APPENDIX M-1

Legal Opinion on Authority to Construct

PPM Energy
A ScottishPower Company

Please Reply To:

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March 29, 2005

Oregon Department of Energy
625 Marion Street, N.E.
Salem, Oregon 97310

Re: Application of Klondike Wind Power III LLC for Site Certificate

Dear Ladies and Gentlemen

I am an in-house attorney for Klondike Wind Power III LLC, an Oregon limited liability company (the "Applicant"), and have also acted as counsel to the Applicant.

In that connection, I have examined originals or copies certified or otherwise identified to my satisfaction of the books and records of Applicant and such other documents, limited liability company records, certificates of public officials and other instruments regarding the Applicant as I have deemed necessary and appropriate for the purposes of this opinion.

In rendering this opinion expressed below, I have assumed (i) the authenticity of all documents submitted to me as originals and (ii) the conformity to original documents of all documents submitted to me as copies. As to factual matters, I have relied to the extent deemed proper, upon statements and certifications of officers and manager of the Applicant.

Based upon the foregoing, to the best of my knowledge, I am of the opinion that, subject to the Applicant's meeting all applicable federal, state and local laws (including all rules and regulations promulgated thereunder), the Applicant has the legal authority to construct and operate the up to 273 MW name-plated capacity wind generation facility and associated facilities located in Sherman County, Oregon (the "Project") that the Applicant proposes in its Application for Site Certificate to the filed with the Oregon Energy Facility Siting Council and in connection with which this opinion is rendered, without violating articles of organization covenants or similar agreements.

I am a member of the bars of the states of California and Washington and admitted on a limited basis in the state of Oregon and do not hold myself out as an expert in, and do not express any opinion with respect to, the law of any jurisdiction other than the law of the states of California and Washington.

The foregoing opinion is limited solely to whether the Applicant has the authority under its operating agreement to construct, own and operate the Project. I express no opinion as to the applicability of any federal, state or local laws (including all rules and regulations promulgated thereunder) to such construction and operation or as to the effects of the foregoing laws on such construction and operation.

Please contact me if you have any additional questions regarding this matter.

Very truly yours,

PPM ENERGY, INC.

Toan-Hao B. Nguyen
Legal Counsel

APPENDIX M-2

Financial Assurance Letter

Safeco

SAFECO Insurance Company of America
SAFECO SURETY

Western Region Office
4854 154th Place NE
Redmond, WA 98052

Telephone: (425) 376-8914
Fax: (425) 376-8840

Mailing Address:
PO Box 34670
Seattle, WA 98124-1670

March 30, 2005

Oregon Energy Facility Siting Council
Oregon Department of Energy
Salem, OR

PPM Energy, Inc. is a subsidiary of PacifiCorp Holdings, Inc. and an affiliate of PacifiCorp. PacifiCorp and its affiliates/subsidiaries are valued clients of Safeco Surety.

It is our understanding that Safeco Surety may be asked to provide a bond on behalf of PPM Energy, Inc. for the project known as the Klondike III Wind Power Facility. It is also our understanding this potential bond could be required in the amount of Two Million ($2,000,000) dollars, inflation adjusted on an annual basis according to the Gross Domestic Product Implicit Price Deflator Index.

PacifiCorp has sufficient available bonding capacity to support this request. There is a reasonable likelihood that Safeco Surety would provide an annual bond for this project, should one be required. This commitment is subject to our review and acceptance of the terms and conditions of the final contract and required bond form or forms.

You understand, of course, that any arrangement for the final bond or bonds is a matter between PPM Energy, Inc. and ourselves and we assume no liability to third parties or to you if, for any reason, we do not execute said bond or bonds.

Best Regards,

Barb D'Ettorre
Sr. Account Specialist
Safeco Surety
Western Region

EXHIBIT M

FINANCIAL ANALYSIS
OAR 345-021-0010(1)(m)

TABLE OF CONTENTS

		Page
M.1	INTRODUCTION	1
M.2	OPINION OF LEGAL COUNSEL	1
M.3	BOND, SECURITY, OR OTHER FINANCIAL INSTRUMENT	1
M.4	EVIDENCE OF REASONABLE LIKELIHOOD OF OBTAINING SECURITY	1
M.5	CONCLUSION	1

APPENDICES

M-1 LEGAL OPINION ON AUTHORITY TO CONSTRUCT

M-2 FINANCIAL ASSURANCE LETTER

M.1 INTRODUCTION

OAR 345-021-0010(1)(m) *Information about the applicant's financial capability, providing evidence to support a finding by the Council as required by OAR 345-022-0050(2). Nothing in this subsection shall require the disclosure of information or records protected from public disclosure by any provision of state or federal law. The applicant shall include:*

Response: See sections M.2 through M.4, below.

M.2 OPINION OF LEGAL COUNSEL

OAR 345-021-0010(1)(m)(A) *An opinion or opinions from legal counsel stating that, to counsel's best knowledge, the applicant has the legal authority to construct and operate the facility without violating its bond indenture provisions, articles of incorporation, common stock covenants, or similar agreements;*

Response: Appendix M-1 is an opinion from Toan Nguyen, in-house legal counsel for the Applicant, conforming to the requirements of the rule.

M.3 BOND, SECURITY, OR OTHER FINANCIAL INSTRUMENT

OAR 345-021-0010(1)(m)(B) *The type and amount of the applicant's proposed bond or letter of credit to meet the requirements of OAR 345-022-0050; and*

Response: Applicant hereby commits to submit, prior to the commencement of facility construction, to the State of Oregon, through the Council, a bond, letter of credit, or other security in a form satisfactory to the Council, in the amount of $998,855. The security shall assure that adequate funds will be available to adequately retire the facility and restore the site to a useful, non-hazardous condition. (Please see Exhibit W for a calculation of the site restoration costs.) The security shall remain in effect until the facility is retired, and will be inflation-adjusted on an annual basis according to the Gross Domestic Product Implicit Price Deflator Index.

M.4 EVIDENCE OF REASONABLE LIKELIHOOD OF OBTAINING SECURITY

OAR 345-021-0010(1)(m)(C) *Evidence that the applicant has a reasonable likelihood of obtaining the proposed bond or letter of credit in the amount proposed in paragraph (B), before beginning construction of the facility.*

Response: A letter from Safeco, agreeing to provide a bond in an amount greater than that proposed in paragraph (B), is included as Attachment M-2.

M.5 CONCLUSION

Based upon the above information, the Applicant has satisfied the requirements in OAR 345-021-0010(1)(m), and the Council may find that the requirements contained in OAR 345-022-0050 are satisfied.

EXHIBIT N

NON-GENERATING FACILITY
OAR 345-021-0010(1)(n)

Exhibit N requires information about a non-generating facility. Exhibit N is not required for this application because the Applicant is not proposing to construct a non-generating energy facility.

EXHIBIT O

WATER RESOURCES
OAR 345-021-0010(1)(o)

TABLE OF CONTENTS

		Page
O.1	INTRODUCTION	1
O.2	SOURCES OF WATER	1
O.3	WATER RIGHTS	1
O.4	WATER USE	1
O.5	WATER LOSSES	2
O.6	WATER BALANCE DIAGRAM	2
O.7	PERMITS OR TRANSFERS REQUIRED	2
O.8	EVIDENCE IN SUPPORT OF PERMITS OR TRANSFERS	2
O.9	MEASURES TO REDUCE CONSUMPTIVE USE OF WATER	3
O.10	OTHER MITIGATION MEASURES	3

O.1 INTRODUCTION

OAR 345-021-0010(1)(o) *Information about the water requirements the applicant anticipates for construction and operation of the proposed facility. If the applicant has submitted any permit applications to the Office, as described in OAR 345-021-0000(4), that contain this information, the applicant may copy relevant sections of those documents into this exhibit or include in this exhibit cross-references to the relevant sections of those documents. The applicant shall include:*

Response: The following description identifies the sources of water to be used, the nature of the water use by the energy facility, and steps taken to minimize consumptive use.

O.2 SOURCES OF WATER

OAR 345-021-0010(1)(o)(A) *A description of each source of water and the applicant's estimate of the amount of water the facility will need from each source under annual average and worst-case conditions;*

Response: During construction of this project, water will be trucked in from offsite for dust control, making concrete, etc. During operations, a well to be located near the proposed Klondike III O&M facility will provide water and produce less than 5,000 gallons per day.

O.3 WATER RIGHTS

OAR 345-021-0010(1)(o)(B) *If a new water right is required, the approximate location of the points of diversion with the estimated quantity of water to be taken at each point;*

Response: No new water rights will be required for this project. Oregon law allows exempt industrial and commercial uses up to 5,000 gallons per day from groundwater wells without a permit (ORS 537.545(1)(f)). Exempt industrial uses include water for drinking, flushing toilets, using sinks, as well as other industrial uses during construction and operation of the energy facility. Otherwise, no new water rights will be required for the water trucked to the site during construction as it will be provided by a contractor, and it is anticipated that this water will originate from a nearby community water system.

O.4 WATER USE

OAR 345-021-0010(1)(o)(C) *A description of how the water is to be used;*

Response: During the construction phase, water will be pumped into tanker trucks, driven to active construction areas, and used for concrete mixing, road compaction, and dust suppression. During operations, water will be used at the O&M facility for industrial uses such as drinking, flushing toilets, and using sinks.

O.5 WATER LOSSES

OAR 345-021-0010(1)(o)(D) *A description of each avenue of water loss or output from the facility site, the applicant's estimate of the amount of water in each avenue under annual average and worst-case conditions, and the final disposition of all wastewater, including stormwater.*

Response: During construction, water loss will occur primarily through evaporation from wetted road surfaces and from drying concrete. Because of the dry conditions at the site and the relatively low rates of water use and application, it is expected that all water used during construction will be lost on or very near the site. No water used on the site will be discharged into wetlands, lakes, rivers, or streams. For the purposes of road compaction, dust suppression, and concrete mixing, water would be used at the rate needed to perform these functions. An estimated 55,000 gallons of water may be applied daily to roads and construction areas during project construction for road compaction and to reduce dust. An additional 11,500 gallons of water will be used to cure concrete for the turbine pads and transformer pads. During operations, all water used for sanitary purposes will enter into the proposed septic system. All stormwater will infiltrate into the ground.

O.6 WATER BALANCE DIAGRAM

OAR 345-021-0010(1)(o)(E) *For operation, a water balance diagram, including the source of cooling water and the estimated consumptive use of cooling water, based on annual average conditions;*

Response: Water will not be used for cooling of any industrial processes. During the operations phase, the only water used will be for sanitary purposes at the O&M facility. At this facility, water used for drinking, hand washing, and toilets will flow into the proposed septic system. No water balance diagram is provided here due to the simplicity of this water use.

O.7 PERMITS OR TRANSFERS REQUIRED

OAR 345-021-0010(1)(o)(F) *If the facility does not require a groundwater permit, a surface water permit, or a water rights transfer, an explanation why no such permit or transfer is required for the construction and operation of the proposed facility;*

Response: No permit or transfer is required because the Applicant proposes an exempt well for use during the construction and operation of the project, and otherwise, no permit or transfer is required for the water to be trucked onto the site.

O.8 EVIDENCE IN SUPPORT OF PERMITS OR TRANSFERS

OAR 345-021-0010(1)(o)(G) *Evidence to support Council findings that the Water Resources Department should issue a groundwater or a surface water permit under ORS Chapter 537 or should approve a transfer of a water use under ORS Chapter 540, including a discussion and evaluation of all relevant factors, including those listed in ORS 537.153(2) and (3), 537.170(8) and OAR Chapter 690, divisions 15 and 310;*

Response: As noted above, no permit or transfer from the Oregon Water Resources Department will be required for constructing or operating this facility.

O.9 MEASURES TO REDUCE CONSUMPTIVE USE OF WATER

OAR 345-021-0010(1)(o)(H) *A discussion of any steps proposed by the applicant to reduce consumptive water use; and*

Response: Consumptive water use will be very low for this facility compared to gas-fired electric plants. During construction, only enough water to suppress dust and cure concrete will be used. During operations, water used at the O&M facility will be minimal; building code requirements for water conservation, such as low-flow toilets, will be met.

O.10 OTHER MITIGATION MEASURES

OAR 345-021-0010(1)(o)(I) *A discussion of any mitigation steps proposed by the applicant to address the impact of the applicant's water use on affected resources.*

Response: A key benefit of wind generation is that it requires very little water, particularly during its operations phase. Because construction and operation of the project will not create any significant impact on water resources, no mitigation is proposed.

EXHIBIT P

FISH AND WILDLIFE HABITATS AND SPECIES
OAR 345-021-0010(1)(p)

TABLE OF CONTENTS

		Page
P.1	INTRODUCTION	1
P.2	FISH AND WILDLIFE HABITAT MITIGATION GOALS AND STANDARDS	1
P.3	IDENTIFICATION AND DESCRIPTION OF FISH AND WILDLIFE HABITATS IN THE ANALYSIS AREA	4
	P.3.1 Category 1 Habitat Description	5
	P.3.2 Category 2 Habitat Description	5
	P.3.3 Category 3 Habitat Description	7
	P.3.4 Category 4 Habitat Description	9
	P.3.5 Category 5 Habitat Description	10
	P.3.6 Category 6 Habitat Descriptions	10
	P.3.7 Special Status/Sensitive Plants and Wildlife	10
P.4	DESCRIPTION OF BIOLOGICAL AND BOTANICAL SURVEYS PERFORMED	13
	P.4.1 Information Review	14
	P.4.2 Habitat Typing and Categorization	14
	P.4.3 Vegetation	15
	P.4.4 Wildlife	15
P.5	MAP OF HABITAT LOCATION	18
P.6	DESCRIPTION OF SIGNIFICANT POTENTIAL IMPACTS ON IDENTIFIED HABITATS	18
	P.6.1 Impacts to Wildlife Habitat	19
	P.6.2 Impacts to Special Status/Sensitive Species	20
P.7	MITIGATION MEASURES	26
	P.7.1 Mitigation for Habitat Impacts	27
	P.7.2 Mitigation for Impacts to Special Status/Sensitive Species	29
P.8	EVIDENCE THAT THE PROPOSED FACILITY COMPLIES WITH ODFW FISH AND WILDLIFE HABITAT MITIGATION GOALS	29
	P.8.1 Category 1 Habitat	29

P.8.2 Category 2 Habitat 29
P.8.3 Category 3 Habitat 30
P.8.4 Category 4 Habitat 31
P.8.5 Category 5 Habitat 31
P.8.6 Category 6 Habitat 31
P.9 MONITORING PROGRAM 32
P.10 CONCLUSION 32
P.11 REFERENCES 33

TABLES

Table P- 1. Habitat Types and Habitat Categories in the Klondike III Wind Project 4
Table P- 2. Special Status/Sensitive Species with the Potential to Occur within the Analysis Area of the Klondike III Wind Project 11
Table P- 3. Habitat Types and Categories in the Klondike III Wind Project Analysis Area with Area of Impact 19

APPENDICES

P-1 PROJECT ANALYSIS AREA – MAP
P-2 DISTRIBUTION OF HABITAT TYPES AND CATEGORIES WITHIN THE PROJECT ANALYSIS AREA – MAPS
P-3 LETTER FROM ODFW RE: CONCURRENCE ON BIOLOGICAL PROTOCOL, DATED JANUARY 27, 2005
P-4 ABR INTERIM REPORT

P.1 INTRODUCTION

OAR 345-021-0010(1)(p) *Information about the fish and wildlife habitats and the fish and wildlife species, other than the species addressed in subsection (q) that may be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0060. The applicant shall include:*

Response: The Energy Facility Siting Council ("EFSC") fish and wildlife habitat standard states that "to issue a site certificate, the Council must find that the design, construction, operation and retirement of the facility, taking into account mitigation, are consistent with the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025." OAR 345-022-0600.

Oregon Department of Fish and Wildlife ("ODFW") goals and standards to mitigate impacts to fish and wildlife habitat caused by land and water development actions are set forth in OAR 635-415-0000 through -0025. EFSC has also adopted these habitat mitigation rules, and this document addresses these rules.

The Council requires information about the fish and wildlife habitats and the fish and wildlife species, other than the species addressed in Exhibit Q, that may be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0060.

P.2 FISH AND WILDLIFE HABITAT MITIGATION GOALS AND STANDARDS

EFSC uses the fish and wildlife habitat mitigation goals and standards described in OAR 635-415-0025 to prioritize fish and wildlife habitats. OAR 635-415-0025 defines six habitat categories and establishes mitigation goals and implementation standards for each category. The six habitat categories and corresponding mitigation goals and implementation standards are described below:

1. **"Habitat Category 1"** *is irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site-specific basis, depending on the individual species, population or unique assemblage.*

   (a) The mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality.

   (b) The Department (ODFW) shall act to protect Category 1 habitats described in this subsection by recommending or requiring:

      (A) Avoidance of impacts through alternatives to the proposed development action; or

      (B) No authorization of the proposed development action if impacts cannot be avoided.

2. **"Habitat Category 2"** *is essential habitat for a fish or wildlife species, population, or unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population or unique assemblage.*

   (a) The mitigation goal if impacts are unavoidable, is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality.

   (b) The Department shall act to achieve the mitigation goal for Category 2 habitat by recommending or requiring:

      (A) Avoidance of impacts through alternatives to the proposed development action; or

      (B) Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality. In addition, a net benefit of habitat quantity or quality must be provided. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

   (c) If neither 635-415-0025(2)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

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

   (a) The mitigation goal is no net loss of either habitat quantity or quality.

   (b) The Department shall act to achieve the mitigation goal for Category 3 habitat by recommending or requiring:

      (A) Avoidance of impacts through alternatives to the proposed development action; or

      (B) Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

   (c) If neither 635-415-0025(3)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

4. **"Habitat Category 4"** *is important habitat for fish and wildlife species.*

(a) The mitigation goal is no net loss in either existing habitat quantity or quality.

(b) The Department shall act to achieve the mitigation goal for Category 4 habitat by recommending or requiring:

(A) Avoidance of impacts through alternatives to the proposed development action; or

(B) Mitigation of impacts, if unavoidable, through reliable in-kind or out-of-kind, in-proximity or off-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

(c) If neither 635-415-0025(4)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

5. **"Habitat Category 5"** *is habitat for fish and wildlife having high potential to become either essential or important habitat.*

(a) The mitigation goal, if impacts are unavoidable, is to provide a net benefit in habitat quantity or quality.

(b) The Department shall act to achieve the mitigation goal for Category 5 habitat by recommending or requiring:

(A) Avoidance of impacts through alternatives to the proposed development action; or

(B) Mitigation of impacts, if unavoidable, through actions that contribute to essential or important habitat.

(c) If neither 635-415-0025(5)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

6. **"Habitat Category 6"** *is habitat that has low potential to become essential or important habitat for fish and wildlife.*

(a) The mitigation goal is to minimize impacts.

(b) The Department shall act to achieve the mitigation goal for Category 6 habitat by recommending or requiring actions that minimize direct habitat loss and avoid impacts to off-site habitat.

P.3 IDENTIFICATION AND DESCRIPTION OF FISH AND WILDLIFE HABITATS IN THE ANALYSIS AREA

OAR 345-021-0010(1)(p)(A) *Identification and description of all habitat within the analysis area, classified by the habitat categories as set forth in OAR 635-415-0030;*

Response:

Table P-1 summarizes the habitat types within the project analysis areas with their corresponding ODFW habitat categories (1-6) and GIS mapping code. The project analysis area is illustrated in Figure P-1 (in Appendix P-1). The distribution of these habitat types and categories within the project analysis area is shown in Figures P-2 through P-6 (in Appendix P-2).

Table P- 1. Habitat Types and Habitat Categories in the Klondike III Wind Project

Habitat Type	Habitat Subtype	Mapping Code	Habitat Category
AGRICULTURAL	Non-irrigated cropland	AG	3 – croplands currently enrolled in the Conservation Reserve Program (CRP) that have developed the characteristics necessary to provide habitat for sensitive wildlife, such as density of cover and quality of forage. Includes strips of Continuous CRP (CCRP).
	Conservation Reserve Program fields	CRP	6 – non-irrigated cropland, currently farmed, with low potential to become essential or important habitat.
UPLAND TREES	Upland trees	UT	3 – essential or important wildlife habitat that is limited within the area; important perching/roost structure/forage for wildlife. In project area found in disturbed/human impacted area, with moderate to heavy cover by weeds.
SHRUB-STEPPE	Shrub-steppe	SS	2 – essential, limited wildlife habitat (potential habitat for target species), replaceable; high degree of cover (>40-50%); contains native shrubs and native grasses; good structure/forage for wildlife. Understory dominated by native species.
			3 – essential or important wildlife habitat that is limited within the area (e.g., relatively undisturbed habitat); high degree of cover (>40-50%); moderate to heavy cover by weeds, moderate structure/forage for wildlife.

Habitat Type	Habitat Subtype	Mapping Code	Habitat Category
GRASSLAND	Grassland	GR	2 – essential, limited wildlife habitat (e.g., potential target species habitat, mainly grasses), replaceable.
			3 – essential or important wildlife habitat, which is limited (e.g., relatively undisturbed habitat, moderate cover by native grasses, moderate structure/forage for wildlife).
			4 – important wildlife habitat (e.g., moderately to highly grazed or showing signs of other disturbance, moderate structure/forage for wildlife); usually weedy and contains a high percentage of non-native grasses.
DEVELOPED	Developed	DE	6 – non-essential wildlife habitat with limited potential to become important or essential in the foreseeable future (e.g., residential areas, corrals, commercial facilities, gravel quarries).
SURFACE WATER	Intermittent Streams	WS	3 – essential or important wildlife habitat, which is limited (e.g., defined channel, moderate structure/forage for wildlife).

P.3.1 Category 1 Habitat Description

There were no habitats identified as a Category 1 within the analysis area. Should any raptor nests be found in an upland tree within the analysis area it would be considered a Category 1 habitat. According to the ODFW standards, if nests are found, these upland trees would be considered irreplaceable because they could support the nest for a special status/sensitive, or non-listed target, species. To date, none of the upland trees within the analysis area have been found to contain a raptor nest. The upland trees will be evaluated during the raptor nest surveys (as described in Section P.4.4.3).

P.3.2 Category 2 Habitat Description

Two habitat types were identified as Category 2 within the analysis area: shrub-steppe and grassland.

P.3.2.1 Shrub-Steppe

Category 2 shrub-steppe habitat occurs in several areas within the analysis area, but primarily on the slopes leading down to Highway 206 from the agricultural areas west of Sandon Road (Figure P-2). This habitat type/category is found in the few areas where fire has not eliminated it from the landscape. This habitat category consists of a robust overstory of sagebrush (*Artemesia tridentata*), generally at least 40-50% cover. The understory includes native grasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), and Idaho fescue (*Festuca idahoensis*). It also includes patches of invasive grasses such as cheatgrass (*Bromus tectorum*) and bulbous bluegrass (*Poa bulbosa*). Although the habitat is often quite weedy in a few

places (up to 40% cover), it is the best remaining shrub-steppe habitat to be found within the vicinity, and as such provides important habitat for wildlife.

Category 2 shrub-steppe was also mapped within dense sagebrush on the upper terraces of Grass Valley Canyon. In places, it extends upslope along the drainages toward the agricultural plateau. Shrub-steppe is generally replaced by grasses and weeds in the upper portions of the tributaries.

P.3.2.2 Grassland

Category 2 grassland habitat consists mainly of native bunchgrasses, typically dominated by bluebunch wheatgrass and Sandberg bluegrass. Other native species, such as Idaho fescue and western needle and thread grass (*Hesperostipa comata*), are present, along with various native forbs and yellow rabbitbrush (*Chrysothamnus vicidiflorus*). Sagebrush, rabbitbrush and other shrubs are dense in small patches or in draws in this habitat type, but do not tend to dominate the vegetation on a landscape scale.

In this habitat type, invasive species, such as cheatgrass, tumblemustard (*Sisymbrium altissimum*), Russian thistle (*Salsola kali*), and fiddleneck tarweed (*Amsinckia lycopsoides*), were generally out-competed by native species. The soil surface is intact and little bare ground or disturbance was found.

Many areas of grassland classified as Category 2 are found on lithosol soils or fairly shallow soils with a southern aspect. Lithosols consist of soils that are stony and very shallow to bedrock (approximately 4-12 inches in the Columbia Basin). They are somewhat widespread in Oregon and Washington, and do not appear to be limited in extent locally. Where the lithosol soils exist in the site boundary, they are generally intact and undisturbed. Lithosolic sites are less subject to modification by grazing than other (deeper soil) grasslands because of the low stature of the vegetation and the stony substrate, which is less erodable.

Lithosols are generally found on south and west aspects and some ridge tops within the analysis area. Category 2 lithosols do not support robust bunchgrasses, but maintain enough bunchgrass structure to provide potential habitat for ground-nesting birds such as the grasshopper sparrow and long-billed curlew, foraging and dispersal habitat for white-tailed jackrabbits, and potential foraging habitat for raptors such as Swainson's hawk and Ferruginous hawk.

In Category 2 lithosols, Sandberg bluegrass is often dominant, in addition to native flowering forbs, such as buckwheat (*Eriogonum* sp.), wild onion (*Alium* sp.), Lomatium (*Lomatium* sp.), and others. Lichen and moss cover the remaining areas. Weed cover is generally well below 20% due mainly to the inability of weeds to colonize the shallow soil. The majority of this habitat was found on south-facing slopes between Webfoot and Grass Valley Canyon in Figure P-4, and north of Grass Valley and Highway 206 in Figure P-2.

Invasive species such as cheatgrass, star thistle, tumblemustard, and fiddleneck tarweed may be present in small quantities (below 20%), but are generally out-competed by native

species. Sagebrush is more common in the deeper soil portions of Category 2 grassland, but is not as dominant as it is within mapped shrub-steppe habitat.

P.3.3 Category 3 Habitat Description

Five types of habitats were identified as Category 3 within the project area: upland trees, low shrub/shrub-steppe, grassland, CRP, and intermittent streams.

P.3.3.1 Upland Trees

Upland trees were located near Emigrant Springs, Webfoot, along Klondike Lane in Figure P-4 and near scattered residences throughout the analysis area. Most appeared to have been planted as a windbreak or as shelter for cattle. Those areas not adjacent to residences are quite weedy, with cheatgrass and escaped wheat dominating the understory. Due to the presence of human disturbance and very weedy or developed understory, these upland trees are not considered irreplaceable since they could not support a nest for target species unless the residences were abandoned in the future. This habitat type includes Lombardy poplar trees in hedgerows, locust and Russian olive (*Eleagnus angustifolia*) trees and shrubs, and various pine and cottonwood species adjacent to residences and driveways. Several species of non-listed raptors were noted to perch on such trees, likely because trees and shrubs are rare in the vicinity. These species include American kestrel and other non-listed raptors.

Scattered locust shrubs in areas separated from human disturbance, such as those found within the old cemetery along Rayburn Road, east of Emigrant Springs (Appendix P-2, Figure P-6) and along Klondike Lane (Appendix P-2, Figure P-4) were used by songbirds for perching and foraging, but were not of sufficient size to provide nesting opportunities for sensitive species.

P.3.3.2 Shrub-Steppe

Category 3 shrub-steppe habitat within the site boundary was found in the southwest corner of the analysis area within the Proposed Mitigation Area (Figure P-2). It consists of native sagebrush and rabbitbrush, with a weedy understory (often greater than 50% cover) of cheatgrass, fiddleneck tarweed, and tumblemustard. In many areas, the herb layer consists entirely of cheatgrass, but these areas were designated as Category 3 rather than Category 4 because of the wildlife value provided by the dense sagebrush cover in an area otherwise dominated by grasslands. Wildlife expected to use Category 3 shrub-steppe may use it primarily for cover, and secondarily for foraging, since prey species may be less common due to the prevalence of less valuable forage such as cheatgrass.

Category 3 shrub-steppe was also mapped within tributaries to Grass Valley Canyon that do not contain riparian or wetland vegetation but do contain dense cover by sagebrush. Weed coverage was similar to other Category 3 shrub-steppe habitat due to overgrazing and other disturbance.

P.3.3.3 Grassland

Category 3 grasslands can be divided into those areas with shallow soils and those areas with deeper soils. The shallow soil areas are characterized by non-native grasses interspersed with some native grasses, while the deeper soil areas are dominated by a mixture of cheatgrass and native bunchgrasses.

Shallow soil, Category 3 grassland, was common throughout the site. These grassland areas were characterized by sparse, native bunchgrasses mixed with a robust layer of non-native storks-bill (*Erodium cicutarium*) and cheatgrass. Bare soil and rocks were common. Some grazing by cattle and deer was noted, and the soil surface in many places was disturbed and slightly more prone to erosion than Category 2 grassland. These areas were identified as Category 3 because they may provide important habitat for more common, less-sensitive wildlife species and, because of the high invasive species content, they are not limited within the region.

Deeper soil Category 3 grasslands contain at least 20 to 50% cheatgrass beneath a sparse native bunchgrass and rabbitbrush element. These areas often characterize the transition zone between the weedier Category 4 areas and the less-disturbed Category 2 bunchgrass-dominated grassland habitats. The majority of Category 3 vegetation was noted along the southern boundary of the project area. The soil surface was fairly intact and native bunchgrass was an important element, but cheatgrass and other weedy cover was high (50% or more). This area was designated a Category 3 because the cheatgrass between clumps of bunchgrass provides less valuable forage than native grasses. It is not the preferred habitat for sensitive grassland species and provides less forage for the prey base for target species such as Swainson's hawk.

Category 3 grassland habitat was also mapped in some places adjacent to intermittent streams in agricultural areas. Although the vegetation in these areas is quite weedy (escaped wheat and non-native grasses), its importance as potential wildlife shelter and forage adjacent to intermittent water sources was considered.

P.3.3.4 Conservation Reserve Program

Category 3 Conservation Reserve Program (CRP) lands are found throughout the analysis area, generally along steeper slopes and more inaccessible areas below existing agricultural areas and above Grass Valley Canyon and its tributaries. CRP areas are historic agricultural fields that are in the process of being restored to a grassland assemblage and wildlife habitat. Most of the CRP lands within the analysis area were tilled and seeded in or around 1997, and have developed well over time.

Within the Category 3 CRP areas, weed cover is generally low to moderate with scattered cheatgrass and bulbous bluegrass in the spaces between robust intermediate wheatgrass and crested wheatgrass. In the northeastern portion of the analysis area, Idaho fescue appears to have been planted in strips in places, perhaps to supplement the monoculture of robust, but non-native, grasses planted in the original CRP.

As of 2005, the CRP areas that were surveyed had developed the characteristics necessary to provide habitat for sensitive wildlife, such as density of cover and quality of forage. Interestingly, the majority of planted species within the CRP are non-native, and include intermediate wheatgrass *(Agropyron intermedium)* and crested wheatgrass (*Apropyron cristatum*). Both species are perennial non-natives.

Although CRP lands provide important wildlife habitat, they do not appear to be very limited on a site-specific or physiographic province level due to the abundance of CRP within and around the analysis area. However, the structure available on CRP lands provides habitat for wildlife, and natural wildlife movement has begun to re-emerge in these areas, including tunneling by gophers and mice, and occasionally badgers. Such tunnel work is fairly uncommon across the landscape.

This habitat category also includes another type of CRP, Continuous CRP (strips of CRP along field edges and drainages, CCRP). CCRP strips are designated Category 3 because, although they are narrow and isolated in nature, they currently maintain the structure necessary to provide shelter for wildlife in an otherwise monotypic agricultural area, and may provide connection to other habitats.

P.3.3.5 Intermittent Streams

Intermittent streams within the analysis area can be divided into two types: lower and upper tributaries to Grass Valley Canyon Creek.

Lower tributaries to Grass Valley Canyon Creek lie in steep drainages, and are often surrounded by dense sagebrush or other riparian vegetation. These areas do not cross any proposed construction areas, and the channels will not be impacted by construction. Since no lower tributary habitat will be directly affected by the project, and the scale of the maps is too small to accurately reflect channel locations, the lower tributaries were not mapped separately. A detailed description of intermittent channels and other Waters of the State or U.S. is included in Appendix J.

The upper portions of these tributaries have been mapped separately since they lie much closer to construction. The channels range from 1 to 5 feet in width, and are usually greatly incised (from 1 to 6 feet). In general, they have been significantly altered by agricultural practices, and are usually found at the edge of cultivated grass fields.

Vegetation within and adjacent to the channels is mostly weedy, with upland species such as cheatgrass and escaped wheat dominating the banks. In many places the channel has been obscured completely by weedy vegetation, although years with high runoff are expected to clear the channel of vegetation. Channel substrate is mostly silt from agricultural runoff, with patches of gravel or cobble.

P.3.4 Category 4 Habitat Description

Grassland was the only habitat type identified as Category 4 within the analysis area.

P.3.4.1 Grassland

Category 4 grasslands include two types: 1) heavily grazed, shallower soils with a sparse overstory of sagebrush and a very high weed component, and 2) deeper soil grasslands dominated by cheatgrass and other weeds with occasional patches of native bunchgrass. In both types, the dense weed cover limits the ability of most wildlife species to use these areas for forage or cover.

The Category 4 deeper soil grasslands are overwhelmingly dominated by a thick cover of weeds, such as cheatgrass, tumble mustard, bulbous bluegrass, mustard, and cereal rye (*Secale cereale*). These areas are commonly found on steep slopes adjacent to agricultural fiends. This may be due to overspray of herbicides, which, in some instances can destroy the native cover and replaces it with weedy species such as Russian thistle, cheatgrass and tumble mustard. Such habitat is found along the north-facing slopes of the tributary between Grass Valley and Webfoot, and along the drainage adjacent to Highway 206, where these weedy species line the slopes to a bare, rocky creek bed. These areas do not provide optimal wildlife habitat, nor are they expected to do so without intense management, such as burning or plowing and re-seeding with native grasses. In addition, the weed cover, often dominated by annuals such as cheatgrass, makes these slopes more susceptible to erosion and soil damage from grazing, because of a lack of the robust root structure found in perennial species, such as the native bunchgrasses. Areas that were heavily burned or otherwise disturbed developed similar characteristics, such as several slopes in the southwest portion of the site, downslope of CRP lands.

