

March 01, 2011

Ms. Sue Oliver
Oregon Department of Energy
245 Main Street, Suite C
Hermiston, OR 97838

Dear Ms. Oliver;

The Oregon Department of Fish and Wildlife (ODFW) previously provided comments on Horizon Energy's (Horizon or Applicant) Notice of Intent to Apply for an Energy Facility Site Certificate (June 01, 2009); Preliminary Application for Site Certificate (December 02, 2009); and Response to Oregon Department of Energy's (ODOE) First Request for Additional Information (May 09, 2010) for the Antelope Ridge Wind Farm (ARWF or Project). Within those comments, ODFW identified several Project siting concerns and recommended modifications to Project siting to minimize impacts to fish and wildlife and their habitats. The majority of ODFW's concerns and recommendations, however, were not addressed or incorporated into the Final Application for Site Certificate (ASC).

The ODFW received Horizon's Final ASC January 06, 2011. Based on ODFW's review of the Final ASC, serious concerns with the proposed siting of the Project remain:

1. The Project as proposed does not avoid impacts to wildlife habitat classified as Category 1 under the Habitat Mitigation Rules;
2. Horizon's proposed mitigation measures are insufficient to avoid or mitigate anticipated impacts of the Project to fish and wildlife in habitat classified as Category 2.
3. The preponderance of the evidence in the record does not support the legal findings necessary for issuance of a site certificate (concerning compliance with the Habitat Mitigation Rules and protection of listed species).

As result, ODFW must recommend against issuance of a site certificate for the project as currently described in the Final ASC. ODFW believes issuance can occur if the ASC is modified to reflect the mitigation recommendations in Attachment 1.

ODFW is responsible for reviewing the ASC and assuring it complies with statutes, rules, policies and management plans related to Oregon's fish, wildlife, and their habitats. Therefore, ODFW met with Horizon staff on multiple occasions in 2009 and 2010 to discuss Project siting, study needs and protocols, impacts, and mitigation. ODFW and Horizon discussed the avoidance, protection,

and enhancement measures that we believed were necessary for the Project to be issued a site certificate. Unfortunately, after a number of meetings, Horizon withdrew from the discussions.

The siting of a wind energy project is the most important element in avoiding or minimizing impacts to fish and wildlife species and their habitats. Despite previous recommendations by ODFW, a substantial part of the proposed facility siting is on either big game winter range or big game critical wildlife habitat. It is also located on sage-grouse breeding and wintering habitat and within ½ mile from multiple sensitive raptor species nests. During wildlife surveys conducted throughout the Site Boundary, 20 state sensitive species (one state threatened bird, four state-critical birds, 12 state vulnerable birds, two state vulnerable mammals, and one state endangered mammal) and nine federal species-of-concern were recorded. In addition, sixty-five active and thirty-one inactive raptor nests were located within the analysis area, and seventy-five species were identified during the forest breeding bird surveys.

The Project is one of the first wind power projects in Oregon proposed to be sited in critical big game winter range and very productive wildlife habitat, resulting in the potential construction of a large industrial facility that negatively impacts Oregon's wildlife. Horizon proposes to erect turbines in an area referred to by ODFW as the Zone of Multiple Biological Values (ZMBV), comprised of habitat classified as either Category 1 or 2 under the Habitat Mitigation Policy rules (OAR chapter 635, division 415). Category 2 habitat in this area has been identified since the 1980's when Union County adopted the county comprehensive land use plan.

The number and diversity of sensitive species and critical habitats present, coupled with the importance of the ZMBV to terrestrial species result in significant concerns with proposed Project siting. These concerns warrant implementing elevated post-construction surveying and monitoring requirements and a higher standard for mitigating impacts to fish and wildlife resources compared to what would occur with development of wind power projects on a previously disturbed site (e.g. wheat fields). This is consistent with recommendations in the Oregon wind energy siting guidelines.

As such, attached are ODFW's comments on Horizon's ASC, including mitigation measures ODFW believes are necessary for the proposed Project to be in compliance with statutes, rules, policies and management plans related to Oregon's fish, wildlife, and their habitats. Also enclosed are ODFW's recommendations for monitoring that will be necessary to estimate actual Project impacts and evaluate adequacy of mitigation.

These impacts, mitigation measures, and monitoring proposals include:

1. No construction in the ZMBV due to significant impacts to wildlife in a large block of native habitat without substantially increasing mitigation for impacts beyond Horizon's current proposal.
2. An estimated 12–93 raptor fatalities per year including golden eagles.
3. Disturbance to six active golden eagle nest sites.

4. A potential sage-grouse lek discovered within the ZMBV on Ramo Flat.
5. An estimated 650 bat fatalities per year from direct and indirect impacts and mitigation for these fatalities.
6. An estimated 377-930 non-raptor bird fatalities per year and mitigation for these fatalities.
7. A directed survey for goshawk nests.
8. A 0.25 - 0.5 mile setback from raptor nests and the edge of rims and ridges.
9. Mitigation for displacement of elk and mule deer. After construction of the Elkhorn Valley Wind Project, deer and elk were displaced up to 1000 – 3000 meters from the tower strings. Displacement effectively removes between 25,000 – 59,000 acres of big game habitat.

The avoidance, protection, and enhancement measures identified by ODFW and included in the attachment are necessary to minimize impacts to fish, wildlife, and their habitats and to provide mitigation and monitoring measures that are consistent with statutes, rules, policies, and mitigation plans related to Oregon's fish, wildlife, and their habitats. Unless included in any site certificate issued for the Project, the certificate will not meet the legal standards for issuance.

Please contact me if you have any questions on the comments provided or need additional information from ODFW.

Sincerely,

Jon Germond
Habitat Resources Program Manager
Wildlife Division

cc: Ron Anglin, Wildlife Division
Craig Ely, Northeast Region
Gary Miller, FWS
Valerie Franklin, Horizon Energy

Attachments: ODFW Comments on Horizon's final Application for Site Certificate

Attachment 1

ODFW'S COMMENTS ON HORIZON'S FINAL APPLICATION FOR SITE CERTIFICATE AND RECOMMENDED TERMS AND CONDITIONS FOR ISSUANCE OF A SITE CERTIFICATE

Introduction

Direct, indirect, and cumulative impacts occur from wind project development. Direct effects include blade strikes, barotrauma, loss of habitat, and “displacement”. Indirect effects include increase in predators or predation pressure; decreased survival or reproduction of the species; and decreased use of the habitat that may result from effects of the project or resulting “habitat fragmentation”. The presence of wind turbines may alter the landscape so that wildlife use patterns are affected, displacing wildlife away from the project facilities and suitable habitat. Displacement could occur through habitat loss and fragmentation for forest-dependent species, increased human activity, disturbance of habitats in proximity to turbines, and loss and fragmentation of habitat for wide ranging species. Animals displaced from wind energy facilities may move to areas with fewer disturbances, but with poorer quality habitat. The overall effect could impact reproductive success. The area of influence of a wind project is not limited to the project footprint. The impacts of the ARWF will extend beyond the project footprint.

To evaluate potential impacts of the Project and sufficiently mitigate for these impacts, an accurate designation of fish and wildlife habitat is necessary. However, despite numerous meetings with ODFW and ODFW's comments on the NOI, preliminary ASC and the Applicant's response to ODOE's First Request for Additional Information, the Applicant continues to inaccurately interpret the ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 615-415-0000). This has resulted in the Applicant inaccurately categorizing habitat in the Project area.

An accurate assessment of Project impacts also requires a cumulative effects analysis that includes the proposed ARWF, the adjacent Elkhorn Valley Wind Project (EVWP), and other foreseeable developments in the region. The Applicant, however, fails to analyze whether construction of the ARWF is contributing cumulatively along with other causes to population declines of birds, bats or other wildlife species, and their habitats. Instead the Applicant references the EVWP only in terms of mortality of birds and bats as a gauge of mortality that can be expected at the ARWF, without proposing mitigation for mortality to any species at the Project. Instead, the Applicant concludes that because population level impacts are not anticipated, mitigation is unnecessary. Population estimates, however, are not provided and likely unknown for most species in the Project area.

Therefore, ODFW recommends substantial modifications to the Applicant's proposed 1) siting of the Project; 2) assessment of Project impacts; and 3) mitigation and monitoring measures. These modifications should be included in any site certificate issued for this Project to be consistent with Oregon and ODFW statutes, rules, policies, and mitigation plans.

ODFW Management Authorities

Some of the Oregon Department of Fish and Wildlife's (ODFW) goals, objectives and management authorities for the fish and wildlife populations affected by the Project are found in the following Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR) and associated plans; and are summarized below.

- Energy Facility Siting Council Siting Standards – Fish and Wildlife Habitat (OAR 345-022-0060)
This standard requires that the design, construction and operation of a proposed facility (including mitigation) be consistent with the habitat mitigation goals and standards in OAR chapter 635, division 415. Oregon's Energy Facility Siting Council (EFSC) must determine whether the applicant has done appropriate site-specific studies to characterize the fish and wildlife habitat at the site and nearby. If impacts cannot be avoided, the applicant must provide a habitat mitigation plan. The plan must provide for appropriate mitigation measures, depending on the habitat categories affected by the proposed facility. The plan may require setting aside and improving other land for fish and wildlife habitat to make up for the habitat removed by the facility.
- Energy Facility Siting Council Siting Standards – Threatened and Endangered Species (OAR 345-022-0070)
To issue a site certificate, EFSC must (after consultation with ODFW) that the design, construction and operation of the proposed facility, taking into account mitigation, are not likely to cause a significant reduction in the likelihood of survival or recovery of a species listed under the Oregon Endangered Species Act. This standard seeks to avoid harmful impacts to plant and animal species identified as threatened or endangered under state law. In practice, this means that the applicant must provide appropriate studies of the site to identify threatened or endangered species that the proposed facility could affect. ODFW determines the state-listed threatened or endangered wildlife species. If a potential risk to the survival or recovery of a threatened or endangered species exists, the applicant must redesign or relocate the facility to avoid that risk or propose appropriate mitigation measures.
- Wildlife Policy (ORS 496.012)
Establishes wildlife management policy to prevent serious depletion of any indigenous species and maintain all species of fish and wildlife at optimum levels for future generations.
- State Endangered Species Act (ORS 496.171-182)
Requires conservation and recovery of wildlife species that are classified as endangered or threatened. Authorizes ODFW to develop conservation and recovery plans for listed wildlife species. At ORS 498.026(1), prohibits "taking" of any listed species. Illegal take is a violation of the wildlife laws, subject to criminal prosecution as a Class A misdemeanor or violation pursuant to ORS 496.992.
- Prohibition of harassment, etc. of wildlife (ORS 498.006)
Prohibits chasing, harassment, molestation, worrying or disturbing any wildlife, except as the Fish and Wildlife Commission may allow by rule.

- Criminal penalties for wildlife violations (ORS 496.992)
Makes violation of any wildlife statute or Fish and Wildlife Commission rule subject to prosecution as a Class A misdemeanor or violation.
- Fish and Wildlife Habitat Mitigation Rule (OAR 635-415-0000-0025)
 Governs ODFW's provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by development actions. Based on standards in the rule, ODFW determines the appropriate category to apply to land where a development action is proposed. If ODFW determines that such land is Category 1, ODFW must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, ODFW must recommend against the development action. If ODFW determines that such land is Category 2, ODFW must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, ODFW must recommend a high level of mitigation (as specified in more detail in the rule). If such mitigation is not required, ODFW must recommend against the development action.
- Wildlife Diversity Plan (OAR 635-100-0001 through 0030)
 Establishes a plan to maintain Oregon's wildlife diversity by protecting and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges.
- Oregon Conservation Strategy Plan (Adopted by Commission)
 A blueprint for conservation of the state's native fish and wildlife and their habitats, the Strategy provides information on at-risk species and habitats, identifies key issues affecting them and recommends actions. The Conservation Strategy emphasizes proactively conserving declining species and habitats to reduce the possibility of future federal or state listings.
- Oregon Plan for Salmon and Watersheds (ORS 541.405)
 Establishes plan to restore native fish populations, and the aquatic systems that support them, to productive and sustainable levels that will provide environmental, cultural, and economic benefits.
- ODFW's Fish Passage Law (ORS 509.580 - 509.645)
 Requires upstream and downstream passage at all artificial obstructions in those Oregon waters in which migratory native fish are currently or have historically been present.
- General Fish Management Goals (OAR 635-007-0510)
 Establishes the goals that fish be managed to take full advantage of the productive capacity of natural habitats, and that ODFW address losses in fish productivity due to habitat degradation through habitat restoration.
- Native Fish Conservation Policy (OAR 635-007-0502-0535)
 Protects and promotes natural production of indigenous fishes.
- Trout Management (OAR 635-500-0100-0120)

Requires maintenance of genetic diversity and integrity of wild trout stocks, and the protection, restoration, and enhancement of trout habitat.

- Oregon's Mule Deer Management Plan (OAR 635-190-0000-0030)
Establishes a plan to protect and enhance mule deer populations in Oregon, to provide optimum balance among recreational uses, habitat availability, primary land uses and other wildlife species.
- Oregon's Elk Management Plan (OAR 635-160-0000-0030)
Establishes a plan to protect and enhance elk populations in Oregon, to provide optimum recreational benefits to the public and be compatible with habitat capability and primary land uses.
- Oregon's Wolf Conservation and Management Plan (OAR 635-110-0000-0040)
Establishes measures ODFW will take to conserve and manage the species. This includes actions that could be taken to protect livestock from wolf depredation and address human safety concerns.
- Recommendations for Greater Sage-Grouse Habitat Classification Under Oregon Department of Fish and Wildlife's Fish and Wildlife Habitat Mitigation Policy (OAR 635-140-0000)
This document provides policy direction, consistent recommendations and supporting rationale to guide ODFW habitat mitigation recommendations associated with impacts to greater sage-grouse habitat from energy development, its associated infrastructure, or other industrial/commercial development.

