map of the pre-identified areas identifies the following Townships and Ranges open to this process. This includes T.15N., Ranges 19E., 20E., 21E., 22E., 23E., T.16N., Ranges 21E., 22E., 23E., T.17N., Ranges 21E., 22E., 23E., T.18N., Ranges 21E., 22E., 23E., T.19N., Ranges 21E., 22E., 23E., T.20N., Ranges 21E., 22E., 23E. W.M. in Kittitas County.



The following siting standards are established for these areas: a minimum 1/2 mile setback from existing structures at the time of application shall apply. If not attainable, additional analysis shall be included to support the application. Further, analysis shall also include, but is not limited to, the following as part of the application: wildlife impact analysis, noise impact analysis, visual impact analysis, and traffic impact analysis.

A wind farm may be authorized by the county in these pre-identified areas only through approval of a site plan and development agreement by the board of county commissioners. The development agreement shall be consistent as authorized in Kittitas County Code 15A.11, Development Agreements. (Ord. 2007-22, 2007)

17.61A.040 Approvals required for wind farm resource overlay zone.

1. Except as noted in 17.61A.035, a wind farm may be authorized by the county only through approval of a wind farm resource development permit in conjunction with approval by the board of county commissioners of a development agreement as authorized by Chapter 15A.11 KCC, Development Agreements, and RCW 36.70B.170 through 36.70B.210. Consistent with KCC 15A.11.020(B) and RCW 36.70B.170, the development agreement approved by the board of county commissioners must set forth the development standards applicable to the development of a specific wind farm, which may include, but are not limited to:
    a. Densities, number, size, setbacks, and location of turbines;
    b. Mitigation measures and such other development conditions as deemed appropriate by the board of county commissioners to be necessary including measures to protect the best interests of the surrounding property or neighborhood or the county as a whole; and
    c. Other development standards including those identified in KCC 15A.11.020(E) and RCW 36.70B.170(3).
2. Required Applications/Approvals. In addition to approval of a wind farm resource development permit and a development agreement as set forth in subsection A of this section, a wind farm shall require the following approvals from the county:

a. A site-specific amendment of the comprehensive plan land use designation map to wind farm resource overlay district (the subarea planning process described in Chapter 1 of the county comprehensive plan and Chapter 15B.03 KCC, Amendments to Comprehensive Plan, may be used if deemed appropriate by the applicant and county);
b. A site-specific rezone of the county zoning map to wind farm resource overlay zoning district pursuant to Chapter 17.98 KCC, Amendments.

3. The approvals by the board of county commissioners set forth in subsections A and B of this section shall only be made if it determined that:
   a. The proposal is essential or desirable to the public convenience;
   b. The proposal is not detrimental or injurious to the public health, peace, or safety or to the character of the surrounding neighborhood; and
   c. The proposed use at the proposed location(s) will not be unreasonably detrimental to the economic welfare of the county and it will not create excessive public cost for facilities and service.
4. A comprehensive plan amendment or subarea plan for a wind farm resource overlay district must be processed by the county concurrent with the rezone application, development permit, and development agreement required for approval of a wind farm. (Ord. 2007-22, 2007; Ord. 2002-19 (part), 2002)

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Caring for
your natural resources
... now and forever

August 5, 2008

Allen J. Fiksdal
EFSEC Manager
PO Box 43172
Olympia, WA 98504-3172

Dear Mr. Fiksdal:

The Department of Natural Resources (DNR) would like to provide comments on the Puget Sound Energy (PSE) request to amend the Wild Horse Wind Power Project Site Certification Agreement (SCA). DNR leases state lands for both wind power and grazing within this area and our comments are based upon our perspective as a land manager.

Specifically, DNR urges EFSEC to amend the existing Site Certificate Agreement (SCA) to wave the requirement for permanent fencing of the springs and mitigation parcel. The water developments do need to be protected. However, the landowners should be encouraged to develop site specific plans to protect the water developments in order to protect the resource while providing benefits to wildlife and livestock. This may or may not include fencing but should be based upon a site specific plan.

PSE is an active member of the Wild Horse Coordinated Resource Management (CRM) planning group. The CRM group is implementing a new grazing plan for the area designed to maintain and improve wildlife habitat, and resource conditions. The CRM also monitors these conditions prior to, and following each grazing season. This planned livestock grazing is significantly different than the grazing plan in place at the time the SCA was written. Participation in the CRM provides superior habitat mitigation across a larger landscape without the need for permanent fencing of the mitigation parcel.

Thank you for your consideration.

Sincerely,

Milton D. Johnston

Milton D. Johnston
Southeast Region Assistant Manager

BB:MJ:jp

c: Brent Billingsley
Files 60-075018, 10-079384

Kittitas County Conservation District
607 E. Mountain View Ave. - Ellensburg, WA 98926 - Phone (509) 925-8585, Ext. 4 - Fax (509) 925-8591

August 6, 2008

Allen J. Fiksdal, EFSEC Manager
PO BOX 43172
Olympia, WA 98504-3172
Fax # (360) 956-2158.

Mr. Fiksdal:

I am writing in regard to the "Request to Amend the Wild Horse Wind Power Project Site Certification Agreement to Expand Wind Power Generating Capacity". I have reviewed the application letter and am pleased to see that PSE is working to finalize the conservation easement with WDFW. As you may know, the Kittitas County Conservation District previously worked with PSE on the conservation easement.

Our very first discussions with PSE began in June 2005. Those were preliminary discussions that occurred before the project was approved by Governor Gregoire. In early 2006, we applied for a Capacity Building grant to fund our staff time for the conservation easement process. Those funds were awarded and became available July 1, 2006. From that date until May 2007, we worked with PSE regularly to draft an MOU and the conservation easement document.

While we are not the entity that will ultimately hold the easement, the process of developing the easement was a good learning experience for us. We know much more about conservation easements, how they function, and which local and regional entities may be better suited to hold the easements.

Again, I'd like to state that I'm pleased to see that PSE is finalizing the conservation easement with WDFW. Thank you for the opportunity to provide these comments.

Sincerely,

Anna Lael, District Manager
Kittitas County Conservation District

Washington State Energy Facility Site Evaluation Council

COMMENT FORM

Wild Horse Wind Power Project
Site Certification Agreement Amendment
Expansion of the Site

Public Meeting – Ellensburg, Washington, August 6, 2008

Name: William Schroeder

Address: 1100 North B Str. #6 Ellensburg, WA 98926
(Please include your Zip!)

Please write any comments you have with respect to the Wild Horse Site Certification Agreement Amendment below.

Leave this sheet in the Comment Box tonight, or mail it to:
EFSEC, PO Box 43172, Olympia, WA 98504-3172.
Comment letters must be postmarked by Friday, August 8, 2008.

Will this project be a federal undertaking - requiring a NEPA/NHPA review - or a state undertaking - requiring a SEPA review? And depending on the answer, how will either or both be handled, by whom or which agency (contractor) and when (if not already done)?

Use the back of this form if you need more room for your comments.

For more information about EFSEC's review of these project changes, please contact:
Jim LaSpina, EFSEC Specialist, PO Box 43172, Olympia, WA 98504-3172,
call (360) 956-2047, or e-mail efsec@cted.wa.gov.

Wild Horse Wind PP
Aug 6, 2008 Comment- 8

David Crane
1201 N. Vista Rd.
Ellensburg, Wa. 98926

8-7-08

Allen Fiksdal, EFSEC Manager
EFSEC
P.O. Box 43172
Olympia, Wa. 98504-3172

Dear Allen,

I regret that I missed the meeting on 8-6-08 here in Ellensburg, regarding the additional turbines at Puget Sound's Wild Horse facility. I strongly favor granting them approval to extend the project.

I am enclosing a letter I addressed to Bonneville Power Administration earlier this month. The letter expresses my feeling about wind farm siting in Kittitas County.

Thank you for the excellent work you have done with regard to these sitings.

Respectfully,

David Lee Crane

David Crane

Enclosure:

Kittitas Valley Wind Interconnection Project.

Fax: (360) 956-2158

8-7-08

David Crane
1201 Vista Rd.
Ellensburg, Wa. 98926

Bonneville Power Administration
Public Affairs Office-DKC-7
P.O Box 144218
Portland, Oregon 97293-4428

To whom it may concern:

I make the following comments regarding Sagebrush's proposed "Kittitas Valley Wind Interconnection Project."

The approval process for them has been unnecessarily cumbersome and drawn out. They have been very professional and restrained throughout this tedious process and have shown amazing patience. I have attended most of the meetings and have heard and read the objections at length. Most, are without any factual basis, and some, are absolutely silly, almost beyond belief. Some who have so strongly objected to the Kittitas Valley siting, don't even live in this valley. Those who do live here and who have opposed the Kittitas Valley Wind Farm siting, represent only a very small minority of the residents in this valley, as I have learned from street petitioning and going door to door, probably more than any one else in the community. I think about eight out of ten, who live here, want the wind farms.

As a community, State, and Nation, we have an urgent need for clean, renewable energy sources. This valley has a good wind source. It would help our tax base, schools and services. We need more power for the expanding use of electric automobiles. Wind farms are currently our best option. To hinder their development in any way seems almost to be a sign of insanity. We have had abundant power for so long that is easy for some to begin to think it happens by magic.

As I have often said, those who opposed the wind farms are not bad people. They are sometimes our friends, neighbors and even relatives. They are simply very mistaken. Since people came to this valley, it is no longer pristine. We have railroads, highways, garbage trucks, traffic, high-rise buildings, power lines, and noisy rodeos, but it is wonderful, because it serves the needs of great people.

If there is anything we can do to streamline the process, and encourage these people to build the wind farms, we should be doing it. Of course, we should be careful for our environment and show respect to our neighbors in every way possible. I have high voltage power lines in my back yard, fifteen feet from my house, but I would not take them out. My neighbors need power, and I need power. I have lived without electric power. I didn't like it. Maybe we should step back and take a good look at what seems to be petty obstructionism.

A visit to the Wild Horse Wind Farm is a great experience. It has already bailed us out of a power outage, and is a great asset to an already good community.

Respectfully,

David Lee Crane

David Crane

(509) 962-1431

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
15 W Yakima Ave, Ste 200 • Yakima, WA 98902-3452 • (509) 575-2490

August 5, 2008

Your address is in the **Deschutes** watershed

Jim LaSpina
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA 98504-3172

Dear Mr. LaSpina:

Thank you for the opportunity to comment on the notice of application for the amendment to allow for 1,280 acre expansion of the Wild Horse Wind Power Project. We have reviewed the application and have the following comment.

Air Quality

Wind power projects typically use crushed rock and concrete for turbine foundation construction. Ecology's Air Quality Program requires portable concrete batch plants to notify Ecology's Air Quality at least 30-days prior to starting portable concrete batching operations. To notify, portable concrete batch plants should fill out an application for a temporary air quality permit. Portable rock crushers are required to have coverage under Ecology's Portable Rock Crusher General Order of Approval. After obtaining coverage under the general permit, the source must notify Ecology's Air Quality Program at least 10-days prior to starting rock crushing activities. For information, contact Jared Mathey (509) 454-7845 or David Ogulei (509) 454-7899.

Sincerely,

Gwen Clear

Gwen Clear
Environmental Review Coordinator
Central Regional Office
(509) 575-2012

1208

Burnett, Diane (CTED)

From: BILLINGSLEY, BRENT (DNR)
Sent: Thursday, August 07, 2008 10:03 AM
To: CTED EFSEC
Subject: Wild Horse Comments

Thank you for taking our comments at the public hearing last night is Ellensburg. Here is a copy of my comments.

My name is Brent Billingsley, and I am the Dept of Natural Resources' representative on the TAC. I urge the Council to approve the proposed amendment to the Site Certificate agreement.

As DNR's member on the TAC, I would like to make several comments on how the TAC is performing and how we are working with the Certificate Holder, Puget Sound Energy.

- I believe that the TAC is functioning well, we are kept well informed by PSE staff, and it has been a productive process.

- The TAC has reviewed, and unanimously recommended for approval, the following plans:
  1. Post-Construction Rangeland Management and Grazing Plan
  2. Hunting Plan
  3. Post-Construction Avian Monitoring Plan
  4. In the process of reviewing implementation of the Post-Construction Restoration Plan.

- The TAC has, and continues to successfully address wildlife habitat issues. For example, we encourage PSE to aggressively control cheat grass in their native restoration seeding and they stepped up to do that. Another example is the time and resources they have contributed to the CRM process on an area much larger than the wind power project area. Through this process we have worked on wildlife needs on a 60,000 acre area.

- The TAC has been able to reach consensus on each of the recommendations that the TAC has made to EFSEC.

Based on PSE's performance in complying with all the conditions of the permit, their commitment to improving habitat conditions, and their active participation in the CRM, we hope to see EFSEC approve their request.

Brent Billingsley
Columbia Basin District Manager
Dept. of Natural Resources, SE Region
509-754-3834
brent.billingsley@dnr.wa.gov

Burnett, Diane (CTED)

From: Steve Alder [eburg1@elltel.net]
Sent: Friday, August 08, 2008 10:45 AM
To: CTED EFSEC
Subject: Wild Horse Find Farm Comments

To Whom It May Concern:

I am writing to give my positive support for the proposed expansion of the Wild Horse Wind Farm.

As you know the voters of Washington state not only support alternative energy sources but mandated that the suppliers of electricity produce energy alternatively.

Puget Power has a great facility in their wind farm and it is a perfect place to generate wind power since it is supported by the majority of the citizens of Kittitas County. It makes sense to expand its capacity if siting allows.

I have been a Kittitas School Board member for 29 years and this wind farm is the biggest asset for our property poor district to come along in the District's history. The first phase of this project lowered the tax payer's school taxes by almost 40%.

Again, I am whole heartedly in support of the wind farm expansion.

Steve Alder
560 Fairview Road
Ellensburg, WA 98926
509-968-3444

Burnett, Diane (CTED)

From: MOODY, SANDRA (DNR)
Sent: Friday, August 08, 2008 2:50 PM
To: CTED EFSEC
Subject: Wildhorse Wind Power Expansion

Attachments: wildhorsewind_08expansion_logo.doc

I have attached a comment letter from the Washington Natural Heritage Program for the Wildhorse Wind Power Expansion. I will also mail a hard copy of the letter. Thank you for considering our comments. Please contact me if you have any questions or would like more information.

Sandy Swope Moody
Environmental and Grants Coordinator
Washington Natural Heritage Program
PO Box 47014
Olympia WA 98504-7014
phone 360-902-1697

wildhorsewind_08e
xpansion_logo...

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

August 8, 2008

Allen Fiksdal, Manager
EFSEC
PO Box 43172
Olympia WA 98504-3172

SUBJECT: Wild Horse Wind Power Project Amendment to SCA for Expansion of the Site by 1280 Acres (T18N R21E S08, 09, 17)

The Washington Natural Heritage Program is responsible for maintaining information on the state's rare plant species as well as high quality native ecosystems. We have reviewed the proposed expansion to the Wild Horse Wind Power Project and have the following comments.

In most places the report correctly refers to the hedgehog cactus as *Pediocactus simpsonii* var. *robustior*, but in Appendix A, on page 8 and on Figure 4, A, *P. simpsonii* is used.

On page 8, Appendix A, Section 5.2, it states that "the Wildhorse Project successfully translocated hedgehog cactus from areas that were to be impacted by turbines or other facility features." It is our understanding that salvaging the cacti and keeping them under cultivation in irrigated locations had a high success rate, but without this care survival would be doubtful. We believe that avoidance of the cacti should be a much higher priority than relocation.

On page 8, Appendix A, Section 5.2, it also states that impacts to the cactus may occur, but we could find no information on how much impact may occur. It would be helpful to have even an approximation of the quantitative level of impact.

In Table 1, Appendix A, the list of "Rare plant surveys for which surveys were conducted", *Tauschia hooveri* (Hoover's tauschia), state threatened and a federal species of concern, should have been included for surveys in the Wildhorse project area. It is known in the general vicinity and has a good likelihood of occurring in the project area.

There are numerous plants reported in Appendix A, "List of Vascular Plant Species Encountered During the 2006 Whiskey Ridge Wind Project Rare Plant Surveys" identified only to the genus, including many that are in genera that include rare species (*Agoseris, Lomatium, Erigeron, Cryptantha, Silene, Astragalus, Phacelia,* and *Penstemon*) that are included in Table 1 (Rare plant species for which surveys were conducted). In the rare plant survey described here, plants that were encountered in these genera were not identified to the species. There is no explanation of how the surveyors knew that the plants in these genera were not the species for which they were performing the survey.

There is a lack of evaluation of vegetation (habitat) impacts in the study. Over half of the sagebrush steppe habitat in Washington has been converted to agriculture, urban areas, and other development. Invasion by exotic plants has further diminished the quality of the remaining shrub-steppe in Washington. The loss of shrub-steppe acreage with this project adds to the cumulating conversion of shrub-steppe habitat.

The placement of wind turbines, although minimizing the impacts in linear strips, fragments a large shrub-steppe landscape. The Natural Heritage Program would prefer the placement of wind turbines and supporting facilities to be on existing converted or heavily disturbed shrub-steppe. Short of avoiding loss of shrub-steppe habitat at the project site, restoration or other mitigation should be required to offset the loss of habitat if the project is completed as proposed.

Thank you for the opportunity to provide comments on this project. Please contact me by phone at (360) 902-1697 if you would like more information, or by e-mail: sandra.moody@dnr.wa.gov.

Sincerely,

Sandy Swope Moody, Environmental Review Coordinator
Washington Natural Heritage Program

Burnett, Diane (CTED)

From: Sabin, Monty [sabinm@kittitas.wednet.edu]
Sent: Friday, August 08, 2008 3:23 PM
To: CTED EFSEC
Subject: Support For Expansion of Wild Horse Wind Farm

To Whom It May Concern:

I serve as the superintendent for the Kittitas School District and wish to give my support for the expansion of the Wild Horse Wind Farm.

The pursuit of new energy sources for our nation is critical for our quality of life. The energy derived from wind is clean and renewable. We live in a valley that is tailored to maximize the benefits of energy produced by wind.

I agree with some that the turbines may distract from the scenic beauty of certain locations in our area. The proposed location of the turbines does not distract from the beauty of our valley. The expansion is in an area that is somewhat void of natural beauty. I enjoy looking at the turbines as they operate in a location that has little to catch the eye.

As a superintendent of a property poor district, I am concerned with the amount of taxes individuals who live in our school district must pay to support our schools. I appreciate the financial relief the wind farm provides our local taxpayers. The current Wild Horse Wind Farm has provided a significant decrease in the rate of taxation for our community members.

Please approve the expansion of the Wild Horse Wind Farm to benefit our citizens, schools, and way of life.

Monty Sabin
Superintendent
Kittitas School District

State of Washington
Department of Fish and Wildlife
201 North Pearl Street, Ellensburg, Washington 98

August 8, 2008

Mr. Jim La Spina
EFSEC
P.O. Box 43172
Olympia, WA 98504-3172

Subject: Comments for the Request for Site Certification Agreement Amendment to Authorize Project Expansion—Wild Horse Wind Power Project

Dear Mr. La Spina:

Thank you for the opportunity to review this project. The Department of Fish and Wildlife (WDFW) has reviewed the information that the Energy Facility Siting Evaluation Council (EFSEC) and Puget Sound Energy (PSE) have provided. From the information, database, and maps examined, WDFW expects the proposed Wild Horse Expansion (Expansion) would have environmental impacts similar to that of the original Wild Horse Wind Power Project, with some notable exceptions. WDFW thinks that construction of the four most eastern turbines, the "V" and "W" strings, would cause too much environmental impact and further degrades the wildlife habitat value of the project and the neighboring wildlife area. The four most eastern turbines are isolated from the rest of the project by a deep drainage and by property ownership. The selection of any alternative of connecting the "V" and "W" strings to the substation, whether overhead or trenched, will cause a severe impacts to the nearby Quilomene Wildlife Area and the surrounding habitat. Therefore, we oppose the amendment in it's current configuration and propose that PSE create a Supplemental Environmental Impact Statement (EIS) to study the impacts of the turbines to wildlife, the greater sage-grouse (*Centrocercus urophasianus*) in particular, and the Quilomene Wildlife Area, and the surrounding habitat. The Supplemental EIS should address the feasibility of construction.

Additionally, WDFW has a few other concerns that PSE could address during mitigation. We recommend that EFSEC incorporate some of the lessons we learned about wind development in sensitive shrub-steppe habitats during the construction of the Wild Horse Project into the amendment of the Site Certification Agreement. Any lesson learned during the last construction would help abate some of the construction impacts of the Expansion project. The Expansion does, however include some new elements of concern, including an increased risk of bat and avian mortality on some turbine strings near woodlands and springs. We do have a number of

other concerns in the appended document with details of our comments that we think PSE can mitigate for or make plans to complete.

In conclusion, WDFW would like to see PSE complete a Supplemental EIS on the environmental impacts of the four most eastern turbines on wildlife, particularly greater sage-grouse and the direct and indirect impacts to habitat. These turbines concern us the most, partly due to the proximity of the Quilomene Wildlife Area. The turbines will cause direct impacts from the road running through the wildlife area, direct mortalities to wildlife from the wildlife area from collisions with turbines and the overhead lines, and indirect effects caused by disturbance, especially on greater sage-grouse. Greater sage-grouse habitat will be degraded through disturbance and habitat fragmentation. Greater sage-grouse cannot tolerate tall vertical structures. Grouse may abandon the area and may have lower nest productivity rates due to nest predation. The project incorporates measures to reduce environmental impacts, but the amendment needs additional detail and mitigation. The overall project has potential for significant adverse impacts to wildlife, wildlife habitat, and recreation associated with wildlife. A supplemental Environmental Impact Statement should be prepared for the V and W turbine strings in the Expansion proposed by this amendment.

EFSEC should have PSE apply to the amendment a number of lessons learned regarding minimizing impacts and improving restoration learned in the original Wild Horse construction. PSE should revise the Site Certification Agreement (SCA) and attachments/submittals accordingly in collaboration with WDFW.

WDFW would like to emphasize the differences between the Expansion site with the rest of Wild Horse project area. PSE should redesign the construction monitoring to reflect these differences or else they should keep the expansion separate when creating post-construction monitoring plans. WDFW and the Technical Assistance Committee (TAC) should approve all monitoring plans.

WDFW welcomes the opportunity to work with the EFSEC and PSE during the design, assessment, and construction phases of the Expansion. PSE can address WDFW's concerns of the impacts from the V and W strings of turbines in a supplemental EIS. PSE can address all other concerns through mitigation and/or additional studies. Our experience working with the Wild Horse Wind Power Project and shrub-steppe may be helpful in your consideration of the Wild Horse Expansion Wind Power Project. Please keep me apprised of the status of the Amendment of the SCA. If you have any questions or need more information from the WDFW,

please feel free to call me at (509) 925-1506.

Sincerely,

Brock A. Applegate

Brock Applegate
Wind Power Mitigation Biologist

Cc: Edd Bracken, WDFW Ellensburg
Cindi Confer, WDFW Yakima
Ted Clausing, WDFW Yakima
Mike Livingston, WDFW Pasco
Travis Nelson, WDFW Olympia
Brent Renfrow, WDFW Ellensburg
Mike Schroeder, WDFW Bridgeport
Jeff Tayer, WDFW Yakima

SPECIFIC COMMENTS CONCERNING THE AMENDMENT TO THE SCA:

Impacts to Greater Sage-Grouse by "V" and "W" Turbines Strings: WDFW remains very concerned about the V and W strings of turbines because of their impacts on the environment, the Quilomene Wildlife Area, and the Greater Sage-Grouse Recovery Area. WDFW (Schroeder et al. 2004) and U.S. Fish and Wildlife Service (2003) both have recommended that sage-grouse receive a 5-mile disturbance buffer for leks. Manes et al. (2002) found and instinctive avoidance of tall structures, even those with perch deterrents by prairie grouse. In California, sage-grouse abandoned leks and attended leks less within three miles of power lines (Rodgers 2003). In Washington, Sage-grouse vacated 95% of their leks (19 out of 20) within 7.5 km (4.7 miles) of 500 kV power lines and abandoned another 59% (22 out of 37 leks) beyond 4.7miles (WDFW 2008). No one has surveyed from 3-5 miles away from the project footprint and the northeastern part of the Expansion with V and W turbine strings would have the largest impact if leks exist. WDFW would expect the area to the northeast of the Expansion the most likely place for leks. Please note that surveying for leks does not discount the possibility of the existence of leks in already surveyed areas.

Greater sage-Grouse in Washington exist in two remnant populations in Washington at approximately 30 miles apart (Schroeder et al. 2000). The best opportunity to reconnect these two populations lies with the Colockum, Quilomene, and Whiskey Dick Wildlife Areas, so we must maintain the habitat quality and integrity for sage-grouse to guarantee a chance of recovery (Stinson et al. 2004). The Whiskey Dick and Skookumchuck watershed reflect some of the best sage-grouse habitat around because 1) the area contains an upper bench separating multiple drainages, 2) sage-grouse tend to move uphill as summer desiccates the plant at lower elevations, and 3) before the project, the area contained some of the most suitable habitat in the region. With that in mind, we would like to minimize the impacts on the Quilomene Wildlife Area because of its potential for sage-grouse.

WDFW (Schroeder et al. 2004) recommends a 2-mile disturbance buffer for sage-grouse habitat from tall structures. The entire project area resides in the Greater Sage-Grouse Recovery Area. We have grown particularly concerned because construction of the V and W strings, proposed in the northeast part of the Expansion, would requires PSE to place turbines very close to the property line of the Quilomene Wildlife Area and will most likely also require access across the wildlife area. The V and W strings of turbines would not only degrade the sage-grouse habitat in the project area but also in the Quilomene Wildlife Area, which we find inappropriate for a public resource. Construction of the V and W strings would be the closest turbines to the Wildlife Area and would further degrade the sage-grouse habitat for other life activities like nesting, brooding, wintering, and migrating because of their aversion to vertical structures.

Sage-grouse's aversion to development includes avoiding roads, highways, drilling rigs, gas wells, etc. Hollaran (2005) noted a decrease in sage-grouse activity close to drilling rigs, gas wells, and haul roads. He noted an overall negative effect on sage-grouse by energy development. With many other studies noting the effects of development, we think that oil and gas drilling would act as a surrogate for wind power development. Connelly et al. (2004) noted a

negative effect of Interstate 80 with a sample size of 802 leks within 100 km. No leks existed within 2 km of the highway, very few within 4 km, and outside 4 km, leks were evenly distributed. In addition, sage-grouse attendance decreased from 44% of the leks within 7.5 km of the highway to 67% beyond 7.5 km beyond the highway. Sage-grouse may avoid areas with regular sound, disturbance, and/or development beyond the avoidance of tall vertical structures.

Direct Impacts from V and W Strings of Turbines: WDFW has noted no good alternatives to connecting the electrical lines of the V and W string of turbines with the substation. As noted above, sage-grouse avoid power lines and an overhead line would create one more obstacle in the migration corridor for the grouse. We have also noted the environmental impacts due to trenching weather PSE runs the lines underground up and down the Skookumchuck Valley, widens impacts through the Quilomene Wildlife Area along the road, or pioneers a new road on PSE's own ownership. We consider this list, a list of bad choices.

WDFW has additional concerns with constant need for an upgraded road to service the V and W string turbines and the disturbance associated with such.

Calculation of Impacts: The construction of the Wild Horse project and the Expansion is greater than the extent of the project footprint (permanent impacts). The construction degrades nesting/brooding/wintering/migration habitat for sage-grouse throughout the entire project area through habitat fragmentation. The construction degrades nesting/brooding/wintering/migration habitat for sage-grouse in the Wildlife Areas. We should take into consideration 2-miles from the project area with the understanding that the habitat is not 100% degraded. WDFW recommend working with our grouse experts, Mike Schroeder and Mike Livingston to discover the percentage of reduction of habitat by indirect effects, disturbance, and habitat fragmentation and to be reflected in the mitigation acreage. The percentage would probably be higher in the project area and lower in the surrounding 5-mile buffer. Ultimately, we feel the permanent impact acreage should be increased to reflect the degradation of habitat within the project area and in the surrounding suitable habitat, especially in the Quilomene and Whiskey Dick Wildlife Areas.

Compensatory Mitigation: In the letter to EFSEC, WDFW does not agree with PSE's assertion that the mitigation for the original Wild Horse Project has been fully mitigated. WDFW sees an increase in permanent and temporary impacts caused by the Expansion. PSE's letter for the amendment also suggests that EFSEC should not require them to conduct further mitigation. This assertion is a substantial mischaracterization of the environmental impacts, mitigation and agreements and settlements associated with the Wild Horse project. We disagree with the idea of "surplus mitigation" that PSE can now apply toward additional impacts from the Expansion project. WDFW and PSE have already negotiated the mitigation package for original Wild Horse project. The proposed Expansion will create additional direct and indirect environmental impacts and PSE should mitigate for these impacts, including the permanent footprint impacts of the project.

The Wind Power Guidelines speaks to the possible content of a mitigation packages: "[Mitigation should be] like-kind (e.g., shrub-steppe for shrub-steppe; grassland for grassland) and/or of equal or higher habitat value than the impacted area, noting that an alternative ratio may be negotiated by a wind developer and WDFW for replacement habitat the differs from the impacted habitat." The original mitigation is part of the mitigation package for the original Wild Horse Wind Power Project, not the Expansion.

Presence of Threatened and Endanger Species and Designated Habitat: PSE asserts that the Expansion will have no significant adverse impacts, has no threatened and endangered species in the project area, and expects no use by threatened and endangered species. Greater sage-grouse have historically used the project area and have recently been observed adjacent to the area. They likely still occur in the project area. Additionally, the letter by PSE and the State Environmental Policy Act (SEPA) checklist leaves out the designation that the entire project area resides in a Greater Sage-Grouse Recovery Area. WDFW finds the impact to the recovery area as significant due to the State listing of "Threatened" and to the current review by the U.S. Fish and Wildlife Service of this federal Candidate Species for listing.

Concerns with Bat Survey Results: Bats will potentially use the northern part of the project more than on other portions of Wild Horse Project. Pre-project survey data suggest greater risk of bat mortality than that occurring on the currently existing project. However, WDFW bases this analysis on only three bat detection devices with high detections and more devices on the S-String, devices on the U-string, and a device on the other springs, Spike springs, might increase sample size to make a better determination. The current number of bats per detector per night suggests that the Expansion project will have more bat mortalities than the current project and moderately higher than average bat mortality for wind power projects in the Western United States. With the recent unexpectedly high bat mortalities for wind power projects in Alberta and Montana, we recommend that PSE study this issue further, including the inability to detect smaller bats because of searchers missing smaller carcasses and the better ability of predators to scavenge smaller carcasses.

Plant Surveys for State Threatened Plant, (*Tauschia Hooverii*): PSE's survey contractor left off Hoover's Tauschia (*Tauschia hooveri*) from the survey list for the Vantage Wind Power Project. Another contractor has found the plant all over the Vantage Wind Power Project area. For the Wild Horse Project plant surveys, PSE's contractor now claims they actually surveyed for the plant and they did not find any individuals. If the Vantage Wind Power Project resides across the Vantage Highway from the Wild Horse Wind Power Project, WDFW finds it hard to believe that no Tauschia exists on the Wild Horse Wind Power Project and/or possibly the Expansion. We recommend that PSE have the project area re-surveyed with another contractor to document the Washington State Threatened plant, Hoover's Tauschia before construction and develop possible mitigation measures.

Greater Sage-Grouse Lek Surveys Concerns: Sage-grouse lek surveys did not extend out far enough to document possible impacts to sage-grouse by 350+ -foot wind turbines. Both the Management Recommendations for Washington's Priority Species, Volume IV: Birds (greater

sage-grouse) (Schroeder et al. 2004) and the U.S. Fish and Wildlife Service's Interim Guidelines To Avoid And Minimize Wildlife Impacts From Wind Turbines (2003) both ask for a 5-mile disturbance buffer for sage-grouse leks to minimize disturbances. PSE searched for a 2-mile buffer outside their project footprint. Sage-grouse leks may exist outside the unsurveyed 2-mile buffer, especially on the Quilomene Wildlife Area to the northeast. PSE should describe the impacts to sage-grouse habitats by the expansion project including leks, nesting, brooding, wintering, and migration habitat.

Literature Cited

Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. Online at http://sagemap.wr.usgs.gov

Holloran, M. J. 2005. Greater sage-grouse (*Centrocercus urophasianus*) population response to natural gas field development in western Wyoming. Dissertation. University of Wyoming, Laramie, USA.

Manes, R., S. Harmon, B. Obermeyer and R. Applegate. 2002. Wind energy and wildlife: an attempt at pragmatism. Wildlife Management Institute, Washington D.C.

Rodgers, R. 2003. Wind Power Generation: Biological Concerns. Wind Energy Symposium April 10, 2003. Ft. Hays State University, Hays, Kansas.

Schroeder, M. A., D.W. Hays, M.F. Livingston, L.E. Stream, J.E. Jacobson, and D.J. Pierce. 2000. Changes in the distribution and abundance of sage grouse in Washington. Northwestern Nat. 81:104-112.

Schroeder, Michael A., Derek Stinson, and Michelle Tirhi. 2004. Sage grouse (*Centrocercus urophasianus*). *In* E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available http://wdfw.wa.gov/hab/phs/vol4/sage_grouse.pdf

Stinson, D.W., D.W. Hays, and M.A. Schroeder. 2003. Washington state recovery plan for the sage-grouse. Washington Department of Fish and Wildlife, Olympia, Washington. 103 pp.

U.S. Fish and Wildlife Service. 2003. Interim guidelines to avoid and minimize wildlife impacts from wind turbines. Washington D.C.

Washington Department of Fish and Wildlife. 2008. Greater Sage-grouse and the Proposed Withrow Wind Farm. Bridgeport, Washington.

Watson, Jim, and M. Whalen. 2004. Golden eagle (*Aquila chrysaetos*). *In* E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available http://wdfw.wa.gov/hab/phs/vol4/goldeagl.pdf

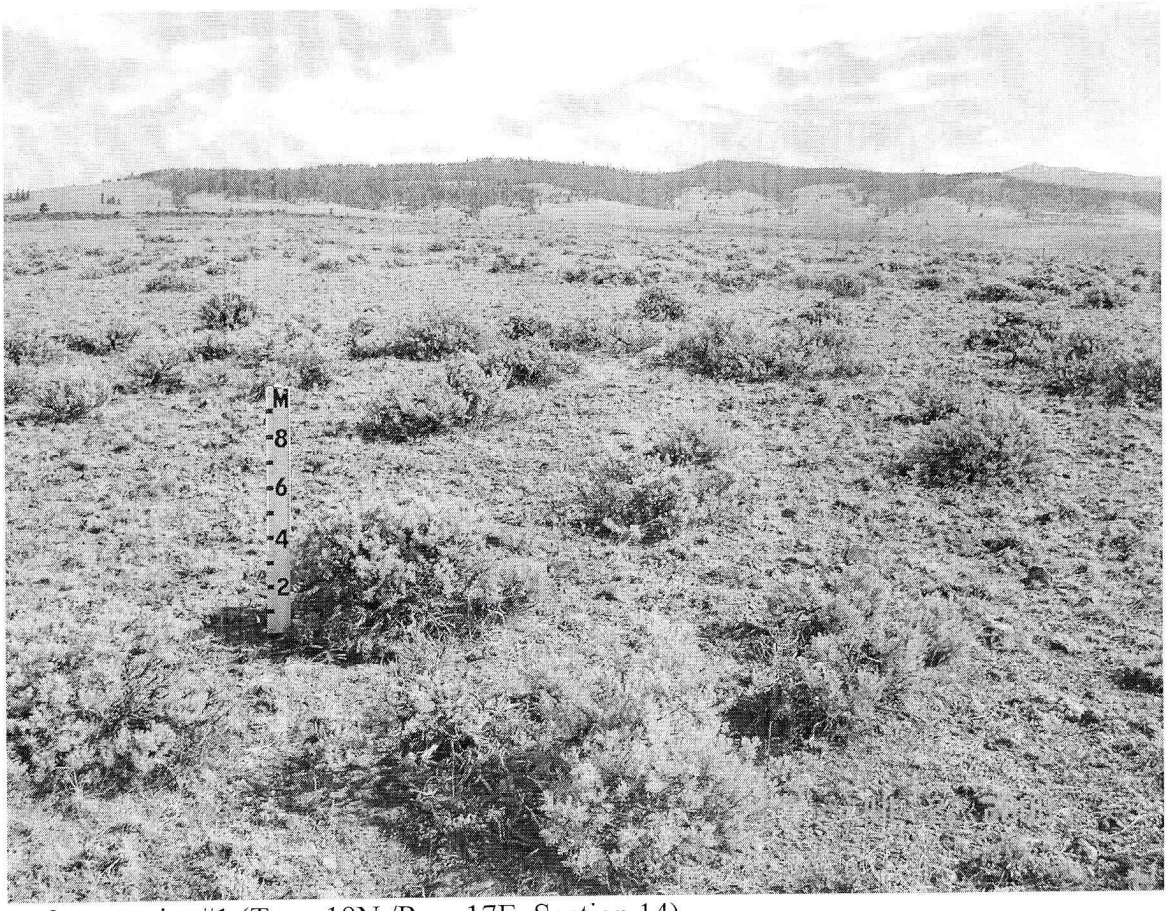
Kittitas Valley Wind Project

Reference Sites for Post-Construction Restoration

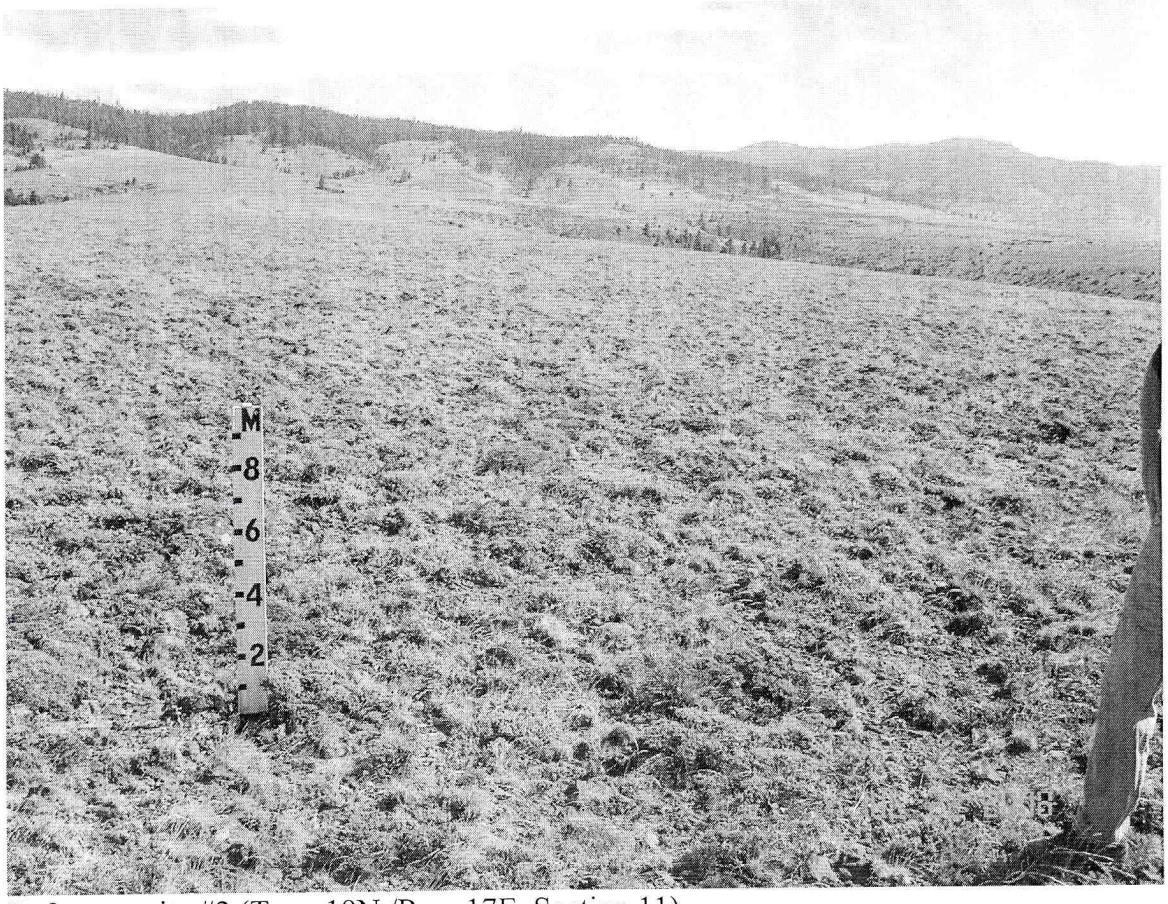
Reference sites were selected to allow comparison of project disturbance and post-construction restoration success with representative undisturbed plant communities. Based upon current plans and information, it appears project impacts will be predominantly in Very Shallow or Dry Stony Ecological Sites. Reference sites were selected to be representative of the plant communities within the disturbance footprint of the project.

At the time these reference sites were selected, the staking had not been placed for project construction. Once final construction plans are approved and construction has begun, the reference sites should be revisited to confirm they are outside of potential construction impacts. If necessary, reference site locations can be revised at that time.

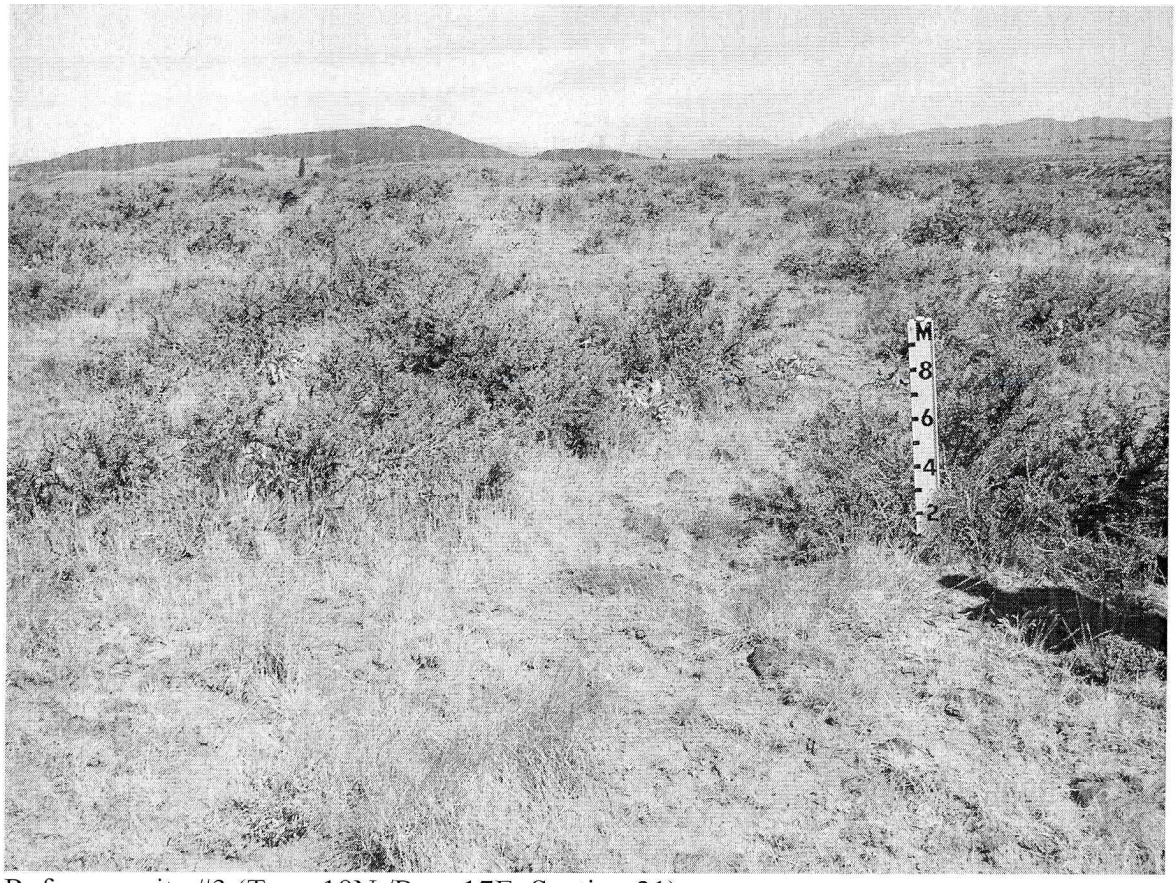
Location of Reference Sites for Kittitas Valley Wind Project				
	UTM Coordinates (NAD 83)		T19N/R17E	
Reference Site	Easting	Northing	Section	Predominant Ecological Site
#1	675440	5224026	14	Very Shallow (9-15 in. precip. zone)
#2	675476	5225299	11	Very Shallow (9-15 in. precip. zone)
#3	673639	5221426	21	Dry Stony (9-15 in. precip. zone)
#4	673851	5221182	22	Dry Stony (9-15 in. precip. zone)
#5	674001	5220957	22	Dry Stony (9-15 in. precip. zone)
#6	674027	5220630	27	Dry Stony (9-15 in. precip. zone)



Reference site #1 (Twn. 19N./Rge. 17E, Section 14).

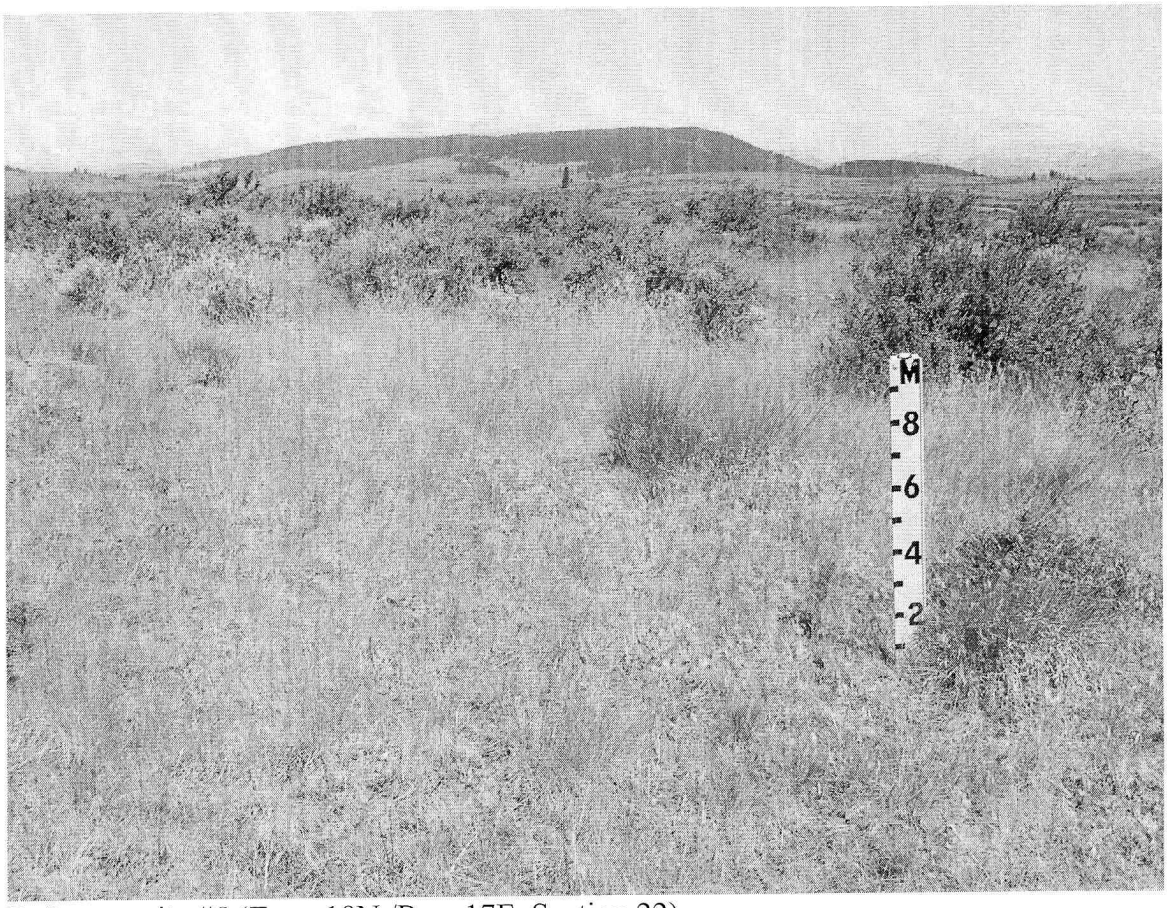


Reference site #2 (Twn. 19N./Rge. 17E, Section 11).

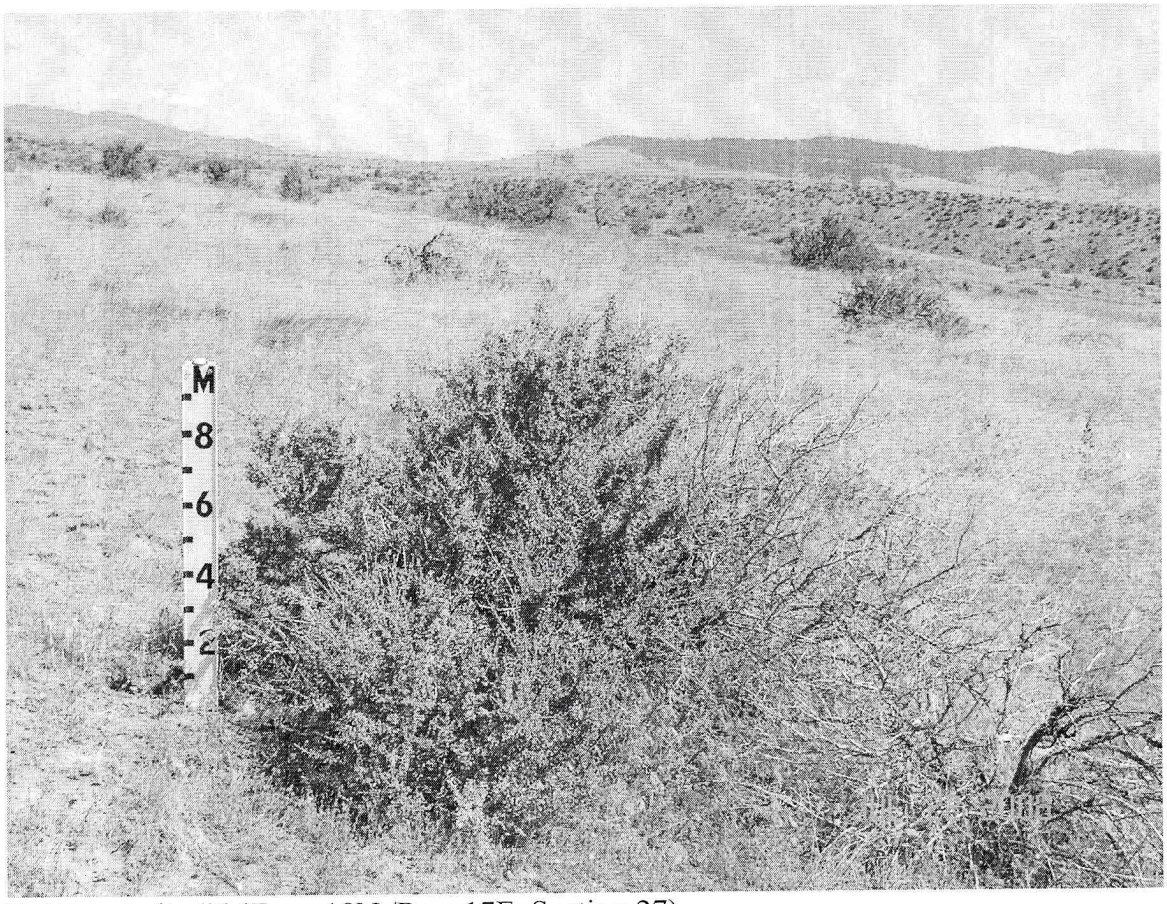


Reference site #3 (Twn. 19N./Rge. 17E, Section 21).

Reference site #4 (Twn. 19N./Rge. 17E, Section 22).



Reference site #5 (Twn. 19N./Rge. 17E, Section 22).



Reference site #6 (Twn. 19N./Rge. 17E, Section 27).

Burnett, Diane (CTED)

From: Marvin, Bruce (ATG)
Sent: Friday, August 08, 2008 4:12 PM
To: CTED EFSEC
Cc: Mulkins, Marlena (ATG); 'dpeeples@ix.netcom.com'
Subject: CFE Comments re: Proposed Amendment No. 5 - WHWPP SCA

Attachments: Fiksdal.pdf

Fiksdal.pdf (168 KB)

Comments by Counsel for the Environment regarding the proposed expansion of the Wild Horse Wind Power Project are attached. A hard copy will follow.

If you have difficulties opening the attached document, please contact my assistant, Marlena Mulkins, at 360 586-2296.

H. Bruce Marvin
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August 8, 2008

Allen Fiksdal
Energy Facility Site Evaluation Council
PO BOX 43172
Olympia, WA 98504-3172

RE: Request to Amend Wild Horse Wind Power Project (WHWPP) Site Certificate Agreement (Amendment No. 5).

Dear Mr. Fiksdal:

Counsel for the Environment (CFE) appreciates the opportunity to comment on proposed Amendment No. 5 to the WHWPP Site Certification Agreement (SCA). The CFE does not take a position in support or opposition to the proposed expansion of the project at this time. The following comments are offered to ensure that the environmental impacts of the proposed expansion are fully documented and understood and to ensure that EFSEC, the applicant and the public have sufficient baseline information regarding conditions currently existing on the proposed expansion site to meaningfully evaluate, gauge and, if necessary, mitigate adverse environmental impacts arising from the proposed expansion.

A. Conservation Easement

Puget Sound Energy (PSE) agreed to voluntarily grant a conservation easement to the Washington Department of Fish and Wildlife on the entire project site as a condition to the SCA. In its application, PSE acknowledges that the conservation easement has not yet been finalized, but promises that it will be executed prior to commencement of the expansion project. In the amendment application, PSE further agrees to include the expansion site within the conservation easement. CFE urges that EFSEC take appropriate steps to ensure that the conservation easement for the existing site is finalized and recorded prior to approval of the proposed expansion.

B. The Baseline Study and Turbine String "S"

PSE supports its amendment application with a Wildlife and Habitat Baseline Study for the Whiskey Ridge Wind Power Project (Baseline Study), prepared by its consultant, WEST, Inc.

The avian observation data used in the study, however, was performed on the existing wind farm site, not the expansion site.[1] *See* Baseline Study at p. 1. While it may be appropriate to extrapolate environmental impacts to the expansion site using data gathered from the adjacent WHWPP site, the applicant should, at a minimum, include an explanation regarding why reliance on off-site data is appropriate.

CFE is also concerned that there appear to be discrepancies between the proposed turbine locations considered in the Baseline Study and the turbine locations set forth in the design for which PSE is currently seeking approval. In its application materials, PSE proposes to construct turbine string "S" along a ridge separating Spike Spring and forested land running parallel to the Beacon Ridge Road. *See* Exhibit A-2[2] – Preliminary Site Layout Proposed Wild Horse Expansion Area (Expansion Site Layout). This string of turbines, however, does not appear in the design reviewed by the authors of the Baseline Study and, therefore, is not discussed in the Baseline Study. Compare Figure 2, Baseline Study at p. 39, and Exhibit A-2 – Expansion Site Layout. *See* also Figure 4, Baseline Study at p. 41, and Figure 5, Baseline Study at p. 42.

Turbine string "S" parallels one of the few areas of forested land within the boundaries of wind farm and effectively separates this forested land from Spike Spring, which appears to be the closest available source of water.[3] This forested area may be important habitat for birds and bats. Given that avian observation surveys have not been conducted in the proposed expansion site, the Baseline Study does not document avian use of this forested land or Spike Spring. Nor does the Baseline Study identify or discuss potential impacts on the avian populations and other wildlife that may arise from construction of a string of turbines between these two features. Consequently, it appears that the Baseline Study's assessment of potential impacts on wildlife, at least with regard to areas adjacent to turbine string "S", would benefit from additional field study, which would provide a true baseline for the site. A supplemental baseline study including this information should be submitted to and evaluated by EFSEC before EFSEC makes any determination regarding the project's environmental impact.

It is also unclear from the Baseline Study whether the habitat and hedgehog cactus populations for the turbine string "S" construction site have been properly identified and documented. *See* Figure 4, Baseline Study at p. 41. This information should also be collected and analyzed in a supplemental report prior to EFSEC making a determination regarding the project's environmental impact.

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[1] Review of the Baseline Study reveals that only a small portion of the proposed expansion area has been subject to avian field observation. *See* Baseline Study at 39, Figure 2. This area does not include any of the springs or forested land located on the expansion site.

[2] Exhibit references are to exhibits submitted by PSE in support of the SCA amendment application.