P.3.5 Category 5 Habitat Description

There was no Category 5 habitat identified within the analysis area.

P.3.6 Category 6 Habitat Descriptions

Category 6 habitats within the analysis area include non-irrigated agricultural croplands and developments (feed lots, roads, equipment storage areas, etc.). The agricultural areas are a monoculture of dryland wheat and include those areas currently in production as well as cut, fallow fields. Developments include residential yards and outbuildings, feed lots and corrals, equipment storage areas, existing substations, and construction management offices. All areas mapped as developed are highly disturbed on a regular basis and have been mostly or entirely cleared of native vegetation.

Due to the high level of disturbance, no special status/sensitive species are known or expected to occur in the Category 6 habitats and these areas are unlikely to become important or essential wildlife habitat in the foreseeable future.

P.3.7 Special Status/Sensitive Plants and Wildlife

Those species considered endangered, threatened, proposed or candidates for listing under the state and/or federal Endangered Species Act, with the potential to occur in the analysis area, are addressed in Exhibit Q.

Table P-2 summarizes special status/sensitive plants and fish and wildlife species that may occur within the analysis area according to the results of the pre-field review (ORNHIC 2005 and USFWS 2005) and the Biological Protocol that was approved by ODFW (ODFW Concurrence letter 2005, Appendix P-3).

Table P- 2. Special Status/Sensitive Species with the Potential to Occur within the Analysis Area of the Klondike III Wind Project

Species	Federal Status[1]	State Status[1]	ORNHIC List[2]	Observed/Documented in Analysis Area
Birds				
Golden eagle (*Aquila chrysaetos*)	EA	--	--	One nest documented in the project vicinity during the 2001-2003 Klondike I and II surveys. Also documented in the 2004-2005 avian baseline surveys.
Swainson's hawk (*Buteo swainsoni*)	--	SV	4	11 nests documented in the project vicinity during the 2001-2003 Klondike I and II surveys. None observed in 2004-2005 surveys to date.
Rough-legged hawk (*Buteo lagopus*)	--	--	--	Documented within the 2001-2003 Klondike I and II surveys as well as the 2004-2005 avian baseline surveys.
Red-tailed hawk (*Buteo jamaicensis*)	--	--	--	18 nests documented in the project vicinity during the 2001-2003 Klondike I and II surveys. Also documented in the 2004-2005 avian baseline surveys.
Ferruginous hawk (*Buteo regalis*)	SoC	SC	4	Documented within the 2001-2003 Klondike I and II surveys. None observed in 2004-2005 surveys to date.
Eastern Oregon Willow flycatcher (*Empidonax trailli adastus*)	SoC	SU	4	None observed. No suitable habitat.
Yellow-breasted chat (*Icteria virens*)	SoC	SC	4	None observed. No suitable habitat.
Lewis' woodpecker (*Melanerpes lewis*)	SoC	SC	4	None observed. No suitable habitat.
Long-billed curlew (*Numenius americanus*)	--	SV	4	Documented within the 2001-2003 Klondike I and II surveys. None observed in 2004-2005 surveys to date.
Western burrowing owl (*Athene cunicularia hypugaea*)	SoC	SC	2	None observed. Suitable habitat may exist within grassland areas.

Species	Federal Status[1]	State Status[1]	ORNHIC List[2]	Observed/Documented in Analysis Area
Loggerhead shrike (*Lanius ludovicianus*)	--	SV	4	Documented within the 2001-2003 Klondike I and II surveys. None observed in 2004-2005 surveys to date. Suitable nesting habitat exists within Grass Valley Canyon, Hay Canyon and the John Day River Canyon.
Mammals				
White-tailed jackrabbit (*Lepus townsendii*)	--	SU	3	Five individuals documented within the 2001-2003 Klondike I and II surveys. None observed in 2004-2005 surveys to date.
Spotted bat (*Euderma maculatum*)	SoC	--	2	None observed. Bat field investigation not conducted.
Pale western big-eared bat (*Corynorhinus townsendii pallescens*)	SoC	SC	2	None observed. Bat field investigation not conducted.
Silver-haired bat (*Lasionycteris noctivagans*)	SoC	SU	4	None observed. Bat field investigation not conducted.
Small-footed myotis (*Myotis ciliolabrum*)	SoC	SU	4	None observed. Bat field investigation not conducted.
Long-eared myotis (*Myotis evotis*)	SoC	SU	4	None observed. Bat field investigation not conducted.
Long-legged myotis (*Myotis volans*)	SoC	SU	4	None observed. Bat field investigation not conducted.
Yuma myotis (*Myotis yumanensis*)	SoC	--	4	None observed. Bat field investigation not conducted.
Desert bighorn sheep (*Ovis canadensis nelsoni*)	SoC	--	4	None observed. No suitable habitat within analysis area.
Amphibians & Reptiles				
Northern sagebrush lizard (*Sceloporus graciosus graciosus*)	SoC	SV	4	None observed during 2001-2003 Klondike I and II surveys. Suitable habitat not anticipated in analysis area.
Western toad (*Bufo boreas*)	--	SV	4	None observed. No suitable habitat within analysis area.
Painted turtle (*Chrysemys picta*)	--	SC	2	None observed. No suitable habitat within analysis area.
Invertebrates				
Pristine springsnail (*Pristinicola hemphilli*)	--	--	3	None observed. No suitable habitat within analysis area.
Shortface lanx (*Fisherola nuttalli*)	--	--	1	None observed. No suitable habitat within analysis area.
Dalles mountainsnail (*Oreohelix variabilis variabilis*)	--	--	1	None observed. No suitable habitat within analysis area.
California floater (*Anodonta californiensis*)	SoC	--	3	None observed. No suitable habitat within analysis area.

Species	Federal Status[1]	State Status[1]	ORNHIC List[2]	Observed/Documented in Analysis Area
Minor Pacific sideband (*Monadenia fidelis minor*)	SoC	--	1	None observed. No suitable habitat within analysis area.
Columbia Gorge oregonian (*Cryptomastix hendersoni*)	--	--	1	None observed. No suitable habitat within analysis area.
Fish				
Pacific lamprey (*Lampetra tridentata*)	SoC	SC	4	None observed. No suitable habitat within analysis area.
Interior redband trout (*Oncorhynchus mykiss gibbsi*)	SoC	SV	2	None observed. No suitable habitat within analysis area.

[1] State and Federal Status Definitions

EA – Bald and Golden Eagle Protection Act

SoC – Species of Concern. Former Category 2 candidates for which additional information is needed in order to propose as threatened or endangered under the ESA; these species are under review for consideration as Candidates for listing under the ESA.

SC – State Sensitive-Critical. Species for which listing is pending; or those for which listing may be appropriate if immediate conservation activities are not taken. Also considered critical are some peripheral species which are at risk throughout their range, and some disjunct populations.

SV – State Sensitive-Vulnerable. Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

SU – State Sensitive-Undetermined Status. Animals in this category are species whose status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study would be required before a judgment can be made.

[2] ONHP Definitions

List 1 - taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 – taxa threatened with extirpation or presumed extirpated from Oregon; often peripheral or disjunct species which are of concern considering species diversity within Oregon; can be very significant in protecting the genetic diversity of the taxon; ONHP regards extreme rarity as a significant threat and has included species which are very rare in Oregon on this list.

List 3 – taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 – taxa which are of conservation concern but not currently threatened or endangered; including taxa that are very rare but considered secure as well as those declining in numbers or habitat but still too common to be proposed as threatened or endangered; these taxa require continued monitoring.

Ex – Presumed extirpated or extinct

P.4 DESCRIPTION OF BIOLOGICAL AND BOTANICAL SURVEYS PERFORMED

OAR 345-021-0010(1)(p)(B) *A description of biological and botanical surveys performed that support the information in this exhibit, including a discussion of the timing and scope of each survey;*

Response: See sections P.4.1 through P.4.4, below.

P.4.1 Information Review

The pre-field review for special status/sensitive species of plants and wildlife within the analysis area included a query of the ORNHIC and USFWS databases for documented and projected occurrences of candidate, proposed, and listed species in the analysis area (ORNHIC 2005; USFWS 2005). Existing literature and scientific data were reviewed and ODFW biologists contacted to determine species distribution and habitat requirements (Anthony et al 1982; Csuti et al 1997; Keith Kohl, ODFW, personal communication). A Biological Protocol was prepared to define the project analysis and survey areas and the species that would be included within Exhibits P and Q of this Site Certificate Application. The Final Biological Protocol is included in Exhibit Q, Appendix Q-6. The Protocol was reviewed by and concurred with by ODFW and their letter of concurrence is included in Appendix P-3.

To supplement the information provided by ORNHIC and USFWS, a number of other sources were consulted for information on special status/sensitive plants. These sources provided additional information such as habitat preferences, morphological characteristics, phenologic development timelines, and species ranges. Sources included: taxonomic keys and species guides (WNHP 2004, Flora ID Northwest 2001, USFWS 2001, Hickman 1993, Cronquist *et al.* 1977-1997, Hitchcock and Cronquist 1973, Hitchcock *et al.* 1955-1969); online databases of common and special status/sensitive plant species (USDA 2005, ECCI 2004); environmental permitting documents from the Klondike I and II projects (Johnson 2004, Johnson *et al.* 2002, 2001), and Natural Resources Conservation Service (NRCS) soils data (NRCS 2004).

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.

P.4.2 Habitat Typing and Categorization

The fish and wildlife habitats described in this section were identified within the project analysis area during the environmental review and field surveys. OAR 345-001-0010(53) indicates the study area for fish and wildlife habitat is the area within the site boundary. Based upon the Final Biological Protocol (Exhibit Q, Appendix Q-6) and the ODFW concurrence letter (Appendix P-3), the analysis area for this project is 1,000 feet from the site boundary. The analysis areas are illustrated in Figure P-1 (Appendix P-1).

All fish and wildlife habitat types within 1,000 feet of the site boundary were analyzed and mapped according to the ODFW Fish and Wildlife Habitat Mitigation Policy. On February 10, 2005, a site visit was conducted with Chris Carey, ODFW Non-Game Biologist to confirm habitat categorization techniques. Aerial photography, at an acquisition scale of 1:24,000, was used to create a preliminary map of the boundaries of the fish and wildlife habitat types within the project area. Habitat boundaries were then ground-truthed by qualified biologists. For each habitat polygon, field notes included dominant vegetation and habitat quality (structure, age, presence/absence of invasive vegetation, history of disturbance).

A habitat classification system (vegetation cover types) was developed for the project analysis area based on the following: (1) the unique signature of each habitat type/ category on the aerial photographs; (2) the habitat types considered important for threatened, endangered, or special status/sensitive species; and (3) consistency with classification systems used by resource agencies. Habitat types were categorized (1 through 6) using the ODFW habitat mitigation goals and standards defined in OAR 635-415-0025 (as described in Section P.2) The habitat types and categories were generally consistent with those identified for the Klondike I and II areas.

Aerial photos were generally sufficient to determine habitat types; however, categorization factors such as disturbance, weed cover, and vegetation type could not always be determined from aerial photos. Ground-truthing was necessary to verify habitat categories and boundaries. Habitat types and categories were validated during field surveys conducted on October 26-28, 2004, January 25-26, 2005, February 9-10, 2005, and March 3, 2005. Vegetation maps were adjusted as necessary to reflect actual conditions in the field. Figures P-2 through P-6 (in Appendix P-2) illustrate the habitat types and categories found within the analysis area.

P.4.3 Vegetation

Field surveys have not yet been conducted for special status/sensitive plants, but these surveys are scheduled to be conducted in Spring 2005, as described in the Rare Plant Technical Report (ECCI 2005) and Exhibit Q. The results of these surveys will be incorporated into a supplement to this Exhibit and will be provided to OOE, ODFW and ODA for their review and comment. Based upon the results of the database searches (USFWS 2005, ORNHIC 2005) and known suitable habitat, there are no special status/sensitive plants anticipated within the analysis area.

P.4.4 Wildlife

Field surveys have not yet been conducted for special status/sensitive wildlife, but these surveys are scheduled to be conducted in spring 2005. The results of these surveys will be incorporated into a supplement to this Exhibit and will be provided to OOE, ODFW and ODA for their review and comment.

Special status/sensitive species will be addressed in several ways: 1) transect surveys, 2) avian baseline surveys, and 3) raptor nest surveys. Each of these surveys is described below.

P.4.4.1 Transect Surveys

Transect surveys will be conducted within 1,000 feet of the site boundary in suitable habitats in those areas within the lease boundary. Areas beyond the lease boundary will be visually evaluated from the closest leased property boundary. These surveys will be designed to provide information on presence/absence and habitat use rather than population estimates; thus the results are primarily qualitative. As the biologists are walking meander transects, designed to target special status/sensitive species, they will use binoculars to scan the area for wildlife. Should any special status/sensitive species be

observed (visual or auditory observations), surveyors will note its location, number of individuals, habitat use and behavior (foraging, nesting, loafing). The presence and location of all special status/sensitive species will also be noted during in-transit travel within the project areas.

Because the white-tailed jackrabbit is generally most active at night, nocturnal survey routes will be established in addition to the diurnal surveys. Nocturnal surveys will be conducted twice during the spring, at least one week apart. Using a spotlight with at least 200,000 candlepower, surveyors will scan those areas within 300 feet of project components in suitable habitat. If possible, all jackrabbits will be identified to species (both white-tailed or black-tailed jackrabbits can be present). This protocol is consistent with the white-tailed jackrabbit survey protocol identified in the *Survey Methodologies for Sensitive, Threatened, and Endangered Species in Oregon* (ODFW 1994).

Bat surveys are not included within the proposed biological protocol. Existing mortality data will be analyzed to evaluate the potential impacts to bat populations.

P.4.4.2 Avian Baseline Surveys

ABR, Inc. conducted avian point-counts with a variable circular-plot method to obtain information on species-composition and relative abundance of birds (Reynolds 1980) and collected information on avian flight paths and flight altitudes during diurnal hours from November 4, 2004 to February 16, 2005. The full methods and preliminary results of this effort are included in their Interim Report (Mabee et al. 2005), which is included as Appendix P-4. It is important to note that the Interim Report does not include all data for the winter survey season. The information provided in this Section should be considered preliminary. An additional month of data will be added to the data included within the Interim Report. The full winter season of data will then be compared to the spring season data in the Final Avian Baseline Report. This report will be provided to ODFW and OOE for their review and comment. The following sections describe the Methods and Summary of Results of the Avian Baseline Surveys to date.

Methods

Survey points were non-overlapping and were chosen to provide excellent viewing conditions and thorough coverage of the proposed turbine strings, representative habitats, and topographical features within the proposed project (Figure 1). Some survey point locations were modified slightly after conversations with ODFW personnel, resulting in one substantive change in location (i.e., moving point 7 to a nearby location 7A, Figure 1). Points 7 and 7A were sampled sequentially over time (i.e., point 7 sampled from 04 November–16 December and point 7A sampled from 28 December 2004–16 February 2005).

The survey protocol was similar to that used in the nearby Scenic Vista (Mabee and Cooper 2004), Stateline (URS and WEST 2001), Vansycle (URS and WEST 1997), and Columbine Hills (Young et al. 2002) projects and entailed recording all observations, regardless of distance, although data from ≤800 m (0.5 mi) radius was used for the

analyses. Although this survey was designed for large birds (i.e., waterfowl and raptors), the surveyors recorded all information for all species observed during each survey. Survey starting point locations were alternated among surveys to reduce spatial and temporal bias. All sites were visited on a weekly basis.

At each Avian Survey Point the surveyor visually scanned and listened for birds for a 20-minute period and recorded the following information for each observation: time, number of minutes elapsed from the beginning of each 20 minute point count, species, number of birds and flocks, minimal distance to bird(s), flight altitude and direction (when first observed), flight behavior (straight line, local/erratic, circling/soaring), breeding behavior (singing/calling, aerial display, sitting on nest), other behavior (aerial forage, ground forage, perch/sit, unknown), habitat (dry agriculture, canyon, CRP lands, riparian [forested or non-forested], shrub-steppe, steppe grassland, developed, surface water ponds, intermittent streams, upland trees, or other), sex, age, Avian Survey Point number, and identification number—a unique number for each raptor or species of interest recorded on maps with the flight path of the bird(s). The surveyor also recorded weather information at each Survey Point, including wind direction, wind speed, cloud cover, ceiling elevation, visibility, temperature, and precipitation. In addition to information collected at the Survey Points, for species of interest (i.e., raptors, loggerhead shrike, burrowing owl, etc.), the surveyor recorded species, number of individuals (and flocks), and mapped their flight paths. This information was also collected when traveling between the survey points (termed in-transit observations).

Summary of Results

Baseline avian-use studies, coupled with an avian risk-assessment protocol, are important tools to assess the likelihood of bird-turbine collisions at proposed wind power projects. Proper interpretation of these studies is vital to making appropriate siting recommendations for wind power projects, so that avian collisions with wind turbines may be minimized (Nelson and Curry 1995). Crucial to this interpretation is an understanding of a species' natural history throughout the annual cycle. Overall, the results of this study have been compared with other studies at wind projects to make general assessments of avian collision risk with turbines. The comparison of the avian use statistics and assessments of the potential collision risk is made using general terms (i.e., low, moderate, high) and are relative to the avian use statistics and collision fatalities found at other projects in the Western United States. It must be emphasized, however, that the "winter" season discussed in this report is incomplete, as an additional month of data will be added to the results presented in this interim report. A complete and truly comparative discussion of both the winter and spring seasons will be presented in the final report.

In this study, the avian use metrics were combined with flight-altitude characteristics (percent of time birds fly, percent of time birds fly within the rotor swept area (RSA) of a turbine) to produce an exposure index—a relative measure of the risk of each species' coming into contact with a turbine blade. Although this combination of metrics is a logical one that may help determine a species' relative risk of collision, it does not account for avoidance behavior (the ability of birds to detect and avoid wind turbines),

the probability of birds to pass through the rotor swept area, or other facets of a species' natural history and behavior that may influence its probability of collision (e.g., whether it is a diurnal or nocturnal migrant, see Mabee and Cooper 2004b). It is important to consider all these behavioral facets of a species and its general biology before determining its propensity to collide with wind turbines.

P.4.4.3 Raptor Surveys

The goal of the raptor nesting surveys is to gather information on nesting species visible from the air. These surveys will include information on nest locations and reproductive success in the area. For the Klondike I and Klondike II projects, raptor nests were identified within a five-mile radius of the respective project boundaries; however, there has been no raptor mortality documented at the Klondike I project (currently operating) (WEST 2004). Because raptor populations do not appear to be at risk of impact from wind power projects in this area, ODFW concurred with a two-mile survey radius.

The raptor nesting survey will consist of two helicopter surveys for raptor nests, within a two-mile radius of the proposed project area (one in late April-early May and a second in early June). There will also be a ground survey in the vicinity of any Swainson's or ferruginous hawk nests observed during the aerial survey. ABR will also check for raptor nests during its point count surveys. The initial aerial surveys are intended to document occupancy, while the ground survey is intended to document production. To augment the raptor use information obtained through the avian baseline surveys and aerial nest surveys, DEA will note the presence of all raptor species observed during the walking transects.

The project site locations and historical raptor sites will be marked on a USGS 7.5 minute quadrangle map before each survey. The area will be systematically searched by helicopter and all suitable nesting areas (e.g., trees and rocky outcrops) will be searched for raptor activity and nests.

P.5 MAP OF HABITAT LOCATION

OAR 345-021-0010(1)(p)(C) *A map showing the locations of habitat identified in (A);*

Response: The habitat types and categories described in Section P.3 are illustrated in Figures P-2 through P-6 in Appendix P-2.

P.6 DESCRIPTION OF SIGNIFICANT POTENTIAL IMPACTS ON IDENTIFIED HABITATS

OAR 345-021-0010(1)(p)(D) *A description of the nature, extent and duration of significant potential impacts on the habitat identified in (A) that may result from construction, operation and retirement of the proposed facility*;

Response: This section describes potential significant impacts of the proposed Project to habitats and associated wildlife during construction, operation, and retirement. The nature, extent, and duration of significant potential impacts that could result from

construction, operation, and retirement of the Project were identified based on the existing values of each site that would be directly or indirectly impacted by the proposed Project.

P.6.1 Impacts to Wildlife Habitat

Potential impacts to wildlife habitat include temporary and permanent habitat loss, alteration and disturbance during construction and operation. After facility retirement, a site restoration plan will ensure conversion of the operations corridors back to a site condition similar to pre-construction conditions. Table P-3 summarizes the temporary and permanent impacts to wildlife habitat from construction of the proposed Project.

Table P- 3. Habitat Types and Categories in the Klondike III Wind Project Analysis Area with Area of Impact

		IMPACTS	
	Total Acres	**Temporary (% of total temporary impact)**	**Permanent (% of total permanent impact)**
Category 1	0.00	0.00	0.00
Category 2			
Grassland	107.77	0.00	0.45 (0.705%)
Shrub-steppe	39.62	0.00	0.19 (0.298%)
Category 3			
CRP	865.19	2.01 (4.338%)	6.10 (9.558%)
Grassland	382.70	0.002 (0.004%)	0.15 (0.264%)
Shrub-steppe	43.96	0.00	0.00
Intermittent streams	4.85 (miles)	0.00	0.00
Upland trees	11.30	0.00	0.03 (0.047%)
Category 4			
Grassland	97.95	0.01 (0.022%)	0.08 (0.125%)
Category 5	0.00	0.00	0.00
Category 6			
Developed	39.67	0.00	0.00
Agricultural	9,614.04	44.31 (95.640%)	56.82 (89.032%)
TOTAL	**11,202.9 + 4.85 miles of intermittent stream**	**46.33 (100%)**	**63.82 (100%)**

Temporary impacts are the construction-related impacts associated with the laydown areas and the underground collector systems. These areas will be temporarily disturbed during construction and will be restored to pre-construction condition after the construction-related activities are complete.

The anticipated impacts to the Category 3, upland tree habitat type are illustrated in Figure P-4 and involve the maintenance of an existing road, which does not require any trees to be removed or altered. As such, these impacts are transferred to Category 3, grassland for purposes of mitigation.

Figure P-4 illustrates an access road crossing an intermittent stream in the vicinity of Klondike Lane; however, there is an existing road and culvert through this area and the intermittent stream will not be impacted by the project. Figure P-4 also illustrates a temporary impact to an intermittent stream in the vicinity of the underground collector north of Klondike Lane; however, this segment of the collector will be placed using a directional bore that will avoid all impacts to the intermittent stream.

P.6.2 Impacts to Special Status/Sensitive Species

P.6.2.1 Plants

If, as anticipated, the field surveys do not locate any populations of special status/sensitive plant species, no direct construction, operation or retirement-related impacts would be anticipated to these plants or their suitable habitat. In the event that the field surveys do locate target plant species within the analysis area, the impact assessment will be modified to reflect the additional data, a proposed avoidance and/or mitigation plan would be prepared and this information would be shared with OOE and ODA.

P.6.2.2 Mammals and Other Special Status/Sensitive Wildlife Species

The pre-field review identified 31 special status/sensitive species; however, the analysis area is anticipated to provide suitable habitat for only 16 species (including bat species). With the inclusion of field data from the Klondike I and Klondike II projects, the following special status/sensitive wildlife species have been observed in the project vicinity: golden eagle (one nest within approximately five miles), Swainson's hawk (11 nests within approximately five miles), ferruginous hawk (two observations during 2001-2002 avian baseline survey), rough-legged hawk (observations during 2004-2005 avian baseline survey), red-tailed hawk (16 nests observed during 2001 aerial surveys and observations during 2004-2005 avian baseline survey), long-billed curlew (one observation in 2001-2002 field work), loggerhead shrike (nests located within approximately five miles of project boundary and one individual observed during 2001-2002 surveys) and the white-tailed jackrabbit (five individuals observed during 2001-2002 surveys). Impacts to avian species are addressed in Section P.6.2.4, below.

Spring transect surveys have not yet been conducted for the special status/sensitive wildlife species within the analysis areas. These surveys will occur in suitable habitat in spring 2005. If the field surveys do not locate any populations of special status/sensitive wildlife species, no direct construction, operation or retirement-related impacts would be anticipated to these species or their suitable habitat. In the event that the field surveys do locate special status/sensitive species within the analysis area, the impact assessment would be modified to reflect the additional data, a proposed avoidance and/or mitigation plan would be prepared and this information would be shared with OOE and ODFW.

P.6.2.3 Bats

Most bat species roost in structures such as buildings, caves, mines and bridges, which are rare to absent within the project area; therefore, the construction or retirement of the facility is not anticipated to result in the loss or degradation of bat roosting and foraging habitat in the analysis area. The potential impact to bats could be from collision mortality during operation. Available evidence indicates that this is confined primarily to the migratory species, especially for open agriculture and grassland projects in the west. Although 46 species of bats occur in the United States, only 11 species comprise all known bat fatalities at U.S. wind plants (Johnson and Strickland 2003), despite the fact that wind projects occur in several regions of the country in a variety of habitats. The three most common species of migratory bats in the United States (hoary, eastern red, and silver-haired bats) comprised 93% of the 774 bat fatalities identified to species at U.S. wind projects (Johnson 2004). At several wind projects evaluated in the United States, bat collision mortality during the breeding season was virtually non-existent, despite the fact that relatively large populations of resident bats of several species were documented breeding in proximity to the wind plant (see Johnson et al. 2003a, Johnson 2004). Based on these studies, it appears that wind projects would pose little risk to non-migratory bat populations in the study area.

Bat research at other wind plants, including several in the Columbia Basin, indicates that migratory bat species are at some risk of collision with wind turbines (Johnson et al. 2003b). Most bat fatalities found at wind plants have been tree-dwelling bats, with hoary and silver-haired bats being the most prevalent fatalities (Scenic Vista Wind Power Project, Draft Exhibit P). Six dead bats were found during the Klondike I mortality study, including three hoary bats (September), one silver-haired bat (May), and two unidentified *Myotis* species (Junè) (Johnson 2004). Based on this preliminary data, some mortality of mostly migratory bats, especially hoary and silver-haired bats, is anticipated during operation of the Project. With the exception of the silver-haired bat, the identified species of bats found appear to be relatively common in the area.

Based on a one-year study the mean number of bats killed per turbine at the Klondike I Wind Project was estimated at 1.16 (Johnson 2004). At the Buffalo Ridge Wind Plant, Minnesota, based on a 2-year study, bat mortality was estimated to be 2.05 bats per turbine per year (Johnson et al. 2003b). At the Foote Creek Rim Wind Plant, based on 3+ years of study, bat mortality was estimated at 1.34 bats per turbine per year (Young et al. 2003). At the Vansycle Ridge Wind Plant in Oregon, bat mortality was estimated at 0.74 bats per turbine for the first year of operation (Erickson et al. 2000).

The results of fatality monitoring for the four regional Columbia Basin wind projects indicate mortality ranges from 0.7 bats per turbine per year (Vansycle) to 3.2 bats/turbine/year (Nine Canyon) (Scenic Vista Wind Power Project, Draft Exhibit P). Based on these rates and the results of the Klondike I mortality study, it is anticipated that bat mortality could range from approximately 1-2 bats/turbine/year, or approximately 165 to 330 bat fatalities per year.

P.6.2.4 Birds

This section describes the potential impacts to birds from the construction, operation and retirement of the proposed wind power facility.

Construction and Retirement

Project construction could affect birds through loss of habitat (described in Section P.6.1, above), potential fatalities from construction equipment, and disturbance/displacement effects from construction activities. Impacts from the retirement of the facility are anticipated to be similar to construction in terms of noise, disturbance and equipment. Potential mortality from construction equipment is expected to be very low. Equipment used in wind facility construction generally moves at slow rates (e.g., cranes) or is stationary for long periods. The risk of direct mortality from construction to avian species is most likely limited to potential destruction of a nest for ground- and shrub-nesting species. Disturbance-type impacts can be expected if construction activity occurs near an active nest or a primary foraging area. Birds displaced from these areas might move to areas with less disturbance, depending on the stage of nesting; however, breeding effort and fledging success could be affected, and foraging opportunities might be altered during the construction period. Limiting construction to within 0.5 miles of special status bird nests during the breeding season may be effective in minimizing direct and indirect impacts to special status bird species.

Displacement

The following discussion of the impacts of displacement is taken from the draft Scenic Vista EFSC Application, Exhibit P.

Most studies of disturbance or displacement effects have been conducted in Europe, and most of the impacts have involved wetland habitats and groups of birds not common on this Project, including waterfowl, shorebirds, and waders (Larsen and Madsen 2000, Pederson and Poulsen 1991, Vauk 1990, Winkelman 1989, Winkelman 1990, Winkelman 1992 in the Draft Scenic Vista Exhibit P). Most disturbance has involved feeding, resting, and migrating birds in these groups (Crockford 1992 in the Draft Scenic Vista Exhibit P). European studies of disturbance to breeding birds suggest negligible impacts, and disturbance effects were documented during only one study (Pedersen and Poulsen 1991). For most avian groups or species or at other European wind plants, no displacement effects on breeding birds were observed (Karlsson 1983, Phillips 1994, Winkelman 1989, Winkelman 1990 in the Draft Scenic Vista Exhibit P).

Avian disturbance or displacement associated with wind power development has not received as much attention in the United States. At a large wind project at Buffalo Ridge, Minnesota, the abundance of shorebirds, waterfowl, upland game birds, woodpeckers, and several groups of passerines was found to be significantly lower at survey plots with turbines than at plots without turbines. However, there were fewer differences in avian use as a function of distance from turbine, suggesting that the area of reduced use was limited primarily to those areas within 328 feet (100 m) of the turbines (Johnson et al. 2000a in the Draft Scenic Vista Exhibit P). A sizeable proportion of these effects is probably related to the direct loss of habitat near the turbine from 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 in the Draft Scenic Vista Exhibit P) found that densities of male songbirds were significantly lower in CRP grasslands containing turbines than in CRP grasslands without turbines. Grasslands without turbines, as well as portions of grasslands located at least 591 feet (180 m) from turbines, had bird densities four times greater than did 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. 2000a in the Draft Scenic Vista Exhibit P).

Construction and operation of the Foote Creek Rim Wind Project did not appear to cause reduced use of the wind plant and adjacent areas by most avian groups, including raptors, corvids, and passerines (Johnson et al. 2000b in the Draft Scenic Vista Exhibit P). Some reduced use of the areas near turbines was apparent for a local population of mountain plovers, although a regional downward trend was also observed during the same time period. A pair of golden eagles successfully nested one-half mile from the wind plant, after one phase was operational and another phase was under construction.

Development of wind turbines near raptor nests could result in indirect and direct impacts to the nesting birds. However, the only report of avoidance of wind plants by raptors occurred at Buffalo Ridge, where raptor nest density on 261 km^2 of land surrounding a wind plant was 5.94/100 km^2, yet no nests were present in the 32 km^2 wind plant facility itself, even though habitat was similar (Usgaard et al. 1997 in the Draft Scenic Vista Exhibit P). The difference between observed (0 nests) and expected (2 nests) is not statistically significant. Similar numbers of raptor nests were found before and after construction of Phase 1 of the Montezuma Hills, California, wind plant (Howell and Noone 1992 in the Draft Scenic Vista Exhibit P). A pair of golden eagles successfully nested 0.8 km from the Foote Creek Rim, Wyoming, wind plant for 3 different years, after it became operational (Johnson et al. 2000b in the Draft Scenic Vista Exhibit P), and a Swainson's hawk nested within 0.8 km of a small wind plant in Oregon (Johnson et al. 2003a in the Draft Scenic Vista Exhibit P). Anecdotal evidence indicates that raptor use of the Altamont Pass, California, wind resource area (WRA) might have increased after installation of wind turbines (Orloff and Flannery 1992, American Wind Energy Association 1995 in the Draft Scenic Vista Exhibit P). Nesting by sensitive raptor species after Stateline 1 and 2 were constructed was slightly higher than the year prior to construction. Species shifted locations somewhat over the monitoring period. Based on extensive monitoring by means of helicopter flights and ground observations, sensitive species still nested in the area at approximately the same levels. Based upon the findings from other wind power projects and the lack of suitable raptor nest habitat within the analysis area, the proposed Project is not anticipated to affect raptor nests.

Operation

The impacts of wind power projects on avian populations have been reduced as a result of changes in facility design. Turbines are now designed to avoid perching opportunities and connector lines are now primarily underground and overhead transmission lines are

now designed with anti-perching devices. The modern turbines also move much slower and, presumably, may be more visible.

The results of the avian mortality study conducted at the Klondike I project are helpful in evaluating potential operational impacts to avian populations. During the Klondike I study, eight fatalities comprised of seven species were found associated with the wind turbines. None were found in association with the meteorological (met) tower. Of the eight fatalities, six were passerines and two were Canada geese. The passerines included European starling, brown-headed cowbird, house wren, golden-crowned kinglet, ruby-crowned kinglet, and dark-eyed junco. No raptor mortalities were observed. The timing of the mortality suggests that the starling and the cowbird were residents and the other four passerines were likely fall migrants that probably collided with the turbines at night (Johnson 2004). The geese were found in late December and were likely winter residents.

The 2002-2003 Klondike I mortality data suggests that wind power-related avian mortality is low in the vicinity of the Klondike Wind Project. The estimated collision rates for all bird species at Klondike are among the lowest of any wind plant studied in the U.S. Klondike is also one of the few wind facilities studies where no raptor fatalities were documented (Johnson 2004). The number of fatalities ranged from 0.26 fatalities/turbine/year for large birds (geese) to 1.16 fatalities/turbine/year for small birds (passerines) (Johnson 2004). This data indicates the anticipated impacts to avian populations from the Klondike III Wind Project will be approximately 191.4 passerines per year and 43 geese per year. These impacts are not anticipated to have a significant effect on the affected avian populations.