Natural Resources Work Group

Recommendation: The Applicant should establish a Natural Resources Work Group comprised of technical representatives from the certificate holder, ODFW, and the USFWS.

ODFW recommends that the Applicant establish a Natural Resources Work Group (NRWG). The NRWG should be strictly comprised of the certificate holder and technical representatives of state and federal fish and wildlife agencies with natural resources expertise including the ODFW and the US Fish and Wildlife Service (USFWS). The main function of the NRWG should be to review and provide information to the ODOE related to 1) mitigation recommendations and compliance; 2) proposals for additional studies; and 3) operational considerations. The Applicant holder should consult with the NRWG on design of restoration, protection, management and monitoring plans and measures, and in the development of adaptive management or other recommendations. Lastly, the NRWG should be responsible for reviewing results of monitoring data and making suggestions to ODOE and resource agencies regarding the need to adjust mitigation and monitoring requirements based on results of initial monitoring data and available data from other projects.

The NRWG will facilitate communication and consultation between the Applicant and agencies for implementation and monitoring of the protection, mitigation, and enhancement measures throughout this site certificate. Timely and effective communications and coordination between the Applicant and the NRWG are crucial to the successful implementation of the site certificate and achievement of resource goals and objectives. Annual work plans and progress reports, plan or strategy updates, recognition and acceptance of the respective participant roles and responsibilities, and ongoing and active participation from all parties, are essential to good communications and coordination.

The Applicant will be responsible for ensuring that the NRWG meets at least once per year, generally in March-April, to review the previous year's activities and achievements, and to discuss and approve a final annual work plan for the current year. The NRWG may choose to meet at other times of the year, as needed, for example to address unanticipated matters or circumstances. Prior to each meeting, the Applicant should provide up-to-date progress reports including results of ongoing research and monitoring, schedules of planned maintenance, report on unplanned maintenance, and general operations information. Specific ground rules for the NRWG should be developed and at a minimum, these ground rules should include reporting requirements, define the extent to which public attendance and participation is allowed and information disseminated to the public, provide for a neutral note taker and meeting facilitator, and detail expectations of member contribution and behavior at the meetings. The ground rules should also include a timeframe for summarizing findings of surveys and studies, providing draft and final reports, and providing draft and final meeting minutes.

Zone of Multiple Biological Values

Recommendation: No construction of wind turbines, associated road systems, and associated Project infrastructure should take place in the Zone of Multiple Biological Values as delineated by ODFW.

Within its comments on the Preliminary ASC and Horizon's Response to the First Additional Information Request, ODFW defined an area called the Zone of Multiple Biological Values (ZMBV). ODFW recommended that no construction of wind turbines, associated road systems, or associated infrastructure take place in this area for several reasons, including:

1. A potential sage-grouse lek site;
2. The presence of sage-grouse and year-round sage-grouse habitat;
3. Virtually all of the ZMBV is classified as Big Game Critical Wildlife Habitat (Category 2 habitat according to ODFW's Fish and Wildlife Habitat Mitigation Policy);
4. Many of the deer and elk that were displaced by the EVWP moved north into the ZMBV and into areas proposed for development;
5. The orientation of Craig Mountain could act as a pathway between the large open valleys for migrating raptors and other birds;
6. The presence of two burrowing owl nests (a state critical species);
7. Four known active golden eagle nests;
8. Five known active raptor nests, four red-tailed hawk and one Swainson's hawk, a state vulnerable species; and

9. Mitigation for impacts to this habitat and species dependent on it, while not impossible, will be very difficult to achieve.

ODFW first identified the importance of land within the ZMBV to the Applicant in 2002. During the planning and siting process for the EVWP, ODFW recommended no development in the area ODFW refers to as the ZMBV (Jim Cadwell, ODFW wildlife biologist, personal communication). After extensive negotiations, turbine strings proposed by the Applicant (Zilkha Renewable Energy, which was later renamed Horizon Wind Energy) on Ramo Flat and the bench southwest of Union, both in the ZMBV, were not included in the EVWP.

Despite ODFW's concerns and recommendations to not develop on the ZMBV during siting of the EVWP and within comments on the NOI, preliminary ASC for the Antelope Ridge Wind Farm (ARWF or Project), and the Applicant's response to the ODOE's first request for additional information, the Applicant continues to propose turbine strings on Ramo Flat and on the low elevation bench southwest of Union as part of the ARWF – the heart of the ZMBV. Most of the turbines proposed in the ZMBV are on lower elevation Big Game Critical Wildlife Habitat. Again, these turbines are proposed in the same areas removed from the EVWP and within the same areas for which ODFW has identified substantial wildlife concerns. Because of these substantial wildlife concerns, ODFW continues to recommend that no project construction occur in the ZMBV.

If the Project is sited in the ZMBV, ODFW believes substantial impacts will occur as discussed further in these comments and substantial mitigation will be required. As demonstrated by the EVWP big game study, these impacts will extend a considerable distance beyond the immediate footprint of the project itself.

Activities associated with construction of the EVWP displaced deer and elk into the ZMBV. In addition, the ZMBV includes sage-grouse, big game critical wildlife habitat, burrowing owl nests, four golden eagle nests, and a large number of sensitive species and raptor nests. This area is Category 2 habitat under ODFW's Habitat Mitigation Policy. If development occurs in this critical wildlife habitat, impacts will be very difficult to mitigate.

The diversity of sensitive species found and high habitat value found in the ZMBV to terrestrial species, and the significant wildlife concerns with project siting here, warrant implementing elevated post-construction surveying and monitoring requirements and a higher standard for mitigating impacts to fish and wildlife resources, consistent with recommendations in the Oregon wind energy siting guidelines. Any proposed mitigation must provide a net benefit in habitat and functions and values. ODFW includes mitigation measures below that will need to be included in a site certificate for the ARWF if construction occurs in the ZMBV. ODFW believes these measures are necessary for suitable protection of resources and to mitigate for likely impacts to aquatic and terrestrial species in compliance with Oregon statutes, rules, policies, and management plans.

Habitat Mitigation Policy:

The ZMBV is largely Category 2 habitat, with localized areas of Category 1 habitat such as sensitive species raptor nests, as classified under the Fish and Wildlife Habitat Mitigation Rules

(OAR 635-415-0000 to 0025). It is essential and limited habitat for deer and elk, sage-grouse, golden eagles, Swainson's hawks, burrowing owls. The mitigation goal for Category 2 habitat if impacts are unavoidable is "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." If avoidance or the no net loss and net benefit mitigation standard cannot be achieved, "the Department shall recommend against...the proposed development action." [OAR 635-415-0025 (2)(b)(B) and (c)] The proposed mitigation measures for impacts to the ZMBV in Horizon's Final ASC fail to achieve the level of mitigation necessary to meet the Category 2 habitat mitigation standard. Therefore, ODFW is required by rule to recommend against the project as currently proposed.

As to the localized areas of Category 1 habitat, the habitat mitigation rules require that ODFW recommend against any development in those areas. Because the project continues to propose development actions that would impact those localized Category 1 areas, ODFW is required by rule to recommend against the project as currently proposed.

Bald Eagles

Recommendation: The Applicant should obtain an Incidental Take Permit for bald eagles from the ODFW.

The bald eagle is known to occur in the analysis area. Twenty-two bald eagles were observed during the baseline studies (Jeffery et al. 2009, Enk et. al. 2010) and 21 bald eagle observations have been recorded during the post-construction surveys at the Elkhorn facility (Jeffrey et al. 2009). Bald eagles were observed in all seasons in the analysis area, but most observations occurred during the winter and spring periods. No nests or roosts were documented during baseline surveys (Jeffery et al. 2009, Enk et. al. 2010), and there are no records of historic nests in the analysis area (ORNHIC 2010). The bald eagle observations in the analysis area were primarily concentrated near Jimmy Creek Reservoir.

Though federally delisted, bald eagles are listed as threatened under the Oregon Endangered Species Act (ESA). As such, take of this species is generally prohibited by ORS 498.026(1). To avoid illegal take (and potential prosecution), the project would need to obtain from ODFW an Incidental Take Permit (ITP). To issue such a permit, ODFW would have to determine that the project's incidental take of bald eagles will not adversely impact the long-term conservation of the species or its habitat. The department may issue the permit under such terms, conditions and time periods necessary to minimize the impact on the species or its habitat. (OAR 635-110-0170). Although bald eagles are common in Union County, there are no identified nests or roosts occurring within the proposed project area. However, fatalities associated with the proposed project are a possibility.

Golden Eagles

Recommendation: Conduct golden eagle studies requested by the US Fish and Wildlife Service, and implement US Fish and Wildlife Service siting recommendations resulting from those studies prior to Project construction.

Although no information on golden eagle studies is provided in the ASC, according to the FWS' Comments on the Final ASC, the FWS has actively initiated efforts with Horizon to better understand and study golden eagle use of the Project area. Golden eagle use studies are scheduled to begin in the spring of 2011, and will begin to provide additional insights into golden eagle use in the Project area.

ODFW has not been consulted on development of the golden eagle studies. However, based on recent conversations with the FWS, ODFW understands that two years of pre-project assessment will/should be conducted to obtain baseline information on eagle nest locations and productivity; use of feeding, roosting, nesting or wintering areas; eagle movements in relation to each proposed turbine location (including an analysis of spatial use in relation to rotor swept zone); numbers of eagles moving through the Project area; movements in relation to weather conditions; and phenology of movements. Also, eagle movement studies will be conducted for at least 20 days for two years during nesting season (June through early October) when adult eagles and their fledged young are most active.

ODFW believes these studies are necessary to help site the Project to minimize fatality and displacement impacts to golden eagles. Therefore, the Applicant should use data from eagle movement studies to carefully site Project turbines to avoid illegal eagle take. As such, final siting and construction of the Project, if issued a site certificate, should not occur prior to the these studies being conducted and conclusions reached.

Recommendation: Develop an Avian and Bat Protection Plan (ABPP) for the Project in consultation with, and for approval by, ODFW. Prior to finalization of an ABPP, the significant bat and bird issues of concern should be thoroughly addressed by Horizon.

Although no information on the drafting of an Avian and Bat Protection Plan (ABPP) is included in the final ASC, according to the FWS' comments on the final ASC, the FWS has actively initiated efforts with Horizon to develop a draft ABPP for the Project, that has an emphasis on golden eagles. ODFW has not been consulted on development of the ABPP.

According to the FWS, the draft ABPP's stated goals and objectives include avoidance, minimization, and mitigation of any unintentional take of golden eagles during construction and operation of the Project. However, the draft ABPP currently lacks specificity as to Horizon's commitments for avoidance and minimization measures for golden eagle, as well as any other compensatory mitigation measures for unavoidable take.

Because ODFW has not been consulted on development of the ABPP, it is impossible to determine if it will comply with ODFW policies. Oregon's Wildlife Diversity Plan (OAR 635-100-0001 through 0030) establishes a plan to maintain Oregon's wildlife diversity by protecting

and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges.

Without the ABPP plan included in the ASC, the ASC does not provide suitable protection or mitigation measures for golden eagles. To ensure compliance with Oregon's Wildlife Diversity Plan, the Applicant should consult with ODFW to develop an ABPP that includes study requirements and site-specific measures to avoid, minimize, and mitigate adverse impacts to golden eagles.

Recommendation: Employ micro-siting measures for the Project's turbines (including ZMBV and other locations) to avoid impacts to eagles, including removal of proposed turbines and turbine strings that are at high risk of golden eagle impact.

Recommendation: If issued a site certificate, Project construction and operation should not begin until golden eagle studies are completed and an Avian and Bat Protection Plan are completed.

Golden eagle populations are believed to be declining throughout their range in the contiguous United States. Wind projects sited in important eagle-use areas pose risks through collision and disturbance that results in loss of productivity at nearby nests or even loss of a nesting territory from construction, operation, and maintenance activities (Hunt 2002, Krone 2003, Chamberlain *et al.* 2006). Additionally, disturbances near areas that are important for roosting or foraging may result in reproductive failure or mortality elsewhere.

The importance of the Project area for golden eagles was demonstrated during baseline surveys conducted by the Applicant. For example, five golden eagle nests were located within two miles of the Project area and a total of 107 observations of golden eagles were documented during the baseline surveys, 32 observations during sensitive species surveys and 75 observations during other surveys or incidentally. Additionally, 86% of golden eagle observations were within the rotor swept height, suggesting golden eagles that use the Project area fly within the same spatial area where turbine blades spin the majority of the time.

As proposed, the Project is located in areas that pose considerable risk of injury and mortality to golden eagles. The proposed locations of Project turbine strings are closer to active golden eagle nests than at the adjacent EVWP. The proposed ARWF is three times larger than the adjacent EVWP, and the proposed locations of Project turbines indicate more risk to golden eagles from the Project's operations than at the EVWP. Given that four golden eagle mortalities have already been documented at the EVWP, ODFW considers the likelihood of golden eagle fatality and disturbance to be high at the ARWF.