[3] The SCA identifies the Pines, a forested area on the original WHWPP site, as an important habitat for wildlife and imposes a 140 m set back requirement for turbines constructed adjacent to this area. *See* SCA at p. 22.

C. Overhead Collector 2.

The preliminary expansion plan calls for connecting turbine strings "V" and "W" to the power plant grid via an overhead collector that spans Skookumchuk Canyon. The Final Environmental Impact Statement for the WHWPP project contains the following passage regarding the possible adverse impacts to sage grouse associated with overhead lines.

> Most of the information regarding the impact of overhead lines and fences on sage grouse is unpublished and anecdotal (Manville 2004). Structures such as power lines and fences may pose hazards to sage grouse from collision as well as provide additional perch sites and potential nest sites for raptors that prey on sage grouse. Braun et al. (2002) has recommended that overhead power lines be placed at least 0.5 mile from any sage grouse breeding and nesting grounds. However, two leks have continued to exist within 1 mile of a new overhead transmission line constructed for the Foote Creek Rim Wind project and the number of birds using the leks has been stable or increasing since the installation of this transmission line in 1997 (Johnson et al 2000). The WHWPP has been designed incorporating measures to discourage perching, nesting, and foraging by raptors and unguyed meteorological towers will be used to minimize the risk to sage grouse from predators and from collision.

Wild Horse Wind Power Project Final EIS at 3.5-9 (May 2005). All other collectors for both the existing project and the proposed expansion project are located underground, presumably at least in part, due to the concerns cited above. The application materials submitted by PSE do not discuss the overhead collector, provide design details, offer analysis regarding its potential environmental impacts or mitigation, or identify possible alternatives to its construction. Given that this overhead connector appears to be unique to the expansion project, applicant should be required to supplement its application to include documentation and analysis regarding the potential environmental impacts of the overhead collector, if any, prior to EFSEC making a determination regarding the project's environmental impact.

Thank you for the opportunity to comment on proposed Amendment No. 5 to the WHWPP SCA. Please contact me at 360-586-2438 if you have any questions or concerns.

Sincerely,

H. BRUCE MARVIN
Assistant Attorney General

HBM:mm

Kittitas Audubon Society • P.O. Box 1448 • Ellensburg, WA 98926

August 8, 2008

Jim Luce, Chair
Washington State Energy Facilities
925 Plum Street SE
Building 4
PO Box 43172
Olympia WA 98504 – 317

Re: Wild Horse Expansion Request

Dear Chairman Luce and Members of the Council:

Kittitas Audubon Society (KAS) is one of the parties to the joint letter submitted to the Council at the August 6, 2008 public hearing on PSE's request to expand the Wildhorse wind farm. KAS members were actively involved in the development of the joint letter, and are keenly interested in how EFSEC responds to the issues raised. Mr. Robert Kruse, in his testimony representing us, affirmed support for wind power sited properly where safeguards to protect natural resources are prior established and enforced.

You are perhaps aware KAS wrote in opposition to establishing the Wildhorse wind farm. From our role as an organization focused on wildlife protection, we didn't see adequate wildlife studies having been performed – for example the one-year's monitoring of bird sightings over the affected area accepted as a meaningful ornithological assessment of conditions to serve as a predictor of events to come. Longer studies with more sophisticated technical investigations needed to address migratory patterns (including night time) were dismissed as too expensive. The reality is that the drive and momentum to expand and industrialize exceeds society's willingness to seriously compromise in favor of protecting natural resources especially wildlife. How else to explain the precipitous decline in bird populations and a willingness to move aggressively into the most rapidly-disappearing natural habitat – shrub steppe.

Wildhorse is now a functioning wind farm, and KAS accepts its reality and the likelihood of its eventual expansion. Our participation in the joint comment with Friends of Wildlife and Wind Power and the Kittitas Field and Stream Club was deemed the best route available to strengthen the voice for protection of habitat and wildlife should approval be given to expand the wind farm.

Our purpose in writing this comment is to emphasize issues raised that are of particular concern to members of Audubon and of Kittitas Audubon Society in particular. A statement of our mission: "The mission of Kittitas Audubon Society is to develop an appreciation of nature and conservation with a focus on birds". Since they are winged creatures and have come into the spotlight of late, we include bats.

For reasons not known, bats are particularly vulnerable to wind turbines judging from kills reported at a number of facilities. Recently reported was a high rate of bat kills at the Judith Gap wind farm in Montana - an estimated 1200 bats killed during an eleven month monitoring period – some 11.4 bats per turbine. The turbine specs are similar to those installed or are planned for installation at Wildhorse. Three fourths of the kills were migrating bats that hang out in trees to rest and nest, but Judith Gap is in a relatively treeless plains area, so the bats were apparently just passing through.

Better studies of greater length need to be performed for bat populations particularly in the more northerly part of the proposed expansion area where a forested landscape comes on the scene and where bats are more apt to be found.

Government officials, agency wildlife experts, industry, and private conservation people are cooperatively engaged in searching for answers to why the surprising and extraordinary level of kills. There are a number of hypotheses, but little or no research data of consequence to apply to the search for clues; emphasizing that so little scientific research on animal behavior has been done in this and in analogous situations. At least one individual studying the situation in the Columbia Gorge where wind turbines are rising in great numbers wonders what will happen to second-generation raptors; the parents having been in the area as the turbines came on scene. How will a chick fare on its first and subsequent flights? We are in a real sense performing experiments with minimal capacity to predict the outcome - one with potentially disastrous consequences. On-the-job training is OK in some instances, but not here.

There are reports of Greater Sage Grouse sightings in the project area, and that at least one nest has been found. Should (We would like to feel comfortable saying "when") the goals of habitat restoration be reached in the Project area and in the newly acquired lands between the Quilomene and Whiskey Dick Wildlife Areas, it is likely we will witness a gradual return to some of the historic occupants including the Greater Sage Grouse. A proposal to string an overhead transmission line to connect the easterly four turbines to the rest of the grid could be a bad move. There are reports that sage grouse exhibit avoidance of high structures including wires. But evidence supported by "best science" is lacking; so if the expansion is approved, along with approval should come an enforceable requirement that the operator assume obligation to take corrective action if such lines prove a wildlife hazard.

Shrub Steppe habitat at Wildhorse has been impacted in excess of earlier predictions, in one instance the result of excess heat generated from the initial-planned layout of the underground transmission cables that subsequently were distributed more widely

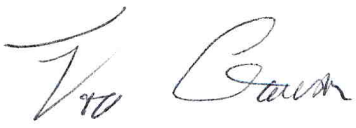
requiring more area. The excess width of new roads in general on the project are, as pointed out in the joint letter, much wider than people were led to expect thus chewing up more habitat.

Shrub Steppe is habitat that is disappearing most rapidly; a 1991- 1993 WA DFW study abstract states the loss of 50% from historic levels. Loss of habitat equates with loss of species that include Sage and Brewer Sparrows, and Loggerhead Shrikes. We've have more than 20 years with an increasing rate of conversion to add to the decline. These species, influenced by both soil and range type, should be beneficiaries of careful pre-installation studies as should other resident species.

The remoteness of the easterly four wind turbines poses big problems. Access for construction and maintenance require extensive road construction. The only current access is across public land and judging from the existing project significant impact will occur from road construction if transmission lines are placed underground. The proposal to connect with an overhead line has its problems; one of which is the potential for impacts on grouse, others are sight pollution and more roads for maintenance. There would be substantial reduction of impact associated with the proposed expansion if the four wind turbines were removed from the project; we ask serious consideration be given that remedy.

Landscape restoration appears to be lagging; successful seeding of native grass species hasn't been accomplished. Wildlife habitat restoration requires this be accomplished. If restoration is to be successful, there can't be a time-limit associated with it.

For the many good reasons listed in the joint letter to which KAS is a party, and for those stated herein, we urge a Supplemental Environmental Impact Statement be required as the best way to avoid unpleasant surprises, to address problems and ensure their resolution.



Tom Gauron President
Kittitas Audubon Society
P.O. Box 1443
Ellensburg, WA 98926

Appendix B
Applicant Responses to Checklist Comments

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PUGET SOUND ENERGY

Puget Sound Energy, Inc
P.O. Box 90868
Bellevue, WA 98009-0868

September 8, 2008

Allen Fiksdal
EFSEC Manager
905 Plum Street SE
PO Box 43172
Olympia, WA 98504-3172

RE: Wild Horse Expansion

ALLEN
Dear ~~Mr. Fiksdal:~~

Puget Sound Energy (PSE) has reviewed the transcripts from the August 6, 2008 public hearing in Ellensburg as well the written comments received on the request for Site Certificate Agreement (SCA) amendment for the Wild Horse expansion. In this letter, we respond to the substantive comments received and have proposed additional mitigation measures where appropriate to support your consideration of the SEPA Checklist and other information submitted with the Request for Amendment. To further assist in your consideration of this Project, we are enclosing the following additional studies and other information, discussed below:

1) An Archaeological Survey of the Wild Horse Wind Facility Expansion Project, Puget Sound Energy, Kittitas County, Washington (Lithic Analysts 2008)
2) Rare Plant Survey for Expansion of Wild Horse Wind Facility (David Evans and Associates [DEA] 2008)
3) Sage-Grouse Surveys for Expansion of Wild Horse Wind Facility (DEA 2008)
4) Post-Construction 2008 Aerial Raptor Nest and Greater Sage-Grouse Lek Surveys for the Wild Horse Wind Facility (Western EcoSystems Technology, Inc. 2008)
5) 1st Year Post-Construction Avian and Bat Monitoring Surveys for Wild Horse (Western EcoSystems Technology, Inc. 2008)
6) Post-Construction Habitat Restoration Monitoring: Year 1, Puget Sound Energy Wild Horse Wind Power Project (WildLands, Inc. 2008)
7) Revised Wildlife and Habitat Baseline Study for the Whiskey Ridge Wind Power Project (Western EcoSystems Technology, Inc. 2007)
8) DNR Letter to David Bricklin regarding Conservation Easement, August 26, 2008
9) WDFW Comments on Draft Protocols for Wildlife and Habitat Surveys, March 2006

Based upon the responses below, we believe that issuance of a Mitigated Determination of Non-significance (MDNS) is appropriate for the amendment request. We believe that impacts from the proposed expansion are well understood based on the studies prepared

and experience gained during construction and operations of the Wild Horse project, and that with appropriate mitigation measures, both included as part of the Project design and as conditions of approval, potential environmental impacts would be insignificant. Moreover, as stated above, we have offered additional mitigation measures to apply lessons learned during that process. Below please find responses to the substantive comments received during the public comment period.

General Comments

Compliance with SCA. As described in more detail below, PSE believes that it has complied with all conditions in the SCA. Additionally, as testified to at the hearing by several commentors, PSE has sponsored several voluntary stewardship activities that have contributed to the condition and value of the project site and the surrounding area.

Specifically with respect to grazing, PSE has funded and voluntarily participated in a Coordinated Resource Management (CRM) Plan. Participating in this group is not a requirement of the SCA but a voluntary commitment made by PSE to help manage important habitat and wildlife resources on the Wild Horse Wind Facility in coordination with representatives from WDFW, DNR, BLM, and other numerous stakeholders using livestock grazing as a tool to achieve the management goals established by participants of the CRM. The only conditions described in the SCA related to livestock grazing requires PSE to develop and implement a Post-Construction Rangeland Management and Grazing Plan and to fence the Mitigation Parcel (Section 27) and the springs *only* if livestock grazing is allowed by PSE on adjacent properties during operation of the wind facility. All of the conditions of the SCA that pertain to grazing, including approval of the grazing plan and fencing of the mitigation parcel (Section 27) and the springs, were fulfilled prior to grazing on the site this year. Temporary hot-wire fencing was used in place of permanent fencing during this year's grazing season based on guidance from WDFW wildlife biologists and sage-grouse experts who were concerned that permanent fencing, as defined in the SCA, may be detrimental to greater sage-grouse recently observed within the wind facility boundaries.

We have also worked collaboratively over time with state and local agencies, and stakeholders through the project Technical Advisory Committee (TAC), the CRM and daily operations.

Conservation Easement. The conservation easement was a **voluntary** commitment, not proposed as "mitigation" but as a voluntary act of good citizenship and stewardship of the land, made by the project developer, Horizon Wind Energy, and PSE for project lands they owned. Further, PSE has offered to apply the easement to the expansion site upon approval of the SCA Amendment. This is a very significant measure which will result in additional mitigation on the project site well in excess of measures required in the SCA. The voluntary easement was offered to conserve and protect habitat in perpetuity, and greatly exceeds measures needed to mitigate project impacts. It is a precedent-setting measure and a model for the industry. PSE cautions that construing such voluntary measures as "mandatory" conditions, and using such voluntary measures to leverage

additional mitigation not supported by wildlife impact data, risks both this voluntary offer and similar efforts that may be made in the future by others. Further it is not within PSE's power to make such commitments on property within the project owned by the Department of Natural Resources (DNR) and the Washington State Department of Fish and Wildlife (WDFW). Reference DNR's letter.

PSE has been working with WDFW for a number of months completing a conservation easement for the 6,551 acres of property that PSE owns within the boundary of the Wild Horse project. The easement has been negotiated and is in the process of being executed and will be forwarded to the Council as soon as it is completed.

Verbal Comments

Steve Verhey. Substation Lighting. PSE is willing to connect yard lights at project step-up substation to motion sensors.

Kittitas County. As testified to at the hearing by Mr. Darryl Piercy, the proposed expansion site is within Kittitas County's designated overlay zone for wind energy and is therefore consistent with County land use plans and regulations. As stated in the request for amendment, PSE will be submitting an amended development agreement to the County for consideration as soon as a SEPA determination is made by EFSEC. This process has been discussed with the County and is expected to take approximately 30-days to complete. PSE is willing to add this approval to the SEPA environmental checklist, as requested by County staff.

Letter from CFE, Bruce Marvin

Conservation Easement. See response to General Comments above.

Baseline Study and Turbine String "S". The WDFW Wind Power Guidelines (2003) recommend and encourage use of existing information from projects in comparable habitat types in locations close to proposed projects. The survey protocols used for wildlife and habitat baseline studies prepared by WEST for the Expansion Area were reviewed and approved by WDFW in March of 2006, prior to implementation (see attached). During their review, WDFW biologists did not recommend avian use surveys for the Expansion Area because these surveys were previously conducted at the Wild Horse project which is immediately adjacent to the Expansion Area and no differences were expected for impact predictions. In addition to the avian use surveys completed on the adjacent Wild Horse project, a full year of post-construction (operational) avian monitoring data from the Wild Horse project was available to help refine impact predications for the Expansion Area.

The Wildlife and Habitat Baseline Study completed by WEST for the Expansion Area was appended to the SEPA Checklist by David Evans and Associates, Inc (DEA). Additional studies have been completed to further assess potential impacts to cultural resources, rare plants and hedgehog cactus for turbine string "S". Those additional

studies are enclosed. The avian portion of the study characterizes the entire site without respect to turbine string locations. Therefore, no additional preconstruction surveys addressing the expansion area are warranted.

Overhead Collector 2. The proposed section of overhead collector would be similar in design to the section south of the Wild Horse project step-up substation. This is very similar in configuration to distribution level power lines that criss-cross the County currently. We believe the alternative of burying a significantly longer section of collector line around the draw would result in significantly greater impacts overall. PSE would be willing to offer un-guyed structures (e.g., steel monopoles or laminated wood) to minimize potential impacts from this crossing to greater sage grouse.

Letter from Sandy Swope Moody, Washington Natural Heritage Program

Hedgehog Cactus. PSE voluntarily worked with a local botanist and a group of volunteers at great expense and effort to rescue and relocate nearly 1,000 hedgehog cacti from areas that would have been cleared during construction of the wind facility. Initial results of this voluntary rescue and relocation effort are very positive and PSE intends to closely monitor their progress over the next few years. In her letter, Ms. Moody expressed concerns about claiming success for our efforts in the Habitat Baseline Study completed by WEST. As a result, this study has been revised to remove any mention of the cacti rescue and relocation project.

Figure 4 in the WEST report shows the distribution of Hedgehog cactus in their study of the Expansion Area. In addition, supplemental rare plant surveys completed by DEA found the species along the "S" string. Because of the large number of individuals observed during these studies, their frequency in preferred habitats, and the high likelihood that many more individuals occur in the area adjacent to the survey corridors, the expansion area is not expected to significantly impact the species' viability in the project area. In addition, public access to the site will be controlled during both construction and operations, which should continue provide greater protection than is currently afforded to this species.

Hoover's tauschia. Surveys for Hoover's tauschia were completed for both the Wild Horse project and the proposed Expansion Area. WEST inadvertently left it off Table 1 of the Wildlife and Habitat Baseline Study that lists rare plant species for which surveys were conducted. Table 1 has been revised to reflect this correction. In addition, qualified third party biologists from DEA also looked for the species during supplemental rare plant surveys of Expansion areas not studied by WEST.

Letter from Kittitas Field and Stream, Kittitas County Audubon, Friends of Wildlife and Windpower

Fencing of the Mitigation Parcel and Springs. As stated in the EFSEC Site Certificate Agreement (SCA) the development of a Grazing Plan and permanent fencing of Section 27 and the springs is only required if PSE chooses to graze the property. PSE has worked

voluntarily and collaboratively over the past 2 years with state and federal agencies and other interested parties as part of a Coordinated Resource Management Group (CRM) to develop a comprehensive approach to sustainable land management that balances traditional cattle grazing with WDFW wildlife habitat objectives. Prior to implementation of the approved Grazing Plan and in accordance with the EFSEC Site Certificate Agreement, the springs and Section 27 were fenced to exclude livestock grazing during the 2008 grazing season using temporary fencing based on guidance from WDFW wildlife biologists and sage-grouse experts who were concerned that permanent fencing may be detrimental to greater sage-grouse.

If PSE chooses to continue grazing on the existing Wild Horse facility PSE is willing to provide alternative mitigation in lieu of permanently fencing Section 27 by working with WDFW to restore and protect the springs from livestock degradation with native seeding around the springs, installation of wildlife-friendly or temporary fencing as determined by WDFW, and noxious weed management.

Spring Preservation and Enhancement. During the design of the Expansion Area, 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). In accordance with Article IV.F.2.B of the EFSEC SCA, turbines will be located no less than 150 meters from the springs identified in the Expansion Area. Additionally, PSE's voluntary participation in the CRM to cooperatively manage grazing on the wind farm within a larger landscape allows for coordinated resource planning across ownership and management boundaries. This combined with less intensive grazing than originally anticipated on the wind farm, along with an aggressive noxious weed control program and controlled public access to the property, will provide better protection of wildlife habitat, including the springs, at Wild Horse than was afforded in the past.

If PSE chooses to continue to graze the Expansion Area, PSE will work with WDFW to restore and protect the springs from livestock degradation by providing native seeding around springs, installation of wildlife friendly or temporary fencing, and noxious weed management.

Mitigation Parcel. In accordance with the WDFW Guidelines for Wind Project Habitat Mitigation and Article IV.F.10 of the Site Certificate Agreement, Section 27 was selected in coordination with WDFW as the "Habitat Mitigation Parcel" to mitigate for all permanent and temporary impacts to habitat caused by the Wild Horse Wind Project. The 600-acre mitigation parcel exceeds the requirements for the ratios outlined in the WDFW Wind Power Guidelines (2003). PSE has fulfilled the requirement to protect this parcel for the life of the project by providing legal protection in the form of a Declaration of Covenant executed on September 21, 2005. In addition, PSE has agreed to voluntarily grant a conservation easement to WDFW in perpetuity which will include all lands owned by PSE within the Wild Horse Wind Project boundary, including Section 27. The easement has been negotiated and is in the process of being executed and will be forwarded to the Council as soon as it is completed.

PSE agrees to provide either additional replacement habitat for impacts from the expansion or annual alternative mitigation fee in accordance with WDFW Wind Power Guidelines (2003), as determined in consultation with WDFW. If replacement habitat is selected the guidelines would require approximately 70 acres (22.9 acres permanent disturbance @ 2:1 plus 47.7 acres temporary disturbance @ 0.5:1). PSE proposes to offer an approximately 80 acre parcel owned by PSE as mitigation (the South half of the South half of the North half of Section 15, Township 18 North, Range 21 East, W.M. Kittitas County, Washington). If habitat replacement is selected, this parcel would be conveyed by PSE to WDFW by quit claim deed. If alternative mitigation is selected, the annual fee would be approximately $3,850. These funds would be paid to WDFW, targeted at funding habitat conservation and restoration efforts.

Landscape Restoration. The Post-Construction Restoration Plan was reviewed and approved by qualified WDFW habitat biologists and is consistent with the WDFW Guidelines for Mitigation of Temporary Impacts to Habitat (WDFW 2003). The Post-Construction Restoration Plan does incorporate criteria for restoration success as recommended by WDFW and a "good faith" effort will be made to restore impacted areas within the Expansion Area, including implementation of a long-term weed control program for the life of the project, which will aid in restoration success of the site. According to recommendations from WDFW, long-term performance targets should not be imposed since temporal losses and the possibility of restoration failure is incorporated into the acquisition and improvement of replacement habitat that will be selected in coordination with WDFW.

As an additional mitigation measure, PSE will reseed certain areas within the existing site, to be selected by PSE in consultation with WDFW and a qualified restoration specialist, where native seeds have not germinated and are not expected to germinate over time. PSE will also extend restoration monitoring requirements on the existing site for an additional 2 years to maintain consistency and to compare restoration results with the expansion area.

Native seeds from the Pacific Northwest were used for restoration on the adjacent Wild Horse Project. Where practicable, locally adapted seeds will be used in restoration of the Expansion Area if available in sufficient quantities at the time of seeding. Based on recommendations from WDFW staff, PSE is in discussions with a local native seed provider to secure native seeds for the Expansion Area. Seed mixes will be selected in coordination with qualified WDFW habitat biologists and will be keyed to specific soils conditions found on site. According to WDFW, adjacent undisturbed areas will also serve as a seed source for the disturbed areas and should re-establish naturally with time from seed from the adjacent undisturbed areas (WDFW 2005). These efforts, in combination with a progressive weed control program, should provide suitable plant cover to protect the site from erosion and allow slow progressive recovery of the site to natural-like conditions.

Turbine Placement. During the design of the Expansion Area, 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) to minimize impacts to wildlife. In accordance with Article IV.F.2.B of the EFSEC SCA, turbines will be located no less than 150 meters from the springs identified in the Expansion Area. No streams, wetlands, springs, or riparian areas will be impacted by construction of the Expansion Area.

Results from the 1st Year Post-Construction Avian and Bat Monitoring Surveys for Wild Horse (WEST 2008), enclosed herein, demonstrate that the small number of bird and bat fatalities documented and the lack of strong patterns in the locations of mortalities (i.e. some near springs, some away from springs) suggest (contrary to the allegations made to the Council) no large differences in mortality by location within the wind project area (WEST 2007). Statistical tests will be conducted after the 2nd year monitoring is completed to compare fatalities among different locations in the project area.

As stated in the WDFW Wind Power Guidelines (2003) the duration and scope of avian and bat monitoring should depend on the size of the project and the availability of existing monitoring data at projects in comparable habitat types. Based on these recommendations, 2 years of post-construction avian and bat monitoring studies were required by EFSEC for the Wild Horse project and adjustments to operational monitoring will be made if significant and unanticipated impacts become apparent from monitoring data. To date there have been no significant or unanticipated impacts on avian or bat species as a result of the Wild Horse project. In addition, a Technical Advisory Committee (TAC) is responsible for reviewing results of operational monitoring data and making recommendations to EFSEC regarding the need, if any, to adjust monitoring requirements based on results from initial monitoring data.

Due to the close proximity of the Expansion Area to the existing Wild Horse site, and based upon the results of pre- and post-construction survey data collected thus far, PSE is willing to conduct a two-year post-construction monitoring study on the expansion site to evaluate impacts to avian and bat species. Monitoring on the expansion area may include areas within the Wild Horse site if recommended by the TAC and approved by EFSEC. If results from this study show significant and unanticipated impacts to birds and bats the TAC may recommend additional monitoring in accordance with the EFSEC SCA. In addition, PSE will report all avian and bat fatalities found by wind project personnel over the entire life of the project in accordance with the Wildlife Incident Reporting and Handling System reviewed by the TAC and approved by EFSEC as part of project operations and monitoring efforts to help detect any significant or unanticipated impacts.

New Science in Bat Mortality. As stated in the Wildlife and Habitat Baseline Study for the Expansion Area, researchers have hypothesized that bats may be attracted to turbines by ultrasound emissions, ephemeral increases in food sources, or bats may investigate turbines for roosting sites or to glean insects from turbine blades (WEST 2007). Currently these hypotheses are based on limited data and have not been fully tested (Erickson 2008). Although potential bat mortality is difficult to predict on the Expansion

Area, a good estimate can be calculated based on levels of mortality at other nearby wind projects and evaluating direct measured impacts identified during the 1st Year Avian and Bat Monitoring Program on the adjacent Wild Horse Project area, which found that overall bat mortality was similar and slightly lower as compared to pre-project predictions at other wind projects in the Pacific Northwest. Existing projects in Washington and Oregon have reported bat mortality near the low end of the national range (i.e., less than 3 bats/turbine/year) (WEST 2007). In addition, on a national scale, no project impacts on bat populations have been demonstrated to date (AWEA 2008).

The proposed Expansion Area is not located near any large, known bat colonies. A supplemental bat acoustic study using state-of-the-art technology was performed in the Expansion Area by qualified 3rd party wildlife biologists from mid-May through late-October 2007. As stated in the Technical Addendum to the Baseline Wildlife and Habitat Study (WEST 2007) for the Expansion Area, the objective of the bat use surveys was to estimate the seasonal and spatial use of the proposed Expansion Area by bats using Anabat® II bat detectors to record bat echolocation calls in the project area. Based on this study and the low number of bats found at the adjacent Wild Horse Project during the 1st Year Post-Construction Avian and Bat Monitoring Survey (which was reviewed and adopted unanimously by the TAC), potential impacts to bats from construction of the Expansion Area are not expected to be greater than other regional projects.

In summary, based upon the reports and surveys submitted to EFSEC, the data is contrary to any inference that any portion of the Expansion Area is more likely to result in high bat mortality.

Overhead Wires. See response to CFE letter, above.

Project Road Widths. Project roads were the minimum width necessary to provide for movement through the site of the main erection crane other vehicles necessary to deliver and erect the wind turbine components. These vehicles have minimum horizontal and vertical curve requirements. Nevertheless, as originally proposed, PSE would have been willing to provide a narrow road cross section (i.e., 16-feet) from the entrance to "S" string to the eastern boundary of the expansion project. This would have required partial disassembly of the main erection crane and traffic control for other vehicles. To avoid additional multiple dismantling and re-assembly of the main erection crane, the remainder of the project roads would be similar to the Wild Horse roads.

Conservation Easement. See general response above.

Regarding DNR participation in the Conservation Easement, it is not within PSE's power to make such commitments on property within the project owned by the DNR. In a letter from William O. Boyum, DNR Southeast Region Manager, to David Bricklin dated August 26, 2008, DNR clarified their position on this matter. DNR submitted a copy of this letter to EFSEC, and a copy is enclosed.

Letter from Brock Applegate, WDFW

PSE has enjoyed the open, transparent relationship we have had with WDFW through permitting and operation of the Wild Horse project. Such an open, transparent relationship is essential to successfully implement the many voluntary and mandatory measures PSE has taken for the protection and conservation of wildlife. The proposed expansion has been discussed with WDFW staff over the course of years and up until very recently (the last meeting with WDFW staff was August 5th, 2008), first by the original developer and then PSE. The survey protocols used for the baseline studies prepared were approved by WDFW in March of 2006 (see attached). The most significant concerns articulated in WDFW's letter submitted to EFSEC were not mentioned in these meetings, and the concerns related to the survey protocols are not consistent with the advice and approval provided by WDFW prior to completion of wildlife and habitat baseline surveys (including the "buffer" area for great sage-grouse surveys). We note that Mr. Applegate's letter itself is confusing in citing both 2- and 5-mile buffers.

Greater Sage-Grouse. PSE has demonstrated through many actions that we share WDFW's concerns about greater sage grouse in and around the project site. For example, after meeting with WDFW staff including Mike Schroeder and Mike Livingston last winter, PSE proactively and at significant expense received training and performed six weeks of additional lek searches using protocols developed by WDFW and the Yakima Training Center. No leks were observed during these voluntary surveys.

According to the Wildlife and Habitat Baseline Study completed by WEST for the Expansion Area, the proposed project is not expected to negatively impact nesting habitat for sage-grouse. Given the expansive intact shrub-steppe habitat to the east of the proposed project and existing Wild Horse project, the Expansion Area should not impact connectivity between Douglas County populations and the YTC populations (WEST 2007) This is consistent with what PSE heard from Mike Schroeder and Mike Livingston at a meeting in early 2008.

Some of the issues raised in WDFW's letter are not supported by actual experience at the Wild Horse project, and are the subject of substantial biological debate (e.g., "Greater sage-grouse cannot tolerate tall vertical structures."). We are not aware of any studies that have shown that sage-grouse avoid wind turbines. In fact, PSE has documented sage-grouse use of the Wild Horse site and nesting in close proximity (approximately 100 meters) to existing turbines and the Expansion Area has been designed to be permeable to wildlife movement. PSE is encouraged by this and believes that mitigation measures in the SCA along with voluntary conservation measures implemented by PSE have made the site more conducive to use by greater sage-grouse now than prior to construction and operation of the project. The conservation and mitigation efforts implemented by PSE directly correspond with Conservation Strategies and Tasks outlined in *WDFW's Greater Sage-Grouse Recovery Plan, May 2004*. If EFSEC would like a catalogue of those efforts, please advise and we will provide them.

We would hope to continue the collaborative efforts that have taken place up to now. We don't believe that impacts to greater sage-grouse from the expansion require any additional mitigation, and that applicable scientific information does not support such additional mitigation.

"V" and "W" Strings. See response to Overhead Collector in response to CFE, Bruce Marvin letter and Road Widths in response to Letter from Kittitas Field and Stream, Kittitas County Audubon, Friends of Wildlife and Windpower, above. PSE believes that impacts from these turbines, as originally proposed, could have been mitigated with the addition of mitigation measures discussed in this letter.

Calculation of Impacts/Compensatory Mitigation. PSE does not agree with the contention that mitigation should be calculated based on percentage of habitat degradation within 5-miles of the project boundary. There is no study, policy, or regulation we are aware of that supports this approach. The WDFW Windpower Guidelines includes calculations for impacts to shrub-steppe habitat of 2:1 for permanent impacts and 0.5:1 for temporary impacts. PSE agrees to provide additional replacement habitat for impacts from the expansion project in accordance with these guidelines. See response to letter from Kittitas Field and Stream, Kittitas County Audubon, Friends of Wildlife and Windpower, above.

Presence of Threatened and Endangered Species and Designated Habitat. The Draft and Final Environmental Impact Statements for the Wild Horse Wind Power Project, which is part of the record for the proposed Expansion Area, and the Wildlife and Habitat Baseline Study completed by WEST for the Expansion Area describe the status of the Greater sage-grouse and the location of the Expansion Area within the Colockum Sage-Grouse Management Unit. According to the WDFW Greater Sage-Grouse Recovery Plan (May, 2004) the Colockum Management Unit has the potential to link the current Douglas-Grant and YTC populations of sage-grouse but has "severe limiting factors" such as insufficient quality or quantity of winter and breeding habitat and is "handicapped" by relatively rugged terrain, much of which may be unsuitable for sage-grouse (WDFW 2004). The 29 acres of permanent impact anticipated from construction of the Expansion Area is approximately 0.02% of the total area of the Colockum Sage-Grouse Management Unit.

In summary, based upon the survey protocols and information provided in the Wild Horse EIS and additional data submitted with the amendment request, the data in the record supports a conclusion that the Expansion Area will not pose any significant risk to Greater Sage-Grouse.

Concerns with Bat Survey Results. See response to letter from Kittitas Field and Stream, Kittitas County Audubon, Friends of Wildlife and Windpower, above.

Plant Surveys for State Threatened Plant (*Tauschia Hooverii*). The studies for the project area included surveys for Hoover's tauschia. WEST inadvertently left it off Table 1 of the Wildlife and Habitat Baseline Study that lists rare plant species for which surveys

were conducted. Table 1 has been revised to reflect this correction. In addition, qualified 3rd party biologists from DEA also looked for this species during supplemental rare plant surveys of Expansion areas not studied by WEST.

Letter from Kittitas Audobon

See response to New Science in Bat Mortaility in response to Letter from Kittitas Field and Stream, Kittitas County Audubon, Friends of Wildlife and Windpower, and Greater Sage-Grouse and "V" and "W" Strings in response to letter from Brock Applegate, WDFW, above.

Additional Proposed Mitigation and Project Design Modifications in Response to Comments.

As stated above, we believe the expansion, as originally proposed, to be fully mitigated with incorporation of mitigation measures in the Wild Horse SCA and additional measures offered by PSE in the request for amendment. We believe that the project as proposed would not result in significant unavoidable adverse impacts on the environment that cannot be mitigated. Nevertheless, unexpected comments raised by Brock Applegate at WDFW with respect to the "V" and "W" strings have created unexpected controversy that PSE simply wishes to avoid. Therefore PSE withdraws (without prejudice) the "V" and "W" strings from the amendment request, as well as all of the property within Section 9. This change reduces the proposed expansion from 26 to 22 turbines and the site area from approximately 1280 acres to 960 acres. Temporary and permanent footprint impacts would be as follows:

Description	Permanent Disturbed Area (acres)	Temporary Disturbed Area (acres)	Total Disturbance (areas)
Roads Total (net - existing)	16.9	20.7	37.6
Wind Turbine Sites	6	2	8
Electrical Collection System	0	16	16
Concrete Batch Plant	0	2	2
Main Laydown Area	0	0	0
Quarry Site/Processing/Borrow Pit	0	7	7
Substation Expansion	0	0	0
TOTAL	22.9	47.7	70.6

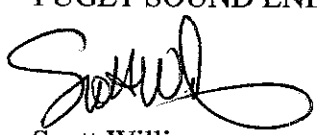
In summary, PSE proposes the following mitigation measures in addition to those proposed in the request for amendment to address the comments received by EFSEC on the proposed site certification agreement amendment:

- PSE will connect yard lights at the project step-up substation to motion sensors.

- PSE will add the amendment of the Kittitas County Development Agreement to the SEPA environmental checklist, as requested by County staff.
- If PSE chooses to continue grazing on the existing Wild Horse facility PSE is willing to provide alternative mitigation in lieu of permanently fencing Section 27 by working with WDFW to restore and protect the springs from livestock degradation with native seeding around the springs, installation of wildlife-friendly or temporary fencing as determined by WDFW, and noxious weed management.
- If PSE chooses to continue grazing on the expansion site PSE will work with WDFW to restore and protect the springs from livestock degradation by providing native seeding around springs, installation of wildlife-friendly or temporary fencing as determined by WDFW, and noxious weed management.
- PSE agrees to provide either additional replacement habitat for impacts from the expansion or annual alternative mitigation fee in accordance with WDFW Wind Power Guidelines (2003), as determined in consultation with WDFW. If replacement habitat is selected the guidelines would require approximately 70 acres (22.9 acres permanent disturbance @ 2:1 plus 47.7 acres temporary disturbance @ 0.5:1). PSE proposes to offer an approximately 80 acre parcel owned by PSE as mitigation (the South half of the South half of the North half of Section 15, Township 18 North, Range 21 East. W.M. Kittitas County, Washington). If habitat replacement is selected, this parcel would be conveyed by PSE to WDFW by quit claim deed. If alternative mitigation is selected, the annual fee would be approximately $3,850. These funds would be paid to WDFW, targeted at funding habitat conservation and restoration efforts.
- PSE will reseed certain areas within the existing site, to be selected by PSE in consultation with WDFW and a qualified restoration specialist, where native seeds have not germinated and are not expected to germinate over time. PSE will also extend restoration monitoring requirements on the existing site for the 2 year period proposed for monitoring the expansion area, to maintain consistency and to compare restoration results with the expansion area.
- PSE is will conduct a two-year post-construction monitoring study on the expansion site to evaluate impacts to avian and bat species. This monitoring may include the Wild Horse site as may be determined by PSE in consultation with the TAC and approved by EFSEC.

Thank you for the opportunity to submit the above responses to public comments. We ask EFSEC staff to expeditiously issue an MDNS for the requested amendment. Please let me know if you have any questions.

Sincerely,
PUGET SOUND ENERGY



Scott Williams
Senior Project Manager

Attachment to September 8, 2008 Letter from PSE		Final SEIS Appendix
1)	An archaeological Survey of the Wild Horse Wind Facility Expansion Project, Puget sound energy, Kittitas County, Washington (Lithic Analysts 2008)	Appendix H
2)	Rare Plant Survey for Expansion of Wild Horse Wind Facility (David Evans and Associates [DEA] 2008)	Appendix D
3)	Sage-Grouse Surveys for Expansion of Wild Horse Wind Facility (DEA 2008)	Appendix D
4)	Post-Construction 2008 Aerial Raptor Nest and Greater Sage-Grouse Lek Surveys for the Wild Horse Wind Facility (Western EcoSystems Technology, Inc. 2008)	Appendix F
5)	1st Year Post-Construction Avian and Bat Monitoring Surveys for Wild Horse (Western EcoSystems Technology, Inc. 2008)	Appendix E
6)	Post-Construction Habitat Restoration Monitoring: Year 1, Puget Sound Energy Wild Horse Wind Power Project (WildLands, Inc. 2008)	Appendix J
7)	Revised Wildlife and Habitat Baseline Study for the Whiskey Ridge Wind Power Project (Western EcoSystems Technology, Inc. 2007)	Appendix C
8)	DNR Letter to David Bricklin regarding Conservation Easement, August 26, 2008	Appendix K
9)	WDFW Comments on Draft Protocols for Wildlife and Habitat Surveys, March 2006	Appendix I

Appendix C
2007 Baseline Wildlife and Habitat Study

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Wildlife and Habitat Baseline Study for the Whiskey Ridge Wind Power Project, Kittitas County, Washington

May 2007

Prepared for:

Whiskey Ridge Power Partners LLC.

Prepared by:

WEST Inc.
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1.0 INTRODUCTION

Whiskey Ridge Power Partners, LLC is evaluating the feasibility of expanding wind power development in Kittitas County, Washington (Figure 1). The Whiskey Ridge Project will be adjacent to the existing Wild Horse Wind Power Project and is proposed to include approximately 22 turbines with capacity to produce approximately 44 megawatts (MW). To predict project impacts on wildlife, Whiskey Ridge Power Partners, LLC contracted Western Ecosystems Technology, Inc. (WEST) to conduct a wildlife and habitat baseline study. Study protocols were developed based upon WEST's experience with wildlife-wind turbine interactions at projects throughout the U.S. The Washington Department of Fish and Wildlife (WDFW) reviewed these protocols in February 2006 and slight modifications were made in early March 2006. The following document contains results of the 2006 baseline study, and an assessment of anticipated impacts to wildlife.

Overview of the Baseline Studies

The principal objectives of the baseline study for this proposed wind project are to: (1) document raptor nest density and location; (2) describe occurrence of any federal and state threatened, endangered, proposed, candidate, or sensitive-status fauna or flora and their potential habitat that may be affected by the project; (3) describe habitat types/ecotones in the general project area; (4) estimate any potential impacts to habitat and wildlife that could result from the construction and operation of the proposed wind energy project, and (5) identify potential project design and/or mitigation measures that could reduce negative impacts.

The Whiskey Ridge study consisted of the following research components: 1) raptor nest surveys, 2) Federal and State sensitive wildlife and wildlife habitat surveys, 3) rare plant surveys, 4) vegetation and habitat mapping, 5) sage grouse surveys, 6) bat echolocation surveys, and 7) general wildlife observations. Avian use surveys were not conducted for the Whiskey Ridge Project because these surveys were conducted at the Wild Horse Project (Erickson et al 2003; see Figure 2) which is immediately adjacent to the proposed Whiskey Ridge Project and no differences are expected for impact predictions.

2.0 STUDY AREA

The project site is located in central Washington's Kittitas County, between the towns of Kittitas and Vantage. More specifically, the project will be built on the high open ridges in the vicinity of Whiskey Dick Mountain, located approximately 10 miles east of Kittitas and approximately 4 miles north of the Old Vantage Highway.

The project area is located within the Columbia Basin physiographic province, which lies within the rain shadow of the Cascade Range. The province is characterized by semi-arid conditions, with low precipitation, warm-to-hot dry summers, and relatively cold winters. Average annual temperature in the project area is approximately 47^{o}F and average annual precipitation is approximately 9 inches, of which 1.3 inches typically occurs from June through August (Franklin and Dyrness 1988). The site features considerable topographic relief and ranges in elevation from approximately 3400 feet to approximately 3650 feet. Several intermittent/ephemeral drainages convey runoff from the site, and a few springs may be perennial (e.g., Basalt and Spike Springs).

3.0 METHODS

3.1 Rare Plant Surveys

Rare plant surveys were conducted by trained botanists during peak flowering and/or fruiting periods when target species are best identified. Study corridors included proposed facilities and a 164-ft (50-m) buffer, based upon an April 2006 layout with turbine strings, access roads, and laydown area. During the survey, botanists followed meandering transects, effectively zigzagging back and forth across the survey corridor. Botanists maintained a list of all vascular plants encountered, and made informal collections of unknown species for later identification using *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973). Additional information collected included general plant associations, land use patterns, unusual habitats, and photographs of habitat types and representative individual plants.

Target Species

For the rare plant survey, 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 (ESA) that potentially occur in the project area. In addition, taxa that have been formally proposed or are candidate species for federal listing, or taxa listed as 'species of concern' that potentially occur within the project area were also considered as target species. The 'species of concern' status is an unofficial status for species that appear to be in jeopardy, but 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 (WHNP) that potentially occur within the project area. The WHNP, 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 2005a).

Prefield Review

As part of the investigation, a review of available literature and other sources was conducted to identify the rare plant species potentially found within the project area. As per Section 7(c)(1) of the ESA, a letter was sent to the USFWS requesting a list of federally listed taxa that have potential to occur within the project area. In addition, the WNHP was contacted to obtain element occurrence records for any known rare plant populations in the project vicinity. To supplement the information provided by the above agencies, a number of other sources were consulted. These sources provided additional information such as habitat preferences, morphological characteristics, phenologic development timelines, and species ranges. Sources included taxonomic keys and species guides (USFWS, 2001; Cronquist et al. 1977; Hitchcock and Cronquist, 1973) and online databases of common and rare plant species (WHNP 2005b; USDA, 2006).

Using data collected during the pre-field review, a list of rare plant species potentially occurring in the project area was compiled (Table 1). 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.

Field Investigation

Pedestrian surveys for rare plant species were conducted on April 27 and from June 10-14, 2006. Surveys were performed by qualified WEST botanists, including Kurt Flaig, Susan Komarek, and Jay Jeffrey. The surveys were timed to locate as many target species as possible, particularly those most likely to occur in the affected habitats (sagebrush steppe and grassland). The survey was accomplished by conducting 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 upon the

structural complexity of the habitat, the visibility of the target species, and the probability of sensitive species occurrence in a given area. In habitats of low visibility with a high probability of sensitive species occurrence, a tighter grid pattern was walked. Care was taken to thoroughly search all unique features and habitats encountered with high probability of occurrence of sensitive species. A GPS unit showing the survey boundaries and turbine locations was used for navigation, in addition to aerial photographs and 7.5 U.S. topographic maps of the site.

A list of vascular plant species encountered during the rare plant surveys was maintained. Flora of the Pacific Northwest (Hitchcock and Cronquist, 1973) was the primary authority used for plant identification.

3.2 Habitat Mapping

Vegetation in the Project area was mapped according to "habitat types," which are considered to be 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 high-resolution digital aerial photography were used for the habitat mapping. The habitat types were mapped during the spring or summer of 2006. Initially, the roads in and around the Project area were driven in order to correlate habitat types with the signature (color, shading, texture) on the aerial photos. Each habitat type was 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 was not be shown. Available literature on the vegetative communities of eastern Washington was consulted during development of the habitat map. The mapped boundaries of each habitat type was digitized using ArcView™.

3.3 Raptor Nest Surveys

The search for raptor and large bird nests within the Project area included an approximate 2-mile buffer; however, much of the 28.5 mi^2 (73.9 km^2) Whiskey Ridge Project area was searched in 2003 for the Wildhorse Project (Figure 1; Erickson et al 2003). Approximately 6.9mi^2 (17.9 km^2) of the northern part of the Whiskey Ridge Project was not surveyed for raptor nests in 2003 (Figure 1). Surveys were conducted from a helicopter with one observer on April 7, 2006. Construction of the Wildhorse Project was underway at this time. Therefore surveys were focused on the Whiskey Ridge Project facility area and a 2-mile buffer to the west, east, and north. The entire 2-mile buffer area was searched but much of the south and southeast areas were not as intensively searched due to ongoing construction activities (Figure 3). Raptor nests observed during two aerial flights for sage grouse leks covering the entire 2-mile buffer were also noted. Search paths were recorded with a real-time differentially-corrected Trimble Trimflight III Global Positioning System (GPS) at 5-second intervals; coordinates as Universal Transverse Mercator, UTM, NAD27. In addition to raptor nests, other notable wildlife observations were made.

Nest searches were conducted by searching habitat suitable for most aboveground nesting species, such as cottonwood, ponderosa pine, tall shrubs, and cliffs or rocky outcrops. During surveys, the helicopter was flown at an altitude of tree-top level to approximately 250 ft (76m) aboveground. If a nest was observed, the helicopter was moved to a position where nest status and species present could be determined. Efforts were made to minimize disturbance to breeding raptors, including keeping the helicopter a maximum distance from the nest at which the species could be identified. Those distances varied depending upon nest location and wind conditions. Data recorded for each nest location included species occupying the nest, nest status (inactive, bird incubating, young present, eggs present, adult present, unknown or other), nest substrate (pine, oak, cottonwood, juniper, shrub, rocky outcrop, cliff or power line), number of young

present, time and date of observation and the nest location (recorded with both a handheld GPS and the differentially-corrected unit). Some nest sites were ground-truthed when activity was unknown.

3.4 Threatened, Endangered, and Sensitive (TES) Species

A list of state and federally protected species that potentially occur within the project area was generated to assess the potential for impacts to these species (Table 2). Species were identified based on the WDFW Species of Concern list, which includes state listed endangered, threatened, sensitive and candidate species; and the USFWS, Central Washington Ecological Services office list of Endangered, Threatened, Proposed, Candidate and Species of Concern for Kittitas County.

Information about occurrence of these species in the Project area is based largely on the following resources:

- Habitat mapping and predicted distribution from Washington State Gap Analysis Program (GAP) project;
- WDFW Priority Habitats and Species (PHS) records for the project area and a buffer or approximately 5 miles;
- Washington Natural Heritage Program (WNHP)
- Breeding Bird Atlas of Washington State, Location Data and Predicted Distributions (Smith et al. 1997);
- Baseline field studies being conducted on site (this report); and
- Other published literature where available.

TES species surveys focused on shrub-steppe obligate species such as sage sparrow, sage thrasher, burrowing owl, sage grouse, white-tailed and black-tailed jackrabbits. Areas within 305 meters (1000 feet) of the centerline of the proposed turbine corridors, new roads, substations, and transmission lines were surveyed for special status/sensitive wildlife three times between May 1 and June 30, 2006. Surveys consisted of walking transects spaced approximately 50 meters apart, and were conducted from dawn to no later than 12:00 PM with wind speeds not consistently exceeding 15 MPH. These three surveys were rotated among areas so that at least one or two of the visits occurs before 9:00 AM. All sage grouse and sage grouse scat were recorded as to location and condition. All observations were recorded using GPS and/or 1:24,000 scale topographic maps and later mapped using GIS. Notes on habitat and condition were also recorded. Observations of other wildlife such as amphibians, reptiles, small mammals, and raptors were also recorded.

3.5 Sage Grouse Surveys

Aerial: Aerial sage grouse lek surveys follow methods used at the Yakima Training Center (YTC). Two helicopter surveys were conducted on March 24 and April 7, 2006. The 2nd survey was conducted in coordination with the raptor nest survey. Timing of the first survey was coordinated with YTC survey results. The survey was conducted at no greater than 40 feet above- ground and at an approximate speed of 40 MPH.

Ground: Sensitive species walking surveys will be used for documenting presence or absence of sage grouse using the Project area for nesting and brood-rearing. In addition to May and June TES ground surveys that may document nesting or brood-rearing, one additional sage grouse survey will be conducted in mid-July focusing on brood detection using the same pedestrian methods. General assumptions are as follows: mid to late March is peak female attendance at leks, nesting and incubation is 3-4 weeks from peak, mean hatch date is around May 28-June 1, brood-rearing is approximately 10 weeks from hatch,

and successful broods disperse around 600 meters during the brood-rearing period (Connelly et al. 2004). Weather patterns may shift these general dates by a few weeks.

3.6 Incidental/In-transit Wildlife Observations

All wildlife species of concern, uncommon species, and big game observed while field observers were conducting various surveys were recorded on incidental/in-transit data sheets. Data recorded with incidental observations included GPS coordinates, observation number, date, time, species, number, sex/age class, height above ground, and habitat.

3.7 Bat Echolocation Study

The vast majority of bat mortality documented at U.S. wind farms has occurred in late summer and early fall, a time period that corresponds with fall migration of tree bats (e.g., hoary bat, silver-haired bat) and dispersal from summer breeding areas to hibernacula for the other species. It is not known if the mortality is occurring to migrating individuals or bats conducting other activities during the migration period. Although bat mortality during the breeding season has been low at existing wind farms, most of these wind farms are in open habitats (e.g., agricultural fields, grassland, shrub steppe) and breeding bats may be more prone to collision at wind farms constructed in or near bat foraging or roosting habitats, such as wetlands and forested areas. The Whiskey Ridge Project is located closer to the forest edge than the existing Wild Horse Project, therefore echolocation surveys conducted by trained Horizon personnel were proposed for 2006 to evaluate bat activity in the project area. However, no data collection occurred due to difficulties with personnel availability, and later with cable and pulley riggings interfering with anemometer instrumentation. Data collection will occur during spring through early fall of 2007, and these data will be compared to existing data at other wind plants. Methods and results for the 2007 echolocation bat study will be provided as a technical addendum to this report.

4.0 RESULTS

4.1 Habitat Mapping

Six habitat classifications were delineated within development corridors of the project: shrub-steppe moderate (79.3 acres), shrub-steppe sparse (260.1 acres), ponderosa pine (24.0 acres), mixed scrub (68.2 acres), talus (19.1 acres), and lithosol (73.9 acres) (Figure 4). The project area is located within the Columbia Basin physiographic province, which lies in the rain shadow of the Cascade Range. The province is characterized by semi-arid conditions, in which the majority of precipitation occurs during the relatively cold winters. As a result of these climatic conditions, shrub-steppe is the primary habitat that evolved in the region.

Shrub-steppe habitat within the project development area was classified using two categories based on relative spatial density of the shrub layer, being either moderate or sparse. Habitat mapped as shrub-steppe moderate featured between 30 and 70 percent shrub cover, and shrub-steppe sparse habitat supported less than 30 percent shrub cover. The latter habitat type typically occurred on shallower soils on ridgetops and knolls (Figure 4). Shrub-steppe moderate was mapped on side slopes below these ridges, and in other areas featuring slightly deeper soils (Figure 4). Big sagebrush (*Artemisia tridentata*) was a dominant shrub species within both density categories, but shrub-steppe sparse also included the dominant stiff sagebrush (*Artemisia rigida*).

The ponderosa pine (*Pinus* p*onderosa*) habitat was mapped immediately below a long ridge in the northwestern portion of the project area (Figure 4). This habitat typically featured a well-established

shrub and herbaceous component. Larger tracts of this habitat were observed in the adjacent lands to the north and west of the site. Mixed scrub habitat consisted of big sagebrush, however antelope bitterbrush (*Purshia tridentata*) and squaw currant (*Ribes cereum*) were the dominant shrub species (Figure 4). Other shrub species observed included mountain snowberry (*Symphoricarpos oreophilus* var. *utahensis*), serviceberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), and snowbrush (*Ceanthus velutinus*). Mixed scrub habitat also featured a relatively dense herbaceous component composed of a variety of grasses and forbs. Talus habitat is composed of rocks and cobbles, and occurred on some of the steeper slopes within the project area (Figure 4). Scattered shrubs and herbaceous vegetation, including bluebunch wheatgrass (*Pseudoroegneria spicatum*) and arrowleaf balsamroot (*Balsamorhiza sagittata*), were observed within this habitat. Lithosol communities were mapped in several locations within the project area (Figure 4). This habitat occurred on shallow, rocky substrates on exposed ridgetops and knolls, and featured relatively sparse shrub and forb species. Dominant vegetation included big sagebrush, stiff sagebrush, buckwheat (*Eriogonum* spp.), Sanberg's bluegrass (*Poa secunda*), and hedgehog cactus (*Pediocactus simpsonii* var. *robustior*).

4.2 Rare Plant Surveys

No USFWS or Washington state Endangered, Threatened, Proposed, or Candidate plant species were encountered during the field surveys. One plant species on the Washington State 'Review' list, hedgehog cactus, was detected in the survey area. Species on the review list are of potential concern within the state, but are in need of additional field work before a status can be assigned. 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. A total of 3 subpopulations of hedgehog cactus were found within the project site, and 1 subpopulation was observed along the project boundary (Figure 4). All of the subpopulations occurred in lithosol habitats, and were typically observed along the rim of ridgetops and knolls throughout the site. Associated species observed with the cactus, comprising relatively low vegetation cover, included stiff sagebrush, big sagebrush, round-headed desert buckwheat, buckwheat, and Sandberg's bluegrass. Subpopulations ranged in size from 50 to over 200 individuals, and were composed of plants growing individually or in clumps of up to six individuals. The majority of the plants encountered were either in flower or fruit. A list of all vascular plant species observed and identifiable during the rare plant surveys is included in Appendix A.

4.3 Raptor Nest Surveys

Two active red-tailed hawk nests were observed during the aerial surveys. One of these is within the project area, located in a pine tree within a drainage less than 300 meters from a proposed road and transmission line, and approximately 0.5 miles from the nearest turbine (turbine D1, Figure 5). The second red-tailed hawk nest is approximately 1.5 miles southwest of the project area boundary, and west of the existing Wildhorse Wind Project. American kestrels likely nest within the project area as well, one suspected active nest was found near a nest box on a dead pine tree (Figure 5). No large old inactive nests were observed. Potential nesting habitat sites in ponderosa pines may have been reduced due to some broken tree tops and lateral branches, apparently from recent high winds or snowload, or both. These may provide new nesting sites later. One subadult golden eagle was observed during aerial surveys. Only one unknown-age golden eagle was observed during four ground TES surveys during May, June, and July.

4.4 Threatened, Endangered, and Sensitive (TES) Species

The USFWS lists 30 wildlife species as threatened or endangered within the state of Washington. Of these, 6 are terrestrial wildlife species and occur within Kittitas County including marbled murrelet, northern spotted owl, grizzly bear, bald eagle, gray wolf, and Canada lynx. Of these 6, only the bald eagle is likely to occur within the vicinity of the Whiskey Ridge site (Erickson et al. 2003). Furthermore, the State of Washington lists 36 threatened or endangered wildlife species. Of these, the ferruginous

hawk (*Buteo regalis*) and greater sage-grouse (*Centrocercus urophasianus*) are the only species recently documented to occur in the vicinity of the Whiskey Ridge site (Erickson et al. 2003). Several other sensitive status species have the potential to occur on the project area (Table 2).

Development corridors were surveyed three times between 17 May and June 29, 2006. An additional survey was conducted on 21 and 22 July, 2006, primarily focused on sage grouse detection. During the May-June period, 48 sage thrashers, 4 sage sparrows, one loggerhead shrike, and one golden eagle were observed (Figure 5). An additional subadult golden eagle observation was made March 24, during an aerial survey (both observations mapped in Figure 5). During the TES survey, one possible ferruginous hawk observation was made of an individual soaring and then landing between turbine strings B and C, no coordinates were mapped due to the distance from the observer. Heat waves prevented positive identification.

4.5 Sage Grouse Surveys

Aerial lek surveys covered the project area with a 2-mile buffer and were conducted on March 24 and April 7, 2006 (Figure 6 and 7). Surveys were conducted between 0530 and 0730 hours, with wind less than 8 MPH and no precipitation. No sage grouse or sage grouse sign were seen at Whiskey Ridge during either the aerial lek surveys or walking ground surveys (see TES species surveys above). Whiskey Ridge had low canopy cover of sagebrush on top of ridges with a very rocky substrate, less big sagebrush, and more stiff sagebrush.

4.6 Incidental/In-transit Observations

One short-horned lizard was observed during TES surveys, as well as two blue grouse with young, and one prairie falcon. Elk were seen at turbine strings A, B, and C during TES sensitive species surveys, numbers were not recorded. Nineteen groups of 612 elk and 10 groups of 149 mule deer were seen during late March and early April aerial surveys (14 groups of 589 elk on April 7). One gyrfalcon was observed during the late March aerial survey.