The potential impact of the proposed Klondike III Wind Project on bird populations was evaluated as part of the preliminary avian baseline study by ABR, Inc. (2005). This evaluation is provided below. An additional cumulative effects analysis is being conducted by WEST, Inc., which will evaluate the potential impacts to bird populations from the wind power facilities in the region. The results of this evaluation will be provided to OOE and ODFW for their review as part of this siting analysis.

Raptors

The concern for raptor collisions at some existing wind projects is warranted, because turkey vulture, red-tailed hawk, northern harrier, golden eagle, American kestrel, and prairie falcon have all collided with wind turbines at Altamont, California, although most of the raptor fatalities were red-tailed hawk (Erickson et al. 2001). The average fatality rate at new generation wind projects is 0.04 raptor fatalities/MW/yr compared to up to ~1 raptor fatality/MW/yr at older generation wind projects such as Altamont (Erickson et al. 2004).

Thirty-five active raptor nests were found within an approximately five miles radius of the Klondike I site boundary during the May and June 2001 aerial surveys, including 16 red-tailed hawks, 11 Swainson's hawks, 6 great horned owls, and one American kestrel, common raven, and golden eagle (Johnson 2004).

During the 2004-2005 avian baseline survey mean use across all raptor species at the Klondike III Wind Project ranged from 0.005–0.059 birds/point count. Mean use of raptors during this survey period was 0.134 birds/point count. Examination of the use values for individual raptor species shows that rough-legged hawk contributed a large amount (44%) to the overall use for raptors. Rough-legged hawk (a migratory species whose population appears to be increasing in Oregon; Marshall et al. 2003) were present at higher numbers during winter, a time when they are considered an uncommon to common winter resident in the open country of Oregon (Marshall et al. 2003). Residents such as northern harrier and American kestrel had low mean use during winter, a time when some individuals may migrate south. Golden eagle (a resident east of the Cascades whose population trend is unknown; Marshall et al. 2003) were observed infrequently during winter. Clearly, an appropriate interpretation of the relative value (among seasons) of mean-use values requires knowledge of a species' annual cycle.

Raptor use this winter at the Klondike III Wind Project was low relative to winter use documented at other regional projects. Johnson et al. (2002) standardized several regional winter season studies, and the current estimate for this project (0.13) is low relative to other studies: Vansycle, OR (0.78); Klondike (0.49; 2002 data); Stateline, WA/OR (0.42); Nine Canyon, WA (0.31); and Foote Creek Rim, WY (0.21). Exposure indices were low for all raptors, and even though rough-legged hawks had the highest value (0.020), they may have lower than expected levels of fatalities because only one fatality has occurred at a newer generation wind project (Condon Wind Project, OR; Fishman 2003) (ABR, Inc. 2005).

Concerns with powerlines and raptors are typically associated with electrocution. Raptors are electrocuted when they contact two energized conductors or an energized conductor and grounded hardware (APLIC 1996). Among avian species, raptors are at greatest risk of electrocution because of their large wingspans and tendency to perch on power poles. Electrocution from transmission lines is very rare because the distances between conductors, and between conductors and grounded hardware are greater than the wingspan of any raptor (APLIC 1996). The 230-kV line proposed in this application does not represent an electrocution risk for raptors. The proposed monopole design has widely spaced, suspended phase conductors. The pole top and crossarms will be fitted with an anti-perching device that can prevent raptor use.

Passerines

Concern for passerine collisions is also warranted at wind power projects, because as a whole, passerines have been the group of birds incurring the most fatalities at several wind plants, often comprising > 80% of the fatalities (Johnson et al. 2002, Erickson et al. 2001). A review of avian fatalities at eight new generation projects in the West and Midwest (Stateline, OR/WA; Vansycle, OR; Klondike, OR; Nine Canyon, WA; Foote Creek, WY; Ponnequin, CO; Buffalo Ridge, MN; Wisconsin) showed that most fatalities are of horned lark (29.6%), followed by sparrows (13.8%), warblers (9.2%), upland game birds (8.8%), and ~<5% for other groups of birds (Erickson et al. 2004). Overall fatality rates for birds (most presumably passerines) in the US (Vansycle, OR; Klondike, OR; Nine Canyon, WA; Foote Creek, WY; Buffalo Ridge, MN; Wisconsin; Buffalo

Mountain, TN; Mountaineer, WV) was ~ 3 fatalities/MW/yr (excluding older generation sites in CA; Erickson 2004). One eastern US site (Buffalo Mountain, TN) had unusually high fatality rates (~11 fatalities/MW/yr) (Erickson et al. 2004).

Passerines numerically dominated avian use at the Klondike III Wind Project, and horned lark was the dominant species. Horned larks were numerous during winter—a time of the year when they aggregate into mobile flocks of foraging birds. During winter, mean use was 30.48 birds/point count compared to 13.65 birds/30 min point count from previous studies at Klondike (Johnson et al. 2002). Mean use by passerines was strongly influenced by two surveys during November where observations of a few large flocks of horned larks and unidentified blackbirds (700–1,000 individuals/flock) inflated the mean use values. As expected during winter, most (83%) passerines flew below the RSA, whereas a much smaller proportion flew within (16.9%) or above (0.1%) the RSA. Exposure indices were highest for horned lark (5.282) and, therefore, may put this species at the highest risk of collision with proposed wind turbines.

Waterfowl

Waterfowl fatalities have occurred at several newer generation wind projects, but apparently in very low numbers relative to the use at those sites (Erickson et al. 2002). Waterfowl carcasses composed 11% of the total fatalities (n = 9 total carcasses found) at Ponnequim, CO; 10% of the total fatalities (n = 21) at Wisconsin; 9% of the total fatalities (n = 55) at Buffalo Ridge, MN (Erickson et al. 2002), and 25% of the total fatalities (n = 2) at Klondike (Johnson et al. 2002).

Canada goose was the dominant species of waterfowl observed in the analysis area, although numbers were lower than during previous studies. During winter, mean use was 3.79 birds/point count, compared to 17.41 birds/30 min point count from previous studies at Klondike (Johnson et al. 2002). Canada geese were often observed flying within the RSA (79%), leading to a relatively high exposure index (relative to all species besides Horned Lark). Two Canada geese carcasses were found during winter 2002 at Klondike (as part of a year-long study; Johnson 2004), and two carcasses were found during three years of fatality monitoring at Stateline Wind Project (Erickson et al. 2004). The relatively high exposure index for Canada geese and history of goose mortality at this project and other regional wind projects suggest that small numbers of collisions of Canada geese could occur at the Klondike III Wind Project.

P.7 MITIGATION MEASURES

OAR 345-021-0010(1)(p)(E) *A description of any measures the applicant proposes to avoid, reduce or mitigate potential adverse impacts;*

Response: This section describes the measures that will be implemented to avoid, reduce or mitigate potential adverse impacts to special status/sensitive species and wildlife habitat.

Measures employed in Project design to avoid or minimize adverse impacts include conducting wildlife use studies to determine use patterns and species diversity, exploring

opportunities to limit development in native habitats, exploring opportunities to minimize turbine placement in high avian use areas, and avoiding the use of overhead collector lines near the turbines. For the impacts that cannot be avoided or minimized, mitigation will be developed by means of reliable methods and in compliance with ODFW habitat mitigation rules (OAR 635-415-0025).

The following mitigation actions will apply to all Project activities and are anticipated to benefit all habitat types/categories and wildlife species:

- Maps will be prepared to show sensitive areas that are off limits during the construction phase. Sensitive areas may include nesting or denning areas for special status/sensitive wildlife.

- Road construction and vehicle use will be minimized where possible to minimize impacts to sensitive habitats.

- Construction personnel will be instructed to be generally aware of all wildlife while driving through the Project area and to maintain reasonable driving speeds so as not to harass or accidentally strike wildlife. Construction personnel will be given a briefing on sensitive wildlife in the area (if applicable), and on required precautions to avoid injuring or destroying wildlife.

- For habitat restoration and revegetation, seed mixes will be developed in consultation with ODFW. Restoration efforts will be discussed with the landowner to take into consideration existing land use activities and their potential impacts to the vegetation restoration efforts.

- Measures to reduce the potential spread of noxious weeds will be developed in consultation with the Sherman County Soil and Water Conservation District. The facility will be monitored regularly to prevent the spread of noxious weeds.

- Best management practices (BMPs) and erosion and sediment control measures will be employed during project construction to avoid and/or minimize impacts to downslope areas. Areas of unavoidable soil disturbance will be bounded downslope with straw wattles and bio-filter bags.

- The underground collectors will be placed using a directional bore in the vicinity of the intermittent streams, thereby avoiding potential impacts to these habitats.

The following section describes the approach to avoid, reduce or mitigate potential adverse impacts to habitats and special status/sensitive species.

P.7.1 Mitigation for Habitat Impacts

A proposed habitat mitigation plan has been developed based upon our knowledge of grassland and shrub-steppe habitat restoration as well as conversations with ODFW (Keith Kohl, ODFW, personal communication) and The Nature Conservancy (TNC)

(Leslie Nelson, TNC, personal communication). An approximately 19-acre site has been selected in the southwest portion of the lease boundary. This area includes a combination of CRP and Category 3 grassland and shrub-steppe (Appendix P-2, Figure P-2). This area was chosen because of its combination of habitat types/categories, slope, existing land use activities, distance from existing and proposed turbines, and accessibility. The intent of the mitigation effort is as follows:

- Mitigate for impacts to Category 2 habitat: Enhance 1.35 acres of Category 3 grassland (3 x 0.45 acres) and 0.57 acres (3 x 0.19) of Category 3 shrub-steppe
- Mitigate for impacts to Category 3 habitat: Set aside 6.10 acres of CRP and 0.18 acres of Category 3 or better grassland (this includes mitigation for the 0.03 acre impact to Category 3 upland tree habitat in which no trees will be altered or removed, as described in Section P.6.1)
- Mitigate for impacts to Category 4 habitat: Set aside 0.08 acres of Category 4 or better grassland

The enhancement efforts will require restoration of Category 3 grassland and shrub-steppe habitats to a Category 2. The following proposed habitat enhancement plan suggests a similar approach to restoring these two habitat types.

1) The first phase of the restoration effort is to clear weeds through a combination of burning (if possible), spraying, and mowing. Optimally, the first step is to burn and mow the site in spring to remove the biomass of robust weeds and clear the land to the surface. It may be possible to avoid burning by using herbicides and mowing if the weed cover is not too dense.

2) The next step is to use Roundup on newly emerging weeds. Roundup is used to avoid herbicide residue, but isn't as powerful as other herbicides, so it must be sprayed early and often (approximately three times) during the growing season.

3) Plant a native grass seed mix (certified weed free from respected local source) with a no-till drill in the fall to take advantage of moisture through the winter. A no-till drill uses a series of smaller disks, followed by a seeding tube to lightly open the ground immediately prior to seeding. The no-till drill does not require tilling or disking prior to seeding; however, too much standing vegetation or thatch may reduce the effectiveness of the no-till method. A no-till drill can be advantageous because it reduces time and effort to prepare a site, reduces moisture loss because the sod acts as a mulch, decreases weeds because seeds are left buried, and reduces loss of physical characteristics of the soil (Fitzpatrick 2004).

   If the site is completely invaded by weeds, and has no native component remaining, it is possible to plow. A combination of plowing and spraying should be used to eliminate the existing weed source prior to planting. This practice requires two seasons and multiple applications to be effective.

4) After grasses have established, continue weed control during first growing season through application of broadleaf-specific and post-emergent herbicides, which can

help reduce persistent weeds after seeding. Hand-pulling can also be effective for small areas.

P.7.2 Mitigation for Impacts to Special Status/Sensitive Species

P.7.2.1 Plants

There are no anticipated impacts to special status/sensitive plants; therefore, no mitigation is required. In the event that the field surveys do locate target plant species within the analysis area, the impact assessment will be modified to reflect the additional data, a proposed avoidance and/or mitigation plan would be prepared and this information would be shared with OOE and ODA.

P.7.2.2 Wildlife

Based upon the results of the pre-field analysis, the results of the Klondike I and II field surveys and the preliminary results of the avian baseline surveys the Project construction, operations and retirement are not expected to cause significant impacts to special status/sensitive wildlife species.

In the event that the spring field survey results suggest potential significant impacts to special status/sensitive wildlife species, the impact assessment would be modified to reflect the additional data, a proposed avoidance and/or mitigation plan would be prepared, and this information would be shared with OOE and ODFW.

P.8 EVIDENCE THAT THE PROPOSED FACILITY COMPLIES WITH ODFW FISH AND WILDLIFE HABITAT MITIGATION GOALS

OAR 345-021-0010(1)(p)(F) *Evidence that the proposed facility, including any proposed mitigation, complies with the fish and wildlife habitat mitigation goals and standards in OAR 345-415-0030; and*

Response: The Klondike III Wind Project complies with the ODFW habitat mitigation goals and standards as described in this section. See sections P.8.1 through P.8.6, below.

P.8.1 Category 1 Habitat

The mitigation goal requires avoidance of this habitat category. There is no Category 1 habitat within the analysis area and no Category 1 habitat will be impacted by the Project; therefore, no mitigation is required.

P.8.2 Category 2 Habitat

The mitigation goal, if impacts are unavoidable, is no net loss of either habitat quantity or quality and the provision of a net habitat benefit. Potentially adverse impacts to Category 2 habitats have been avoided, minimized, and mitigated to the greatest extent practicable.

The following mitigation complies with the ODFW fish and wildlife habitat mitigation goals

P.8.2.1 Grassland

Approximately 0.45 acres of Category 2 grassland habitat will be permanently impacted by the placement of project facilities. To mitigate for this unavoidable impact approximately 1.35 acres of Category 3 grassland habitat will be restored to a Category 2 quality. The restoration techniques are described in Section P.7.1, above. In addition to the restoration, a conservation easement, deed restriction, or other similar protective measure will be undertaken for the area in order to protect this area as wildlife habitat. The proposed mitigation area is illustrated in Figure P-2, Appendix P-2.

P.8.2.2 Shrub-Steppe

Approximately 0.19 acres of Category 2 shrub-steppe habitat will be permanently impacted by the placement of project facilities. To mitigate for this unavoidable impact approximately 0.57 acres of Category 3 shrub-steppe habitat will be restored to a Category 2 quality. The restoration techniques are described in Section P.7.1, above. In addition to the restoration, a conservation easement, deed restriction, or other similar protective measure will be undertaken for the area in order to protect this area as wildlife habitat. The proposed mitigation area is illustrated in Appendix P-2, Figure P-2.

P.8.3 Category 3 Habitat

The mitigation goal for Category 3 habitat, if impacts are unavoidable, is no net loss in either existing habitat quantity or quality. Potentially adverse impacts to Category 3 habitats have been avoided, minimized, and mitigated to the greatest extent practicable. The following mitigation complies with the ODFW fish and wildlife habitat mitigation goals

P.8.3.1 CRP

Approximately 6.10 acres of Category 3 CRP habitat will be permanently impacted by the placement of project facilities and approximately 2.01 acres will be temporarily impacted during Project construction. To mitigate for these unavoidable impacts the area that will be temporarily impacted will be restored to pre-construction conditions following construction activities, with an ODFW and Sherman County Soil and Water Conservation District (SWCD) - approved seed mix. Permanent impacts will be mitigated by imposing a conservation easement, deed restriction, or other similar protective measure over approximately 6.10 acres of CRP habitat. The proposed mitigation area is illustrated in Appendix P-2, Figure P-2.

P.8.3.2 Grassland

Approximately 0.15 acres of Category 3 grassland habitat will be permanently impacted by the placement of project facilities and approximately 0.002 acres will be temporarily impacted during Project construction. In addition, approximately 0.03 acres of Category

3, upland tree habitat will be impacted; however, no trees will be removed or altered. To mitigate for these unavoidable impacts the area that will be temporarily impacted will be restored to pre-construction conditions following construction activities, with an ODFW and Sherman County SWCD - approved seed mix. Permanent impacts will be mitigated by imposing a conservation easement, deed restriction, or other similar protective measure over approximately 0.18 acres of Category 3 or better grassland habitat (0.15 + 0.03). The proposed mitigation area is illustrated in Appendix, P-2, Figure P-2.

P.8.3.3 Intermittent Streams

The project will not impact any Category 4 intermittent stream habitat. Impacts were avoided by using a directional bore to place the underground collector beneath the intermittent stream.

P.8.4 Category 4 Habitat

The mitigation goal for Category 4 habitat, if impacts are unavoidable, is no net loss in either existing habitat quantity or quality. Potentially adverse impacts to Category 4 habitats have been avoided, minimized, and mitigated to the greatest extent practicable. The following mitigation complies with the ODFW fish and wildlife habitat mitigation goals.

P.8.4.1 Grassland

Approximately 0.08 acres of Category 4 grassland habitat will be permanently impacted by the placement of project facilities and approximately 0.01 acres will be temporarily impacted during Project construction. To mitigate for these unavoidable impacts the area that will be temporarily impacted will be restored to pre-construction conditions following construction activities, with an ODFW and Sherman County SWCD - approved seed mix. Permanent impacts will be mitigated by imposing a conservation easement, deed restriction, or other similar protective measure over approximately 0.08 acres of Category 4 or better grassland habitat. The proposed mitigation area is illustrated in Appendix, P-2, Figure P-2.

P.8.5 Category 5 Habitat

The mitigation goal for Category 5 habitat, if impacts are unavoidable, is to provide a net benefit of quantity or quality. There is no Category 5 habitat within the analysis area and no Category 5 habitat will be impacted by the Project; therefore, no mitigation is required.

P.8.6 Category 6 Habitat

The mitigation goal for Category 6 habitat, if impacts are unavoidable, is to minimize the impacts.

P.8.6.1 Agricultural

Approximately 56.82 acres of Category 6 agricultural habitat will be permanently impacted by the placement of permanent project facilities and approximately 44.31 acres will be temporarily impacted by construction activities.

Impacts will be minimized by 1) requiring the Project facilities to be the minimum size needed for operations, 2) replacing agricultural topsoil to original condition, 3) using best management practices to prevent loss of topsoil during construction, 4) performing repair activities during operations, and 5) controlling noxious weeds in areas disturbed by the project construction activities. This mitigation plan complies with the ODFW fish and wildlife habitat mitigation goals.

P.9 MONITORING PROGRAM

OAR 345-021-0010(1)(p)(G) *The applicant's proposed monitoring program, if any, for impacts to such fish and wildlife species and their habitats.*

Response: A monitoring program will be developed in consultation with ODFW and OOE.

P.10 CONCLUSION

The facility siting process has considered and complied with the ODFW Fish and Wildlife Habitat Mitigation Policy as set forth in OAR 635-415-0000 through -0025. As part of the siting process, all of the fish and wildlife habitats within the fish and wildlife habitat analysis area were identified and categorized according to the ODFW Policy. In summary, there are no Category 1 habitats within the analysis area and impacts to Category 6 agricultural habitat constitute 96% and 89%, respectively, of the total temporary and permanent impacts. The percentage of impacts in the Category 6 habitat verifies that this facility siting process has met ODFW's standard of minimizing habitat loss.

Field surveys have not yet been conducted for special status/sensitive plants and wildlife. These surveys are scheduled to be conducted in Spring 2005. The results of these surveys will be incorporated into a supplement to this Exhibit and will be provided to OOE, ODFW and ODA for their review and comment. Based upon the pre-field review and the habitat typing, there are no anticipated impacts to special status/sensitive plants and wildlife species that may occur within the analysis area.

Based upon the above information, the Applicant will satisfy the requirements in OAR 345-021-0010(1)(p), and the Council may find that the design, construction, operation, and retirement, taking into account mitigation, will be consistent with fish and wildlife habitat mitigation goals and standards pursuant to OAR 345-022-0060.

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APPENDIX P-1

Figure P-1
Project Analysis Area – Map

Klondike III Wind Project

Figure P-1
Fish and Wildlife
Habitat Analysis Area

Emigrant Springs Rd
Medler Ln
N Klondike Rd
Not Leased
E
Dehler Rd
Beacon Rd
D
C
Klondike Ln
McDonald Ferry Ln
Spanish Hollow
Hollow
Sandorn Rd
Not Leased
Gosson Ln
Hwy 206
Smith Ln
B
A
GRASS VALLEY
CANYON

Legend

- Habitat Map Tile Boundary
- Proposed Mitigation Area
- Fish and Wildlife Habitat Analysis Area
- Site Boundary
- Lease Boundary

Habitat Type:

- Intermittent Stream (WS)
- Agriculture (AG)
- Conservation Reserve Program (CRP)
- Developed (DE)
- Grassland (GR)
- Shrub-Steppe (SS)
- Upland Trees (UT)

0 0.5 1 2
Miles

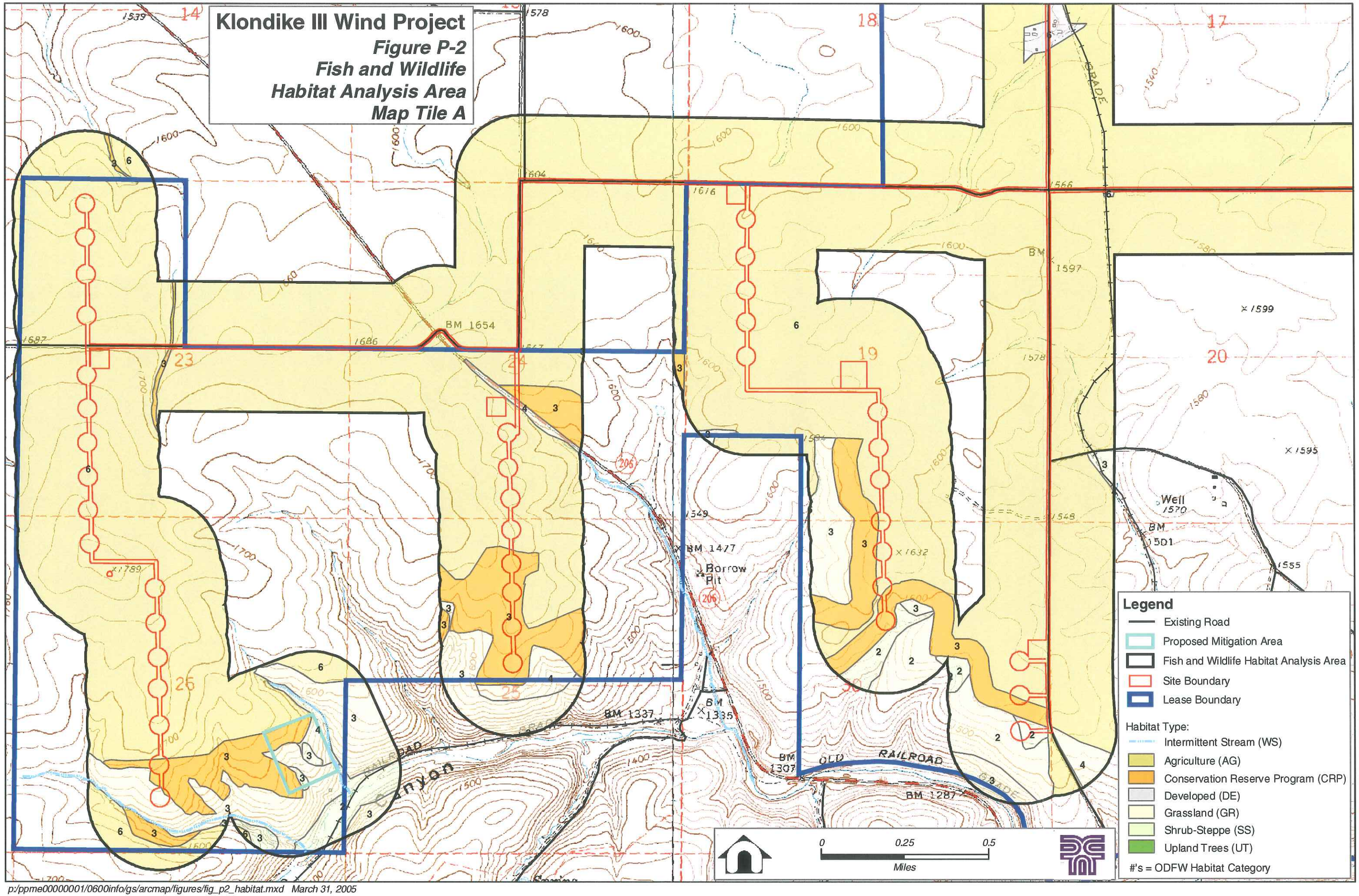
p:/ppme00000001/0600info/gs/arcmap/figures/fig_p1_habitat.mxd March 29, 2005

APPENDIX P-2

Figures P-2 through P-6
Distribution of Habitat Types and Categories within the Project Analysis Area – Maps

Klondike III Wind Project

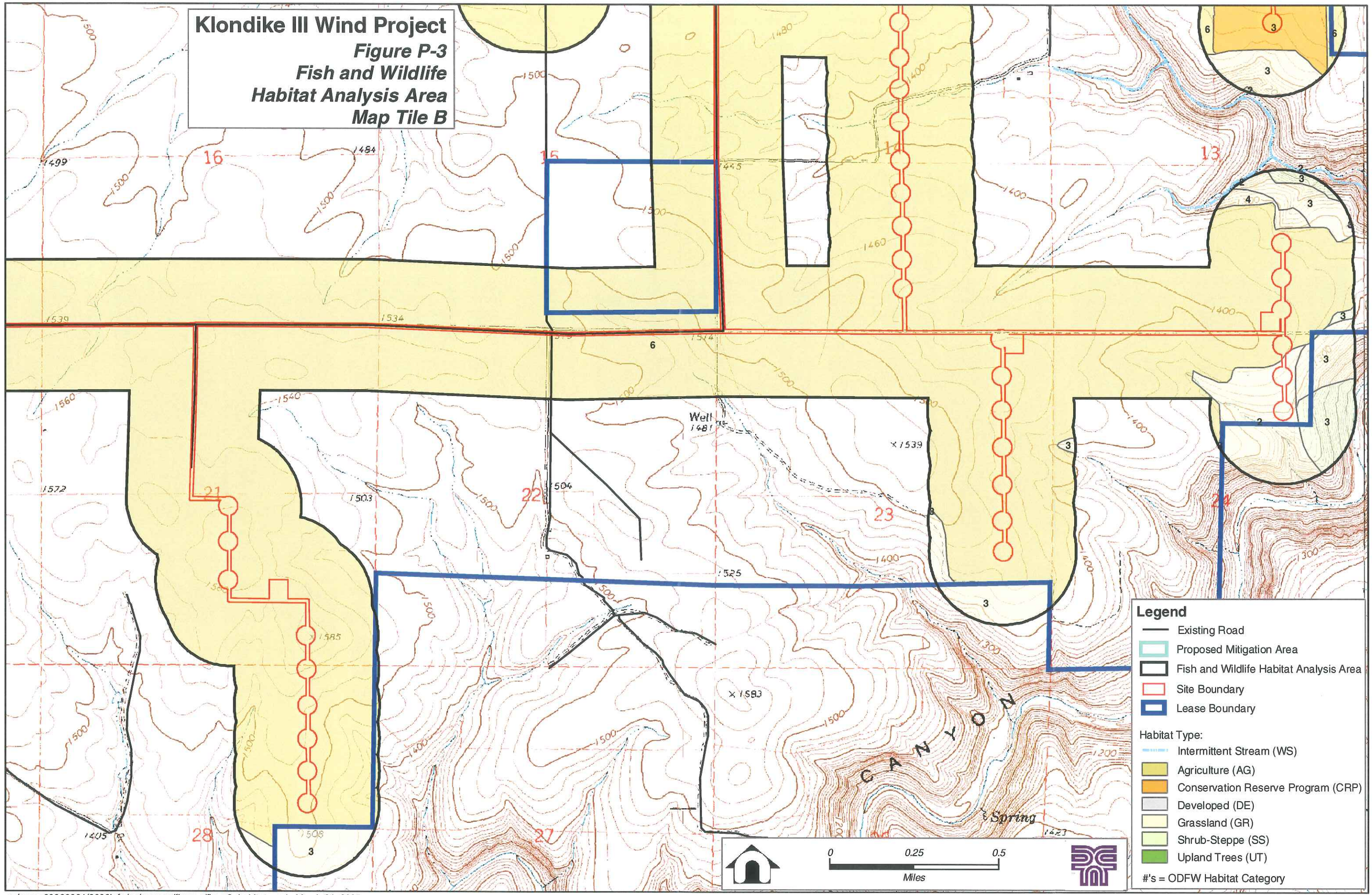
Figure P-2
Fish and Wildlife
Habitat Analysis Area
Map Tile A



p:/ppme00000001/0600info/gs/arcmap/figures/fig_p2_habitat.mxd March 31, 2005

Klondike III Wind Project

Figure P-3
Fish and Wildlife
Habitat Analysis Area
Map Tile B



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Klondike III Wind Project

Figure P-4
Fish and Wildlife
Habitat Analysis Area
Map Tile C

Legend

- Existing Road
- Proposed Mitigation Area
- Fish and Wildlife Habitat Analysis Area
- Site Boundary
- Lease Boundary

Habitat Type:

- Intermittent Stream (WS)
- Agriculture (AG)
- Conservation Reserve Program (CRP)
- Developed (DE)
- Grassland (GR)
- Shrub-Steppe (SS)
- Upland Trees (UT)

#'s = ODFW Habitat Category

0 0.25 0.5
Miles

p:/ppme00000001/0600info/gs/arcmap/figures/fig_p4_habitat.mxd March 31, 2005

Klondike III Wind Project

Figure P-5
Fish and Wildlife
Habitat Analysis Area
Map Tile D

Legend

- Existing Road
- Proposed Mitigation Area
- Fish and Wildlife Habitat Analysis Area
- Site Boundary
- Lease Boundary

Habitat Type:

- Intermittent Stream (WS)
- Agriculture (AG)
- Conservation Reserve Program (CRP)
- Developed (DE)
- Grassland (GR)
- Shrub-Steppe (SS)
- Upland Trees (UT)

#'s = ODFW Habitat Category

Landing Strip
Webfoot
Klondike Azimuth
OREGON TRAIL (APPROXIMATE ROUTE)
BARLOW CUTOFF
Donald Az 1253

0 0.25 0.5
Miles

p:/ppme00000001/0600info/gs/arcmap/figures/fig_p5_habitat.mxd March 31, 2005

Klondike III Wind Project

Figure P-6
Fish and Wildlife
Habitat Analysis Area
Map Tile E

Legend

- Existing Road
- Proposed Mitigation Area
- Fish and Wildlife Habitat Analysis Area
- Site Boundary
- Lease Boundary

Habitat Type:

- Intermittent Stream (WS)
- Agriculture (AG)
- Conservation Reserve Program (CRP)
- Developed (DE)
- Grassland (GR)
- Shrub-Steppe (SS)
- Upland Trees (UT)

#'s = ODFW Habitat Category

Cistern
Emigrant Springs
Emigrant Spring
Canyon
Gravel Pit

0 0.25 0.5
Miles

p:/ppme00000001/0600info/gs/arcmap/figures/fig_p6_habitat.mxd March 31, 2005

APPENDIX P-3

Letter from ODFW re: Concurrence on Biological Protocol, dated January 27, 2005

Oregon
Theodore R. Kulongoski, Governor

Department of Fish and Wildlife
High Desert Region
61374 Parrell Road
Bend, OR 97702
(541) 388-6363
FAX (541) 388-6281

January 27, 2005

Ms. Jennifer Miller
David Evans and Associates
2100 SW River Parkway
Portland, Oregon 97201

Re: ODFW concurrence on biological protocol for Klondike III Wind Project

Dear Ms. Miller,

The Department has reviewed the revised biological protocol submitted to us on January 19, 2005 and the map of the revised avian waypoints submitted on January 26, 2005. We concur that the revised survey protocol for wildlife and vegetation will provide adequate information on biological resources, within the proposed project area, for the purpose of preparing an Application for Site Certificate pursuant to the rules of the Oregon Energy Facility Siting Council.

The Department believes the adjustment in avian waypoints will provide better survey coverage along the proposed turbine strings and in habitats contained within Conservation Reserve Program (CRP) lands.

We appreciate the opportunity to assist in the design of the biological evaluation for the Klondike III wind power project.