Based on raptor use and collision mortality at 13 new generation wind facilities, the Applicant estimates that four raptor mortalities per year for each 100 megawatts of wind energy development at the ARWF. With a generating capacity of approximately 300 megawatts, an average of 12 raptor mortalities per year is expected to occur at the ARWF. Using the 90% prediction interval, the raptor fatalities could be as high as 93 raptor fatalities per year (31 fatalities/100 MW/year) for the Project.

An estimated 102 golden eagles, 23 bald eagles, and 54 Swainson's hawks were observed in the analysis area during surveys. Based on relative abundance and the high exposure index, there is a higher potential for golden eagle and red-tailed hawk fatalities than other raptor species.

Because active nesting of red-tailed hawks, golden eagles, and Swainson's hawks occur within the analysis area, some fatalities of these species will occur over the life of the project. Golden eagles are protected under the Bald and Golden Eagle Protection Act, and Swainson's hawks are a state vulnerable species.

Because of the anticipated mortality of 12-93 raptors including numerous state-sensitive species, and because golden eagle studies will begin in 2011, project siting and construction should not occur prior to studies and an ABPP being completed.

Recommendation: Restrict construction and maintenance activities to times outside January 1 through July 15 within 0.5 miles of an active golden eagle nest to avoid Project access-related disturbance impacts to nesting golden eagles.

Most studies and guidelines (Pagel et al. 2010, Kochert et al. 2002) suggest limiting disturbance during critical periods such as courting and nesting. Therefore, ODFW recommends restricting maintenance activities from January 1 through July 15. The window timing is based on documented periods of golden eagle courtship and nesting in the intermountain west region (Beebe 1974, Kochert et al. 2002, Watson and Whalen 2003). Fatalities of golden eagles are very likely to occur at the ARWF. These fatalities, when combined with fatalities at the EVWP, could result in population level effects to golden eagles. Oregon's Wildlife Diversity Plan (OAR 635-100-0001 through 0030) establishes a plan to maintain Oregon's wildlife diversity by protecting and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges. Therefore, minimizing other impacts such as disturbance and potential nest abandonment are critical.

Recommendation: Prevent construction of wind turbines within 0.25 miles of the edge of rims and ridges within the Project area

McGrady *et al.* (2002) and Watson and Davies (2009) indicated nesting territories of golden eagles extend to at least four miles from their nests. The Project's baseline studies identified a possible golden eagle flyway, whereby golden eagle flight paths tended to show affinity toward steep ridgelines. In addition, the flight paths of golden eagles observed in the Project area show use beyond the proposed 50 m setback from the edge of Craig Mountain (Attachment P-7, Page 116, Figure 8f). Given this use beyond the proposed setback, the majority of the golden eagles observed flying within the rotor swept height, and use of steep ridgeline slopes within the Project, ODFW believes to minimize the very high risk of mortality to golden eagles, construction of turbines should occur greater than 0.25 miles from the edge of rims and ridges.

Again, ODFW believes minimizing impacts are necessary to prevent population declines and to remain in compliance with Oregon's Wildlife Diversity Plan.

Recommendation: Design or site all new roads and any other roads that will be used for the construction or operation of the Project at least 0.5 miles away from any active or inactive golden eagle nests to avoid Project access-related disturbance impacts to nesting golden eagles.

Disturbance of golden eagles is also very likely from proposed Project road construction and use of these roads. An estimated 20,000 heavy duty round-trip truck deliveries are expected during Project construction (Page U-18). This level of use will likely have significant disturbance impacts on individual golden eagles, their nests, and nesting success. Furthermore, a proposed main transporter route identified for Project construction is located immediately adjacent to one known golden eagle nest and is approximately one mile from a second known golden eagle nest.

To avoid Project access related impacts to nesting golden eagles, all new roads should be designed and sited at least one mile away from any active or inactive nests.

Gray Wolves

Recommendation: The Applicant should immediately report any wolf sightings to the Oregon Department of Fish and Wildlife.

The Applicant reports two separate incidences of wolves being sighted in the Project area by project biologists in 2009 (Page Q-13). ODFW requests that any future sightings of wolves be reported immediately to ODFW so that sightings can be verified.

Gray wolves are listed as endangered under Oregon's ESA. Oregon's wolf population is low and ODFW does not have data which suggests the project area has resident wolves. The documentation of multiple wolves within the project boundary by the Applicant, however, suggests the area is potentially important for wolves.

Within ODFW's Wolf Conservation and Management Plan, ODFW encourages reports of wolf locations to ODFW. The cite certificate should direct the reporting of gray wolf locations to aid in the implementation of the Management Plan.

Recommendation: To minimize the potential for wolf conflicts with humans and wolf depredation of livestock, ODFW's recommendations for big game protection and mitigation should be included as conditions in the Project's Site Certificate

As habitat generalists, it is unknown if the proposed project will impact wolf distribution. The Oregon Wolf Conservation and Management Plan (2010) identifies sufficient prey availability and human tolerance as two key factors which will affect wolf recovery in Oregon. Thus, the potential effects of the proposed project on prey species (primarily deer and elk) distribution and abundance may significantly affect wolf recovery in Oregon. If big game species are displaced to lower elevation agricultural lands it is expected that wolves will also use these lands, thereby increasing the potential for human conflicts. For the purpose of minimizing wolf-human conflicts it will be important to implement ODFW's big game recommendations (towards the end of this document) relating to the displacement of deer and elk as a result of this project.

Sage Grouse

The following comments and recommendations pertain to the potential lek site identified in Horizon's Application for Site Certificate for the ARWF only, and should not be construed as applying to any other potential lek sites that may be identified for this Project or any other project.

Recommendation: A management area, with a 1.4 mile radius surrounding the potential sage-grouse lek site, featuring no turbines or meteorological towers, provided that the Applicant identifies and mitigates at a 2:1 ratio for impacts within a 3-mile radius of the potential lek.

Greater sage-grouse are a state sensitive-vulnerable species and an Oregon Conservation Strategy species for the Blue Mountain Region. The proposed Project has the potential to impact sage-grouse population abundance and habitat in the project area. Live birds, fresh scat, and a potential lek site were identified during pre-construction surveys for the EVWP and the ARWF.

Based on the best available science, ODFW believes that the fragmentation of habitat from wind development, the direct loss of habitat, the disturbance caused by activity associated with wind development, and the general avoidance caused by tall structures on the landscape will negatively affect the sage-grouse population located near the ARWF.

ODFW and the Applicant met April 9, 2010 to discuss the Applicant's response to ODOE's Request for Additional Information and ODFW's comments on its proposed sage-grouse protection measures included in a White Paper developed for ODFW consideration. At this meeting, ODFW and the Applicant tentatively agreed to no construction of turbines, towers, or transmission lines within 1.4 mi of this site, if the Applicant provides mitigation for impacts within a 3-mile radius of the potential lek site at a 2:1 ratio. This mitigation would be for impacts to sage-grouse only. However, within the Final ASC, the Applicant has modified the siting proposal to no tall structures (turbines, meteorological towers, and overhead transmission lines), in **suitable sagebrush habitat only** within 1.4 miles of the potential sage-grouse lek site and no mitigation for impacts within a 3-mile radius is proposed, except as mitigation for the Project footprint rather than impact to sage-grouse.

In an effort to protect breeding habitat, ODFW's current policy direction is to establish habitat protection areas of no development around (3-mile radius) occupied leks. Because the potential lek site has not been confirmed, ODFW was willing to consider Horizon's proposal for a management area with a 1.4 mile radius surrounding this potential lek site, featuring no turbines or meteorological towers, provided that Horizon provides suitable mitigation for sage-grouse. To identify impacts and mitigation measures, ODFW discussed with the Applicant that identification of impacts and mitigation measures should be developed in consultation with, and recommended for approval by, ODFW prior to issuance of a Site Certificate. Horizon, however, did not consult with ODFW to identify impacts and recommend mitigation for impacts within a 3-mile radius of this potential lek site.

Without a 1.4 mile radius surrounding the potential sage-grouse lek site featuring no turbines or meteorological towers, regardless of habitat type and without sage-grouse specific mitigation provided at a 2:1 ratio for impacts within a 3-mile radius of the potential lek, ODFW must consider this Category 1 habitat for sage-grouse. The mitigation goal for Category 1 habitat is avoidance of impacts or no authorization of the development action if impacts cannot be avoided [OAR 635-415-0025 (1)(b)(A) and (B)]. ODFW's Recommendations for Greater Sage-Grouse Habitat Classification under Oregon Department of Fish and Wildlife's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000) recommends limiting construction of wind farms to no closer than a 3 mile radius of sage-grouse lek sites. Therefore, no development should occur within 3 miles of the potential lek site.

Recommendation: A setback for all surface development of ≥ 0.5 miles from the potential sage-grouse lek site.

Oregon sage-grouse numbers have declined over the long-term (1957-2009; See Hagen 2005). Reasons for these losses include the cumulative effects of habitat loss and degradation, changes in predator control methods, and increases in human disturbance.

Sage-grouse use large landscapes often traveling over vast areas to fulfill various seasonal habitat requirements. They require specific vegetation types, and or structure, to meet daily nutritional and protection needs. ODFW's overarching habitat goals for sage-grouse are to 1) maintain or enhance the current range and distribution of sagebrush habitats in Oregon, and to 2) manage those habitats in a range of structural stages to benefit sage-grouse. Attaining population objectives is largely dependent upon achieving habitat goals.

In an effort to protect breeding habitat, ODFW recommends no development within a 3 mile radius of occupied leks. At the February meeting, Horizon indicated that a 3 mile set back for the potential lek would remove 45-65 turbines from the project. Therefore, Horizon proposed avoidance, minimization, and mitigation measures, in lieu of the 3 mile setback, for the potential sage-grouse lek associated with the ARWF. Horizon's proposal was included in a white paper filed with its response to the ODOE's Request for Additional Information on February 19, 2010.

ODFW and the Applicant met April 9, 2010 to discuss the Applicant's response to ODOE's Request for Additional Information and ODFW's comments on the Applicant's proposed sage-grouse protection measures included in its White Paper. At this meeting, ODFW and the Applicant agreed to no surface disturbance, including road construction, within 0.5 mi of the potential lek site.

ODFW's "Recommendations for Greater Sage-Grouse Habitat Classification under Oregon Department of Fish and Wildlife's Fish and Wildlife Habitat Mitigation Policy" recommends limiting construction of wind farms to no closer than a 3 mile radius of sage-grouse lek sites; 2) recommends buffers of 0.5 miles for winter and brood rearing habitats; and 3) recommends that ground level structures (e.g. roads and buried power lines) not be sited within 0.5 miles of the nearest lek site. Therefore, ODFW recommends a setback for all surface development of ≥ 0.5 miles.

Recommendation: Construction activities and scheduled maintenance activities should be restricted during the breeding period, March 1 to June 30, within a two-mile radius of active leks.

Horizon proposes restricting construction activities and scheduled maintenance activities during the breeding period, March 15 to June 30, within a two-mile radius of active leks. To be consistent with ODFW's policy guidance, this date should be modified to March 01 to June 30.

Timing restrictions in ODFW's Recommendations for Greater Sage-Grouse Habitat Classification are identified as March 1 through June 30. March 1 through June 30 is also identified by ODFW as the sage-grouse breeding season in Oregon. Therefore, construction activities and scheduled maintenance activities should be restricted March 1 to June 30, within a two-mile radius of active leks.

Recommendation: ODFW supports the Applicant's proposed timely removal of all garbage and food items to discourage corvid and eagle presence in potential sage grouse habitat.

Recommendation: ODFW supports the Applicant's proposal to employ perch guards on all power lines present within one mile of the potential lek site to discourage perching by raptors and ravens.

Increased abundance of raptors and corvids within occupied sage-grouse habitats may result in predation rates outside the range of natural variation (Coates 2007). Perching on power poles and transmission structures increases a raptor or corvid's range of vision, allowing for greater speed and effectiveness in searching for and acquiring prey. Transmission structures may also provide nesting sites for corvids and raptors in habitats with low vegetation and relatively flat terrain. Thus, raptors and corvids may preferentially seek out transmission structures in areas where natural perches and nesting sites are limited.

If corvid use is identified as an issue of concern at the Project once these measures are implemented, the Applicant should consult with ODFW to identify and implement further measures to decrease corvid use and concerns.

Monitoring

Recommendation: The potential lek site and other suitable lekking habitat should be monitored annually for seven years post construction.

ODFW defines a lek site as an area with one or more males observed displaying in two or more of the seven previous years. A total of 12 greater sage-grouse were observed during baseline studies in the analysis area (Jeffery et al. 2009, Enk et. al. 2010). During aerial lek surveys conducted on March 24, 2009, a single greater sage-grouse was documented on the western slopes of Clark Mountain. No sage-grouse were observed during a second flight on April 14, 2009. Four follow-up ground surveys were conducted between April 6, 2009 and April 20, 2009 to observe the location of the bird detected during the first aerial survey. On April 13, two males and one female were observed exhibiting mating behavior at the site, which was classified as a

potential lek site. No sage grouse were observed at the site during the other three surveys in 2009 or during a series of ten ground surveys conducted in April 2010.

Survey methods utilized for this study should come from the lek search procedures described in the ODFW Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Hagen 2005; Appendix A).

Bats

Recommendation: The Applicant should develop a Bird and Bat Protection Plan in consultation with, and for approval by, ODFW. This Plan should include all mitigation and monitoring measures for bats, raptors, and non-raptor bird species included in this attachment.

Although no information on the drafting of an Avian and Bat Protection Plan (ABBP) is included in the final ASC, according to the FWS' comments on the final ASC, the FWS has actively initiated efforts with Horizon to develop a draft ABPP for the Project, that has an emphasis on golden eagles. ODFW, however, has not been consulted on development of the ABPP.