5.0 DISCUSSION AND IMPACT ASSESSMENT

5.1 Evaluation Criteria

Impacts to avian and bat species are expected to occur from the proposed project. Measured use of the site by avian species in addition to mortality estimates from other existing wind plants is used to predict mortality of birds and bats from the project (site avian use data from Wildhorse Project baseline study; Erickson et al. 2003). For example, use of the site by raptors is relatively low compared to other wind plants and mortality estimates of raptors from other "newer generation" wind plants are relatively low (e.g. <0.04 raptors/turbine/year for Foote Creek Rim wind plant, Wyoming; <0.01 raptors/turbine/ year for the Buffalo Ridge wind plant, Minnesota). Therefore mortality estimates for raptors from the project are expected to be very low. Post construction monitoring is proposed to validate mortality predictions and monitor the actual level of mortality from the project.

Other impacts include direct loss of habitat due to the project facilities, and indirect impacts such as disturbance and displacement from the wind turbines, roads and human activities. Both construction (e.g., blasting) and operations impacts are discussed. Potential impacts are discussed for rare plants, birds, bats, big game, other mammals, reptiles and amphibians, and fish. Discussion of potential impacts to unique species including State and Federal listed species is also included.

5.2 Rare Plants

During the Whiskey Ridge rare plant surveys, no federally-listed 'Endangered', 'Threatened', 'Proposed' or 'Candidate' plant species were found, nor were any Washington state-listed 'Endangered', 'Threatened', or 'Sensitive' plant species found in the survey area. One Washington State 'Review' plant species was found, the hedgehog cactus (*Pediocactus simpsonii*). This species is listed in Review Group 1, meaning more research is needed before assigning a more definitive status. This species appears to be common in the region, and was documented to be relatively widespread during Wildhorse Project vegetation surveys (Lack et al. 2003). The hedgehog cactus populations found within the project area are located in lithosolic habitats. These habitats are well represented within the project area, interspersed among sagebrush steppe and grassland habitats.

Construction: Impacts ***to cactus may occur in development areas (Figure 4) if not marked and avoided, or physically translocated.***

Operations: No impacts to cactus are anticipated after road and facility construction.

5.3 Birds

Avian habitats on the Project area are primarily shrub-steppe, mixed scrub, lithosol, and pine trees. Some upper watershed drainages also provide riparian habitat near the proposed facility. A few springs on site with mixed scrub/shrub-steppe habitat likely provide important water and foraging opportunities for both resident and migrating avian species. The Project area is located within the Pacific Flyway, one of four principal north-south bird migration routes in North America. Bounded roughly by the Pacific Ocean and the Rocky Mountains, the Pacific Flyway extends from the arctic regions of Alaska and Canada to Central and South America. Within the flyway, certain groups of birds may travel along narrower migration corridors, with more well defined paths.

The Project's location along the east flank of the Cascades places it within possible migration corridors of several bird species. Given the limited riparian and other important stopover habitat (water bodies), use by migratory birds is likely low. It would be expected that areas further to the east along and closer to the Columbia River would be more important to migrating birds, including songbirds, waterfowl and raptors.

Potential impacts to birds using the study area include fatalities from collision with wind turbines or from construction equipment, loss of habitat, disturbance to foraging and breeding behavior, collision with overhead power lines, and electrocution. Project-related human activity could alter bird behavior and cause displacement during the construction phase of the Project, and the post-construction density of turbines and facilities on the developed portion of the site may alter avian use.

Construction: Wind plant construction may affect birds through loss of habitat, potential fatalities from construction equipment, and disturbance/displacement effects from construction and human occupation of the area. Potential ***mortality from construction equipment on site is expected to be quite low. Equipment used in wind plant construction generally moves at slow rates (e.g., cranes) or is stationary for long periods. The risk of mortality from construction to avian species is most likely limited to potential destruction of a nest with eggs or young for ground and shrub nesting species when equipment initially disturbs the habitat. Disturbance type impacts can be expected to occur if construction activity occurs near an active nest or primary foraging area. Birds displaced from these areas may move to areas with less disturbance, however, breeding effort may be affected and foraging opportunities altered during the life of the construction. A disturbance impact to one raptor nest, the red-tailed hawk nest north of turbine D1 (Figure 5), could occur if construction occurs on the***

proposed road and transmission line within 300 meters of the nest during the breeding and nesting season. Otherwise, no disturbance impacts to raptor nests are anticipated.

Operations: Substantial data on avian mortality at operational windplants are currently available (e.g., Erickson et al. 2001, Erickson et al. 2004, Young et al. 2006). Outside of California and based on the 2001 summary (Erickson et al. 2001), diurnal raptor fatalities composed only 2% of wind plant-related fatalities. Passerines (excluding house sparrows and European starlings) were the most common collision victims, composing 82% of the 225 fatalities documented. No other group (e.g., raptors, waterfowl) composed more than 5% of fatalities. Of 841 avian fatalities reported from California studies (>70% from Altamont Pass, CA) in Erickson et al. (2001), 39% were diurnal raptors, 19% were passerines (excluding house sparrows and European starlings), and 12% were owls. Non-protected birds including house sparrows, European starlings, and rock doves composed 15% of the fatalities. Other avian groups generally made up less than 10% of fatalities.

Because of differences in rotor swept area, and similarly nameplate MW output among turbines included in mortality studies, fatality rates are presented both in terms of estimated number of fatalities/MW/year and fatalities/turbine/year. The estimated number of fatalities/MW/year is used as the basis for predicting impacts of the project. This MW approach assumes that the fatality rates are approximately proportional to the MW nameplate of the turbine, which yields results similar to assuming fatality rates are proportional to the turbine's rotor swept area. Although some research suggests that larger turbines with slower rpm's and larger ground clearance may be safer for some bird groups such as raptors (e.g., Smallwood and Thelander 2004). However, this relationship for different sizes of newer generation turbines has not been clearly defined. Therefore, assuming fatality rates are proportional to a turbine's MW nameplate is considered a conservative approach for estimating impacts.

For all avian species combined, estimates of the number of bird fatalities per MW per year from individual studies have ranged from 0 at Searsburg, VT, and Algona, IA sites (Kerlinger 1997, Demastes and Trainer 2000, respectively) to approximately 10 (7.7/turbine/year) at the Buffalo Mountain, TN site (Nicholson et. al. 2003). The overall U.S. average number of avian collision fatalities is 2.19/turbine/year, or approximately 3/MW/year (Erickson et. al. 2001).

Project and turbine characteristics of five Pacific Northwest regional wind facilities where standardized fatality monitoring has been conducted are described in Table 4. Average fatality estimates from these projects for all birds have ranged from 0.6 to 3.6 fatalities/turbine/year or 0.9 to 2.9 fatalities/MW/year (Table 5). The only species representing more than 10% of the documented fatalities has been horned lark, the most commonly observed species at all of these facilities during daytime use surveys (Table 6). Using 2002-2003 Wildhorse Project baseline data, overall estimated bird use was not high relative to other open habitat project sites in the U.S., suggesting that mortality estimates observed at these projects provide a strong basis for predicting mortality impacts for the Project. The following addresses background information and wind facility operations impact assessment for raptors, passerines, and waterbirds.

5.3.1 Raptors

The Altamont Pass Wind Resource Area (APWRA) has had a history of high raptor mortality (Orloff and Flannery 1992, Smallwood and Thelander 2004). The APWRA consists of approximately 5000 mostly small (<200 kW) older wind turbines located in a 60 square mile area. Approximately 500 – 1300 raptors are estimated to be killed annually at this site (Orloff and Flannery 1992, Smallwood and Thelander 2004) based on estimates of approximately 1 to 2.2 raptor fatalities/MW/year. The most common raptors killed include red-tailed hawks, American kestrels, burrowing owls, golden eagles, and barn owls. Until just recently, the largest operating turbines were 330-kW turbines, with rotor diameters of 33 m.

Wind turbine design has changed significantly since the first large wind plants were developed in California such as those in the APWRA. Turbines are now typically installed on tubular steel towers instead of lattice towers and without open platforms at the top of the tower, eliminating perching and nesting opportunities for raptors and other birds. Raptors and ravens commonly nest one turbines within the APWRA. No observations have been made of raptors perched on the new turbine types during studies at Foote Creek Rim (WY) (Johnson et al. 2000a), Buffalo Ridge (MN) (Johnson et al. 2000b), Vansycle (OR) (Erickson et al. 2000), Hopkins Ridge (Young et al. 2007) and Stateline (OR/WA) (Erickson et al 2004), suggesting that new turbines are not a perch attractant for birds.

Collisions with wires and electrocutions have been a common source of mortality at Altamont Pass (CA) (Orloff and Flannery 1992) and other older wind projects, whereas electrical collection lines between turbines in new-generation wind plants are typically buried underground to eliminate perching opportunities, collisions with wires, and electrocutions. Overhead lines within new wind plants are typically designed to be raptor safe from electrocution and anti-perching devices are often installed (e.g., Stateline Wind Project, OR/WA, Nine Canyon Wind Project, WA).

Turbines are much larger, with blades moving at fewer revolutions per minute (rpm) and are therefore presumably more visible than blades on the smaller older turbines. For example, the blades of the 1.5-MW turbines installed at the Klondike (OR) wind plant turn at approximately 20 rpm's, contrasted to greater than 60 rpm's for the Kenetech 56-100 downwind turbine, the most common turbine at the Altamont Pass (CA) wind plant. Blade tip speeds are similar for both new generation and old generation wind turbines. While relationship between blade tip speed and mortality is unknown, it is presumed that rpm's play a factor in avian mortality due to decreasing ability to distinguish blades and blade position as rpm's increase.

Raptor mortality has been much lower at all new generation wind projects in the U.S compared to the APWRA. The highest reported raptor fatality rate at new generation wind projects occurred at the facility in Solano County, California. The High Winds Project is a 162-MW facilty consisting of 91 1.8-MW turbines located in an area with very high raptor use estimates compared to the APWRA, especially for American kestrels. Raptor mortality estimates of approximately 0.3/MW/year have been reported based on preliminary data, with most of mortality consisting of American kestrels. Overall raptor use at High Winds is estimated to be higher than estimated at APWRA overall (1.5 to approximately 2 times), and 7 times higher for American kestrels.

Mean raptor use at the Project site is relatively low (<0.5/20- min survey; 2002-2003 Wildhorse data) compared to several other wind plants in the U.S that have been surveyed using similar methods, and much lower than both the High Winds Facility (3.5/20-min survey) and the APWRA (~2.3/20 min survey) (Figure 8). Projects in the region consistently observe red-tailed hawk, American kestrel, northern harrier, and wintering rough-legged hawks as the most abundant raptor species.

Raptor nest density within the Whiskey Ridge site and a 2-mile buffer was 0.07/mi^2, which is much lower than the average raptor nest density for other representative proposed and existing wind facilities in mixed-habitat landscapes (Table 7). At Klondike I, OR, raptor nest density was 0.15/mi^2 within 5 miles of the project area but no raptor mortality was documented during a one-year fatality monitoring study (Johnson et al. 2003). At Buffalo Ridge, MN, raptor nest density was also 0.15/mi^2, and the only documented raptor mortality over a 6-year period was a single red-tailed hawk (Osborn et al. 2000, Johnson et al. 2002). Raptor nest density at the large Stateline Windplant on the OR/WA border was 0.21/ mi^2 and raptor mortality was estimated to be 0.09 raptor fatalities/MW/year, consisting primarily of red-tailed hawks and American kestrels. Raptor nest density for the 41-MW Combine Hills Wind Project, adjacent to Stateline, was estimated to be 0.24/mi^2, and no raptor fatalities were documented the first year of operation (Young et al. 2005). Raptor nest density for the recently permitted Hopkins Ridge Wind

Project in Columbia County, Washington was 0.43/mi^2 (Young et al. 2003), and raptor mortality was estimated to be 0.14 raptor fatalities/MW/year (Young et al. 2007). Raptor nest densities are also available for other wind plants in the region, including Condon, Oregon (0.06/mi^2), Nine Canyon, Washington (0.03/mi^2), and Zintel Canyon, Washington (0.08/mi^2). Very few raptor fatalities have been documented at those smaller facilities (1 rough-legged hawk at Condon; American kestrel, and short-eared owl at Nine Canyon).

Given the information on raptor use and nesting density at this and other projects, the habitat and topographic characteristics of the site, and relevant mortality data from nearby projects, raptor fatality rates are anticipated to be low (<0.1/MW/year). We expect the majority of the fatalities of diurnal raptors to consist of red-tailed hawks and American kestrels. Aside from great horned owls, red-tailed hawks and American kestrels have the largest estimated raptor population sizes in North American (979,000 and 2,175,000, respectively; Millsap and Allen 2006). Monitoring results from the Wildhorse Project for 2007 will provide additional data for raptor fatality predictions in this eastern Kittitas region.

5.3.2 Passerines/Songbirds

Passerines, often referred to as songbirds, have been the most abundant avian fatality at wind plants outside California often composing more than 80% of the total avian fatalities (Erickson et al. 2001, Erickson et al. 2002). Passerines are also the most commonly observed birds during point count surveys at all of these sites. Both migrant and resident passerine fatalities have been observed.

Songbird mortality at operating wind projects in eastern Oregon and Washington has been reasonably consistent. Horned larks have been the most commonly observed resident songbird fatality at agriculture and grassland projects in the Pacific Northwest (Table 6), and have been the most abundant songbird observed during point count surveys at these sites. Based on the U.S. Geological Survey's Breeding Bird Survey (BBS) data, horned larks are likely one of the most common birds in the Columbia Plateau. Otherwise, no other resident songbird species has composed a large proportion of the fatalities observed at the projects in the Pacific Northwest.

Studies of nocturnal migration at several wind plants suggest that the mortality compared to the number of birds passing through the area is low (Johnson et al. 2002, Mabee and Cooper 2002, McCrary et al. 1984). In much of the West, songbirds appear to migrate across a broad front, except in unique topographic situations such as coastlines, and large river valleys or riparian corridors. In the Pacific Northwest, nocturnal migration has been studied at the Stateline Wind Project on the Oregon/Washington border (Mabee and Cooper 2002), as well as some small sampling effort at the Nine Canyon Wind Project in Washington. The Stateline study was designed to monitor waterfowl, shorebird, and passerine movements during two fall migration seasons (2000 and 2001) and one spring migration seasons (2001). Marine radar was used to study nocturnal bird migration at two stations: one near the existing Vanscycle Wind Project near the southeastern end of the Stateline project area, and one to the north of the project area in Washington. The northern and southern stations had very similar passage rates, suggesting broad front movements throughout the project site.

There have been numerous events recorded at communication structures that document up to several hundred avian fatalities in one night, while there have been only two events reported, both reasonably small, at U.S. wind generation facilities. Fourteen fresh nocturnal migrating passerine fatalities were observed at two adjacent turbines during a single search at the Buffalo Ridge wind project in Minnesota during spring migration (Johnson et al. 2002). Approximately 25-30 nocturnal migrating passerine fatalities were observed at three turbines and a well-lit substation at the Backbone Mountain, WV facility during one or two nights of foggy weather (Kerns and Kerlinger 2004). The data suggest that sodium vapor lamps at the substation were the primary attractant, since fatality locations were correlated with the

location of the substation, and the other turbines away from the substation had few fatalities documented the morning after the event. After the lights were turned off at the substation, no events occurred.

Tall, lighted structures are suspected of attracting nocturnal migrating birds, especially during inclement weather (Kerlinger 2000). Lighting at communication towers, where larger mortality events have been documented, is typically different than lighting at wind turbines. Communication towers commonly have more than one light location on a tower, while wind turbines have only one location for the light (on top of the nacelle, per FAA requirements). Communication towers often have one red pulsating or flashing light on the top of the tower, and several solid red lights at various heights1. Communication tower lighting may be more of an attractant than wind turbine lighting (Kerlinger 2004), but research and data are limited. No large measured differences in nocturnal migrant fatality rates have been documented between wind turbines that are lit with aircraft obstruction lighting and unlit turbines. At the Stateline (OR/WA) Wind Project, observed fatality rates at lit turbines were slightly higher than at unlit turbines, although none of the differences were statistically significant ($p>0.10$) (Erickson et al. 2004). Similar results were found at the Nine Canyon wind project, which has the same lighting characteristics (red-flashing at night) but on larger and taller turbines than Stateline turbines (Erickson et al. 2003b). The Buffalo Ridge wind project showed a similar result for turbines similar in size to Stateline, although lighting types differ (i.e., steady-burning red incandescent; Johnson et al. 2002). Buffalo Ridge wind project Phase I turbines were not lit, whereas Phase II turbines had approximately every other turbine lit with solid red lights (approximately 70 of 143 turbines). Six of the 138 Phase III turbines along the outer boundary of the site were lit with solid red lights. No statistical differences were found between lit and unlit turbines.

Based on mortality observed at other operating wind projects located in similar landscapes (Erickson et al. 2004, Erickson et al. 2003b, Johnson et al. 2003, Young et al 2005, 2007), an approximate range of 1.0 to 2.75 songbird fatalities/MW/year are predicted for the Project. The largest number of fatalities will likely be horned larks, a common grassland songbird. No other species (migrant or resident) is anticipated to make up a large proportion of the fatalities, based on the patterns of results of other regional studies. No impacts to threatened or endangered songbird species are anticipated.

5.3.3 Waterfowl and Other Waterbirds

Wind plants with year-round waterfowl use have shown the highest waterfowl mortality, although levels of waterfowl/waterbird mortality appear insignificant compared to use of the sites by these groups. Two Canada goose fatalities were documented at the Klondike I wind plant, OR, although several Canada geese flocks were observed during preconstruction surveys (Johnson et al. 2003). Few Canada goose fatalities have been observed at U.S. wind projects (Erickson et al. 2004).

The recently constructed Top of Iowa Windfarm, comprised of 89 turbines with tip heights of 97.5 meters (320 feet), is located in cropland between three Wildlife Management Areas (WMAs) with historically high bird use, including migrant and resident waterfowl, shorebirds, raptors, and songbirds. During a recent study, approximately 1 million total goose-use days and 120,000 total duck-use days were recorded in the WMAs during the fall and early winter, yet no waterfowl fatalities were documented during concurrent and standardized wind project fatality studies.

Similar findings were observed at the Buffalo Ridge Wind Project in southwestern Minnesota (Johnson et al 2000b), which is located in an area with relatively high waterfowl/waterbird use and some shorebird use. Some large flocks of snow geese, and Canada geese and mallards were the most common waterfowl observations. Five of the 55 fatalities observed during the fatality studies were waterfowl, including 2

[1] Recent FAA lighting regulations released in 2005 for wind turbines favor solid red lighting during the night, and white lights with some strobe during the day. Wind projects are to be "outlined" with lighting rather than every turbine being lighted.

mallards, 2 American coots, and 1 blue-winged teal. One herring gull, one pied-billed grebe, and one killdeer were the only other waterbird fatalities found.

Canada geese were the only waterfowl observed flying over the Project area in the 2002-2003 baseline study. Other migrant species may also fly over the Project area, however overall use of the site is predicted to be very low due to the predominant shrub-steppe habitat lacking stopover or foraging opportunities. Waterfowl mortality on average is expected to be very low. The possibility exists for a rare event involving several individuals of a flock colliding with wind turbines given unusual weather circumstances. However, this would have negligible effects, if any, on the Pacific population of Canada geese (exhibiting an increasing trend over the last decade, USFWS 2003).

5.3.4 Displacement Effects

The presence of wind turbines may alter the landscape so as to change wildlife habitat use patterns, thereby displacing wildlife from areas near turbines. Several studies have been conducted in the U.S. looking at the potential displacement effects on birds; however most of the studies focused on grassland bird and raptor species (e.g., Leddy et al. 1999, Erickson et al. 2004, Osborn et al. 1998). "Displacement" means that birds tend to avoid an area. However, avoidance of an area may not imply impacts on population parameters such as population size, and such impacts have not been documented. While displacement effects have been documented for some species/groups in U.S. and Europe, there is little information on whether displacement effects have any real impacts on population parameters such as population size and reproduction.

Avian baseline studies of the Foote Creek Rim (FCR), WY wind plant conducted in 1994 and 1995 documented mountain plovers (*Charadrius montanus*)[2] in the proposed development area. Construction of the Foote Creek Rim Wind Plant began in the fall of 1997. Phase I of the wind plant project as identified in the BLM Environmental Impact Statement was construction of turbines in several units on the southern end of Foote Creek Rim. Development of Phase I of the wind plant took place between 1997 and 2000 during which four construction units were completed totaling 133 turbines. This wind plant is located in shortgrass prairie habitat on a mesa topographic feature with a relatively flat top and steep sloping sides. Habitat on top of Foote Creek Rim is suitable for mountain plovers which prefer flat areas with a prevalence of bare ground and short vegetation. Transect surveys to census mountain plovers were conducted on an annual basis through 2004.

In 1995, the estimated mountain plover population size for the Foote Creek Rim wind plant was approximately 60 individuals. The estimated population size declined through 1999 to 18 individuals when only 39 total observations of mountain plovers were made during the surveys. After 1999, the estimated population size in the wind plant rose slowly to 36 during the 2003 and 2004 field seasons when 89 and 66 total plovers were observed, respectively. The period of plover population decline on Foote Creek Rim (1995-1999) also corresponds with the wind plant construction period (1998-2000). It is unknown whether plovers were simply displaced from the rim due to the construction activity or if the population in the area was experiencing a decline in numbers. The initial impression is that the low population on Foote Creek Rim from 1998-2000 followed by a steady recovery was related to displacement during construction of the wind plant and subsequent habituation to the facility by plovers. However, it is hard to separate potential displacement type effects from a broader decline in the mountain plover population. The Foote Creek Rim population appeared to be declining prior to the initiation of

[2] The U.S. Fish Wildlife Service proposed listing mountain plover as a threatened species under the Endangered Species Act in February 1999 (USFWS 1999). Prior to this time, mountain plover had been included on the USFWS list of *candidate* species. In 2003, the USFWS found that listing mountain plover as threatened was not warranted and the proposed rule was withdrawn stating that the threats to the species as identified are not as significant as earlier believed, and the plover is now not listed.

construction. Also, declines in other regional populations (southeast Wyoming - northeast Colorado) suggest a larger species-wide or regional decline during the decline observed at Foote Creek Rim.

Based upon European research summaries, displacement impacts on breeding waterbirds, shorebirds, and waterfowl have been less than impacts on non-breeding birds. European studies suggest variable levels of disturbance for feeding and roosting birds (Spaans et al. 1998). Based on this European summary, the authors concluded that with the exception of lapwings, black-tailed godwits, and redshanks, species used areas for breeding that were close to the wind farms. In general, the displacement effects (areas with reduced densities) rarely exceeded 100 m for breeding birds. During the non-breeding season many bird species of open landscapes avoided approaching wind parks closer than a few hundred meters, and this avoidance behavior was especially noted for waterfowl and shorebirds. Displacement effects of up to 600 m from wind turbines (reduced densities) have been reported for some waterfowl species (e.g., pink-footed goose *Anser brachyrhunchus*, and European white-fronted goose). However, a study in the U.S. did not document such a large scale displacement impact. Based on preliminary analysis at the large Top of Iowa wind facility, no large scale displacement of Canada geese was apparent based on counts and behavior observations of geese in areas with and without turbines (Koford and Jain 2004).

At a large wind plant on Buffalo Ridge in Minnesota, the abundance of shorebirds, waterfowl, upland gamebirds, woodpeckers, and several groups of passerines was found to be statistically significantly lower at survey plots with turbines than at plots without turbines. There were fewer differences in avian use as a function of distance from turbines, however, suggesting that the area of reduced use was limited primarily to those areas within 100 meters of the turbines (Johnson et al. 2000b). Some portion of these displacement effects is likely to be the result of direct loss of habitat near the turbine for the turbine pad and associated roads. These results are similar to those of Osborn et al. (1998), who reported that birds at Buffalo Ridge avoided flying in areas with turbines. Also at Buffalo Ridge, Leddy et al. (1999) found that densities of male songbirds were significantly lower in Conservation Reserve Program (CRP) grasslands containing turbines than in CRP grasslands without turbines. Grasslands without turbines and portions of grasslands located at least 180 meters from turbines had bird densities four times greater than grasslands located near turbines. Reduced avian use near turbines was attributed to avoidance of turbine noise and maintenance activities and reduced habitat effectiveness because of the presence of access roads and large gravel pads surrounding turbines (Leddy 1996, Johnson et al. 2000b).

Preliminary results from the Stateline (OR/WA) Wind Project suggest a relatively small-scale impact of the wind facility on grassland nesting passerines, with a large portion of the impact due to direct loss of habitat from turbine pads and roads and temporary disturbance of habitat between turbines and road shoulders (Erickson et al. 2004). Horned larks appeared least impacted, with some suggestion of displacement to grasshopper sparrows, although sample sizes were limited.

Some indirect impacts to birds in shrub-steppe habitat are anticipated. Given that displacement effects have been relatively low at other projects (reduced densities <100 m from turbines/roads), indirect impacts are anticipated to be minimal. Additionally, the majority of the proposed turbines are located in sparse shrub-steppe or lithosols, many of the shrub-steppe obligate species were observed away from proposed permanent facilities (Figures 4 and 5).

5.4 Big Game

The site receives some year-round use by mule deer and elk, but it is more concentrated in the winter. During the April 7, 2006, aerial sage grouse lek and raptor nest survey, 14 groups of 589 elk and 7 groups of 126 mule deer were observed within the project area and 2-mile buffer. WDFW have expressed concern over potential effects of wind project development and operation on wintering big game. Winter

is a crucial period of time for the survival of many big game species. Severity of winter and availability of forage are important factors related to over-winter survival (Reeve and Lindzey 1991). Increases in human activity from vehicles and other sources and habitat fragmentation, depending on the levels, are postulated to affect over-winter survival (Stephenson et al. 1996, Brown 1992).

The Project is located within habitats designated by WDFW as winter range for mule deer and elk, and is located in the extreme southeast region of the Quilomene migration corridor. The Quilomene elk winter range is approximately 83,000 acres in size and winters approximately 1500-2000 elk. The Colockum elk calving area is north of the Project. The Quilomene mule deer winter range is approximately 40,000 acres in size and winters approximately 700-800 deer. The project area is not located within the high density deer sub-area of Quilomene mule deer winter range which winters 100-200 deer. This area begins approximately 1.5 miles to the north east of the Project area, and extends down to the Columbia River. The project area is also not located within the Quilomene primary winter range, a sub-area of the Quilomene winter range, which winters approximately 500 elk.

Wintering elk forage on native grass species such as Sandberg's bluegrass, which greens up with fall and winter rains, while mule deer likely utilize more shrub species in the project area. Wind-blown slopes and ridges remain snow-free most of the year. West and south-facing slopes green up earlier and provide accessible nutritious forage during the harsh winter months and early spring. Mule deer and elk also use the site during other seasons. Nearby drainages and mid-elevation rock strata and springs provide riparian and mixed scrub habitats for cover and water. Mule deer and elk hunting have been allowed on the Project area lands historically.

Construction: Elk and mule deer are expected to be temporarily displaced from the site due to the influx of humans and heavy construction equipment and associated disturbance (e.g., blasting). Construction related disturbance and displacement is expected to be limited to the 9-12 month construction period. Most heavy construction is expected to take place during the summer months, minimizing construction disturbance to wintering big game. In addition, construction will likely not take place in severe winters, when big game impacts may be of most concern. Following completion of the Project, the disturbance levels from construction equipment and humans will diminish significantly and the primary disturbances will be associated with operations and maintenance personnel, occasional vehicular traffic, and the presence of the turbines and other facilities.

Operations: There is little information regarding wind project effects on big game. At the Foote Creek Rim wind project in Wyoming, antelope observed during raptor use surveys were recorded year round (Johnson et. al. 2000a). The mean number of antelope observed at the six survey points was 1.07 prior to construction of the wind farm and 1.59 and 1.14/survey the two years immediately following construction, indicating no reduction in use of the immediate area. Mule deer and elk also occurred at Foote Creek Rim, but their numbers were so low that meaningful data on wind farm avoidance could not be collected. A more recent study regarding interactions of elk populations with operating wind farms was recently conducted by David Walter in conjunction with the Rocky Mountain Elk Foundation, the Oklahoma Department of Wildlife Conservation, Nature Works, and the Oklahoma Cooperative Fish and Wildlife Research Unit (Walter et al. 2004). The study found no evidence that operating wind turbines have a measurable impact on elk use of the surrounding area. The operating Wildhorse wind facility, immediately adjacent to the proposed Whiskey Ridge project, has numerous observations of elk near operating wind turbines (WEST biotechnicians, pers. comm..). These observations have noted elk behavior of non-alarm or distress and include resting, grazing, and walking.

There are published studies of big game winter use related to other human developments such as oil and gas. Indirect impacts associated with human activity or development has been documented with elk (e.g., Lyon 1983, Wisdom et al. 1986, Czech 1991, Morrison et al. 1995, Rowland et al. 2000) and mule deer

(e.g., Rost and Bailey 1979, Easterly et al. 1992, Merrill et al. 1994, Sawyer et al. 2004). In south-central Montana, Van Dyke and Klein (1996) documented elk movements through the use of radio telemetry before, during, and after the installation of a single oil well within an area used year round by elk. Drilling activities during their study ceased by November 15, however, maintenance activities continued throughout the year. Elk showed no shifts in home range between the pre and post drilling periods, however, elk shifted core use areas out of view from the drill pad during the drilling and post drilling periods. Elk also increased the intensity of use in core areas after drilling and slightly reduced the total amount of range used. It was not clear if the avoidance of the well site during the post-drilling period was related to maintenance activities or to the use of a new road by hunters and recreationists. The authors concluded that if drilling activities occupy a relatively small amount of elk home ranges, that elk are able to compensate by shifting areas of use within home ranges.

A study by Rost and Bailey (1979) found that wintering mule deer and elk avoided areas within 656 ft (200m) of roads in eastern portions of their Colorado study area, where presumably greater amounts of winter habitat were present. Road avoidance was greater where roads were more traveled. Only mule deer showed a clear avoidance of roads in the western portion of their study area, where winter range was assumed to be more limiting. Mule deer also showed greater avoidance of roads in shrub habitats versus more forested areas. The authors concluded that impacts of roads depended on the availability of suitable winter range away from roads, as well as the amount of traffic associated with roads.

Oregon radio-telemetry studies of elk and mule deer have been conducted in a large fenced experimental research area. Results of spring studies (April – early June) suggest that elk habitat selection may be negatively related to traffic and other human disturbance (Johnson et al. 2000c). Mule deer habitat selection appeared to be related to elk distribution, with mule deer avoiding areas used by elk. Traffic and roads did not appear to be an important factor in spring distribution of mule deer (Wisdom et al. 2002). Distances moved by elk tended to increase as a function of increased use by humans, including ATV use, hiking, and horseback riding. The same was true for mule deer, but the response was less than that of elk (Wisdom et al. 2002). In western Wyoming, a multi-year GPS/radio-telemetry study suggests that winter mule deer habitat selection and distribution patterns have been affected by natural gas development, specifically by road networks and well pads (Sawyer et al. 2004).

We are aware of no studies that have documented population level impacts. Most of the studies have focused on displacement of big game, but have not determined whether these displacement effects result in any significant population level effects such as decreases in survival. Due to the lack of data regarding the potential impacts of energy development on big game, it is difficult to predict with certainty the effects of the Project on wintering mule deer and elk. While human related activity at wind turbines during regular maintenance will be dramatically less than during the construction period, it is not known if human activity associated with regular maintenance activity will exceed tolerance thresholds for wintering elk and mule deer. The Project will have the benefit of being under the spatial umbrella of the Wildhorse project grazing management plan which is designed to support and expand optimal forage production and improved wildlife habitat. This Project area has historically been overgrazed, coordination with WDFW and Wildhorse project personnel may provide ideas for mitigating impacts to wintering big game habitat and wildlife habitat in general.

5.5 Bats

Due to the current lack of understanding of bat communities in North America, the species and relative abundance of bats occurring in the project area are difficult to determine. Little is known about bat

species distribution, but several species of bats could occur in the Project area based on the Washington GAP project and inventories conducted on the Hanford Site, Arid Lands Ecology Reserve (ALE) located in Benton County to the south (Table 3). The potential for bats to occur is based on migratory patterns and key habitat elements such as food sources, water, and roost sites. The various springs within the Project area may be used as foraging and watering areas.

Construction: Impacts ***to bats or bat habitat on the site are unlikely during construction.***

Operations: Bat casualties have been reported from most windpower facilities where post-construction fatality data are available. Reported estimates of bat mortality at windpower facilities have ranged from 0.01 – 47.5 per turbine per year (0.9 – 43.2 bats/MW/year) in the U.S. with an average of 3.4 per turbine or 4.6 per MW (NWCC 2004). Most of the bat casualties at windpower facilities to date are non-hibernating migratory species that conduct long-distance migrations between summer breeding and wintering areas, namely the hoary bat, eastern red bat and silver-haired bat (Johnson 2005). A recent report documented from 25–38 bat fatalities per turbine during a 6 week study period at windpower facilities in West Virginia and Pennsylvania. Most of the species killed were eastern red bat, hoary bat, and eastern pipistrelle (Kerns et al. 2005). The West Virginia and Pennsylvania sites are located on prominent forested ridges in the Appalachian Mountains. A large number of hoary and silver-haired bats (532) were also found at a southern Alberta, Canada wind farm in 2005. Unlike the eastern U.S. wind farms with high bat mortality, the Alberta facility is in open grasslands and cropfields, although it is adjacent to foothills along the Rocky Mountains and may be in a bat migration corridor (Rowland 2006). The causes of the relatively high number of migratory bat deaths at windpower facilities are not well understood (Johnson 2005). Kerns et al. (2005) hypothesized that bats may have been attracted to turbines by ultrasound emissions, ephemeral increases in food sources, or bats may have investigated turbines for roosting sites or to glean insects from turbine blades. Researchers also theorized that clearings made in the forest for turbines and roads may have created attractive foraging areas for bats (Kerns et al. 2005).

Unlike the West Virginia and Pennsylvania sites, the proposed project area does not contain topographic features that may funnel migrating bats and is lacking large tracts of forest cover. The proposed project is not located near any large, known bat colonies, thus the majority of bat casualties are likely to be migrants. The proposed project will likely result in the mortality of some bats; however, fatality levels are not expected to reach those observed in the eastern U.S. or Alberta. Existing projects in Washington and Oregon have reported bat mortality near the low end of the national range (i.e., less than 3 bats/turbine/yr). At the Vansycle Ridge Wind Project in Oregon, bat mortality was estimated at 0.74 bats per turbine for the first year of operation (Erickson et al. 2000). At the Klondike Windpower Project, bat mortality was estimated at 1.16 bat fatalities per turbine per year (Johnson et al. 2003). At the Stateline Windpower Project, bat mortality was estimated at approximately 1 to 2 bat fatality per turbine per year (Erickson et al. 2004) from July 2001 through December 31, 2002. At the Nine Canyon Wind Project, bat mortality was estimated at approximately 3 bat fatalities per turbine per year (Erickson et al. 2003). Bat mortality patterns at wind plants in Washington and Oregon have followed patterns similar to the rest of the country. Over 90% of the mortality documented at wind projects in these open habitat projects has been hoary and silver-haired bats. The other mortalities have consisted of occasional big brown bats, little brown bats, and some unidentified bats. The hoary bat is a non-hibernating migratory species with the widest distribution of any bat in North America, ranging from just below the Canadian tree line to South America (Shump and Shump 1982). They are solitary bats that roost primarily in deciduous trees (Barbour and Davis 1969, Nordquist 1997) and occasionally in coniferous trees (Gruver 2002). Silver-haired bats are also migratory (Izor 1979, Kunz 1982, Barclay *et al.* 1988). Historically, silver-haired bats were also believed to be strictly solitary tree bats, but recent studies have documented maternal colonies of silver-haired bats (Barclay *et al.* 1998). Virtually all of the mortality at wind power sites has occurred in late summer and early fall, during the fall migration period for hoary and silver-haired bats.

Although potential future mortality of migratory bats is difficult to predict, an estimate can be calculated based on levels of mortality documented at other wind plants. Using the estimates from other wind plants, operation of the proposed project could result in approximately 20 to 60 bat fatalities per year. Actual levels of mortality are unknown and could be higher or lower depending on regional migratory patterns of bats, patterns of local movements through the area, and the response of bats to turbines, individually and collectively. Bat mortality estimates for the Wildhorse Project will be available in 2008, as well as echolocation data from the Whiskey Ridge project which will be collected concurrently with the Wildhorse avian and bat fatality monitoring research.

5.6 Other Mammals

Other mammals that likely exist within the Project site include, badger, coyote, pocket gopher, ground squirrels (*Spermophilus* species) and other small mammals such as rabbits, voles and mice. Construction of the wind project may affect these mammals on site through loss of habitat and direct mortality of individuals occurring in construction zones. Excavation for turbine pads, roads, or other wind project facilities could kill individuals in underground burrows. Road and facility construction will result in loss of foraging and breeding habitat for small mammals. Ground-dwelling mammals will lose the use of the permanently impacted areas; however, they are expected to repopulate the temporarily impacted areas. Some small mammal fatalities can be expected from vehicle activity during operations. Impacts are expected to be very low and not significant.

5.7 Reptiles and Amphibians

Twenty-seven species of reptiles and amphibians occur in Kittitas County and could be present in the project area. Short-horned lizards were observed within the Project area. Other reptiles that may likely occur in the project site include snakes such as the yellow-bellied racer and northern pacific rattlesnake. Amphibian and aquatic reptile habitat is limited within the Project area. Many amphibians migrate short distances during spring or fall breeding periods to and from suitable wetlands and during fall dispersal of juveniles. No migration corridors for reptiles or amphibians are known to be present in the Project area.

Construction: Impacts to reptiles and amphibians on site through loss of habitat and direct mortality of individuals may occur in construction zones. Provided best management practices are employed on site and compliance with applicable permits regarding runoff and sediment control is maintained, no amphibians should be affected by construction or operation of the project. The level of mortality to reptiles on site associated with construction would be based on the abundance of species on site. Some mortality may be expected with common slow-moving reptiles that may occur on site such as short-horned lizards and rattlesnakes. Reptiles that are dormant or using burrows or rock crevices for cover within development corridors may be vulnerable. Excavation for turbine pads, roads, or other Project facilities could kill individuals in underground burrows or rock refuges or hibernacula. While above ground, snakes are likely mobile enough to be less vulnerable to construction equipment, however, short horned lizards do not move fast over long distances and rely heavily on camouflage for predator avoidance. Some individual lizard fatalities can be expected from vehicle activity.

Operations: No impacts to amphibians are anticipated during operations. Impacts to reptiles during operation are likely limited to some potential direct mortality due to vehicle collisions. While above ground, yellow bellied racers and other snakes are likely mobile enough to escape most vehicles, however, short horned lizards do not move fast over long distances and rely heavily on camouflage for predator avoidance. Some lizard fatalities may occur from vehicle activity. Post construction monitoring for avian and bat fatalities should also document reptile use within turbine study plots. Snake and lizard observations have been made at other regional wind facilities and populations appear to persist in close association with operating wind turbines.

5.8 Fish

Based on available information, no fish occur in the project area. Provided best management practices are employed on site and compliance with applicable permits regarding runoff and sediment control is maintained, no fish should be affected by construction or operation of the project.

5.9 Threatened, Endangered, and Sensitive (TES) Species

No impacts to federally threatened or endangered species are anticipated from the project. Bald eagle is the only federal threatened or endangered species documented to occur on the project site.

5.9.1 Bald Eagle

Only one bald eagle observation was reported by Erickson et al. (2003) for the Wildhorse baseline study. This winter observation was about 1.5 miles southeast of the proposed project, of an adult flying high over Whiskey Creek. No bald eagle nests were observed during raptor nest surveys. Based on the apparent low use of the project area by bald eagles, impacts to the species are considered negligible. No bald eagle fatalities have been observed at other wind projects, and many have estimated bald eagle use similar or higher than this Project (Erickson *et al.* 2001). Although the risk is low, the potential exists for bald eagle fatalities during operation of the Project. The status of bald eagle in the Project area and range wide is not expected to change due to the Project. Bald eagle populations have been increasing and USFWS has proposed the species for delisting (USFWS 1999). Bald eagle populations in Washington and throughout North America will likely continue to increase during and after the project is constructed.

5.9.2 Golden Eagle

Erickson et al. (2003) reported low use year-round by golden eagles for the Wildhorse baseline study. No active nests were documented during 2002-2003 or 2006 aerial surveys. Golden eagles have nested historically within two miles of the proposed project area. Overall use of the proposed project area by golden eagles is relatively low compared to other wind plants where golden eagle fatalities have been documented. The project is in the northern area of the Great Basin Bird Conservation Region (BCR) which has a population estimated to be approximately twice the size of populations in all three other BCRs east of the cascades (Good et al. 2007). While the potential exists for golden eagles to collide with turbines at the proposed facility, overall risks to golden eagle populations are considered low and only a few individuals are expected to collide with turbines over the life of the project.

5.9.3 Sage Sparrow and Sage Thrasher

Sage sparrows and sage thrashers breed within sagebrush and shrub habitats within the proposed project area. Most sagebrush and other shrub habitats within the project area occur on the sides of ridges and in drainages, while most turbines will be located on ridge tops lacking dense shrub habitats. Observations of breeding individuals indicate that the species generally does not fly within blade height (Erickson et al. 2003). The potential exists for migrating individuals to collide with turbines. Displacment effects from operations my occur with these two species. However, the majority of the proposed turbines are located in sparse shrub-steppe or lithosols, many of the 2006 sage thrasher and sage sparrow observations were away from proposed permanent facilities (Figures 4 and 5; see 'Displacement Effects' section above). Overall impacts to sage sparrow and sage thrasher populations are considered negligible.

5.9.4 Sage Grouse

The project area was used historically by sage grouse (WDFW PHS Data), and is located along the western edge of the Colochum proposed sage grouse management unit (Stinson pers. comm.). The Colochum management unit primarily provides connectivity between the populations with the Yakima Training Center and the Douglas County population. No sage grouse or leks were observed during sage grouse surveys in March and April, 2003 within and surrounding the Wildhorse project. No sage grouse, sage grouse scat, or leks were observed during surveys from March through July, 2006. The nearest

known active lek is approximately 7 miles south of the Wildhorse project on the Yakima Training Center. Sage grouse have historically been observed in the Project area, especially in the fall and winter. Broods have been observed in the general vicinity of the Project, suggesting some historical nesting may have occured near the Project. Presence of young broods at the Foote Creek Rim Wind Project suggest nesting has likely occured somewhere near wind turbines, although the nesting location relative to the wind project is not known (WEST, R. Good, pers. comm.). The proposed project is not expected to negatively impact nesting habitat for sage grouse. Given expansive intact shrub-steppe habitat to the east of the proposed project and existing Wildhorse project, the project should not impact connectivity between Douglas County populations and the Yakima and Kittitas County populations.

5.9.5 Peregrine Falcon

The nearest known peregrine eyrie is located approximately 6.5 miles from the Wildhorse project area. No peregrine falcon eyries were located during 2002-2003 or 2006 raptor nest surveys. Cliff habitat is not present within two miles of the project area. Most suitable peregrine falcon nesting habitat is located along the Columbia River and it is unlikely that peregrine falcons will nest within two miles of the project area. Use of the project area by peregrine falcons is likely limited to rare dispersal events or occasional individuals migrating or hunting within the project area. No peregrine falcon observations have been made in the project area during 2002-2003 or 2006 surveys. There is a very low risk over the life of the project that an individual peregrine falcon will collide with turbines.

5.9.6 Burrowing Owl

Although no burrowing owls have been documented within the project area during surveys, burrowing owl breeding areas have been designated by the WDFW 3-4 miles southeast of the Wildhorse project area. The potential exists for breeding burrowing owls to occur within the project area. However, considering the lack of sightings within the project area during 2002-2003 and 2006, burrowing owls likely occur only occasionally within the project area, if at all, and no impacts to burrowing owl populations are expected.

5.9.7 Other Bird Species

The potential range of several other species listed as candidates under the Washington Endangered Species Act overlap with the proposed project, including ferruginous hawk, flammulated owl, merlin, northern goshawk, sharp-tailed grouse, common loon, western grebe, loggerhead shrike, Lewis' woodpecker, white-headed woodpecker, and Vaux's swift (Table 2). The potential exists for these species to occur within the project area, however use of the project area is expected to occur very rarely during migration or dispersal events. The potential exists for a few individuals of each species to collide with turbines over the life of the project. Impacts to populations of these species are not anticipated.

5.9.8 Mammals

The Project occurs within the potential range of several species of federally and state protected mammals, which are unlikely to occur within the Project area due to habitat constraints and/or uncertain population status in Washington. These species include Townsend's big-eared bat, long-legged myotis, and long-eared myotis. These species are not expected to occur within the Project area and no impacts to these species are likely to occur.

Both the white-tailed and black-tailed jackrabbits have been documented within Kittitas County, and suitable habitat for these species is present in the Project area. The potential exists for individuals to be killed by vehicles on roads, and some suitable habitat for these species will be lost to turbine pads and road construction. Limits on vehicle speeds within the Project will minimize the potential for road kills, and the permanent loss of suitable habitat is relatively small. Overall, impacts to these species should be minimal.

Suitable habitat for three bat species, which are listed as federal species of concern, is present within the Project area: fringed myotis, small-footed myotis and Yuma myotis. However, only general descriptions of habitat requirements and potential distribution are available for the three species. Very little is known concerning the ecology of the three species, making it even more difficult to accurately predict potential impacts to these species. To date, we are unaware of any documented fatalities of these species at wind projects within the U.S.

Merriam's shrew has been documented within Kittitas County, and suitable habitat for the species occurs within the Project area. The potential also exists for the brush prairie pocket gopher to occur within the project area. Shallow-soiled sparse shrub-steppe and lithosols of the proposed development area limit the potential for these species to be impacted. Assuming these species are present within the Project development area, the construction of turbine pads and roads, and vehicle traffic has the potential to crush individuals within burrows or moving about above ground. Overall, total impacts to habitat are small and no significant impacts to populations of these species are expected to occur as a result of this Project.

5.9.9 Reptiles and Amphibians

The proposed project area occurs within the potential range of the striped whipsnake, sharptail snake, western toad, and Columbia spotted frog. There is very little suitable habitat for amphibians or aquatic reptiles (e.g., turtles) in the study area. None of these sensitive status reptiles or amphibians were documented on the project site and no impacts are anticipated.

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.

Table 1. Rare plant species for which surveys were conducted

Scientific Name/ Common Name	Flowering/ Fruiting Period	Status	Habitat	Species Encountered (Yes/No)
Agoseris elata Tall agoseris	June-August	S	Meadows, open woods, and exposed rocky ridgetops	No
Anemone nuttalliana Pasque flower	May-August	S	Prairies to mountain slopes, typically on well-drained soils	No
Astragalus arrectus Palouse milk-vetch	April-July	S	Grassy hillsides, sagebrush flats, river bluffs, and openings in ponderosa pine and Douglas fir forests	No
Astragalus columbianus Columbia milk-vetch	March-June	SOC/T	Sagebrush steppe	No
Astragalus misellus var. pauper Pauper milk-vetch	April-mid June	S	Open ridgetops and slopes	No
Camissonia pygmaea Dwarf evening-primrose	June-August	T	Unstable soil or gravel in steep talus, dry washes, banks and roadcuts	No
Camissonia scapoidea Naked-stemmed evening primrose	May-July	S	Sagebrush desert, typically in sandy, gravelly areas	No
Collomia macrocalyx Bristle-flowered collomia	Late May-early June	S	Dry, open habitats	No
Corydalis aurea Golden corydalis	May-July	R1	Varied habitats, moist to dry and well-drained soils	No
Cryptantha rostellata Beaked cryptantha	Late April-mid June	S	Very dry microsites within sagebrush steppe	No
Cyperus bipartitus Shining flatsedge	August-September	S	Streambanks and other wet, low places in valleys and lowlands	No

Table 1. Rare plant species for which surveys were conducted				
Scientific Name/ Common Name	**Flowering/ Fruiting Period**	**Status**	**Habitat**	**Species Encountered (Yes/No)**
Delphinium viridescens Wenatchee larkspur	July	SOC/T	Moist meadows, moist microsites in coniferous forest, springs, seeps, and riparian areas	No
Eatonella nivea White eatonella	May	T	Dry, sandy or volcanic areas within sagebrush-steppe	No
Erigeron basalticus Basalt daisy	May-June	C/T	Crevices in basalt cliffs on canyon walls	No
Erigeron piperianus Piper's daisy	May-June	S	Dry, open places, often with sagebrush	No
Hackelia hispida var. *disjuncta* Sagebrush stickseed	May-June	S	Rocky talus	No
Iliamna longisepala Longsepal globemallow	June-August	S	Sagebrush steppe and open ponderosa pine and Douglas fir forest	No
Lomatium tuberosum Hoover's desert-parsley	March-early April	SOC/T	Loose talus and drainage channels of open ridgetops within sagebrush steppe	No
Mimulus suksdorfii Suksdorf's monkey-flower	Mid April-July	S	Open, moist to rather dry places in sagebrush steppe	No
Nicotiana attenuata Coyote tobacco	June-September	S	Dry, sandy bottom lands, dry rocky washes, and other dry open places	No
Oenothera cespitosa ssp. *cespitosa* Cespitose evening-primrose	Late April-mid June	S	Open sites on talus or other rocky slopes, roadcuts, and the Columbia River terrace	No
Pediocactus simpsonii var. *robustior* Hedgehog cactus	May-July	R1	Desert valleys and low mountains	Yes

Table 1. Rare plant species for which surveys were conducted				
Scientific Name/ Common Name	**Flowering/ Fruiting Period**	**Status**	**Habitat**	**Species Encountered (Yes/No)**
Pellaea breweri Brewer's cliff-brake	April-August	S	Rock crevices, ledges, talus slopes, and open rocky soils	No
Penstemon eriantherus var. *whitedii* Fuzzytongue penstemon	May-July	R1	Dry open places	No
Phacelia minutissima Least phacelia	July	SOC/S	Moist to fairly dry open places	No
Pyrrocoma hirta var. *sonchifolia* Sticky goldenweed	July-August	R1	Meadows and open or sparsely wooded slopes	No
Silene seelyi Seely's silene	May-August	SOC/T	Shaded crevices in ultramafic to basaltic cliffs and rock outcrops, and among boulders in talus	No
Tauschia hooveri Hoover's tauschia	March-April	SOC/T	Basalt lithosols within sagebrush steppe with low veg cover, bare rock and gravel prominent; flat microsites	No

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 in 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

Table 2. Species of special status documented as occurring or likely to occur within the vicinity of the project area.

Group/Species	Status[a]	Notes
Mammals		
black-tailed jack rabbit (*Lepus californicus*)	SC	Documented as occurring near the project area. The species is likely to occur within the project area due to the presence of suitable sagebrush and shrub habitats.
white-tailed jack rabbit (*Lepus townsendi*)	SC	Documented as occurring near the project area. The species is likely to occur within the project area due to the presence of suitable sagebrush and shrub habitats.
brush prairie pocket gopher (*Thomomys talpoides douglasi*)	SC	Project occurs within the potential range of the species. No individuals have been documented near the project area.
Merriam's shrew (*Sorex merriami*)	SC	Project occurs within the potential range of the species. No individuals have been documented near the project area.
Townsend's big-eared bat (*Coryhorhinus townsendii*)	SC	Project occurs within the potential range of the species. No individuals have been documented near the project area.
Amphibians and Reptiles		
Columbia spotted frog (*Rana luteiventris*)	SC	The proposed project area occurs within the potential range for the species. Impacts to wetlands and springs on the project are not anticipated and no impacts to the species are anticipated.
western toad (*Bufo boreas*)	SC	The proposed project area occurs within the potential range for the species. Impacts to wetlands and springs on the project are not anticipated and no impacts to the species are anticipated.
sharptail snake (*Contia tenuis*)	SC	The proposed project area occurs within the potential range for the species. No impacts are anticipated, see section 5.9.
striped whipsnake (*Masticophis taeniatus*)	SC	The proposed project area occurs within the potential range for the species. No impacts are anticipated, see section 5.9.
Raptors		
bald eagle (*Haliaeetus leucocephalus*)	ST FT	See section 5.9.
golden eagle (*Aquila chrysaetos*)	SC	See section 5.9.
peregrine falcon (*Falco peregrinus*)	SS	See section 5.9.
burrowing owl (*Athene cunicularia*)	SC	See section 5.9.
ferruginous hawk (*Buteo regalis*)	ST	One possible sighting during 2006 TES surveys. The species is considered a rare migrant and potential breeder within the project area. No ferruginous hawks were observed during the 2002-2003 avian use study (Erickson et. al 2003a). No impacts to the species are anticipated.
merlin (*Falco columbarius*)	SC	Two merlin observations were made during the 2002-2003 avian use study (Erickson et al 2003a). The species is considered a rare transient through the project area and is not likely to breed within the project area. No impacts are expected.

Table 2. Species of special status documented as occurring or likely to occur within the vicinity of the project area.

Group/Species	Status[a]	Notes
flammulated owl (*Otus flammeolus*)	SC	The proposed project occurs within the potential range of flammulated owls. Suitable habitat exists for the species within patches of conifer within and to the north of the project area. If flammulated owls occur within the proposed project area, a low potential exists for the species to collide with turbines. Only one flammulated owl has been documented as a fatality at wind plants within the U.S. (Erickson et al. 2001).
northern goshawk (*Accipiter gentiles*)	SC	Two observations of two individuals were made within the project area during the winter of 2002 – 2003 (Erickson et al 2003a). Overall use of the project area by breeding northern goshawks appears to be relatively low, and no impacts to the species are anticipated.
Grouse		
sage grouse (*Centrocercus urophasianus*)	ST	The proposed project area occurs within a mapped area of historic high use. One documented lek is present approximately 2.75 miles from a proposed southern transmission route. No sage grouse or leks were observed during fixed point or lek surveys within the proposed project area, although pellets were found incidentally on the south side of Whiskey Dick Mountain in the fall. Although used historically, the proposed project area is not currently occupied used by sage grouse for leks and no impacts to the species are anticipated.
sharp-tailed grouse (*Tympanuchus phasianellus*)	ST	The WDFW has one record of a sharp-tailed grouse sighting from 1981 approximately 4 – 6 miles from the Wildhorse project. No sharp-tailed grouse were observed during surveys. It is very unlikely that the species occupies the proposed project area and no impacts are expected.
Waterbirds / Waterfowl		
common loon (*Gavia immer*)	SS	Common loons are considered a rare migrant through the project area. No loons were observed during surveys, and no impacts to the species are anticipated.
western grebe (*Aechmophorus occidentalis*)	SC	Western grebes are considered a rare migrant through the project area. No grebes were observed during surveys, impacts are considered unlikely and rare.
Songbirds		
Lewis' woodpecker (*Melanerpes lewis*)	SC	The proposed project occurs within the potential range of the Lewis' woodpecker. Suitable habitat exists for the species within patches of conifer within and to the north of the project area. No Lewis' woodpeckers were observed during surveys, but individuals may migrate through the area. Impacts are unlikely.
white-headed woodpecker (*Picoides albolarvatus*)	SC	The proposed project occurs within the potential range of the Lewis' woodpecker. Suitable habitat exists for the species within patches of conifer within and to the north of the project area. No Lewis' woodpeckers were observed during surveys,

Table 2. Species of special status documented as occurring or likely to occur within the vicinity of the project area.

Group/Species	Status[a]	Notes
		but individuals may migrate through the area. Impacts are unlikely.
loggerhead shrike (*Lanius ludovicianus*)	SC	Three observations totaling four individuals were observed within the project area during the spring of 2002 and 2003. An additional observation was made during 2006 surveys. Use of the project area by breeding loggerhead shrikes appears to be relatively low, and low impact to the species are anticipated. See section 5.9.
sage sparrow (*Amphispiza belli*)	SC	
sage thrasher (*Oreoscoptes montanus*)	SC	See section 5.9.
Vaux's swift (*Chaetura vauxi*)	SC	The proposed project area occurs within the potential range of the Vaux's swift. No individuals were observed during surveys. The potential exists for migrating individuals to collide with turbines, however, the overall risk to the species is considered low.

[a]
FE Federal Endangered,
FT Federal Threatened
FC Federal Candidate
FSC Federal Species of Concern
SE State Endangered
ST State Threatened
SC State Candidate

Table 3. Potential occurrence of bat species in the Project area.