Sincerely,

Regional Diversity Biologist

Cc: Kolh, Kunkel

APPENDIX P-4

ABR Interim Report

BASELINE AVIAN USE AT THE PROPOSED KLONDIKE III WIND PROJECT, OREGON, WINTER 2004/2005

INTERIM REPORT

TODD J. MABEE
BRIAN A. COOPER
COREY GRINNELL

PREPARED FOR

DAVID EVANS & ASSOCIATES INC.
PORTLAND, OREGON

AND

KLONDIKE WIND POWER III LLC
PORTLAND, OREGON

PREPARED BY

ABR, INC.
FOREST GROVE, OREGON

BASELINE AVIAN USE AT THE PROPOSED KLONDIKE III WIND PROJECT, OREGON, WINTER 2004/2005

INTERIM REPORT

Todd J. Mabee
Brian A. Cooper
Corey Grinnell

Prepared for

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Forest Grove, Oregon

March 2005

TABLE OF CONTENTS

LIST OF FIGURES iii
LIST OF TABLES iv
ACKNOWLEDGMENTS iv
PREPARERS iv
INTRODUCTION 1
BACKGROUND 1
EXISTING CONDITIONS 1
METHODS 3
DATA ANALYSIS 3
RESULTS 4
ALL DATA 4
AVIAN USE 4
SPECIES 4
PERCENT COMPOSITION 6
SPECIES 6
FREQUENCY OF OCCURRENCE 6
SPECIES 6
AVIAN USE, FREQUENCY OF OCCURRENCE, AND PERCENT COMPOSITION 14
SPECIES GROUPS 14
FLIGHT CHARACTERISTICS 14
EXPOSURE INDEX 14
AVIAN FLIGHT PATHS 14
DISCUSSION 19
RAPTORS 19
PASSERINES 21
WATERFOWL 21
REFERENCES 22

LIST OF FIGURES

Figure 1. Map of the proposed Klondike III Wind Project in Sherman County, Oregon 2
Figure 2. Passerine mean use and frequency of occurrence by survey number on the Klondike III Wind Project, Oregon, during winter 8
Figure 3. Raptor mean use and frequency of occurrence by survey number on the Klondike III Wind Project, Oregon, during winter 9
Figure 4. Passerine mean use and frequency of occurrence by Avian Survey Point on the Klondike III Wind Project, Oregon, during winter 10
Figure 5. Raptor mean use and frequency of occurrence Avian by Survey Point on the Klondike III Wind Project, Oregon, during winter 11
Figure 6. Avian flight paths observed on Survey Points 12–16 of the Klondike III Wind Project, Oregon, during winter 17
Figure 7. Avian flight paths observed on Survey Points 6–11 of the Klondike III Wind Project, Oregon, during winter 18
Figure 8. Avian flight paths observed on Survey Points 1–5 of the Klondike III Wind Project, Oregon, during winter 20

LIST OF TABLES

Table 1. Avian species recorded within survey points while conducting point counts on the Klondike III Wind Project, Oregon, during winter 5

Table 2. Estimated mean use of avian species and species groups on the Klondike III Wind Project, Oregon, during winter 7

Table 3. Estimated percent composition of avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter 12

Table 4. Estimated frequency of occurrence of avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter 13

Table 5. Flight height characteristics and percent of avian species and species groups observed flying within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter 15

Table 6. Exposure indices calculated for avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter 16

ACKNOWLEDGMENTS

We thank J. Miller and D. Siegfried (David Evans & Associates) for coordinating this study. We are grateful to A. Miller (ABR, Inc.) for helping with the field work.

LIST OF PREPARERS

Todd Mabee, Co-principal investigator, Senior Scientist

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Alden Miller, Technician

INTRODUCTION

The overall objective of this study was to collect baseline avian information on the spatial and temporal use of birds at the proposed Klondike III Wind Project area located in Sherman County, Oregon for use in an avian risk assessment. To accomplish this objective, we conducted standard avian point-counts to obtain information on (1) species composition, (2) relative abundance, (3) flight patterns, and (4) flight altitudes of birds, so that (5) an exposure index (a metric for risk assessment) could be calculated for avian species and groups of species.

The Klondike III Wind Project is located on ~14,500 acres in Sherman County, Oregon (Figure 1). It is ~1 mile west of the John Day River at its closest point, ~5 miles south of the Columbia River, and ~12 miles east of the Deschutes River, and ~ 7 miles east of Wasco, Oregon. Grass Valley, which contains an intermittent tributary to the John Day River, extends along the southern edge of the project site. The project will generate up to 273 MW of power and will include up to 165 wind turbines. Previous phases of the Klondike Wind Project exist or are under construction near the site. The tower alignments will be accessed by new and existing 16-foot wide gravel-surfaced roads, the underground collector system will be largely within road corridors. Project elements also include a 4-acre office and maintenance facility, 19 laydown areas throughout the site, a 3.5-mile 230 kV overhead transmission line, and a new substation.

BACKGROUND

Avian fatalities typically are one of the main concerns when a wind power project is proposed. Proper studies designed to estimate avian use and risk are important, because appropriate siting of wind-energy facilities is one of the best ways to minimize collisions with birds (Nelson and Curry 1995). Meetings that included David Evans & Associates (DEA; the lead contractor on the Klondike III Wind Project), ABR, Inc., and the Oregon Department of Fish and Wildlife (ODFW) were held to discuss the potential avian issues at this project and to determine appropriate methods to conduct field studies. All parties agreed to use field methods similar to those used at nearby existing facilities (e.g., the Phase I Klondike Wind Project), to ensure compatability and comparability of the data sources for an avian impact assessment. These methods were reviewed and agreed upon by all parties and finalized in January 2005.

The baseline avian information collected at this site, in addition to the relevant baseline and operational monitoring data collected at other wind-energy developments in this region will be used to assess the potential project impacts. This interim report will provide a partial assessment of the winter survey period (3 November 2004–16 February 2005), whereas the final report will cover the complete winter (i.e., 3 November–15 March) and spring (16 March–15 May 2005) periods. A complete assessment of project impacts will be made upon completion of all field studies.

EXISTING CONDITIONS

The Klondike III Wind Project is located in the Deschutes-Columbia Plateau physiographic province. This province is a north-sloping, volcanic plateau that measures over 60,000 sq. mi in Oregon, Washington, and Idaho. This plateau consists of volcanic rocks (basalt) that erupted from vents in central and northeastern Oregon, southeastern Washington, and Idaho, and flowed westward to the Pacific Ocean during the middle Miocene ~6–17 million years ago (Beeson et al. 1989). Topography within the project site is typified by gently rolling to level ground with areas of steep slopes confined to portions of the northeastern and southern margins of the study area that drop down into Grass Valley and several unnamed intermittent tributaries of the John Day River. Elevation in Sherman County varies from North to South: 170 feet ASL along the Columbia River; 1,250–1,500 feet within the project area; ~1,000 feet in Grass Valley, to 3,000 feet in the southern part of the county (Orr et al. 1992).

Located on the eastern side of the Cascade Mountains, the project area predominantly exhibits the continental climate of the Intermountain Region – extreme temperatures and low rainfall (Orr et al. 1992). The Columbia River Gorge, however, also provides a passageway for the normal eastward movement of ocean-conditioned air masses from the Pacific, leading to shorter hot or cool periods than those typical of the Intermountain Region. Most of the annual rainfall

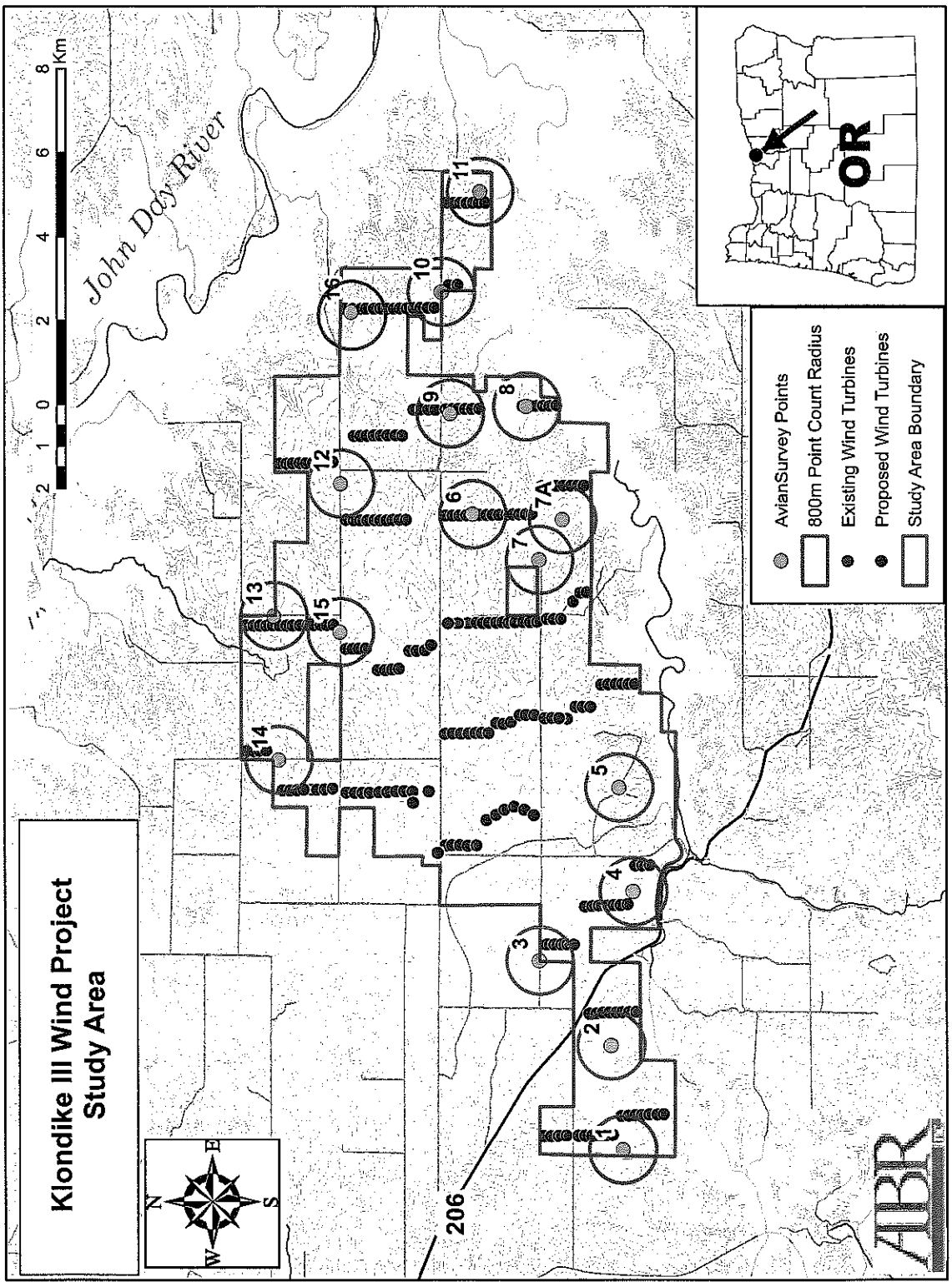

Figure 1. Map of the proposed Klondike III Wind Project in Sherman County, Oregon.

in Sherman County occurs between November and February, reflecting the strong influence of marine air masses entering from the Pacific Ocean. Between 1910 and 1995, mean total annual precipitation was 11.76 inches in Wasco, Oregon. Mean monthly rainfall measured between 1971 and 2000 at Moro, Oregon ranged from 0.31 inches in July to 1.57 inches in January. Between 1971 and 2000, mean minimum and maximum temperatures ranged from 24.7 to 38.3°F during January, to 52.6–81.8°F during August, with extremes ranging from -16 to 106°F (Oregon Climate Center 2005).

Agriculture, particularly dry land wheat, is the predominant land use and there are very few residential dwellings within the project area. Conservation Reserve Program (CRP) lands planted with a mix of native and non-native bunchgrasses are located throughout the project area. Very little acreage of native plant communities (sage, rabbit brush, bunchgrass) remains within the project site, occurring predominantly along the plateau margins and steep side slopes of Grass Valley.

METHODS

We conducted avian point-counts with a variable circular-plot method to obtain information on species-composition and relative abundance of birds (Reynolds 1980) and collected information on avian flight paths and flight altitudes during diurnal hours from 04 November 2004 to16 February 2005. Survey points were non-overlapping and were chosen to provide excellent viewing conditions and thorough coverage of the proposed turbine strings, representative habitats, and topographical features within the proposed project (Fig. 1). Some survey point locations were modified slightly after conversations with ODFW personnel, resulting in one substantive change in location (i.e., moving point 7 to a nearby location 7A, Fig. 1). Points 7 and 7A were sampled sequentially over time (i.e., point 7 sampled from 4 November–16 December and point 7A sampled from 28 December 2004–16 February 2005).

Our survey protocol was similar to that used in the nearby Scenic Vista (Mabee and Cooper 2004a), Stateline (URS and WEST 2001), Vansycle (URS and WEST 1997), and Columbine Hills (Young et al. 2002) projects and entailed recording all observations, regardless of distance, although we used data from ≤800 m (0.5 mi) radius for our analyses. Although this survey was designed for large birds (i.e., waterfowl and raptors), we recorded all information for all species observed during each survey. Survey starting point locations were alternated among surveys to reduce spatial and temporal bias. All sites were visited on a weekly basis.

At each Avian Survey Point we visually scanned and listened for birds for a 20-minute period and recorded the following information for each observation: time, number of minutes elapsed from the beginning of each 20 minute point count, species, number of birds and flocks, minimal distance to bird(s), flight altitude and direction (when first observed), flight behavior (straight line, local/erratic, circling/soaring), breeding behavior (singing/calling, aerial display, sitting on nest), other behavior (aerial forage, ground forage, perch/sit, unknown), habitat (dry agriculture, canyon, Conservation Reserve Program lands, riparian (forested or non-forested), shrub-steppe, steppe grassland, developed, surface water ponds, intermittent streams, upland trees, or other), sex, age, Avian Survey Point number, and identification number—a unique number for each raptor or species of interest recorded on maps with the flight path of the bird(s). We also recorded weather information at each Survey Point, including wind direction, wind speed, cloud cover, ceiling elevation, visibility, temperature, and precipitation. In addition to information collected at the Survey Points, for ODFW species of interest (i.e., raptors, waterfowl, Loggerhead Shrike), we recorded species, number of individuals (and flocks), and mapped their flight paths while we were conducting the avian point counts and when traveling between the survey points (termed in-transit observations).

DATA ANALYSIS

We used the same avian-use metrics found in other studies in the region (Young et al. 2002, Mabee and Cooper 2004a). To maintain comparability with other studies in the region, we excluded data from Avian Survey Points that had compromised visibility due to fog (average visibility during the survey <0.5 mi [800 m]), eliminating one survey day from the database. We

computed standardized metrics for avian species or species-groups on mean use, percent composition, frequency of occurrence, and an exposure index based on mean use and flight behavior characteristics.

Mean use for a species equals the mean number of individuals/20-min point count for each species and provides an index of avian relative abundance per survey point. This index does not describe density, however, because individuals may have been observed at multiple points (particularly raptors) and data were not corrected for differences in detectability. *Percent composition* equals the mean use for a species/total use for all species, multiplied by 100, and provides an estimate of the relative use of a particular species compared with the use of all other species. *Frequency of occurrence* equals the percent of surveys in which a species is observed and it provides an index of how often a species occurs in the project area. Mean use and frequency of occurrence reflect different aspects of abundance, in that mean use is based on the number of individuals (i.e., large flocks can produce high estimates), whereas frequency of occurrence is based on the number of flocks (i.e., it is not influenced by flock size). Together, these two estimates help one to discern the importance of high mean use values.

The *exposure index*, a relative index of collision exposure (R) for bird species can be calculated as:

$$R = A * P_f * P_t$$

Where A = mean use for a species, P_f = percentage of all observations when a species was observed flying (an index of the approximate percentage of time a species spends flying during diurnal hours), and P_t = percentage of all flight observations within the rotor-swept area (RSA). Note that this index accounts only for differences in certain aspects of flight behavior and does not directly address other behaviors or ecological attributes of a particular species that may influence collision exposure (e.g., turbine avoidance behavior, high-density prey locations that may increase foraging behavior, flight movements along proposed turbine strings).

All analyses were conducted in SPSS v. 12.0 (SPSS 2002). Flight paths of raptors and species of interest observed at all distances were mapped in the field and later were digitized, summarized, and presented with ArcView GIS software.

RESULTS

ALL DATA

An examination of the data used in all our analyses (observations 800 m with good visibility) describes the total number of species, individuals, and groups observed within our Avian Survey Points (Table 1). This summary is provided to give an overall list of the species observed and their numbers recorded during the entire survey. Although we attempted to minimize duplicate sightings of the same bird(s), these data may contain duplicate sightings because individual birds were not marked and they could have traveled between survey points. All scientific names of species are presented in Table 1.

Sixteen avian species totaling 6,967 individuals in 347 flocks were observed during winter (Table 1). Waterfowl (predominantly Canada Geese) were fairly common in small to large flocks (3–250 individuals), whereas Trumpeter Swan were only observed in small groups. Raptors were generally uncommon, with Rough-legged Hawk being the most common (n = 12), with fewer observations of Northern Harrier (n = 4), American Kestrel (n = 3), and Golden Eagle (n = 1). Prairie Falcon also were observed (n = 4), although only during intransit times (traveling between survey points). Common passerines included Horned Lark (n = 4,836) and unidentified Blackbirds (n = 1,021 with one large flock of 1,000 individuals), with fewer numbers of Brewer's Blackbird (n = 55), Common Raven (n = 37), Western Meadowlark (n = 25), European Starling (n = 25), and other species (Table 1). We did not observe any state or federally listed species during winter surveys, although we did observe one Loggerhead Shrike which is listed as an Oregon Sensitive Species–Vulnerable (ODFW 1997).

AVIAN USE

SPECIES

Avian use (mean number of individuals within 800 m/20-min point count) is a metric that provides an index of the numbers of birds using the project

Table 1. Avian species recorded within survey points (=800 m with good visibility) while conducting point counts on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Species-group/species		Winter		Spring		Total	
		Number	Groups	Number	Groups	Number	Groups
Waterfowl							
Trumpeter Swan	*Cygnus buccinator*	5	1			5	1
Canada Goose	*Branta canadensis*	766	10			766	10
Raptors							
Northern Harrier	*Circus cyaneus*	4	4			4	4
Eagles							
Golden Eagle	*Aquila chrysaetos*	1	1			1	1
Unidentified eagle		1	1			1	1
Buteos							
Rough-legged Hawk	*Buteo lagopus*	12	12			12	12
Unidentified buteo		1	1			1	1
Small falcons							
American Kestrel	*Falco sparverius*	3	2			3	2
Unidentified raptor		5	5			5	5
Upland game birds							
Chukar	*Alectoris chukar*	7	3			7	3
Ring-necked Pheasant	*Phasianus colchicus*	5	2			5	2
Passerines							
Songbirds							
Loggerhead Shrike	*Lanius ludovicianus*	1	1			1	1
Unidentified shrike		1	1			1	1
Horned Lark	*Eremophila alpestris*	4836	249			4836	249
European Starling	*Sturnus vulgaris*	25	2			25	2
Western Meadowlark	*Sturnella neglecta*	25	10			25	10
Red-winged Blackbird	*Agelaius phoeniceus*	1	1			1	1
Brewer's Blackbird	*Euphagus cyanocaephalus*	55	3			55	3
Unidentified blackbird		1021	3			1021	3
Brown-headed Cowbird	*Molothrus ater*	3	1			3	1
Unidentified finch		12	1			12	1
Unidentified passerine		138	8			138	8
Corvids							
Common Raven	*Corvus corax*	37	24			37	24
Unidentified corvid		2	1			2	1
Total		6967	347			6967	347

area and, therefore, evaluates which species may be affected by the project. Because we are interested in making risk comparisons among species at the proposed project facilities, mean use is an appropriate metric for this comparison.

Avian use varied among species but was low for all species relative to use by Horned Larks (Table 2). During winter, Horned Lark (23.94 observations within 800 m/20-min point count), unidentified Blackbird (5.05), and Canada Goose (3.79) were the dominant species in the study area, with all remaining species having a mean use value of <1.0 (Table 2).

Avian use by passerines (the numerically dominant species-group) and raptors (a species-group of interest) was graphed to illustrate the temporal variation in mean use for these groups (Figs. 2 and 3). Mean use by passerines was unusually high on two surveys (survey numbers 1 and 2, Fig. 2) during November because of the observation of a few large flocks of Horned Larks and Unidentified Blackbirds (700–1,000 individuals/flock) and poor visibility conditions during survey 2. The poor visibility conditions during survey 2 caused the mean use to be calculated on a smaller number of points on this day, and hence inflated the mean use value for this day. Mean use of passerines was much lower after these initial two surveys (Fig. 2). Compared to passerines, mean use by raptors was very low throughout the entire period (Fig. 3).

Avian use by passerines and raptors also was graphed to illustrate the spatial variation in mean use for these groups among the Avian Survey Points (Figs. 4 and 5). Mean use by passerines was highest at Avian Survey Point 5, because of the observation of a large flock of Horned Larks (1,000 individuals) and Unidentified Blackbirds (1,000 individuals), and second highest at Point 12, driven by the observation of a large flock of Horned Larks (700 individuals; Fig. 4). The remaining points had similar mean use values over the study period. Mean use by raptors was substantially lower than that for passerines (note the difference in scale between figures) with no major differences between points at which they were observed, although raptors were not observed at nearly half the points (Fig. 5).

PERCENT COMPOSITION

SPECIES

Percent composition (mean use for a species/total use across all species, multiplied by 100) provides an estimate of the relative use of any particular species, relative to the use by all other species. This metric is particularly useful for identifying whether any one species has a dominant presence in the study area. During winter, Horned Larks had a dominant presence in the study area, with a percent composition value of ~69%; in contrast, Unidentified Blackbirds (~15%), Canada Goose (~11%), and all remaining species (<1%) had much lower values (Table 3).

FREQUENCY OF OCCURRENCE

SPECIES

Frequency of occurrence (percentage of surveys in which a species was observed) provides an index of how often a species occurs in the project area. In combination with mean use, it allows one to understand the basis of mean-use values. For example, if one large flock of Canada Goose is observed one time, its mean use can be high because it is based on the number of individuals, even though its frequency of occurrence is low. To understand the risks of birds near proposed structures, it is important to understand both how many birds are using the study area (mean use) and how frequently they are using it (frequency of occurrence).

In winter, Horned Lark were frequently observed in the study area (~80%), whereas Common Raven (~10%), Rough-legged Hawk (~6%), Western Meadowlark (~5%), Canada Goose (~3%) and all other species (<2%) were observed much less frequently (Table 4).

The frequency of occurrence of passerines (the numerically dominant species-group) and raptors (a group of interest) was presented graphically to illustrate the seasonal variation in their occurrence (Figs. 2 and 3). Passerine occurrence was lowest during January, otherwise they occurred frequently throughout all surveys (Fig. 2). Raptors always occurred much less often than passerines, ranging from 0–25% occurrence within a given survey, and were completely absent on 3 surveys (Fig. 3). The frequency of occurrence

Table 2. Estimated mean use (mean number of observations within 800 m/20-min point count) of avian species and species groups on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Species-group/species	Winter	Spring
Waterfowl	3.817	
Trumpeter Swan	0.025	
Canada Goose	3.792	
Raptors	0.134	
Northern Harrier	0.020	
Eagles	0.010	
Golden Eagle	0.005	
Unidentified eagle	0.005	
Buteos	0.064	
Rough-legged Hawk	0.059	
Unidentified buteo	0.005	
Small falcons	0.015	
American Kestrel	0.015	
Unidentified raptor	0.025	
Upland game birds	0.600	
Chukar	0.035	
Ring-necked Pheasant	0.025	
Passerines	30.480	
Songbirds	30.287	
Loggerhead Shrike	0.005	
Unidentified shrike	0.005	
Horned Lark	23.941	
European Starling	0.124	
Western Meadowlark	0.124	
Red-winged Blackbird	0.005	
Brewer's Blackbird	0.272	
Unidentified blackbird	5.054	
Brown-headed Cowbird	0.015	
Unidentified finch	0.059	
Unidentified passerine	0.683	
Corvids	0.193	
Common Raven	0.183	
Unidentified corvid	0.010	

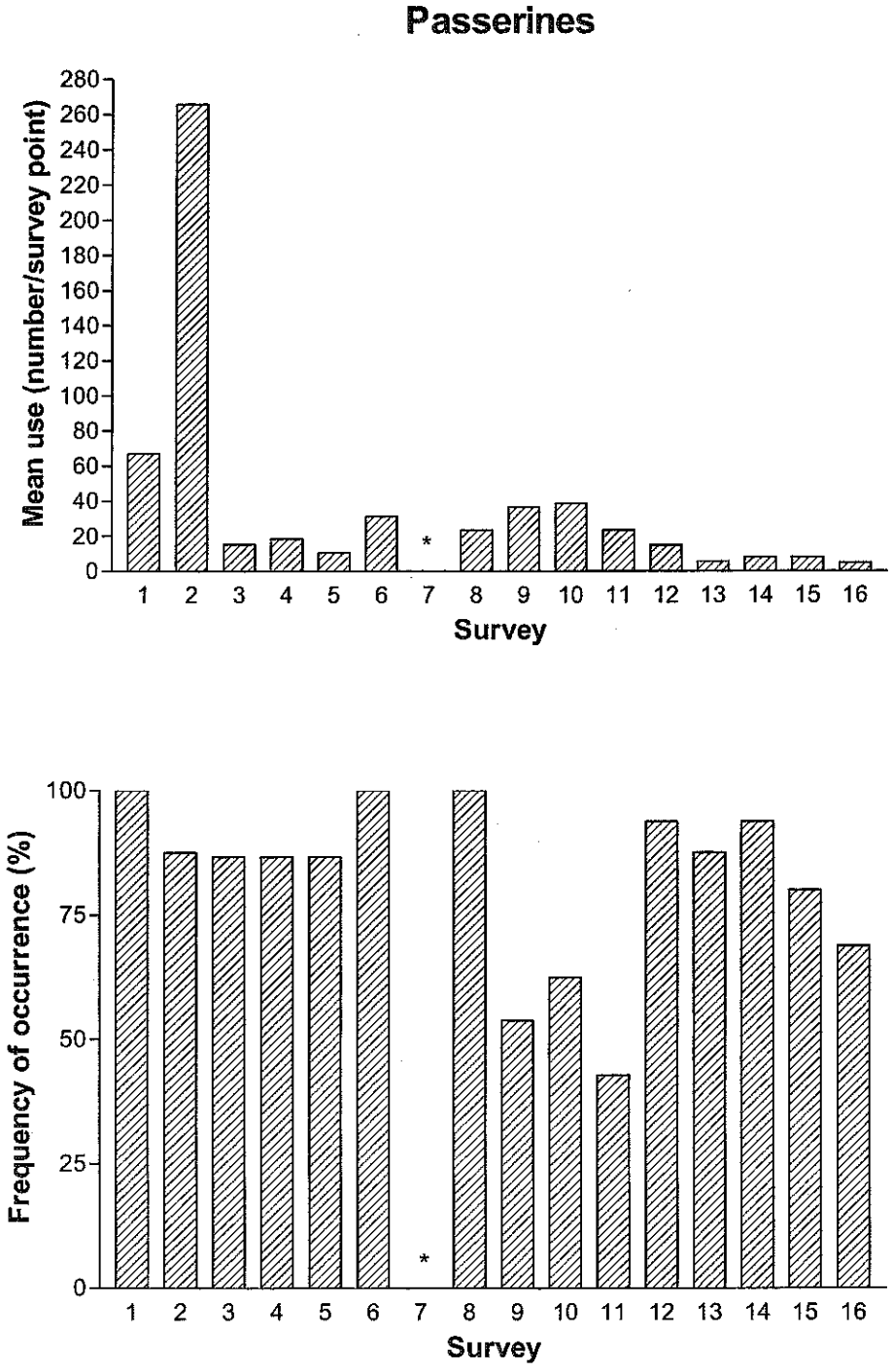

Figure 2. Passerine mean use (number/survey point) and frequency of occurrence (%) by survey number on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005). Survey numbers correspond to approximately weekly intervals. Asterisks denote survey days excluded due to poor visibility.

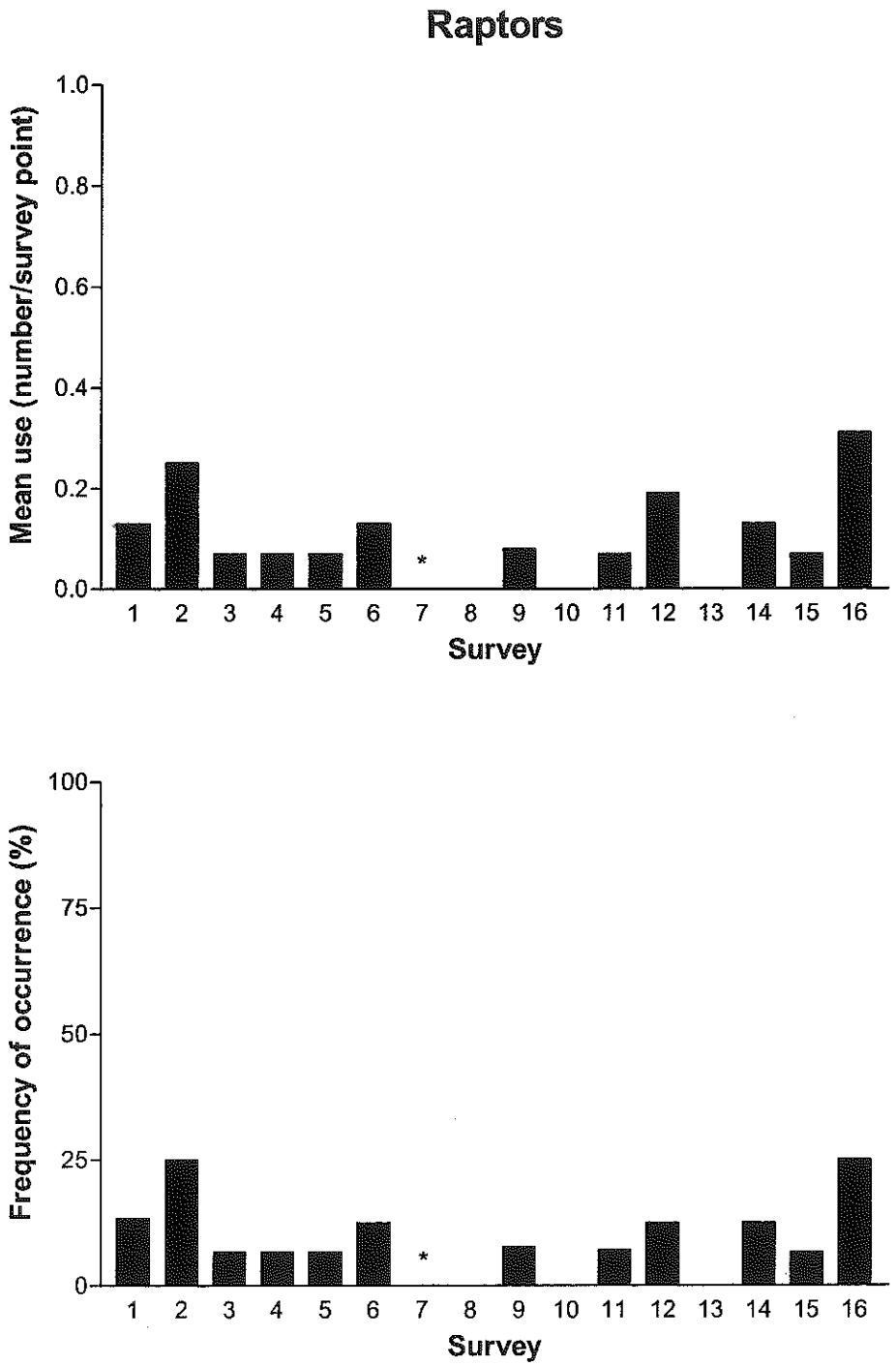

Figure 3. Raptor mean use (number/survey point) and frequency of occurrence (%) by survey number on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005). Survey numbers correspond to approximately weekly intervals. Asterisks denote survey days excluded due to poor visibility.