Because ODFW has not been consulted on development of the ABPP, ODFW is not able to determine if it and the ASC will comply with ODFW policies. Oregon's Wildlife Diversity Plan (OAR 635-100-0001 through 0030) establishes a plan to maintain Oregon's wildlife diversity by protecting and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges.

Thirteen of the 15 bat species in Oregon may occur in the proposed Project area, 11 of which are considered Special Status Species. Nine of these bat species are designated as Federal Species of Concern, 6 are on the State Sensitive List, and 8 are Oregon Conservation Strategy Species. The Silver-haired bat is a Federal Species of Concern, State Sensitive, and an Oregon Conservation Strategy Species, and accounted for 39.7% of all bat fatalities in the first year of monitoring at the neighboring EVWP. Also at the EVWP, 41% of bat fatalities were of the Hoary Bat, a State Sensitive and Oregon Conservation Strategy Species. Expected annual mortality at the ARWF is between 117 and 738 bats, with no mitigation proposed.

Without the ABPP plan included in the ASC, the ASC does not provide suitable protection or mitigation measures for bats and birds. ODFW believes that mortality and habitat fragmentation, particularly when evaluated cumulatively with impacts from the EVWP, will result in population level effects to some of Oregon's sensitive bat species. To ensure compliance with Oregon's Diversity Plan, the Applicant should consult with ODFW to develop an ABPP that includes study requirements and site-specific measures to avoid or minimize and reduce risk to bats and bird and their habitats, and mitigate adverse impacts in the Project area.

Recommendation: To mitigate for an anticipated 450 bat fatalities per year as a result of collision or barotraumas, the Applicant shall protect and enhance 473 acres of forested

habitat in-proximity to the Project which includes documented roosting areas, natal colony sites and/or hibernacula for the species affected.

The Project area's combination of conifer forest, deciduous trees, grasslands, shrub-steppe, rocky outcrops and water sources including streams and ponds makes the proposed Project area ideal for bats. This diversity provides habitat edges preferred by bats for foraging, access to water, and a variety of secure day roosts, maternity roosts and hibernation sites for multiple species of bats.

Based on information presented by the Applicant regarding bat fatalities per MW per year at other wind projects in the Pacific Northwest, expected annual mortality at the ARWF is between 117 and 738 bats. Based on mortality observed at the EVWP, a minimum of 378 bat mortalities per year are expected at the ARWF. However, additional mortality per MW at the ARWF is expected because, as the Applicant writes, turbines constructed next to coniferous areas may experience higher levels of bat mortality. The ARWF is proposed for native habitat with approximately 10% of the project sited in coniferous forest.

Therefore, ODFW expects the fatality rate at the ARWF will be approximately 1.50 bats per MW per year. This is within the range of 0.39 – 2.46/MW/year cited for all Pacific Northwest wind energy projects (Page P-58) and reflects the expectation, for reasons described above, of a higher fatality rate at this Project than at the EVWP (1.26/MW/year). If fatality monitoring shows a fatality rate higher than 1.50/MW/year or 450 bats, additional compensatory mitigation may be necessary and the Applicant will need to consult with ODFW and ODOE to determine mitigation needed beyond that being proposed by ODFW to benefit the affected species.

Bats are long-lived (up to 31 years) with low reproductive rates. Females usually only have 1-2 young per year, depending on the species. Young are entirely dependent on parental care. Approximately 45% of all fatalities documented at the EVWP occurred during summer when young would still be dependent on parental care. The death of an adult female would therefore also cause the death of her dependent young. In species with naturally low reproductive rates, the loss of individuals above natural mortality rates is a blow to the reproductive potential of the population. Bats are dependent upon communities in equilibrium and "almost any alteration of the environment might be expected to have a deleterious effect on them" (Verts and Carraway 1998, p 75). Therefore, sustained, high fatality rates from collisions with wind turbines and barotraumas could have potentially significant impacts to bat populations due to low reproductive rates and the long dependency of young.

Although 400+ bat mortalities per year are expected at the ARWF, no mitigation is proposed by the Applicant for direct losses of bats. The applicant indicates that mitigation may be appropriate if annual fatality rates exceed a "Threshold of Concern". The Applicant writes of low anticipated impacts to bats and cites numbers of bats killed per MW per year at other projects in the Pacific Northwest with the implication that fatality rates within the range found elsewhere would or should be acceptable. The Applicant further writes that fatalities over the life of the Project "...are not likely to result in any population-level effects to sensitive bat species" (Page P-60). Given that little data exists to quantify bat population numbers or

demographics in Oregon, and with eight species already considered at-risk (Oregon Conservation Strategy Species), it is impossible to predict what level of additional mortality the populations can withstand without negative consequences. Furthermore, little is known of impacts of wind energy projects on bats from habitat loss, population displacement, and/or disruption of community social structure.

Mortality caused by the proposed Project will be additive to impacts from the EVWP. Given that mortality from wind projects and other development is cumulative and that the population level effects of that mortality are unknown, it is unknown what level of fatality per turbine or per MW the population can withstand. It is, therefore, important to avoid bat fatalities whenever possible and to minimize mortality when it can not be avoided. The ARWF Monitoring and Mitigation Plan fails to address any actions that may minimize direct impacts to bats, it only suggests monitoring bat fatalities and including those numbers in Project reports.

The Monitoring and Mitigation Plan does offer a potential mitigation package of \$10,000 per year for three years to Bat Conservation International or other bat conservation group if 750 plus bats are killed per year at the ARWF. While such a contribution to improve understanding of the impacts of wind energy on bat populations is admirable and encouraged, it does not meet the standard of compensatory mitigation resulting in in-kind and in-proximity mitigation and a net benefit to the species, nor does it offset the annual bat mortality that will continue for the life of the Project. Such contributions should be considered minimization measures by helping to explain why so many bats are killed by wind turbines and thereby suggesting ways to minimize those losses. However, the Applicant provides no justification for potentially providing a mitigation package for bats only if 750 plus bats per year are killed nor any information to suggest that this level of mortality will not have population level effects, particularly when added to mortalities occurring without mitigation at the EVWP. In addition, the 750 bat threshold appears to be upper limit of the 90 CI for average expected mortality of bats at Pacific Northwest wind facilities.

Compensatory mitigation should focus on actions that directly benefit the species such as protection and enhancement of critical habitat features and/or sites occupied by the affected species. As compensatory mitigation for expected losses to bats resulting from construction and operation of the ARWF, ODFW recommends the Applicant protect and improve in perpetuity and in-proximity, forested habitat that includes documented roosting areas, natal colony sites and/or hibernacula in northeast Oregon for the species affected. Sites protected and improved through acquisition or permanent easement should, in aggregate, house numbers equivalent to or greater than the expected annual fatalities at ARWF (1.5/MW multiplied by 300 MW equal 450 bats annually) and should emphasize sites for the species most affected by the Project. Mitigation actions of this type will have a real benefit to the species by preventing development from further eroding population viability in the protected sites.

Bat critical habitat, including roosts, maternity colonies, and hibernacula are identified as Category 1 habitat in the *Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines*. ODFW considers forested habitat in the Project area Category 2 habitat, because it is essential habitat for multiple bat and bird species and limited in the Project area. Approximately 157 acres of coniferous forest will be permanently lost or temporarily impacted

from Project construction and operation. To mitigate for 450 direct bat fatalities, and direct non-raptor mortalities caused by Project operations, ODFW recommends protection and enhancement of 473 acres of forested habitat, which roughly equals a 3:1 mitigation ratio.

ODFW recommends that mitigation be required in the Site Certificate to compensate for expected levels of bat mortality. If fatality monitoring reveals higher than expected mortality to bats, then additional compensatory mitigation may be appropriate. Additional compensatory mitigation would be determined in consultation with ODFW and must result in a net benefit to the affected species.

Recommendation: Turbine operations should be reduced at low wind speeds and/or turbine cut-in speeds should be raised to 5.0 or 6.5 m/s.

It is unknown what level of fatality per turbine or per MW local bat populations can withstand. It is, therefore, important to avoid bat fatalities whenever possible and to minimize mortality when it can not be avoided.

Efforts should first be made to minimize impacts and fatalities to bats at ARWF. Reducing turbine operation at low wind speeds can reduce bat fatalities at individual turbines by up to 82% with minimal loss of power generation annually (Baerwald et al. 2009; Arnett et al. 2010). Methods include raising turbine cut-in speeds to 5.0 m/s or 6.5 m/s, or use of a low-speed idle strategy to minimize the time blades are rotating at low wind speeds, the period of highest bat fatality rates. If operational changes are made that reduce turbine operation at low wind speeds, the expected fatality rate may be reduced substantially.

The cumulative effects of sustained high mortality from ever-increasing wind energy projects and the introduction of White-nose Syndrome, a devastating disease that has killed over a million bats in the eastern U.S. and is moving westward, could be catastrophic to populations of hibernating bats in the west. Avoiding or minimizing bat fatalities is essential to prevent population crashes that could lead to ESA listing of the hardest hit species, some of which are already in decline.

Recommendation: Use all non-guyed meteorological towers.

The use of non-guyed meteorological towers is a positive step toward minimizing bird and bat collisions. ODFW recommends the Applicant forgo the use of temporary guyed meteorological towers to avoid this additional source of mortality to birds and bats.

Monitoring

Recommendation: Fatality monitoring should begin no more than two weeks after Project turbines begin operating.

Within the Monitoring and Mitigation Plan, the Applicant proposes that fatality monitoring begin “within approximately one month of the Facility becoming commercially operational.” Bird and bat fatalities may begin to occur immediately upon Project start-up and may, in fact, be significant in that early period as wildlife that have become accustomed to stationary towers,

suddenly experience operational turbines. For that reason, ODFW recommends that fatality monitoring begin no more than two weeks after Project turbines begin to operate. Monitoring should take place within the search frequency period appropriate for the season as described by the Applicant. The fatality monitoring year would thus begin on the day of the first fatality search effort and would conclude twelve months later.

Recommendation: A minimum of 2 consecutive years of fatality monitoring in shrub-steppe and riparian habitats and 3 years in forested habitat, then every three to five years thereafter.

On page 4 of the Monitoring and Mitigation Plan, the Applicant proposes two complete years of fatality monitoring while on page 2, “at least one year” is proposed. ODFW does not believe one year of monitoring is sufficient to assess Project impacts given year to year differences in vegetation, weather, operational variations, and other factors. Because of the high use of the Project area by Special Status Species, the large size of the Project (300 MW), and the lack of information on mortality in conifer forest areas, ODFW recommends a minimum of 2 consecutive years of fatality monitoring in shrub-steppe and riparian habitats and 3 years in forested habitat. Fatality monitoring would then continue every three to five years, with frequency determined based on previous study results and Applicant consultation with ODFW.

Recommendation: Fatality searches should be conducted once per week during spring migration, summer/breeding, and fall migration season.

Due to evidence of a summer breeding population of hoary bats in the Project area and the high level of bat mortality during summer at the EVWP, ODFW recommends fatality search frequency during the summer equal to the frequency during migration. Thus, fatality searches should be conducted once per week during spring migration, summer/breeding, and fall migration season.

Recommendation: Small rodents, such as *Microtus* spp., should be used in lieu of small bird carcasses during carcass removal and searcher efficiency trials.

Regarding carcass removal and searcher efficiency trials, the Applicant proposes to use small bird carcasses as a surrogate for bats, unless fresh bat carcasses are available. It is probable that bird carcasses, with feathers and feather shafts that decompose slowly, would persist in the environment longer than bats, with no such tissues. In the Fatality Monitoring Search Protocol, a carcass condition category is included for a “feather spot” acknowledging the expectation that feathers will persist when other tissues have decomposed or been removed. Additionally, when a bird is scavenged, feathers may remain even if other tissues have been consumed by the scavenger. If a bat carcass is scavenged, it is unlikely that much, if any, of the carcass would remain to be found by searchers. For this reason, ODFW suggests that birds are a poor surrogate for bat carcasses and small rodents such as *Microtus* spp would offer a more realistic correction factor for both carcass removal and searcher efficiency. Rodents with fur are marginally similar in appearance to bats, and would better approximate searcher efficiency for bat carcasses when used in trials.

Recommendation: Compare fatality data with pre-construction acoustic survey data to determine if fatality rates are correlated with bat activity zones.

Bat fatality data should be compared with pre-construction acoustic survey data to determine whether and to what extent fatality rates are correlated with bat activity zones documented prior to Project start-up. This information would help inform future efforts on the part of the Applicant or others to design wind energy projects with minimum impacts to bats.

Recommendation: Monitoring of bat presence and activity throughout construction, post construction and start up of the project and at least 2 consecutive years after the Project becomes operational, should be conducted.

The Monitoring and Mitigation Plan for Antelope Ridge only includes fatality monitoring for bats. There is no mention of monitoring actual bat species presence, population density, roosts, or breeding activity in the vicinity of the project. The Plan does propose to monitor raptors and passerine birds in the Project area, but no equivalent surveys for bats are described.

Fatality monitoring alone, without the context of actual bat density and/or activity in the area is insufficient for determining the impact of the project on bat populations in the Project area. The ARWF is proposed for native habitat with approximately 10% of the project sited in coniferous forest. The Applicant writes in Exhibit P of the final application that the effect on bats of wind energy facilities in coniferous forested habitats is relatively unknown. Therefore, ODFW recommends monitoring bat presence and activity throughout construction, post construction and start up of the project and at least two consecutive years after the Project becomes operational, then every three to five years thereafter.