Common Name and Scientific Name	Typical Habitat	Expected Occurrence in Project Area	Occurrence Documentation
California bat *Myotis californicus*	Generally found in open habitats where it forages along tree edges, riparian areas, open water; roosts in cliffs, caves, trees	Possible; documented on ALE	WA GAP Analysis Project[a], 1999; England, 2000; Fitzner and Gray, 1991
small-footed myotis *Myotis ciliolabrum*	Varied arid grass/shrublands, ponderosa pine and mixed forests; roosts in crevices and cliffs; hibernates in caves, mines	Possibe; documented on ALE	WA GAP Analysis Project, 1999; England ,2000; West *et al.*, 1998, 1999
long-eared myotis *Myotis evotis*	Primarily forested habitats and edges, juniper woodland, mixed conifers, riparian areas; roosts snags, crevices, bridges, buildings, mines	Unlikely due to habitat; not documented on ALE	WA GAP Analysis Project, 1999; England, 2000; TNC, 1999
little brown bat *Myotis lucifugus*	Closely associated with water; riparian corridors; roosts buildings, caves, hollow trees; hibernates in caves	Possible; documented on ALE	WA GAP Analysis Project, 1999; England, 2000; West *et al.*, 1998, 1999
fringed myotis *Myotis thysanodes*	Primarily forested or riparian habitats; roosts buildings, trees; hibernates in mines and caves	Possible in suitable habitat; not documented on ALE	WA GAP Analysis Project, 1999; England, 2000; TNC, 1999
long-legged myotis *Myotis volans*	Coniferous and mixed forests, riparian areas; roosts caves, crevices, buildings, mines	Possible in suitable habitat; documented on ALE	WA GAP Analysis Project, 1999; England, 2000; Fitzner and Gray, 1991
yuma myotis *Myotis ymanensis*	Closely associated with water; varied habitats: riparian, shrublands, forests woodlands; roosts in mines, buildings, caves, bridges	Possible; documented on ALE	WA GAP Analysis Project, 1999; England, 2000; West *et al.*, 1998, 1999
hoary bat *Lasiurus cinereus*	Forested habitats, closely associated with trees; roosts in trees; migratory species	Possible in suitable habitat; probable migrant; documented on ALE	WA GAP Analysis Project, 1999; England, 2000; West *et al.*, 1998, 1999
silver-haired bat *Lasionycteris noctivagans*	Forested habitats; generally coniferous forests; roosts under bark; believed to be a migratory species	Possible in suitable habitat; probable migrant; documented on ALE	WA GAP Analysis Project, 1999; England, 2000; West *et al.*, 1998, 1999

Table 4. Project and turbine characteristics of six regional wind energy facilities where fatality monitoring studies are or have been conducted.

	Project Size		Turbine Characteristics			
Wind Project	# Turbines	# MW	RD (m)	Tip Height (m)	RSA m^2	MW/turbine
Pacific Northwest						
Stateline, OR/WA	454	300	47	74	1735	0.66
Vansycle, OR	38	25	47	74	1735	0.66
Klondike, OR Phase I	16	24	65	100	3318	1.50
Nine Canyon, WA Phase I	37	48	62	91	3019	1.30
Nine Canyon, WA Phase II	12	20	62	91	3019	1.30
Combine Hills, OR	41	41	61	84	2961	1.00

Table 5. Pacific Northwest regional annual fatality estimates on a per turbine,and per MW nameplate basis for all birds and for all raptors.
The Combine Hills project monitoring and results are not publicly available.

	Bird Fatality Rates		Raptor Fatality Rates	
Pacific Northwest Wind Project	#/ Turbine	#/ MW	#/ Turbine	#/ MW
Stateline, OR/WA	1.9	2.9	0.06	0.09
Vansycle, OR	0.6	1.0	0.00	0.00
Klondike, OR, Phase II	1.4	0.9	0.00	0.00
Nine Canyon, WA Phase I	3.6	2.8	0.07	0.05
Average	**1.9**	**1.9**	**0.03**	**0.04**

Table 6. Number and species composition of bird fatalities found at the Pacific Northwest regional wind facilities
(Johnson et al,. 2002; Erickson et al., 2000; Erickson et al., 2001; Erickson et al., 2003; Erickson et al., 2004).
N = Non-native species.

Species	% Composition	Number of Fatalities
horned lark	37.5	107
ring-necked pheasant (N)	9.1	26
golden-crowned kinglet	7.7	22
western meadowlark	4.9	14
gray partridge (N)	4.2	12
White-crowned sparrow	3.9	11
chukar (N)	3.5	10
red-tailed hawk	3.2	9
European starling (N)	2.5	7
American kestrel	2.1	6
unidentified passerine	2.1	6
yellow-rumped warbler	1.8	5
winter wren	1.8	5
Canada goose	1.1	3
dark-eyed junco	1.1	3
unidentified bird	1.1	3
House wren	1.1	3
unidentified sparrow	0.7	2
short-eared owl	0.7	2
savannah sparrow	0.7	2
ruby-crowned kinglet	0.7	2
rock dove (N)	0.7	2
vesper sparrow	0.7	2
White-throated swift	0.7	2
golden-crowned sparrow	0.7	2
red-breasted nuthatch	0.7	2
great blue heron	0.7	2
red-winged blackbird	0.4	1
black-billed magpie	0.4	1
ferruginous hawk	0.4	1
grasshopper sparrow	0.4	1
American pipit	0.4	1
Mallard	0.4	1
Swainson's thrush	0.4	1
Swainson's hawk	0.4	1
spotted towhee	0.4	1
northern flicker	0.4	1
Lewis's woodpecker	0.4	1
Macgillivray's warbler	0.4	1
House finch	0.4	1
Rough-legged hawk	0.4	1
Virginia rail	0.4	1
Total	**100.0**	**287**

Table 7. Estimated raptor nest densities from other regional proposed and existing wind projects.

	Raptor Nest Density (#/mi^2)							
Project Site	all raptors	SWHA	RTHA	FEHA	GOEA	PRFA	GHOW	SSHA
Biglow OR	0.15	0.04	0.08	0.00	0.00	0.00	0.02	0.00
Klondike OR	0.16	0.04	0.08	0.00	0.00	0.00	0.04	0.00
Stateline OR/WA	0.21	0.03	0.08	0.03	0.00	0.00	0.07	0.00
Nine Canyon, WA	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zintel Canyon, WA	0.08	0.04	0.02	0.02	0.00	0.00	0.00	0.00
Buffalo Ridge, MN	0.15	0.07	0.06	0.01	0.00	0.00	0.02	0.00
Klickitat County, WA	0.12	0.00	0.09	0.00	0.00	0.01	0.03	0.00
Combine Hills, OR	0.24	0.06	0.11	0.01	0.00	0.00	0.00	0.00
Columbia Hills, WA	0.30	0.04	0.18	0.00	0.02	0.02	0.02	0.02
Ponnequin, CO	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Hopkins Ridge, WA	0.43	0.01	0.27	0.01	0.00	0.00	0.08	0.00
Maiden, WA	0.18	0.05	0.04	0.03	0.00	0.03	0.02	0.00
AVERAGE	0.18	0.04	0.08	0.01	0.00	0.00	0.02	0.00

Figure 1. Map of Whiskey Ridge project area with 2-mi project area buffer. The 2-mi buffered area around the Wild Horse Project is shown in grey and was surveyed for raptor nests in 2003.

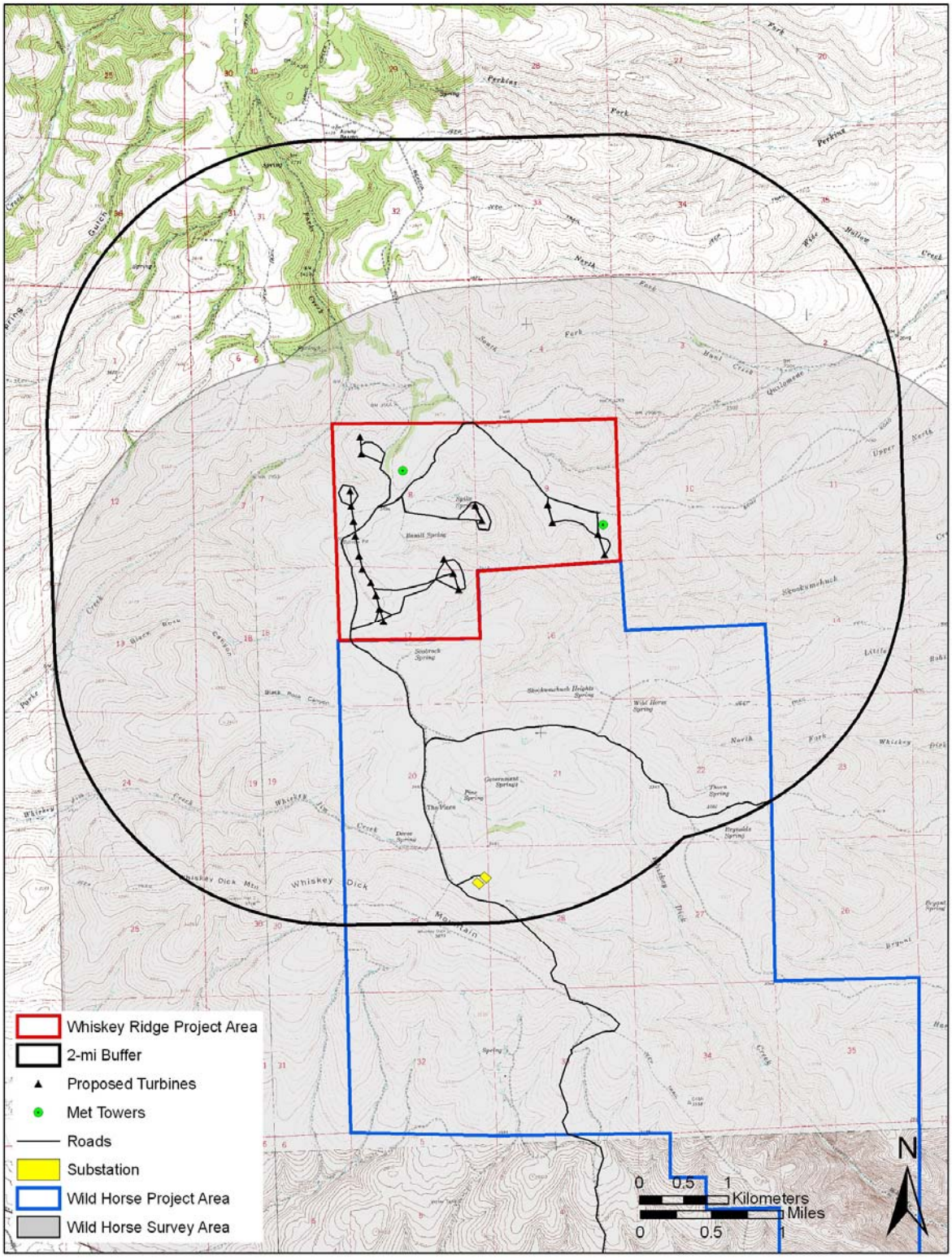


Figure 2. Location of Wild Horse Wind Power Project boundary and avian observation points in relation to the Whiskey Ridge Project area.

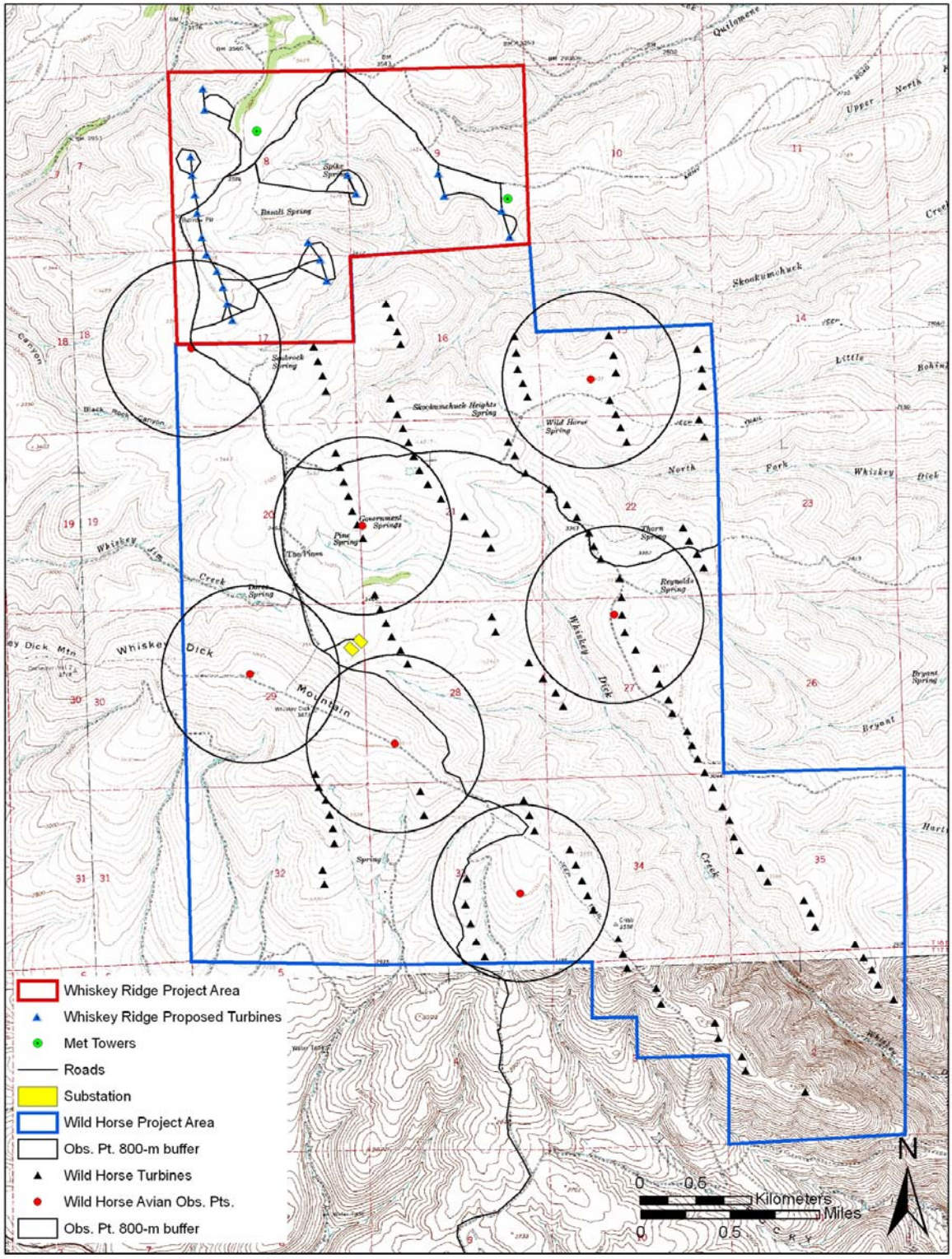


Figure 3. Aerial flight path for the 2007 raptor nest survey.

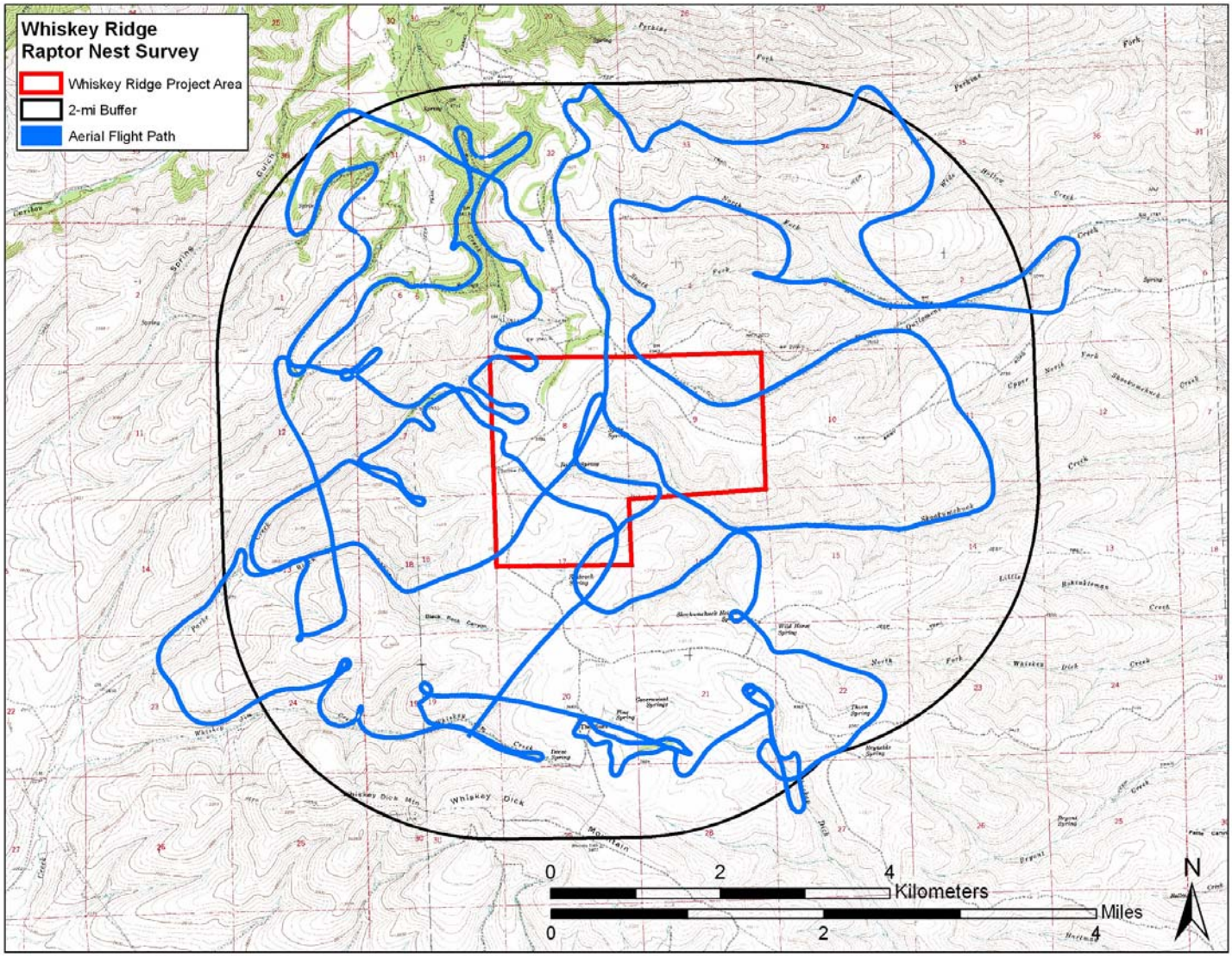


Figure 4. Habitat and hedgehog cactus (*Pediocactus simpsonii*) populations for the proposed Whiskey Ridge Project development area.

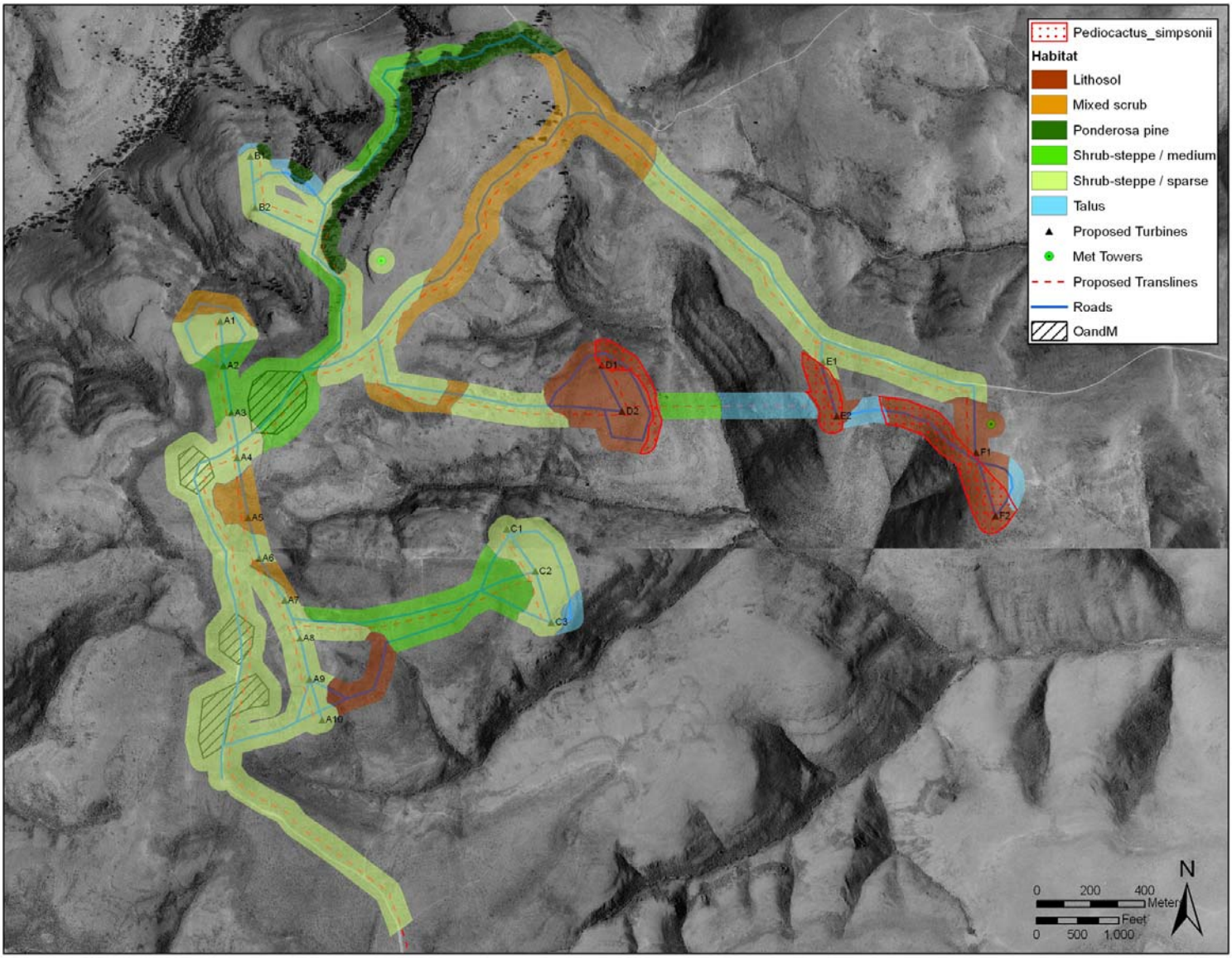
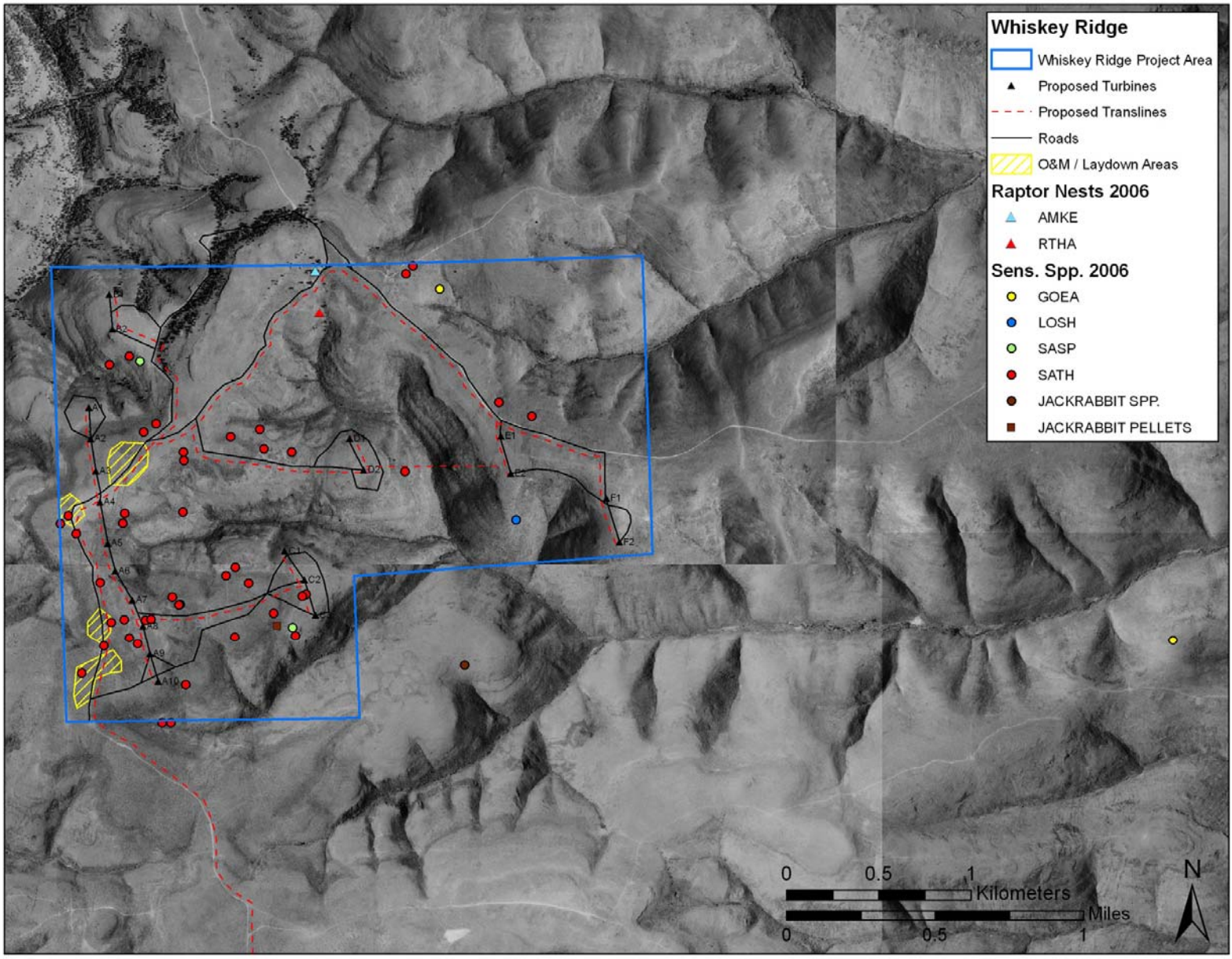


Figure 5. Raptor nests and threatened, endangered, and sensitive wildlife species for the proposed



Whiskey Ridge Project development area; surveys conducted 2006.

Figure 6. Aerial flight path for the first sage grouse lek survey, 24 March, 2006.

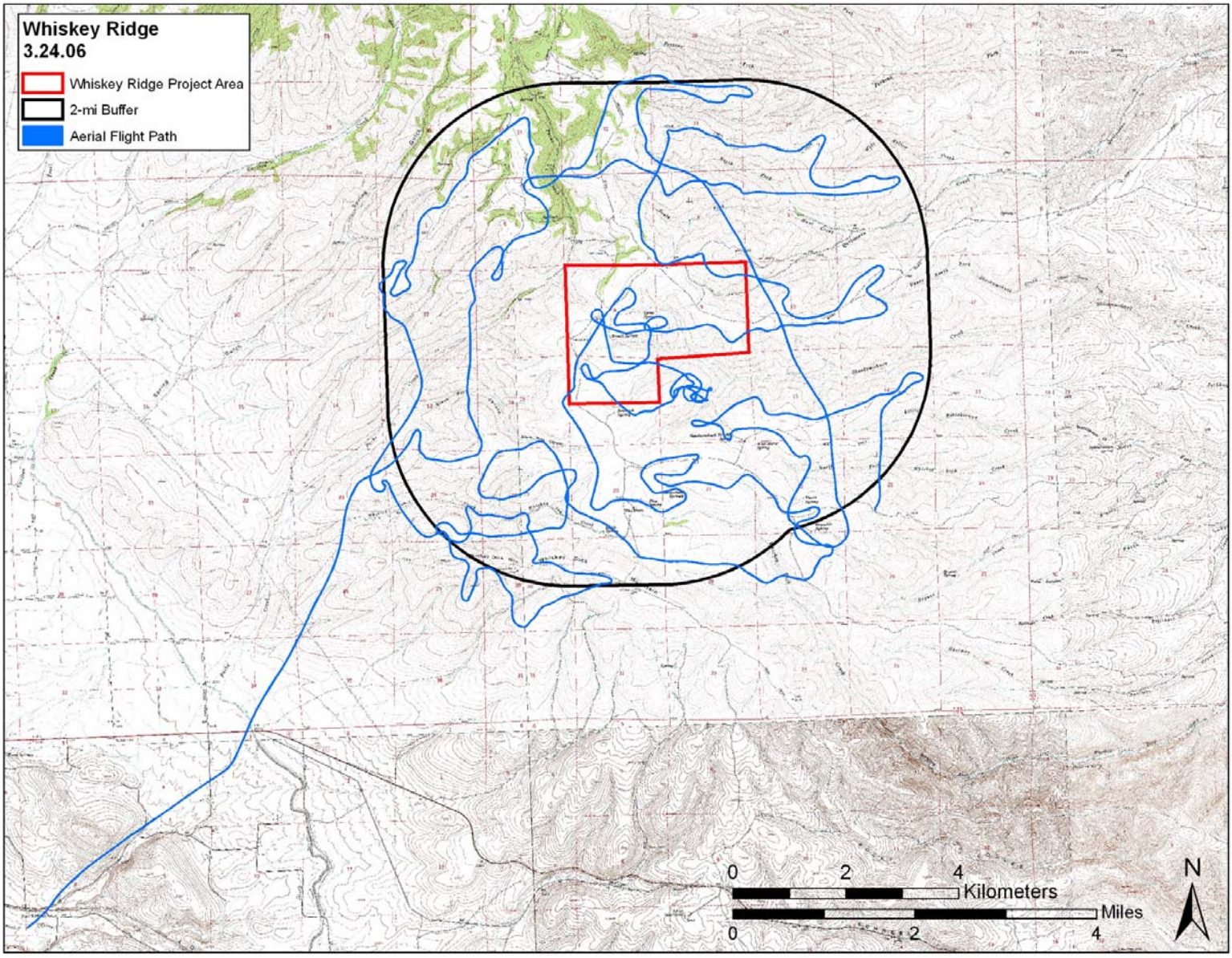
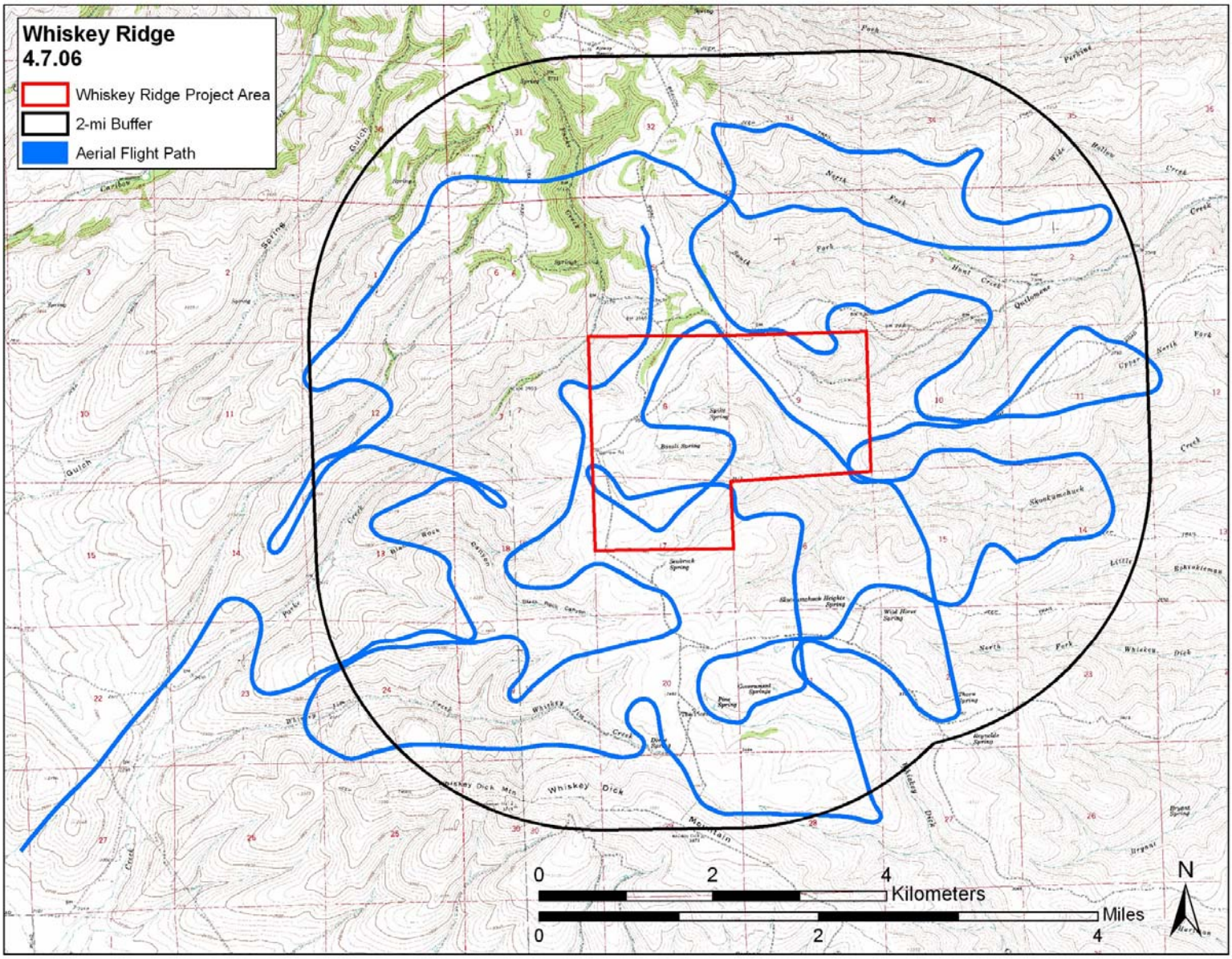


Figure 7. Aerial flight path for the second sage grouse lek survey, 7 April, 2006.



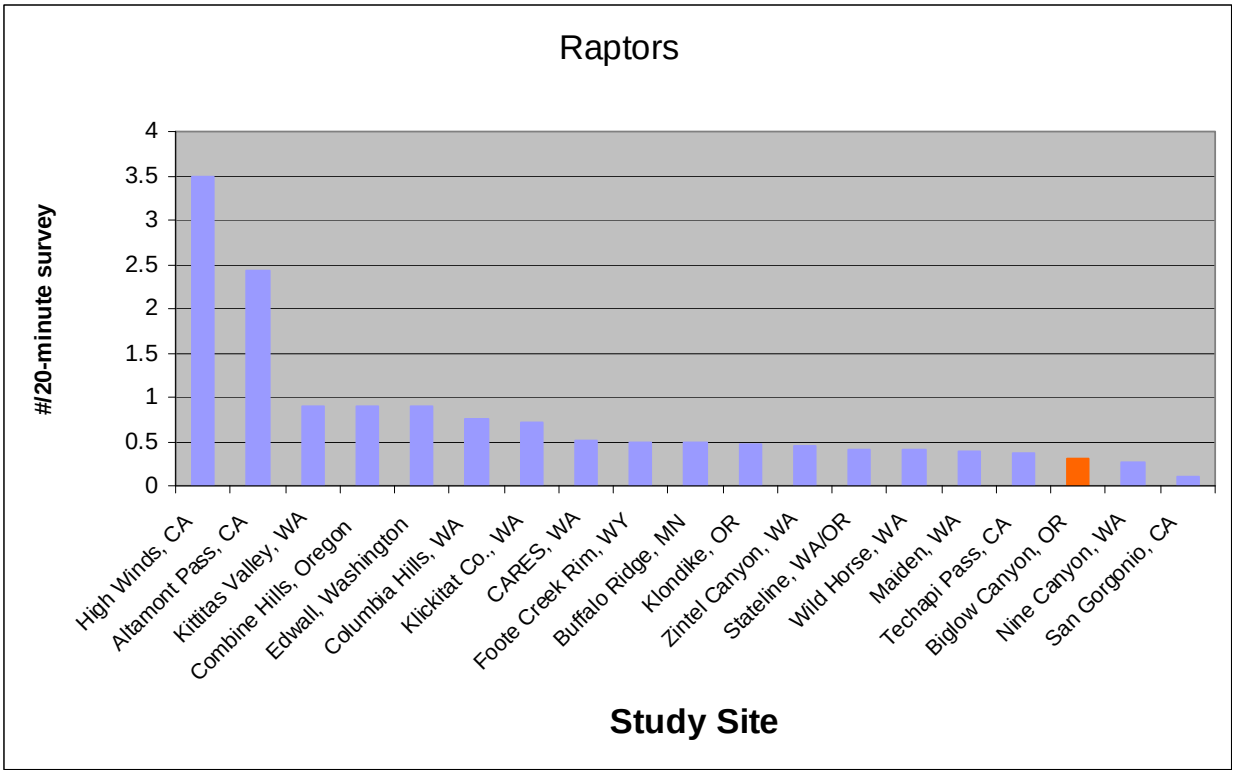


Figure 8. Raptor use estimates from at projects in the West and Midwest that have used similar methods of data collection.

Appendix A. List of Vascular Plant Species Encountered During the 2006 Whiskey Ridge Wind Project Rare Plant Surveys

Family	Scientific Name	Common Name
APIACEAE	*Lomatiun canbyi*	Canby's lomatium
	Lomatium dissectum	fern-leaved lomatium
	Lomatium macrocarpum	large-fruited lomatium
	Lomatium grayi	Gray's desert parsley
	Lomatium gormanii	salt and pepper
	Lomatium spp.	lomatium
	Osmorhiza sp.	sweet-root
ASTERACEAE	*Achillea millefolium*	common yarrow
	Agoseris sp.	agoseris
	Antennaria dimorpha	low pussytoes
	Antennaria spp.	pussytoes
	Artemisia rigida	stiff sagebrush
	Artemisia tridentata	big sagebrush
	Balsamorhiza sagittata	arrow-leaf balsamroot
	Balsamorhiza hookeri	Hooker's balsamroot
	Centaurea sp.	knapweed
	Chaenactis sp.	chaenactis
	Cirsium sp.	thistle
	Ericameria nauseosa ssp. *nauseosa*	gray rabbitbrush
	Erigeron sp.	fleabane
	Madia sp.	tarweed
	Senecio integerrimus	western groundsel
	Stenotus stenophyllus	woolly goldenweed
	Taraxacum officinale	common dandelion
	Tragopogon dubius	yellow salsify
BORAGINACEAE	*Amsinckia* sp.	fiddleneck
	Cryptantha spp.	cryptantha
	Lithospermum ruderale	Columbia puccoon
	Mertensia longiflora	long-flowered bluebells
BRASSICACEAE	*Arabis* sp.	rockcress
	Chorispora tenella	blue mustard
	Descurainia sp.	tanseymustard
	Erysimum asperum	rough wallflower
	Sisymbrium altissimum	tumble mustard
CACTACEAE	*Pediocactus simpsonii*	hedgehog cactus
CAPRIFOLIACEAE	*Sambucus nigra* ssp. *cerulea*	blue elderberry
	Symphoricarpos oreophilus var. *utahensis*	mountain snowberry
CARYOPHYLLACEAE	*Silene* sp.	silene
CHENOPODIACEAE	*Salsola kali*	Russian thistle
CRASSULACEAE	*Sedum sp.*	stonecrop
CRUCIFERAE	*Phoenicaulis cheiranthoides*	dagger-pod

Family	Scientific Name	Common Name
FABACEAE	*Astragalus* spp.	milkvetch
	Astragalus purshii	wooly-pod milkvetch
	Lupinus argenteus	silver lupine
	Trifolium macrecephalum	big-headed clover
	Vicia americana	American vetch
GROSSULARIACEAE	*Ribes aureum*	golden currant
	Ribes cereum	squaw currant
HYDRANGEACEAE	*Holodiscus* sp.	oceanspray
HYDROPHYLLACEAE	*Phacelia linearis*	threadleaf phacelia
	Phacelia sp.	phacelia
IRIDACEAE	*Iris missouriensis*	western blue flag
LAMIACEAE	*Salvia dorrii*	purple sage
LILIACEAE	*Allium* spp.	onion
	Calochortus spp.	mariposa
	Fritillaria pudica	yellow bell
	Maianthemum sp.	Solomon-plume
	Triteleia douglasii	Douglas' triteleia
	Zigadenus venenosus	death camas
ONOGRACEAE	*Epilobium* sp.	Willow herb
PINACEAE	*Pinus ponderosa*	ponderosa pine
POACEAE	*Bromus tectorum*	cheatgrass
	Festuca idahoensis	Idaho fescue
	Poa bulbosa	bulbous bluegrass
	Poa pratensis	Kentucky bluegrass
	Poa secunda	Sandberg's bluegrass
	Pseudoroegneria spicata	blue-bunch wheatgrass
POLEMONIACEAE	*Collomia grandiflora*	large flowered collomia
	Gilia aggregata	scarlet gilia
	Phlox hoodii	Hood's phlox
	Phlox longifolia	long-leaf phlox
POLYGONACEAE	*Eriogonum douglasii*	Douglas' buckwheat
	Eriogonum ovalifolium	cushion buckwheat
	Eriogonum sphaerocephalum	round-headed desert buckwheat
	Eriogonum sp.	Buckwheat
	Rumex acetosella	field sorrel
PORTULACACEAE	*Lewisia rediviva*	bitterroot
	Talinum spinescens	spiny fameflower
	Claytonia lanceolata	spring beauty
PRIMULACEAE	*Dodecatheon sp.*	shooting star
RANUNCULACEAE	*Delphinium nuttallianum*	larkspur
	Ranunculus testiculatus	hornseed buttercup
RHAMNACEAE	*Ceanothus velutinus*	snowbrush
ROSACEAE	*Amelanchier alnifolia*	serviceberry
	Crataegus douglasii	black hawthorn
	Geum triflorum	old man's whiskers
	Prunus virginiana	chokecherry

Family	Scientific Name	Common Name
	Purshia tridentata	bitterbrush
	Rosa woodsii	Wood's rose
SANTALACEAE	*Comandra umbellata*	bastard toad flax
SAXIFRAGACEAE	*Lithophragma* sp.	Lithophragma
SCROPHULARIACEAE	*Castilleja thompsonii*	Thompson's paintbrush
	Castilleja sp.	Paintbrush
	Penstemon gairdneri	Gairdner's penstemon
	Penstemon spp.	penstemon
VIOLACEAE	*Viola trinervata*	sagebrush violet

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18 December 2007

TECHNICAL ADDENDUM

TO: Whiskey Ridge Power Partners, LLC
Joy Potter, Project Manager; Horizon
FROM: Jay Jeffrey, Research Ecologist; WEST
Wallace Erickson, Project Manager; WEST
RE: Bat Acoustic Study -- 2007

Western EcoSystems Technology, Inc. initiated surveys and monitoring of wildlife resources in 2006 within the proposed Whiskey Ridge Wind Resource Area. A supplemental bat acoustic study was conducted in 2007. Passive Anabat surveys for bats were conducted from mid-May through late-October 2007. This document provides a Technical Addendum for the 2006 study (see WEST 2007).

Methods

The objective of the bat use surveys was to estimate the seasonal and spatial use of the Whiskey Ridge site by bats. Fixed station passive sampling using Anabat® II bat detectors (Titley Electronics Pty Ltd., NSW, Australia) coupled with a ZCAIM (zero crossings analysis interface module) were used to record bat echolocation calls in the project area. Bat detectors are a recommended method to index and compare habitat use by bats (Kunz et al. 2007*a*). Four survey stations were established in the project area covering two anemometer locations, a forest area, and a spring-fed wetland site. Two anabats were fixed at anemometer locations and a third was alternated by week between the forest and wetland site. Anabat unit malfunctioning required some additional rotation among survey stations.

Anabat detectors record bat echolocation calls with a broadband microphone. The echolocation sounds are then translated into frequencies audible to humans by dividing the frequencies by a predetermined ratio. A division ratio of 16 was used for the study. Bat echolocation detectors also detect other ultrasonic sounds made by insects, raindrops hitting vegetation, and other sources. A sensitivity level of six was used to reduce interference from these other sources of ultrasonic noise. The calls were recorded via the ZCAIM which uses a compact flash memory card with large storage capacity. The Anabat detectors were placed inside plastic weather-tight containers with a hole cut in the

side of the container for the microphone to extend through. Microphones were encased in PVC tubing with drain holes that curved vertically outside the container to minimize the potential for water damage due to rain. A similar setup was used with drybags for the forest and anemometer locations (hanging vertically with PVC curved upright). The Anabat units were elevated approximately one meter above ground to minimize echo interference and elevate the units above vegetation, and were programmed to turn on each night approximately ½ hour before sunset and turn off approximately ½ hour after sunrise.

For this study, bat passes were the units of activity. The absolute abundance of bats within a study area cannot be determined through acoustic sampling, and bat pass data represent levels of bat activity rather than numbers of individuals. A pass is defined as a series of echolocation calls produced by an individual bat, and consists of a continuous series of $\geq$ 2 call notes with no pauses between call notes of > 1 second. The number of bat passes was determined by downloading the data files to a computer and tallying the number of echolocation passes recorded. Bat calls were grouped as high frequency (≥35 kHz) calls, which are generally given by small-bodied bats (e.g., *Myotis* spp., western pipistrelle) and low frequency (<35 kHz) calls, which are generally given by larger bats (e.g., big brown bat, silver-haired bat, and hoary bat).

The total number of bat calls, regardless of species group, was used as an index to bat use of the project area. To evaluate potential for bat mortality (i.e., low, moderate, high), the mean number of bat passes per detector-night was compared to existing data at wind-energy facilities where both bat activity and mortality levels have been measured.

Results

In total, 2950 bat calls were recorded between May 17th and October 30th, 2007. The mean number of calls per detector-night across the entire study period was 14.97. Calls per detector-night varied by location and date. The number of calls per detector night was highest in late July at the wetland site ("Basalt") and also at the forest area ("PineGrove") throughout early September (Figure 1). Malfunctioning Anabat units limited continuous data coverage and provided unequal sampling effort among survey stations. However, one of the two anemometer stations (Met 1) provided 124 nights of data for the 167 day study period. The Met 1 site had much lower bat activity than the wetland and forest site, even though the latter sites had substantially less survey nights of data; 51 nights combined (Figure 2).

Calls were grouped into low frequency and high-frequency calls which roughly correspond with large-bodied and small-bodied bats respectively. High-frequency calls were the most commonly recorded (Figure 3) suggesting greater relative abundance of small bats such as mouse–eared bats (*Myotis* spp). Low-frequency bats such as big brown bat (*Eptisecus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), and hoary bat (*Lasiurus cinereus*) were less commonly detected (Figure 3).

Discussion

The results presented here are designed to give Whiskey Ridge Power Partners, LLC an early warning if unusual results (e.g., very high call rates) or species of concern are documented during the season of interest. To date, monitoring studies of wind projects have shown a common trend in bat mortality. Specifically, increased fatality occurs among migrant bats species during the post-breeding or fall migration season (roughly August and September), and this pattern has been documented at wind energy facilities across North America (see Johnson 2005). Anabat sampling at Whiskey Ridge was timed to occur before and during this period of highest risk to bats. The results of the Anabat sampling indicate low bat use during the late summer to early fall study period at the anemometer sites, where wind turbines would likely occur. In contrast, high numbers of bat passes, in particular high-frequency species, were documented at the wetland and forest sites during late summer and early fall. Although the timing of this event is consistent with the period when bat mortality at wind projects is greatest, species with high-frequency calls do not generally comprise the majority of wind project fatalities.

Risk to bats from turbines appears to be unequal across species and seasons. Some studies have shown apparent low risk from turbines to resident bat populations (Johnson et al. 2004) while others have shown that nightly mortality is not strongly associated with nightly Anabat call rates (Nicholson 2002, 2003). Some studies of wind projects have recorded both Anabat detections per night and bat mortality (Table 1). The number of bat calls per night, as determined from Anabat detectors, shows a rough correlation with bat mortality but may be misleading because of the few number of sites evaluated (4), and effort, timing of sampling, species recorded, and detector settings (equipment and locations) varied among studies.

The number of bat calls detected per night at the Whiskey Ridge project area was highest in July and September for high-frequency species, and highest in September for low-frequency species. The placement of Anabats in this study at ground level (1 meter above ground) may be biased against detecting low frequency migratory bats that are most commonly found as fatalities in the Pacific Northwest. Fatality studies of bats at wind projects in the U.S. have shown a peak in mortality in August and September and generally lower mortality earlier in the summer (see Johnson 2005). While the survey efforts varied among the studies, those that combine Anabat surveys and fatality surveys showed a general association between the timing of increased bat call rates and timing of mortality, with both call rates and mortality peaking during the fall (Table 1). It is expected that timing of bat mortality at the Whiskey Ridge project area would be similar to the other studies in the U.S., with the peak of mortality likely occurring in the fall season

Species Identification

Interspecific (between species) variation in echolocation call structure exists among bat species providing a means by which to distinguish species; however, significant variation can exist intraspecifically (within species) among individuals and populations, confounding species identification from echolocation calls (Broders et al. 2004).

Additionally, individual bats vary calls based on factors such as habitat, behavior, and presence of other bats, further confounding species identification (Barclay and Brigham 2004, Wund 2006).

For this study, recorded bat calls were divided into low (<35 kHz) and high (≥35 kHz) frequency calls as an index to species variation in the study area. During the study period, substantially greater high frequency bat calls were recorded, indicating higher relative abundance of small bats such as *Myotis* species. Other bat species such as eastern red bat and eastern pipistrelle have been recorded as fatalities at wind projects in eastern North America in much greater abundance than *Myotis* species (Johnson 2005, Arnett et al. 2005). Similarly, in the Pacific Northwest low frequency bat species such as silver-haired bat and hoary bat fatalities at wind projects have been recorded in much greater abundance than *Myotis* species (e.g., Erickson et al. 2000, 2003, 2004; Young et al. 2006, 2007). Species of bats that produce low frequency calls tend to be larger-bodied, with higher wing-loading and less maneuverability. As a result, they generally are strong, fast fliers that forage in open areas with less vegetative clutter. Species with high wing-loading also tend to be long-distance migrants, many of which appear to be particularly susceptible to collisions with wind turbines (Johnson 2005, Kunz et al. 2007*b*).

Potential Impacts

The mean number of bat passes per detector night at the Whiskey Ridge project area is higher than similar data collected at Buffalo Ridge, Minnesota and Foote Creek Rim, Wyoming, where bat collision mortality was low. When comparing the rates at the anemometer locations, the rates are very similar to those observed at those sites. The overall rate, including the wetland and forest sites in the average, is still much lower than that recorded at sites in West Virginia and Tennessee where bat mortality rates were high (Table 1). Based on the relatively small numbers of low frequency calls recorded at the Whiskey Ridge project area, it appears that long-distance migrants were not very common at low elevations during the period sampled. Low numbers of bats have been found at the adjacent Wild Horse project (WEST 2007b), which strongly supports the conclusion that the potential impacts to bats from a wind project built at the Whiskey Ridge site are not expected to be greater than other regional wind projects. Additional information regarding this assessment may be found in WEST (2007a).

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Table 1. Wind Projects in the U.S. with Pre-Project Anabat Sampling Data and Post-Construction Mortality Data for Bat Species.

Project Area	Study Period	Detector nights	Bat activity (#/detector/night)	Mortality (bats/turbine/yr)
Mountaineer, WV	Aug 1-Sep 14, 2004	33	38.3	38.0
Top of Iowa, IA	Sep 4-Oct 9, 2003; May 26-Sep 24, 2004	42	34.9	10.2
Foote Creek Rim, WY	Jun 15-Sep 1, 2000-01	39	2.2	1.3
Buffalo Ridge, MN	Jun 15-Sep 1, 2001	216	2.1	2.2
Buffalo Mountain, TN	Apr 1-Sep 30, 2001-02	149	23.7	20.8

Figure 1. Nightly bat activity at the proposed Whiskey Ridge Wind Project area, May 17 through October 30, 2007.

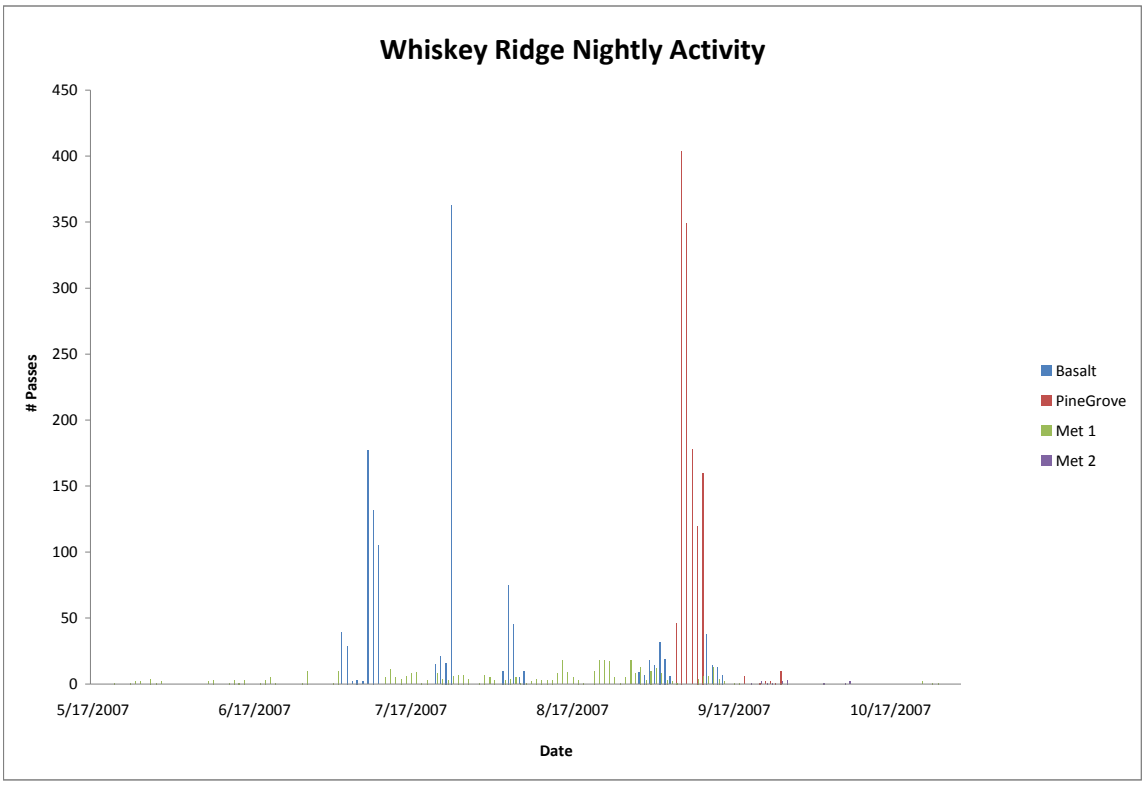


Figure 2. Spatial bat activity at the proposed Whiskey Ridge Wind Project area, May 17 through October 30, 2007.