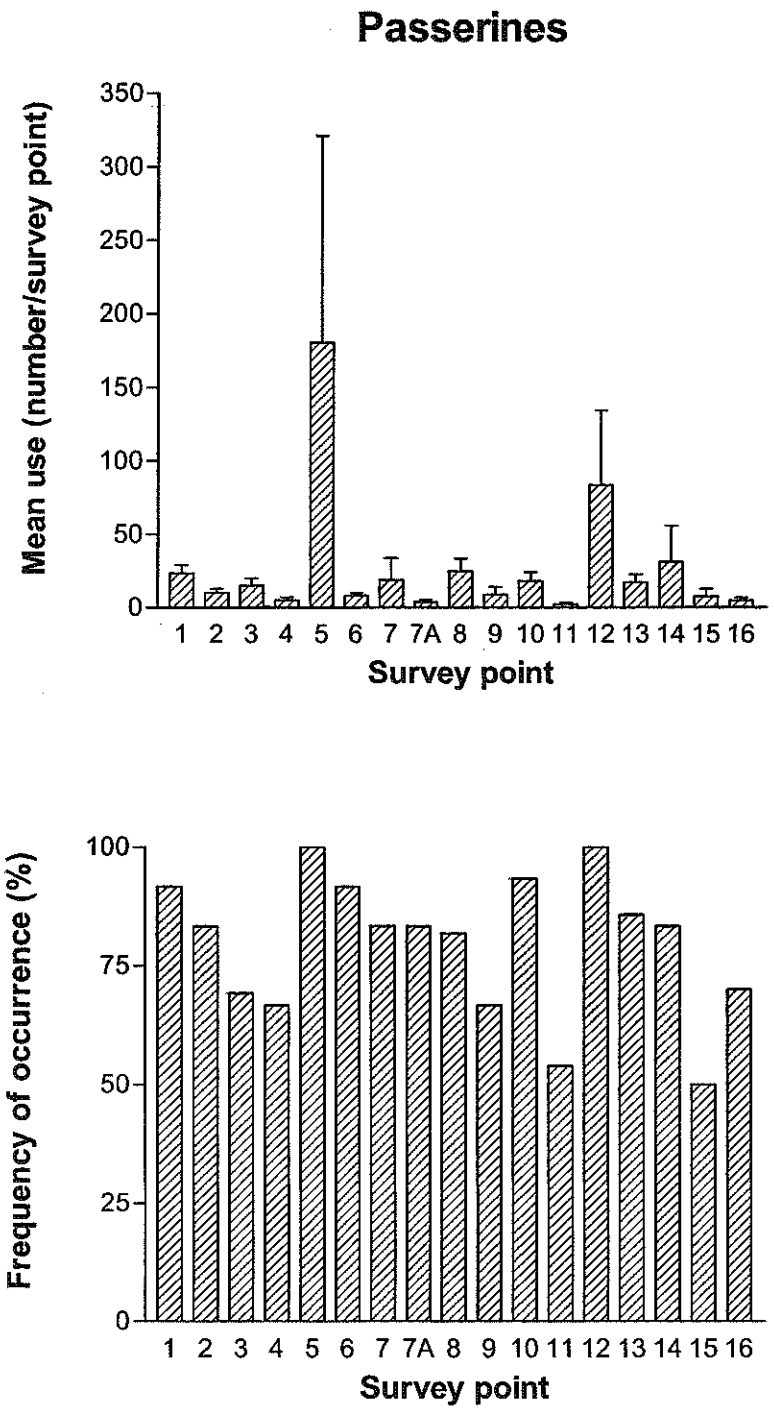

Figure 4. Passerine mean use (number/survey point) and frequency of occurrence (%) by Avian Survey Point on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

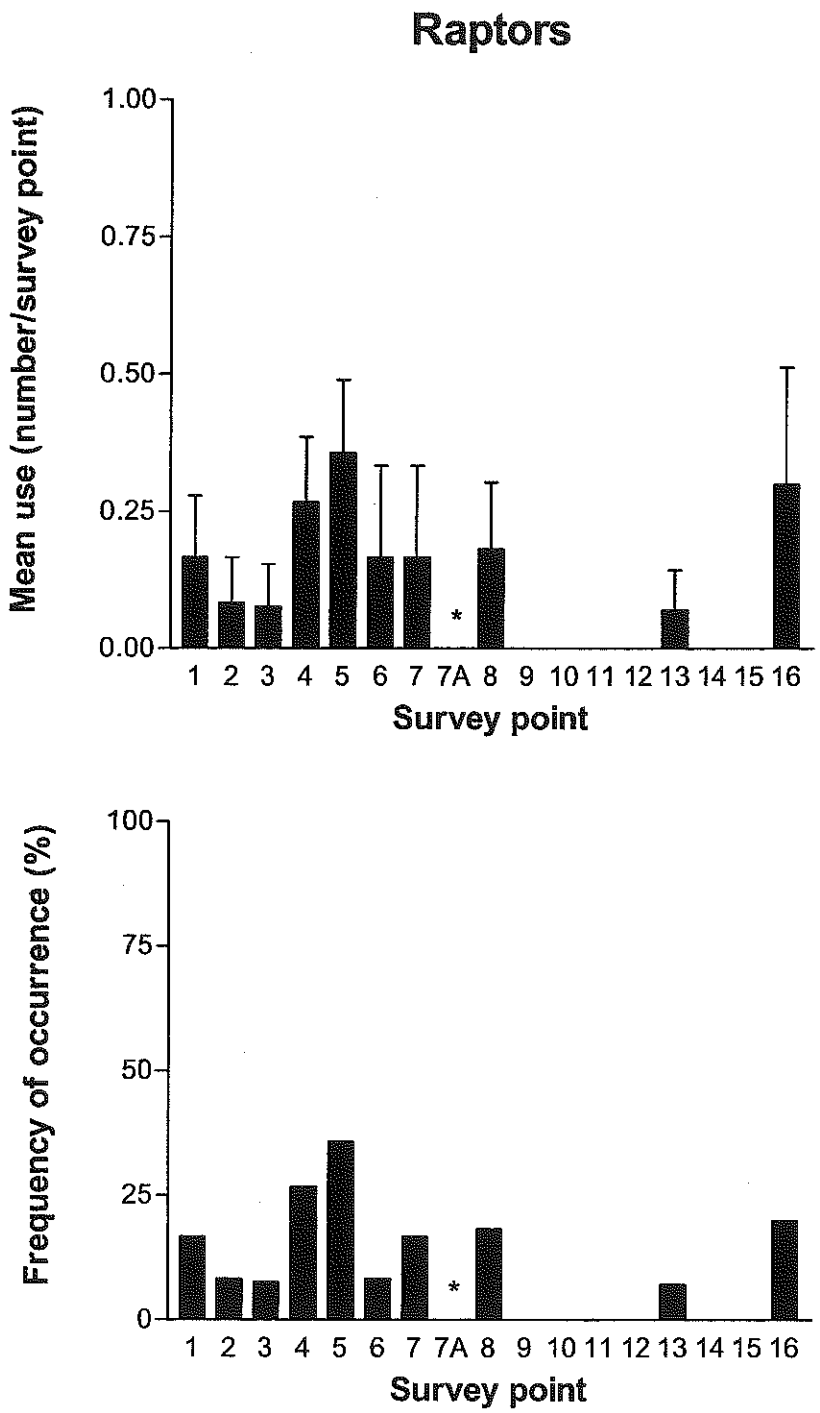

Figure 5. Raptor mean use (number/survey point) and frequency of occurrence (%) Avian by Survey Point on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Table 3. Estimated percent composition (mean use/total use for all species x 100) of avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Species-group/species	Winter	Spring
Waterfowl	11.07	
Trumpeter Swan	0.07	
Canada Goose	10.99	
Raptors	0.39	
Northern Harrier	0.06	
Eagles	0.03	
Golden Eagle	0.01	
Unidentified eagle	0.01	
Buteos	0.19	
Rough-legged Hawk	0.17	
Unidentified buteo	0.01	
Small falcons	0.04	
American Kestrel	0.04	
Unidentified raptor	0.07	
Upland Game birds	0.17	
Chukar	0.10	
Ring-necked Pheasant	0.07	
Passerines	88.37	
Songbirds	87.81	
Loggerhead Shrike	0.01	
Unidentified shrike	0.01	
Horned Lark	69.41	
European Starling	0.36	
Western Meadowlark	0.36	
Red-winged Blackbird	0.01	
Brewer's Blackbird	0.79	
Unidentified blackbird	14.65	
Brown-headed Cowbird	0.04	
Unidentified finch	0.17	
Unidentified passerine	1.98	
Corvids	0.56	
Common Raven	0.53	
Unidentified corvid	0.03	

Table 4. Estimated frequency of occurrence (percentage of surveys on which the species was recorded) of avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Species-group/species	Winter[1]	Spring[1]
Waterfowl	3.47	
Trumpeter Swan	0.50	
Canada Goose	2.97	
Raptors	10.89	
Northern Harrier	1.98	
Eagles	1.00	
Golden Eagle	0.50	
Unidentified Eagle	0.50	
Buteos	6.44	
Rough-legged Hawk	5.94	
Unidentified buteo	0.50	
Small falcons	0.99	
American Kestrel	0.99	
Unidentified raptor	1.98	
Upland game birds	2.48	
Chukar	1.49	
Ring-necked Pheasant	0.99	
Passerines	82.18	
Songbirds	82.18	
Loggerhead Shrike	0.50	
Unidentified shrike	0.50	
Horned Lark	79.21	
European Starling	0.99	
Western Meadowlark	4.95	
Red-winged Blackbird	0.50	
Brewer's Blackbird	0.99	
Unidentified blackbird	1.49	
Brown-headed Cowbird	0.50	
Unidentified finch	0.50	
Unidentified passerine	3.96	
Corvids	10.89	
Common Raven	10.40	
Unidentified corvid	0.50	

[1] Frequency of occurrence values can not be added within, or across, species groups (e.g. corvids were observed at surveys where passerines were also observed).

of passerines and raptors also was presented graphically to illustrate the spatial variation in their occurrence among Avian Survey Points (Figs. 4 and 5). Passerines occurred at nearly all survey points with the lowest frequency at survey points 11 and 15 (Fig. 4), whereas raptors occurred at a much lower frequency than passerines, with Survey Point 5 having the highest occurrence, and nearly half the points having no occurrence (Fig. 5).

AVIAN USE, FREQUENCY OF OCCURRENCE, AND PERCENT COMPOSITION

SPECIES GROUPS

Species were aggregated into larger taxonomic groups (when possible) to make them comparable to other studies in the region (Young et al. 2002, Mabee and Cooper 2004a). During winter, passerines had the highest mean use (30.48 individuals within 800 m/20-min count), followed by waterfowl (3.82), Upland Game Birds (0.60) and raptors (0.13; Table 2). The percent composition during winter was highest for passerines (~88%), followed by waterfowl (~11%), raptors (~0.4%), and upland game birds (~0.2%; Table 3). During winter, frequency of occurrence was highest for passerines (~82%), followed by raptors (~11%), waterfowl (~3%), and Upland Game Birds (~2%; Table 4).

FLIGHT CHARACTERISTICS

The percentage of birds flying within the turbine rotor swept area (RSA) provides an estimate of the likelihood that a species will fly through this area and assumes that birds will not avoid the turbine blades or be able to pass through the turbine blades. Although both of these assumptions are unrealistic, few data are available to be able to model these avoidance variables—hence they are currently not part of the exposure index. Because the exact turbine sizes have yet to be selected for this project, we identified the RSA or, zone of potential risk, [i.e., 38–121 m above ground level (agl)] based on the worst-case scenario of turbine dimensions (i.e., the smallest turbine towers coupled with the largest turbine blades).

Numbers and groups of birds flying, percent of birds flying, and flight-altitude categories (in m [agl]) are presented for species and species groups observed within 800 m of Avian Survey Points in Table 5. Flight altitudes were divided into three categories: 37 m agl (below turbine blades), 38–121 m agl (RSA of the turbine—the potential collision zone) and 122 m agl (above turbine blades). In general, most waterfowl (~80%) appeared to be flying within the RSA (Table 5). Raptors appeared to be flying mainly below the RSA (~43%) but also within the RSA (~29%) and above the RSA (~29%; Table 5). Species differences were strong, with Northern Harriers (n = 3) and American Kestrels (n = 1) always flying below the RSA, Golden Eagles (n = 1) always flying within the RSA, and Rough-legged Hawk (n = 9) flying within all three zones (Table 5). Upland Game Birds always flew below the RSA, and passerines fly primarily (83%) below the RSA, with smaller percentages within the RSA (~17%; Table 5). Patterns were similar for the two major types of passerines observed during this study, songbirds and corvids (Table 5).

EXPOSURE INDEX

The Exposure Index is a relative measure of the risk that each species will come into contact with a turbine blade (assuming no avoidance behavior of wind turbines). The Exposure Index is the product of a species' mean use, the percentage of time spent flying, and the percentage of time that a bird will fly within the RSA and is presented for species and species groups in Table 6. Horned Lark had the highest exposure index of any species (5.282), followed by Canada Goose (2.073), with the remaining species having very low exposure indices (Table 6). Species groups showed the same pattern, with passerines (4.445) and waterfowl (1.600) having the highest exposure indices, followed by raptors (0.030) and Upland Game Birds (0; Table 6).

AVIAN FLIGHT PATHS

We mapped flight paths of raptors and other species of interest to summarize seasonal movement patterns throughout the proposed project area. All flight paths presented on Figures 6 and 7 come from observations within 800 m, so

Table 5. Flight height characteristics and percent of avian species and species groups observed flying within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005). Values represent percentages of birds flying below the rotor swept area (RSA < 37 m), within RSA (38–121 m), and above RSA (> 122 m).

	Groups flying		Birds flying		% individual flying		Flight altitude (%)					
							Winter			Spring		
Species-group/species	W	S	W	S	W	S	<RSA	RSA	>RSA	<RSA	RSA	>RSA
Waterfowl	7		407		52.8		12.3	79.4	8.4			
Trumpeter Swan	1		5		100.0		0	100.0	0			
Canada Goose	6		402		69.1		12.4	79.1	8.5			
Raptors	21		21		77.8		42.9	28.6	28.6			
Northern Harrier	3		3		100.0		100.0	0	0			
Eagles	2		2		100.0		0	100.0	0			
Golden Eagle	1		1		100.0		0	100.0	0			
Unidentified eagle	1		1		100.0		0	100.0	0			
Buteos	10		10		76.9		50.0	30.0	20.0			
Rough-legged Hawk	9		9		100.0		55.6	33.3	11.1			
Unidentified buteo	1		1		100.0		0	0	100.0			
Small falcons	1		1		33.3		100.0	0	0			
American Kestrel	1		1		100.0		100.0	0	0			
Unidentified raptor	5		5		100.0		0	20.0	80.0			
Upland game birds	2		5		41.7		100.0	0	0			
Chukar	1		3		100.0		100.0	0	0			
Ring-necked Pheasant	1		2		100.0		100.0	0	0			
Passerines	242		5311		86.3		83.0	16.9	0.1			
Songbirds	218		5273		86.2		83.0	16.8	0.1			
Horned Lark	206		4205		98.5		77.6	22.4	0			
European Starling	1		1		100.0		100.0	0	0			
Western Meadowlark	1		2		100.0		100.0	0	0			
Brewer's Blackbird	2		38		100.0		100.0	0	0			
Unidentified blackbird	2		1001		100.0		100.0	0	0			
Brown-headed Cowbird	1		3		100.0		100.0	0	0			
Unidentified passerine	5		23		100.0		56.5	17.4	26.1			
Corvids	24		38		97.4		78.9	21.1	0			
Common Raven	23		36		97.3		77.8	22.2	0			
Unidentified corvid	1		2		100.0		100.0	0	0			

Table 6. Exposure indices (mean use x percent flying x percent flying within the rotor-swept area [RSA]) calculated for avian species and species groups observed within 800 m of survey points on the Klondike III Wind Project, Oregon, during winter (04 November 2004–16 February 2005).

Species-group/species	Winter				Spring			
	Mean use	Percent individual flying	Percent flying in RSA	Exposure index	Mean use	Percent flying	Percent flying in RSA	Exposure index
Waterfowl	3.817	52.8	79.4	1.600				
Trumpeter Swan	0.025	100	100	0.025				
Canada Goose	3.792	69.1	79.1	2.073				
Raptors	0.134	77.8	28.6	0.030				
Northern Harrier	0.02	100	0	0.000				
Eagles	0.010	100.0	100.0	0.010				
Golden Eagle	0.005	100	100	0.005				
Unknown Eagle	0.005	100	100	0.005				
Buteos	0.064	76.9	30.0	0.015				
Rough-legged Hawk	0.059	100	33.3	0.020				
Unidentified Buteo	0.005	100	0	0.000				
Small falcons	0.015	33.3	0	0.000				
American Kestrel	0.015	100	0	0.000				
Unidentified raptor	0.025	100	20.0	0.005				
Upland game birds	0.600	41.7	0	0.000				
Chukar	0.035	100	0	0.000				
Ring-necked Pheasant	0.025	100	0	0.000				
Passerines	30.480	86.3	16.9	4.445				
Songbirds	30.287	86.2	16.8	4.386				
Horned Lark	23.941	98.5	22.4	5.282				
European Starling	0.124	100	0	0.000				
Western Meadowlark	0.124	100	0	0.000				
Brewer's Blackbird	0.272	100	0	0.000				
Unidentified blackbird	5.054	100	0	0.000				
Brown-headed Cowbird	0.015	100	0	0.000				
Unidentified passerine	0.683	100	17.4	0.119				
Corvids	0.193	97.4	21.1	0.040				
Common Raven	0.183	97.3	22.2	0.040				
Unidentified corvid	0.01	100	0	0.000				

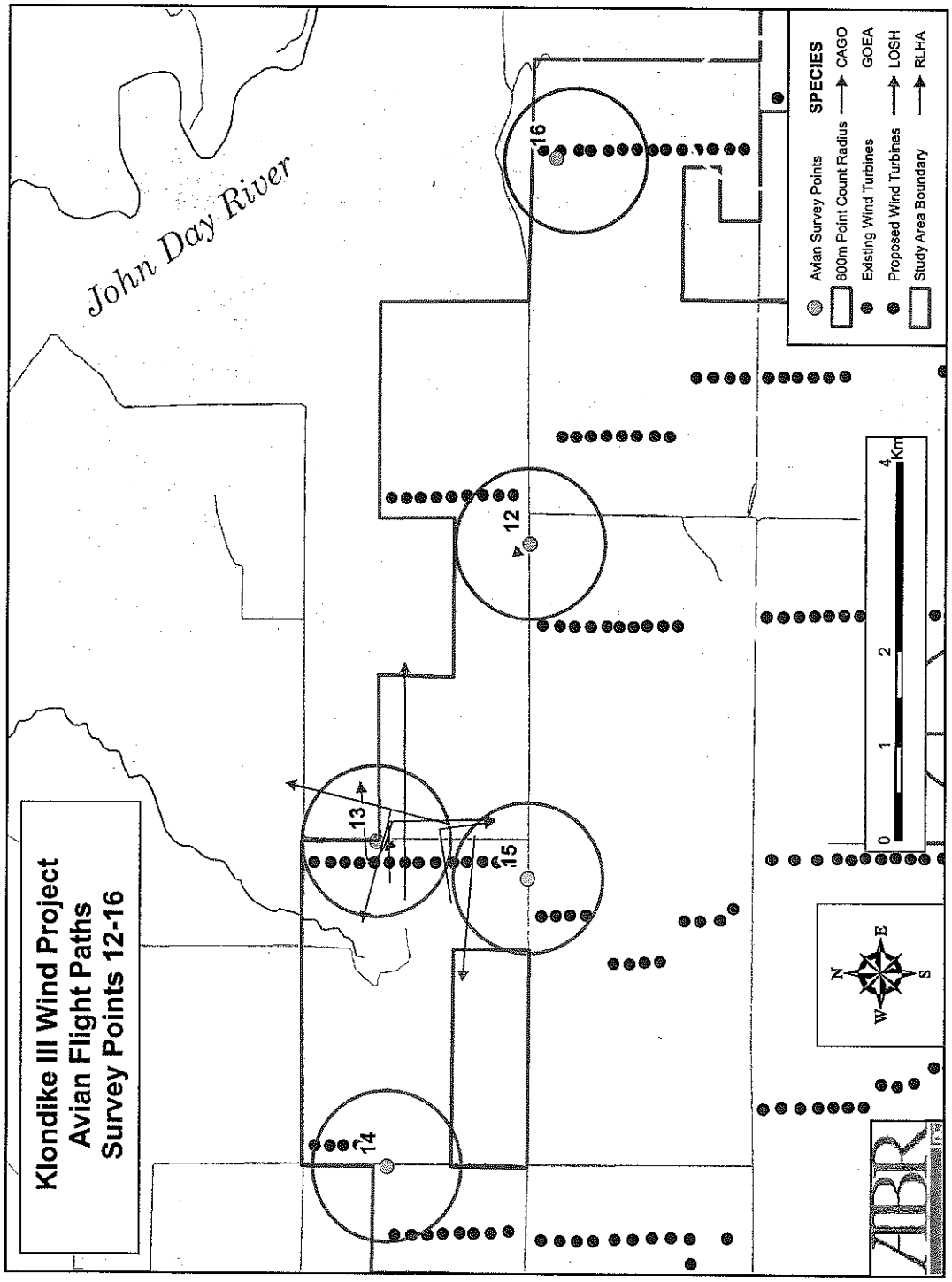

Figure 6. Avian flight paths observed on Survey Points 12–16 of the Klondike III Wind Project, Oregon, during winter (04 November–16 February 2005). Species codes are as follows: CAGO = Canada Goose, GOEA = Golden Eagle, LOSH = Loggerhead Shrike, RLHA = Rough-legged Hawk.

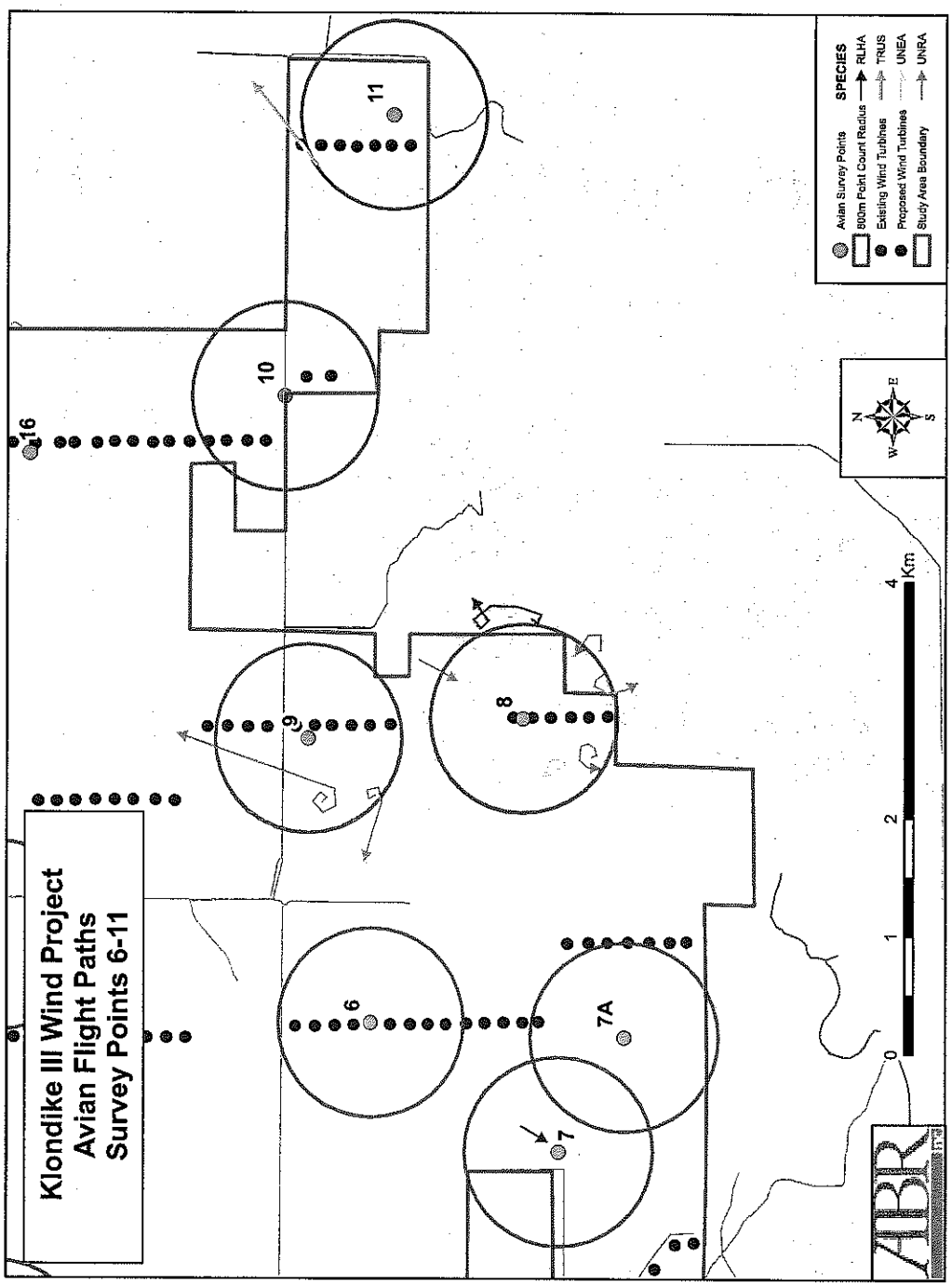

Figure 7. Avian flight paths observed on Survey Points 6–11 of the Klondike III Wind Project, Oregon, during winter (04 November–16 February 2005). Species codes are as follows: RLHA = Rough-legged Hawk, TRUS = Trumpeter Swan, UNEA = Unidentified eagle, UNRA = Unidentified raptor.

that our statements on the patterns of spatial use in the project area are consistent with the previous information in this report. This information should be considered preliminary because of the limited number of flight paths recorded for raptors and waterfowl.

During winter, flight paths of raptors (especially Rough-legged Hawks) appeared concentrated in the southeastern section of the project near avian survey point 8 (Fig. 7). Waterfowl (Canada Geese) flight paths appeared to be concentrated in the northern section of the project near avian survey points 13 and 14 (Fig. 6). Passerine species of interest (i.e., Loggerhead Shrike) were only observed once at Point 12 (Fig. 6). No obvious patterns of aggregation were observed for any species in the southwestern portion of the project (Fig. 8).

DISCUSSION

Baseline avian-use studies, coupled with an avian risk-assessment protocol, are important tools to assess the likelihood of bird–turbine collisions at proposed wind power projects. Proper interpretation of these studies is vital to making appropriate siting recommendations for wind power projects, so that avian collisions with wind turbines may be minimized (Nelson and Curry 1995). Crucial to this interpretation is an understanding of a species' natural history throughout the annual cycle. Overall, we have compared the results of this study with other studies at wind projects to make general assessments of avian collision risk with turbines. Our comparison of the avian use statistics and assessments of the potential collision risk are made using general terms (i.e., low, moderate, high) and are relative to the avian use statistics and collision fatalities found at other projects in the Western United States. It must be emphasized, however, that the 'winter' season discussed in this report is incomplete, as an additional month of data will be added to the results presented in this interim report. A complete and truly comparative discussion of both the winter and spring seasons will be presented in our final report.

In this study, the avian use metrics were combined with flight-altitude characteristics (percent of time birds fly, percent of time birds fly within the RSA of a turbine) to produce an exposure index—a relative measure of the risk of each species' coming into contact with a turbine blade. Although this combination of metrics is a logical one that may help determine a species relative risk of collision, it does not account for avoidance behavior (the ability of birds to detect and avoid wind turbines), the probability of birds to pass through the rotor swept area, or other facets of a species' natural history and behavior that may influence its probability of collision (e.g., whether it is a diurnal or nocturnal migrant, *see* Mabee and Cooper 2004b). It is important to consider all these behavioral facets of a species and its general biology before determining its propensity to collide with wind turbines.

RAPTORS

The concern for raptor collisions at some existing wind projects is warranted, because turkey vulture, red-tailed hawk, northern harrier, golden eagle, American kestrel, and prairie falcon have all collided with wind turbines at Altamont, California, although most of the raptor fatalities were red-tailed hawk (Erickson et al. 2001). The average fatality rate at newer generation wind projects is 0.04 raptor fatalities/MW/yr compared to up to ~1 raptor fatality/MW/yr at older generation wind projects such as Altamont (Erickson et al. 2004). Mean use across all raptor species at the Klondike III Wind Project ranged from 0.005–0.059 birds/point count. Mean use of raptors across winter was 0.134 birds/point count. Examination of the use values for individual raptor species shows that Rough-legged Hawk contributed a large amount (44%) to the overall use for raptors. Rough-legged Hawk (a migratory species whose population appears to be increasing in Oregon; Marshall et al. 2003) were present at higher numbers during winter, a time when they are considered an uncommon to common winter resident in the open country of Oregon (Marshall et al. 2003). Residents such as Northern Harrier and American Kestrel had low mean use during winter, a time when some individuals may migrate south. Golden Eagle (a resident east of the Cascades whose population trend is unknown; Marshall et al. 2003) were observed infrequently during winter. Clearly, an appropriate interpretation of the relative value (among seasons) of mean-use values requires knowledge of a species' annual cycle.

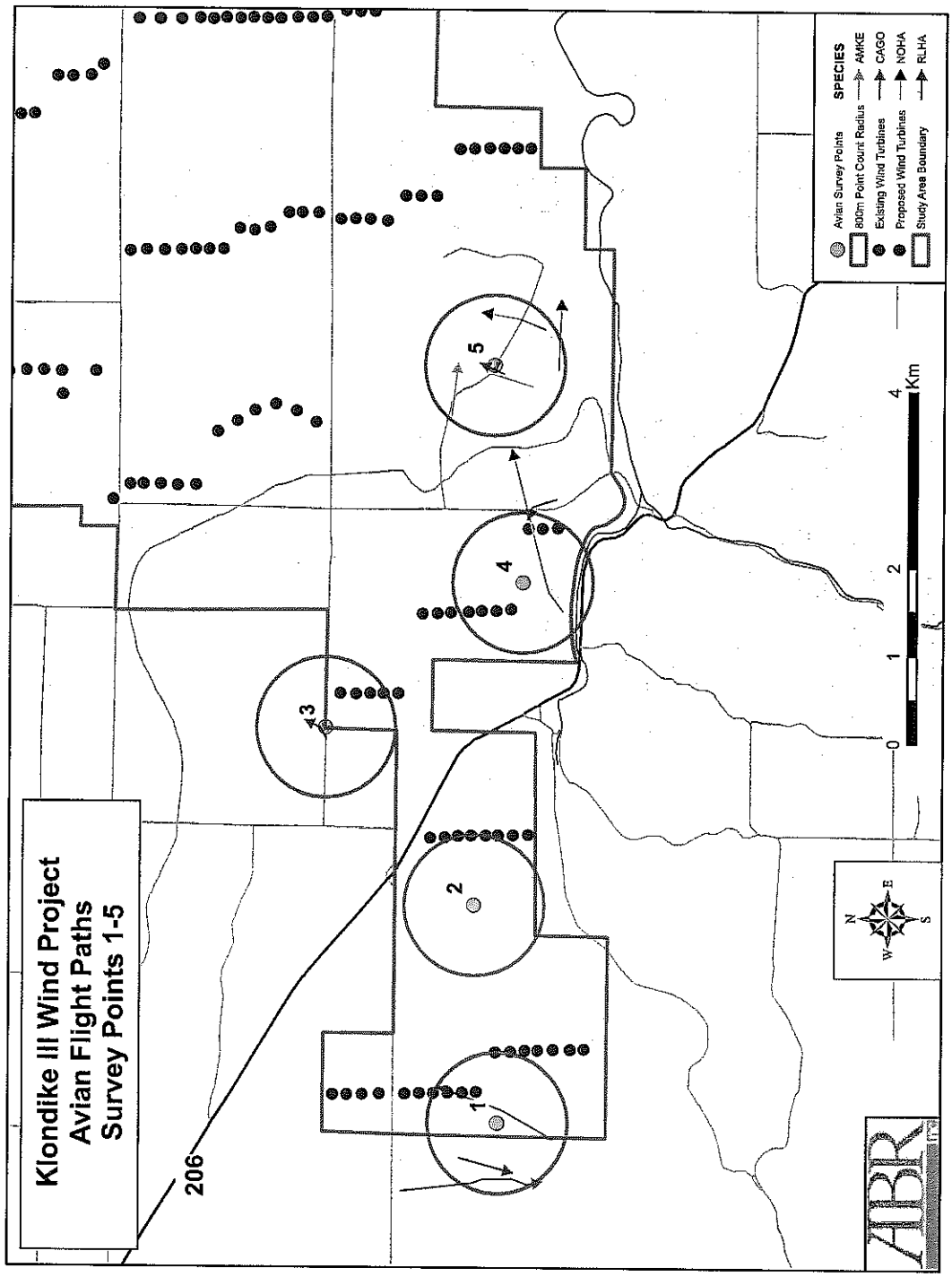

Figure 8. Avian flight paths observed on Survey Points 1–5 of the Klondike III Wind Project, Oregon, during winter (04 November–16 February 2005). Species codes are as follows: AMKE = American Kestrel, CAGO = Canada Goose, NOHA = Northern Harrier, RLHA = Rough-legged Hawk.

Raptor use this winter at the Klondike III Wind Project was low relative to winter use documented at other regional projects. Johnson et al. (2002) standardized several regional studies for 20 min point counts during the winter season, and our current estimate (0.13) is low relative to other studies: Vansycle, OR (0.78); Klondike (0.49; 2002 data); Stateline, WA/OR (0.42); Nine Canyon, WA (0.31); and Foote Creek Rim, WY (0.21). Exposure indices were low for all raptors, and even though Rough-legged Hawks had the highest value (0.020), they may have lower than expected levels of fatalities because only one fatality has occurred at a newer generation wind projects (Condon Wind Project, OR; Fishman 2003).

PASSERINES

Concern for passerine collisions is also warranted at wind power projects, because as a whole, passerines have incurred the most fatalities at several wind plants, often comprising > 80% of the fatalities (Johnson et al. 2002, Erickson et al. 2001). A review of avian fatalities at eight new generation projects in the West and Midwest (Stateline, OR/WA; Vansycle, OR; Klondike, OR; Nine Canyon, WA; Foote Creek, WY; Ponnequin, CO; Buffalo Ridge, MN; Wisconsin) showed that most fatalities are of Horned Lark (29.6%), followed by sparrows (13.8%), warblers (9.2%), upland game birds (8.8%), and ~<5% for other groups of birds (Erickson et al. 2004). Overall fatality rates for birds (most presumably passerines) in the US (Vansycle, OR; Klondike, OR; Nine Canyon, WA; Foote Creek, WY; Buffalo Ridge, MN; Wisconsin; Buffalo Mountain, TN; Mountaineer, WV) was ~ 3 fatalities/MW/yr (excluding older generation sites in CA; Erickson et al. 2004). One eastern US site (Buffalo Mountain, TN) had unusually high fatality rates (~11 fatalities/MW/yr; Erickson et al. 2004).

Passerines numerically dominated avian use at the Klondike III Wind Project, and Horned Lark was the dominant species. Horned Larks were numerous during winter—a time of the year when they aggregate into mobile flocks of foraging birds. During winter, mean use was 30.48 birds/point count compared to 13.65 birds/30 min point count from previous studies at Klondike (Johnson et al. 2002). Mean use by passerines was strongly influenced by two surveys during November where observations of a few large flocks of Horned Larks and Unidentified Blackbirds (700–1,000 individuals/flock) inflated the mean use values. As expected during winter, most (83%) passerines flew below the RSA, whereas a much smaller proportion flew within (16.9%) or above (0.1%) the RSA. Exposure indices were highest for Horned Lark (5.282) and therefore may put this species at the highest risk of collision with proposed wind turbines.

WATERFOWL

Waterfowl fatalities have occurred at several newer generation wind projects, but apparently in very low numbers relative to the use at those sites (Erickson et al. 2002). Waterfowl carcasses composed 11% of the total fatalities (n = 9 total carcasses found) at Ponnequim, CO; 10% of the total fatalities (n = 21) at Wisconsin; 9% of the total fatalities (n = 55) at Buffalo Ridge, MN (Erickson et al. 2002), and 25% of the total fatalities (n = 2) at Klondike (Johnson et al. 2002).

Canada Goose was the dominant species of waterfowl observed in the study area, although numbers were lower than during previous studies. During winter, mean use was 3.79 birds/point count, compared to 17.41 birds/30 min point count from previous studies at Klondike (Johnson et al. 2002). Canada Geese were often observed flying within the RSA (79%), leading to a relatively high exposure index (relative to all species besides Horned Lark). Two Canada Geese carcasses were found during winter 2002 at Klondike (as part of a year-long study; Johnson et al. 2002), and two carcasses were found during three years of fatality monitoring at Stateline Wind Project (Erickson et al. 2004). The relatively high exposure index for Canada Geese and history of goose mortality at this project and other regional wind projects suggest that small numbers of collisions of Canada Geese could occur at the Klondike III Wind Project.