Monitoring should include bat acoustic surveys using a combination of Pettersson and AnaBat bat detectors at a minimum of ten sites in the proposed Project area, with at least one site in each of the major habitat types, particularly the conifer forest zones. While many wind energy projects use AnaBat detectors for acoustic bat surveys to compare to other projects, the resolution of the collected calls is low and limits species discrimination to acoustic groups or to the level of genus. The standard for collecting acoustic bat data in the Pacific Northwest is time expansion data such as that collected with Pettersson bat detectors allowing for better species discrimination and consistency with other data collection efforts. Post-construction surveys should be designed to determine changes in bat migratory patterns and local use patterns compared with pre-construction surveys and to locate breeding colonies, roost sites or any other sites with high density use by bats.

The ASC fails to develop an adequate habitat mitigation plan that complies with OAR 345-022-0060. The proposed ASC mitigation is to pay for three years into a Bat International Conservation group only after reaching the “Threshold of Concern” in bat mortality. The proposed mitigation does not have any sort of protection for future bat losses on site or in close proximity to the project (Oregon’s Mitigation Policy). In addition, bat losses will occur every year of ARWF operations not just for three years. ODFW believes the ASC did not meet the mitigation and habitat standards for bat losses.

Raptors

Recommendation: A 0.5 mile setback area around all sensitive raptor nest sites (excluding golden eagles) which includes all permanent and temporary disturbances associated with the proposed Project. Golden eagle protection and mitigation measures are discussed earlier.

The Applicant identifies Category 1 Habitat for nest sites of golden eagle, Swainson's hawk, goshawk, and burrowing owl. However, the Applicant considers these point habitats with no associated acreage. While this approach is convenient, it is inconsistent with historical regulatory measures (e.g., forestry practices) regarding sensitive and threatened and endangered wildlife species in Oregon. In the Columbia Basin, Category 1 Habitat associated with Washington ground squirrel colonies were defined as the occupied area AND its associated use area. This approach recognizes the importance of the area surrounding a natal site as integral to the continued use of the site (i.e., wildlife need more than a specific point to be successful). Because of this, ODFW recommends a ½ mile setback area (no impact) around all sensitive raptor nest sites (excluding golden eagles). This buffer should include all permanent and temporary disturbances associated with the proposed project, not simply turbines.

Recommendation: A minimum setback of 0.25 miles from the rim of Craig Mountain.

ODFW is concerned with the Applicant's proposal of only a 50 meter setback along the Craig Mountain rim as a mitigation measure for raptor collisions. This area was shown to be used by golden eagles during surveys, and the applicant acknowledges that use of rim edges by eagles is not uncommon. Golden eagles did exhibit some flyway affinity towards steep slopes and ridgelines, for example the east slopes of Craig Mountain (Page P-48).

Given the height of the turbines (328'-475'), the proposed 50 meter setback (approximately half the height of a single turbine) is insufficient. Lacking any specific data from the Applicant on the adequacy of this type of mitigation, ODFW recommends a minimum setback of .25 mile from the rim to reduce potential collisions, similar to the proposed Jimmy Creek Reservoir setback.

The documented raptor use of the site based on sampling efforts (not a complete inventory) is significant. This is not unexpected due to the location of the project in relation to surrounding geography (nearby high elevation mountainous terrain and low elevation valley bottom) and the variety of unique habitats (identified in Attachment P-2) within the project boundary. In addition, the high number of nesting raptors (65 nests identified during surveying) within the project boundary indicates a higher possibility of raptor fatalities.

Therefore, ODFW is concerned with the Applicant's general assessment that raptor mortality will be low based on estimators derived from other wind power projects. Specifically, the use of the nearby EVWP project as a comparator is misleading because the proposed ARWF is roughly three times the size of the Elkhorn project. In addition, it is unknown if the 0.04 /MW projected raptor mortality rate is an acceptable level of raptor mortality – it is likely dependent on which

raptor species are killed. Based on the supplied calculations in the application raptor fatalities at Antelope Ridge will be double that of Elkhorn. Given the species of raptor mortalities documented to date at the EVWP (i.e., golden eagles and Swainson's hawks) the projected fatality estimates are of great concern to ODFW. This concern is compounded with the data supplied by the applicant that 47.3% of the birds observed flying within the zone of risk during pre-construction surveys at Antelope Ridge were raptors.

Several of the Applicant's comments state that raptor mortality, particularly of golden eagles and red-tailed hawks, are few and that these species exhibit little disturbance from wind projects. However, the four golden eagle fatalities at the EVWP are substantially higher than at any other wind project in Oregon, where no eagle mortalities have been recorded.

Although mean raptor use in the analysis area is considered low, raptor nest density within the Site Boundary is moderately high relative to other wind facilities. Raptor nest density in the Project area is .28/mi², compared to 10 other western U.S. wind facilities (ranging from .03 to .30). Based on raptor use and collision mortality at 13 new generation wind facilities, the Applicant estimates that four raptors per year for each 100 MW of wind energy development will be fatalities at the ARWF. With a generating capacity of approximately 300 MW, an average of 12 raptor mortalities per year is expected at the ARWF.

The Applicant estimates that the majority of the fatalities of diurnal raptors will likely consist of red-tailed hawk, American kestrel, and golden eagle. Because active nesting of red-tailed hawk, golden eagles, and Swainson's hawks occur within the analysis area, some fatalities of these species will occur over the life of the project. Golden eagles are protected under the Bald and Golden Eagle Protection Act and Swainson's hawks are a state vulnerable species.

The Applicant proposes surrounding known nests with buffers when siting turbines to reduce potential impacts. The Applicant, however, does not propose any mitigation for fatalities or impacts from displacement.

The Applicant states that "no adverse population-level impacts are expected". ODFW is concerned that this assessment is not supported with documentation or analysis of the cumulative impacts of this and neighboring projects. Simply put, without adequate population data for many of the potentially affected raptor species – especially the low density raptors (e.g., burrowing owls, goshawk, and golden eagle), ODFW is unable to determine if the combined impacts to these species are sustainable to local populations of these species. Oregon's wildlife

The ASC lacks adequate population information on raptors. Several species have been identified as sensitive species and the estimated annual raptor mortality could be as high as 93 birds at the ARWF. During the first 10 years of ARWF operations an estimated 120- 93 raptors will be killed. The Applicant does not propose any mitigation for direct raptor fatalities nor does it provide information indicating this level of mortality is sustainable for state sensitive species. Because the Applicant reports that golden eagles, along with red-tailed hawk and American Kestrels, are expected to comprise a large proportion of the raptor fatalities ODFW believes the Project as proposed will result in serious declines of golden eagles and potentially Swainson's hawks.

ODFW is also concerned with the selection of threshold criteria that is proposed in the ASC. For example, it is difficult to understand why 60 state sensitive bird species must be killed by the project per year before mitigation options are considered. ODFW previously requested justification for these threshold numbers, but none has been provided.

ODFW questions the sustainability of this approach. Exceeding the projected threshold does not trigger mitigation, rather it appears to be an alert that more raptors are being killed than was anticipated and may indicate “if mitigation is appropriate”.

Recommendation: If studies indicate that the Project has a negative effect on raptor nesting success, nest use, or nest distribution mitigation should be developed in consultation with ODFW and implemented by the Applicant.

Varying levels of avoidance or lower nesting levels near turbines has been reported for raptors (Page P-59). The Applicant claims that there will be limited nesting displacement of raptors at the Facility, and that creation of a buffer surrounding known nests when siting turbines will further reduce any potential impact. However, little information on changes in nest densities with distance from the turbines is provided.

According to the Applicant, “If the analysis shows that mitigation is appropriate” it will consult with ODFW and ODOE on mitigation for the affected species. If a nesting displacement or a reduction in either nesting success or nest use occurs because of the Project, mitigation will be necessary and should be developed in consultation with ODFW.

Sensitive species nest sites are considered Category 1 habitat. Other raptor species nest sites are considered Category 2 habitat. ODFW’s Fish and Wildlife Habitat Mitigation Policy first requires avoidance of impacts through alternatives to the proposed development action to protect Category 1 or 2 habitats. Therefore, changes in operations or removal of turbines could be required. For Category 2 habitat, any mitigation required would need to be provided in-kind and in-proximity to the area of impact. Contributing to overall scientific knowledge or participating in research projects would not be considered in-kind mitigation.

The Applicant indicates that if mitigation is necessary, it should be designed to benefit the affected species or contribute to overall scientific knowledge. Also, that it could include additional raptor nest monitoring, protection of nest sites from disturbance, or participation in research projects. ODFW does not consider additional monitoring as mitigation without including an adaptive management component. As defined in ODFW’s Fish and Wildlife Habitat Mitigation Policy, “mitigation” means taking one or more of the following actions listed in order of priority [OAR 635-415-0005 (16)]:

- (a) Avoiding the impact altogether by not taking a certain development action or parts of that action;
- (b) Minimizing impacts by limiting the degree or magnitude of the development action and its implementation;
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the development action and by monitoring and taking appropriate corrective measures;

(e) Compensating for the impact by replacing or providing comparable substitute resources or environments.

Therefore, the Applicant will need to consult with ODFW to avoid and mitigate unavoidable impacts to nesting success, nest use, or nest distribution.

Monitoring

Recommendation: To accurately assess impacts to raptors from construction and operation of the ARWF and to determine suitability of mitigation, raptor nest surveys should occur the first two consecutive years following Project construction, then every 3-5 years thereafter.

As proposed, the raptor nest survey will be conducted to estimate the size of the local breeding populations of tree or other above-ground-nesting raptor species in the vicinity of the Facility and to determine whether operation of the Facility may have an impact on nesting activity or nesting success in the local populations of raptors. To accomplish this, two years of post-construction surveys are proposed. One survey will occur in the first nesting season after construction is completed. The second survey will be conducted as late as four years post construction.

ODFW does not believe one year of monitoring is sufficient to assess Project impacts given year to year differences in vegetation, weather, operational variations, and other factors. Because of the high use of the Project area by Special Status Species, the large size of the Project (300 MW), and the lack of information on mortality in conifer forest areas, ODFW recommends a minimum of 2 consecutive years of fatality monitoring. Two successive years of nesting surveys should provide a sufficient baseline to compare with long term monitoring results to help determine impacts to raptors and suitability of mitigation measures.

To accurately assess impacts to raptors from construction and operation of the ARWF, and to determine suitability of mitigation, raptor nest surveys should occur in the first two years following Project construction, then every 3-5 years thereafter.

ODFW supports the Applicant's proposal to conduct long-term raptor nest surveys at five year intervals for the life of the facility. However, ODFW believes raptor nest surveys should be conducted in two successive years immediately following initial start up of the Project. Based on results of first two years of study, ODFW may recommend monitoring occur more frequently than every five years. As such, the first long-term raptor nest survey would occur no later than the seventh year after construction is completed.

The Applicant indicates that given the relatively low raptor nest densities of target species in the area, impacts may have to be judged based on trends in the data, results from other wind facilities, and regional literature. Horizon should consult with ODFW to identify Project impacts to nesting raptor and to identify what, if any, mitigation is required.

Passerines

Recommendation: Mitigation for expected bird fatality should be provided and combined with bat fatality mitigation discussed earlier in the attachment. To mitigate for expected passerine fatalities at the ARWF, the Applicant shall protect and enhance 473 acres of forested habitat in-proximity to the Project.

The Applicant indicates that mitigation may only be appropriate if fatality rates exceed some hypothetical threshold of concern. The Applicant provides no biological justification for these thresholds of concerns, although it says they were developed based on previous site certificates and current knowledge of the species that are likely to use the habitat in the area of the facility. In addition, the Applicant indicates that mitigation may be appropriate if fatality rates for individual species (especially State Sensitive Species) are higher than expected AND at a level of biological concern.

It appears the Applicant chose these thresholds of concern because they are in other EFSC issued certificates rather than based on scientific information that considers the species that could be affected by the ARWF and the habitat types found in the Project area. The thresholds of concern also appear to simply be the Applicant's best guess of expected mortality based on mortality at other wind projects in the country.

Two separate thresholds of concerns for eagles are included, 0.09 and 0.06 annual fatalities per MW. This would mean 18 to 27 raptors including eagles we need to be killed before mitigation may be appropriate. This would result in illegal take for bald and golden eagles per the Bald and Golden Eagle Management Plan.

Furthermore, the Applicant proposes that mitigation may be appropriate for state sensitive species if annual fatalities are above 60 per year. These species are state sensitive because of their low numbers. Any take of state sensitive species is considered an impact.

Therefore, ODFW recommends that mitigation be provided based on the expected level of fatality attributed to the ARWF, and based on information provided in the application and observed levels of passerine mortality at the EVWP. Please see ODFW recommended mitigation section in this letter for specific mitigation needs. Mitigation will also need to provide in-kind and in-proximity positive benefits to affected species. Contributions to research funds, although valuable information could be gained, would not constitute in-kind and in-proximity mitigation.

Because of the large expected mortality of birds at the ARWF, compounded by the cumulative effects of unmitigated bird mortality at the EVWP, the lack of any biological justification provided by the Applicant for its "Threshold of Concerns", the lack of population information to support the Applicant's claims that mortality will not have population level effects or be of biological concern, and the lack of mitigation for anticipated bird fatality at the ARWF, the final ASC is not consistent with Oregon and ODFW statutes, rules, and policies.