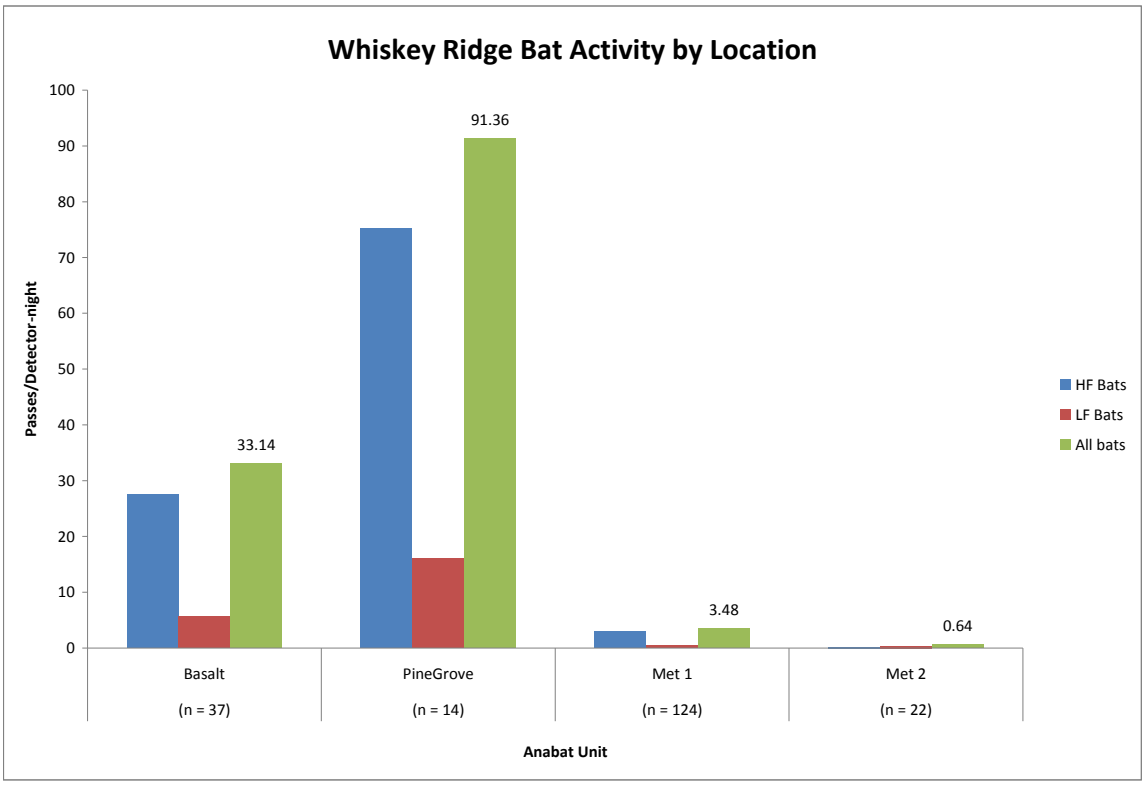
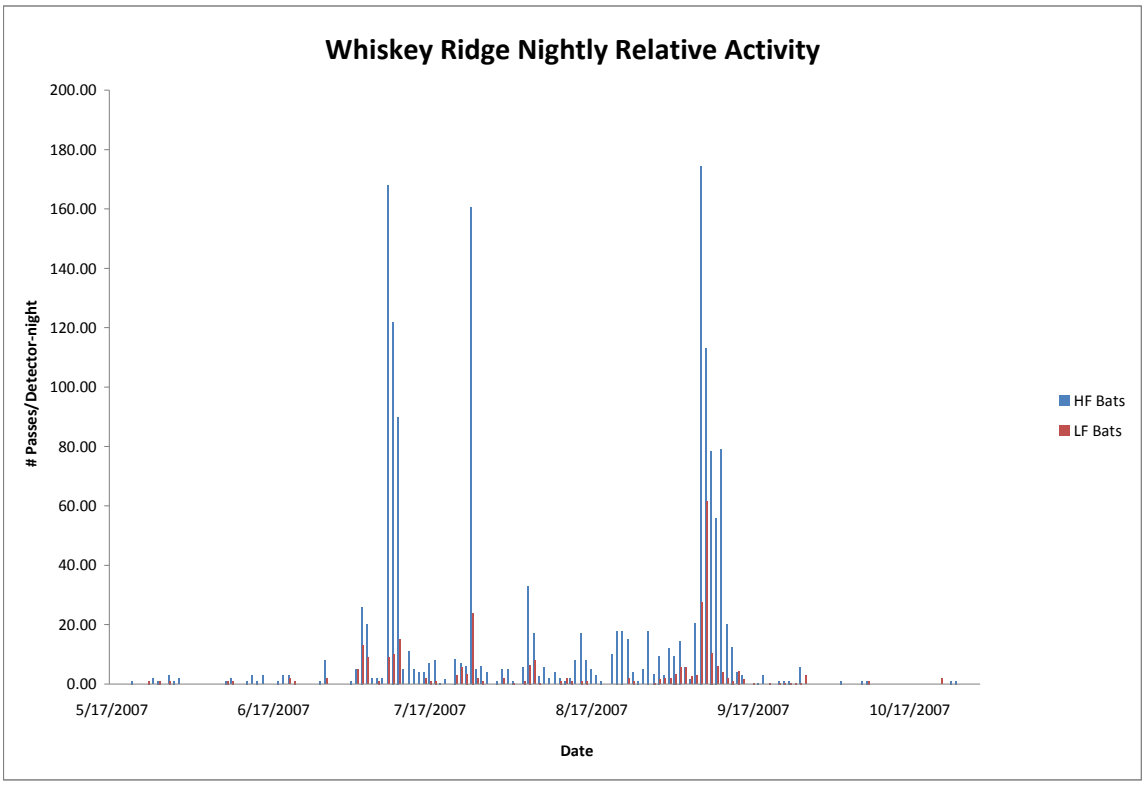


Figure 3. High-frequency (HF bats) and low-frequency (LF bats) bat activity at the proposed Whiskey Ridge Wind Project area, May 17 through October 30, 2007.



Appendix D
2008 Rare Plant Survey/Sage-grouse Lek Survey

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DAVID EVANS
AND ASSOCIATES INC.

TECHNICAL MEMORANDUM

DATE: July 23, 2008

TO: Scott Williams, Puget Sound Energy

FROM: Gray Rand, Senior Biologist

SUBJECT: **Rare Plant Survey for Expansion of Wild Horse Wind Facility**

PROJECT: Wild Horse Expansion

PROJECT NO: PSEN00000134

COPIES Ron Bockelman, Jennifer Diaz

This memorandum documents the results of a rare plant survey conducted on portions of the proposed expansion at the Wild Horse Wind Power Facility (WHWPF). The Expansion would add 1,280 acres to the 8,600 acres of the original site for a total of 9,880 acres and add 26 new turbines to the 127 turbines currently operating for a total of 153 turbines at the WHWPF. The expansion area is located immediately north of the existing WHWPF on approximately 1,280 acres within Sections 8, 9, and 17 of Township 18N, Range 21 East. The site is located approximately 13 miles east of Ellensburg near the headwaters of Skookumchuck Creek.

The intent of this memorandum is to document the results of a rare plant survey conducted in new areas identified for the expansion not covered by a previous survey conducted by WEST, Inc. in 2006.

Methods

Surveys were conducted by trained botanists during peak flowering and/or fruiting periods when target species are best identified. Meandering transects were walked in two separate areas (Figure 1): Survey Area 1 is the small mesa where the proposed S-string is located, and Survey Area 2 is the area surrounding the additional proposed R-11 through R-13 turbines. These areas were completely inventoried for rare plants on May 27 and June 15, 2008.

Results

Exhibit 1 lists all plant species found during site visits by the botanists. Habitat in the two surveyed areas was characterized by plants adapted to shallow lithosol soils, including biscuitroot, stiff sagebrush, false dandelion, a variety of lomatium species, Sandberg's bluegrass, thyme desert buckwheat, alumroot, bitter root, and sagebrush violet. Other species, including a variety of shrubs and different grasses were found on the fringes of these survey areas. No federal or state endangered, threatened, proposed or candidate plant species were encountered during the field surveys. One plant species on the Washington State "Review" plant list—hedgehog cactus—was observed, primarily along the exposed rocky edges of Survey Area 1. This species has been widely observed on the existing WHWPF as well as other nearby wind farms.

Exhibit 1. Species Observed During Rare Plant Surveys on Wild Horse Expansion Area

Family	*Scientific Name*	Common Name	Survey Area Where Observed
Apiaceae	*Lomatium gormanii*	salt and pepper	1,2
Apiaceae	*Lomatium grayi*	Gray's desert lomatium	1,2
Apiaceae	*Lomatium macrocarpum*	large-fruited lomatium	1,2
Apiaceae	*Lomatium sp.*		1
Apiaceae	*Lomatium triternatum*	nineleaf biscuitroot	1
Asteraceae	*Achillea millefollium*	common yarrow	1,2
Asteraceae	*Antennaria lanata*	pussytoes	1
Asteraceae	*Artemesia rigida*	stiff sagebrush	1,2
Asteraceae	*Artemesia tridentata*	big sagebrush	1,2
Asteraceae	*Balsamorhoza hookeri*	Hooker's balsamroot	1,2
Asteraceae	*Chaenactis douglasii*	dusty maidens	1
Asteraceae	*Chrysothamnus nauseosus*	gray rabbitbrush	1,2
Asteraceae	*Crepis modocensis*	low hawksbeard	1,
Asteraceae	*Erigeron linearis*	Linear-leaf daisy	1,2
Asteraceae	*Erigeron pumilus????*	shaggy fleabane	1
Asteraceae	*Nestotus stenophyllus*	narrowleaf goldenweed	1,2
Asteraceae	*Nothocalais troximoides*	sagebrush false dandelion	1,2
Asteraceae	*Senecio canus (Packera cana)*	woolly groundsel	1
Asteraceae	*Senecio integerrimus*	western groundsel	1,2
Asteraceae	*Taraxicum offinale*	common dandelion	2
Asteraceae	*Tragopogon dubius*	yellow salsify	1,2
Berberidaceae	*Mahonia sp.*	Oregon grape	1
Boraginaceae	*Cryptantha affinis???*	quill cryptantha	1
Brassicaceae	*Arabis divaricarpa*	spreading rockcress	1
Brassicaceae	*Arabis sp.*	rockcress	1
Brassicaceae	*Clorospora tenella*	blue mustard	2
Brassicaceae	*Descurainia pinnata*	western tansymustard	1
Brassicaceae	*Drabis sp.*		1
Brassicaceae	*Phoenicaulus cheiranthoides*	dagger-pod	1
Brassicaceae	*Sisymbrium altissimus*	tumble mustard	1
Cactaceae	*Pediocactus simpsonii*	hedgehog cactus	1
Caprofoliaceae	*Symphoricarpos oreophilus*	mountain snowberry	1
Crassulaceae	*Sedum sp.*		1
Crassulaceae	*Sedum stenopetalum?*	wormleaf stonecrop	1
Fabaceae	*Lupinus aridus*	dry-ground lupine	1
Fabaceae	*Lupinus sulphureus*	sulphur lupine	1,2
Fabaceae	*Trifolium macrocephalum*	big-headed clover	1,2
Grossulariaceae	*Ribes cereum*	squaw current	1,2
Hydrophyllaceae	*Holidiscus sp.*	oceanspray	1
Hydrophyllaceae	*Hydrophyllum capitatum*	ballhead waterleaf	1
Hydrophyllaceae	*Phacelia linearis*	threadleaf phacelia	1
Liliaceae	*Allium acuminatum*	tapertip onion	1
Liliaceae	*Calicortus sp.*	mariposa	1
Liliaceae	*Triteleia grandiflora var. howellii (Brodiaea howelii)*	Howell's triteleia	2
Liliaceae	*Zigodenus venenosus*	death camas	1
Onagraceae	*Camissonia andina*	obscure evening primrose	1,2
Pinaceae	*Pinus ponderosa*	ponderosa pine	1
Poaceae	*Bromus tectorum*	cheatgrass	1,2
Poaceae	*Elymus elymoides (Sitanion histrix)*	squirreltail	1,2
Poaceae	*Festuca idahoensis*	Idaho fescue	1,2
Poaceae	*Poa bulbosa*	bulbous bluegrass	1
Poaceae	*Poa secunda*	Sandberg's bluegrass	1,2
Poaceae	*Pseudoroegneria spicata*	bluebunch wheatgrass	1,2
Polemoniaceae	*Collomia grandiflora*	large-flowered collomia	1
Polemoniaceae	*Gilia sp.*		1
Polemoniaceae	*Leptodactylon pungens*	granite prickly phlox	1
Polemoniaceae	*Phlox gracilis*	midget phlox	1
Polemoniaceae	*Phlox hoodii*	Hood's phlox	1,2
Polemoniaceae	*Phlox longifolia*	long-leaf phlox	2
Polygonaceae	*Erigonum thymoides*	thyme desert buckwheat	1,2
Polygonaceae	*Eriogonum caespitosum*	cushion desert buckwheat	1,2
Polygonaceae	*Eriogonum compositum*	arrowlead buckwheat	1
Polygonaceae	*Eriogonum heracleoides*	parsley desert buckwheat	1,2
Polygonaceae	*Eriogonum strictum*	strict desert buckwheat	1,2
Portulacaceae	*Claytonia sp.*	spring beauty	1
Portulacaceae	*Lewisia rediviva*	bitter root	1,2
Portulacaceae	*Montia linearis*	narrowleafed montia	1
Portulacaceae	*Montia sp.*	montia	1
Ranunculaceae	*Delphinium sp.*	larkspur	1,2
Ranunculaceae	*Ranunculus glaberrimus*	sagebrush buttercup	1
Ranunculaceae	*Ranunculus testiculatus*	bur buttercup	1
Rhamnaceae	*Ceanothus velutinus*	snowbrush ceanothus	1
Rosaceae	*Ameliancher alnifolia*	serviceberry	1,2
Rosaceae	*Purshia tridentata*	bitterbrush	1,2
Rosaceae	*Rosa woodsii*	wood's rose	1
Rubiaceae	*Galium aparine*	cleavers	1
Saxifragaceae	*Heuchera cylindrica*	alumroot	1
Saxifragaceae	*Lithophragma bulberas*	prairie woodland star	1,2
Scrophulariaceae	*Castilleja thompsonii*	paintbrush	1,2
Scrophulariaceae	*Collinsia parviflora*	maiden blue eyed Mary	1,2
Scrophulariaceae	*Penstemon gairdneri*	Rock penstemon	1
Scrophulariaceae	*Verbascum thapsus*	mullien	1
Violaceae	*Viola trinervata*	sagebrush violet	1,2

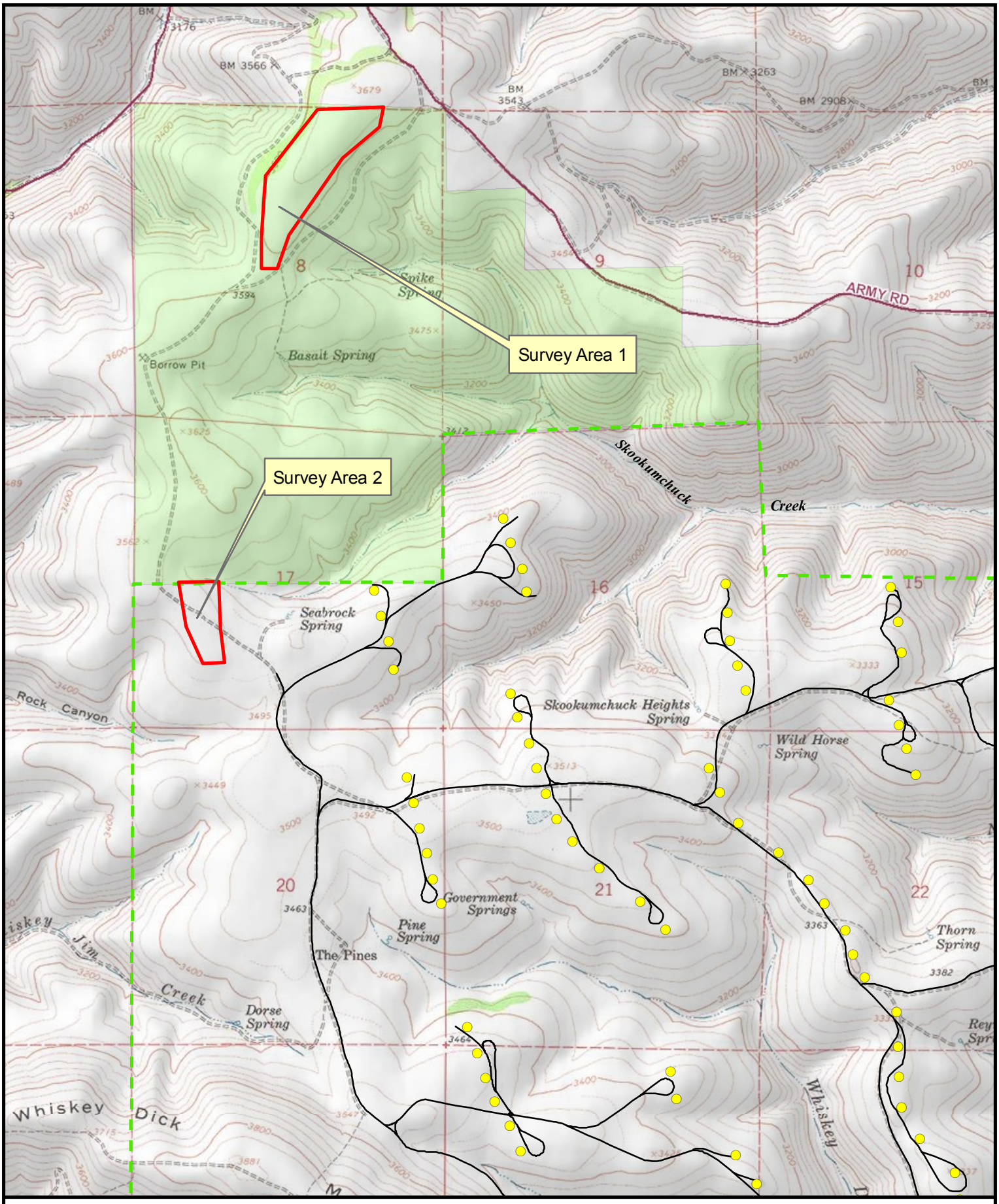

Figure 1 - Additional Rare Plant Survey Areas
Proposed Wild Horse Expansion Area

PUGET SOUND ENERGY
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DAVID EVANS AND ASSOCIATES INC.

Existing Wind Turbines
Roads
Expansion Area
Existing Boundary

0 3,000 6,000 Feet

DAVID EVANS
AND ASSOCIATES INC.

TECHNICAL MEMORANDUM

DATE: July 23, 2008

TO: Scott Williams, Puget Sound Energy

FROM: Gray Rand, Senior Biologist

SUBJECT: **Sage Grouse Surveys for Expansion of Wild Horse Wind Facility**

PROJECT: Wild Horse Expansion

PROJECT NO: PSEN00000134

COPIES: Ron Bockelman, Jennifer Diaz

This memorandum documents the results of surveys conducted by DEA personnel in spring 2008 looking for active leks being used by greater sage grouse (*Centrocercus urophasianus*) in the vicinity of Puget Sound Energy's (PSE) Wild Horse Wind Power Facility (WHWPF) outside of Ellensburg, Washington. The Expansion Area is located immediately north of the existing WHWPF on approximately 1,280 acres within Sections 8, 9 and 17 of Township 18N, Range 21 East. The site is located approximately 13 miles east of Ellensburg near the headwaters of Skookumchuck Creek. These surveys were voluntarily conducted by PSE due to the discovery of an active sage grouse nest on the existing WHWPF during 2007.

Methods

A total of six vehicle-based surveys were conducted by a DEA biologist in the expansion area between March and April 2008. Table 1 below lists the survey dates and conditions during each survey. The surveyor stopped at approximately ¼ mile intervals along existing roads on the site, got out of the car, and looked and listened for evidence of sage grouse leks, including vocalizations and visual observations of adult birds. The entire expansion area was covered by visual and auditory observation.

Results

No sage grouse leks were found during the surveys in the expansion area. Similarly, lek surveys conducted simultaneously by PSE biologists on the existing WHWPF did not encounter leks. Given that sage grouse are nesting on the WHWPF, it is likely that a lek exists somewhere north of I-90, but this lek could be in the lower elevation areas away from the facility that are dominated by big sagebrush.

Table 1. Survey Dates, Times, and Conditions

Survey Date	Surveyor	Time Begin	Time End	Wind Speed Begin (mph)	Wind Speed End (mph)	Temp Begin (°F)	Temp End (°F)	Comments/Observations
March 26, 2008	G. Rand	6:15 am	10:15 am	30	30			150 elk in 3 herds
April 3, 2008	G. Rand	6:00 am	9:15 am	5	10	28	37	Horned larks, loggerhead shrike, red-tailed hawk, northern harrier, 10 deer, 3 elk
April 9, 2008	G. Rand	5:33 am	9:15 am	10	15	25	25	Great horned owl, mountain bluebirds, northern flicker, juncos, spotted towhee, kestrel nest, Clark's nutcracker, 1 bull elk
April 17, 2008	G. Rand	5:32 am	8:25 am	15	25	35	35	Vesper sparrow, kestrel, robin, mountain bluebird, northern flicker, Clark's nutcracker, 25+ deer; 180+ elk
April 24, 2008	G. Rand	5:21 am	8:20 am	25	25	30	30	Horned lark, red-tailed hawk nest, Townsend's chipmunk, kestrel, 9 elk
April 28, 2008	G. Rand	5:06 am	9:00 am	<5	10	45	45	Horned lark, Brewer's sparrow, Gray partridge, California quail, kestrel, vesper sparrow, white-crowned sparrows, sage thrasher, 17 deer, 100+ elk

Appendix E
2007 First-Year Operation Wildlife Monitoring Report

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Puget Sound Energy
Wild Horse Wind Facility
Post-Construction Avian and Bat Monitoring
First Annual Report
January – December 2007

Prepared for:

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EXECUTIVE SUMMARY

The Wild Horse Wind Facility (Wild Horse) is located in Kittitas County, Washington, approximately 11 miles east of the City of Kittitas. Wild Horse consists of 127 V80 1.8-MW wind turbines with a total nameplate capacity of 229 MW. As part of the conditions for Wild Horse Site Certificate Agreement (SCA) with the Washington State Energy Facility Site Evaluation Council (EFSEC), Puget Sound Energy (PSE) is required to implement a two year operational (post construction) monitoring study to evaluate impacts to avian and bat species. With the assistance of a Technical Advisory Committee, PSE developed a post-construction study plan to monitor impacts to birds and bats over a period of two years. The first year of monitoring surveys were conducted on the site between January and December 2007.

The primary objective of the monitoring study is to estimate the number of avian and bat casualties attributable to collisions with wind turbines and meteorological towers for the entire project on an annual basis. The monitoring study consists of four components: (1) standardized carcass searches of selected turbines or turbine strings; (2) searcher efficiency trials to estimate the percentage of carcasses found by searchers; (3) carcass removal trials to estimate the length of time that a carcass remains in the field for possible detection; and (4) a Wildlife Incident Reporting and Handling System for wind project personnel to handle and report casualties found in the project incidentally to the study.

Thirty-two rectangular plots were searched for carcasses. Each plot consisted of two turbines for a total of 64 turbines searched in the monitoring year. Search plots were a minimum of 110 m from the two turbines included in the plot. Surveyors walked parallel transects within the search plot spaced approximately 10-12 meter apart while scanning the ground for fatalities or injured birds or bats. Standardize searches of all plots were conducted once every four week (28 day) period. During the spring and fall migration periods, a sub-set of the selected plots (16 turbines) were searched once a week. For the entire monitoring period, 1088 turbine searches were conducted with over 2500 hours of searching.

A total of 13 searches of all 32 plots and an additional 16 searches of the 8-plot subset were conducted during the first year of study (January-December 2007). Seventy-seven bird fatalities comprised of 29 identified species and three unidentified species were found, and 17 bat fatalities comprised of four species were found. No Federal or State Threatened or Endangered species were found during the study.

The most common bird species found included horned lark (14% of total number), dark-eyed junco (9%), golden-crowned kinglet (9%), and Brewer's sparrow (6.5%). Six raptors were found (4 American kestrels, 1 red-tailed hawk, and 1 great-horned owl). Two of the kestrels and the red-tailed hawk were found incidentally. No increase in fatalities was observed during the spring and fall migration seasons, and there was no strong concentration of avian fatalities within the search plots. The most bird fatalities found at any one turbine was 5 found at J3. Only five other turbines had more than one fatality (4 turbines with 2 fatalities, 1 with 3 fatalities).

Seventeen bat fatalities were found between April 20 and October 10, 2007. Fourteen (82%) of the bat fatalities were found between the months of August and October, which is considered the fall migration season for bats. The remaining three bats (18%) were found in the spring. Hoary bat comprised 58.8% (10 fatalities), little brown bat comprised 23.5% (4 fatalities), and silver-haired bat comprised 17.6% (3 fatalities) of the bat fatalities. There did not appear to be any strong concentrations of bat fatalities within the search plots. The maximum number of bats found at any one turbine was two fatalities found at turbines C15, A1, and M5.

Overall fatality estimates were calculated by adjusting for carcass removal and observer detection bias. The estimated number of all bird fatalities per turbine per year for the first year of study was 2.79 (1.55 per MW per year). The estimated number of small bird fatalities per turbine per year was 2.31 (1.28 per MW per year) and large bird fatalities per turbine per year was 0.48 (0.27 per MW per year). The estimated number of nocturnal migrant fatalities per turbine per year was 1.58 (0.88 per MW per year), and the estimated number of grassland songbird fatalities was 0.52 (0.29 per MW per year). For raptors the number of fatalities per turbine per year was estimated to be 0.17 (0.09 per MW per year).

Adjustments for carcass removal and observer detection bias for bats were made using the estimates for small birds. The estimated number of bat fatalities per turbine per year for first year of study was 0.70 (0.39 per MW per year).

Fatality estimates for birds and bats from the study are similar to other wind projects in the region. All fatalities found were assumed to be wind project related so the estimate of avian mortality is an over-estimate of actual wind project mortality. In order to compare Wild Horse to other wind projects with different turbines, the fatality rates were standardized on a per MW capacity basis. For Wild Horse the estimate was 1.55 birds per MW per year. This estimate was lower than the nearby Combine Hills (2.56 bird fatalities per MW) and Stateline (2.90 fatalities per MW) projects, and was also lower than the overall average for new generation wind projects in the U.S of 3.1 fatalities per MW. The Wild Horse bat fatality rate of 0.39 per MW capacity per year is also lower than Combine Hills (1.88 per MW) and Stateline, (1.70 per MW), and lower than the average rate for new generation wind projects in the west and mid-west of 2.10 per MW.

Species composition for bird and bat fatalities was similar to composition at other wind projects in the Pacific Northwest. The raptor fatality rate was comparable to other regional wind projects and similar to what would be predicted based on the pre-project estimation of use defined as the number of raptors observed per 20-minute survey. The estimated fatality rate for nocturnal migrants fell within the range of other wind projects studied in the Pacific Northwest. The observed nocturnal migrant mortality was slightly higher at lit compared to unlit turbines (0.53 compared to 0.38), but not statistically different.

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ACKNOWLEDGEMENTS

A number of individuals from different and varied organizations were instrumental in the completion of the first year of monitoring at Puget Sound Energy's Wild Horse Wind Facility. Brent Renfrow, Washington Department of Fish and Wildlife; Brent Billingsley, Washington Department of Natural Resources; Gregg Kurz, Diane Petrula, and Philip Knudsen, U.S. Fish and Wildlife Service; Joe Meuchel, Kittitas County Audubon Society; Tim Cullinan, State Audubon Society; Bill Essman, Kittitas County Field and Stream Club; Robert Kruse, Friends of Wildlife and Wind Power; Sherry Luke, Economic Development Group of Kittitas County; and Kevin Eslinger, Kittitas County Farm Bureau served on the Technical Advisory Committee and provided comments, suggestions, guidance, and methods for improving the studies.

Special thanks to Irina Makarow and Stephen Posner from the Washington State Energy Facility Site Evaluation Council for providing facilitation and guidance for Technical Advisory Committee members.

Horizon Wind Energy and Puget Sound Energy provided funding for the field studies, both pre- and post-construction. Jennifer Diaz, PSE, has served as project manager administering pre- and post- construction studies throughout the Wild Horse project development. On-site personnel, Dan Rottler and Shelley Miller were helpful in safety instruction, access, storage, and other logistical considerations for the study.

1.0 INTRODUCTION AND BACKGROUND

The Wild Horse Wind Facility (Wild Horse) is located in Kittitas County, Washington, approximately 11 miles east of the City of Kittitas. Wild Horse consists of 127 V80 1.8-MW wind turbines mounted on 67-m (221-ft) towers with blades 39 m (129 ft) long. Maximum height with the blade fully extended is 107 m (351 ft) with rotors turning at 15.5 rpm. Turbines begin producing electricity at wind speeds of 9 mph, and shut down at constant wind speeds of 56 mph.

As part of the conditions for Wild Horse Site Certificate Agreement (SCA) with the Washington State Energy Facility Site Evaluation Council (EFSEC), Puget Sound Energy (PSE) is required to implement a two year (24 month) operational (post construction) monitoring study to evaluate impacts to avian and bat species. Data was collected according to a detailed monitoring protocol developed in cooperation with the Wild Horse Wind Facility Technical Advisory Committee. The protocol for this monitoring study is described in detail in The Avian and Bat Monitoring Plan (WEST 2006).

The monitoring study for the project consists of the following components:

1) Standardized carcass searches of selected turbines or turbine strings in a rectangular plot centered on the turbine;
2) Searcher efficiency trials to estimate the percentage of carcasses found by searchers;
3) Carcass removal trials to estimate the length of time that a carcass remained in the field for possible detection; and
4) A Wildlife Incident Reporting and Handling System (WIRHS) for wind project personnel to handle and report casualties found in the project incidentally to the study.

As part of the overall wind project monitoring effort, avian and bat casualties (fatalities or injured avian and bat species) found incidentally to the monitoring study by wind project personnel or others were handled under the WIRHS protocol described in the monitoring plan (WEST 2006). Casualties found by wind project personnel are included in the overall dataset.

Kittitas County and EFSEC requested a Technical Advisory Committee (TAC) to be convened to provide guidance and oversight of the Wild Horse Wind Facility monitoring studies. The TAC is intended to provide a neutral forum to formulate and review monitoring studies and data; facilitate collaboration among project stakeholders (owners, landowners, agencies, conservation organizations, interested individuals); and make recommendations to EFSEC for changes to the monitoring studies. The TAC membership includes representatives from: Kittitas County, the Washington State Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the Washington State Department of Natural Resources, the Kittitas County Audubon Society, the State Audubon Society, the Kittitas County Farm Bureau, the Kittitas County Field and Stream Club, the Economic Development Group of Kittitas County, the Friends of Wildlife and Wind Power, the project owner (PSE), and other interested parties.

This report presents the results of the first year of wildlife monitoring at this facility.

1.1 Avian and Bat Fatality Study

The primary objective of the monitoring study is to estimate the number of avian and bat casualties attributable to collisions with wind turbines for the entire project on an annual basis. The monitoring study began within one month of the date when the project was fully operational. The study will be conducted for a minimum of two years (24 months), with the WIRHS monitoring program (WEST 2006) in place for the life of the project. The methods of the fatality study are broken into four primary components: (1) standardized carcass searches, (2) searcher efficiency trials, (3) scavenger removal trials, and (4) the WIRHS.

There are three scenarios under which casualties may be found in the wind project: (1) during the standardized searches for the study; (2) while observers are on site but not conducting a standardized search; and (3) by wind plant personnel or others on site for other purposes such as turbine maintenance. The reporting and handling methods for wind plant personnel discoveries is addressed by the WIRHS. Casualties found by study personnel regardless of timing (e.g., during a standard search or not) are recorded by the methods described below. All casualties located in a search plot have been included in the dataset under the broad assumption that each casualty would have been found during standardized searches.

All casualties located within areas surveyed, regardless of species, are recorded and cause of death determined, if possible, based on field inspection of the carcass. Total number of avian and bat carcasses are estimated by adjusting for search frequency, removal bias (length of stay in the field), and searcher efficiency bias (percent found). For carcasses where the cause of death is not apparent, the assumption that the fatality is a wind turbine or met tower collision casualty is made for the analysis. This approach leads to an overestimate of the true number of wind plant-related fatalities, but most projects have used this conservative approach because of the relative high costs associated with obtaining accurate estimates of natural or reference mortality.

2.0 DEFINITIONS AND FIELD METHODS

2.1 Seasons

Seasons are based roughly on the calendar seasons. For analysis purposes and to help with categorizing impacts (e.g., migratory birds) a spring and fall migration period and summer breeding season are also defined.

The following dates are used for defining seasons in the study:

Spring	March 16 – June 15
Spring Migration	March 16 – May 15
Summer	June 16 - September 15
Breeding Season	May 15 – August 15
Fall	September 15 – December 15
Fall Migration	August 16 - October 31
Winter	December 16 - March 15

These dates are used for analysis purposes only and may not cover all potential migrants or breeding residents in the project area.

2.2 Search Plot and Sample Size

Thirty-two rectangular plots were searched for carcasses (Figure 1). Each plot consisted of two turbines for a total of 64 turbines searched in the monitoring year. Search plots were a minimum of 110 m from the two turbines included in the plot (Figure 2). Studies at wind plants with other large turbines, Klondike in Sherman County Oregon (Johnson et al. 2003), and Combine Hills, Umatilla County, Oregon (Young et al. 2005) indicate nearly all fatalities are found within the area that is roughly equivalent to the height of the turbine.

2.3 Scheduling/Timing

Standardized searches of all selected plots (64 turbines) were conducted once every four week (28 day) period (Table 1). During the spring and fall migration periods, the search effort was increased at a sub-set of the selected plots (16 turbines) to once a week (Table 2).

2.4 Standardized Carcass Searches

The objective of the standardized carcasses searches was to systematically search the wind project for bird and bat casualties that were attributable to collision with project facilities. Personnel were trained in proper search techniques prior to conducting the carcass searches. Parallel transects were set approximately 10-12 meters apart in the area to be searched. Orientation of the transects was based on the orientation of the topography surrounding the turbines. A searcher walked at a rate of approximately 45-60 meters a minute along each transect taking approximately 80-120 minutes to search each turbine. Searchers scanned the area on both sides out to approximately 5-6 meters for casualties as they walked each transect.

The condition of each carcass found was recorded using the following categories:

- Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger.
- Scavenged - an entire carcass, which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location (e.g., wings, skeletal remains, portion of a carcass, etc.), or a carcass that has been heavily infested by insects.
- Feather Spot - 10 or more feathers or 2 or more primaries at one location indicating predation or scavenging.

All carcasses were labeled with a unique number, bagged and frozen for future reference and possible necropsy. A copy of the data sheet for each carcass was maintained, bagged and frozen with the carcass at all times. For all casualties found, data recorded included species, sex and age when possible, date and time collected, GPS location, condition (intact, scavenged, feather spot), and any comments that may indicate cause of death (see WEST 2006). All casualties were photographed as found and plotted on a detailed map of the study area showing the location of the wind turbines and associated facilities such as overhead power lines and met towers.

Casualties found outside the formal search area by carcass search technicians were treated following the above protocol as closely as possible. Casualties found in non-search areas (e.g., near a turbine not included in the search area) were coded as incidental discoveries and were documented in a similar fashion as those found during standard searches. Casualties found by maintenance personnel and others not conducting the formal searches were documented using the WIRHS.

2.5 Searcher Efficiency Trials

The objective of the searcher efficiency trials was to estimate the percentage of casualties found by searchers. Searcher efficiency trials were conducted in the same areas as carcass searches. Searcher efficiency was estimated by major habitat type (grassland/lithosol and shrub steppe), size of carcass, and season. Estimates of searcher efficiency are used to adjust the total number of carcasses found for those missed by searchers, correcting for detection bias.

Searcher efficiency trials began about the same time as carcass search studies began. Personnel

conducting standardized carcass searches did not know when trials were being conducted or the location of the searcher efficiency carcasses. During each season and within two major habitat types (lithosol/grassland and shrub steppe), approximately 20 carcasses of birds of two different size classes were placed within the search plots. A total of 82 searcher efficiency trial carcasses were placed in 2007 on 10 different dates. Carcasses used for searcher efficiency trials were non-native/non-protected or commercially available species such as house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), rock pigeons (*Columba livia*), hen mallards (*Anas platyrhynchos*), or hen pheasants (*Phasianus colchicus*). Detection rates for small brown birds (house sparrows) were used to estimate the searchers' ability to detect bats.

All searcher efficiency trial carcasses were placed at random locations within the search area prior to that day's scheduled carcass search. If avian scavengers appeared, attracted by placement of carcasses, the carcasses were distributed before dawn. Carcasses were placed in a variety of postures to simulate a range of conditions. For example, birds were: 1) placed in an exposed posture (tossed randomly to one side), 2) partially hidden, or 3) mostly hidden to simulate a crippled bird (e.g., placed beneath a shrub or bunch grass).

Each trial carcass was discreetly marked so that it could be identified as a study carcass after it was found. The number and location of the searcher efficiency carcasses found during the carcass search was recorded. The number of carcasses available for detection during each trial was determined immediately after the trial by the person responsible for distributing the carcasses.

2.6 Carcass Removal Trials

The objective of carcass removal trails was to estimate the average length of time a carcass remained in the study area and was potentially detectable. Carcass removal includes removal by predation or scavenging. Carcass removal studies were conducted during each season, outside of the carcass search plots (i.e., near a turbine that was not included in the standard search plots). Estimates of carcass removal were used to adjust the total number of carcasses found for those removed from the study area, correcting for removal bias.

Carcass removal trials began at about the same time that search studies begin. During each season and within two major habitat types (lithosol/grassland and shrub steppe), approximately 10 carcasses of birds of two different size classes (same as searcher efficiency birds) were placed in the study plots, for a total of 80 removal trial carcasses for the entire year. Carcasses were placed on a minimum of four dates during each season for a total of 16 trial initiation dates. As a result, the trials were spread throughout the year to incorporate the effects of varying weather, climatic conditions, and scavenger densities. Small brown birds (house sparrows and starlings) were used during the late summer and fall seasons to simulate bat carcasses.

Removal trial birds were not placed in the standardized search plots in order to minimize the chance of confusing a trial bird with a true casualty. Turbines not included in the standardized searches were randomly selected for inclusion in the removal trials. Trial carcasses were randomly placed at selected turbines within a plot of similar size to the actual search plots. Trial carcasses were placed

in a variety of postures to simulate a range of conditions. For example, birds were: 1) placed in an exposed posture (tossed randomly to one side), 2) partially hidden, or 3) mostly hidden to simulate a crippled bird (e.g., placed beneath a shrub or bunch grass).

Personnel conducting carcass searches monitored the trial birds over a 40-day period, checking the carcasses every day for the first 4 days, and then on day 7, day 10, day 14, day 20, day 30 and day 40. This schedule varied somewhat depending on weather and coordination with the other survey work. Removal trial carcasses were marked discreetly (e.g., with dark electrical tape around one or both legs) for recognition by searchers and other personnel, and left at the location until the end of the carcass removal trial. At the end of the 40-day period any remaining evidence of the carcass was removed.

3.0 STATISTICAL METHODS FOR FATALITY ESTIMATES

Estimates of facility-related fatalities are based on:

(1) Observed number of carcasses found during standardized searches during the first year of monitoring for which the cause of death is either unknown or is probably facility-related.
(2) Non-removal rates expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during removal trials
(3) Searcher efficiency expressed as the proportion of planted carcasses found by searchers during searcher efficiency trials.

On an annual basis, estimates of fatalities are calculated for seven categories: 1) all birds, 2) small birds, 3) large birds, 4) raptors 5) target grassland/shrub steppe birds, 6) likely nocturnal migrants, and 7) bats. The number of avian and bat fatalities attributed to operation of the facility is based on the number of avian and bat fatalities found at the facility. All carcasses located within areas surveyed, regardless of species and fatality cause, were recorded and, if possible, a cause of death determined based on blind necropsy results. Total number of avian and bat carcasses is estimated by adjusting for removal and searcher efficiency bias.

3.1 Definition of Variables

The following variables are used in the equations below:

c_i the number of carcasses detected at plot i for the study period of interest (e.g., one monitoring year) for which the cause of death is either unknown or is attributed to the facility
n the number of search plots
k the number of turbines searched (including the turbines centered within each search plot)
$\bar{c}$ the average number of carcasses observed per turbine per monitoring year

s	the number of carcasses used in removal trials
s_c	the number of carcasses in removal trials that remain in the study area after 30 days
se	standard error (square of the sample variance of the mean)
t_i	the time (in days) a carcass remains in the study area before it is removed, as determined by the removal trials
$\bar{t}$	the average time (in days) a carcass remains in the study area before it is removed, as determined by the removal trials
d	the total number of carcasses placed in searcher efficiency trials
p	the estimated proportion of detectable carcasses found by searchers, as determined by the searcher efficiency trials
I	the average interval between standardized carcass searches, in days
$\hat{\pi}$	the estimated probability that a carcass is both available to be found during a search and is found, as determined by the removal trials and the searcher efficiency trials
m	the estimated annual average number of fatalities per turbine per year, adjusted for removal and searcher efficiency bias

3.2 Observed Number of Carcasses

The estimated average number of carcasses ($\bar{c}$) observed per turbine per monitoring year is:

$$\bar{c} = \frac{\sum_{i=1}^{n} c_i}{k} \qquad (1)$$

3.3 Estimation of Carcass Non-Removal Rates

Estimates of carcass non-removal rates are used to adjust carcass counts for removal bias. Mean carcass removal time ($\bar{t}$) is the average length of time a carcass remains in the study area before it is removed:

$$\bar{t} = \frac{\sum_{i=1}^{s} t_i}{s - s_c} \qquad (2)$$

3.4 Estimation of Searcher Efficiency Rates

Searcher efficiency rates are expressed as *p,* the proportion of trial carcasses that are detected by searchers in the searcher efficiency trials. These rates are estimated by carcass size and season.

3.5 Estimation of Facility-Related Fatality Rates

The estimated per turbine annual fatality rate (m) is calculated by:

$$m = \frac{\bar{c}}{\hat{\pi}} \qquad (3)$$

where $\hat{\pi}$ includes adjustments for both carcass removal (from scavenging and other means) and searcher efficiency bias. Data for carcass removal and searcher efficiency bias were pooled across the study to estimate $\hat{\pi}$.
$\hat{\pi}$ is calculated as follows:

$$\hat{\pi} = \frac{\bar{t} \cdot p}{I} \cdot \left[\frac{\exp\left(I / \bar{t} \right) - 1}{\exp\left(I / \bar{t} \right) - 1 + p} \right]$$ (Shoenfeld 2004)

Final estimates were obtained by a weighted average of estimates from the 16 turbines sampled more frequently (7 days in the migration season) and the 48 turbines sampled monthly.

4.0 RESULTS

A total of 13 searches of all 32 plots and an additional 16 searches of the 8-plot subset were conducted during the first year of study (January-December 2007; Table 2), for a total of 1,088 turbine searches and over 2,500 hours of searching. This section describes the number, species, location, and other characteristics of the bird and bat fatalities, and provides fatality estimates adjusted for searcher efficiency and carcass removal biases.

4.1 Bird Fatalities

Bird fatalities found during 2007 are listed in Appendix A. This list includes fatalities observed during standardized plot searches and other fatalities that were not observed during standardized searches (incidental finds). During 2007, a total of 77 bird fatalities were found. All birds found during regularly scheduled searches and most of the incidental finds are plotted in Figure 3. Of the 77 fatalities, 53 were found during regularly scheduled searches, and 24 were documented as incidental fatalities. The most common species found included horned lark (*Eremophila alpestris*; 14% of total number), dark-eyed junco (*Junco hyemalis*; 9%), golden-crowned kinglet (*Regulus satrapa*; 9%), and Brewer's sparrow (*Spizella brewei*; 6.5%) (Table 3). Six raptors were found (4 American kestrels (*Falco sparverius*), 1 red-tailed hawk (*Buteo jamaicensis*), and 1 great-horned owl (*Bubo virginianus*)). Two of the kestrels and the red-tailed hawk were found incidentally.

Given the small number of birds found, no statistical tests were conducted comparing fatalities among different locations (e.g., near springs, away from spring). However, the lack of strong patterns in the locations displayed in Figure 3 suggests no large differences in mortality by location within the wind project. Statistical tests will be conducted after the 2nd year of monitoring is completed.

The most fatalities found at any one turbine was 5 found at J3 (2 American robins (*Turdus migratorius*), one dark-eyed junco, one horned lark, and one Townsend's warbler (*Dendroica townsendi*)). Only 5 other turbines had more than 1 fatality (4 turbines with 2 fatalities, 1 with 3

fatalities).

4.2 Bat Fatalities

Bat fatalities found during 2007 during standardized carcass searches and incidentally are listed in Table 4. A total of 17 bat fatalities were found comprising three different species; 10 hoary bats (*Lasiurus cinereus*), 4 silver-haired bats (*Lasionycteris noctivagans*), and 3 little brown bats (*Myotis lucifugus*), (Figure 4). Of the 17 bat fatalities, 12 were found during regularly scheduled searches and 5 were found incidentally (Appendix A). The silver-haired bats and one of the little brown bats were found in the spring, while the remaining bats were all found in the fall (between August and October; figure 5).

The maximum number of bats found at any one turbine was 2 (C15, A1, M5) and the maximum number of bats found during any one search period was 4 (August 21 – September 18). The bat fatalities were spread out throughout the facility. Given the small number of bats found, no statistical tests were conducted comparing fatalities among different locations (e.g., near springs, away from spring). However, the lack of strong patterns in the locations displayed in Figure 5 suggests no large differences in mortality by location within the wind project. Statistical tests of these patterns will be conducted after the 2nd year of monitoring is completed.

4.3 Searcher Efficiency Trials

A total of 162 carcasses (82 large, 80 small) were placed in the field during 10 searcher efficiency trials. Species used in the trials included rock pigeons, European starlings, mallards, coturnix quail (*Coturnix japonica*), ring-necked pheasants, house sparrows, American robins and Savannah sparrows (*Passerculus sandwichensis*). Observer detection rates were 41% for small birds and 74% for medium to large sized birds (Table 5).

4.4 Carcass Removal Trials

Eight carcasses were placed during each of 16 different removal trials throughout the study period. Thirty-five small birds were used in the trials and consisted of 20 house sparrows, 11 young quail, and 4 European starlings. Forty-five medium to large-sized birds were used in the trials and consisted of 17 rock pigeons, 16 hen mallards and 12 hen pheasants. Approximately 50 percent of the small birds were removed by day 12 while 50 percent of the large birds were removed by day 10. Mean removal time for small birds was 17.7 days and mean removal time for large birds was 19.0 days (Figure 6).

4.5 Fatality Estimates

Unadjusted fatality estimates and estimates adjusted for searcher efficiency and scavenging are provided in Table 6. The small bird adjusted fatality rate is 2.31/turbine/year and 1.28/MW/year. The large bird adjusted fatality rate is 0.48/turbine/year and 0.27/MW/year. Combining the two, the all bird adjusted fatality estimate is 2.79/turbine/year or 1.55/MW/year. The adjusted raptor fatality rate is 0.17/turbine/year or 0.09/MW/year. The nocturnal migrant estimate is

1.58/turbine/year or 0.88/MW/year, and the grassland bird estimate is 0.52/turbine/year or 0.29/MW/year.

The bat adjusted fatality rate is 0.70/turbine per year or 0.39/MW/year.

The observed nocturnal migrant mortality was slightly higher at lit compared to unlit turbines (0.53 compared to 0.38), but not statistically different.

4.6 Incidental Wildlife Observations

Raptors flying within the project area that were observed by biotechnicians while traveling on-site or during searches included: northern harrier (*Circus cyaneus*), red-tailed hawk, rough-legged hawk (*Buteo lagopus*), American kestrel, golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrines*), merlin (*Falco columbarius*), and prairie falcon (*Falco mexicanus*) (Table 7; Appendix B). Four golden eagles and one bald eagle were observed during the monitoring period. Red-tailed hawk and American kestrel were the most commonly observed raptor species. Beginning in November, all observations of raptors perched on the transmission lines were recorded (Figure 7). During November, there were five observations of raptors perched on transmission line poles (poles G, W, Y, C and H), including one peregrine falcon, one red-tailed hawk, and three unidentified raptors.

One sage grouse was observed 126 meters west of turbine D2 at 1:20PM on September 24th. In addition, a sage grouse nest with five eggs was observed 98 m from turbine E1 (see Figure 8). It appeared the nest had been predated (M. Schroeder pers. comm., pers. comm. Dec 03, 2007). The nest was found hidden beneath a large clump of grass on the west slope of a large wash with abundant sagebrush and grass cover.

Big game observations were recorded by biotechnicians while conducting carcass searches or traveling within the project area, however, this information is largely anecdotal, and may consist of some repeated observations of the same animal. Elk and deer were observed throughout the study period, with Elk observations highest from February to July, and deer observations highest in March and April (Figure 9). Fifty-one groups of mule deer consisting of 207 individuals, and 82 groups of elk consisting of 1,279 individuals were observed near turbine facilities by biotechnicians during the first year of monitoring (Table 9). Elk were typically observed grazing, resting, and walking (see Appendix B), with few observations of running or alarmed behavior noted. Elk were observed on ridges or in ravines and near turbines, or directly underneath turbines. Elk were also observed on ridges and slopes outside the project area, however, the numbers and locations of these individuals were not documented. A complete list of general wildlife observations are presented in Appendix B.

5.0 DISCUSSION

The Wild Horse Wind Facility is located on the northwestern edge of the Columbia Basin

physiographic province, a region with extensive wind power development. Umatilla County, Oregon and Walla Walla County, Washington, roughly 100 miles southeast of the Wild Horse Wind Project, are home to three utility scale wind projects: the Vansycle wind plant (24 MW), the Stateline Wind Project (300 MW), and the Combine Hills Turbine Ranch (41 MW). In addition, the Nine Canyon Wind Project in Benton County, Washington, the Klondike I and II Wind Project in Sherman County, Oregon, the Bighorn Project in Klickitat County, Washington, and the Leaning Juniper Wind Project in Gilliam County Oregon have been monitored using similar protocols. Another project, Condon, is also located in Gilliam County, Oregon, but has not undergone rigorous monitoring studies[1]. Monitoring studies have occurred at these wind projects within the last seven years providing a relatively contemporary pool of data for comparison (Table 8). Studies at the Wild Horse Wind Facility were designed to provide results comparable to these regional studies.

There are numerous factors that could contribute to both positive and negative biases in estimating fatality rates (Erickson 2006). The overall design of this study incorporates several assumptions or factors that affect the results of the fatality estimates. First, all bird casualties found within the standardized search plots during the study were included in the analysis. A few carcasses were found incidentally within a search plot during other activities on-site and it was assumed that these carcasses would have been found during scheduled carcass searches. Second, it was assumed that all carcasses found during the study were due to collision with wind turbines. True cause of death is unknown for most of the fatalities. It is possible that some of the fatalities were caused by predators (e.g., raptors, fox) and some of the other casualties may have been due to collisions with vehicles or facility buildings. It is likely that some of the casualties included in the data pool were due to natural causes (background mortality). A few wind facility studies have provided information on background mortality. During a four-year study at Buffalo Ridge, Minnesota, 2,482 fatality searches were conducted on study plots without turbines to estimate reference mortality in the study area. Thirty-one (31) avian fatalities comprising 15 species were found (Johnson et al. 2000). Reference mortality for this study was estimated to average 1.1 fatalities per plot per year.

Some pre-project carcass searches were conducted at a proposed wind project in Montana (Harmata et al. 1998). Three bird fatalities were found during 8 searches of 5 transects, totaling 17.61 km per search. On average, approximately 1.8 km of transect is searched within every 180 m diameter turbine plot. Therefore, the amount of transect searched at the Montana site per search was equivalent to searching approximately 9 turbines at Wild Horse. The background estimate for observed mortality would be approximately 0.33 per turbine plot per year, unadjusted for scavenging and searcher efficiency. The background mortality information from Minnesota and Montana suggest that the estimates of bird mortality include some avian fatalities

[1] Monitoring at the Condon wind project took place for less than one year in 2003 (Fishman 2003). Three bird fatalities, including one rough-legged hawk, and no bats were located during the study. No searcher efficiency or carcass removal trials were conducted.

not related to turbine collision, and this factor alone would lead to an over-estimate of true avian collision mortality for the study.

There are some other potential negative biases. For example, no adjustments were made for fatalities possibly occurring outside of the rectangular plot boundaries. Plot boundaries were established a minimum distance of 110 m from the turbines. Because the search plots were rectangular in shape, the maximum distance to a turbine within a search plot was 141 m at the corners. The search plot distance for this study was selected based on results of other studies (Higgins et al. 1996, Erickson et al. 2004, Young et al. 2003, Young et al. 2005) where a distance equal to the approximate height of the turbine appeared to capture a very large percentage of fatalities. Based on the distribution of fatalities as a function of distance from turbines (Figure 3), a small percentage of bird fatalities possibly fell outside the search plots and may have been missed. This factor would lead to an underestimate of bird fatality rates. However, again it is unknown if the fatalities detected at greater than 90 m (2) were actual turbine collision fatalities. The distribution of bat fatalities at Wild Horse (see Figure 4) and at other sites (e.g., Erickson et al. 2004, Young et al. 2003, Kerns and Kerlinger 2004) suggest bat casualties fall closer to turbines than bird casualties. No bat carcasses were found beyond 66 m from a turbine and it is unlikely that many bats fell outside the effective search area.

Other potential biases are associated with the experimental carcasses used in searcher efficiency and carcass removal trials and whether or not they are representative of actual carcasses. This may occur if the types of birds used are larger or smaller than the carcasses of fatalities, more or less cryptic in color than the actual fatalities, etc. We used house sparrows, savannah sparrows, American robin, European starlings, rock pigeons, coturnix quail, hen pheasants and hen mallards to represent the range of fatalities expected. We feel this range captures the range of sizes and other characteristics of actual fatalities and should be a reasonable representation of scavenging rates of the birds as a group. It is generally not practical or feasible to obtain many of the native bird species in fresh condition for these trials.

Concern has also been raised regarding how the number of carcasses placed in the field for carcass removal trials on a given day could lead to biased estimates of scavenging rates. Hypothetically, this would lead to underestimating true scavenging rates if the scavenger densities are low enough such that scavenging rates for these placed carcasses are lower than for actual fatalities. The logic is that if the trials are based on too many carcasses on a given day, scavengers are unable to get to all trial carcasses, whereas they could get to all wind turbine collisions. If this is the case, and the trial carcass density is much greater than actual turbine fatality density, the trials would underestimate scavenging rates compared to rates on actual fatalities. In our study, we placed approximately 1 carcass for every 1.5 – 2.5 square miles on a given trial day, which we believe is not high enough to create a significant bias.

5.1 Species Composition and Fatality Estimates

Species composition for bird casualties was similar to composition at other sites in the Pacific Northwest, with horned larks comprising the majority of avian fatalities. Species composition for

bats was also very similar to other Pacific Northwest projects with only three species found: silver-haired bat, hoary bat, and little brown bat. The silver-haired bats were found in the spring, which was also the case for the Hopkins Ridge Project in Columbia County, Washington. As supported by this study and by numerous other monitoring studies throughout the US, the majority of bat fatalities are found in the late summer and early fall during the time period when both silver-haired and hoary bats are migrating (Cryan et al. 2004).

The fatality estimates from this study were generally within the range predicted in the permitting documents for the Wild Horse (Section 3.6, Site Certificate Application). The empirical fatality estimates from this study were in the range of predictions for all birds (100-400), bats (100-400), and passerines (100-300). The raptor estimates (21) were higher than what was predicted (approximately 10). The prediction method used regional estimates of fatality rates expressed on a per turbine basis. Since the predictions were made (year 2003), other approaches that use, for example, regional estimates expressed on a per MW basis have been utilized. This approach assumes that mortality is roughly proportional to the MW output of the turbines, which is a surrogate for mortality being proportional to the rotor swept area. Our predictions would have been higher for raptors, had we used the mortality estimates using a per MW basis.

Population estimates for species killed have been derived from breeding bird surveys (Blancher et al. 2007). These estimates can be made for different regions and states within the US, and can provide some perspective on how the level of mortality compares to these broad populations. The raptor fatalities were comprised of the most common raptor species in Eastern Washington (American kestrel, great horned owl, and red-tailed hawk). Using Blancher et al. (2007), it is estimated there are 110,000 American kestrels, 17,000 great-horned owls and 36,000 red-tailed hawks in eastern Washington (Great Basin Bird Conservation Region within Washington) during the summer. These estimates do not account for birds migrating through or wintering in the area from other Bird Conservation Regions. The low level of mortality at this site (estimated 21 total raptors per year) would likely have negligible impacts on the populations defined above.

There are an estimated 1,100,000 horned larks, 500,000 dark-eyed juncos, and 180,000 golden-crowned kinglets in Eastern Washington during the summer. These three species were the most common fatalities and comprised approximately 32% of the fatalities found. We would estimate less than 40 of each species killed each year at this facility.

The overall bird and raptor fatality estimates for Wild Horse fall within the range of estimates reported for other Pacific Northwest Projects (Table 8), and the patterns in fatality locations and species composition were consistent with the other regional projects. No state or federally threatened species were found. There appeared to be a larger diversity in the species found compared to many of the other sites, likely due to the diversity of habitat at Wild Horse. Where horned larks have typically comprised 30-60% of the fatalities at the other Pacific Northwest projects, they only comprised 14% of the fatalities at Wild Horse.

The overall bat fatality rate is towards the lower range of estimates for the other Pacific Northwest Projects (Table 8). There are potential biases in the estimates because we needed to

use surrogates for the experimental trials; however, the results are consistent with the patterns observed at other Pacific Northwest wind projects. Bat fatality estimates at new projects are more variable than bird estimates, with the highest estimates occurring at site in the Eastern US (Nicholson 2003, Kerlinger and Kerns 2004, Arnett 2005). Based on these comparisons, bird and bat mortality at Wild Horse is similar and slightly lower than other newer generation wind projects studied in the Pacific Northwest and the US in general.

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Table 1. List of survey visits and dates.

Visit Number	Dates
1	1/9/07-2/1/07
2	2/6/07-2/26/07
3	3/6/07-3/21/07
4	3/22/07-3/26/07
5	3/27/07-3/29/07
6	3/30/07-4/3/07
7	4/4/07-4/6/07
8	4/4/07-5/2/07
9	4/18/07-4/20/07
10	4/25/07-4/27/07
11	5/2/07-5/4/07
12	5/9/07-5/11/07
13	5/7/07-5/24/07
14	5/29/07-6/12/07
15	6/26/07-7/11/07
16	7/25/07-7/27/07
17	7/24/07-8/16/07
18	8/22/07-8/24/07
19	8/29/07-8/31/07
20	9/5/07-9/7/07
21	8/21/07-9/18/07
22	9/19/07-9/21/07
23	9/26/2007-9/28/07
24	10/3/07-10/5/07
25	9/24/07-10/16/07
26	10/17/07-11/7/07
27	10/31/07-11/2/07
28	11/13/07-11/30/07
29	12/4/07-12/15/07

Table 2. List of plots and number of searches/visits.