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APPENDIX Q-2

Results of USFWS Database Search

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
Phone: (503) 231-6179 FAX: (503) 231-6195

Reply To: 8330.SP01(05)
File Name: Sp0152.wpd
TS Number: 05-0918

Phil Rickus
David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon 97201

JAN 2 8 2005

Subject: Klondike III Wind Power Project
USFWS Reference # 1-7-05-SP-0152

Dear Mr. Rickus:

This is in response to your Species List Request Form, dated January 7, 2005, requesting information on listed and proposed endangered and threatened species that may be present within the area of the Klondike III Wind Power Project in Sherman County. The Fish and Wildlife Service (Service) received your correspondence on January 7, 2005.

We have attached a list (Enclosure A) of threatened and endangered species that may occur within the area of the Klondike III Wind Power Project. The list fulfills the requirement of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Bonneville Power Administration (BPA) requirements under the Act are outlined in Enclosure B.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems on which they depend may be conserved. Under section 7(a)(1) and 7(a)(2) of the Act and pursuant to 50 CFR 402 *et seq.*, BPA is required to utilize their authorities to carry out programs which further species conservation and to determine whether projects may affect threatened and endangered species, and/or critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) which are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA) (42 U.S.C. 4332 (2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to the Biological Assessment be prepared to determine whether they may affect listed and proposed species. Recommended contents of a Biological Assessment are described in Enclosure B, as well as 50 CFR 402.12.

If BPA determines, based on the Biological Assessment or evaluation, that threatened and endangered species and/or critical habitat may be affected by the project, BPA is required to consult with the Service following the requirements of 50 CFR 402 which implement the Act.

Enclosure A includes a list of candidate species under review for listing. The list reflects changes to the candidate species list published May 4, 2004, in the Federal Register (Vol. 69, No. 86, 24876) and the addition of "species of concern." Candidate species have no protection under the Act but are included for consideration as it is possible candidates could be listed prior to project completion. Species of concern are those taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed.

If a proposed project may affect only candidate species or species of concern, BPA is not required to perform a Biological Assessment or evaluation or consult with the Service. However, the Service recommends addressing potential impacts to these species in order to prevent future conflicts. Therefore, if early evaluation of the project indicates that it is likely to adversely impact a candidate species or species of concern, BPA may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. The Service encourages BPA to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact Kevin Maurice or Corissa Larvik at (503) 231-6179. All correspondence should include the above referenced file number. For questions regarding salmon and steelhead trout, please contact NOAA Fisheries Service, 525 NE Oregon Street, Suite 500, Portland, Oregon 97232, (503) 230-5400.

Sincerely,

KJ Maurice

for Kemper M. McMaster
State Supervisor

Enclosures
1-7-05-SP-0152

cc electronic:
Nongame, Oregon Department of Fish and Wildlife, Salem, Oregon.

Enclosure A

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, CANDIDATE SPECIES AND SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE AREA OF THE KLONDIKE III WIND POWER PROJECT
1-7-05-SP-0152

LISTED SPECIES[1/]

Birds		
Bald eagle[2/]	*Haliaeetus leucocephalus*	T
Fish		
Steelhead (Middle Columbia River)[3/]	*Oncorhynchus mykiss*	**T
Steelhead (Snake River Basin)[4/]	*Oncorhynchus mykiss*	** T
Steelhead (Upper Columbia River)[4/]	*Oncorhynchus mykiss*	** E
Sockeye salmon Salmon River tributary to the Snake River, Idaho.	*Oncorhynchus nerka*	CH **E
Chinook salmon Snake River spring/summer runs	*Oncorhynchus tshawytscha*	CH **T
Chinook salmon Snake River fall runs	*Oncorhynchus tshawytscha*	CH **T
Chinook salmon (Upper Columbia River)[5/]	*Oncorhynchus tshawytscha*	** E

PROPOSED SPECIES

None

CANDIDATE SPECIES[6/]

Birds	
Yellow-billed cuckoo[7/]	*Coccyzus americanus*

SPECIES OF CONCERN

Mammals	
Pale western big-eared bat	*Corynorhinus townsendii pallescens*
Silver-haired bat	*Lasionycteris noctivagans*
Small-footed myotis (bat)	*Myotis ciliolabrum*
Long-eared myotis (bat)	*Myotis evotis*
Long-legged myotis (bat)	*Myotis volans*
Yuma myotis (bat)	*Myotis yumanensis*
California bighorn	*Ovis canadensis californiana*
Birds	
Western burrowing owl	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Willow flycatcher	*Empidonax trailli adastus*
Yellow-breasted chat	*Icteria virens*
Lewis's woodpecker	*Melanerpes lewis*

Amphibians and Reptiles	
Northern sagebrush lizard	*Sceloporus graciosus graciosus*
Fish	
Pacific lamprey	*Lampetra tridentata*
Interior redband trout	*Oncorhynchus mykiss gibbsi*
Invertebrates	
California floater (mussel)	*Anodonta californiensis*
Minor Pacific sideband (snail)	*Monadenia fidelis minor*
Plants	
Disappearing monkeyflower	*Mimulus evanescens*
Little mousetail	*Myosurus minimus apus*

(E) - Listed Endangered *(T) - Listed Threatened* *(CH) - Critical Habitat has been designated for this species*
(PE) - Proposed Endangered *(PT) - Proposed Threatened* *(PCH) - Critical Habitat has been proposed for this species*
(S) - Suspected *(D) - Documented*

Species of Concern - Taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed.

** *Consultation with National Marine Fisheries Service may be required.*

1/ *U. S. Department of Interior, Fish and Wildlife Service, October 31, 2000, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12*
2/ *Federal Register Vol. 60, No. 133, July 12, 1995 - Final Rule - Bald Eagle*
3/ *Federal Register Vol. 64, No. 57, March 25, 1999, Final Rule - Middle Columbia and Upper Willamette River Steelhead*
4/ *Federal Register Vol. 62, No. 159, August 18, 1997, Final Rule-Upper Columbia and Snake River Steelhead*
5/ *Federal Register Vol. 64, No. 56, March 24, 1999, Final Rule - West Coast Chinook Salmon*
6/ *Federal Register Vol. 69, No. 86, May 4, 2004, Notice of Review - Candidate or Proposed Animals and Plants*
7/ *Federal Register Vol. 66, No. 143, July 25, 2001, 12-Month Finding for a Petition To List the Yellow-billed Cuckoo*

ATTACHMENT B

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTION 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7(a)-Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c)-Biological Assessment for Major Construction Projects[1]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify proposed and/or listed species which are/is likely to be affected by a construction project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

---

[1]A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332. (2)c). On projects other that construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

APPENDIX Q-3

Rare Plant Technical Report

EAGLE CAP
CONSULTING

An Investigation of Rare Plant Resources Associated with the Proposed Klondike III Wind Project, Sherman County, Oregon

Prepared for:
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2100 SW River Parkway
Portland, Oregon 97201

Prepared by:
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4130 SW 117th, #148
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Technical Report

March 22, 2005

TABLE OF CONTENTS

TABLE OF CONTENTS I

LIST OF TABLES III

LIST OF FIGURES III

LIST OF APPENDICES III

ABREVIATIONS AND ACRONYMS IV

1. INTRODUCTION 1

1.1 PROJECT OVERVIEW 1

1.2 LOCATION 1

1.3 STUDY OVERVIEW 1

2. EXISTING CONDITIONS 2

2.1 GEOLOGY, PHYSIOGRAPHY AND SOILS 2

2.2 CLIMATE 2

2.3 VEGETATION 3

2.4 LAND USE 3

3. METHODS 3

3.1 AREA ADDRESSED 3

3.2 TARGET SPECIES 4

3.3 PREFIELD REVIEW 4

3.4 FIELD INVESTIGATION 5

4. RESULTS 6

4.1 PREFIELD REVIEW 6

4.2 FIELD INVESTIGATION 8

5. DISCUSSION 8

5.1 SURVEY TIMING AND COVERAGE 8

5.2 TARGET PLANT SPECIES WITHIN THE RARE PLANT SURVEY AREA 8

5.3 POTENTIAL PROJECT IMPACTS TO TARGET PLANT SPECIES 8

5.4 SIGNIFICANCE OF IMPACTS 8

6. RECOMMENDED MITIGATION MEASURES 9

7. LIST OF PREPARERS 9

REFERENCES 11

TABLES 13

FIGURES 15

APPENDICES 17

LIST OF TABLES

TABLE 1: RARE PLANT SPECIES WITH POTENTIAL FOR OCCURRENCE IN THE KLONDIKE III WIND POWER ANALYSIS AREA 13

LIST OF FIGURES

FIGURE 1: KLONDIKE III WIND PROJECT MAP 16

LIST OF APPENDICES

APPENDIX 1: SAMPLE RARE PLANT OCCURRENCE DATA SHEET

ABREVIATIONS AND ACRONYMS

aMW	Average Megawatt(s)
BPA	Bonneville Power Administration
CRP	Conservation Reserve Program
ECCI	Eagle Cap Consulting Inc.
EIS	Environmental Impact Statement
EFSC	Oregon Energy Facility Siting Council
EO	Element Occurrence
F	Fahrenheit
GIS	Geographic Information System
GPS	Geographic Positioning System
kV	Kilovolt(s)
MW	Megawatt(s)
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
ODA	Oregon Department of Agriculture
ORNHIC	Oregon Natural Heritage Information Center
USFWS	US Fish and Wildlife Service
WNHP	Washington Natural Heritage Program
WRCC	Western Regional Climate Center

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Klondike Wind Power III LLC (applicant) proposes to construct an approximately 273 megawatt (MW) wind generation project in Sherman County, Oregon. The proposed project would be an expansion of the Klondike I (24 MW) and II (75 MW) wind generating projects located on adjacent lands. The project would provide up to 273 MW of capacity, and approximately 91 average megawatts (aMW) of energy. The project would be constructed on privately-owned land and would be connected to the regional transmission grid at the Bonneville Power Administration's (BPA) proposed substation on Klondike Lane.

All project facilities would be located on private agricultural land upon which the applicant has negotiated long-term wind energy leases with the landowners. The wind energy leases allow for the applicant to permit, construct, and operate wind energy facilities for a defined period. The terms of the wind energy leases allow landowners to continue their farming operations in and around the wind turbine generators and other facilities where the farming activities do not impact the operation and maintenance of the wind generation equipment. Figure 1 shows the area currently under lease agreements for the project (the lease area).

The new proposed transmission line and supporting facilities will be reviewed under the National Environmental Policy Act (NEPA) standards, including a project-specific Environmental Impact Statement (EIS), with a Record of Decision anticipated by BPA in early 2006. Construction of the project, transmission line, and supporting facilities is planned to commence in the second quarter of 2006 with a commercial operation date in December 2006.

1.2 LOCATION

The Klondike III lease area is located in rural northeast Sherman County. At its closest, it is roughly one mile west of the John Day River, approximately five miles south of the Columbia River, and twelve miles east of the Deschutes River. Grass Valley Canyon, which contains an intermittent tributary to the John Day River, extends along the southern edge of the lease area. The lease area is located approximately seven miles east of Wasco, Oregon.

1.3 STUDY OVERVIEW

As part of the application process, the applicant is required to conduct studies to analyze potential impacts that the project may have on environmental resources. One of these studies is an investigation of rare plant resources designed to evaluate potential project effects (if any) on rare plant species. The prefield review phase of this investigation is complete, and field surveys are planned for the spring and possibly summer of 2005. This preliminary report documents the

methods and results of the prefield review, as well as describing the methods that will be used for the field surveys and subsequent data analysis.

2. EXISTING CONDITIONS

2.1 GEOLOGY, PHYSIOGRAPHY AND SOILS

The proposed project would be located in the Deschutes-Columbia Plateau physiographic province. This province is a north-sloping, volcanic plateau that measures over 60,000 square miles in Oregon, Washington, and Idaho. Volcanic rocks mapped as Columbia River Basalt Group underlie nearly all of the province. These rocks are middle Miocene in age (around 6 to 17 million years old) and principally consist of basalt that erupted from vents in central and northeast Oregon, southeast Washington, and Idaho, and flowed westward to the Pacific Ocean (Beeson *et al.* 1989). In late Pleistocene time, a surficial layer of wind-derived, fine-grained sediment referred to as "loess" was deposited in the province along the Columbia River drainage. Arid-land processes have also locally formed light-colored layers of calcium carbonate, known as "caliche" in the near surface loess soils.

Elevations range from 170 feet above mean sea level along the Columbia River at the northern edge of the county, to 3,000 feet in the southern part of the county (Orr *et al.* 1992). Topography within the lease area is typified by gently rolling to level ground located along the high plateau. Areas of steep slopes are confined to portions of the northeast and southern margins of the site. These slopes drop rapidly from the high and relatively level plateau down to the stream in Grass Valley Canyon, as well as several other unnamed intermittent streams which border the lease area. Elevations along the plateau range between approximately 1,250 feet to 1,500 feet. Elevations drop to roughly 1,000 feet in project portions of Grass Valley Canyon.

2.2 CLIMATE

Located on the eastern side of the Cascade Mountains, the lease area predominantly exhibits the continental climate of the Intermountain Region (*i.e.* extreme temperatures and low rainfall) (Orr *et al.* 1992). However, the Columbia River Gorge provides a passageway for the normal eastward migration of ocean-conditioned air masses from the Pacific. These currents usually lead to shorter hot or cool periods than those typical of the Intermountain Region. For the period from 1928 to 2004, mean minimum and maximum temperatures for the month of January, the coldest month of the year, were 23.9 and 37.5° Fahrenheit (F) respectively, as measured at Moro, Oregon (WRCC 2005). For the month of July, the warmest month of the year, mean minimum and maximum temperatures were 53.6 and 83.2°F respectively. Most of the annual rainfall in Sherman County occurs between November and March, reflecting the strong influence of marine air masses entering from the Pacific Ocean. Mean monthly precipitation at the Moro station ranges from 0.22 inches in July to 1.64 inches in January, for a total mean annual precipitation of 11.27 inches (WRCC 2005). Snowfall is typically light with an average annual snowfall at Moro of 20.1 inches (WRCC 2005).

2.3 VEGETATION

The Columbia Basin Ecoregion (where the project would be located) is characterized by steppe and shrub-steppe vegetation types, but these have often been modified heavily by human activities (Kagen *et al.* 1999). In general, shrub-steppe vegetation (where shrubs and bunchgrasses co-dominate) occurs in the middle of the ecoregion, while steppe vegetation (where bunchgrasses dominate) occurs around the eastern rim of the ecoregion (Franklin and Dyrness 1988, Daubenmire 1970).

Historical land cover maps from the Oregon Gap Analysis Program place the lease area within the 'Perennial Bunchgrass' type (Kagen *et al.* 1999). However, the program's Current Land Cover maps show the lease area to be primarily composed of the agricultural type, with minor inclusions of shrub cover types.

The above descriptions of generalized vegetation zones and associations are based on climax communities, which typically develop over time in the absence of anthropogenic disturbance. Within the lease area (as in most of the steppe and shrub-steppe regions) many of the plant communities have been significantly modified due to numerous disturbance factors. The vast majority of the ground is under dry land wheat production. Very little acreage of native plant communities remain within the lease area, occurring predominantly along the plateau margins and steep side slopes of Grass Valley Canyon. These communities consist of sagebrush and rabbitbrush dominated shrub lands and native bunchgrass grasslands, each with varying degrees of invasive species present. Agricultural areas that are enrolled under the Conservation Reserve Program (CRP) are located throughout the lease area, occurring as narrow strips in previously plowed drainageways, and as large blocks in other areas. CRP areas have been planted with a mix of native and non-native bunch grasses with the primary intent of increasing wildlife habitat in the area.

2.4 LAND USE

Agriculture, particularly dry land wheat, is the predominant land use. However, there are very few residential dwellings and agriculture related structures within the lease area. In addition, limited recreational use of the private lands may occur.

3. METHODS

3.1 AREA ADDRESSED

The proposed rare plant survey area is designed to take in all ground potentially disturbed by the project. For the purposes of the rare plant investigation, the rare plant survey area includes all lands within at least 150 feet of the centerline of all linear proposed facilities. This includes proposed turbine strings, underground and overhead electrical lines, and access roads. In most cases, the resultant survey corridors are 300 feet wide, although in many areas, several project

facilities are proposed to be located along side each other, resulting in a wider survey corridor. For non-linear proposed facilities (staging areas, substation sites, etc.), the entire proposed disturbance footprint of the facility will be surveyed, as well as an additional 150 foot buffer on all sides. The map presented in Figure 1 shows the rare plant survey area which will be considered.

Within the rare plant survey area, however, only those portions that contain potential habitat for the target species will be searched by pedestrian transect. This will include all ground not currently in cultivation, including all grassland and shrubland habitat (both native- and non-native-dominated), as well as all CRP ground. The only areas that will not be traversed on foot within the rare plant survey area are agricultural fields currently planted to monoculture crops (as these areas are not thought to have potential for occurrence of any of the target species). All proposed new or existing access roads likely to be upgraded by the project are included in the survey area.

Although for the purposes of impact analysis, only the rare plant survey area will be considered, a larger area (the analysis area) was addressed during the prefield review in determining which rare plant species had potential for occurrence within the survey area. This was necessary to analyze the project in a regional context, and ensure that the target species list for the investigation was complete. The analysis area takes in all lands within five miles of proposed project facilities.

3.2 TARGET SPECIES

For the rare plant investigation, the target species include all vascular plant taxa listed as 'Endangered', or 'Threatened' by the US Fish and Wildlife Service (USFWS). In addition, taxa that have been formally proposed, or are candidates, for such federal listing are also considered target species. Target species also include all vascular plant taxa defined as 'Endangered', 'Threatened', or 'Candidate' by the Oregon Department of Agriculture (ODA). Finally, taxa contained on lists 1, 2, or 3 of the Oregon Natural Heritage Information Center's (ORNHIC) rare plant lists are also considered target species for this investigation. Taxa meeting the above criteria are being targeted by the investigation to determine their presence or absence within the rare plant survey area. Determinations of status for rare plant species are based on the ORNHIC's list of tracked plant species (ORNHIC 2004, 2003, 2001), and entries published in the US Federal Register.

3.3 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 analysis area. As per Section 7(c)(1) of the US Endangered Species Act of 1973 (16 USC 1531, *et seq.*, as amended), a letter was sent to the USFWS requesting a list of federally Threatened, Endangered, or Proposed taxa which have potential to occur within the analysis area. In addition, the ORNHIC was contacted to obtain element occurrence records for any known rare plant populations in the analysis area. To supplement the information provided by the above agencies, a number of other sources were

consulted. These sources provided additional information on the potential rare plant species for the project, including critical information such as habitat preferences, morphological characteristics, phenologic development timelines, and species ranges. Sources included: taxonomic keys and species guides (Washington Natural Heritage Program [WNHP] 2004, Flora ID Northwest 2001, USFWS 2001, Hickman 1993, Cronquist *et al.* 1977-1997, Hitchcock and Cronquist 1973, Hitchcock *et al.* 1955-1969); online databases of common and rare plant species (USDA 2005, ECCI 2004); environmental permitting documents from previous phases of the project (Johnson 2004, Johnson *et al.* 2002, 2001), and Natural Resources Conservation Service (NRCS) soils data (NRCS 2004).

Using data collected during the prefield review, a list of rare plant species potentially occurring in the analysis area was compiled. Habitat preferences and identification periods were derived from the literature for each potential species. Using this information, along with topographic maps of the lease area, a field survey plan was developed to guide the timing and intensity of the field surveys.

3.4 FIELD INVESTIGATION

As of the date of this report, surveys had not been performed within the rare plant survey area. These surveys are planned, however, for late April/early May of 2005, when the majority of the target species will be identifiable in the field. In addition, a summer survey may also be performed in riparian areas if needed (however, there are no anticipated impacts to riparian areas so a riparian survey is not planned at this time). As such, the remainder of this section describes the methods to be used during the upcoming field work.

All field work will be performed by the principal investigator and an additional botanist. Both individuals have extensive experience performing rare plant surveys in the region for numerous wind power projects.

It is anticipated that one full search of the rare plant survey area will be performed in late April/early May. This survey will cover the entire rare plant survey area (excepting the currently cultivated fields), and is designed to locate those target species that are identifiable in the spring (which includes all of the upland-associated species of concern). The investigators will survey all ground using an 'intuitive controlled' pedestrian survey pattern. The 'intuitive controlled' pattern is a variable intensity survey protocol designed to cover all ground within a given study area at a level sufficient to locate all occurrences of the identifiable target species. The botanists, working primarily in tandem, will walk each survey corridor, crossing back and forth from one edge of the corridor to the other in a zig-zag pattern. The intensity of the pattern, and the speed at which the surveyors walk, is variable, and depends on the structural complexity of the habitat, the visibility of the target species, and the probability of target species occurrence in a given area. It is anticipated that in some higher-probability, low visibility habitats, a tight grid pattern will need to be walked. Care will be taken to thoroughly search all unique features and any high probability habitats encountered.

As noted above, a second survey may be necessary in mid- to late-summer, if it is determined that riparian areas will be affected by the project (at this time, however, the project is not

anticipated to have any effects on riparian areas). This survey would be needed to determine presence or absence of the target riparian-associated species, many of which are only identifiable in the summer. This survey would be conducted by carefully examining all potentially affected riparian areas (as well as a 150 foot buffer on either side) at the 'complete' survey intensity level. This search pattern strives to visually cover all ground within the search area, typically by walking a tight grid pattern through the riparian zone. No attempt will be made during this survey to cover the intervening upland areas, which would have been examined during the spring survey.

During all the surveys, the investigators will keep a list of all vascular plants encountered, and make informal collections of unknown species for later identification in the laboratory. *Vascular Plants of the Pacific Northwest* (Hitchcock *et al.* 1955-1969) and *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973) will be used as the primary authorities for vascular plant species identification. Updated taxonomy will be referenced in the NRCS PLANTS database (which also serves as the source for the common plant names used in this document) (USDA 2005). Notes will also be recorded regarding plant associations, land use patterns, unusual habitats, etc.

Should target plant occurrences be found, data would be collected regarding occurrence size, location, associated habitat, and a number of other parameters, using a standard element occurrence form (Appendix 1). Photographs of the occurrence (both close-ups and general habitat shots) would be taken using an Olympus® C-5050 digital camera. The location of the occurrence would be mapped on 7.5" US Geological Survey topographic quadrangle sheets. Garmin® 12-Series Geographic Positioning System (GPS) receivers would be used to record the perimeter of the occurrence for later entry into the project Geographic Information System (GIS).

The entire extent of each occurrence will be mapped, where feasible. However, if the populations are extensive and extend well beyond the edge of the survey corridors, mapping the entire extent will not be undertaken. In these cases, only the part of the population that occurs within the survey corridor will be mapped.

4. RESULTS

4.1 PREFIELD REVIEW

The USFWS Section 7 response letter did not contain any federally endangered, threatened, proposed, or candidate plant species with potential for occurrence in the analysis area (USFWS 2005). However, the USFWS letter did contain two plant 'Species of Concern', which may potentially occur in the analysis area: *Mimulus evanescens* (disappearing monkeyflower) and *Myosurus minimus* ssp. *apus* (little mousetail) (also known as *Myosurus sessilis*). The USFWS's 'Species of Concern' are "...those taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed" (USFWS 2005). These two species were added to the target species list for the project.

The ORNHIC reported eleven element occurrence (EO) records for six different tracked plant taxa in the analysis area (although none were within the rare plant survey area itself) (ORNHIC 2005). The five occurrences are described below:

- *Artemisia campestris* ssp. *borealis* var. *wormskioldii* (field sagewort) - Two EOs: The first EO is an historical occurrence, which was last seen in 1941. The species is believed to be extirpated from the state. The site is located along the Columbia River, approximately two miles west of Rufus, Oregon. The site is over 1.5 miles away from the proposed BPA substation on Klondike Lane (at the terminus of the project transmission line), and over ten miles away from the nearest proposed project turbine location. The second EO is also historical, last seen in 1932 at the mouth of John Day River. This site is over eight miles away from the nearest proposed turbine location.

- *Heliotropium curassavicum* (salt heliotrope) - One EO: This occurrence is based on an herbarium collection for which no collection date was given. Although site locational data is not exact for this occurrence, it is believed to be located near the town of Moro, over five miles away from the nearest proposed project turbine.

- *Astragalus collinus* var. *laurentii* (Laurent's milkvetch) - Two EOs: Both EOs are historical occurrences based on herbarium collections from 1950. The first site is located along the John Day River, approximately three miles from the nearest proposed project turbine. The second EO site is also located along the John Day River approximately six miles from the nearest project turbine location.

- *Mimulus jungermannioides* (liverwort monkeyflower) - Four EOs: All four EOs are recent populations (last visited in 1986 through 1998). They are all located either along the John Day River, or near the Columbia River.

- *Mimulus evanescens* (disappearing monkeyflower) - One EO: This is an historical occurrence based on a number of undated herbarium collections. The locational data is imprecise, but the site directions place it somewhere in the vicinity of Cottonwood Canyon. The site would therefore be at least 3.5 miles from the nearest proposed project turbine.

- *Allium robinsonii* (Robinson's onion) - One EO: This is an historical occurrence based on an herbarium record from 1942. The EO is located along the Columbia River near the mouth of the John Day River.

The final list of rare plant species thought to have potential for occurrence within the Klondike III Wind Power analysis area is presented in Table 1. It includes all of the species discussed in this section, as well as a number of others which were suggested by additional contacts and references consulted during the prefield review (see Section 3.3 for a list of references consulted). Although rare plant species other than those listed in Table 1 are not thought to have potential for occurrence within the analysis area, all rare plant species known, or suspected, to occur in Oregon will be considered during the field survey. The species listed in Table 1, however, will receive the most focus during the investigation.

4.2 FIELD INVESTIGATION

As noted above, the rare plant field surveys have not yet been performed for the project. When these surveys are complete (in the spring or summer of 2005), the results will be fully documented in an amendment to this report.

5. DISCUSSION

5.1 SURVEY TIMING AND COVERAGE

The timing of the proposed late April/early May, 2005 survey is thought to be sufficient to allow for location and identification of all of the target species within the upland habitats. All of these upland target species will presumably be identifiable when the spring survey is conducted. This assumption is based on the typical flowering times for these species, and observed phenological development of the other plant species in the region.

The spring survey will occur too early to identify all of the riparian-associated target species (which typically are only identifiable in mid- to late-summer). However, no riparian impacts from the project are anticipated at this time, and it is not expected that a late summer survey will be needed.

5.2 TARGET PLANT SPECIES WITHIN THE RARE PLANT SURVEY AREA

There are currently no known rare plant occurrences within the rare plant survey area. However, as site specific surveys have not yet been performed, the absence of rare plant populations cannot be confirmed at this time. Given the poor quality of most of the habitats at the site (primarily cultivated or in CRP), it is unlikely that the surveys will locate any target plant species.

5.3 POTENTIAL PROJECT IMPACTS TO TARGET PLANT SPECIES

If, as assumed, the field surveys do not locate any populations of target plant species, no direct project-related impacts would be anticipated to any federally Endangered, Threatened, Proposed, or Candidate plant species. Likewise, no direct project-related impacts would be predicted for any ODA Endangered, Threatened, or Candidate plant species.

In the event that the field surveys do locate target plant species within the rare plant survey area, the above impact assessment will be modified to reflect the additional data.

5.4 SIGNIFICANCE OF IMPACTS

If the field surveys do not locate any target plant species, the proposed project would have no effect on federally listed, proposed or candidate plant species. Likewise, the project would not

adversely impact designated critical habitat for such species. No ODA Endangered, Threatened, or Candidate plant species would be affected by the project, nor would recovery efforts for these species be adversely impacted.

6. RECOMMENDED MITIGATION MEASURES

Because no direct project-related impacts to any federal or state Endangered, Threatened, Sensitive, Proposed, or Candidate plant species are anticipated, no species-specific mitigation measures are proposed at this time. Should the field surveys locate target plant populations, species-specific mitigations may be recommended in the amendment to this document. However, at this time, several general measures are recommended to mitigate possible indirect effects to other species of concern (if any) potentially in the vicinity, outside of the survey corridors.

1. Because noxious weeds can have numerous detrimental effects on native plant populations, measures should be implemented to control the introduction and spread of undesirable plants during and after construction. Noxious weed control measures may include: quickly revegetating habitats temporarily disturbed during construction, and actively controlling noxious weeds that have established themselves as a result of the project. Prior to construction, a noxious weed control plan should be developed, and the plan should be implemented over the life of the project.

2. Indirect project-related impacts to plant species of concern may also occur as a result of changes in fire frequency patterns in the area. Project access roads can act as fire breaks, thereby decreasing the size of a wildfire. Likewise, the project roads may allow fire crews to access small fires faster, and more effectively fight larger fires. Conversely, project operation and maintenance activities have the potential to ignite wildfires if precautions are not taken. Because it is not clear if these effects would have a positive or negative effect on native plants in the vicinity, the most prudent course of action would be to implement measures to maintain existing fire frequency patterns. While certain factors are out of the control of the applicant, steps can be taken to minimize the risk of wildfire during both the construction and operation phases of the project. A comprehensive fire control plan should be developed prior to construction, and implemented project-wide over the life of the project. The fire control plan should take into account the dry nature of the region, and address risks on a seasonal basis.

7. LIST OF PREPARERS

- Randall S. Krichbaum, Project Manager, Eagle Cap Consulting Inc. (Principal author)
- Margaret A. Horvath, Biologist/GIS Technician, Eagle Cap Consulting Inc.

In addition, paragraphs relating to the project description and site conditions have been provided by David Evans & Associates. They are included in this document, with only slight modifications.

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TABLES

Table 1: Rare Plant Species with Potential for Occurrence in the Klondike III Wind Power Analysis Area

Name	Status[1]	Habitat	ID Period
Achnatherum hendersonii **Henderson's needlegrass**	USFWS: SC ODA: C TNC: G3/S2 ORNHIC: 1	Dry, rocky, shallow soil, in sagebrush or ponderosa pine	May-June
Allium robinsonii **Robinson's onion**	USFWS: SC TNC: G3/SH ORNHIC: 2-ex	Sandy/gravely soils along the Columbia river and lower benches	Apr-May
Ammannia robusta **grand redstem**	TNC: G5/SNR ORNHIC: 3	Wet places, drying ponds, and ditch margins	
Artemisia campestris ssp. *borealis* var. *wormskioldii* **field sagewort**	USFWS: C ODA: LE TNC: G5T1/SX ORNHIC: 1-ex	Basaltic, cobbly, or sandy shrub-steppe along the Columbia River	Apr-May
Astragalus collinus var. *laurentii* **Laurent's milkvetch**	USFWS: SC ODA: LT TNC: G5T1/S1 ORNHIC: 1	Basaltic grassland and sagebrush desert	May-June
Astragalus reventiformis **Yakima milkvetch**	TNC: G5/SNR ORNHIC: 3	Sagebrush desert, stony flats, hilltops, grassy hillsides, and ponderosa pine forests	Apr-June
Camissonia pygmaea **dwarf suncup**	USFWS: SC ODA: C TNC: G3/S1 ORNHIC: 1	Unstable soil or gravel, steep talus, dry washes, banks, and roadcuts in sagebrush-steppe	May-Aug
Carex hystericina **bottlebrush sedge**	TNC: G5/S2 ORNHIC: 2	Wet ground near streams	May-June
Cryptantha leucophaea **gray cryptantha**	TNC: G2G3/SH ORNHIC: 2-ex	Dry sagebrush/grassland plains; sandy soils	May-June
Escobaria vivipara var. *vivipara* **spinystar**	TNC: G5T4/S1 ORNHIC: 2	Desert valleys and hills	May-June
Heliotropium curvassavicum **salt heliotrope**	TNC: G5/S2 ORNHIC: 2	Saline places at low elevations; dried ponds	June-Sept
Lesquerella douglasii **Douglas' bladderpod**	TNC: G4?/SNR ORNHIC: 3	Sagebrush desert and ponderosa pine forest	Mar-July
Lomatium watsonii **Watson's desertparsley**	TNC: G4/S1 ORNHIC: 2	Open hillsides, often with sagebrush	May

Mimulus evanescens **disappearing monkeyflower**	USFWS: SC ODA: C TNC: G2S2 ORNHIC: 1	Seasonally moist areas in and near sagebrush plant communities	May-Sept
Mimulus jungermannioides **liverwort monkeyflower**	ODA: C TNC: G2/S2 ORNHIC: 1	Shaded seeps along cliffs	Apr-June
Myosurus sessilis **vernal pool mousetail**	USFWS: SC ODA: C TNC: G2S1 ORNHIC: 1	Vernal pools, alkali flats, and grasslands	Apr-May
Navarretia leucocephala **whitehead navarretia**	TNC: G5/SNR ORNHIC: 3	Vernal pools and margins of ponds	July
Penstemon deustus var. *variabilis* **scabland penstemon**	TNC: G5T1T2/SNR ORNHIC: 3	Dry foothills and lowlands	May-July

Nomenclature follows the USDA - PLANTS database (USDA 2005)

[1]**Status:**

USFWS=US Fish and Wildlife Service Status
- LE: Listed Endangered
- LT: Listed Threatened
- C: Candidate for listing
- SC: Species of Concern (Former C1 candidate species recently removed from consideration)

ODA=Oregon Department of Agriculture Status
- LE: Listed Endangered
- LT: Listed Threatened
- C: Candidate for listing

TNC=The Nature Conservancy Ranking (ranked on a rarity scale of 1[few] to 5 [abundant])
- G: Global distribution
- T: Trinomial distribution (*i.e.* distribution of subspecies or variety)
- S: State distribution
- Q: Indicates taxonomic questions exist regarding this species, variety or subspecies
- H: Indicates species represented by a historical occurrence which has not recently been verified
- X: Presumed extirpated or extinct
- NR: Not ranked yet

ORNHIC=Oregon Natural Heritage Information Center Status
- 1: Taxa which are endangered or threatened throughout their range
- 2: Taxa which are threatened, endangered or extirpated from Oregon but are stable elsewhere
- 3: Taxa for which addition information is needed before status can be determined
- 4: Taxa which are not currently threatened, but may require monitoring
- ex: Presumed extirpated from Oregon
- X: Presumed extinct

FIGURES

EXHIBIT Q

THREATENED AND ENDANGERED SPECIES
OAR 345-021-0010(1)(q) and OAR 345-022-0070

TABLE OF CONTENTS

Page

Q.1 INTRODUCTION 1

Q.2 ANALYSIS AREA 3

Q.2.1 Description of Analysis Area 4

Q.2.2 Description of Project Vicinity 4

Q.3 METHODOLOGY 5

Q.3.1 General 5

Q.3.2 Wildlife 5

Q.3.3 Plants 6

Q.4 EXISTING CONDITIONS AND POTENTIAL IMPACTS TO STATE AND FEDERAL LISTED, CANDIDATE AND PROPOSED SPECIES 6

Q.4.1 Wildlife 7

Q.4.2 Plants 9

Q.5 DESCRIPTION OF MEASURES PROPOSED TO AVOID OR REDUCE ADVERSE IMPACTS TO SPECIES 10

Q.5.1 Wildlife 10

Q.5.2 Plants 10

Q.6 FINDINGS THAT THE PROPOSED FACILITY WILL NOT LIKELY CAUSE A SIGNIFICANT REDUCTION IN THE LIKELIHOOD OF SURVIVAL OR RECOVERY OF THE PLANT SPECIES IDENTIFIED 11

Q.6.1 Identified Plant Species with an ODA protection and conservation program 11

Q.6.2 Identified Plant Species without an ODA protection and conservation program 12

Q.7 FINDINGS THAT THE PROPOSED FACILITY WILL NOT LIKELY CAUSE A SIGNIFICANT REDUCTION IN THE LIKELIHOOD OF SURVIVAL OR RECOVERY OF THE FISH AND WILDLIFE SPECIES IDENTIFIED 12

Q.8 MONITORING PROGRAM 12

Q.9 CONCLUSION 12

Q.10 REFERENCES 14

Q.10.1 Documents and Websites 14
Q.10.2 Personal Communications 17
Q.10.3 Written Correspondence 17

TABLE

Table Q- 1. State and Federal Listed, Candidate, and Proposed Species with the Potential to Occur Within the Analysis Area of the Klondike III Wind Project 1

APPENDICES

Q-1 THREATENED AND ENDANGERED SPECIES ANALYSIS AREA - MAP
Q-2 RESULTS OF USFWS DATABASE SEARCH
Q-3 ECCI RARE PLANT TECHNICAL REPORT
Q-4 RESUMES OF PLANT SURVEYORS
Q-5 LETTER FROM JOHN WHITE, OREGON OFFICE OF ENERGY, FEBRUARY 28, 2005
Q-6 FINAL BIOLOGICAL PROTOCOL

Q.1 INTRODUCTION

OAR 345-021-0010(1)(q) *Information about threatened and endangered plant and animal species that may be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0070. The applicant shall include:*

Response: The U.S. Fish and Wildlife Service (USFWS) and the Oregon Natural Heritage Information Center (ORNHIC) were queried for information on listed and sensitive species within the 5-mile analysis area. The Oregon Department of Agriculture (ODA) was contacted for information about plant distribution and protection and conservation programs. The Oregon Department of Fish and Wildlife (ODFW) was contacted for information on fish and wildlife habitat requirements and distribution. Federal Species of Concern, State Sensitive species and other non-listed, rare species are addressed in Exhibit P; this Exhibit addresses all state and federal listed, candidate and proposed species. Candidate and proposed species are included in Exhibit Q due to their potential for listing during the project application process.