Direct impacts to birds from wind energy facilities occur due to collisions with turbines, met tower guy wires, or vehicles and from loss of habitat or project construction site clearing. Using mortality data from a 10-year period from wind facilities throughout the United States, the Applicant estimated that the average number of bird collision fatalities was 3.1 per MW per year or 2.3 per turbine per year. That translates into an estimated 377-930 bird fatalities per year at the ARWF.

Based on the proportion observed during baseline studies, passerines are likely to comprise a large proportion of fatalities within the Site Boundary. Passerines identified by the Applicant as most at risk include mountain bluebird, American robin, European starling, and American goldfinch.

Some wind turbines will be sited within forested areas. The Applicant indicates that it is unknown if these areas may experience greater mortality levels of migrant and breeding birds.

The Applicant reports that fatality estimates for the EVWP are in the lower range of estimates compared to other regional wind projects. ODFW believes this low rate of mortality may be due to the macro and micro-siting efforts of the Applicant and ODFW to avoid canyons, cliffs, and reservoirs and clustering of turbine strings.

Recommendation: If displacement of forest breeding birds is documented, suitable mitigation shall be determined in consultation with and for approval by ODFW.

The site boundary includes approximately 10% forested habitat.

ODFW supports a breeding bird displacement study. However, ODFW believes the proposal to limit the study to two post-construction years, year 1 and year 5 of facility operation, is insufficient. Instead ODFW recommends that 3 successive years of forest breeding bird surveys be conducted and begin the first spring/early summer season after ARWF begins operation. Surveys should then be repeated every 5 years for the life of the Project.

If displacement of forest breeding birds is documented, mitigation will be necessary to offset these impacts. The Applicant, however, does not propose any mitigation for displacement affects, rather only that it will include an analysis of the data in reports.

Considering the number of turbines and area covered by the proposed ARWF, the Applicant should mitigate for bird displacement at the project.

Wind energy facility construction can cause small-scale local displacement of grassland passerines due to birds avoiding turbine noise and maintenance activities. Construction also reduces habitat effectiveness because of the presence of access roads and large gravel pads around turbines. According to the Applicant, turbines placed in grasslands and shrub areas will likely have some level of displacement on grassland and shrub nesting species in close proximity to the facilities. The Applicant reports that bird displacement away from turbines in other studies ranged from 50 to 180 meters (Pages P 57-58). However, the Applicant does not, but should, propose mitigation to mitigate for passerine fatalities at the ARWF.

Because the literature indicates a significant number of displacement effects on various bird species, especially grassland birds and raptors, the Applicant should implement mitigation of the Site Certificate so that these displacement effects can begin mitigated upon the construction of the project. In the event that displacement occurs beyond the estimated 50-180 m, mitigation should be expanded.

Monitoring

Avian Fatality Monitoring

Recommendation: Avian fatality monitoring should begin no more than two weeks after Project turbines begin operating

Within the Wildlife Monitoring and Mitigation Plan, the Applicant proposes that fatality monitoring begin “within approximately one month of the Facility becoming commercially operational.” Bird and bat fatalities may begin to occur immediately upon Project start-up and may, in fact, be significant in that early period as wildlife that have become accustomed to stationary towers, suddenly experience operational turbines. For that reason, ODFW recommends that fatality monitoring begin no more than two weeks after Project turbines begin to operate. Monitoring should take place within the search frequency period appropriate for the season as described by the Applicant. The fatality monitoring year would thus begin on the day of the first fatality search effort and would conclude twelve months later. If additional turbines are added to the Project at any time in the future, additional monitoring should occur at a frequency and duration similar to the original Project turbines.

Recommendation: A minimum of two consecutive years of fatality monitoring in shrub-steppe and riparian habitats and three full and three consecutive years of monitoring in forested habitat, then every three to five years thereafter.

On page 4 of the Monitoring and Mitigation Plan the Applicant proposes two complete years of fatality monitoring, while on page 2, “at least one year” is proposed. ODFW does not believe one year of monitoring is sufficient to assess Project impacts given year to year differences in vegetation, weather, operational variations, and other factors. Because of the high use of the Project area by Special Status Species, the large size of the Project (300 MW), and the lack of information on mortality in conifer forest areas, ODFW recommends a minimum of 2 consecutive years of fatality monitoring in shrub-steppe and riparian habitats and 3 years in forested habitat.

Recommendation: Fatality monitoring should occur at each turbine in the Project during the first three years of monitoring. Numbers and locations of towers to be monitored in subsequent years should be determined by the NRWG.

The Applicant’s proposed monitoring for mortalities in search plots is insufficient to determine the level of bird mortality attributable to the Project. The Applicant indicates that fatality monitoring during the monitoring year will occur at approximately one-third of the turbines, which are representative of habitat in different parts of the facility. Because each turbine in the

Project area will occupy a slightly different microsite (e.g., proximity to rock outcrops, conifer forest, etc.) each turbine may have an impact on bird fatalities completely independent of other turbines. Therefore, to gauge the true impact of turbines on birds, ODFW recommends fatality monitoring at each turbine in the Project. Thus, if a turbine or group of turbines is shown to have an impact greater than the rest of the Project, steps may be taken to mitigate that impact.

Passerines (primarily perching birds) have been the most abundant bird fatality at wind energy projects outside California (Erickson et al. 2001a, Erickson et al. 2002), often comprising more than 80% of the bird fatalities. Both migrant and resident passerine fatalities have been observed.

The Applicant's avian use surveys indicated that the coniferous forest habitats within the analysis area, Craig and Clark Mountains in particular, were used by migrant and breeding passerine songbirds, as well as several other bird species. These areas with mixed forest including coniferous trees and deciduous trees, and a diverse mix of understory shrubs, are considered important stopover habitats for migrating passerines and neo-tropical migrants.

Passerines and nocturnal migrants are common fatalities at wind facilities studied in the Pacific Northwest. However, information for the Pacific Northwest is from wind facilities that are not sited in forested ridge tops. Approximately 10% of the ARWF will be sited within coniferous forest habitat. It is unknown if these areas may experience greater mortality levels of migrant and breeding birds. Therefore, the first 1-3 years of monitoring should occur at all turbines to determine annual bird fatality, particularly in and near forested habitat, and to also determine if there are any trouble or hot spots. If monitoring results indicate a specific turbine or group of turbines is responsible for impacts significantly greater than the remainder of the Project, turbine removal should be considered.

Recommendation: All meteorological towers should be monitored for two successive years, beginning no more than two weeks after Project turbines begin operating. Based on results of this monitoring, additional monitoring may need to be conducted every three to five years.

The Applicant does not propose fatality monitoring at meteorological towers, indicating they are known to cause little, if any, bird mortality. To verify that meteorological towers are not causing fatalities at the Project, two full, successive years of monitoring should be conducted at all meteorological towers. Based on results of this monitoring, additional monitoring every three or more years may be warranted.

Recommendation: Removal and Searcher Efficient Trial and Fatality Monitoring Search Protocols should be developed in consultation with and approved by ODFW.

Prior to initiation of fatality monitoring, detailed study protocols should be developed in consultation with, and for approval by, ODFW.

Forest Breeding Bird Displacement Study

Recommendation: ODFW recommends that the Applicant conduct a before-after comparison of pre- and post-construction breeding bird surveys in and near forested

habitat to determine if displacement impacts occur, due to the high bird use and sensitive species found.

Four of the 11 state-sensitive bird species are grassland birds (burrowing owls, Swainson's hawk, grasshopper sparrow, long-gilled curlew). The applicant correctly presents a number of studies that indicate displacement of this species group with distances ranging from 164 to 600 feet from turbines. Yet the application contains no provisions to utilize this information in a way to protect or enhance local bird populations

ODFW recommends that the Applicant conduct a before-after comparison of pre- and post-construction breeding bird surveys in and near forested habitat to determine if displacement impacts occur, due to the high bird use and sensitive species found. The Applicant has already conducted the baseline study.

Recommendation: Three successive years of forest breeding bird surveys be conducted and begin the first spring/early summer season after ARWF begins operation. Surveys should then be repeated every 5 years for the life of the Project.

Mitigation Policy – As proposed, the proposed project will impact Category 1 habitat for raptors and Category 2 and 4 habitats for passerines as classified under the Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000 to 0025). For raptors, it is essential, limited, and irreplaceable. The mitigation goal for Category 1 habitat is “Avoidance of impacts through alternatives to the proposed development action; or no authorization of the proposed development action if impacts cannot be avoided” [OAR 635-415-0025 (1)(b)(A) and (B)]. For passerines, nesting habitat is considered essential and limited and for other use area the habitat is considered important, and therefore, categorized as 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...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” [OAR 635-415-0025 (4)(a) and (b)(B)].

Goshawks

Recommendation: Goshawk surveys should be conducted to thoroughly assess the resident population of goshawks and potential impacts from construction and operation of the ARWF

The single goshawk nest appears to have been discovered incidentally within the proposed project boundary. The survey protocol for the other bird species is likely inadequate to accurately determine the number of goshawk nests that may occur on the site. In addition, the Applicant states that ponderosa pine habitat represents sub-optimal habitat for goshawk. This is

inaccurate as many goshawk nests are known to occur in ponderosa pine habitats where canopy cover is sufficient. Furthermore, the Applicant acknowledges that much of the forested habitat type in the proposed project area is mixed conifer which may contain additional nests. Because the site is occupied by nesting goshawks, ODFW recommends that additional survey efforts be conducted to thoroughly assess the resident population of goshawks and any possible effects from the construction of the Project.

Burrowing Owls

Recommendation - A 0.25 mile setback from burrowing owl nests which includes all permanent and temporary disturbances associated with the proposed Project.

The Applicant proposes a 0.25 mile setback from burrowing owl nests for turbines only. ODFW, however, recommends the 0.25 mile setback include all permanent and temporary disturbances. ODFW also recommends that the Applicant avoid impacts to owls during the breeding season, generally February 1 through August 31.

Burrowing owls are present and likely breeding within the project area. The Applicant believes that because of behavior and low abundance of burrowing owls on site, the impacts are not expected to be significant. However, burrowing owls have been documented as fatalities in the western United States. Since the abundance is low in the Project area, any mortality or disturbance causing nesting failure would be compounded. Therefore, nesting areas should be avoided by implementing an appropriate buffer for roads and turbines. In addition, there should be no disturbing or clearing of habitat outside of the breeding season within these buffers.

Monitoring

Recommendation: To assess potential impacts to burrowing owls, surveys of known burrowing owl nests should occur the first two years following construction of the Project, and every 3-5 years thereafter. New or suspected burrowing owl nests should also be surveyed.

Surveys for burrowing owls are not proposed by the Applicant in the ASC. Instead, the Applicant proposed to monitor below ground nests as found incidentally during other survey efforts. Burrowing owls are a state sensitive species and burrowing owl nests have been found within the Project boundary. To assess potential impacts to this state sensitive species, surveys of known burrowing owl nests should occur in the first two years following construction of the Project, and every 3-5 years thereafter. New or suspected burrowing owl nests should also be surveyed. Without targeted surveys for nests for this state sensitive species, impacts to this population cannot be adequately identified and mitigation, if necessary, implemented.

ODFW believes that burrowing owl nest sites are a Category 1 habitat type (Mitigation Policy OAR 635.415-0000-0025) and the ASC proposes a 0.25 mile setback. Because burrowing owls are a state sensitive species, ODFW recommends a minimum 0.25 mile setback with no disturbance.

Big Game

Recommendation: To mitigate for displacement impacts to big game on both summer and winter range, acquisition and enhancement of 25,500 acres of low elevation winter range and 10,130 acres of summer range in-proximity to the proposed ARWF should occur.

Based on the proposed number and location of turbines within the project, ODFW expects to see a significant displacement of big game from primary use areas. Work previously conducted on the Elkhorn Valley Wind Project documented a statistically significant change in big game use patterns around turbine locations. During 2005 pre-construction surveys, the average distance to the proposed turbine sites was 344 m for mule deer and 1,326 m for elk. For post-construction data, the actual average distance to turbine was 3,073 m for deer and 3,497 m for elk.

In addition, mule deer counted within the Elkhorn Valley project area indicated an overall decrease in animal use. Preconstruction counts resulted in 1,560 deer counted in three flights (average of 520 per flight) in 2004-2005 decreasing to 1,170 counted in four flights in 2008-2009 (average of 293 per flight). These counts when coupled with the radio telemetry data indicate that deer likely moved out of the project area. Based on the information presented and analyses conducted, ODFW believes facility presence and human disturbance impacted big game distribution and habitat selection.

Compared to pre construction use, counts of mule deer during post construction surveys showed reduced use of habitats in the first seven distance bands evaluated, 0 to 500 m out to 3,000 to 3,500 m. This shift in distribution of mule deer is consistent with deer response to natural gas development in Wyoming (Sawyer et al. 2009), where mule deer avoided liquefied gathering systems and selected areas greater than 2.6 to 4.35 km from a well pad.

Much of the high-use area used by mule deer post-construction of the EVWP is included in the proposed ARWF. ARWF turbine strings will be placed directly on areas that were identified as big game high use areas and deer displaced to from the EVWP. These deer will die, disperse, or habituate to the activity. Based on work completed in Wyoming evaluating mule deer responses to natural gas field development in which deer avoided the area, population numbers declined (Sawyer et al. 2009, Sawyer and Nielson 2010) and they did not habituate to field development and operations over the 10 years of monitoring, deer will not habituate to the ARWF.