Plot ID	# turbines	# searches/visits
A1-A2	2	29
A5-A6	2	13
B1-B2	2	13
C10-C11	2	29
C14-C15	2	13
C2-C3	2	13
C6-C7	2	13
D13-D14	2	13
D17-D18	2	13
D1-D2	2	13
D21-D22	2	13
D25-D26	2	29
D30-D31	2	13
D34-D35	2	13
D5-D6	2	13
D9-D10	2	13
E1-E2	2	29
E5-E6	2	13
E9-E10	2	13
F2-F3	2	13
G2-G3	2	13
G6-G7	2	13
H2-H3	2	29
J3-J4	2	29
K3-K4	2	13
L3-L4	2	13
M1-M2	2	13
M5-M6	2	29
N1-N2	2	13
O2-O3	2	13
P1-P2	2	29
Q3-Q4	2	13

Table 3. List of bird fatalities by species.

Species	# found	% of Total
Birds		
horned lark	11	14.3
dark-eyed junco	7	9.1
golden-crowned kinglet	7	9.1
Brewer's sparrow	5	6.5
unidentified bird	5	6.5
American kestrel	4	5.2
unidentified kinglet	4	5.2
American robin	3	3.9
common nighthawk	3	3.9
yellow-rumped warbler	3	3.9
ruby-crowned kinglet	2	2.6
Townsend's warbler	2	2.6
unidentified passerine	2	2.6
black-billed magpie	1	1.3
gray partridge	1	1.3
great-horned owl	1	1.3
hairy woodpecker	1	1.3
house finch	1	1.3
house wren	1	1.3
magnolia warbler	1	1.3
mallard	1	1.3
mourning dove	1	1.3
northern flicker	1	1.3
red-tailed hawk	1	1.3
rock pigeon	1	1.3
sage sparrow	1	1.3
Vaux's swift	1	1.3
warbling vireo	1	1.3
western grebe	1	1.3
western kingbird	1	1.3
western tanager	1	1.3
Williamson's sapsucker	1	1.3
Total	**77**	**100.0**

Table 4. List of bat fatalities by species.

Species	# found	% of Total
Bats		
hoary bat	10	58.8
silver-haired bat	4	23.5
little brown bat	3	17.6
Total	**17**	**100.0**

Table 5. Carcass detection rates for large and small birds during searcher efficiency trials at the Wild Horse Wind Project, 2007.

	Large		Small	
Date	**# Placed**	**% Found**	**# Placed**	**% Found**
2/16/2007	5	60.00	5	0.00
3/6/2007	5	0.00	5	0.00
3/28/2007	10	90.00	10	80.00
4/19/2007	5	100.00	5	40.00
6/8/2007	4	100.00	5	40.00
7/11/2007	11	100.00	10	40.00
8/23/2007	10	100.00	10	50.00
9/27/2007	10	60.00	10	50.00
11/7/2007	11	45.45	10	20.00
12/12/2007	11	72.73	10	50.00
TOTAL	**82**	**74.39**	**80**	**41.25**

Table 6. Observed and adjusted fatality rates for birds and bats.

	Observed Fatality Rate			Adjusted Fatality Rate	
	# found	#/turbine/yr	#/MW/yr	#/turbine/yr	#/MW/yr
Raptors	5	0.08	0.04	0.17	0.09
all small birds	42	0.66	0.36	2.31	1.28
all large birds	13	0.20	0.11	0.48	0.27
all birds	55	0.86	0.48	2.79	1.55
grassland songbirds	10	0.16	0.09	0.52	0.29
likely nocturnal migrants	27	0.42	0.23	1.58	0.88
Bats	14	0.22	0.12	0.70	0.39

Table 7. Incidental observations of mammals, raptors, sage grouse, and reptiles during the one year study. Not all observations of raptors were recorded.

Species	groups	total
Mammals		
coyote	11	11
elk	82	1279
mule deer	51	207
greater sage grouse	1	1
sage grouse nest	1	1
Raptors		
American kestrel	8	9
bald eagle	1	1
golden eagle	4	4
merlin	1	1
northern harrier	6	6
peregrine falcon	1	1
prairie falcon	1	1
red-tailed hawk	10	11
rough-legged hawk	3	3
unidentified falcon	3	3
unidentified raptor	3	3
Reptiles		
gopher snake	5	5
rattlesnake	4	4
rubber boa	2	2
short-horned lizard	28	49
unidentified lizard	1	1
unidentified snake	2	2
western diamondback	1	1
western yellow-bellied racer	1	1

Table 8. Raptor, all bird, and bat mortality estimates at existing wind energy projects in the Columbia Plateau Ecoregion.

	Fatality Rate (#/MW/year)			
Project	**Raptors**	**All birds**	**Bats**	**Source**
Wild Horse, WA	**0.09**	**1.55**	**0.39**	This Study
Bighorn I, WA	0.15	2.6	1.9	NWC 2008
Combine Hills, OR	0.00	2.6	1.9	Young et al. 2005
Hopkins Ridge, WA	0.14	1.2	0.6	Young et al. 2007
KlondikeI OR	0.00	0.9	0.8	Johnson et al. 2003
Klondike II, OR	0.11	3.1	0.4	NWC and WEST 2007
Leaning Juniper, OR	0.06	3.2	0.9	NWC 2007
Nine Canyon, WA	0.05	2.8	2.5	Erickson et al. 2001
Stateline, WA/OR	0.09	2.9	1.7	Erickson et al. 2004
Vansycle, OR	0.00	1.0	1.1	Erickson et al. 2000
Mean	**0.07**	**2.3**	**1.2**	

Figure 1. Location of carcass search plots at the Wild Horse Wind Project.

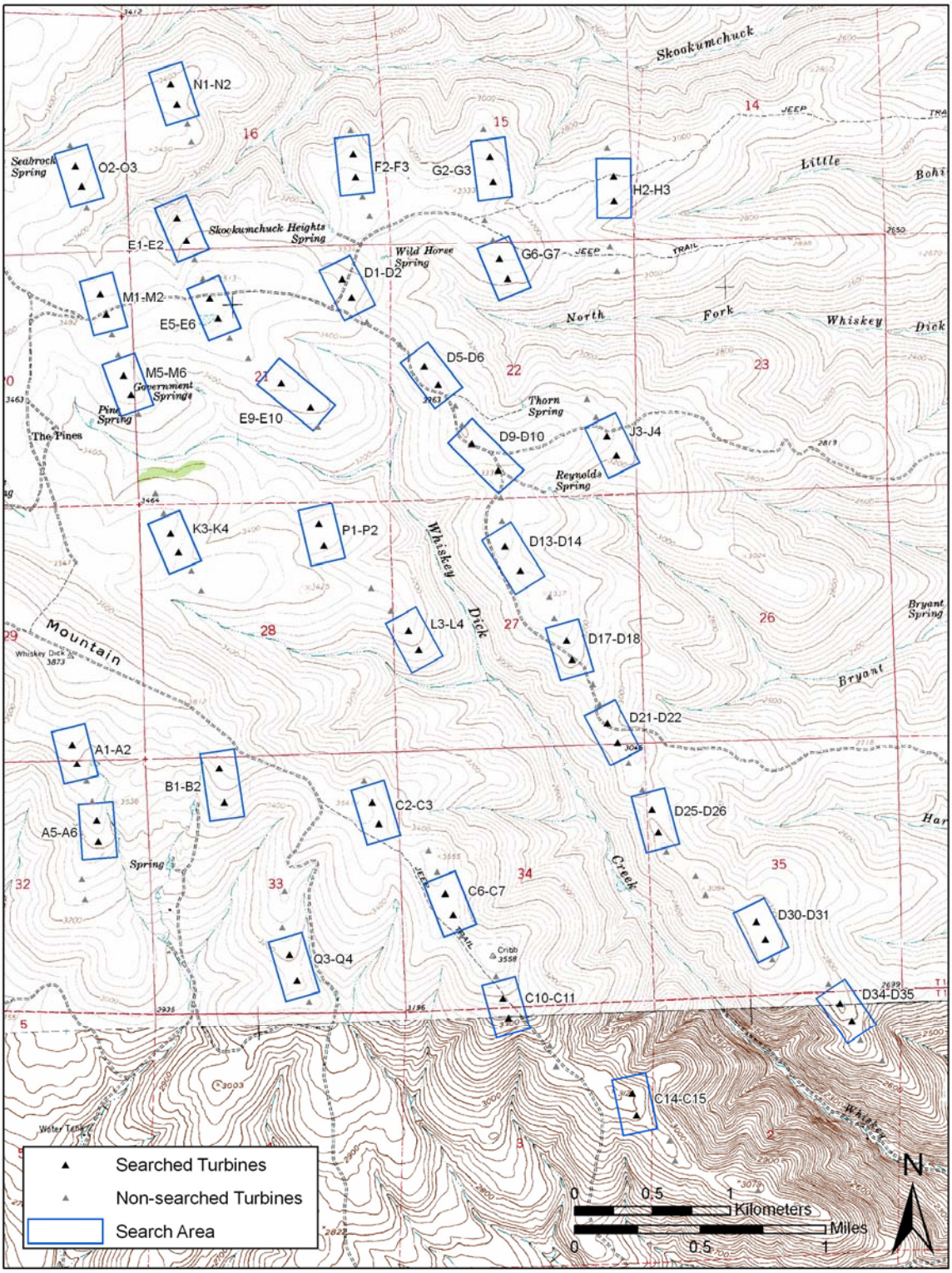


Figure 2. Illustration of search plots and search transects.

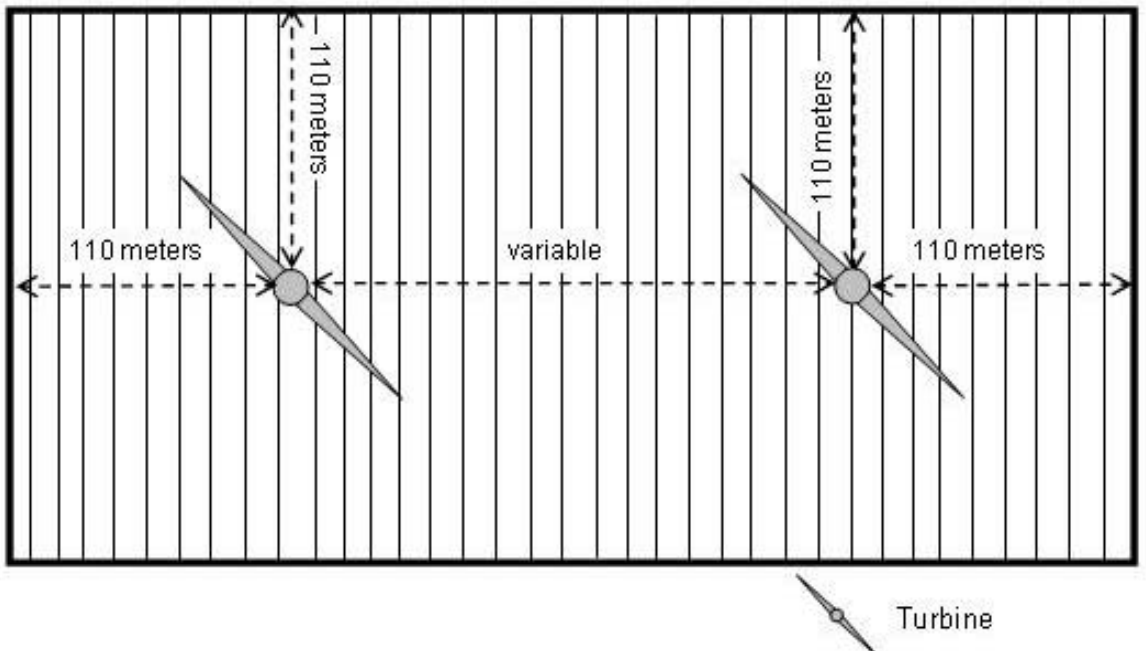


Figure 3. Location of bird fatalities found during 2007 at the Wild Horse Wind Project.

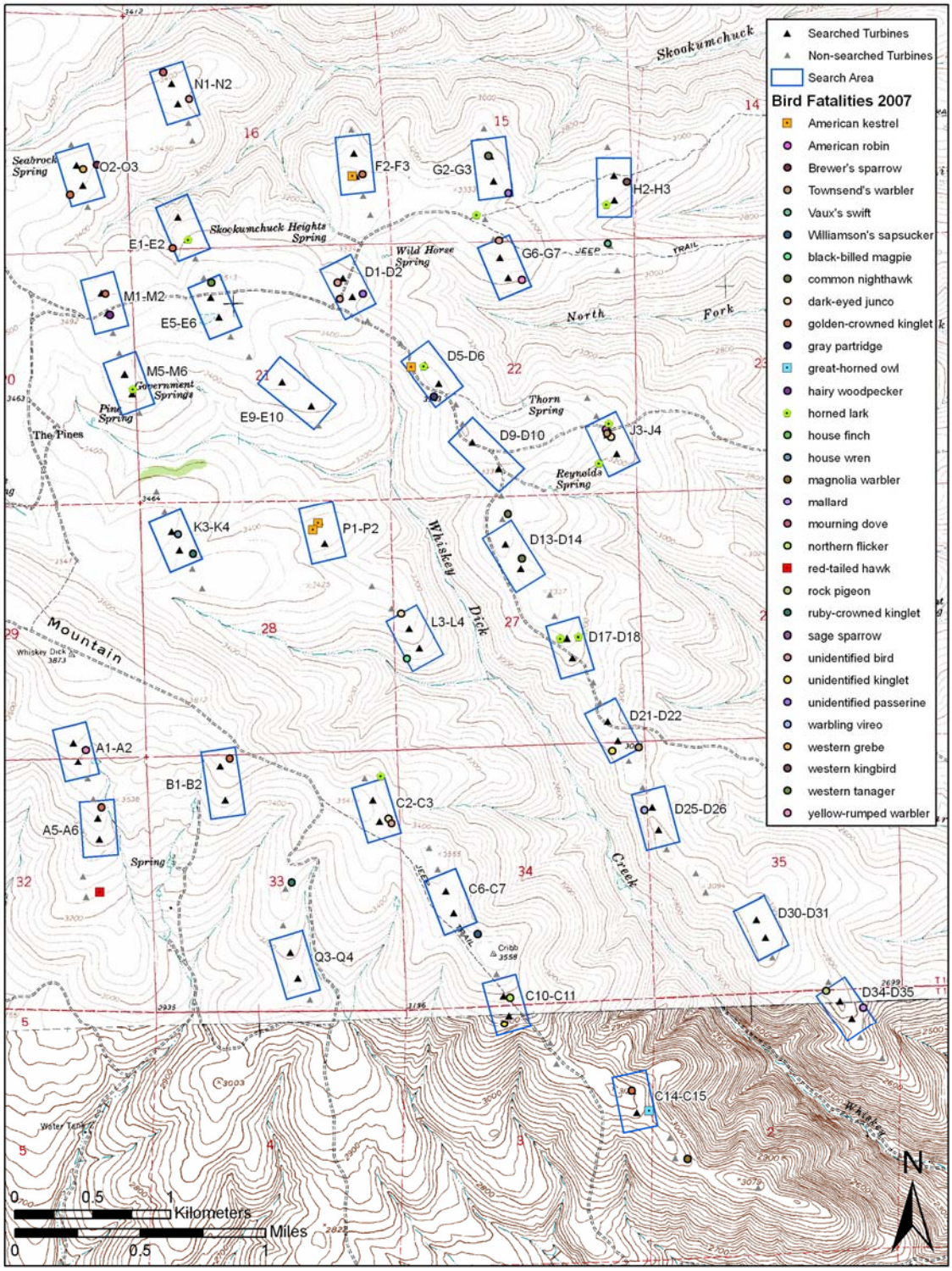
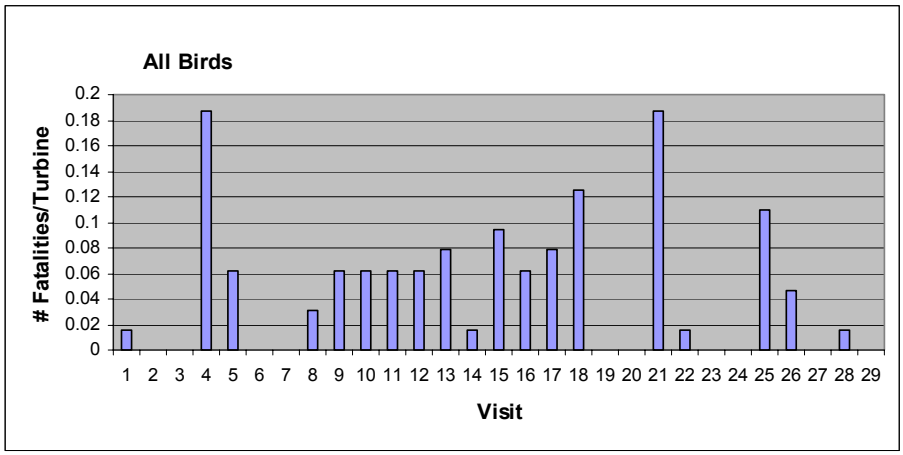
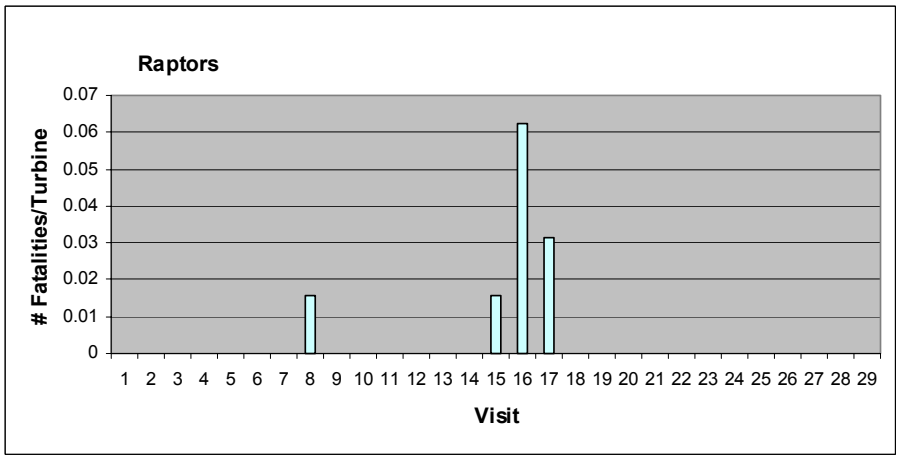
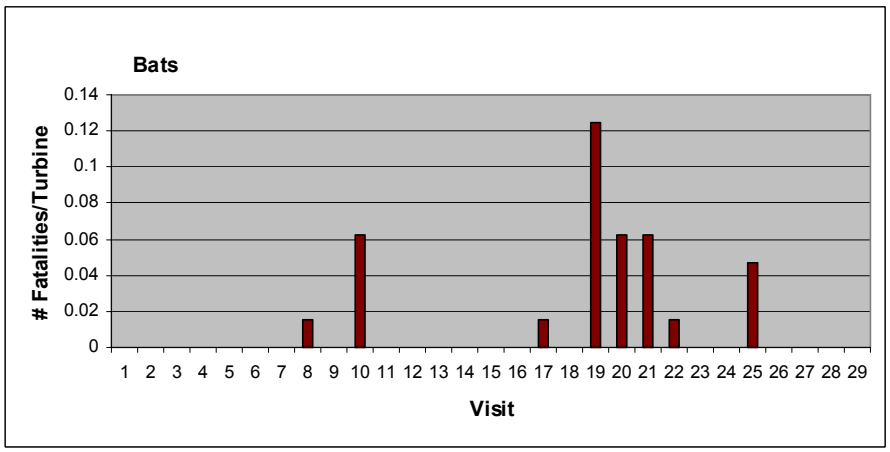


Figure 4. Timing of all bird, raptor and bat mortality at the Wild horse wind project.







Visit	Dates
1	1/9/07-2/1/07
2	2/6/07-2/26/07
3	3/6/07-3/21/07
4	3/22/07-3/26/07
5	3/27/07-3/29/07
6	3/30/07-4/3/07
7	4/4/07-4/6/07
8	4/4/07-5/2/07
9	4/18/07-4/20/07
10	4/25/07-4/27/07
11	5/2/07-5/4/07
12	5/9/07-5/11/07
13	5/7/07-5/24/07
14	5/29/07-6/12/07
15	6/26/07-7/11/07
16	7/25/07-7/27/07
17	7/24/07-8/16/07
18	8/22/07-8/24/07
19	8/29/07-8/31/07
20	9/5/07-9/7/07
21	8/21/07-9/18/07
22	9/19/07-9/21/07
23	9/26/2007-9/28/07
24	10/3/07-10/5/07
25	9/24/07-10/16/07
26	10/17/07-11/7/07
27	10/31/07-11/2/07
28	11/13/07-11/30/07
29	12/4/07-12/15/07

Figure 5. Location of bat fatalities found during 2007 at the Wild Horse Wind Project.

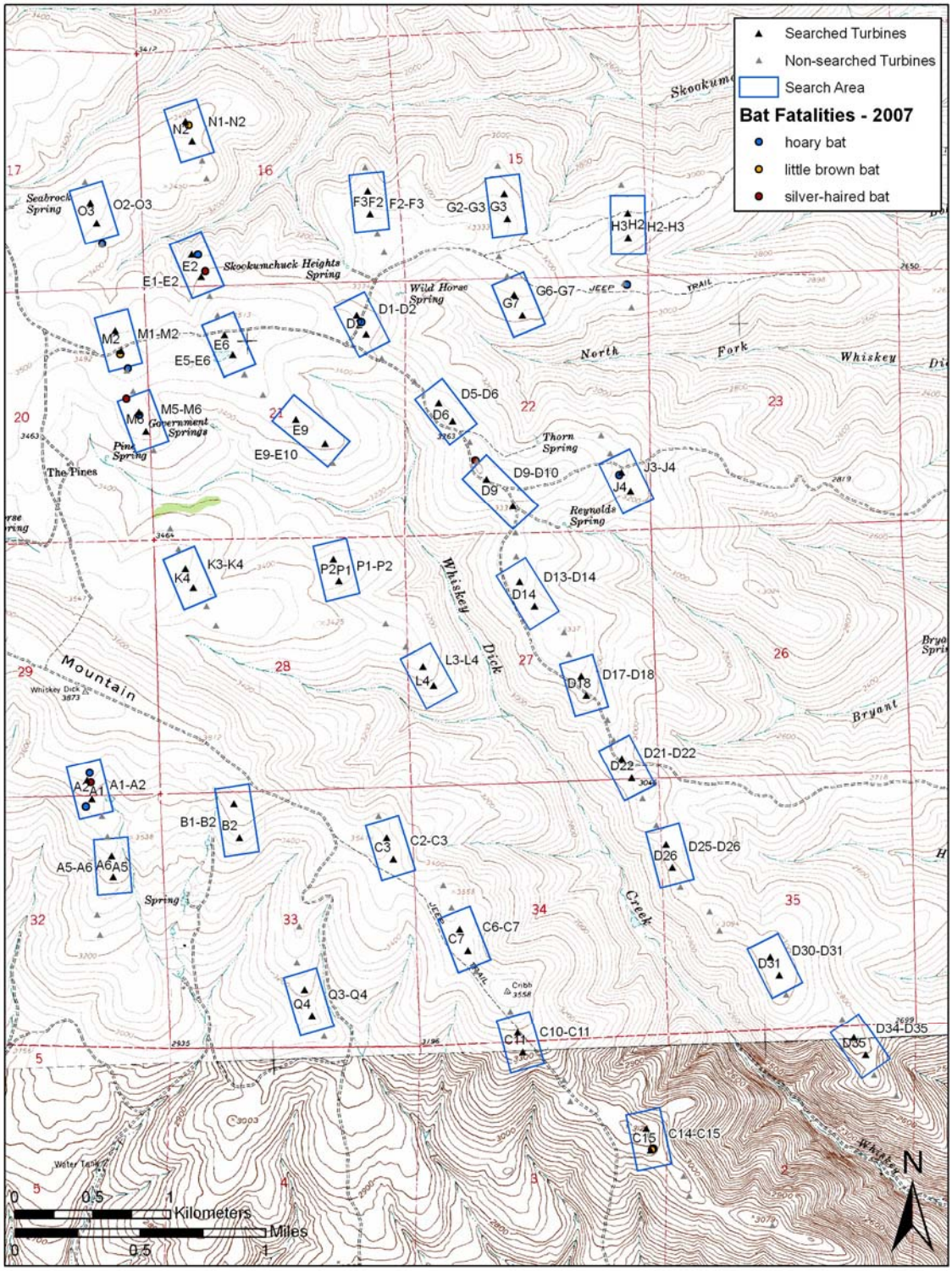


Figure 6. Removal rates for large birds (mallards, ring-necked pheasants, rock pigeons), and small birds (house sparrows, European starling, *Coturnix* quail, mallard chicks).

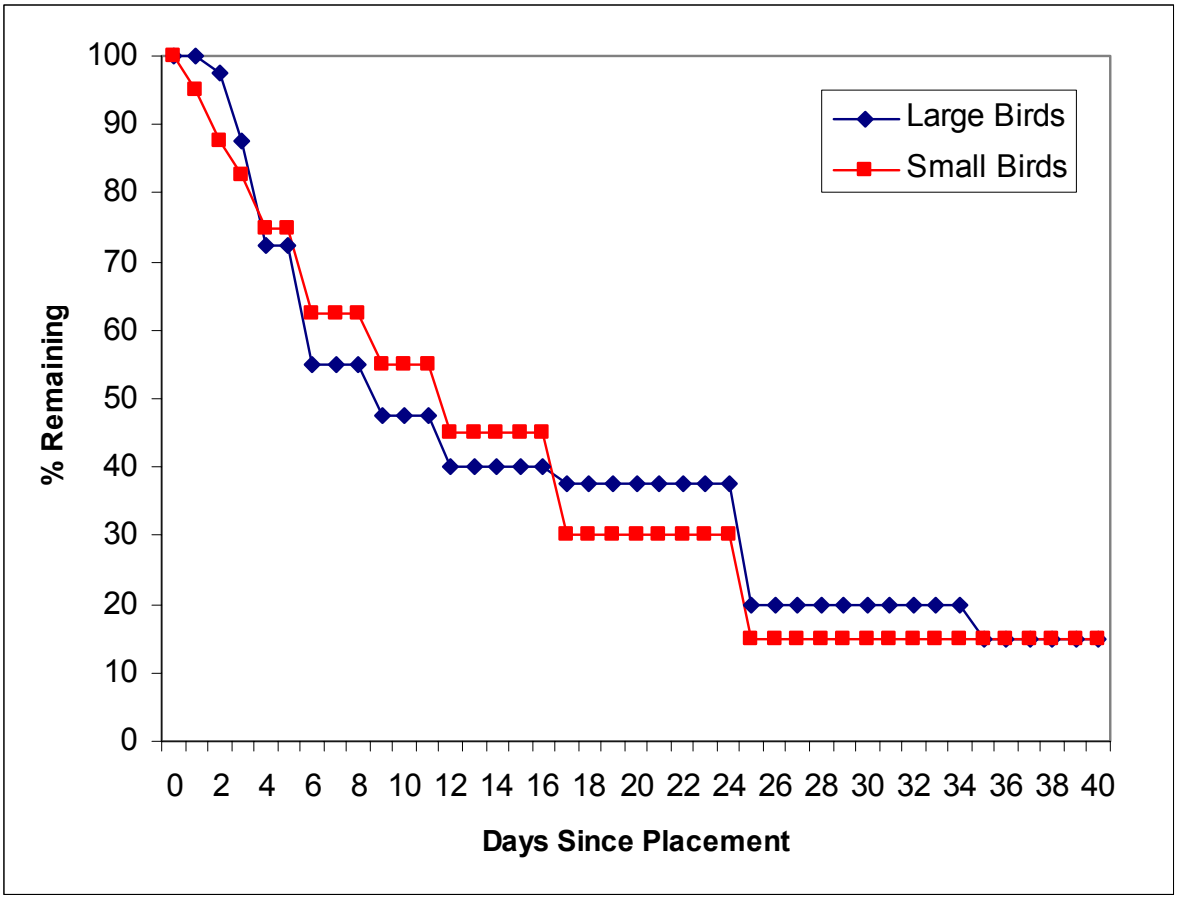


Figure 7. Location of Transmission line poles.

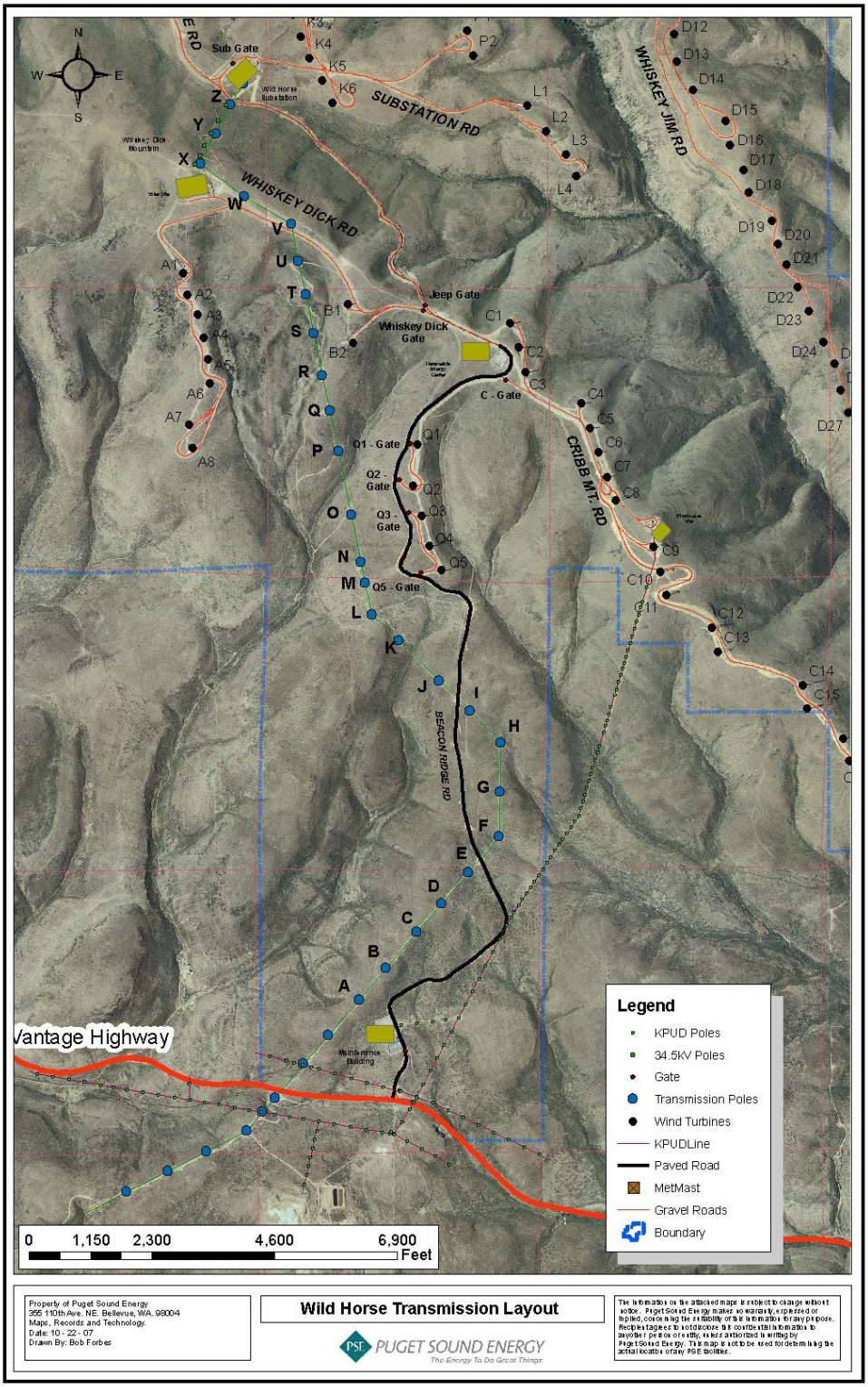
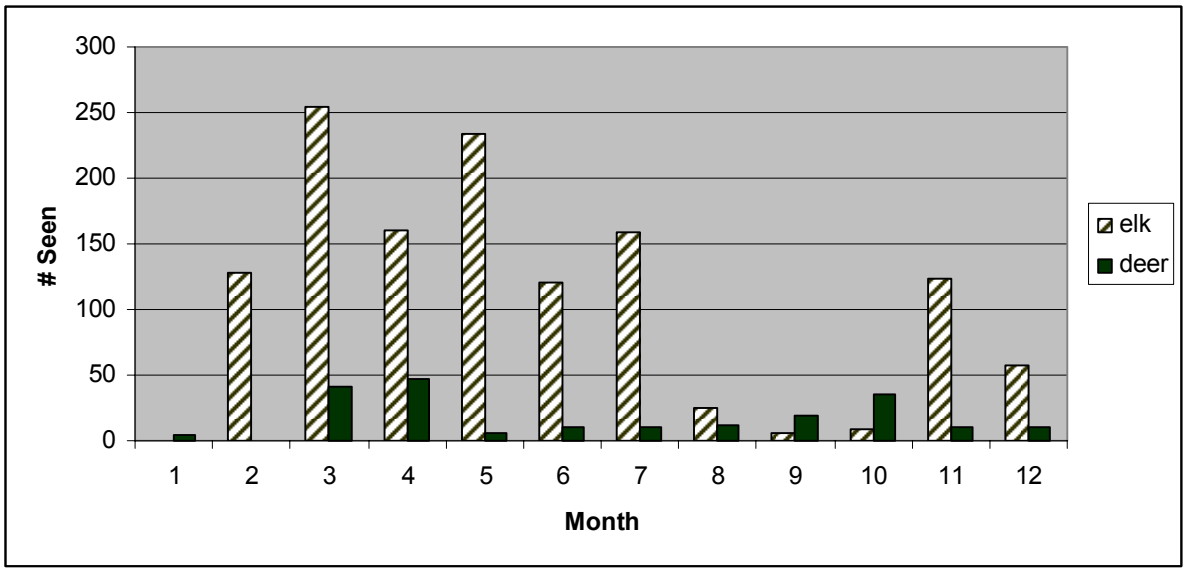


Figure 8. Photograph of sage grouse nest found near turbine E1.

Figure 9. Number of elk and deer observed by month.



APPENDIX A

Sample ID	Date	Taxa ID	Turbine	Plot	Scheduled Search	Condition
AMKE-041207-01	4/12/2007	American kestrel	P1	P1-P2	incidental	intact
AMKE-062107-01	6/21/2007	American kestrel	F3	F2-F3	incidental	intact
AMKE-072407-01	7/24/2007	American kestrel	D5	D5-D6	scheduled search	dismembered
AMKE-072607-01	7/26/2007	American kestrel	P1	P1-P2	scheduled search	feather spot
AMRO-032807-01	3/28/2007	American robin	J3	J3-J4	scheduled search	scavenged
AMRO-082307-01	8/23/2007	American robin	J3	J3-J4	scheduled search	scavenged
AMRO-102907-01	10/29/2007	American robin	O&M building		incidental	intact
BBMA-052207-01	5/22/2007	black-billed magpie	L4	L3-L4	scheduled search	dismembered
BRSP-082407-01	8/24/2007	Brewer's sparrow	O&M building		incidental	intact
BRSP-082407-02	8/24/2007	Brewer's sparrow	O&M building		incidental	scavenged
BRSP-082807-01	8/28/2007	Brewer's sparrow	O2	O2-O3	scheduled search	scavenged
BRSP-082807-02	8/28/2007	Brewer's sparrow	O&M building		incidental	intact
BRSP-100907-01	10/9/2007	Brewer's sparrow	O&M building		incidental	
CONI-070307-01	7/3/2007	common nighthawk	G2	G2-G3	scheduled search	dismembered
CONI-092407-01	9/24/2007	common nighthawk	D12		incidental	feather spot
CONI-092407-02	9/24/2007	common nighthawk	D14	D13-D14	scheduled search	feather spot
DEJU-100807-01	10/8/2007	dark-eyed junco	L2	L3-L4	scheduled search	dismembered
DEJU-100907-01	10/9/2007	dark-eyed junco	C3	C2-C3	scheduled search	feather spot

Sample ID	Date	Taxa ID	Turbine	Plot	Scheduled Search	Condition
DEJU-101007-01	10/10/2007	dark-eyed junco	Interpretive center		incidental	intact
DEJU-101107-01	10/11/2007	dark-eyed junco	J3	J3-J4	scheduled search	intact
DEJU-101507-01	10/15/2007	dark-eyed junco	O&M Building		incidental	intact
DEJU-103007-01	10/30/2007	dark-eyed junco	Interpretive center		incidental	dismembered
DEJU-103107-01	10/31/2007	dark-eyed junco	O&M Building		incidental	intact
GCKI-050107-01	5/1/2007	golden-crowned kinglet	C14	C14-C15	scheduled search	intact
GCKI-091007-01	9/10/2007	golden-crowned kinglet	A5	A5-A6	scheduled search	intact
GCKI-091207-01	9/12/2007	golden-crowned kinglet	E2	E1-E2	scheduled search	intact
GCKI-091807-01	9/18/2007	golden-crowned kinglet	M1	M1-M2	scheduled search	intact
GCKI-092407-01	9/24/2007	golden-crowned kinglet	F3	F2-F3	scheduled search	intact
GCKI-102207-01	10/22/2007	golden-crowned kinglet	O3	O2-O3	scheduled search	feather spot
GCKI-102907-01	10/29/2007	golden-crowned kinglet	B1	B1-B2	scheduled search	feather spot
GHOW-080207-01	8/2/2007	great-horned owl	C15	C14-C15	scheduled search	feather spot
GRPA-072407-01	7/24/2007	gray partridge	D6	D5-D6	scheduled search	feather spot
HAWO-070907-01	7/9/2007	hairy woodpecker	M2	M1-M2	scheduled search	feather spot
HOBA-081407-01	8/14/2007	hoary bat	O4	O2-O3	incidental	intact
HOBA-081407-02	8/14/2007	hoary bat	I1		incidental	intact
HOBA-082707-01	8/27/2007	hoary bat	C15	C14-C15	scheduled search	intact
HOBA-082907-01	8/29/2007	hoary bat	E1	E1-E2	scheduled search	scavenged
HOBA-082907-02	8/29/2007	hoary bat	M5	M5-M6	scheduled search	scavenged

Sample ID	Date	Taxa ID	Turbine	Plot	Scheduled Search	Condition
HOBA-083007-01	8/30/2007	hoary bat	M3		incidental	intact
HOBA-090607-01	9/6/2007	hoary bat	A1	A1-A2	scheduled search	intact
HOBA-091307-01	9/13/2007	hoary bat	A2	A1-A2	scheduled search	intact
HOBA-092007-01	9/20/2007	hoary bat	J3	J3-J4	scheduled search	dismembered
HOBA-092407-01	9/24/2007	hoary bat	D1	D1-D2	scheduled search	intact
HOFI-042507-01	4/25/2007	house finch	O&M Building		incidental	intact
HOLA-032207-01	3/22/2007	horned lark	E2	E1-E2	scheduled search	feather spot
HOLA-032307-01	3/23/2007	horned lark	J4	J3-J4	scheduled search	feather spot
HOLA-041807-01	4/18/2007	horned lark	H3	H2-H3	scheduled search	scavenged
HOLA-050307-01	5/3/2007	horned lark	M6	M5-M6	scheduled search	Intact
HOLA-051007-01	5/10/2007	horned lark	J3	J3-J4	scheduled search	Dismembered
HOLA-051507-01	5/15/2007	horned lark	D17	D17-D18	scheduled search	feather spot
HOLA-062507-01	6/25/2007	horned lark	Q5		incidental	Intact
HOLA-070507-01	7/5/2007	horned lark	C1	C2-C3	scheduled search	Scavenged
HOLA-082407-01	8/24/2007	horned lark	G4		incidental	Dismembered
HOLA-090407-01	9/4/2007	horned lark	D5		incidental	Dismembered
HOLA-091007-01	9/10/2007	horned lark	D17	D17-D18	scheduled search	Scavenged
HOWR-050807-01	5/8/2007	house wren	K3	K3-K4	scheduled search	Intact
LBBA-042007-01	4/20/2007	little brown bat	C15	C14-C15	incidental	Intact
LBBA-082807-01	8/28/2007	little brown bat	N1	N1-N2	scheduled search	Scavenged

Sample ID	Date	Taxa ID	Turbine	Plot	Scheduled Search	Condition
LBBA-091807-01	9/18/2007	little brown bat	M2	M1-M2	scheduled search	Intact
MALL-080707-01	8/7/2007	mallard	D35	D34-D35	scheduled search	feather spot
MGWA-050907-01	5/9/2007	MacGillivray's warbler	C17		incidental	Intact
MODO-080207-01	8/2/2007	mourning dove	D18	D17-D18	scheduled search	Intact
NOFL-032607-01	3/26/2007	northern flicker	C10	C10-C11	scheduled search	feather spot
RCKI-050807-01	5/8/2007	ruby-crowned kinglet	K5	K3-K4	scheduled search	Intact
RCKI-103007-01	10/30/2007	ruby-crowned kinglet	Q1		incidental	Intact
ROPI-061107-01	6/11/2007	rock pigeon	D34	D34-D35	scheduled search	feather spot
RTHA-060907-01	6/9/2007	red-tailed hawk	A8		incidental	Dismembered
SAGS-082307-01	8/23/2007	sage sparrow	O&M Building		incidental	Intact
SHBA-042507-01	4/25/2007	silver-haired bat	A1	A1-A2	scheduled search	Intact
SHBA-050907-01	5/9/2007	silver-haired bat	D8		incidental	Intact
SHBA-101007-01	10/10/2007	silver-haired bat	E2	E1-E2	scheduled search	Scavenged
SHBA-101007-02	10/10/2007	silver-haired bat	M4	M5-M6	scheduled search	Intact
TOWA-091707-01	9/17/2007	Townsend's warbler	D23	D21-D22	scheduled search	Intact
TOWA-092007-01	9/20/2007	Townsend's warbler	J3	J3-J4	scheduled search	Dismembered
UNID-062607-01	6/26/2007	unidentified bird	D1	D1-D2	scheduled search	feather spot
UNID-062607-02	6/26/2007	unidentified bird	D2	D1-D2	scheduled search	feather spot
UNID-092507-01	9/25/2007	unidentified bird	N2	N1-N2	scheduled search	feather spot
UNID-100907-02	10/9/2007	unidentified bird	C3	C2-C3	scheduled search	feather spot

Sample ID	Date	Taxa ID	Turbine	Plot	Scheduled Search	Condition
UNID-102207-01	10/22/2007	unidentified bird	G5	G6-G7	scheduled search	feather spot
UNKL-091407-02	9/14/2007	unidentified kinglet	C11	C10-C11	scheduled search	feather spot
UNKL-091707-01	9/17/2007	unidentified kinglet	D22	D21-D22	scheduled search	feather spot
UNPA-012507-01	1/25/2007	unidentified passerine	G3	G2-G3	scheduled search	feather spot
UNPA-050807-01	5/8/2007	unidentified passerine	D2	D1-D2	scheduled search	feather spot
VASW-081407-01	8/14/2007	Vaux's swift	I1		incidental	scavenged
WAVI-091407-01	9/14/2007	warbling vireo	D25	D25-D26	scheduled search	intact
WEGR-111307-01	11/13/2007	western grebe	O2	O2-O3	scheduled search	intact
WEKI-082207-01	8/22/2007	western kingbird	H2	H2-H3	scheduled search	scavenged
WETA-050907-01	5/9/2007	western tanager	E4		incidental	dismembered
WISA-031907-01	3/19/2007	Williamson's sapsucker	C8		incidental	intact
YRWA-042507-01	4/25/2007	yellow-rumped warbler	A2	A1-A2	scheduled search	intact
YRWA-091707-01	9/17/2007	yellow-rumped warbler	G7	G6-G7	scheduled search	dismembered
YRWA-121107-01	12/11/2007	yellow-rumped warbler	O&M Building		incidental	intact

APPENDIX B – INCIDENTAL WILDLIFE OBSERVATIONS

Species	Date	No.	Location	Notes
coyote	2/23/2007	1	M1, M2	act= trotting
coyote	5/14/2007	1	W of Q string, 200m	act= running. turbines running
coyote	5/21/2007	1	C10, C11	act= running. turbines running
coyote	5/29/2007	1	200m W of O string	act= running. turbines running
coyote	5/31/2007	1	water hole N of substation	act= walking.
coyote	8/8/2007	1	ON PLOT E9-E10	running
coyote	8/23/2007	1	CROSSING MAINLINE RD	running
coyote	9/27/2007	1	300 S Q5	running; turbinenotrunning
coyote	11/19/2007	1	300 m W, C14	turbine not running. turbine not running.
coyote	11/27/2007	1	100 m E, M2	turbine running.
coyote	11/27/2007	1	100 m E, D17	turbine not running.
elk	2/15/2007	10	1500m N of D18	
elk	2/16/2007	13	near turbine F3	act = grazing
elk	2/22/2007	30	east of turbine D-15	
elk	2/22/2007	75	approx. 100m from K6	1 antlered bull. act = grazing, bedding
elk	3/8/2007	11	ridge E of D25	act= resting
elk	3/8/2007	17	ridge E of D21	act = resting
elk	3/8/2007	23	ridge NW of F1	act = resting
elk	3/8/2007	20	D26	act= resting
elk	3/9/2007	25	G1	act = resting, grazing
elk	3/12/2007	100	crossing road near D1	act = walking
elk	3/12/2007	50	ridge N of N1	
elk	3/15/2007	4	moving W to E under D8	act= walking
elk	3/19/2007	2	near P1-P2	
elk	3/26/2007	1	300 m W, D4	turbine running
elk	3/29/2007	2	on ridge near C-string	both bulls observed from d25
elk	4/3/2007	5	A1, A2	act = resting. ran off when they saw me
elk	4/4/2007	10	ridge N of E1	act= resting
elk	4/6/2007	3	ridge W of D21	act= grazing
elk	4/9/2007	30	valley N of M1	act = grazing, walking
elk	4/10/2007	16	800m W of turbine A3	act= grazing
elk	4/10/2007	3	N of visitor's center	act= grazing

Species	Date	No.	Location	Notes
elk	4/10/2007	3	near turbine D15	act= running
elk	4/10/2007	8	near L4	act= grazing, bedding
elk	4/10/2007	20	near Q-string	act= walking
elk	4/13/2007	5	SE of J4	act= grazing
elk	4/16/2007	15	W of D8	
elk	4/16/2007	12	E of L1	act= grazing
elk	4/23/2007	9	near F2	
elk	4/24/2007	9	100m from E8	
elk	4/26/2007	13	200m W of M6	act= grazing
elk	5/2/2007	3	200m from EI	act= grazing. turbines running.
elk	5/3/2007	15	800m from P1	act= bedded. turbines not running
elk	5/3/2007	13	800m from J4	act= bedded. turbines running.
elk	5/7/2007	10	800m from F3	act= grazing. turbines running.
elk	5/8/2007	50	N1, N2	turbines running
elk	5/10/2007	5	J3, J4	act= grazing. turbines not running
elk	5/10/2007	4	800m from interp. Center	act= running
elk	5/14/2007	27	P1, P2	act= grazing. turbines running
elk	5/15/2007	20	800m E of P2	act= bedded.turbines not running
elk	5/18/2007	15	400m W of O1	act= bedded. turbines running
elk	5/21/2007	8	800m E of D7	act= grazing. turbines running
elk	5/22/2007	3	200m NW of B1	act= grazing. turbines running
elk	5/22/2007	20	50m from L2	turbines running
elk	5/29/2007	5	300m of O string	act= walking. turbines running
elk	5/29/2007	13	N1, N2	act= bedded. turbines running
elk	5/30/2007	7	100m from J1	act= grazing. turbines running
elk	5/30/2007	1	E1, E2	act= grazing. turbines running
elk	5/31/2007	9	J3, J4	act= grazing. turbines running
elk	5/31/2007	6	200m S of E9	act= grazing. turbines running

Species	Date	No.	Location	Notes
elk	6/5/2007	2	300m W, L4	act= grazing. turbines running
elk	6/7/2007	8	400m W O2	act= grazing. turbines running
elk	6/18/2007	4	300m W D6	act= bedded. turbines running
elk	6/18/2007	30	200m W M-string	turbines running
elk	6/18/2007	1	300m S substation	act= grazing
elk	6/26/2007	1	F2, F3	act= running. turbines running
elk	6/27/2007	4	300m E mainline Rd	act= bedded
elk	6/27/2007	8	at H2O tank near F string	turbines running
elk	6/28/2007	7	200m W K6	act= bedded. turbines running
elk	6/29/2007	32	200m W M6	turbines running
elk	6/29/2007	2	D5, D6	act= crossing road. turbines running
elk	6/29/2007	2	150m W D4	act= bedded. turbines running
elk	6/30/2007	20	100m W mainline Rd	
elk	7/1/2007	17	100 M FROM F5	turbine running; grazing bedded
elk	7/1/2007	31	100 M W OF F3	turbine running; grazing bedded
elk	7/4/2007	1	SITTING BENEATH M4 STARIS	turbine running; bedded
elk	7/7/2007	40	CORAL 200 M W M6	turbine running; various activities
elk	7/26/2007	30	100M NW P1	turbine running; various activities
elk	7/27/2007	40	WATER TROUGHT AT MAINLINE RD	bedded/grazing
elk	8/31/2007	25	200 M E M2	turbine running; crossing road
elk	9/13/2007	6	300 M S OF P1	grazing. turbine running
elk	10/4/2007	7	400 JOF E-10	turbine not running; walking
elk	10/8/2007	2	400 S G6	turbine running; grazing
elk	11/1/2007	1	300 m W, D4	turbine running.
elk	11/3/2007	70	100 m N, Interpretive Center	
elk	11/3/2007	30	100 m W, Substation	
elk	11/21/2007	1	400 m W, D3	turbine not running.

Species	Date	No.	Location	Notes
elk	11/26/2007	1	300 m S, Substation	
elk	11/27/2007	20	400 m W, D29	turbine running.
elk	12/6/2007	40	100 m E of E-String	turbines not running.
elk	12/10/2007	9	200 m E, Turbine G2	turbine not running.
elk	12/10/2007	7	200 m E, Turbine G2	turbines not running.
elk	12/10/2007	2	100 m E of E-String	turbines not running.
mule deer	1/11/2007	4	300 m W, C18	turbine running.
mule deer	3/13/2007	5	within the .66-.67 plot	act= grazing
mule deer	3/13/2007	12	underneath M6	act= grazing
mule deer	3/14/2007	4	on ridge W of L3	
mule deer	3/19/2007	5	near J3	act = grazing
mule deer	3/21/2007	6	near G1	act = grazing
mule deer	3/22/2007	6	near F5	act = grazing
mule deer	3/27/2007	3	on ridge N of E1	act= running
mule deer	4/9/2007	5	near visitor's center	act= grazing
mule deer	4/9/2007	9	along E-string	act= walking
mule deer	4/10/2007	2	ridge W of Dstring	
mule deer	4/12/2007	8	near G-string	act= grazing
mule deer	4/13/2007	6	near visitor's center	act= grazing
mule deer	4/25/2007	3	E1, E2	act= grazing
mule deer	4/25/2007	10	100m from G3	act= grazing
mule deer	4/30/2007	4	B1, B2	
mule deer	5/10/2007	2	S of plot J3, J4, 800m	act= grazing
mule deer	5/14/2007	1	800m from turbine K8	act= walking. turbine running.
mule deer	5/15/2007	1	B1, B2	act= grazing. turbines running
mule deer	5/22/2007	1	underneath D3	act= running. turbines running
mule deer	5/31/2007	1	P1, P2	act= bedded. turbines running
mule deer	6/7/2007	2	D9, D10	act= grazing. turbines running
mule deer	6/28/2007	1	P1, P2	act= bedded. turbines running
mule deer	6/29/2007	3	100m W L3	act= running. turbines running
mule deer	6/29/2007	2	150 W F String	act= running. turbines running
mule deer	6/29/2007	2	D20-21	act= crossing road. turbines running
mule deer	6/30/2007	1	50m W C4	act= grazing. turbines running
mule deer	7/2/2007	2	MAINLINE RD NEAR SUB STAT	running

Species	Date	No.	Location	Notes
mule deer	7/3/2007	1	SITTING BENEATH D8 STAIR	turbine running, activity bedded
mule deer	7/4/2007	1	400 m S, K6	turbine running
mule deer	7/4/2007	2	SITTING BENEATH P1 STAIRS	turbine running; bedded
mule deer	7/24/2007	1	300 M W F2	turbine running; grazing
mule deer	7/28/2007	3	200M W OF L1	turbine running; grazing
mule deer	8/3/2007	4	200M W H3	turbine running; grazing
mule deer	8/15/2007	4	150 M E OF D6	turbine running; grazing
mule deer	8/21/2007	4	150M E OF D6	turbine running; grazing
mule deer	9/2/2007	3	150 M N OF C1	turbine running
mule deer	9/6/2007	4	200 M OF D5	grazing. turbine running
mule deer	9/19/2007	3	100 W G-STRING	running; turbine running
mule deer	9/21/2007	1	50 N OF D5	running; turbine running
mule deer	9/21/2007	3	200 M N INTERP CENTER	running
mule deer	9/21/2007	1	100 S OF SUBSTATION	grazing
mule deer	9/24/2007	4	100 M W OF SUBSTATION	grazing
mule deer	10/1/2007	1	400 W OF HZ	turbine running; crossing road
mule deer	10/3/2007	4	300 M S G3	grazing; turbine running
mule deer	10/3/2007	3	300 E E-STRING	turbine not running; grazing
mule deer	10/4/2007	5	300 W K-STRING	turbine not running; grazing
mule deer	10/5/2007	2	300 S SUBSTATION	turbine not running; running
mule deer	10/5/2007	2	100 D8	turbine not running; running
mule deer	10/8/2007	2	300 W L4	turbine running; running
mule deer	10/24/2007	7	ON PLOT M5-M6	turbine running; running
mule deer	10/25/2007	3	300 W G-STRING	turbine running; walking

Species	Date	No.	Location	Notes
mule deer	10/29/2007	1	400 W M6	turbine running; walking
mule deer	10/30/2007	2	400 S K6	turbine running; drinking
mule deer	10/31/2007	4	100 S F5	turbine not running; grazing
mule deer	11/2/2007	1	200 m S, K6	turbine running.
mule deer	11/8/2007	1	300 m W, F1	turbine not running.
mule deer	11/14/2007	7	On plot M5 - M6	turbines running.
mule deer	11/14/2007	2	Crossing main road	
mule deer	12/4/2007	6	50 m W, Substation	
mule deer	12/10/2007	4	100 m W, Turbine G5	turbine not running.
greater sage grouse	9/24/2007	1	10T 0712713/5213366; 126 M W D2	turbine running
sage grouse nest	11/14/2007	1	10T 07116647, 5213881 UTM NAD27, 98 m, E1	possible grsg nest. pictures taken. egg fragments collected.
American kestrel	3/6/2007	1	approx. 200 m from substation	
American kestrel	3/19/2007	1	near substation	
American kestrel	4/2/2007	1	near M6	
American kestrel	4/10/2007	1	near turbine D6	
American kestrel	4/13/2007	1	near E-string	
American kestrel	4/13/2007	2	near B1	
American kestrel	4/16/2007	1	near D2	
American kestrel	4/17/2007	1	near H-string	
bald eagle	3/22/2007	1	above Q, string heading W	
golden eagle	2/8/2007	1	Near 01	west of o1 500 meters
golden eagle	5/30/2007	1	soaring over E-string	turbines running
golden eagle	9/7/2007	1	150 W OF D25	turbine running
golden eagle	12/10/2007	1	100 m E, Turbine G7	turbine not running.
merlin	12/5/2007	1	100 m N, Turbine E1	turbine running.
northern harrier	3/6/2007	1	flying under turbine J4	
northern harrier	3/7/2007	1	approx. 300m from MS	
northern harrier	3/9/2007	1	near E5	
northern harrier	3/22/2007	1	within plot E1-E2	
northern harrier	3/23/2007	1	near turbine P2	
northern harrier	3/27/2007	1	near E2	
peregrine falcon	11/22/2007	1	Perched on pole "W"	
prairie falcon	4/13/2007	1	near Q5	
red-tailed hawk	2/16/2007	1	300 m West of M6	
red-tailed hawk	3/7/2007	1	hoovering under E8	
red-tailed hawk	3/19/2007	1	flying within plot C6 -C7	
red-tailed hawk	3/26/2007	1	above C7	

Species	Date	No.	Location	Notes
red-tailed hawk	3/29/2007	2	near turbine C10	
red-tailed hawk	4/3/2007	1	valley W of D-string	
red-tailed hawk	4/6/2007	1	near substation	
red-tailed hawk	4/6/2007	1	near visitor's center	
red-tailed hawk	4/12/2007	1	canyon N of E1	
red-tailed hawk	11/8/2007	1	Perched on pole "G"	
rough-legged hawk	2/8/2007	1	Near D9	tree. l.h.
rough-legged hawk	2/22/2007	1	near main office	
rough-legged hawk	3/9/2007	1	on telephone pole by substation	
unidentified falcon	4/2/2007	1	near substation	
unidentified falcon	4/9/2007	1	near M1	
unidentified falcon	11/15/2007	1	Perched on pole "Y"	
unidentified raptor	10/31/2007	1	PERCHE ON POWERPOLE E OF MAIN ROAD BELOW HILL	
unidentified raptor	11/16/2007	1	Perched on pole "C"	
unidentified raptor	11/22/2007	1	Perched on pole "H"	
gopher snake	5/11/2007	1	0714478, 5212666	act= basking. turbines running
gopher snake	6/4/2007	1	D13, D14	act= basking. turbines running
gopher snake	6/26/2007	1	F-string road	act= basking. turbines running. moved him off of road
gopher snake	6/28/2007	1	J3, J4	act= basking. turbines running
gopher snake	8/3/2007	1	ON PLOT G2-G3	turbine running; basting
rattlesnake	7/7/2007	1	COILED IN ROCKS BASE G1	aggravated. 0913 am, sunny light breeze, turbine running
rattlesnake	7/26/2007	1	60M E J3, PLOT J3-J4	aggrevated, hiding in sage, 0958 am turbine running
rattlesnake	8/13/2007	1	ON ROAD 30 M C16	turbine running; basking
rattlesnake	9/17/2007	1	ON PLOT G6-G7	basking turbine running
rubber boa	5/16/2007	1	0711658, 5213842	act= basking. turbines running
rubber boa	5/29/2007	1	N1, N2	act= moving. turbines running

Species	Date	No.	Location	Notes
short-horned lizard	4/6/2007	1	near C11 within plot C10-C11	act= basking. photographs taken
short-horned lizard	4/18/2007	1	within plot E1-E2	act= running
short-horned lizard	4/27/2007	1	Q3, Q4	act= basking
short-horned lizard	5/14/2007	1	G2, G3	
short-horned lizard	5/15/2007	2	A5, A6	act= running. turbines running
short-horned lizard	5/16/2007	2	on M5, M6	act= running. turbines running
short-horned lizard	5/18/2007	2	O2-O3	act= running. turbines running
short-horned lizard	5/22/2007	1	on plot B1, B2	act= running. turbines running
short-horned lizard	5/24/2007	1	D30, D31	act= running. turbines running
short-horned lizard	6/6/2007	1	G6, G7	act= basking. turbines running
short-horned lizard	6/11/2007	2	D17, D18	act= basking. turbines running
short-horned lizard	6/12/2007	1	A5, A6	act= running. turbines running
short-horned lizard	6/27/2007	4	H2, H3	act= running. turbines running
short-horned lizard	8/7/2007	2	ON PLOT D30-D31	turbine running; crawling
short-horned lizard	8/23/2007	2	300 M W J3	turbine running
short-horned lizard	8/23/2007	2	ON PLOT M5-M6	turbine running; crawling
short-horned lizard	8/24/2007	3	ON PLOT A1-A2	turbine running
short-horned lizard	8/29/2007	2	ON PLOT M5-M6	turbine running
short-horned lizard	8/29/2007	2	ON PLOT H2-H3	turbine running
short-horned lizard	8/30/2007	2	ON PLOT J3-J4	turbine running
short-horned lizard	8/31/2007	2	ON PLOT C10-C11	turbine running
short-horned lizard	9/4/2007	1	ON PLOT D1-D2	turbine running
short-horned lizard	9/4/2007	2	ON PLOT D13-D14	turbine running
short-horned lizard	9/5/2007	3	ON PLOT H2-H3	turbine running
short-horned lizard	9/5/2007	2	ON PLOT E1-E2	turbine running
short-horned lizard	9/7/2007	2	ON PLOT C10-C11	turbine running
short-horned lizard	9/11/2007	1	ON PLOT D30-D31	turbine running
short-horned lizard	9/12/2007	1	ON PLOT M5-M6	turbine running
unidentified lizard	5/10/2007	1	711127, 5210563	
unidentified snake	5/18/2007	1	D25-26	act= basking. turbines running
unidentified snake	5/31/2007	1	J3, J4	act= moving. turbines running

Species	Date	No.	Location	Notes
western diamondback rattlesnake	6/4/2007	1	D13, D14	act= basking. turbines running
western yellow-bellied racer	8/16/2007	1	ON PLOT D25-D26	turbine running

Appendix F
2008 Aerial Raptor and Sage-Grouse Surveys

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POST-CONSTRUCTION 2008 AERIAL RAPTOR NEST AND GREATER SAGE- GROUSE LEK SURVEYS FOR THE WILD HORSE WIND FACILITY

KITTITAS COUNTY, WASHINGTON

FINAL TECHNICAL REPORT

April 2008

Prepared for:

Puget Sound Energy
25901 Vantage Highway
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Prepared by:

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INTRODUCTION

The Wild Horse Wind Facility (Wild Horse) is located in Kittitas County, Washington, approximately 11 miles east of the City of Kittitas. Wild Horse consists of 127 V80 1.8-MW wind turbines mounted on 67-m (221-ft) towers with blades 39-m (129-ft) long. Maximum height with the blade fully extended is 107-m (351-ft) with rotors turning at a maximum of 16.4 rpm.