Based upon the database results received from USFWS (USFWS 2005) and ORNHIC (ORNHIC 2005), as well as additional contacts and references consulted during the prefield review, a total of twelve federal and state listed and candidate plant and wildlife species have the potential to exist within the analysis area. The database results identified three species and six Evolutionarily Significant Units (ESUs) of federal listed, proposed, and candidate anadromous fish that occur within the analysis area, including steelhead (three ESUs), sockeye salmon (one ESU), and chinook salmon (two ESUs). All of the state and federal listed species that will be addressed within this Exhibit are listed in Table Q-1.

Table Q- 1. State and Federal Listed, Candidate, and Proposed Species with the Potential to Occur Within the Analysis Area of the Klondike III Wind Project

Species	Federal Status[1]	State Status[1]	ORNHIC List[2]	Occurrence	Impacts
Birds					
Bald Eagle (*Haliaeetus leucocephalus*)	LT	LT	4	Potential	Potential
Yellow-billed Cuckoo (*Coccyzus americanus*)	C	--	--	No	No
American Peregrine Falcon (*Falco peregrinus anatum*)	--	LE	2	Yes	Potential
Mammals					
Washington Ground Squirrel	C	LE	1	No	No
Fish					
Steelhead – Mid-Columbia River ESU, summer run (*Oncorhynchus mykiss*)	LT	SV	2,3	Yes	No
Steelhead – Snake River Basin ESU	LT	--	2,3	Yes	No

Species	Federal Status[1]	State Status[1]	ORNHIC List[2]	Occurrence	Impacts
Steelhead – Upper Columbia River ESU	LE	--	--	Yes	No
Sockeye Salmon – Salmon River Tributary to the Snake River (*Oncorhynchus nerka*)	LE	--	--	Yes	No
Chinook Salmon – Snake River ESU, spring/summer and fall runs (*Oncorhynchus tshawytscha*)	LT	LT	1	Yes	No
Chinook Salmon – Upper Columbia River ESU	LE	--	--	Yes	No
Plants					
Northern wormwood (*Artemisia campestris* var. *wormskioldii*)	C	LE	1-ex	No	No
Henderson's needlegrass *(Achnatherum hendersonii)*	SOC	C	2	Potential	No
Dwarf suncup *(Camissonia pygmaea)*	SOC	C	1	Potential	No
Vernal pool mousetail *(Myosurus sessilis)*	SOC	C	1	Potential	No
Whitehead navarretia *(Navarretia leucocephala)*	LE	--	--	Potential	No
Laurence's milkvetch (*Astragalus collinus* var. *laurentii*)	SOC	LT	1	Potential	No
Disappearing monkeyflower (*Mimulus evanescens*)	SOC	C	1	Potential	No
Liverwort monkeyflower (*Mimulus jungermannioides*)	SOC	LT	1	Potential	No

[1] **State and Federal Status Definitions**

LE – Listed Endangered. Taxa listed by the USFWS or National Marine Fisheries Service (NMFS) as Endangered under the Endangered Species Act (ESA), or by the Departments of Agriculture (ODA) and Fish and Wildlife (ODFW) of the state of Oregon under the Oregon Endangered Species Act of 1987 (OESA). Endangered taxa are those which are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.

LT – Listed Threatened. Taxa listed by the above agencies as Threatened; defined as those taxa likely to become endangered within the foreseeable future.

PE – Proposed Endangered. Taxa proposed by the above agencies to be listed as endangered.

PT – Proposed Threatened. Taxa proposed by the above agencies to be listed as threatened.

C – Candidate. Candidate taxa for which NMFS or USFWS have sufficient information to support a proposal to list under the ESA, or which is a candidate for listing by the ODA under the OESA.

SoC – Species of Concern. Former Category 2 candidates for which additional information is needed in order to propose as threatened or endangered under the ESA; these species are under review for consideration as Candidates for listing under the ESA.

SC – State Sensitive-Critical. Species for which listing is pending; or those for which listing may be appropriate if immediate conservation activities are not taken. Also considered critical are some peripheral species which are at risk throughout their range, and some disjunct populations.

SV – State Sensitive-Vulnerable. Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

SU – State Sensitive-Undetermined Status. Animals in this category are species whose status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study would be required before a judgment can be made.

[2] **ORNHIC Definitions**

List 1 - Taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 – Taxa threatened with extirpation or presumed extirpated from Oregon; often peripheral or disjunct species which are of concern considering species diversity within Oregon; can be very significant in protecting the genetic diversity of the taxon; ONHP regards extreme rarity as a significant threat and has included species which are very rare in Oregon on this list.

List 3 – Taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 – Taxa which are of conservation concern but not currently threatened or endangered; including taxa that are very rare but considered secure as well as those declining in numbers or habitat but still too common to be proposed as threatened or endangered; these taxa require continued monitoring.

Ex – Presumed extirpated or extinct

There is no suitable habitat for listed fish species within the site boundary and no aquatic habitat will be impacted by project construction or operation (see Exhibit P). There are dry channels located in the project vicinity that may eventually lead to Grass Canyon Creek; however, these channels will not be impacted by the project. The ORNHIC results for the Washington ground squirrel referenced a siting from 1979; however, their range has been dramatically reduced since then and the Washington ground squirrel's current range is limited to areas east of the John Day River (NEDC et al. 2000). The yellow-billed cuckoo and northern wormwood are considered extirpated from the state and are, therefore, not anticipated to occur within the project vicinity. Because there are no anticipated impacts to fish, the Washington ground squirrel, the yellow-billed cuckoo or northern wormwood, these species will not be addressed further within this Exhibit.

The standard also calls for a description of the nature, extent, locations, and timing of each species occurrence in the analysis area and how the facility might adversely affect each listed, proposed or candidate species (OAR 345-021-0010(q)(B)). The descriptions and evaluation of potential impacts on these species are included in Section Q.4. The measures proposed to avoid and/or reduce the potential impacts are presented in Section Q.5. Sections Q.6 and Q.7 document the likelihood of the project causing a significant reduction in the likelihood of survival or recovery of the listed species, and Section Q.8 addresses the proposed monitoring approach.

Q.2 ANALYSIS AREA

This section describes the analysis area with regard to threatened and endangered species. The analysis area for threatened and endangered species is defined as the area within the site boundary and five miles from the site boundary (OAR 345-001-0010(53)(b); letter from John White, Office of Energy [OOE] February 28, 2005, See Appendix Q-5; Final Biological Protocol, February 8, 2005, See Appendix Q-6). For purposes of the Klondike III project, the site boundary is defined as:

- 150 feet from the turbine string center lines. Turbine strings consist of access road, collector system, and turbines, with the turbine defining the center.

- 30 feet from the centerline of existing county roads that will be graveled and/or will contain a portion of the underground collector system. All county roads in the area are within a right-of-way of a minimum of 60 feet.
- 60 feet from the centerline of proposed overhead line and proposed underground collector system not in the road prism.
- Proposed laydown areas.
- Proposed operations and maintenance facility.
- Proposed substation facilities.
- Proposed habitat mitigation area(s).

Q.2.1 Description of Analysis Area

The analysis area for threatened and endangered plants and wildlife is illustrated in Appendix Q-1.

Threatened and endangered wildlife: For threatened and endangered animal species the analysis area is within the site boundary and five miles from the site boundary (OAR 345-001-0010(53)(b); letter from John White, Office of Energy [OOE] February 28, 2005, see Appendix Q-5; Final Biological Protocol, February 8, 2005, see Appendix Q-6). The initial database search was conducted within five miles of the lease boundary. If suitable habitat for threatened and endangered wildlife exists within 1,000 feet of project components, these areas will be surveyed by walking transects.

Threatened and endangered plants: For threatened and endangered plant species the analysis area is within the site boundary and five miles from the site (OAR 345-001-0010(53)(b); letter from John White, Office of Energy [OOE] February 28, 2005, see Appendix Q-5; Final Biological Protocol, February 8, 2005, see Appendix Q-6). An initial database search was conducted within five miles of the lease boundary. (Note that while the Final Biological Protocol originally proposed a database search for all areas within two miles of the lease boundary, upon discussions with John White, Office of Energy, this boundary was expanded to five miles.) The proposed rare plant survey corridors are designed to take in all ground potentially disturbed by the project. If suitable habitat exists (generally non-agricultural), ground surveys will be conducted within 150 feet of the centerline of all linear proposed facilities (which generally results in a 300 foot survey corridor). For non-linear facilities, the entire proposed disturbance footprint will be surveyed, as well as an additional 150 feet on all sides.

Q.2.2 Description of Project Vicinity

The Klondike III project site is located in rural, northeast Sherman County. It is roughly one mile west of the John Day River, at its closest, approximately five miles south of the Columbia River, and twelve miles east of the Deschutes River. Grass Valley, which contains an intermittent tributary to the John Day River, extends along the southern edge of the project site. The nearest population center is Wasco, Oregon, which has a population of 380 (Population Research Center, 2005).

The vast majority of the project vicinity is under dry land wheat production. Very little acreage of native plant communities remain within the project site, occurring predominantly along the plateau margins and steep side slopes of the Grass Valley. These communities consist of sage and rabbit brush dominated shrub lands and native bunchgrass grasslands, each with varying degrees of invasive species present. Agricultural areas that are enrolled under the Conservation Reserve Program (CRP) are located throughout the analysis area, occurring as narrow strips in previously plowed drainageways, and as large blocks in other areas. CRP areas have been planted with a mix of native and non-native bunchgrasses with the primary intent of increasing wildlife habitat in the area.

Q.3 METHODOLOGY

OAR 345-021-0010(q)(A) *Based on appropriate literature and field study, identification of all threatened or endangered species listed under ORS 496.172(2), ORS 564.105(2) or 16 USC § 1533 that may be affected by the proposed facility;*

Response: See sections Q.3.1 through Q 3.3, below.

Q.3.1 General

Letters were written to USFWS and the ORNHIC requesting information on threatened, endangered and sensitive species within the analysis area (i.e., the area within the site boundary and five miles beyond the site boundary). The results of these database searches provide the basis for the species included in this Exhibit (USFWS 2005; ORNHIC 2005). The results of the USFWS database search is included in Appendix Q-2, but the results of the ORNHIC database search is not included because of the sensitivity of the site-specific information.

Field surveys have not yet been conducted for threatened and endangered plants and wildlife, but these surveys are scheduled to be conducted as described in the following section. The results of these surveys will be incorporated into a supplement to this Exhibit and will be provided to OOE, ODFW and ODA for their review and comment.

Q.3.2 Wildlife

Existing literature and scientific data were reviewed and ODFW biologists contacted to determine species distribution and habitat requirements (Anthony et al 1982; Csuti et al 1997; Keith Kohl, ODFW, personal communication). The ORNHIC database and USFWS were queried for documented and projected occurrences of candidate, proposed, and listed species in the analysis area (ORNHIC 2005; USFWS 2005). Field investigations have not yet been conducted. Wildlife surveys are scheduled to be conducted by qualified biologists from mid-April through mid-May 2005 in suitable habitats within the site boundary and within an additional 1,000 feet from the site boundary in those areas within the lease boundary. Areas beyond the lease boundary will be visually evaluated from the closest leased property boundary. Threatened and endangered species' occurrence and wildlife habitats will be investigated during the field visits.

Two raptor nesting surveys will gather information on nesting species visible from the air. These surveys will include information on nest locations and reproductive success in the area. The raptor nesting survey will consist of two helicopter surveys for raptor nests, within a two-mile radius of the proposed lease boundary (as described in the Final Biological Protocol, one in late April or early May and a second in early June). Surveyors will also check for raptor nests during the avian point-count surveys. The initial aerial surveys are intended to document occupancy, while the ground survey is intended to document production. The project site locations and historical raptor sites will be marked on a USGS 7.5 minute quadrangle map before each survey. The area will be systematically searched by helicopter and all suitable nesting areas (e.g., trees and rocky outcrops) will be searched for raptor activity and nests.

Q.3.3 Plants

Eagle Cap Consulting Inc. (ECCI) prepared a Rare Plant Technical Report based upon the results of their pre-field review (ECCI 2005). This report is included as Appendix Q-3. The plant information in this Exhibit is taken from this Technical Report.

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 analysis area. A letter was sent to the USFWS requesting a list of federally Threatened, Endangered, or Proposed taxa which have potential to occur within the analysis area. In addition, the ORNHIC was contacted to obtain element occurrence records for any known rare plant populations within five miles of the lease boundary. To supplement the information provided by the above agencies, a number of other sources were consulted. These sources provided additional information on the potential rare plant species for the project, including critical information such as habitat preferences, morphological characteristics, phenologic development timelines, and species ranges. Sources included: taxonomic keys and species guides (WNHP 2004, Flora ID Northwest 2001, USFWS 2001, Hickman 1993, Cronquist *et al.* 1977-1997, Hitchcock and Cronquist 1973, Hitchcock *et al.* 1955-1969); online databases of common and rare plant species (USDA 2005, ECCI 2004); environmental permitting documents from the previous Klondike I and Klondike II projects (Johnson 2004, Johnson *et al.* 2002, 2001), and Natural Resources Conservation Service (NRCS) soils data (NRCS 2004).

Using data collected during the prefield review, a list of rare plant species potentially occurring in the project area was compiled. 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 (ECCI 2005).

Q.4 EXISTING CONDITIONS AND POTENTIAL IMPACTS TO STATE AND FEDERAL LISTED, CANDIDATE AND PROPOSED SPECIES

OAR 345-021-0010(1)(q)(B) *For each species identified under (A), a description of the nature, extent, locations and timing of its occurrence in the analysis area and how the facility might adversely affect it;*

Response: **Error! Reference source not found.** outlines those fish, wildlife and plant species that are either known to occur or considered to have the potential to occur within the analysis area, based on habitat suitability and information received from the USFWS and ORNHIC. Table Q-1 also addresses the potential occurrence of each species within the analysis area and its potential for impacts from the construction and operation of the proposed project based upon the evaluation of fish and wildlife habitats in the analysis area.

The following section describes the "*...nature, extent, location and timing...*" (OAR 345-021-0010(q)(B) of each of the listed species that has the potential to occur within the analysis area or that may be affected by the proposed project. This section also addresses how the construction and operation of the project might affect these species (OAR 345-021-0010(q)(B). Mitigation for potential impacts is addressed in Section Q.6.

Q.4.1 Wildlife

Q.4.1.1 Bald Eagle - Natural History and Occurrence in Analysis Area

The bald eagle (*Haliaeetus leucocephalus*) is a federal and state listed threatened species. Critical habitat has not been designated for the bald eagle. The three main factors affecting distribution of nests and territories are proximity to water and availability of food; suitable trees for nesting, perching, and roosting; and the number of breeding-aged eagles (Stalmaster et al. 1985). The critical nesting period for the bald eagle is from January 1 to August 15 (USFWS 1986; Stalmaster et al. 1985). Bald eagles do not nest within the analysis area (Keith Kohl, ODFW, personal communication).

Wintering bald eagles concentrate in areas where food is abundant and disturbance is minimal. The birds use perches during the day, which are selected primarily according to their proximity to a food source. Wintering bald eagles may roost communally at night near major foraging areas. Roosts typically are established in isolated areas in old growth stands that have trees taller than the surrounding trees (USFWS 1986). The key wintering period is from November 15 to March 15 (USFWS 1986; Stalmaster et al. 1985). ODFW and other researchers conduct winter raptor surveys within the project vicinity and they have found that bald eagles are feeding on wintering waterfowl and are, therefore, primarily found along the Columbia River corridor. These winter surveys have not noted any bald eagle use of the upland areas within and/or near the site boundary (Keith Kohl, ODFW, personal communication).

The ORNHIC database did not identify any bald eagle nests or roosting areas within the analysis area (ORNHIC 2005) and there are no known communal winter roost sites within the vicinity of the proposed project (Keith Kohl, ODFW, personal communication). Frank Isaacs indicated the closest bald eagle nest is located on Browns Island on the Columbia River, west of the mouth of the Deschutes River (Frank Isaacs, personal communication). This nest is approximately 10 miles from the site boundary.

Q.4.1.2 Peregrine Falcon - Natural History and Occurrence in Analysis Area

The peregrine falcon (*Falco peregrinus anatum*) is a State of Oregon endangered species and has no status under the federal Endangered Species Act because it was removed from the federal list of endangered and threatened wildlife on August 25, 1999 (USFWS 1999). Peregrine falcons are limited to areas that contain suitable nesting ledges. Cliffs and bluffs typically found along river courses and other large bodies of water usually provide habitat for nesting peregrines. Peregrine falcons will also use suitable nesting ledges on man-made structures, such as bridges and buildings. Falcons prefer to nest where the concentration of prey, generally smaller birds, is high and where habitat characteristics may increase prey vulnerability. Much of the prey consists of species the size of pigeons and doves; however, avian prey ranges in size from hummingbirds to Aleutian Canada geese. Peregrine falcon courtship begins soon after the winter solstice. Peregrines lay two to four eggs from mid-February through May, and eggs hatch after an incubation period of 31 to 33 days. The young fledge between 37 and 45 days of age, and the juveniles continue to be fed and protected by the adults until they disperse, which can range from three weeks to three months (J. Pagel, USFS, personal communication).

Peregrine falcons may occur in the analysis area year-round. There are three peregrine falcon eyries in the vicinity of the project; however, none are located within the analysis area. The closest eyrie is approximately 6.5 miles away. All three are located along the south side of the Columbia River corridor (Keith Kohl, ODFW, personal communication). Data on these nests indicate they were active in 2003 and 2004, with all nests fledging young in 2003 and all but one nest fledging young in 2004 (Frank Isaacs, personal communication). Juveniles are generally fledged in June.

The analysis area provides a variety of habitat types, which provides for a diversity of avian prey species. Grain elevators within the project vicinity support pigeon populations and these pigeons are a primary prey item for the peregrines (Keith Kohl, ODFW personal communication). There have been no sightings of peregrine falcon during the avian point-count surveys (Todd Mabee, ABR, personal communication).

Q.4.1.3 Potential Impacts to Bald Eagle and Peregrine Falcon

There are no impacts to bald eagle and a very low risk to peregrine falcon anticipated from the Klondike III Wind Project. In general, raptor mortality at new wind power projects has been low. No raptor fatalities have been observed at the 16-turbine Klondike I Wind Project (Johnson et al. 2003); no raptor mortality was observed at the Vansycle Wind Project in Oregon during a 1-year study (Erickson et al. 2000); one rough-legged hawk carcass was found outside of the study plots established for a 12-month carcass search survey at the Condon Wind Project (84 turbines, 1 met tower) located in eastern

Oregon (Fishman 2003). Raptor mortality estimates from the Stateline Wind Project and the Nine Canyon Wind Project have ranged from 0.05 to 0.07 raptor fatalities per turbine per year, with most fatalities consisting of red-tailed hawks and American kestrels (Erickson et al. 2004). Extremely low risk is anticipated for species only infrequently observed within the site boundaries, such as the peregrine falcon, and an anticipated negligible risk to those species not observed within the site boundaries, such as the bald eagle. The nesting ranges and locations of the peregrine falcon and bald eagle are constantly expanding (Frank Isaacs, personal communication); therefore, the database will be reviewed again should project construction be postponed.

Q.4.2 Plants

Q.4.2.1 Natural History and Potential Occurrence in Analysis Area

Henderson's needlegrass *(Achnatherum hendersonii)*. This species is a federal species of concern and is considered a candidate for listing under the Oregon ESA. It occurs in dry, rocky, shallow soil, in sagebrush or ponderosa pine habitats. There are no records of this species within the project vicinity.

Dwarf suncup *(Camissonia pygmaea)*. This species is a federal species of concern and is considered a candidate for listing under the Oregon ESA. It occurs in unstable soil or gravel, steep talus, dry washes, banks, and roadcuts in sagebrush-steppe. There are currently no records of this species within the project vicinity.

Vernal pool mousetail *(Myosurus sessilis)*. This species is a federal species of concern and is considered a candidate for listing under the Oregon ESA. It occurs in vernal pools, alkali flats, and grasslands. There are currently no records of this species within the project vicinity.

Whitehead navarretia *(Navarretia leucocephala)*. This species is listed as endangered under the federal ESA and currently has no status under the Oregon ESA. It occurs in vernal pools and margins of ponds. There are currently no records of this species within the project vicinity.

Laurence's milkvetch (*Astragalus collinus* var. *laurentii*). This species is a federal species of concern and is listed as threatened under the Oregon ESA. The ORNHIC database lists an occurrence from 1950, which was collected along the John Day River, approximately three miles from the nearest proposed project turbine (ECCI 2005). This species occurs in basaltic grasslands and sagebrush deserts (ECCI 2005).

Disappearing monkeyflower (*Mimulus evanescens*). This species is a federal species of concern and is considered a candidate for listing under the Oregon ESA. The ORNHIC listing is from an historical, undated herbarium collection. The locational data is imprecise, but the site is located somewhere in the vicinity of Cottonwood Canyon in Gilliam County. The site would therefore be at least 3.5 miles from the nearest proposed project turbine (ECCI 2005). This species occurs in seasonally moist areas in and near sagebrush plant communities (ECCI 2005)

Liverwort monkeyflower (*Mimulus jungermannioides*). This species is a federal species of concern and is listed as threatened under the Oregon ESA. The ORNHIC database lists a recently located occurrence (1990), situated along the road to the John Day Dam visitor's center near the Columbia River. The site is located approximately 2.5 miles from the proposed BPA substation on Klondike Lane, and over eight miles from the nearest proposed project turbine (ECCI 2005). This species occurs in shaded seeps along cliffs (ECCI 2005).

Q.4.2.2 Potential Impacts to Plants

If, as anticipated, the field surveys do not locate any populations of target plant species (ECCI 2005), no direct project-related impacts would be anticipated to any federally Endangered, Threatened, Proposed, or Candidate plant species. Likewise, no direct project-related impacts would be predicted for any ODA Endangered, Threatened, or Candidate plant species.

In the event that the field surveys do locate target plant species within the project area, the above impact assessment will be modified to reflect the additional data.

Q.5 DESCRIPTION OF MEASURES PROPOSED TO AVOID OR REDUCE ADVERSE IMPACTS TO SPECIES

OAR 345-021-0010(1)(q)(C) *For each species identified under (A), a description of measures proposed by the applicant, if any, to avoid or reduce adverse impact;*

Response: The following section complies with OAR 345-021-0010 by discussing the possible means by which adverse impacts to state and federal listed species from the proposed project can be avoided or minimized.

Q.5.1 Wildlife

Q.5.1.1 Bald Eagle

There are no anticipated impacts to the bald eagle from the construction and operation of the wind power facility; therefore, no additional mitigation is required.

Q.5.1.2 Peregrine Falcon

There are no anticipated impacts to the peregrine falcon from the construction and operation of the wind power facility; therefore, no additional mitigation is required.

Q.5.2 Plants

Because no direct project-related impacts to any federal or state Endangered, Threatened, Sensitive, Proposed, or Candidate plant species are anticipated, no species-specific mitigation measures are proposed at this time. Should the field surveys locate target plant populations within the analysis area, species-specific mitigation may be recommended in the supplement to this Exhibit. However, at this time, several general measures are

recommended to mitigate possible indirect effects to other species of concern (if any) potentially in the vicinity, outside of the survey corridors.

1. Because noxious weeds can have numerous detrimental effects on native plant populations, measures should be implemented to control the introduction and spread of undesirable plants during and after construction. Noxious weed control measures may include: quickly revegetating habitats temporarily disturbed during construction; and actively controlling noxious weeds that have established themselves as a result of the project. Prior to construction, a noxious weed control plan should be developed, and the plan should be implemented over the life of the project.

2. Indirect project-related impacts to plant species of concern may also occur as a result of changes in fire frequency patterns in the area. Project access roads can act as fire breaks, thereby decreasing the size of a wildfire. Likewise, the project roads may allow fire crews to access small fires faster, and more effectively fight larger fires. Conversely, project operation and maintenance activities have the potential to ignite wildfires if precautions are not taken. Because it is not clear if these effects would have a positive or negative effect on project area native plants, the most prudent course of action would be to implement measures to maintain existing fire frequency patterns. While certain factors are out of the control of the Applicant, steps can be taken to minimize the risk of wildfire during both the construction and operation phases of the project. A comprehensive fire control plan should be developed prior to construction, and implemented project-wide over the life of the project. The fire control plan should take into account the dry nature of the region, and address risks on a seasonal basis.

Q.6 FINDINGS THAT THE PROPOSED FACILITY WILL NOT LIKELY CAUSE A SIGNIFICANT REDUCTION IN THE LIKELIHOOD OF SURVIVAL OR RECOVERY OF THE PLANT SPECIES IDENTIFIED

OAR 345-021-0010(1)(q)(D) *For each plant species identified under (A), a description of how the proposed facility, including any mitigation measures, complies with the protection and conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3);*

Q.6.1 Identified Plant Species with an ODA protection and conservation program

Response: Protection and Conservation Programs are prepared by ODA for plant species that are listed as threatened or endangered under the Oregon ESA. Of the species with the potential to occur within the analysis area, only the Laurence's milkvetch and the liverwort monkeyflower are listed as threatened under the Oregon ESA; however, these species do not currently have a formal Protection and Conservation Plan (Bob Mienke, ODA, personal communication). Potential impacts to all identified species are addressed below, in Section Q.6.2.

Q.6.2 Identified Plant Species without an ODA protection and conservation program

OAR 345-021-0010(1)(q)(E) *For each plant species identified under (A), if the Oregon Department of Agriculture has not adopted a protection and conservation program under ORS 564.105(3), a description of significant potential impacts of the proposed facility on the continued existence of the species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species;*

Response: As there were no anticipated occurrences of state or federal listed species within the analysis area, the construction and operation of the proposed project are not likely to cause a significant reduction in the likelihood of survival or recovery of these species.

Q.7 FINDINGS THAT THE PROPOSED FACILITY WILL NOT LIKELY CAUSE A SIGNIFICANT REDUCTION IN THE LIKELIHOOD OF SURVIVAL OR RECOVERY OF THE FISH AND WILDLIFE SPECIES IDENTIFIED

OAR 345-021-0010(1)(q)(F) *For each animal species identified under (A), a description of significant potential impacts of the proposed facility on the continued existence of such species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species;*

Response: In compliance with these requirements, Section Q.5 of this Exhibit described the potential impacts of the proposed facility on the continued existence of state and federal species and on the suitable habitat for these species. The mitigation measures described in Section Q.6 were designed to avoid and/or minimize any adverse impacts to the listed wildlife species. Through utilization of these mitigation measures, the construction, operation and maintenance of the proposed facility will not likely cause a significant reduction in the likelihood of survival or recovery of the bald eagle or the peregrine falcon.

Q.8 MONITORING PROGRAM

OAR 345-021-0010(1)(q)(G) *The applicant's proposed monitoring program, if any, for impacts to threatened and endangered species;*

Response: Programs to monitor the potential impacts to the individual listed species, if required, will be developed in coordination with the ODFW for fish and wildlife species and with ODA for plant species.

Q.9 CONCLUSION

The pre-field review identified a total of twelve federal and state listed and candidate plant and wildlife species that have the potential to exist within the analysis area.

Field surveys have not yet been conducted for threatened and endangered plants and wildlife. These surveys are scheduled to be conducted in Spring 2005. The results of these surveys will be incorporated into a supplement to this Exhibit and will be provided to OOE, ODFW and ODA for their review and comment. Based upon the pre-field review and the fish and wildlife habitat analysis, there are no anticipated impacts to threatened and endangered species from the construction, operation and retirement of the Klondike III Wind Project.

Based upon the above information, the Applicant will satisfy the requirements in OAR 345-021-0010(1)(q), and the Council will be able to find compliance with OAR 345-022-0070 once field studies are complete.