If further displacement occurs as a result of the construction of the Antelope Ridge project, ODFW expects animals to move onto private agricultural lands in the Grande Ronde Valley. Any significant shifts of deer and elk onto these lower elevation agricultural lands will result in increased damage problems associated with crop lands, hay stacks and pastures. The ODFW is required to manage big game populations in a manner that is compatible with other land management practices. In order to do so biological, social, and political factors are considered in establishing management objectives for big game in Oregon. Local work groups are convened to establish these management objectives that are then adopted into OAR by the Fish and Wildlife

Commission. One key factor used to establish management objectives has been deer or elk damage impacts to private lands. Big game impacts can have a significant financial impact to private landowners. With a consequence of animal displacement and increased wildlife damage to private agricultural lands, ODFW may have to adjust its management objectives downward. This is not desirable since it will decrease the number of big game available for both consumptive and non-consumptive users. A decrease in hunting opportunity will have an impact on local economies that depend on the expenditures made by hunters. It may also decrease revenue the state receives from the sale of big game hunting licenses and tags.

Any significant displacement of mule deer and elk from winter range may ultimately lead to population level effects. Some of these animals will be displaced onto summer range or poorer quality winter range where survival will be compromised.

Locating wind turbines on ridges where wind currents are strongest and most consistent; also creates an immediate area of potential disturbance, as in the winter these are the same areas that would have more bare ground and less snow pack because of the scouring effects of the persistent wind. Thus, one would predict that areas immediately adjacent to wind turbines prior to construction would have higher densities of deer and elk compared to areas where wind was not as strong resulting in deeper or more persistent snow pack. If there was no effect of either the turbines or human activities associated with the wind development, winter counts should be equivalent to predevelopment conditions. Because winter counts of mule deer on the Elkhorn Valley project decreased post construction, the presence of turbines and/or associated human activities likely influenced mule deer distribution.

There is a lack of published literature on the effects of wind-turbines on elk and mule deer. Best science for activities of similar size and extent are found, however, for mule deer responses to natural gas development (Sawyer et al. 2009, Nielson et al. 2009). Sawyer et al. (2009) found that mule deer avoided roads and natural gas facilities and effects extended out 4.6 km. Sawyer and Nielson (2010) updated results presented by Sawyer et al. (2009) and found mule deer continued to avoid additional areas of winter range as the field continued to be developed and that mule deer populations within the gas field declined faster and did not recover at the same rates as either a control area or within the entire mule deer population indicating that as the habitat was degraded, the population declined. Their protocol for monitoring was reviewed by a blue-ribbon committee of wildlife biologists (Bissonette et al. 2010) who concluded that population monitoring was an essential part of monitoring for industrial impacts to wildlife. How mule deer and elk are displaced by other types of disturbance provides a reasonable means of understanding how wildlife will respond to wind turbine development and associated activities (Wyoming Game and Fish Commission 2010).

Results from the Elkhorn Valley project big game study illustrate the dynamic nature of mule deer distribution and may be used to begin making predictions of how deer may respond to the development of the ARWF. Literature on energy development is also valuable for predicting big game response to development of the ARWF

Based on results of the Elkhorn Valley project big game study and literature cited above, construction of the ARWF will likely displace deer and elk from 1000 – 3000 meters from the

tower strings. Displacement will effectively remove between 25,000 – 59,000 acres of big game habitat. Displacement out to 1,000 m amounts to a loss of habitat of 25,550 acres of winter range and 10,132 acres of summer range.

Draft Big Game Winter Range and Critical Wildlife Habitat Management and Monitoring Plan

Recommendation: The Draft Big Game Winter Range and Critical Wildlife Habitat Management and Monitoring Plan should be revised to incorporate ODFW’s big game mitigation and monitoring requirements included in these comments.

The proposed management and monitoring plan is insufficient to Comply with Oregon and ODFW statutes, rules, policies, and management plans.

The proposed management and monitoring plan indicates that “The potential impacts for the proposed Facility will be mitigated in favor of the resource through monitoring, **off-site habitat mitigation** (emphasis added), and management techniques, as discussed below” (Page 1). To be consistent with ODFW’s Fish and Wildlife Habitat Mitigation Policy, monitoring must include a commitment to “taking appropriate corrective measures” [OAR 635-415-0005 (16)(d)]. Furthermore, mitigation for impacts to Category 2 and 3 habitats must be provided through reliable in-kind, in-proximity habitat mitigation, with a net benefit accrued to Category 2 habitat [OAR 635-425-0025 (2)(b)(B) and (3)(b)(B)].

The off-site mitigation as proposed may not be in compliance with ODFW’s Fish and Wildlife Habitat Mitigation Policy. The proposal includes off-site mitigation at a minimum of a 2:1 ratio for impacts to Big Game Critical Wildlife Habitat and Big Game Winter Range (Page 6). The proposed mitigation includes acquisition of a 2,000 acre or 5,000 acre parcel in a nearby area. Without knowledge of these specific parcels, ODFW cannot evaluate whether they are adequate to offset any portion of the impacts from the proposed Project. Again, mitigation for Category 2 habitat, which includes big game winter range, must be provided in-kind and in-proximity. Additionally as previously mentioned, ODFW has identified a project footprint of over 35,000 acres that would need to be considered for mitigation.

Preservation Techniques

Recommendation: ODFW recommends the Minimization Techniques and Best Management Practices included in the Draft Monitoring and Mitigation Plan be included in the Final Plan and incorporated as conditions of the Site Certificate, with modification to Seasonal Restrictions.

Recommendation: To avoid disturbance to big game during winter months, the Applicant should not conduct routine scheduled preventative maintenance from December 1 to April 15 in designated Big Game Winter Range or Big Game Critical Wildlife Habitat.

Recommendation: To minimize impacts to wintering big game, the Applicant should construct as much of the facility as possible outside of the winter period.

The big game wintering period is generally early December through mid-April. During the winter period, animals are under a tremendous amount of stress. Any disturbance can compromise an animal's ability to survive a winter.

Monitoring

Recommendation: Population monitoring of mule deer and elk should be conducted annually to adequately determine ARWF effects on local big game populations.

The Applicant should be commended for agreeing to conduct a big game telemetry study to evaluate the habitat selection and distribution patterns of elk and mule deer before construction and during operations of the facility.

The telemetry study should contain two key elements, 1) distribution and 2) population trends, for mule deer and elk in the Project area. Placing GPS collars on elk and mule deer is a good first-step to evaluating the habitats elk and mule deer select as the Project is developed and placed into operation. Unfortunately the plan for monitoring elk and mule deer population size as currently proposed is inadequate.

The population monitoring plan should be designed to detect any distribution shifts by deer or elk onto adjacent agricultural lands. Additionally the population monitoring plan needs to be able to detect and determine the overall shift by animals off of the project site into other areas.

Because no estimate of abundance of either deer or elk will be made, evaluating effects of wind turbine development and determining if mitigation is sufficient will be more difficult. Therefore, ODFW recommends that estimating deer and elk abundance be added to the Big Game Winter Range and Critical Wildlife Habitat Management and Monitoring Plan.

Big Game associated Policies

The ASC assessment for big game does not meet a number of Oregon's statutes, Administrative Rules, Policies and Management Plans. Listed are the statutes, rules, policy and plan references where the ASC does not meet Oregon's standards.

Oregon Revised Statutes

The Wildlife Policy (ORS496.012) (1) and (5) direct ODFW to manage wildlife in a manner that prevents serious depletion of indigenous species: (1) maintain all species of wildlife at optimum levels and (5) regulate wildlife in a manner that is compatible with primary uses of lands and waters of the state. Proposed mitigation in the ASC will fail to maintain big game populations at the optimum because of the loss of critical winter range habitat. The direct effect on the big game population level because of displacement is not discussed in the ASC. ODFW believes big game will be forced off established summer and winter ranges toward private property resulting in a negative population effect. The management tool available to ODFW is to reduce the population because of damage on agriculture crops.

ODFW manages wildlife in a manner that is compatible with the primary uses of the land. In the case of placing a wind farm in established big game habitat, the primary use of the land changes.

A large industrial site in productive wildlife habitat is a significant alteration of the current primary use. The Applicant fails to address how big game use will be mitigated.

In addition to the anticipated big game population effect, the Applicant fails to address Oregon's Damage Statutes (ORS 498.012) or the ODFW's Damage Policy. The Damage Policy is the on the ground guidance for implementing the Damage Statutes. Since Oregon does not pay for direct damage to agricultural crops, ODFW uses a number of tools in the Policy for responding to big game damage. The displacement of big game from Project operations will result in more agriculture damage. Within the ASC, the Applicant does not recognize that big game damage will rise as the result of project operations.

Management Plans

The Oregon Fish and Wildlife Commission adopted by Administrative Rule the Mule Deer Plan (OAR 635-160-0000-0030) and Elk Plan (OAR 635-190-0000-0031). Both plans identify the economic importance of deer and elk to Oregon's economy. In a recent survey (Dean Runyon Associates, 2008) of Oregon's Hunting Public, an estimated \$9.95 million dollars per year of travel generated expenditures were associated with overnight hunting trips to Baker and Union Counties.

The Deer and Elk Management Plans describe the importance of managing big game populations to provide optimum recreational benefit for the public within the habitat compatibility and primary land uses. In addition, the plans go on to raise the importance of maintaining high quality winter range. During the winter period, animals are under a tremendous amount of stress and any change can compromise the ability to survive a winter. The loss or degradation of winter range or displacement of animals due to disturbance may lead to declines in big game populations and increased conflicts on private property.

Oregon Administrative Rules

The EFSC Siting Standards (OAR 345-022-0060) require that a proposed facility comply with the habitat mitigation goals and standards of ODFW. ODFW staff analyzed the EVWP Big Game Study data and determined that big game displacement from construction and operation of the Project was at a minimum 1,000 meters from the tower string. The Applicant, however, only proposed to mitigate for the actual footprint of the Project. ODFW considers Big game winter range Category 2 habitat because it is essential and limited (Mitigation Policy 635-415-0000-0025). Mitigation for impacts to Category 2 habitat must be provided in kind and in-proximity, and also provide a net benefit of either habitat quantity or quality. The proposal to mitigate for the project footprint is insufficient to meet the requirements of either the Siting Standard or the Mitigation Policy. A minimum of 25,000 acres of winter range and 10,000 acres of summer range is projected to be affected by the Project.

Antelope Ridge Wind Farm Habitat Mitigation Plan (September 2010)

Recommendation: A Revised Habitat Mitigation Plan Incorporating ODFW Habitat Categories and Mitigation Requirements Drafted in Consultation With, and for Approval by, ODFW Prior to Issuance of a Site Certificate

Per OAR 635-415-0000, "Mitigation Plan" means a written plan or statement that thoroughly describes the manner in which the impact of a development action will be reduced or eliminated over time, avoided, and/or minimized; and the affected environment, including fish and wildlife habitat, monitored, restored, rehabilitated, repaired and/or replaced or otherwise compensated for in accordance with OAR 635-415-0010 of these rules. A written mitigation plan shall include the information required in OAR 635-415-0020 (a)-(d); and (b) Describe the mitigation actions which shall be taken to achieve the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025; and (c) Describe and map the location of the development action and mitigation actions including the latitude and longitude, township, range, section, quarter section and county; (d) Complement and not diminish mitigation provided for previous development actions; and (e) Include protocols and methods, and a reporting schedule for monitoring the effectiveness of mitigation measures. Monitoring efforts shall continue for a duration and at a frequency needed to ensure that the goals and standards in OAR 635-415-0025 are met, unless the Department determines that no significant benefit would result from such monitoring; and (f) Provide for future modification of mitigation measures that may be required to meet the goals and standards of OAR 635-415-0025; and (g) Be effective throughout the project life or the duration of project impacts whichever is greater; (h) Contain mitigation plan performance measures including: (A) Success Criteria. The mitigation plan must clearly define the methods to meet mitigation goals and standards and list the criteria for measuring success; (B) Criteria and a timeline for formal determination that the mitigation goals and standards have been met; (C) Provisions for long-term protection and management of the site if appropriate; and (D) A reporting schedule for identifying progress toward achieving the mitigation goals and standards and any modification of mitigation measures. Mitigation goals and standards must be achieved within a reasonable timeframe to benefit the affected fish and wildlife species.

As drafted, Habitat Mitigation Plan does not meet the standards of ODFW's Fish and Wildlife Habitat Mitigation Policy nor does it provide sufficient mitigation for the proposed Project. Because this plan only proposes mitigation for the Project "footprint", the majority of the Project impacts are not identified or addressed.

Additionally there appears to be confusion over the amount of acres impacted in Category 2 and 3 habitats. Table 1 should be updated to reflect winter range and sage-grouse wintering and brood-rearing habitat as Category 2 habitat.

The Habitat Mitigation Plan only addresses impacts from the footprint of the facility. An accurate estimate of footprint acreage, however, should also include the transmission line right of way (ROW). As such, permanent acres lost in Table 1 should increase by 218 acres to 523 acres (12 mile transmission line with a 150' right of way).

As mitigation for impacts from the Project footprint, minus transmission line ROW clearing, the Habitat Mitigation Plan includes proposals to either acquire or donate a mitigation area to ODFW for protection and enhancement or protection and enhancement of a mitigation area through a conservation easement or similar conveyance. The Applicant indicates it will select a mitigation area in proximity to the facility and that it has identified suitable options including a 2,000 acre parcel in a relatively remote setting on High Valley, a 2,000 acre parcel bordering the

Elkhorn Wildlife Management Area, and a 5,000 acre parcel that could be purchased in partnership with the Rocky Mountain Elk Foundation. The Applicant does not provide any information on these parcels particularly how they provide in-kind mitigation, therefore their sufficiency for meeting ODFW's Fish and Wildlife Habitat Mitigation policy cannot be determined at this time.