As part of the conditions for Wild Horse Site Certificate Agreement (SCA) with the Washington State Energy Facility Site Evaluation Council (EFSEC), Puget Sound Energy (PSE) is required to perform a post-construction assessment of raptors nesting within the Wild Horse facility area including a 1 mile buffer to locate and monitor active raptor nests potentially affected by construction and operation of the facility.

During 2007 post-construction avian and bat fatality monitoring one adult sage grouse observation was made of an individual in early fall, and in late fall a sage grouse nest was found (Erickson *et al.* 2008). No sage grouse leks or individuals were documented during 2003 pre-construction surveys (Erickson *et al.* 2003).

PSE contracted Western EcoSystems Technology, Inc. (WEST) to conduct the post-construction raptor nest survey as well as conduct an additional aerial sage grouse lek survey. This report presents findings from those surveys conducted in early spring 2008.

METHODS

Raptor Nest Surveys

The objective of the aerial raptor nest survey was to locate nests that may be subject to disturbance and/or displacement effects from the wind-energy facility construction and/or operation.

The search area for raptor, corvid, and other large bird nests included the Wild Horse facility and a 1-mile buffer (Figure 1). This study area was extended north to include the proposed Wild Horse Expansion Area (Expansion Area) which was covered in the pre-construction baseline surveys for the Wild Horse Project (Figure 1). Surveys were conducted from a helicopter on March 25, 2008. Search paths were recorded with a real-time differentially-corrected Trimble Trimflight III GPS at 5-second intervals; coordinates were set as Universal Transverse Mercator (UTM) North American Datum (NAD) 27.

Aerial raptor nest surveys were scheduled after most species of raptor had finished courtship and were incubating eggs or brooding young. A focal species for the nest survey was ferruginous hawk (*Buteo regalis*), a state threatened species. Richardson (1996) reports that ferruginous hawks in Washington initiate their nesting activity in late-March and early-April. Golden eagles (*Aquila chrysaetos*) were also a focal species, and

one historic golden eagle nest within the study area was checked. All nests documented in the 2003 pre-construction nest survey were also checked as to status of activity and/or presence. Surveys were scheduled just prior to the onset of leaf-out to increase the visibility of nests within deciduous habitats. Nest searches were conducted by searching habitat suitable for most above-ground nesting species, such as cottonwood, ponderosa pine, tall shrubs, and cliffs or rocky outcrops. During surveys, the helicopter was flown at an altitude of tree-top level to approximately 250 ft (76 m) aboveground. If a nest was observed, the helicopter was moved to a position where nest status and species present could be determined. Efforts were made to minimize disturbance to breeding raptors, including keeping the helicopter a maximum distance from the nest at which the species could be identified, with distances varying depending upon nest location and wind conditions. Data recorded for each nest location included species occupying the nest, nest status (e.g., inactive, bird incubating, young present, eggs present, adult present, unknown or other), nest substrate (e.g., pine, poplar, cottonwood, juniper, shrub, rocky outcrop, cliff or power line), nest type (e.g., stick, scrape, eyrie), nest size, number of young present, time and date of observation and the nest location (recorded with both a handheld Garmin GPS 12 unit and the differentially-corrected unit). The surveys were conducted by a biologist experienced in raptor nest surveys.

Sage Grouse Lek Surveys

The search area for sage grouse leks included the raptor nest study area covering the Wild Horse facility and a 1-mile buffer. This study area also extended north to include the proposed Expansion Area which was covered in the pre-construction lek surveys (Figure 2). Aerial sage grouse lek surveys followed Washington Department of Fish and Wildlife (WDFW) protocols and methods used at the Yakima Training Center (YTC). A helicopter survey was conducted on March 25, 2008 a half hour before sunrise to 1.5 hours after sunrise. Timing of this survey was based upon YTC survey results using the general period when peak attendance at leks by females occurs. The survey was conducted at a range of 30-85 meters above-ground and at an approximate speed of 40 MPH. North-south transects spaced at 0.5 mile intervals were used to cover the survey area, occacionally departing transects to cover historic lek locations and open flat ridgelines (Figure 3). Transects over large open areas were flown higher than areas along fringes of narrower ridgelines, varying based upon topography and associated viewshed. Survey conditions consisted of clear skies, excellent visibility, and little to no wind for the entire survey period.

RESULTS

Raptor Nest Surveys

An aerial survey for raptor nests was completed on March 25, 2008 within the raptor nest study area (project boundary plus minimum one-mile buffer; Figure 4 and 5). One active red-tailed hawk (*Buteo jamaicensis*) nest was located within the study area, and one active red-tailed hawk nest was located approximately two miles east of the project area

(Figure 5). Three inactive large stick nests were located within the study area and four were outside. A historic golden eagle nest location in conifers near the northwest boundary of the study area contained no nest. A nest was found in this area but was inactive during 2003 pre-construction surveys (Figure 4). During pre-construction surveys, unconfirmed potential prairie falcon (*Falco mexicanus*) and great-horned owl (*Bubo virginianus*) nest sites were located approximately 2.5 miles and 3.5 miles from the project area, respectively. The potential prairie falcon nest location was checked during the post-construction survey without any adult observations or nest/eyrie found. Two active red-tailed hawk nests were located within the study area during pre-construction surveys (Figure 4). One of these was inactive during this study, and the other location no longer contained a nest (Figure 5). The active post-construction red-tailed hawk nest was approximately one mile south of the location lacking a nest, approximately one mile north of the existing Wild Horse facility (Figure 4 and 5). One active pre-construction red-tailed hawk nest was found just outside the western edge of the study area, this nest was inactive during the post-construction survey (Figures 4 and 5). One active pre-construction red-tailed hawk nest was located approximately two miles east of the Wild Horse facility, no nest existed at this location during the post-construction study (Figure 4); an active red-tailed hawk nest was found in a new location approximately 1.5 miles south of the old location and two miles east of the Wild Horse facility boundary (Figures 4 and 5). No ferruginous hawks were observed or nests found, and no nest structures characteristic of ferruginous hawk nests were found.

Sage Grouse Lek Surveys

Survey conditions on March 25, 2008 (0620 hrs – 0828 hrs) consisted of clear skies, excellent visibility, and little to no wind for the entire survey period. No sage grouse were flushed or observed.

Incidental Elk Observations

Nineteen groups of elk totaling approximately 720 individuals were documented during the raptor nest and sage grouse lek surveys (Figure 6). Five of these groups were in the Wild Horse facility area, 10 groups were in the 1-mile buffer zone, and 4 groups were observed outside the study area while checking pre-construction nest sites (Figure 6). Mule deer were also seen but not tallied.

DISCUSSION

In general, active raptor nests within the study area during pre-construction surveys (2 red-tailed hawks) and post-construction surveys (1 red-tailed hawk) was low. The study area is 38 square miles (99 km^2); pre-construction nest density was 0.05 nests/mi^2 and post-construction nest density is 0.03 nests/mi^2. During the post-construction survey, two pre-construction red-tailed hawk nests (one in study area and one outside study area) and the historic golden eagle nest (inactive in 2003) no longer had stick nest structures. Two new active red-tailed hawk nests (one in study area, one outside study area) were located

during the post-constructions survey. One of these nests is less than a mile from the Wild Horse facility. During Wild Horse facility construction in 2006, Jeffrey *et al.* (2007) documented two active red-tailed hawk nests (the same active nest in 2008 less than a mile from Wild Horse, and one active nest just west of 1-mile buffer of Wild Horse that was inactive during 2008). Jeffrey *et al.* (2007) also noted that potential nesting habitat sites in ponderosa pines and other trees may have been reduced due to some broken tree tops and lateral branches, apparently from recent high winds or snowload, or both. This may account for areas where stick nests were no longer present and therefore no active nesting was documented. These results with few nests identified during pre-construction and post-construction surveys suggest no displacement impacts on nesting raptors from the Wild Horse Wind Facility.

The objective of sage grouse surveys was to investigate the likelihood of presence of breeding sage grouse within the project vicinity. Aerial and ground-based pre-construction surveys at Wild Horse for breeding season sage grouse presence, including leks, during 2003 surveys documented no lekking or flushed birds (Erickson *et al.* 2003). In spring 2006, aerial lek surveys were conducted within the proposed Expansion Area and a 2-mile buffer which included much of the Wild Horse facility north of Whiskey Dick Mountain (Jeffrey *et al.* 2007). Ground surveys were also conducted in 2006 within the proposed Expansion Area during the sage grouse nesting and brood-rearing seasons (May – July). No sage grouse or sage grouse sign were seen at the Expansion Area during the aerial lek surveys or walking ground surveys (Jeffrey *et al.* 2007).

In the fall season of 2007, one adult sage grouse was flushed during the Avian and Bat Monitoring study of the Wild Horse Wind Facility, and one sage grouse nest site was also documented. The spring 2008 aerial lek survey reported here detected no sage grouse leks or observations of individuals.

Overall, the Wild Horse Wind Facility:

- Had very low raptor nest density during both pre-construction and post-construction surveys, with no sensitive or listed raptor species nesting in the study area.
- Had no evidence of new sage grouse leks or use of historic leks in the study area in spring 2003 or 2008. Additionally, no leks were identified in the 2006 Expansion Area survey, which included most of the Wild Horse Wind Facility north of Whiskey Dick Mountain.
- Had use by elk near existing turbines and nearby areas during early spring.

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Erickson, W.P., D. Young, G. Johnson, J.D. Jeffrey, K. Bay, R. Good, and H. Sawyer. 2003. Wildlife baseline study for the Wild Horse Wind Project: summary of results from 2002-2003 wildlife surveys. Technical report prepared by WEST Inc. for Zilkha Renewable Energy, Portland, OR.

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Richardson, S.A. 1996. Washington State Recovery Plan for the Ferruginous Hawk, August 1996. Washington Department of Fish and Wildlife, Olympia, Washington.

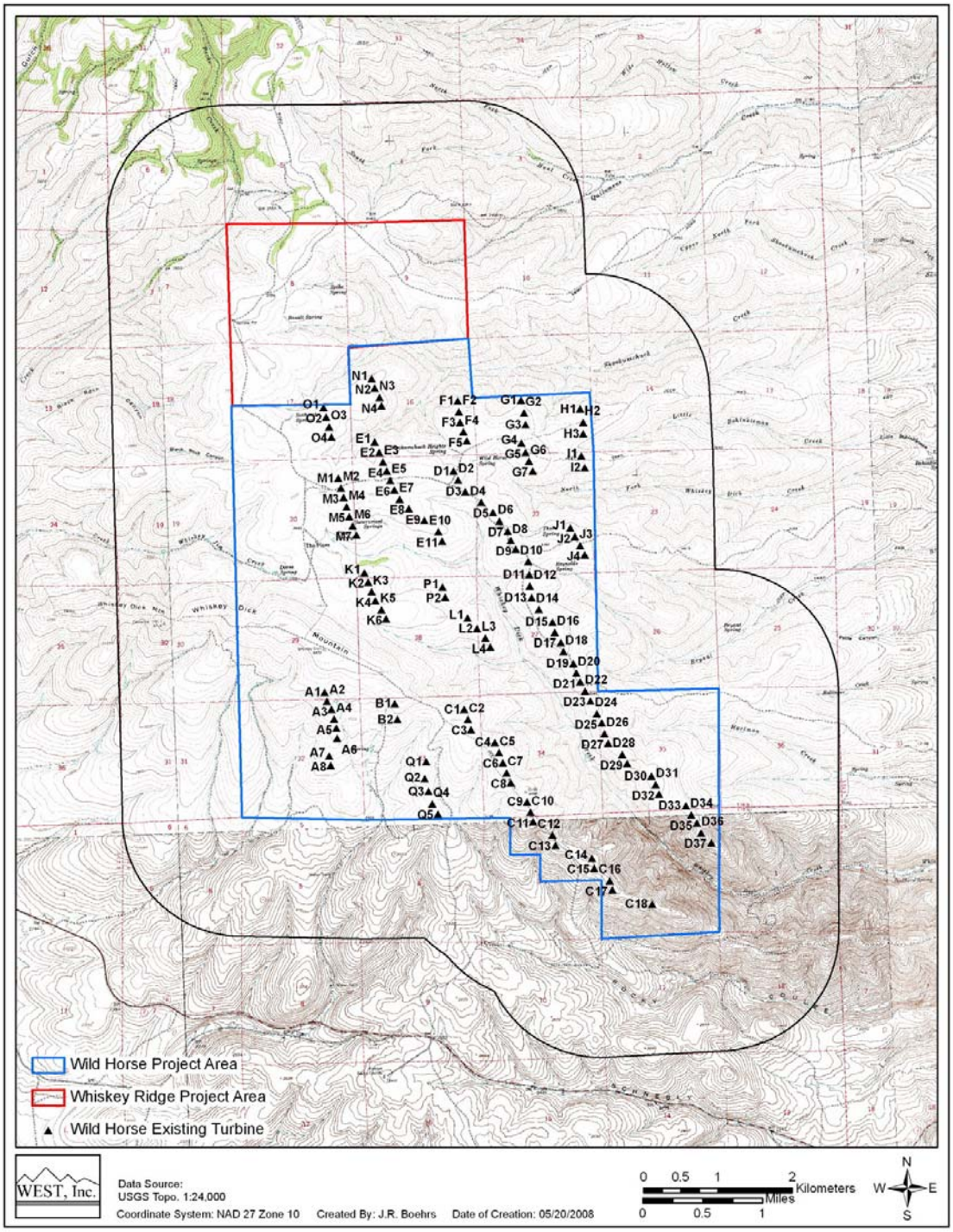

Figure 1. Study area for raptor, corvid, and other large bird nests in the Wild Horse facility and 1-mi buffer. Study area extended north to include proposed Expansion Area which was part of Wild Horse pre-construction raptor surveys. Post-construction aerial surveys conducted on March 25, 2008.

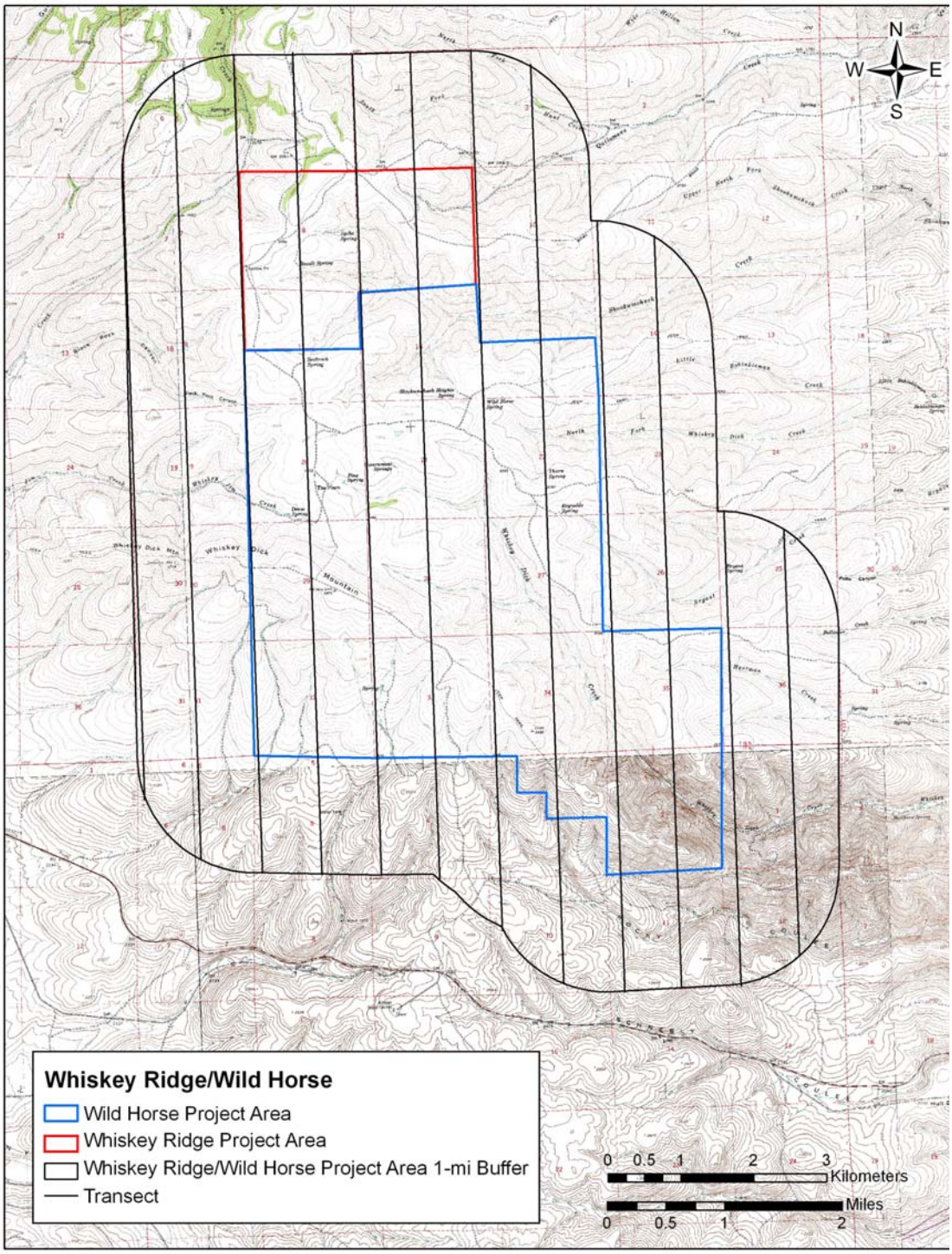

Figure 2. Post-construction Wild Horse sage grouse lek study area with north-south 0.5 mile transects surveyed on March 25, 2008.

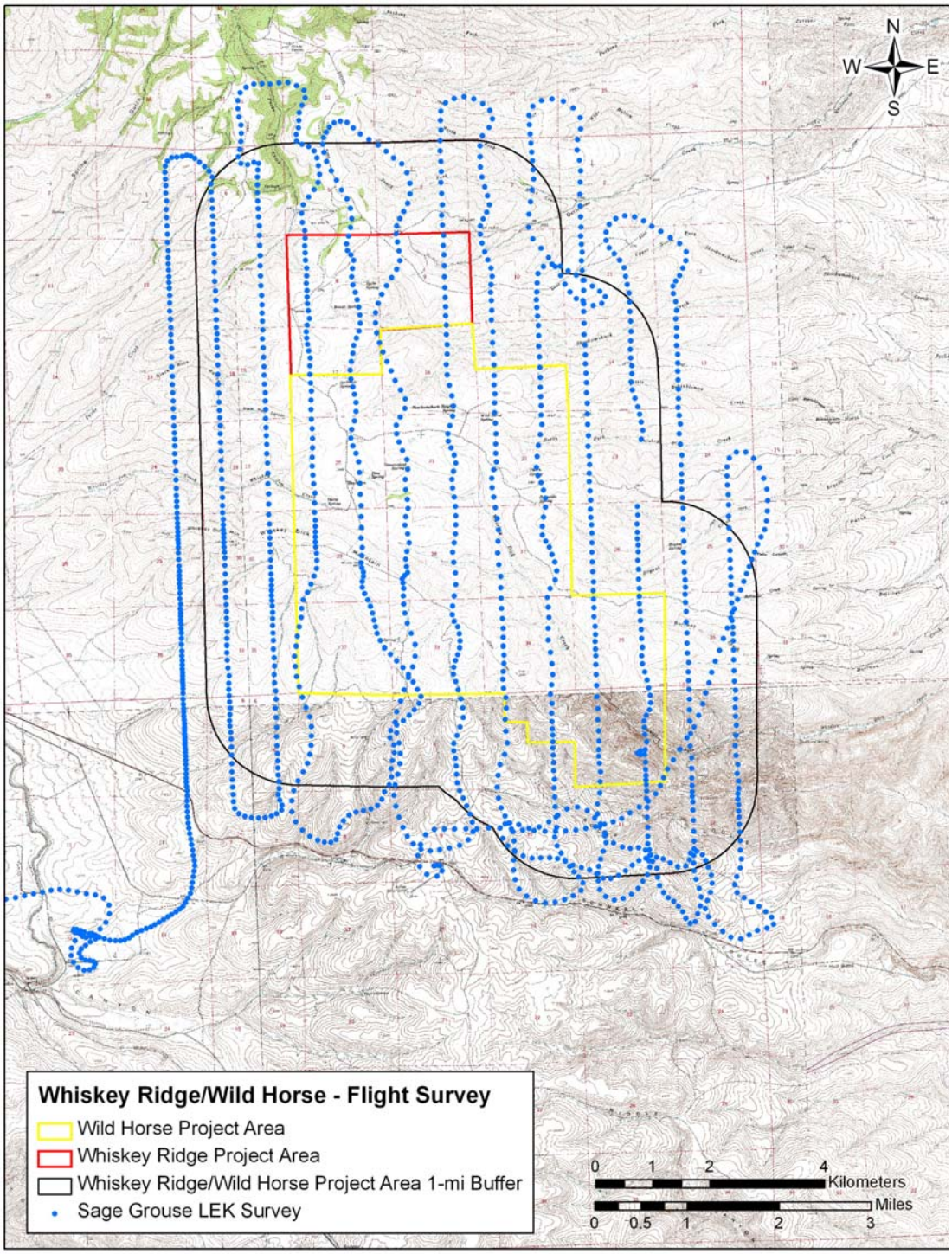

Figure 3. Post-construction Wild Horse sage grouse lek aerial survey path conducted on March 25, 2008.

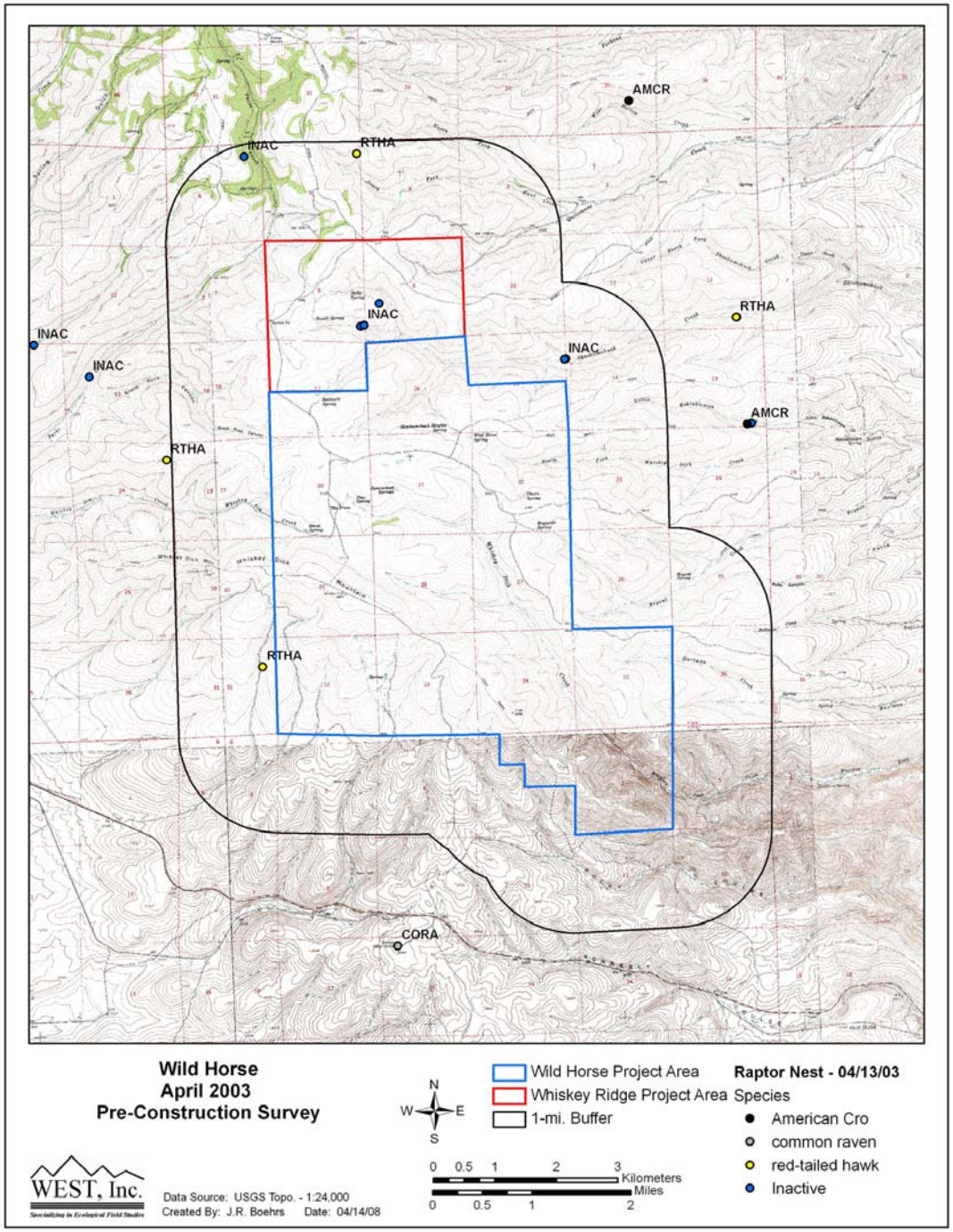

Figure 4. Pre-construction locations of active and inactive raptor nests documented during 2003 aerial survey of the Wild Horse study area and nearby vicinity.

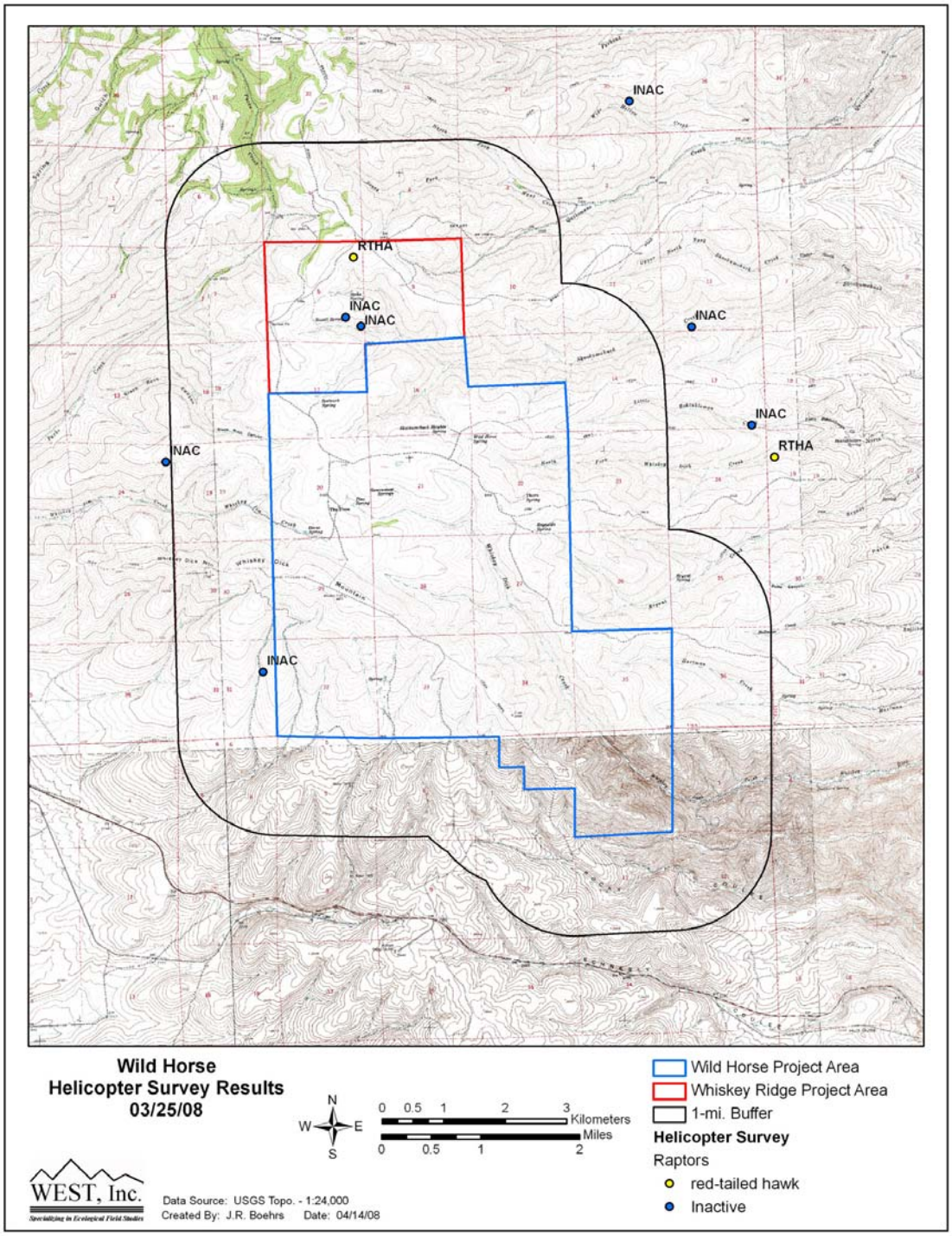

Figure 5. Post-construction locations of active and inactive raptor nests documented in the Wild Horse study area and nearby vicinity on March 25, 2008.

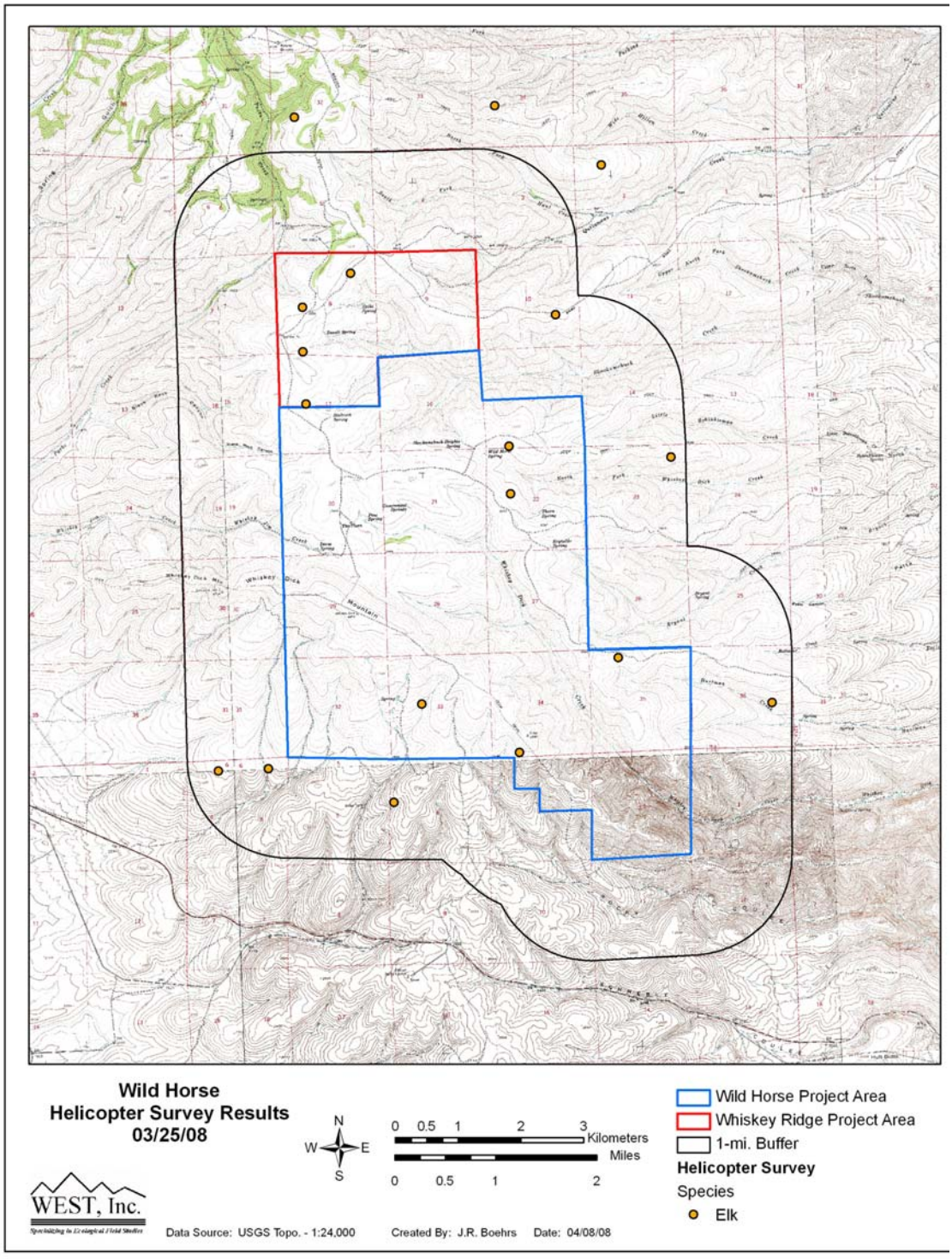

Figure 6. Observations of elk in the Wild Horse study area and nearby vicinity on March 25, 2008.

STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

PO Box 43172 • Olympia, Washington 98504-3172

January 15, 2009

Dear Reader:

Please note that the Energy Facility Site Evaluation Council has issued an abbreviated form Final Supplemental Environmental Impact Statement (FSEIS) for the Wild Horse Wind Power Project expansion request. This document supplements or corrects information provided in the Draft Supplemental Environmental Impact Statement (DSEIS) issued in November 2008. The proponent, Puget Sound Energy, has requested to expand the Wild Horse Wind Power Project by constructing and operating an additional twenty-two wind turbines that would generate an additional 44 megawatts of wind power in Kittitas County, Washington. The expanded project adds an additional 960 acres to the 8,600-acre site north of Vantage Highway at Whiskey Dick Mountain, roughly 11 miles east of the City of Kittitas.

The Wild Horse Wind Power Project was approved by Governor Gregoire in July 2005 and has been operating since early 2007. Modification of the Site Certification Agreement (the permit to construct and operate the project) must be approved by the Washington Energy Facility Site Evaluation Council (EFSEC) through Chapter 463-66 WAC.

The FSEIS is available on the Internet at www.efsec.wa.gov. For further information you may contact Tammy Talburt at (360) 956-2121.

Allen J. Fiksdal
Energy Facility Site Evaluation Council

STATE OF WASHINGTON

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Allen J. Fiksdal
Energy Facility Site Evaluation Council

Appendix G
2008 Visual Impact Study

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DAVID EVANS
AND ASSOCIATES INC.

TECHNICAL MEMORANDUM

DATE:	June 30, 2008
TO:	Scott Williams, Puget Sound Energy
FROM:	Jon Gage, M.L.A., Landscape Architecture
SUBJECT:	**Visual Quality Evaluation for Expansion of Wild Horse Wind Facility**
PROJECT:	Wild Horse Expansion
PROJECT NO:	PSEN00000134
COPIES:	Ron Bockelman, Gray Rand, Jim Sammet

This memorandum is a visual quality evaluation of the proposed Expansion at the Wild Horse Wind Facility. The Expansion would add 1280 acres to the 8600 acres of the original site for a total of 9880 acres, and add 26 new turbines to the 127 turbines currently operating for a total of 153 turbines at Wild Horse.

The intent of this memorandum is to evaluate the visual impacts of the 26 Expansion turbines from the viewpoints used in Section 3.10 Visual Resources/Light and Glare in the draft and final environmental impact statements (EFSEC 2004, 2005), which are herein referred to collectively as the EIS. **Figure 3.10-1** from the EIS is attached to show the location of the viewpoints. The EIS concluded the impacts to visual quality from the Wild Horse Wind Facility would not be significant.

Affected Environment

The Expansion area is immediately north of the original Wild Horse boundary on property recently purchased by Puget Sound Energy. This area includes dry, rocky grasslands used for grazing, and areas covered with a mixture of sagebrush, bitterbrush, and bunchgrasses, with clusters of ponderosa pine. The existing condition for evaluating the visual effects of the Expansion is the operating facility with 127 turbines.

Construction Impacts

Construction activities for the Expansion (e.g., large earthmoving equipment, trucks, cranes, etc.) would be similar to those described in the EIS. They would be visible from a few nearby seasonal residences northwest of the site. However, it is anticipated that construction activities would be low to moderately visible elsewhere, including Kittitas and surrounding valley areas and the plateaus east of the Columbia River.

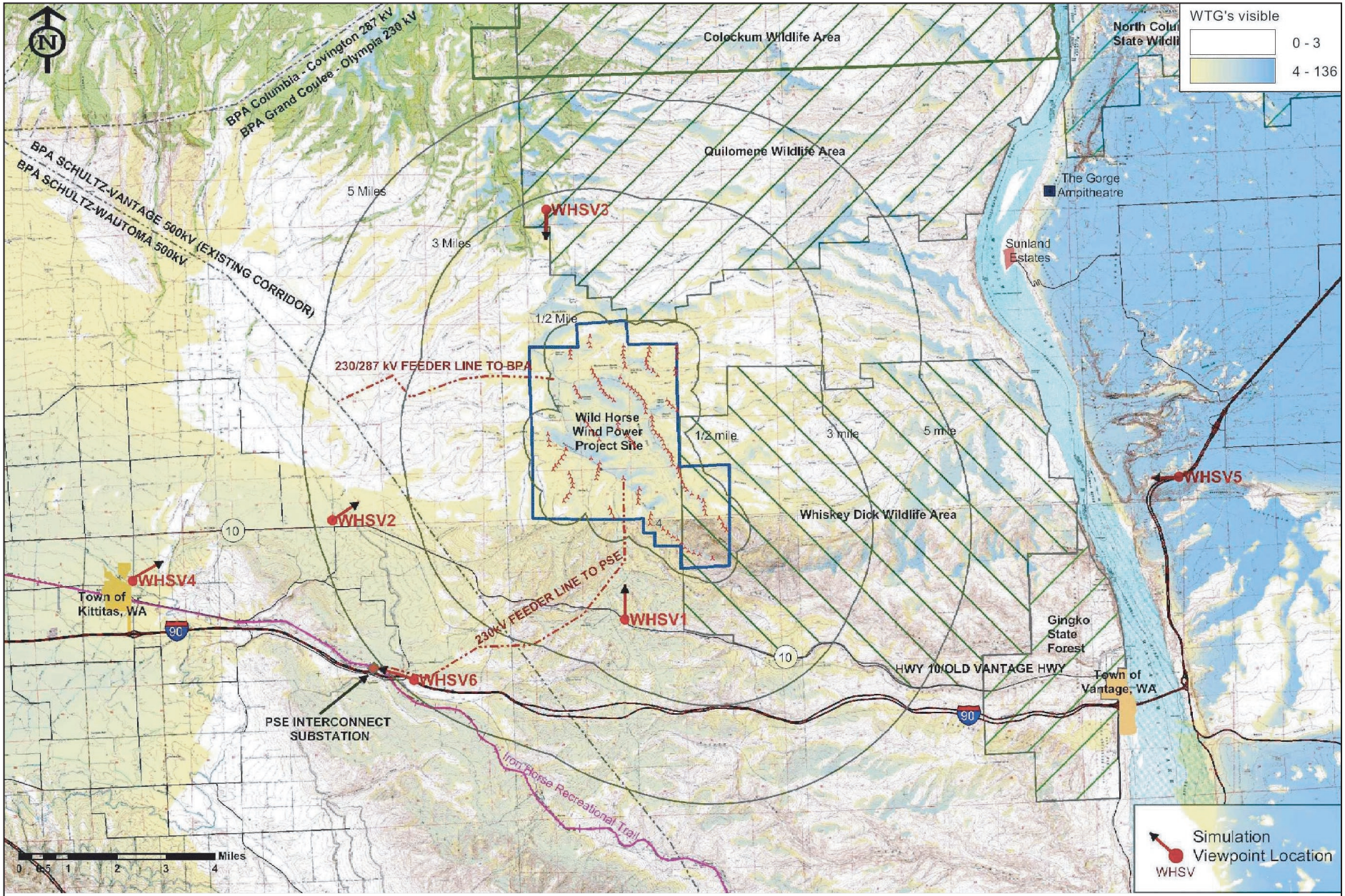
Operational Impacts

The facilities for the Expansion area would include 26 new turbines, roads, one overhead collector line (the remaining electrical collecting lines are underground), and expansion of the existing substation footprint. Mitigation measures for impacts to visual quality would be as described in the EIS.

To determine impacts to visual quality from the expansion area, representative viewpoints from the EIS were evaluated. The evaluation was based on: 1) Site reconnaissance conducted on June 24, 2008; and 2) Visual simulations for three key viewpoints where new turbines would be visible. The viewpoint locations for this evaluation have been approximated from the EIS. Visual changes to the viewpoints are as follows:

- **WHSV1** was not simulated because a ridge blocks the view north toward the Expansion area from this viewpoint along Vantage Highway. Thus there is no change to the existing view.
- **WHSV2** was not simulated because the ridge extending west from Whiskey Dick Mountain blocks the view northeast toward the Expansion area from this viewpoint along Vantage Highway. Thus there is no change to the existing view.
- **WHSV3** was simulated because the Expansion turbines would be visible from this viewpoint. New turbines would extend north from Wild Horse along the upland plateau. These new turbines would be 2.8 miles away from (or 1.7 miles closer to) this viewpoint which looks south from Beacon Ridge Road (**Exhibit 1**). The increased proximity and quantity of turbines would introduce more vertical elements and reduce the intactness of the landscape. The larger apparent scale of the facilities would increase vividness of the landscape. Overall visual impacts would be small as this viewpoint does not have many viewers. The degree of visual change caused by the Expansion would be minor and it is not anticipated to change the potential level of visual impact from "Moderate" described in the EIS.
- **WHSV4** was simulated because new turbines would be visible to the northeast from this viewpoint which is located near the intersection of Patrick Avenue, No. 81 Road, and Clerf Road at the eastern edge of the city of Kittitas (**Exhibit 2**). The Expansion turbines would be visible along ridges. The visual impacts would be greatly attenuated by the fact that these turbines are 8 to 11 miles away. Additional vertical elements would reduce intactness of the landscape. However, the degree of visual effect is minor and it is not anticipated to change the potential level of visual effect from "Low" described in the EIS.
- **WHSV5** was simulated because new turbines would be visible on the the ridgeline while looking west from this viewpoint on the I-90 on-ramp from Silica Road (**Exhibit 3**). The Expansion turbines appear north of the operating Wild Horse turbines. Additional vertical elements would reduce intactness in the landscape. However, these turbines would be partially obscured behind the ridge, silhouetted against the sky, and would be greatly attenuated by the fact that they are located 9 to 13 miles away. The degree of visual effect from the Expansion is minor and it is not anticipated to change the potential level of visual impact from "Low" as described in the EIS.
- **WHSV6** was not simulated because the Expansion area is not visible to the northeast from this viewpoint along I-90. Thus there is no change to the existing view. This viewpoint was included in the EIS to evaluate visual impacts of the new electrical substation to the west.

In conclusion, the Expansion would continue the change in visual character that resulted when the operating turbines at Wild Horse were added to the viewshed. The visual effect of the Expansion turbines is greatest for the viewpoint from the north because it is much closer than the other viewpoints. However, this location is much less frequently traveled than the other viewpoints. Thus the Expansion is not anticipated to change the findings in the EIS of no significant impacts to visual quality.



Source: Wind Ridge Power Partners, LLC 2004.

03323.03-010 EIS

Jones & Stokes

Figure 3.10-1
Zone of Visual Influence (ZVI)
WILD HORSE WIND POWER PROJECT

EXISTING

PROPOSED

Viewpoint WHSV3 - Existing View.

Viewpoint WHSV3 - Proposed: View simulation looking south from Beacon Ridge Road.

Selected Viewpoints Showing Existing and Proposed Conditions

Wild Horse Wind Facility Expansion

PSEN0000-0134

June 2008

Exhibit 1

DAVID EVANS AND ASSOCIATES INC.

Env1017

EXISTING

PROPOSED

Viewpoint WHSV4 - Existing View.

Viewpoint WHSV4 - Proposed: View simulation looking east from the edge of the city of Kittitas.

Selected Viewpoints Showing Existing and Proposed Conditions

Wild Horse Wind Facility Expansion

PSEN0000-0134

June 2008

Exhibit 2

DAVID EVANS AND ASSOCIATES INC.

Env1017

EXISTING

PROPOSED

Viewpoint WHSV5 - Existing View.

Viewpoint WHSV5 - Proposed: View simulation looking west from I-90 on-ramp from Silica Road.

Selected Viewpoints Showing Existing and Proposed Conditions

Wild Horse Wind Facility Expansion

PSEN0000-0134

June 2008

Exhibit 3

DAVID EVANS AND ASSOCIATES INC.

Env1017

Appendix H
2008 Cultural Report Summary

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PUBLIC SUMMARY

An Archaeological Survey of the
Wild Horse Wind Facility Expansion Project,
Puget Sound Energy,
Kittitas County, Washington

J. Jeffrey Flenniken, Ph.D., Principal Investigator
Pam Trautman, B.S.

Lithic Analysts Short Report 0806-02
June 13, 2008

For
David Evans and Associates, Inc.
118th Avenue SE
Bellevue, WA 98005

By
Lithic Analysts
659 Old Dallas Road
Royal, AR 71968-9661

AUTHOR: J. Jeffrey Flenniken and Pam Trautman, Lithic Analysts
DATE: June 13, 2008
LOCATION: Sections 8, 9, and 17, Township 18 North, Range 21 East, W.M., Kittitas County
USGS: Whiskey Dick Mountain, WA, 7.5' Quadrangle, 1973

Executive Summary

The Wild Horse Wind Facility is an existing 127-turbine wind farm owned by Puget Sound Energy (PSE) and located in Central Washington (Figures 1-16, Appendix A). PSE wishes to expand the facility from its current capacity that serves approximately 55,000 households to serve approximately 10,000 additional homes (PSE 2008) by the construction of an additional 26 turbines. As part of the expansion process, PSE has applied to the Energy Facility Site Evaluation Council (EFSEC) to amend the Site Certification Agreement (SCA). The EFSEC provides a siting process for major energy facilities in the State of Washington. The total number of turbines will remain within the range in the SCA and SEPA EIS. However, there will be additional ground disturbance from turbine installation, and road and electrical collection systems construction. David Evans and Associates, Inc, contracted with Lithic Analysts to conduct cultural resources investigations into the new areas of ground disturbance.

Pedestrian surveys were conducted by Lithic Analysts for all areas of potential ground disturbance within the expansion area on two occasions, in October 2005 and May 2008. The pedestrian survey revealed five previously unrecorded archaeological sites and two isolates. In addition, one previously identified archaeological site was revisited, and the site boundaries expanded as a result of the current investigation (Appendix B).

Appendix I
2006 Baseline Survey Protocols and WDFW Response Letter

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State of Washington
Department of Fish and Wildlife
South Central Region – Ellensburg District Office, 201 North Pearl, Ellensburg, WA 98926
Phone: (509) 925-1013, Fax (509) 925-4702

March 8, 2006

Chris Taylor
Director of Development
Horizon Wind Energy LLC
53 SW Yamhill Street
Portland, OR 97204

Subject: Whiskey Ridge Wind Power Project - Draft Protocol for Wildlife and Habitat Surveys

Dear Chris:

We have completed our review of the Whiskey Ridge Project Wildlife and Habitat Survey protocol. I apologize that this has taken so long to reply to your request. In general the protocol is satisfactory and we agree with how the overall strategy addresses the particular needs of this site. We do have some requests for modifications to the sensitive species surveys and sage grouse surveys, which I have detailed below.

Sensitive Species Surveys – Shrub-steppe Obligates
Generally we agree that proposed May 1st- June 15th time period for surveys is appropriate. However, at present we are expecting a cooler, later spring which could affect breeding timing. WEST, Inc. should consider local conditions and make adjustments to the timing as appropriate. For sage sparrows and sage thrashers in particular, surveys should be conducted between the hours of 1 hour before sunrise to 2 to 3 hours after sunrise - depending on the temperature. We recommend surveys be repeated at least once at each location, however repeating the surveys two or more times would be better.

Sage Grouse Surveys
WDFW requests that Horizon include helicopter surveys for sage grouse leks in the protocol. Locations of lek sites are somewhat predictable based on vegetation. Leks can consist of several males, which with favorable lighting and a bit of good fortune, can be quite visible. Surveys should be done between March 15th and April 15th, ½ hour before sunrise to 2 hours after sunrise. We request that WEST, Inc. stay in contact the US Army Yakima Training Center (YTC) biologists this spring to determine when the male attendance at the large YTC leks is peaking. We expect that would be the best time to do the aerial searches with the greatest likelihood of detection.

Sage grouse brood surveys, should be done during June through mid-July. Our data indicate that median hatch dates on the YTC range between the last week in April and 3rd week in May and the median date is around the second week of May. In late July, and definitely by 1 August, the hens and broods begin to form fall flocks. At that time, the chicks are difficult to distinguish from adults when in large flocks. Our experience has been that finding broods is difficult. Hens with broods occupy a variety of habitats and they are highly dispersed across the landscape. In some western states where sage-grouse numbers are still high, brood surveys have been effective in late summer where the birds congregate near agricultural fields. In Washington, we do not have such high numbers of birds.

Thank you for the opportunity to review the protocol.

Sincerely,

Brent D. Renfrow
District Habitat Biologist

Cc: Ted Clausing, WDFW
Edd Bracken, WDFW
Perry Harvester, WDFW

Protocol for Wildlife and Habitat Surveys for the Whiskey Ridge Wind Power Project, Kittitas County, Washington

DRAFT

February 2006

Prepared for:

Whiskey Ridge Power Partners LLC.

Prepared by:

WEST Inc.
2003 Central Avenue
Cheyenne WY 82001

Table of Contents

List of Figures

Introduction

Whiskey Ridge Power Partners LLC. is evaluating the feasibility of expanding wind power development in Kittitas County, Washington (Figure 1). The Whiskey Ridge Project will be adjacent to the existing Wild Horse Wind Power Project and is proposed to include approximately 22 turbines with capacity to produce approximately 44 megawatts (MW). To predict project impacts on wildlife, Whiskey Ridge Power Partners LLC. has contracted with Western Ecosystems Technology, Inc. (WEST) to develop and implement a survey protocol for wildlife surveys in the project area. The following protocol contains an outline of the proposed studies. This protocol has been developed based on our experience with wildlife-wind turbine interactions at projects throughout the U.S.

Overview of the Baseline Studies

The principal objectives of the baseline study for this proposed wind project are to: (1) document raptor nest density and location; (2) describe occurrence of any federal and state threatened, endangered, proposed, candidate, or sensitive-status fauna or flora and their potential habitat that may be affected by the project; (3) describe habitat types/ecotones in the general project area; (4) estimate any potential impacts to habitat and wildlife that could result from the construction and operation of the proposed wind energy project, and (5) identify potential project design and/or mitigation measures that could reduce negative impacts.

These objectives can be addressed by a combination of data collected at the proposed project site and from baseline and post-construction monitoring data collected at other wind power sites. A baseline and impact assessment report will be produced from these studies that will describe survey methods, data collection, results of statistical analyses, and will assess impacts of the project. The baseline study report may also provide information that can be used to design a post construction (operational) monitoring study as appropriate.

The Whiskey Ridge study will consist of the following components: 1) raptor nest surveys, 2) Federal and State sensitive wildlife and wildlife habitat surveys, 3) rare plant surveys, 4) vegetation and habitat mapping, 5) sage grouse surveys, 6) bat echolocation surveys and 7) general wildlife observations. Avian use surveys are not planned for the Whiskey Ridge Project because these surveys were conducted at the Wild Horse Project (WEST 2003; see Figure 2) which is immediately adjacent to the proposed Whiskey Ridge Project and no differences are expected for impact predictions.