Q.10 REFERENCES

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APPENDIX Q-1

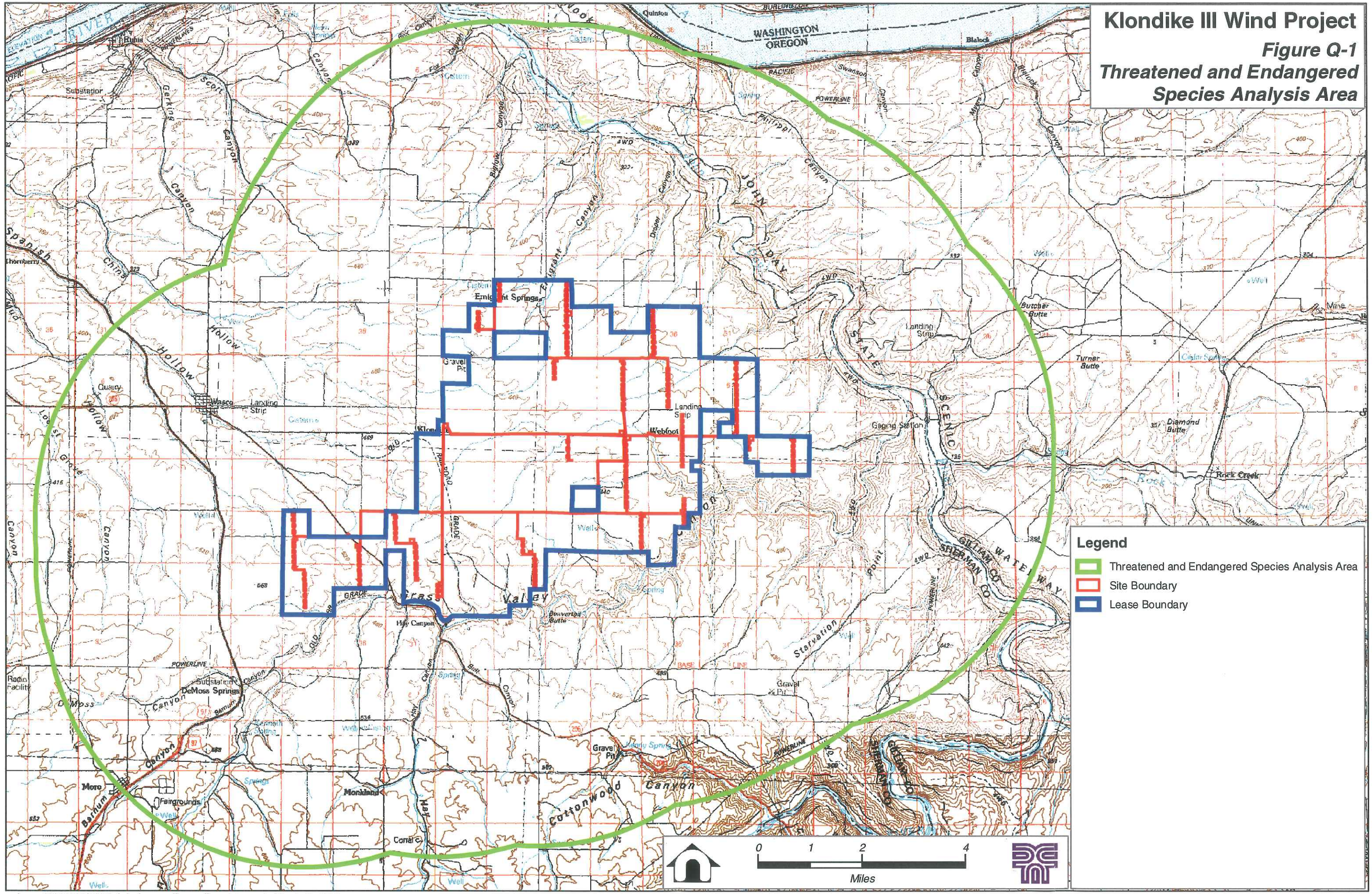
Threatened and Endangered Species Analysis Area - Map

APPENDIX Q-1

Threatened and Endangered Species Analysis Area - Map

Klondike III Wind Project

Figure Q-1
Threatened and Endangered Species Analysis Area



p:/ppme00000001/0600info/gs/arcmap/figures/fig_q1_te.mxd March 10, 2005

APPENDICES

Appendix 1: Sample Rare Plant Occurrence Data Sheet

Eagle Cap Consulting Rare Plant Observation Form

Project: _____

Sci. Name: _____ Spp. Code: _____ Site Number: _____

Recorder(s): _____ Phone: _____ Date: _____

Address: _____

Quad Name: _____ Landowner: _____

County: _____ UTM Coord.: _____N _____E

T: _____ R: _____ S: _____ _____ ¼ of the _____ ¼; T: _____ R: _____ S: _____ _____ ¼ of the _____ ¼

Directions:

New Site? ☐ EO#: _____ Min. Elevation (m): _____ Max. Elevation (m): _____

Total # in pop.: _____actual _____estimated Survey Intensity: _____

What was counted? ☐Genets (genetically distinct individuals) or ☐Ramets (stems of a clonal plant)

Phenology (% of pop.): _____Vegetative _____Flower _____Fruit _____Dormant

Pop. age class (%): _____Seedlings _____Immature _____Mature _____Senescent _____Unknown

Gross pop. area:_____m² Net area: _____m² Slope (deg.): _____ Aspect (deg.):_____

Habitat:

Percent Cover: _____Trees _____Shrubs _____Forbs _____Grasses _____Litter _____Bare

Abundant Species			Common Species			Uncommon Species		

Threats: _____

How was ID made? _____

Other knowledgeable individuals: _____

Photo Roll and No.: _____ Collection ID: _____ Herbarium: _____

Comments:

APPENDIX Q-4

Resumes of Plant Surveyors

Randall Scott Krichbaum

4130 SW 117th #148
Beaverton, Oregon 97005
Phone: 888-272-0270
E-Mail: rkrichbaum@eagle-cap.com

Summary

More than twenty years experience working with, and studying, the biological resources of western North America. Fifteen years performing botanical, wildlife, and impact assessment studies for both public and private concerns. Good working relationship with agency and academic experts regarding natural resource issues. Excellent management and administrative skills gained from directing numerous projects. Demonstrated ability to produce clear, scientifically defensible documentation that communicates study results and conclusions in a manner appropriate for the target audience.

Experience

President — Eagle Cap Consulting Inc. (1991-present)

- Co-founded an environmental consulting firm specializing in natural resource studies.
- Designed and managed resource investigation projects for numerous private and public concerns.
- Prepared documentation to the standards of the scientific community and government regulations.

Project experience includes:

Principal Investigator (Botanical Task): Rare plant studies, wetland delineations, revegetation planning, and vegetation mapping support for the Stateline Wind Power Project on the Oregon-Washington border. This is an ongoing project supporting one of the largest wind farms in the nation. Tasks: design rare plant impact assessment studies; consult with agency specialists; perform field surveys and supervise field crews; prepare revegetation plan; implement revegetation monitoring program; perform wetland delineations and determinations; document all botanical and vegetation studies; prepare relevant text for permit applications.

Principal Investigator: Rare plant investigation and cover type mapping project for a proposed wind power project near The Dalles, Oregon. Tasks: Design rare plant study methodology; supervise botanical field crews; perform rare plant surveys; delineate and field check cover type polygons; prepare technical report documenting the rare plant investigation; prepare cover type map and extended legend describing habitat types; analyze GIS data to summarize cover type extent.

Principal Investigator (Botanical Task): Rare plant investigations for the Vansycle Ridge wind power facility in N.E. Oregon. This facility is located adjacent to the Stateline wind power project, and was Oregon's first major wind power plant. Tasks: design rare plant study methodologies; perform prefield and field work to determine rare plant existing conditions; prepare rare plant impact assessment technical memoranda; contribute sections for permit application.

Principal Investigator (Botanical Task): Rare plant investigations for the proposed TPC-Vansycle wind power project, located near the Stateline and Vansycle Ridge wind power facilities. Tasks: design rare plant impact assessment methodologies; perform field surveys and supervise field crews; prepare compliance documentation describing potential project impacts on rare plant populations.

Principal Investigator (Botanical and GIS Tasks): Rare plant investigations and GIS analysis for a major proposed wind power project in N.E. Oregon. Tasks: design and implement rare plant impact assessment studies; document potential project-related botanical impacts; design and maintain the project GIS database.

Revegetation Specialist: Revegetation monitoring for the Nine Canyon wind power project near Richland, Washington. Tasks: develop revegetation monitoring protocol; supervise monitoring crew; perform monitoring activities; prepare report evaluating success of revegetation efforts.

Experience (continued)

Principal Investigator (Botanical Task): Rare plant studies and vegetation mapping for the proposed Kittitas Valley wind power project near Ellensburg, Washington. Tasks: design, perform, and document rare plant impact assessment studies; supervise field crews; delineate current vegetation types within the project area; prepare GIS themes and maps to document cover types; provide expert witness testimony during application hearings.

Principal Investigator (Botanical Task): Rare plant impact assessment studies for a major proposed wind power project near The Dalles, Oregon. Tasks: design rare plant study methodologies; perform field surveys and supervise field crews; prepare impact assessment documentation for inclusion in the project application.

Principal Investigator (Botanical Task): Rare plant impact assessment studies for the proposed Maiden Wind Farm near Sunnyside, Washington. Tasks: design rare plant studies; perform field surveys and supervise field crews; prepare documentation for inclusion in the project application.

Principal Investigator: Rare plant investigations for a proposed wind power project near Roosevelt, Washington. Tasks: design study protocols; supervise field crews; perform rare plant surveys; prepare technical report documenting methods and results of surveys.

Botanist/Revegetation Specialist: Rare plant investigations and revegetation plan development/monitoring for a natural gas-fired cogeneration plant near Hermiston, Oregon. Tasks: design rare plant investigation methodology; perform rare plant surveys; perform wetland delineations; prepare final documentation; develop revegetation plan; monitor success of revegetation efforts.

Principal Investigator: Rare plant impact assessment investigations and GIS support for a proposed wind power project near Arlington, Oregon. Tasks: design rare plant study methodology; supervise field crews; perform rare plant surveys; prepare project technical report; compile and analyze GIS data.

Principal Investigator: Rare plant survey and slickspot peppergrass habitat evaluation for a proposed Idaho Power project near Mountain Home, Idaho. In addition to a thorough floristic-level rare plant survey of all ground within the proposed right-of-way, this project involved the development and implementation of a slickspot habitat quality assessment protocol designed to determine the potential for slickspot peppergrass occurrence in apparently unoccupied habitat. Tasks: design study methodology; develop habitat quality assessment protocol in consultation with the US Fish and Wildlife Service; hire and train field botanists; perform field surveys; prepare final report.

Principal Investigator: Comprehensive study of road impacts on botanical and wildlife species of concern within a 1,350 square mile basin along the Snake River. The study was part of Idaho Power Company's FERC relicensing effort for the three hydroelectric dams that make up the Hells Canyon Complex. Because the analysis focused on a large number of species and species groups, extensive use was made of bibliographic database and GIS technology to collect and analyze the sizeable volume of data that was collected for the study. Tasks: design study methodology; collect and compile literature and other existing data; design and implement GIS modeling techniques to analyze road impacts; prepare peer-reviewed report describing methods, results, and conclusions.

Project Manager: Preparation of an environmental assessment (EA) for a radio tower/powerline project on BLM land near the Oregon-Idaho border. This project involves all aspects of the impact assessment process, from initial scoping to final mitigation. Tasks: coordinate all project communications between the various affected agencies; act as a liaison between the proponent and government; hire and direct all environmental subconsultants for the project; analyze project impacts on environmental resources; design mitigation measures; perform rare plant surveys; prepare EA document to BLM and NEPA standards.

Botanist: Rare plant and vegetation studies for a natural gas extraction project in the prairie region of southern Alberta, Canada. Tasks: survey proposed test well locations for rare plants; characterize vegetation at these sites; document results for inclusion in impact assessment document.

Experience (continued)

Principal Investigator: Multi-year study of rare plant resources and noxious weeds along a 160 mile-long reservoir complex on the Snake River. This study involved crews of botanists inventorying the shoreline for target rare plant and noxious weed species. Multiple logistic regression analysis was then used to determine correlations between species occurrence and a variety of disturbance and habitat parameters. Tasks: design study methodology; hire and train field botanists and supervisors; schedule and direct field work; analyze collected data; prepare peer-reviewed report; present results at conference.

Principal Investigator (Botanical Task): Rare plant investigation and Biological Assessment preparation for the US Highway 95 upgrade project between Copeland Junction and Eastport in Northern Idaho. This study took place along a 16 mile-long section of highway in peatland and upland habitats. Tasks: design study methodologies; supervise survey crews; perform rare plant surveys; analyze collected data; prepare technical report and Biological Assessment.

Project Manager: Several rare plant, noxious weed, and vegetation studies for the Wallowa-Whitman National Forest. Tasks: design study methodologies; coordinate and supervise botanical survey crews; document results consistent with Forest Service standards. Ten projects have been completed over the course of six years.

Project Manager: Rare plant investigations on a 150 square mile timber management unit in the northern Rocky Mountains of British Columbia, Canada. Tasks: design survey methodologies; supervise survey crews; coordinate data input; prepare technical documentation.

Botanical Investigator: Rare plant surveys for a natural gas extraction project in the foothills of the Rocky Mountains in Alberta, Canada. Tasks: survey remote areas for rare plants; prepare report describing results.

Project Manager: Rare plant, wildlife, archaeological, and wetland studies for various Idaho Power Company projects in Idaho and Oregon. Projects have included major transmission line impact assessments (some greater than 200 miles long), hydroelectric facilities relicensing, and numerous other energy related projects. Tasks: design methodologies for impact assessment studies; coordinate and supervise field crews; analyze collected data to determine potential project impacts; design mitigation measures; prepare peer-reviewed documentation consistent with Idaho Power and federal specifications. Sixteen projects have been completed over the past eight years.

Project Manager: Several rare plant studies for the US Bureau of Land Management in Klamath Falls, Oregon. Tasks: design rare plant study methodologies; supervise survey crew; prepare compliance documentation; analyze impacts related to various alternatives. Five projects have been completed in recent years.

Botanist: Rare plant and vegetation studies on the island of St. Vincent in the British West Indies for a United Nations project. Tasks: design study methodologies; perform field surveys in primary rain forest and palm brake habitats; prepare input to a technical report on the project.

Botanist: Rare plant and vegetation studies for a natural gas pipeline project in the boreal forest region of central Alberta, Canada. Tasks: survey major pipeline route for rare plant species; characterize vegetation along the route.

Principal Investigator: Slickspot identification and field marking along an existing powerline right-of-way between Caldwell, Idaho and Ontario, Oregon. The goal of this project was to identify and stake all potential habitat for slickspot peppergrass within the right-of-way for avoidance during line upgrade construction. Tasks: coordinate field crew; identify and stake potential habitat; prepare final report.

Project Manager: Biological Assessment for a waste treatment plant/golf course project near the City of Union, Oregon. Tasks: coordinate wildlife, botanical, and fisheries subcontractors; act as a liaison between the City and federal agencies; prepare documentation consistent with the Endangered Species Act.

Experience (continued)

Project Manager: Rare plant and noxious weed study for the Burns Ranger District of the Malheur National Forest, Oregon. Tasks: select, coordinate, and supervise survey crew; design study methodology; perform rare plant surveys; prepare documentation consistent with Forest Service standards.

Project Biologist: Impact assessment studies for a proposed power generation project near Spokane, Washington. Tasks: design and perform studies to assess potential project impacts to rare plants, wildlife, and wetlands; perform wetland delineations; map vegetative cover types; design mitigation options; prepare technical memoranda detailing all investigations.

Botanist: Rare plant, vegetation, and noxious weed studies for various Oregon Department of Transportation projects in Central Oregon. Tasks: design and perform botanical studies; document results to Department standards; suggest mitigation measures to reduce impacts on rare species.

Botanist: Botanical investigations of two projects in Central and Eastern Oregon for Pacific Power. Tasks: design study methodologies; perform surveys for rare plants; prepare documentation consistent with federal and state environmental regulations; design mitigation plans for threatened populations.

Interdisciplinary Team Member: Impact assessment studies for a railroad improvement project in Eastern Oregon. Tasks: collect background information on various natural resources; design studies to determine distribution and abundance of rare plant populations and noxious weeds; supervise field crew; analyze direct and indirect impacts; provide technical input for regulatory compliance documents; map historical plant communities; prepare cumulative impacts analysis.

Botanist: Preparation of a revegetation plan for a power generation project near Hermiston, Oregon. Tasks: survey disturbance areas; design appropriate seed mixes and planting methods; coordinate contacts with revegetation contractors.

Wetland Scientist: Wetland determination in the Columbia Basin of Oregon for an agricultural concern. Tasks: read vegetative plots consistent with US Army Corps of Engineers standards; provide documentation to support the determination.

Botanist: Post-construction undesirable plant survey on a transmission line corridor for the US Bonneville Power Administration in Northern California. Tasks: perform noxious weed surveys; document results; prepare noxious weed control plans.

Project Manager: Environmental assessment preparation for an airport expansion project in NE Oregon. Tasks: collect background data on project site; design studies for endangered species, and wildlife; conduct wetland inventories; supervise survey crew; prepare compliance documentation; analyze impacts related to various alternatives; prepare mitigation plans.

Botanical Surveyor — Wallowa-Whitman National Forest, Enterprise, Oregon (1989-1990)

- Conducted rare plant surveys in a variety of habitats (desert to sub-alpine).
- Served on interdisciplinary planning teams for various projects.
- Wrote Biological Evaluations for timber sales, range allotments, and development projects.

Biological Technician — Southern Oregon Experiment Station, Medford, Oregon (1988)

- Conducted surveys of noxious weeds in the pear orchards near Medford.
- Collected and analyzed field samples for integrated pest management research.

Science Instructor — Hancock Field Station, Fossil, Oregon (1977-1982)

- Taught students (grades 6-12) basic concepts of natural history at a science camp/outdoor school.
- Prepared and presented workshops on plant ecology, keying, and ethnobotany as well as other natural science topics.

Education

Master of Science Degree (Resources and the Environment) — University of Calgary, Canada (1998)

- Thesis title: *An Investigation of Methods Used in Rare Plant Surveys Conducted for Impact Assessment*
- Thesis subject: The work consisted of a comprehensive review of rare plant survey methodologies currently in use worldwide, with particular emphasis on those applied to impact assessment projects. In addition, scientific and regulatory requirements for these surveys were analyzed. A set of guidelines were produced to be used in conducting rare plant studies. These guidelines specified minimum investigator qualifications, prefield review techniques, field survey methods and intensities, and documentation content.

Bachelor of Science Degree (Zoology) — Oregon State University, Corvallis, Oregon (1985)

APPENDIX Q-5

Letter from John White, Oregon Office of Energy, February 28, 2005

Oregon
Theodore R. Kulongoski, Governor

625 Marion St. NE
Salem, OR 97301-3737
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Toll Free: 1-800-221-8035
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www.energy.state.or.us

Date: February 28, 2005

To: Dana Siegfried

From: John G. White

Subject: Klondike III analysis areas

The rules in Division 21 that address the content of an application for a site certificate require site-specific information within "analysis areas." Not all analysis areas are the same; different exhibits address different analysis areas. In the standard review process, the analysis areas are defined by the project order. For an expedited review, the analysis areas are defined by Council rule as the study areas described in OAR 345-001-0010(53), subject to modification as described in OAR 345-015-0300(3).

The "baseline" for the study area definition is the "area within the site boundary." For the gas-fired power plants, identification of the site boundary is fairly straightforward, but for a wind energy facility, identifying the site boundary is a more challenging analysis.

The study area definition gives this guidance: "For the purposes of this definition, 'site boundary' means the perimeter of the site of the proposed energy facility, its related or supporting facilities, all temporary laydown and staging areas and, for a facility that is a pipeline or a transmission line, all corridors proposed by the applicant." Further guidance comes from the definition of "site" in OAR 345-001-0010(49): "'Site'" means all land upon which a facility is located or proposed to be located."

One approach to defining the "site" for a wind facility would be to identify the area that would be permanently occupied by the facility (which includes the wind turbines and all related or supporting facilities). This would be the area that is ultimately identified by the legal description that a certificate holder must submit to the department before beginning construction (OAR 345-027-0020(2)). This approach, however, could be problematic at the time of the submission of the application for a site certificate if the applicant has not determined the precise location of the turbines and related infrastructure. In such a case, the applicant should (in the notice of intent or in the request for expedited review) identify a "site" for the purposes of analysis in the site certificate application. The "site" should include all areas that could be permanently occupied by the proposed facility; that is, to the extent the applicant is uncertain about the ultimate locations

of facility components, the applicant should make the "site" larger to take into account all the land area that might be occupied by the time all of the final location decisions have been made.

Note that the "site boundary" for purposes of the definition of "study area" is a boundary (or "perimeter") that encloses the "site" of the energy facility and all related or supporting facilities *and* all temporary laydown and staging areas.

In the case of the Stateline facility, our project order required the applicant to "specifically describe the site boundary" in the application. In preparing this memo, I briefly reviewed the Stateline application (including supplemental materials). Although I did not find a section heading called "Description of the Site Boundary" or something similar, the site boundary was effectively identified by the site maps and maps of temporarily disturbed areas. These maps were included in Exhibits B and C.

For the proposed Klondike facility, it would be helpful to have a section, as part of Exhibit C, that explicitly identifies and describes the "site" and the "site boundary." This will likely involve showing the site and site boundary lines on a map. The area defined by the "site boundary" may be larger than the "site" depending on the location of the temporarily disturbed areas.

Once you have identified the "area within the site boundary," then the study areas can be determined by reference to that boundary. The study areas would be the areas described in OAR 345-001-0010(5). The analysis areas would be the study areas unless we agree to modify those areas.

The following table shows the study areas as defined by rule and the applicable site certificate application exhibit and affected standard.

ASC Exh.	Affected Standard or Resource	Study Area
L	Protected Areas	The area within the site boundary and 20 miles from the site boundary.
P	Fish and Wildlife Habitat	The area within the site boundary.
Q	Threatened and Endangered Species	The area within the site boundary and five miles from the site boundary.
R	Scenic and Aesthetic Values	The area within the site boundary and 30 miles from the site boundary.
S	Historic, Cultural and Archaeological Resources	The area within the site boundary.
T	Recreation	The area within the site boundary and five miles from the site boundary.
U	Public Services	The area within the site boundary and 30 miles from the site boundary.
The following exhibits do not refer explicitly to an "analysis area," but they require reference to the "site."		
F	Property owners notification	Identified by reference to the "site"
H	Structural Standard	The area within the facility "site."
I	Soils	The area within the site boundary.

J and O	Surface and groundwater quality and availability	The area within the site boundary.
K	Land Use	The area within the site boundary and one-half mile from the site boundary.

There is no study area for air quality.

KWP's Request for Expedited Review proposes a modified analysis area for T&E species. The request, however, refers to a "broader-ranging study of the habitat, presence, and migratory behavior of these species" without defining the area to be studied. It is my current understanding, based on our conversation last week, that KWP proposes to conduct a literature survey for the area within five miles from the "site boundary" plus an aerial survey (for raptor species) within two miles and a ground survey of ferruginous hawk and Swainson's hawk nests located in the aerial survey. I do not know whether there are other T&E or state sensitive species, aside from the raptors, within five miles of the site boundary. If other such species might be present within five miles and be adversely affected by construction or operation of the facility, then how would you justify a modification of the T&E study area? Note that the T&E analysis should include both plant and animal species.

I have reviewed the project order for the Stateline Wind Project. In general, it is our intent to be consistent in our treatment of wind energy facility applications, subject to changes in the Siting Council rules. The Council did, in fact, amend the rule defining "study area" in April 2002, after the Stateline project had been through the siting process, although the changes did not alter the distance applicable to threatened or endangered plant or animal species. For Stateline, we allowed a modified analysis area for T&E, which amounted to the area within the site boundary (as currently defined) plus "a 300-foot corridor centered on turbine strings and treansmission and road centerlines." It is important to point out, however, that there was a large body of baseline wildlife survey and analysis that had previously been done in the Stateline area. Our decision was influenced by that existing body of knowledge.

APPENDIX Q-6

Final Biological Protocol

Final Biological Protocol
Klondike III Wind Power Project
February 8, 2005

1 INTRODUCTION

David Evans and Associates (DEA) is responsible for the preparation of Exhibits P and Q of the Energy Facility Siting Council (EFSC) Application for the project. These Exhibits address Fish and Wildlife Habitat (Exhibit P) and Threatened and Endangered Species (Exhibit Q). The surveys are intended to define the boundaries and categories of the fish and wildlife habitat within the project area and to identify the potential impacts to special status species and their suitable habitat from the proposed project. This information can then be used to avoid and/or mitigate the potential impacts to the identified resources. Preliminary investigations within the project area did not reveal any surface water expressions (pond, spring, drainage), therefore, there are no anticipated impacts to fish.

The project boundaries are currently being revised; however, the biological protocol will be applied to the entire project area. Due to the proximity of the proposed project to the Klondike I and Klondike II project, DEA has incorporated study methodology concepts of many of the biological protocols that were developed for these projects as they were previously approved by ODFW.

2 ANALYSIS AREAS

The Analysis Areas define those areas that ODFW and Oregon Department of Energy (ODE) will require the Applicant to review for potential impacts to fish and wildlife habitat and special status species. The following proposed Analysis Areas are based, upon those used within the first two Klondike projects and DEA's experience with the EFSC requirements:

- **Fish and wildlife habitat:** The identification of habitat types is an important preliminary step in determining suitable habitat for special status species. The Analysis Area for fish and wildlife habitat will be within 1,000 feet of the turbine strings, transmission line, and any other project component (e.g., construction staging areas and new roads).
- **Threatened and endangered animal species:** An initial database search will be conducted within five miles of the project boundary; however, it is anticipated that the state or federally listed species with the potential to occur within the project vicinity are the bald eagle and the peregrine falcon. To address these species, DEA will document any potential bald eagle or peregrine falcon roosting, nesting, or

foraging habitat within the project vicinity as part of the fish and wildlife habitat evaluation and the raptor nest survey (as described below).

- **Threatened and endangered plant species:** An initial database search will be conducted within two miles of the project boundary. If suitable habitat exists (generally non-agricultural), ground surveys will be conducted within a 300-foot corridor along the turbine strings, transmission lines and new roads and within 150 feet of other, non-linear, project components.
- **Non-listed, sensitive plant and wildlife species:** The following non-listed, sensitive wildlife species may occur within the project area: golden eagle, burrowing owl, loggerhead shrike, all raptors species (with an emphasis on the Swainson's hawk), long-billed curlew, and the white-tailed jackrabbit. DEA proposes to address these sensitive species by conducting surveys, according to the *Survey Methodologies for Sensitive, threatened, Endangered Species in Oregon* (ODFW 1994), within appropriate habitats. It is anticipated that most of the habitat within the project area is in agricultural production and, therefore, not considered suitable habitat. Should suitable habitat exist, transects will be walked within 1,000 feet of project components in these areas. In addition, evening spotlight surveys, designed specifically for the white-tailed jackrabbit, will be conducted within 600 feet of project components in areas of suitable habitat. If required, ground surveys for non-listed sensitive plant species will be conducted within a 300-foot corridor along the turbine strings, transmission lines and new roads and within 150 feet of other, non-linear, project components.
- **Raptors:** For the first two phases of the Klondike project, raptor nests were identified within a five-mile radius of the project boundary; however, there has been no raptor mortality documented at either of the two Klondike projects (WEST 2004). Because raptor populations do not appear to be at risk of impact from wind power projects in this area, DEA suggests conducting aerial and ground raptor surveys within two miles of the project boundary. To augment the raptor use information obtained through the avian baseline surveys and aerial nest surveys, DEA will note the presence of all raptor species observed during the walking transects.

3 SPECIAL STATUS/SENSITIVE SPECIES

The following species will be addressed within Exhibits P and Q, and surveys will be designed to assess potential impacts to these species from the proposed project:

Exhibit P: Species that are not listed as threatened or endangered by the state or federal ESA (referred to hereafter as sensitive species) include the long-billed curlew, loggerhead shrike, raptors, burrowing owl, and white-tailed jackrabbit.

Exhibit Q: The state or federal listed species with the potential to occur within the project vicinity are the bald eagle and the peregrine falcon.

The final list of plant species will be determined following the botanical pre-field review, which will include a review of the current USFWS and ONHIC database lists.

4 SURVEY PROTOCOLS

Final project areas, which will include turbine string(s), transmission lines, construction staging areas, new roads and other project components, are still being determined. All surveys will be conditional upon property access. Should the Analysis Area extend beyond the property boundary and the adjacent property owner does not offer access, remote survey methods will be used in place of the ground surveys.

The known project area is characterized by non-irrigated agriculture. The survey areas will be dictated by the presence of suitable (non-agricultural) habitat within 1,000 feet of project components.

4.1 HABITAT MAPPING AND CLASSIFICATION

DEA will map and categorize all fish and wildlife habitat types within 1,000 feet of all project components according to the ODFW Fish and Wildlife Habitat Mitigation Policy. Existing aerial photography will be used to create a preliminary map of the boundaries of the fish and wildlife habitat types within the project area. Habitat boundaries will then be ground-truthed by qualified biologists. For each habitat polygon, field notes will be taken that will include dominant vegetation and habitat quality (structure, age, presence/absence of invasive vegetation, history of disturbance). Maps of the habitat types will be used during the spring wildlife surveys so that wildlife use of each habitat type can be noted. Habitat types will be categorized (1 through 6) in part by utilizing the wildlife location data from the spring surveys. It is anticipated that the habitat types and categories will be generally consistent with those identified for the first two phases of the Klondike project.

4.2 BOTANICAL SURVEY

Prior to performing the botanical field surveys, an extensive review of existing botanical information will be conducted. The goal of this review will be to characterize vegetation patterns within the project area, and to determine the special status plant species that have potential to occur there. Sources of information will include (but are not limited to) the Oregon Natural Heritage Information Center (ONHIC), USFWS, the Natural Resources Conservation Service, published reports from nearby wind power projects, aerial photos, topographic maps, soil surveys, federal wetland data, and local botanists with knowledge of particular species of interest.

Field surveys will be conducted to determine presence/absence of special status plant populations and to fully characterize the vegetation patterns. These surveys will be conducted by Eagle Cap Consulting, Inc., which has conducted botanical surveys for multiple wind power projects in the region. The searches will be conducted by walking

the length of proposed project impact corridors that occur in suitable habitat [or: that are non-agricultural] using a survey pattern designed to locate all target species populations. The special status plant surveys will be performed during the appropriate times of the year when the target species are identifiable.

The field work will make extensive use of GIS and GPS technology to accurately locate proposed facilities corridors, special status plant populations, and other features of interest in the field. If rare plant populations are found, data will be collected on population size, location, associated habitat, and a number of other parameters. Standard rare plant site forms (based on ONHIC data input forms) will be used to collect the information. All rare plant location and population data will be incorporated into the project GIS to assist with documentation of existing conditions and, if necessary, the development of mitigation options.

4.3 SPECIAL STATUS/SENSITIVE SPECIES

Special status and sensitive species with the potential to occur within the project area include the bald eagle, peregrine falcon, golden eagle, burrowing owl, loggerhead shrike, all raptor species, long-billed curlew, and the white-tailed jackrabbit. These species will be addressed in several ways; 1) raptor nest surveys (described above), 2) avian baseline surveys (described in section 4.4), and 3) transect surveys.

Transect surveys will be conducted within 1,000 feet of all project elements in all suitable habitats. These surveys will be designed to provide information on presence/absence and habitat use rather than population estimates; thus the results are primarily qualitative. As the biologists are walking the meander transect, as described above, they will use binoculars to scan the area for wildlife. Should any special status/sensitive species be observed (visual or auditory observations), surveyors will note its location, number of individuals, habitat use and behavior (foraging, nesting, loafing). The presence and location of all special status/sensitive species will also be noted during in-transit travel within the project areas.

Because the white-tailed jackrabbit is generally most active at night, nocturnal survey routes will be established in addition to the diurnal surveys. Nocturnal surveys will be conducted twice during the spring, at least one week apart. Using a spotlight with at least 200,000 candlepower, surveyors will scan those areas within 300 feet of project components. If possible, all jackrabbits will be identified to species (both white-tailed or black-tailed jackrabbits can be present). This protocol is consistent with the white-tailed jackrabbit survey protocol identified in the *Survey Methodologies for Sensitive, Threatened, and Endangered Species in Oregon* (ODFW 1994).

Bat surveys are not included within the proposed biological protocol. Existing mortality data will be analyzed to evaluate the potential impacts to bat populations.

4.4 AVIAN BASELINE SURVEY

ABR, Inc. will conduct the avian baseline survey. The avian study will have two main components: a winter and spring avian use survey, and a raptor nesting survey. Following is a discussion of the methods that will be used for each of those components.

4.4.1 WINTER AND SPRING MIGRATION AVIAN USE SURVEYS

The goal of this portion of the study is to use visual sampling techniques to obtain information on species composition, relative abundance, flight direction, and flight altitude of birds during the winter and spring within the project area during diurnal hours. These data would then be used to estimate the temporal and spatial use of the project area by birds in winter (waterfowl) and spring (migrant birds).

The winter waterfowl and spring avian use surveys would consist of weekly standard point counts at approximately 16 circular, 800-m plots (include map of plot circles if available). Each survey would consist of a 20-minute point count at each of the plots during which a single observer equipped with 10X binoculars would record data. Methods will follow those used for the Klondike I and II point counts. Survey timing will be rotated among plots, so that sampling is conducted at various times of day. Surveys will be conducted an average of once per week during the winter waterfowl period (November 1 to March 15) for a total of 18 surveys, and an average of 1 survey per week during the spring (March 15 to May 15) for a total of 8 surveys.

A standard set of analyses, similar to those produced for the Klondike I and II projects, will be conducted to allow for comparisons with data from previous Klondike studies, as well as other wind projects in the area. Such comparisons facilitate estimation of potential avian impacts of the proposed facility. Data on avian abundance will be presented by species and species group, avian diversity and richness, avian flight heights and behavior, and a relative index to collision exposure. All findings of the study will be presented in a standard scientific report format (i.e., introduction, methods, results, discussion) with appropriate figures and tables.

In-transit observations of any wildlife species of concern or unusual sightings made while driving within the project area will be noted on maps with information on date and location.

4.5 RAPTOR NESTING SURVEYS

The goal of the raptor nesting surveys is to gather information on nesting species visible from the air. These surveys will include information on nest locations and reproductive success in the area. The raptor nesting survey will consist of two helicopter surveys for raptor nests, within a two-mile radius of the proposed project area (one in late April-early May and a second in early June). There will also be a ground survey in the

vicinity of any Swainson's or ferruginous hawk nests observed during the aerial survey. ABR will also check for raptor nests during their point count surveys. The initial aerial surveys are intended to document occupancy, while the ground survey is intended to document production.

The project site locations and historical raptor sites will be marked on a USGS 7.5 minute quadrangle map before each survey. The area will be systematically searched by helicopter and all suitable nesting areas (e.g., trees and rocky outcrops) will be searched for raptor activity and nests.

5 REFERENCES

Oregon Department of Fish and Wildlife. 2004. Survey Methodologies for Sensitive, Threatened, Endangered Species in Oregon.

WEST, Inc. 2002. Baseline Ecological Studies for the Klondike Wind Project, Sherman County, Oregon. Prepared for Northwestern Wind Power. May 29, 2002.

WEST, Inc. 2004. Analysis of Potential Wildlife and Habitat Impacts from the Klondike II Project, Sherman County, Oregon. Prepared for CH2M Hill and PPM Energy. February 19, 2004.

Not Leased

Not Leased

Figure 1: Klondike III Wind Power Project

- Klondike I Turbines
- Klondike II Turbines
- Proposed Klondike III Turbines
- Proposed New Roads
- Existing Roads Requiring Widening
- Proposed Electrical System
- Proposed BPA Transmission Line (Alt. 2)
- Proposed BPA Transmission Line (Alt. 3)
- Rare Plant Survey Area
- Proposed Substations
- Lease Boundary

Contour Interval: 20 ft.

Scale 1: 45,000

1 0 1 2 Miles

N

EAGLE CAP CONSULTING

March 22, 2005