Methods

Habitat Mapping

Vegetation in the Project area will be 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 will be determined based on visual assessment of dominant plant species. Commercially available black and white high-resolution digital aerial photography will be used for the habitat mapping. The habitat types will be mapped during the spring or summer of 2006. Initially, the roads in and around the Project area will be driven in order to correlate habitat types with the signature (color, shading, texture) on the aerial photos. Each habitat type

will then be 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 will not be shown. Available literature on the vegetative communities of eastern Washington may also be consulted during development of the habitat map. The mapped boundaries of each habitat type will be digitized using ArcView™. This methodology is similar to what was done for the Wild Horse Project, with the Washington Department of Fish and Wildlife's (WDFW) approval.

Rare Plant Surveys

A list of rare plants with potential to occur in the general project area will be compiled, based on agency database searches and the results of the Wild Horse studies.

During the Wild Horse rare plant surveys, no federally-listed 'Endangered', 'Threatened', 'Proposed' or 'Candidate' plant species were found, nor were any Washington state-listed 'Endangered', 'Threatened', or 'Sensitive' plant species found in the survey area. One Washington State 'Review' plant species was found, the hedgehog cactus (*Pediocactus simpsonii*). This species is listed in Review Group 1, meaning more research is needed before assigning a more definitive status.

Rare plant surveys will be conducted by trained botanists during peak flowering and/or fruiting periods when target species are best identified. Study corridors will include proposed facilities and a 164-ft (50-m) buffer. During the survey, botanists will follow meandering transects, effectively zigzagging back and forth across the survey corridor. Botanists will maintain a list of all vascular plants encountered, and will make informal collections of unknown species for later identification using *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973). Additional information collected will include general plant associations, land use patterns, unusual habitats, and photographs of habitat types and representative individual plants.

Raptor Nest Surveys

We will search for raptor, corvid, and large bird nests within the Project area and a 2-mile buffer; however, much of the 28.5 mi^2 (73.9 km^2) Whiskey Ridge Project area was already searched for the Wildhorse Project (Figure 1). We do not anticipate that the previously searched area will need to be searched again, so approximately 6.9mi^2 (17.9 km^2) of the northern part of the Whiskey Ridge Project area will be surveyed for raptor nests (Figure 1).

Surveys will be conducted from a helicopter. Search paths will be recorded with a real-time differentially-corrected Trimble Trimflight III Global Positioning System (GPS) at 5-second intervals; coordinates as Universal Transverse Mercator, UTM, NAD27. In addition to raptor nests, we will also record sage grouse observations (leks and flushed birds).

Raptor nest surveys will be scheduled in spring just prior to tree leaf-out when most raptor species are incubating eggs or brooding young, and nests are still visible in deciduous habitats. Nest searches will be conducted in habitats such as cottonwood, ponderosa pine, tall shrubs, and cliffs or rocky outcrops suitable for most above-ground nesting species. The helicopter will be flown at an altitude of tree top level to approximately 250' (76m) above the ground during surveys. If a nest is observed the helicopter will be moved to a position where nest status and

species present can be determined. Efforts will be made to minimize disturbance to breeding raptors, including keeping the helicopter a maximum distance from the nest at which the species could be identified. Those distances may depend upon nest location and wind conditions. Nests detected from the air may also be surveyed from the ground to verify nest status or species. Data recorded for each nest location will include species occupying the nest, nest status (inactive, bird incubating, young present, eggs present, adult present, unknown or other), nest substrate (pine, oak, cottonwood, juniper, shrub, rocky outcrop, cliff or power line), number of young present, time and date of observation, and the nest location (recorded with both a handheld GPS and the differentially-corrected helicopter unit).

Sensitive, Threatened, and Endangered Species

Current listings of federal and state endangered, threatened, and special status species will be obtained through relevant government agencies. Information regarding habitat requirements and documented or suspected occurrence of listed species in the project vicinity will be obtained from government agencies, non-governmental organizations, local consultants familiar with the project area, species specialists, and from on-site field surveys. A review of published literature on endangered, threatened, and special status species in the project area also will be conducted to determine habitat requirements and potential for occurrence in the project area. The following agencies and organizations will be contacted:

- U.S. Fish and Wildlife Service (USFWS)
- Washington Natural Heritage Program (WNHP)
- Washington Department of Fish and Wildlife (WDFW)

The USFWS will provide a list of federal endangered, threatened, proposed and candidate species, and designated critical habitat potentially occurring in the project vicinity.

The WNHP maintains a database on rare plants, high quality wetland ecosystems, and high quality terrestrial ecosystems in the state of Washington. The WNHP will conduct a search of the database for records of occurrence in the vicinity of the project area and provided a list of species and habitats with accompanying species information.

The WDFW Species of Concern list will be reviewed, and any species potentially occurring in the project area will be included in the analysis for possible impacts from the project. Furthermore, a request will be made to WDFW for a database search for known priority habitats and species occurring within the project and within a 3-mile radius of the project.

The USFWS lists 30 wildlife species as threatened or endangered within the state of Washington. Of these, 6 are terrestrial wildlife species and occur within Kittitas County including marbled murrelet, northern spotted owl, grizzly bear, bald eagle, gray wolf, and Canada lynx. Of these 6, only the bald eagle is likely to occur within the vicinity of the Whiskey Ridge site (Erickson et al. 2003). Furthermore, the State of Washington lists 36 threatened or endangered wildlife species. Of these, the ferruginous hawk (*Buteo regalis*) and greater sage-grouse (*Centrocercus urophasianus*) are the only species recently documented to occur in the vicinity of the Whiskey Ridge site (Erickson et al. 2003a).

Several Washington State Candidate species were observed within or near the project area during the Wild Horse studies. However, reported frequency of observations, particularly for avian species, indicates that the species may be occasional migrants through the project area. Four State Candidate species were observed and documented to occur within the project area. Two avian species, sage sparrow (*Amphispiza belli*) and sage thrasher (*Oreoscoptes montanus*), were observed with significant frequency, and the black-tailed jack rabbit (*Lepus californicus*) (1 observation) and white-tailed jack rabbit (*L. townsendii*) (6 individuals) were also observed. Sage grouse scat was observed near Whiskey Dick Mountain. Burrowing owls were not observed during the Wild Horse studies, but have potential to occur.

Sensitive species surveys will focus on shrub-steppe obligate species such as sage sparrow, sage thrasher, burrowing owl, sage grouse, white-tailed and black-tailed jackrabbits. Areas within 305 meters (1000 feet) of the centerline of the proposed turbine corridors, new roads, substations, and transmission lines will be surveyed for special status/sensitive wildlife twice between May 1 and June 15th 2006. Surveys will consist of walking transects spaced approximately 50 meters apart, and will be conducted from dawn to no later than 1:00 PM with wind speeds not consistently exceeding 15 MPH. All sage grouse and sage grouse scat will be recorded as to location and condition. All observations will be recorded using GPS and/or 1:24,000 scale topographic maps and later mapped using GIS. Notes on habitat and condition will also be recorded. Observations of other wildife such as amphibians, reptiles, small mammals, and raptors will also be recorded.

Sage Grouse Surveys

Sensitive species walking surveys will be used for documenting presence or absence of sage grouse using the Project area for nesting and brood-rearing. In addition to May and June surveys, two additional sage grouse surveys will be conducted in July and August. General assumptions are as follows: mid to late March is peak female attendance at leks, nesting and incubation is 3-4 weeks from peak, mean hatch date is around May 28-June 1, brood-rearing is approximately 10 weeks from hatch, and successful broods disperse around 600 meters during the brood-rearing period (Connelly et al. 2004). Weather patterns may shift these general dates by a few weeks.

Incidental/In-transit Observations

All wildlife species of concern and uncommon species observed while field observers are traveling between plots will be recorded on incidental/in-transit data sheets. Other incidental observations made during other surveys or visits to the sites also will be recorded. Data recorded with incidental observations will include GPS coordinates, observation number, date, time, species, number, sex/age class, height above ground, and habitat.

Bat Echolocation Studies

The vast majority of bat mortality documented at U.S. wind farms has occurred in late summer and early fall, a time period that corresponds with fall migration of tree bats (e.g., hoary bat, silver-haired bat) and dispersal from summer breeding areas to hibernacula for the other species. It is not known if the mortality is occurring to migrating individuals or bats conducting other activities during the migration period. Although bat mortality during the breeding season has been low at existing wind farms, most of these wind farms are in open habitats (e.g., agricultural fields, grassland, shrub steppe) and breeding bats may be more prone to collision at wind farms

constructed in or near bat foraging or roosting habitats, such as wetlands and forested areas. Because the Whiskey Ridge Project is located closer to the forest edge than the existing Wild Horse Project, we propose some echolocation surveys to evaluate bat activity in the project area.

Bats in the project area will be surveyed using ultrasonic sensors that detect bat echolocation calls. Bat detectors are widely used to index and compare habitat use by bats. The use of bat detectors for calculating an index to bat impacts has been used at several wind projects, and is currently being recommended by Bat Conservation International (E. Arnett pers. comm.) as a primary and economically feasible bat risk assessment tool. We propose to use Anabat® II bat detectors (Titley Electronics Pty Ltd., NSW, Australia). These detectors can easily be set up at multiple survey sites, do not require constant attention by the researcher, and are considered a valuable tool for comparing relative amounts of bat activity. Anabat® II detectors record bat echolocation calls with a broadband microphone. The echolocation sounds are then translated into frequencies audible to humans by dividing the frequencies by a predetermined ratio. We will use a division ratio of 16 that lowers the frequencies of most bat species to less than 10 kHz, the upper limit for the Anabat® software. Bat echolocation detectors also detect other ultrasonic sounds made by insects, raindrops hitting vegetation, and other sources. We will use a sensitivity level of 5-7 (usually 6) to reduce interference from these other sources of ultrasonic noise.

The Anabat II detector will be coupled with a ZCAIM (zero crossings analysis interface module) recently introduced to the market by Titley Electronics. ZCAIMS use compact flash memory cards with large storage capacity, eliminating the need for large batteries and tape recorders. The Anabat II detector will be placed inside a plastic Tupperware® container and a hole will be cut in the side of the container for the microphone to extend through. The detectors will be placed so that the microphone is oriented in a vertical position.

We propose to use three Anabat® II detectors during the study. We propose to sample a minimum of 10 nights each in May, June, July, August and September from two detectors installed on met towers. For each sampling night, a pair of Anabat units will be located at a met tower, with one unit located 30-50 m above ground, and the 2nd approximately 10 feet above ground. Some flexibility in locating the detectors may be necessary, especially if elevating the detectors on existing met towers proves to be infeasible. A third detector will be rotated among different sampling locations, including some reference areas where higher bat call rates might be anticipated, such as around Basalt Spring, and at forest edges within and to the north of the site. Each detector will typically be left at a location for three to five consecutive nights before recovery of the systems for data download and refreshing batteries.

For this study, bat passes will be the units of activity. Except at isolated roost locations such as caves, the absolute abundance of bats cannot be determined in most cases, and bat pass data represent levels of bat activity rather than numbers of individuals. A pass is defined as a train of echolocation calls produced by an individual bat, and consists of a continuous series of $\geq$ 2 call notes with no pauses between call notes of > 1 second. The number of bat passes will be determined by downloading the calls from the ZCAIMS onto a computer and simply counting the number of echolocation passes recorded. Although it is possible to identify bat species by their echolocation calls, overlap in calls between species, variation in calls among individuals,

less than optimal call clarity on the recordings, and even differences in calls due to weather variations make unequivocal species identifications troublesome. There is significant debate even among experienced researchers on the accuracy of species identifications using bat detectors. Attempting to identify each call recorded to species is also extremely time consuming, and could take up to several hours for each detector-night. For these reasons, we believe that identifying each call recorded with bat detectors is cost prohibitive and beyond the scope of this study. The lack of any state or federally listed bats also reduces the need to identify each bat recorded during the study. However, the information will be stored so that it can be accessed in the future if the need arises.

The number of passes recorded per night will also be plotted over time so that relative abundance of bats across each study period can be determined. The mean number of bat passes per detector-night at the met towers and at the reference areas will be compared to existing data at other wind plants.

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Figure 1. Map of Whiskey Ridge project area with 2-mi project area buffer. The 2-mi buffered area around the Wild Horse Project is shown in grey and has previously been searched for raptor nests.

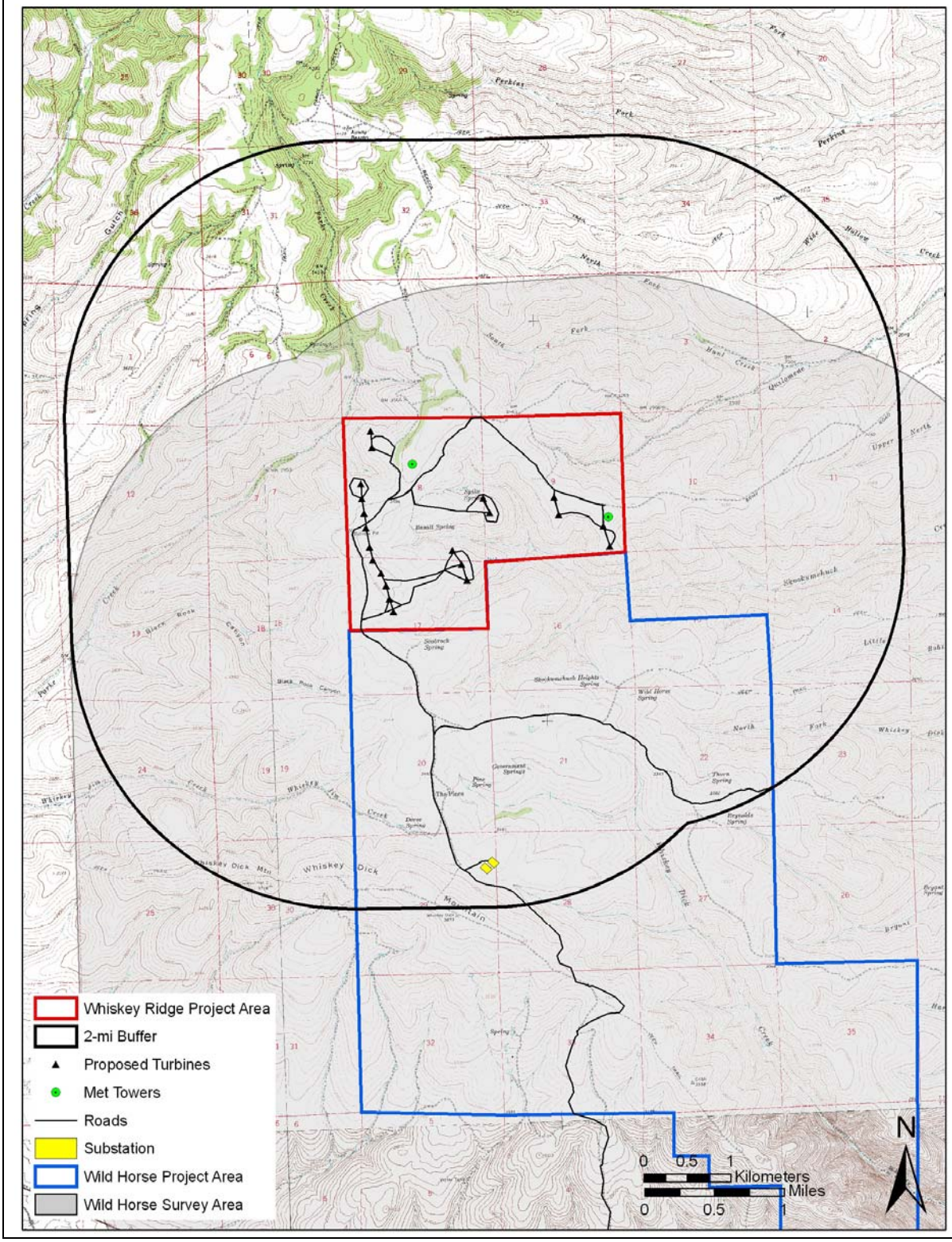
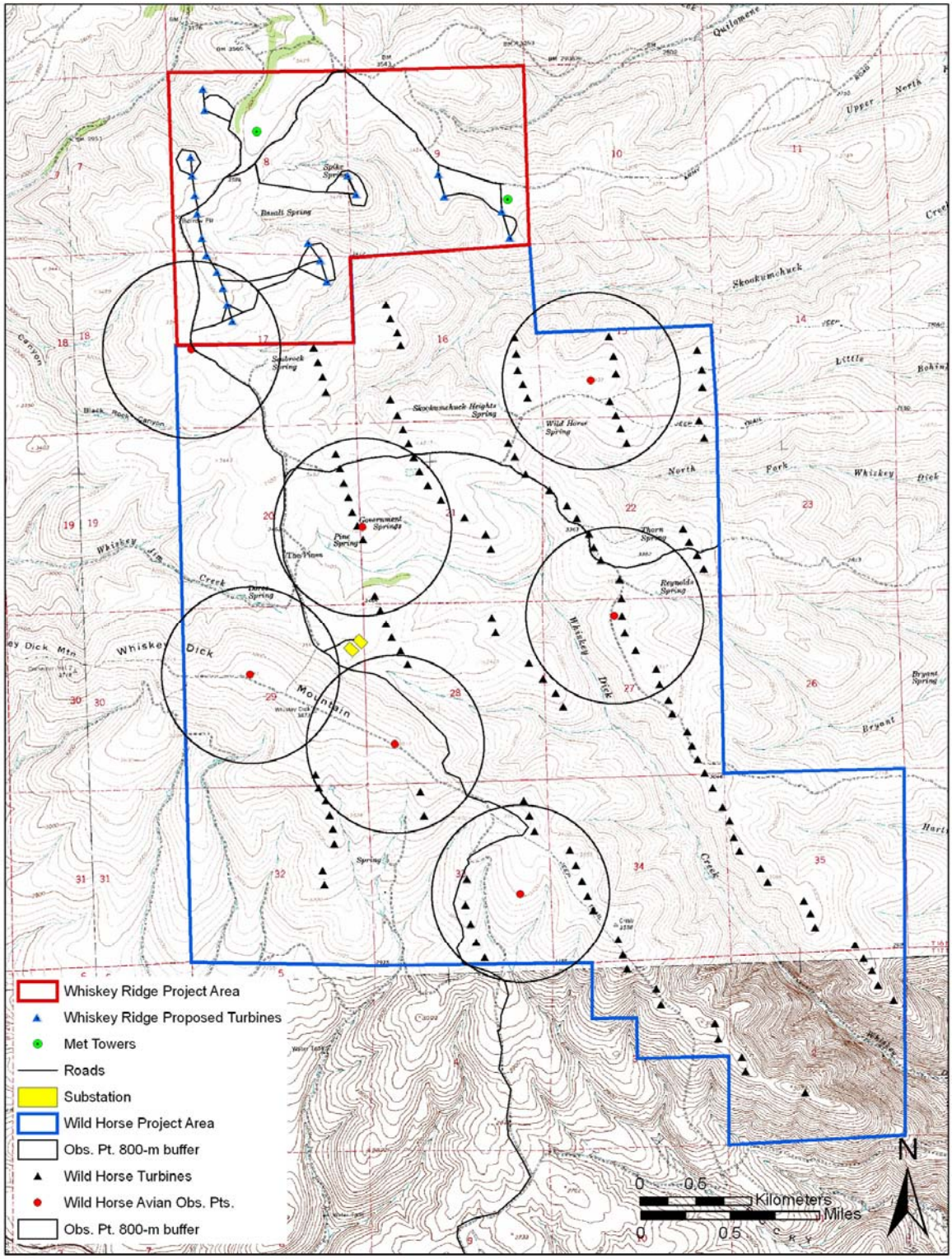


Figure 2. Location of Wild Horse Wind Power Project boundary and avian observation points in relation to the Whiskey Ridge Project area.



Appendix J
2008 Post-Construction Habitat Restoration Monitoring Year 1 Report

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WildLands Inc: Post-Construction Habitat Restoration Monitoring Year 1 Puget Sound Energy Wild Horse Wind Power Project

Introduction

WildLands conducted field assessments at the Wild Horse Wind Power Project to monitor and evaluate the success of post-construction habitat restoration in accordance with the Post Construction Restoration Plan, as required by Article IV.F.9 of the Wild Horse Site Certification Agreement. Restoration of disturbed areas took place during the Fall of 2006 and Spring of 2007. Objectives for the first year of monitoring were described in the Restoration Plan, and include analysis of site condition to determine erosion activity and level of weed infestation.

Monitoring plots were established prior to the commencement of the restoration project, as specified in the Restoration Plan. *Reference Site* plots were recorded at the time of establishment. *Restored Site* plots were recorded in June, 2008, following the first full year of recovery of the project site. This report documents the condition of restored areas during the first year post-construction. In accordance with the approved plan, annual monitoring of these plots will continue through the third year post-construction. Information gathered by WildLands will be reported annually over the next 3 years in the form of written reports which will be issued to TAC members for review. The first report will be submitted to PSE before the end of June.

Methods

Study Plot Site Location

Three soil types were identified within the areas temporarily disturbed by construction of the Wild Horse Wind Power Project – 1) Lithosol Sites – very shallow soils, 2) Loamy Soil Sites – deep soils, and 3) Stony/Shallow Soil Sites. Three reference sites per soil type for a total of 9 study plots were selected and established on existing vegetation, in coordination with WDFW, in September of 2006. These 9 reference sites were paired with 9 parallel comparison plots located on adjacent reseeded areas (*restored sites*) for use in evaluating the success of restoration, which will inform future restoration efforts at other wind projects.

Study Plot Design

WildLands established nine paired 15-meter long study transects marked by rebar at either end (9 transects in *reference sites* and 9 parallel transects in *restored sites*). Transects in restored sites were located in the following types of disturbed areas: 6 transects along underground cable trenches (L1, L2, L3, D2, D3, and S1); 2 transects along road shoulders (D1 and S2); and 1 transect along a restored overhead powerline access road (S3). Location of monitoring transects was restricted to areas which were of a similar slope and aspect to adjacent undisturbed areas (to be used as reference sites). See Appendix 3 for plot locations.

For each transect, we collected data from 1-meter square plots on alternating sides of a tape stretched between the two end-points, for a total of 15 square meters of vegetation recorded along each study transect. Data collection included identification of native, perennial plant species and non-native species

present in each 1-meter square plot, along with percent cover for each plant species, bare ground, litter, and rock. Percent cover was determined by visual estimation, with the same person estimating each plot in order to maintain consistency between plots. Plants were identified to the lowest taxonomic level feasible, given the size and phenology of vegetation at the time of the survey.

General Site Review

An inspection of overall site condition was performed by driving all roads and spot-checking disturbed areas for evidence of erosion, weed infestation, and vegetation growth patterns. Observations were recorded by photographing the area.

Results and Discussion.

During the first year post-construction the monitoring goal is to determine whether the site is eroding or not and is not becoming infested with weeds. The second year we will determine whether all the species in the seed mix are represented in the stands established in the seeded areas. The third year we will make comparisons of plant density of the revegetated areas with the reference sites

Survey results from the monitoring plots are largely preliminary, following only one year of vegetative growth. Raw plot data is included as Appendix 1 of this report, and a chart displaying this data is included as Appendix 2. Average percent vegetative cover was comparable throughout the 9 restored transects, regardless of soil type. Transects in Lithosol soils varied between 12% and 16.5%, with an average of 5.5% non-native weed species included. Deep-Loamy soils contained between 9% and 24.4% overall vegetative cover. The proportion of this cover that was comprised of non-native weed species varied widely, with no weed components in two transects and 17% weed cover in the third transect. Shallow-stony soils were the least vegetated, with one transect containing a combination of bare ground and rock, with 0% vegetative cover. Of the other 2 transects, one had 9.7% vegetative cover of all native species, and the other had over 24% total cover but only 6.3% cover of native plants.

Lithosols

Reference areas for lithosols vary from 26.6% to 33.5% cover of native plants with no non-native component. Restored areas for these soils vary from 12.1% to 16.5% cover with between a quarter and a half of the cover provided by non-native plants.

Deep loamy soils

Reference areas for deep loamy soils vary from 39.9% to 53.9% cover of native plants with no non-native component in two of the 3 sites. Restored areas for these soils vary from 9.3% to 24.4% cover with non-native species present in only one pair of plots. Sites D-1 and D-2 have no non-native component and D-3 has 17.1% cover of non-native in the reference plot and 7.7% in the restored plot.

Shallow, stony soils

Reference areas for shallow, stony soils vary from 33.3% to 34.6% cover of native plants with no non-native component. Restored areas for these soils vary from 0% to 24.1% plant cover with 17.8% non-native cover in plot S-1.

General Condition of the Site

General inspection of the project site produced a number of interesting observations. On some cut slopes, wind has eroded away most of the mulch and tackifier applied during the hydroseeding process. In these areas, there is some evidence of slow but persistent sloughing of material down the steep cut slopes and into the inside ditch. No rill or gully erosion was noted. Fill slopes, flat road shoulders, and underground cable trenches appear to have retained the majority of mulch and tackifier that was applied, and no erosion is evident in these areas.

Weeds

Overall, weed presence appears to be sporadic. Cheatgrass and tumble mustard are the most prevalent weeds throughout the site. No knapweed or thistle was noted at the time of the survey. Treatment during the winter of 2007 with glyphosate and Plateau to control cheatgrass infestations appeared to be effective. We observed large areas of dead cheatgrass stands, with very few newly germinated seedlings. This observation was confirmed by our monitoring plots, which contained surprisingly few cheatgrass seedlings. Timing of winter treatments with glyphosate is difficult, however. A better strategy may be to use a pre-emergent treatment of Plateau during winter dormancy, followed by a later treatment of glyphosate, targeted at areas where the pre-emergent treatment has not achieved full control.

Topsoil Conditions

Vegetation growth patterns are variable throughout the site. On areas such as cut slopes, where little or no topsoil was present at the time of seeding, vegetation growth is thin and patchy to non-existent. Wind erosion depleting the seed supply may account for some of this. However, we suspect that lack of available nutrients and water holding capacity in the soil are likelier suspects. Observations of greater vegetation density at the tops of these cut slopes, where thin layers of topsoil have drifted over the edge of the cut, disappearing to nothing where the topsoil fades out, support this conclusion.

Other areas, such as flat road shoulders and cable trenches, where some topsoil was present in the fill material or where soil was merely disturbed and not actually removed, displayed much higher levels of vegetation density and diversity. In fact, areas of mere soil disturbance exhibited large populations of shrub and forb seedlings that were not present in the seed mix. These plants have volunteered on the site, due to the presence of an existing seed bank in the soil combined with seed drift from adjacent vegetated areas. These volunteers are fast-growing and healthy in appearance. Again, we believe the success of these areas is largely due to the presence of good quality topsoil, which is lacking in many other areas of the project.

Conclusions

Overall the results from the monitoring plots and site overview are largely preliminary. The broad patterns present restored sites as having native species established partly seeded and partly volunteer in origin. Areas seeded in the Fall of 2007 had not germinated at time of monitoring. Germination is expected to take place in the Fall of 2008.

The areas with best seeding establishment are those where topsoil is present and soils were not compacted. Steep slopes (cut banks and road shoulders) and highly compacted soils have not established stands of seeded grass and many of these areas have little or no vegetation.

Our overall site review led us to the conclusion that the site is free of any significant erosion control problems.

The weed control program certainly seems to be effective. There is very little cheatgrass in construction-disturbed areas and although we were a little early to effectively survey for broadleaf weeds (thistles and knapweeds particularly) the program appears to be controlling these as well.

The purpose of this assessment was to monitor and evaluate the success of revegetation efforts following construction of the Wild Horse Wind Power Project. As stated earlier, however, the results discussed in this report are largely preliminary. Due to the variability of seeding times during the project (i.e. from Fall 2006 to Fall 2007), some areas have had more time for seed to germinate and develop than other areas. More recently seeded areas have not yet germinated. Therefore, overall success of the project cannot be evaluated at this time. However, as discussed above, preliminary results do indicate that revegetation efforts are proving successful in controlling erosion and populations of non-native weed species, which satisfies the monitoring goals for the first year following revegetation activities.

APPENDIX 1

PLOT DATA TABLE

Wild Horse Wind Power Project Post-Construction Monitoring Report
Appendix 1: Plot Data

	L1-Restored	L1-Reference	L2-Restored	L2-Reference	L3-Restored	L3-Reference
BARE GROUND	**47.2%**	**33.9%**	**18.4%**	**44.9%**	**55.5%**	**29.2%**
LITTER						
ROCK	**36.3%**	**32.5%**	**66.4%**	**27.8%**	**32.3%**	**36.1%**
Achillea millefolium	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
Antennaria dimorpha	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Artemisia rigida	0.1%	0.0%	0.9%	0.0%	0.0%	12.2%
Artemisia tridentata	5.1%	10.9%	0.0%	1.6%	0.4%	0.0%
Astragalus tweedii	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%
Balsamorrhiza hookeri	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%
Chenactis douglasii	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Chrysothamnus nauseosus	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%
Chrysothamnus viscidiflorus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Collinsia parviflora	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Crepis sp.	0.3%	0.0%	1.5%	0.0%	0.0%	0.0%
Cryptantha sp.	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
Elymus elymoides	0.8%	0.0%	0.0%	0.0%	1.0%	0.0%
Erigeron linearis	0.0%	0.0%	0.1%	0.0%	0.3%	0.0%
Erigeron poliospermis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erigeron sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum douglasii	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%
Eriogonum sp.	0.0%	1.2%	0.0%	6.1%	0.0%	4.1%
Eriogonum heracleoides	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erysimum occidentalis	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Festuca idahoensis	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Lithospermum ruderale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lomatium sp.	1.2%	0.0%	2.3%	0.0%	0.0%	0.0%
Lomatium triternatum	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus sp.	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Nothocalais troximoides	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%
Phacelia sp.	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Phlox hoodii	0.2%	0.3%	0.1%	4.4%	0.0%	0.5%
Phlox longifolia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phlox sp.	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
Phoenicaulis sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pseudoroegneria spicata	0.0%	0.0%	0.0%	4.6%	0.0%	0.0%
Purshia tridentata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poa sandbergii	2.1%	19.1%	0.4%	9.9%	2.8%	17.2%
Stenotus stenophyllus	0.1%	1.9%	0.2%	0.0%	0.0%	0.5%
Stipa occidentale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium macrocephalum	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Viola trinervata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wheatgrass sp.	0.3%	0.0%	0.4%	0.0%	0.8%	0.0%
NATIVE SPECIES	**12.6%**	**33.5%**	**8.8%**	**26.6%**	**5.5%**	**34.6%**
Bromus tectorum	3.8%	0.0%	0.2%	0.0%	0.6%	0.0%
Chenopodium sp.	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Descurania pinnata	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%
Lactuca serriola	0.1%	0.0%	3.1%	0.0%	6.0%	0.0%
Medicago sativa	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%
Poa bulbosa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tragopogon dubius	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vulpia octaflora	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NON-NATIVE SPECIES	**3.9%**		**6.2%**		**6.6%**	

Wild Horse Wind Power Project Post-Construction Monitoring Report
Appendix 1: Plot Data

	D1-Restored	D1-Reference	D2-Restored	D2-Reference	D3-Restored	D3-Reference
BARE GROUND	**90.3%**	**60.1%**	**58.7%**	**57.3%**	**71.5%**	**32.0%**
LITTER						**14.1%**
ROCK			**29.7%**		**2.9%**	
Achillea millefolium	0.0%	0.0%	0.9%	0.0%	0.0%	3.0%
Antennaria dimorpha	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia rigida	0.0%	0.0%	0.0%	2.1%	0.1%	17.2%
Artemisia tridentata	5.8%	29.6%	1.3%	0.0%	1.1%	2.0%
Astragalus tweedii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Balsamorrhiza hookeri	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Chenactis douglasii	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
Chrysothamnus nauseosus	0.0%	0.3%	3.1%	0.5%	0.4%	0.4%
Chrysothamnus viscidiflorus	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Collinsia parviflora	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Crepis sp.	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Cryptantha sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Elymus elymoides	1.4%	0.0%	1.5%	0.0%	1.1%	5.5%
Erigeron linearis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erigeron poliospermis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erigeron sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum douglasii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum heracleoides	0.0%	0.0%	0.6%	6.9%	0.2%	1.4%
Erysimum occidentalis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Festuca idahoensis	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%
Lithospermum ruderale	0.2%	0.0%	0.0%	0.0%	0.7%	0.0%
Lomatium sp.	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Lomatium triternatum	0.0%	0.0%	0.0%	0.0%	0.6%	6.3%
Lupinus sp.	0.2%	0.0%	0.2%	0.0%	1.1%	0.3%
Nothocalais troximoides	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phacelia sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phlox hoodii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phlox longifolia	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
Phlox sp.	0.0%	0.0%	0.2%	0.0%	0.5%	0.0%
Phoenicaulis sp.	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Pseudoroegneria spicata	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
Purshia tridentata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poa sandbergii	1.1%	10.0%	1.4%	32.7%	0.1%	6.7%
Stenotus stenophyllus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stipa occidentale	0.0%	0.0%	0.0%	0.0%	0.2%	2.7%
Trifolium macrocephalum	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Viola trinervata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wheatgrass sp.	0.2%	0.0%	1.3%	0.0%	0.3%	0.0%
NATIVE SPECIES	**9.3%**	**39.9%**	**11.2%**	**42.7%**	**7.3%**	**46.2%**
Bromus tectorum	0.4%	0.0%	0.0%	0.0%	0.0%	7.6%
Chenopodium sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Descurania pinnata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lactuca serriola	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Medicago sativa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poa bulbosa	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Senecio sp.	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
Tragopogon dubius	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Vulpia octaflora	0.0%	0.0%	0.2%	0.0%	16.4%	0.0%
NON-NATIVE SPECIES					**17.1%**	**7.7%**

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Appendix 1: Plot Data

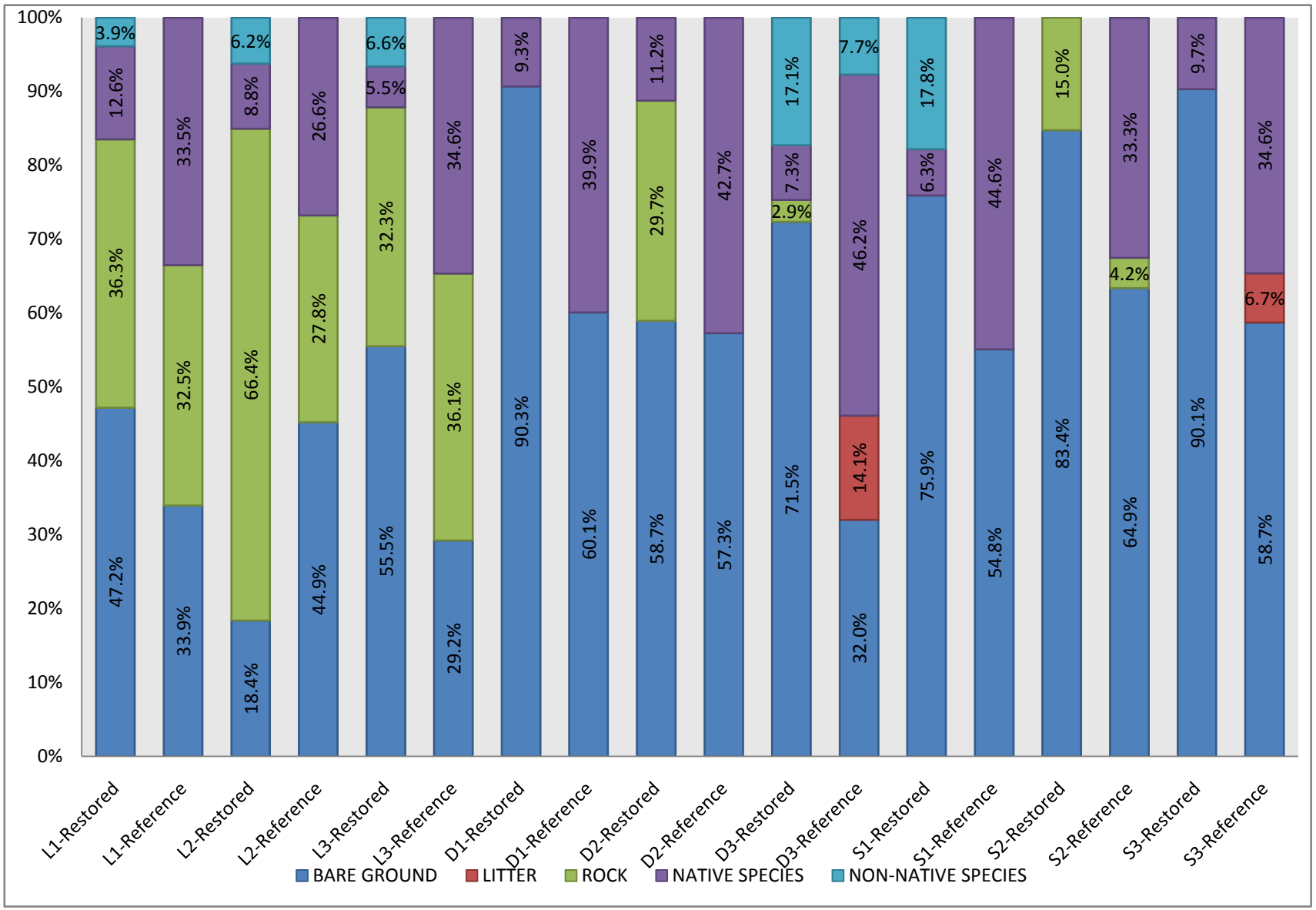
	S1-Restored	S1-Reference	S2-Restored	S2-Reference	S3-Restored	S3-Reference
BARE GROUND	**75.9%**	**54.8%**	**83.4%**	**64.9%**	**90.1%**	**58.7%**
LITTER						**6.7%**
ROCK			**15.0%**	**4.2%**		
Achillea millefolium	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
Antennaria dimorpha	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia rigida	0.0%	3.2%	0.0%	4.1%	0.8%	7.5%
Artemisia tridentata	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Astragalus tweedii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Balsamorrhiza hookeri	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenactis douglasii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chrysothamnus nauseosus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chrysothamnus viscidiflorus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Collinsia parviflora	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Crepis sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cryptantha sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Elymus elymoides	0.4%	0.7%	0.2%	0.1%	0.8%	1.7%
Erigeron linearis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erigeron poliospermis	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
Erigeron sp.	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum douglasii	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum sp.	0.0%	1.1%	0.0%	1.9%	0.0%	0.0%
Eriogonum heracleoides	0.7%	6.5%	0.0%	2.3%	0.0%	0.0%
Erysimum occidentalis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Festuca idahoensis	0.0%	13.5%	0.0%	0.3%	0.0%	0.0%
Lithospermum ruderale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lomatium sp.	0.2%	0.0%	0.0%	0.0%	0.0%	0.9%
Lomatium triternatum	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus sp.	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
Nothocalais troximoides	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%
Phacelia sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phlox hoodii	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Phlox longifolia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phlox sp.	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Phoenicaulis sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pseudoroegneria spicata	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%
Purshia tridentata	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%
Poa sandbergii	3.0%	19.3%	0.2%	17.5%	1.9%	7.6%
Stenotus stenophyllus	0.0%	0.3%	0.0%	0.0%	1.2%	13.0%
Stipa occidentale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium macrocephalum	0.0%	0.0%	0.0%	0.0%	0.5%	1.1%
Viola trinervata	0.4%	0.0%	0.0%	0.0%	0.0%	2.6%
Wheatgrass sp.	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%
NATIVE SPECIES	**6.3%**	**44.6%**		**33.3%**	**9.7%**	**34.6%**
Bromus tectorum	1.2%	0.0%	0.4%	0.0%	0.0%	0.0%
Chenopodium sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Descurania pinnata	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lactuca serriola	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Medicago sativa	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Poa bulbosa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tragopogon dubius	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vulpia octaflora	13.2%	0.0%	0.0%	0.0%	0.2%	0.0%
NON-NATIVE SPECIES	**17.8%**					

APPENDIX 2

CHART SHOWING

PERCENT COVER IN MONITORING PLOTS

Appendix 2:
Percent Cover of Monitoring Plots in Lithosol (L), Stony/Shallow (S) and Deep/Loamy (D) Soil Types



APPENDIX 3

PLOT LOCATION DESCRIPTIONS

Appendix 3: Plot Locations

Transect D1: Coordinates - 10 0712353 E, 5206704 N. **Description -** On the north side of Main Line road, just past a sharp eastward bend in the road. The *Restored Site* transect is on the road shoulder. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect D2: Coordinates – 10 0710624 E, 5212987 N. **Description** – On the west side of Jeep Line road, across from The Pines. The *Restored Site* transect is along the underground cable trench. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect D3: Coordinates – 10 0714078 E, 5213945 N. **Description** – On the east side of I-Line road, past the intersection with the WHS-Line and just before an eastward bend in the road. The *Restored Site* transect is along the underground cable trench. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect S1: Coordinates – 10 0711519 E, 5213622 N. **Description** – On the north side of the WC-Line road, about midway between the M-Line and E-Line intersections. The *Restored Site* transect is along the underground cable trench. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect S2: Coordinates – 10 0712250 E, 5211748 N. **Description** – On the south side of L-Line road, past the P-Line intersection but before the road curves back northward; in a patch of Bitterbrush. The *Restored Site* transect is on the road shoulder. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect S3: Coordinates – 10 0712592 E, 5208328 N. **Description** – On the east side of Main Line road, south of the intersection with the Q-Line. The *Restored Site* transect is on the northernmost restored overhead power line access road that crosses the Main Line road. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

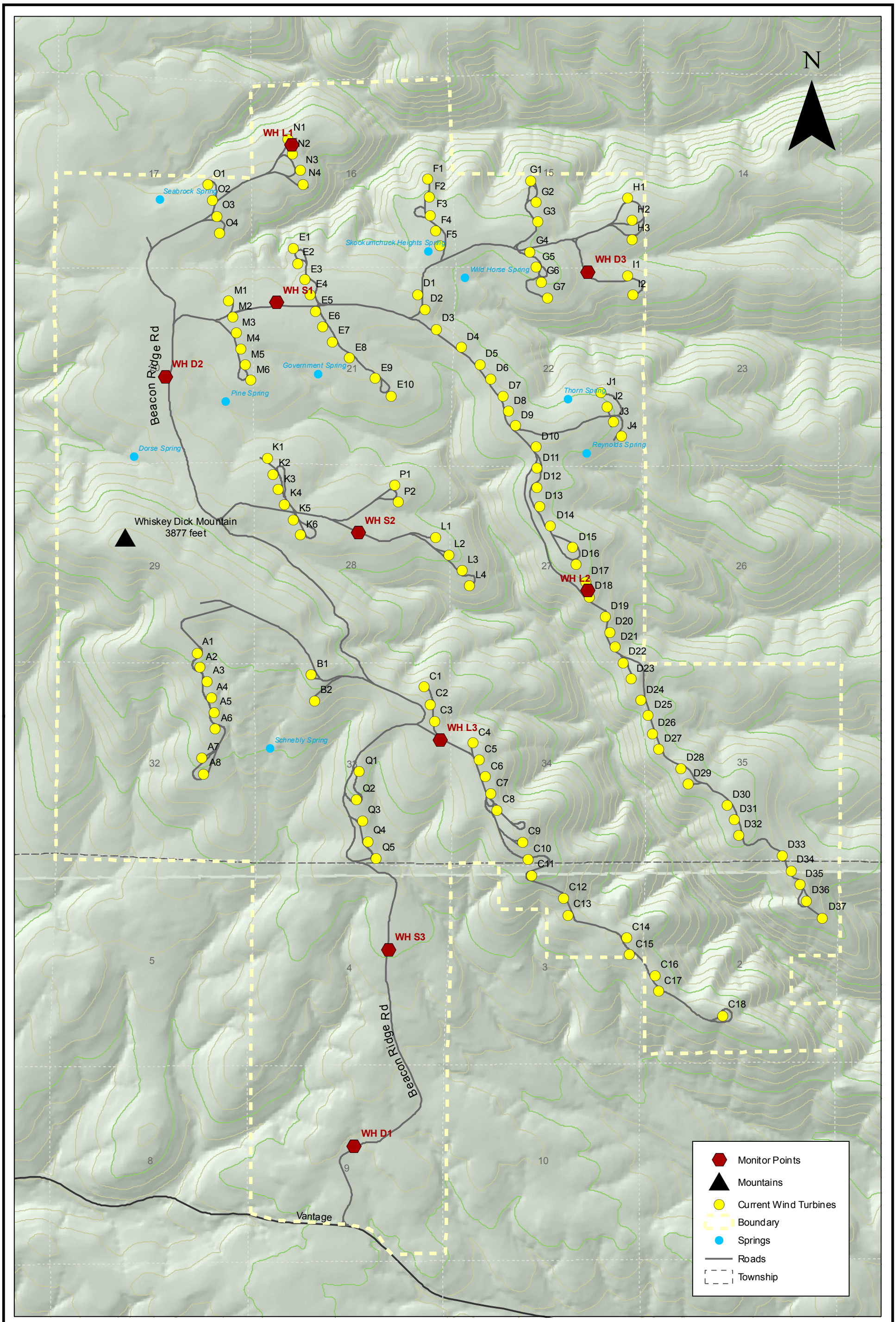
Transect L1: Coordinates – 10 0711608 E, 5214922 N. **Description** – Northeast of the loop road that connects N2 and N3 with the rest of N-Line road. The *Restored Site* transect is along the underground cable trench connecting turbines N3 and N4. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect L2: Coordinates – 10 0714144 E, 5211325 N. **Description** – East of the D-Line road, between turbines D17 and D18. The *Restored Site* transect is along the underground cable trench that connects turbine D17 to turbine D18. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

Transect L3: Coordinates – 10 0712965 E, 5210063 N. **Description** – On the south side of C-Line road, across from the where the spur to C1, C2, and C3 intersects. The *Restored Site* transect is along the underground cable trench that runs parallel to the road. The *Reference Site* transect is parallel to it, offset ~5 meters into undisturbed vegetation.

APPENDIX 4

PLOT LOCATION MAP



Property of Puget Sound Energy
355 110th Ave. NE. Bellevue, WA. 98004
Maps, Records and Technology.
Date:4-23-2008
Drawn By:Austin Hildreth
File Location:...\MRT_Projects\WildHorse\Expansion

Wildhorse Restoration Monitoring

PUGET SOUND ENERGY
The Energy To Do Great Things

Appendix K
2008 Conservation Easement Correspondence

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August 26, 2008

David A. Bricklin
1001 Fourth Ave Suite 3303
Seattle, WA 98154

RE: Wild Horse Wind Power Project

Dear Mr. Bricklin:

Thank you for your comments on behalf of Robert Kruse and Friends of Wildlife and Wind Power regarding the Wild Horse Project. I would like to respond to the conservation easement and land exchange issues you raised.

The Department of Natural Resources (DNR) does not intend to encumber the Common School Trust Lands within the project with a conservation easement. The Energy Facility Site Evaluation Council's Site Certificate Agreement does not require a conservation easement on state land. Council Order No. 814 acknowledged that the applicant was committed to voluntarily placing the project area into a conservation easement with a local land conservancy. However, this is not appropriate for DNR managed Trust Lands.

You also urged DNR to transfer two sections to Department of Fish and Wildlife (WDFW) in the upcoming land exchange. The two parcels that you described to the west of the wind project were not selected for that exchange, I have passed your recommendation to our transactions program for future consideration.

Thank you for your interest in this project and the WDFW exchange.

Sincerely,

William O. Boyum
Southeast Region Manager

BB:jp

c: Allen Fiksdol, EFSEC Manager
Scott Williams, Puget Sound Energy
Brent Billingsley, Columbia Basin District Manager
File 60-075018

September 17, 2008

TO: Director Jeff Koenings, Ph.D.
Washington Dept. of Fish & Wildlife
600 Capitol Way North
Olympia, WA 98504-1091

SUBJ: Wild Horse Wind Power Project Conservation Easement & Expansion

Dear Director Koenings,

Members of the Kittitas County Field & Stream Club, the Kittitas Audubon Society and Friends of Wildlife and Wind Power are very concerned about the status of the conservation easement on the Wild Horse Wind Power Project. Our organizations supported the original project based on promised protections by Puget Sound Energy and agreements negotiated as depicted in the Environmental Impact Statement and the Site Certification Agreement. Grazing on the project was an important part of the community support. Now it appears it is considered optional by PSE. Section 27 and all the springs were supposed to be fenced and protected. They are not. The entire 8600 acres of the original project were to be placed in the conservation easement and have not been. The S.C.A. and the final E.I.S permitted a "Wind Energy Facility" not solar power or other alternative energy development or a 25% expansion in wind towers on the existing project.

We urge the Department not to sign off on the proposed Conservation Easement.

Sincerely,

Kittitas County Field & Stream Club
8770 Brick Mill Road
Ellensburg, WA 98926

Kittitas Audubon Society
PO Box 1443
Ellensburg, WA 98926

Friends of Wildlife & Wind Power
8885 42nd Ave SW
Seattle, WA 98136

cc: WDFW Commission
Governor Christine Gregoire
E.F.S.E.C.

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

November 7, 2008

Kittitas County Field & Stream Club
8770 Brick Mill Road
Ellensburg, Washington 98926

Kittitas Audubon Society
Post Office Box 1443
Ellensburg, Washington 98926

Friends of Wildlife & Wind Power
8885 42nd Avenue Southwest
Seattle, Washington 98136

Gentlemen and Ladies:

Thank you for your September 17, 2008, letter to Washington Department of Fish and Wildlife (WDFW) Director Jeff Koenings regarding your concerns with the conservation easement and expansion associated with the Wild Horse Wind Power Project. Director Koenings has asked that I respond on his behalf.

We share your concern about the protection of shrub-steppe habitat. As you know, shrub-steppe habitat is identified as a priority habitat by WDFW due to continued development and conversion. Protecting, restoring, and maintaining ecological connectivity between the remaining large contiguous tracts of shrub-steppe is one of our highest priorities.

There are few regulatory tools that provide protection of terrestrial habitats, and WDFW has no laws within the fish and wildlife code that provide protection of upland wildlife habitat. We rely on a few direct and indirect methods, such as other agency's regulatory processes to protect upland habitat.

In this instance, there are provisions of the Energy Facility Site Evaluation Council (EFSEC) Site Certification Agreement that are intended to mitigate habitat impacts associated with the wind farm. The WDFW settlement agreement related to the Wild Horse Wind Power Project that also contains several habitat protection elements. We do not believe that the conservation easement negotiated between WDFW and Puget Sound Energy (PSE) is part of either or any regulatory process. The conservation easement is part WDFW's acquisition program which is based on a non-regulatory habitat protection approach between willing buyers and willing sellers. This non-regulatory tool is an important part of our efforts to work cooperatively with private landowners to implement conservation benefits on private lands.

Conservation easements almost always require extensive negotiations regarding allowed uses. The Wildhorse Conservation Easement is no different than most easements in this regard. Often the most difficult part of any conservation easement discussion revolves around what uses will and will not be permitted after the acquisition of the easement. As negotiated, the Wildhorse Conservation Easement allowed uses include wind-power, grazing, recreation, and solar and geothermal power development on the southeast quarter of the property. Allowing for future opportunity for solar and geothermal power production along the Beacon Ridge Road south of Whiskey Dick Mountain is the culmination of WDFW and PSE's joint effort to accommodate limited renewable power production on the site, while protecting in perpetuity the most valuable wildlife habitat. Roughly 7,500 acres of PSE lands will ultimately be included in the conservation easement. The 7,500 acres includes about 2,000 acres that were not owned by PSE at the time the project was permitted. Thus, these lands were not part of the commitment PSE made to place an easement on their private lands within the original wind farm. Most of the area where solar and/or geothermal energy may be developed is located within the PSE ownership that is outside of the permitted wind power project. Solar and/or geothermal development is limited to the area nearest the Vantage Highway in the most arid and least diverse portion of PSE land ownership.

It should be noted that the negotiated conservation easement prohibits almost all of the threats to shrub-steppe habitat. While we share your concerns about the potential impacts associated with a large solar energy development, we would be very reluctant to give up the substantial protections the easement provides to all other potential threats to the habitat over a large geographic area. PSE made significant concessions with regard to allowed uses within the easement on their property. Although initial discussions included the possibility that renewable energy would be allowed anywhere on the property, they concluded with limited solar/geothermal energy development allowed only in the southeast quarter of the property.

Finally, we must also point out that the conservation easement does not permit or support solar/geothermal development, it merely does not extinguish the landowners right to apply for a permit for solar/geothermal development. Any future permit application for solar/geothermal development would trigger environmental review and mitigation for associated impacts as with any other site.

With regard to the Washington Department of Natural Resource's (WDNR) ownership within the Wild Horse Wind Power Project, the issue of whether WDNR lands would be included in the future conservation easement between WDFW and PSE, was not discussed. WDFW did not assume that PSE had the authority to convey an easement over WDNR lands, and we did not request or discuss the possibility of including an easement on WDNR lands with the WDNR. Only WDNR can convey an easement on their lands and you may wish to pursue that part of your concern directly with WDNR

WDFW was not part of discussions that committed PSE to grazing their lands. We have advocated that if grazing should occur, is needs to be conducted as part of a science supported, performance based, grazing plan that protects fish and wildlife habitat. The Coordinated Resource Management (CRM) group has worked diligently to prepare that plan and is consistent

with WDFW's "Skookumchuck" acquisition. The investment WDFW and PSE have made in the CRM should reflect our united commitment to include grazing in an ecologically sustainable and beneficial manner within this area.

We view the fencing provision of the EFSEC permit for PSE as safety net in the event that our best efforts for implementing a wildlife friendly grazing program was not fruitful. Fortunately, a landscape level, wildlife friendly grazing plan has been developed. The section 27 fencing provision was specific to grazing management, and the CRM is achieving what was intended regarding upland wildlife habitat protection. Building permanent fences where they are not needed can be harmful to wildlife. Fences can pose a significant hazard to sage grouse and should be avoided whenever possible, and since the agreed upon grazing performance standards will now be applied to Section 27, there is no longer a need to fence it. We do concur that protection of springs and riparian areas with fencing is necessary, but temporary electric fences that are only up when they are needed and are the least intrusive method consistent with our range management performance standards.

WDFW and PSE did install temporary fencing along riparian corridors during the 2008 grazing period to exclude livestock, and protect water quality and fish and wildlife habitat. PSE remains responsible for protecting springs and watercourses on their ownership, both within their EFSEC permit and under the provisions of the proposed conservation easement. The easement has strong protective language for both grazing, and protection of springs and waterways. Thus, the conservation easement provides protection for 7,500 acres of shrub-steppe habitat and riparian areas, rather than just the 640 acres that would be protected by the fence.

The wind farm expansion area will be included in the easement when the expansion is permitted. This provides important protection for the headwaters of Skookumchuck Creek and parts of Quilomene and Skookumchuck Ridges. Additionally, during the course of our discussions regarding their proposed wind farm expansion, PSE agreed to remove the four northernmost wind turbines from consideration. These four turbines straddled Quilomene Ridge and were inholding to the Quilomene Wildlife Area. They potentially would have required an overhead power line creating significant environmental impacts and expected mitigation. PSE has now agreed that if they ever sell the Quilomene Ridge property, they intend to sell it to WDFW.

The conservation easement also commits PSE to funding the baseline inventory and periodic monitoring of their property to land trust alliance standards. PSE also has obligated itself to condition any future mineral extraction to protect the conservation values identified in the easement. PSE cannot convey the mineral rights because they do not own them. However, they can and have extended the impact avoidance and mitigation authority they do have as the surface landowner, to protect WDFW's interest in habitat as described in the easement.

While some may not regard the conservation package for the Wild Horse Wind Power Project as being perfect, PSE negotiated in good faith to provide significant conservation that accompanies the project beginning with their efforts to obtain the option for acquisition of the 18,000 acre Skookumchuck property. Without PSE's assistance, the Skookumchuck acquisition would likely not have occurred. PSE was also a big help in obtaining funding for the Skookumchuck and has

been a key player in implementing a vastly improved grazing program in this area. The conservation easement now not only includes the 5,600 acres of the original project, but another 2,000 acres that were acquired since.

Finally, PSE has been responsive to WDFW's concerns about turbines on Quilomene Ridge and are committed to not selling the Quilomene Ridge property to anyone other than WDFW. At this point, it is our opinion that the benefits of our partnership with PSE with regard to the long-term protection of fish and wildlife habitat far outweigh the potential risks.

Sincerely,

Greg Hueckel, Assistant Director
Habitat Program

cc: Governor Gregoire
WDFW Fish & Wildlife Commission
Jeff Koenings, Director
Jeff Tayor, Region 3 Director
Peter Birch, Deputy Assistant Director
Perry Harvester, Region 3 Habitat Program Manager