ODFW is concerned that the proposed habitat mitigation ratios may not be sufficient. Further analysis of the overall footprint of the project and the various habitat categories will be required. Only then can the appropriate ratios be developed that would adequately address the "no net loss" and "net benefit" standards within the Habitat Mitigation Policy.

The Applicant provides a list of enhancement actions to be implemented. No information, however, is provided to verify enhancements will provide in-kind mitigation. For example, 10% of the Project will be sited in forested habitat, but no information is provided that indicates that mitigation will include forested habitat.

To ensure mitigation meets ODFW's mitigation standards, ODFW recommends that all mitigation areas be identified, in consultation with, and approved by ODFW. In addition, a management plan should be developed for each mitigation area.

If land acquisition is selected as a mitigation action, any parcels will have to be carefully analyzed to ensure that the lands are capable of meeting the "no net loss" and/or "net benefit" standards of the Habitat Mitigation Policy. Simple acquisition of lands may not yield a net benefit and in some cases may also require investments in operations and management of those lands.

Changes in grazing practices may be used to benefit big game, but will need to be evaluated closely on a case by case basis.

The monitoring strategy does not specify monitoring procedures for mitigation areas. Instead, monitoring is proposed annually for the first five years, with any continued monitoring occurring as necessary. This language is too ambiguous to ensure sufficient mitigation and monitoring of mitigation areas occurs.

The Applicant's success criteria do not address the location of the habitat mitigation, whether it will be in proximity or whether the mitigation will be provided in-kind, both are requirements for compliance with ODFW's Fish and Wildlife Mitigation Policy.

Sage-grouse Habitat

ODFW's *Recommendations for Greater Sage-Grouse Habitat Classification Under Oregon Department of Fish and Wildlife's Fish and Wildlife Habitat Mitigation Policy* (August 7, 2009, ODFW Sage-Grouse White Paper) provides policy direction, consistent recommendations, and supporting rationale to guide ODFW's habitat mitigation recommendations associated with impacts to greater sage-grouse habitat from energy development, its associated infrastructure, or other industrial or commercial development. The objective of these recommendations is to

protect essential habitats to meet habitat and population objectives in the cooperatively developed *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon*.

Within its ASC, the Applicant has categorized sagebrush/shrub-steppe habitat that is in a grazed condition and shorter, less mature and less dense big sagebrush species as Category 3 habitat. The ASC notes that “The Category 3 sagebrush habitat type was considered important habitat for sagebrush obligate species, including the greater sage-grouse which may use these areas infrequently throughout the year, particularly in winter for foraging”.

Sage-grouse are sagebrush “obligates”, meaning they are dependent on sagebrush for reproductive success and year-round survival. Major causes of sage-grouse population decline include the conversion or loss of sagebrush habitat, which includes winter, breeding, and nesting habitat, and development. The availability of sagebrush above the snow pack is critical to winter survival of sage-grouse. Winter habitat can vary from low sagebrush exposed on wind swept ridges to tall dense stands of basin big sagebrush in valley bottoms.

Winter foraging and brood rearing habitat for sage-grouse is essential and limited as outlined in ODFW’s Sage-Grouse White Paper. Sage-grouse feed exclusively on sagebrush during winter, and temporally its availability is limited. Therefore, ODFW considers sagebrush habitat used for winter foraging Category 2 habitat, with “no net loss” of either habitat quantity or quality and a net benefit of habitat quantity or quality provided through mitigation paramount if protection is not possible. All sagebrush identified as sage-grouse winter habitat and brood rearing habitat is Category 2 habitat not Category 3 habitat as identified within the ASC.

Recommendation: The Applicant should consult with ODFW to identify suitable acquisition options. Acquisition of all mitigation lands is to be completed within the first three years of license issuance.

The plan does not include a timeframe for meeting mitigation goals. ODFW recommends that no later than three years post certification, the Applicant acquire all mitigation lands with management plans for each parcel completed no later than year 3 post certification.

Recommendation: For each mitigation parcel acquired, the Certificate Holder should develop, in consultation with and for approval by ODFW, a land enhancement and mitigation plan.

A critical component of the land enhancement and mitigation plan will be documenting current and future habitat conditions. The Applicant needs to describe how baseline conditions and habitat enhancements will be measured and how it will be determined that mitigation has been achieved. ODFW recommends use of Habitat Evaluation Procedures (HEP) or other methodology approved by ODFW. The FWS developed HEP for use in impact assessment and project planning. HEP is used to mitigate impacts to terrestrial resources caused by development and operation of the Columbia River hydropower system.

Develop mitigation plan for property that is approved by ODOE and funding necessary to achieve the mitigation requirements. Funding level should be sufficient for the Applicant to

meet its mitigation requirements for fish and wildlife species and their habitat. Therefore, there should be no funding cap and contingencies included in the plan in case enhancement projects do not provide sufficient mitigation for project impacts. It is the sole responsibility of the Applicant to meet its mitigation requirements.

Recommendation: The Certificate Holder should fund implementation of the land enhancement and mitigation plan.

Recommendation: The Certificate Holder should fund maintenance and enhancement of acquired mitigation parcels beginning in year one through the length of license.

ODFW shall recommend mitigation consistent with the goals and standards of OAR 635-415-0025, and based on the following considerations:

- a) The location, physical and operational characteristics, and duration of the proposed development action; and
- b) The alternatives to the proposed development action; and
- c) The fish and wildlife species and habitats which will be affected by the proposed development action; and
- d) The nature, extent, and duration of impacts expected to result from the proposed development action.

Recommendation: An accurate estimate of acreage by Habitat Category should be provided by the Applicant.

ODFW's Habitat Mitigation Policy is based on the premise that habitats can have varying levels of "relative importance" or influence on the survival of fish and wildlife species. This variability depends on the ecological condition and physical setting of habitat at a specific site, and the needs and sensitivity of fish and wildlife species using the habitat. The physical and biological components of ecosystems produce the diversity, abundance, and productivity of plant and animal species. The combination of suitable habitats and necessary ecological functions forms the ecosystem structure and conditions needed to provide the desired abundance and productivity of specific species. Loss of species and their functions lessens the ability of the ecosystem to withstand disturbance and change.

Therefore, the Habitat Mitigation Policy describes six levels of habitat categories ranging from irreplaceable, essential habitat to low potential to become essential or important habitat. "Essential habitat" refers to habitats that contain the physical and biological conditions necessary to support the most critical life history functions of the fish and wildlife species being considered. These habitats are those that species are dependent upon for long-term population maintenance. Generally, essential habitats will be those that provide critical support to the population or species for reproduction, rearing, forage and dispersal necessary for the completion of one or more life history functions. "Limited habitat" refers to the lack of an adequate amount of habitat necessary to sustain, over time, the fish and wildlife species or populations being considered. This concept requires that the relative availability of suitable habitats to support important life history functions be considered at variable scales that may go beyond the project

site. In the case of relatively mobile species, the presence and abundance of suitable habitats may need to be assessed at the watershed or regional scale.

As mentioned previously, ODFW does not agree with some of the habitat categorizations. The ODFW is willing to provide the habitat categorizations consistent with Fish and Wildlife Commission adopted plans and OARs for use in evaluation of the application and the mitigation requirements.

Big Game Winter Range

Every county in the state east of the Cascades has identified big game winter range in its Comprehensive Plan as a significant Goal 5 resource. There is a long history of ODFW comments to these counties, including Union County, that Goal 5 big game Critical Wildlife Habitat and Winter Range resources are Category 2 habitat. Only eight areas within Union County are classified as Big Game Critical Wildlife Habitat. Portions of three of these areas (North Craig Mountain, East Craig Mountain, and Catherine Creek/High Valley) fall within the ZMBV. These areas are extremely critical to the continued welfare of the wildlife that are dependent on them, and were identified by ODFW in 1978.

ODFW worked very closely with each county in the state to legally designate big game habitat in each county based on site-specific conditions. Therefore, ODFW bases its big game winter range habitat recommendations on that legal designation within each county.

Mule deer experts throughout the western United States and Canada have delineated mule deer habitat at the state level. Winter range was identified as that part of the overall range where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site-specific period of winter. A severe winter range definition includes areas within the winter range where 90% of the individuals are located when annual snow pack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.

Winter concentration area were identified as that part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten. Based on the expertise of wildlife biologists throughout the western United States and Canada, as proposed, the ARWF will be located in a winter concentration area, impacting one of the most important deer winter ranges in the entire area. Winter range delineations generated out of the county planning process overlay very closely with what mule deer experts identified as winter range.

Big game winter range is usually in the lower elevation areas where deer and elk spend the winter months as a result of heavy snow in the higher elevations. Critical big game winter range is those areas where large concentrations of big game are known to occur during winters with normal to above normal amounts of snow, or normal amounts of snow during periods of extremely low temperatures. A large portion of the annual mortality of mule deer populations in the Intermountain West occurs while deer are concentrated on winter range.

Most of the proposed project is on either big game winter range or big game critical wildlife habitat, and extremely critical to the continued welfare of the deer and elk dependent upon it. ODFW is recommending against development only on the most important areas within the ZMBV. There are portions of Big Game Critical Wildlife Habitat in the project with proposed turbines to which ODFW has not objected.

Because winter habitat is a critical component of the mule deer and elk's annual habitat requirements, ODFW considers winter range habitat as essential and limited for deer and elk, and has consistently classified winter range as Category 2 habitat. Winter range has been used as an example of Category 2 habitat for over 10 years. At every wind project in Oregon, ODFW has considered winter range Category 2 habitat. Therefore, at the proposed ARWF, ODFW considers big game winter range Category 2 habitat. Because winter range is classified as Category 2 habitat, ODFW recommends that mitigation for unavoidable impacts to this habitat from project construction and operation result in no net loss of either habitat quantity or quality and a net benefit of habitat quantity or quality.

The Applicant should also recalculate acres of impact based on correct habitat categorizations to accurately reflect impacts from temporary and permanent facilities.

Wildlife Monitoring and Mitigation Plan

ODFW supports the Applicant's conducting wildlife monitoring at the ARWF. However, the monitoring included in the Wildlife Monitoring and Mitigation Plan may be insufficient to accurately determine wildlife fatality attributable to the Project, and population level effects of the Project on birds, bats, or big game.

Recommendation: The Applicant should develop detailed protocols for all monitoring and studies in consultation with, and for approval by, ODFW. These protocols should be approved prior to Project construction.

ODFW supports the Applicant's recommendation that detailed protocols will be developed prior to implementation of the Wildlife Monitoring and Mitigation Plan. ODFW should approve these protocols prior to their being implementing. To ensure mitigation is not delayed by protocol development, all protocols should be developed and approved prior to construction.

Recommendation: A detailed study plan and survey protocol should be developed in coordination with, and for approval by, ODFW prior to operation of the Project.

To ensure information collected can be used to identify potential Project effects on nesting raptors, a detailed study plan and survey protocol should be developed in coordination with, and for approval by, ODFW prior to operation of the Project.

Recommendation: All monitoring data should be provided to ODFW annually.

The Applicant indicates that monitoring data and analysis will be provided to ODOE. All monitoring data should be provided to ODFW annually. Monitoring information is needed annually to determine additional monitoring needs, project impacts, and to evaluate adequacy of mitigation measures for meeting state and ODFW statutes, rules, policies, and management plans.

Fish & Aquatic Species

Recommendation: The Applicant should continue to work with ODFW to identify all stream crossings requiring in-stream work.

Based on Tim Bailey's (ODFW District Fish Biologist) site visit in April of 2010, fish passage is being appropriately addressed by the Applicant. ODFW requests that the Applicant continue to work with ODFW to identify all stream crossings requiring in-stream work.

Recommendation: The Applicant should mitigate impacts to riparian habitat by enhancing 4.5 acres of low elevation riparian habitat in-proximity to the ARWF.

The Proposed project will impact a total of 1.51 acres (65,570 sq ft) of riparian zone for all streams in the site boundary, of which .44 acres is impacts within the riparian zone of Class 1 streams – in response to Union County Zoning, Partition, and Subdivision Ordinance (UCZPSO). The Applicant, however, does not propose mitigation due to its determination that it is poor quality habitat. ODFW considers riparian habitat Category 2 Habitat according to ODFW's Fish and Wildlife Habitat Mitigation Policy (essential and limited for the fish species that reside in those streams). Therefore, ODFW recommends that the Applicant provide mitigation for riparian habitat lost and provide a net benefit in habitat quantity or quality, including in-kind and in-proximity.

Low elevation riparian areas are especially prone to disturbance from human activities associated with recreation, roads, and O&M activities. Riparian zones are significant in ecology and environmental management because of their role in soil conservation, their habitat biodiversity, and the influence they have on fauna and aquatic ecosystems. In the western United States, riparian plant communities account for less than 1% of the total western landscape. Riparian habitat is often structurally complex and, as a consequence, supports a wider variety of bird species than surrounding uplands (Knopf 1988). Also, riparian vegetation attracts a greater number and variety of bird species during migration than during breeding season. Woody riparian vegetation provides cover and food during winter for a variety of small birds and may be critical to local populations during the stressful months (Lewke and Buss 1977).

Either of the Applicants proposed methods to mitigate wetland impacts would be acceptable. ODFW's preference is to implement the mitigation as part of the Grande Ronde Model Watershed Project (GRMW) on Catherine Creek. This project was implemented in the fall of 2010.

Recommendation: Mitigation for riparian habitat should be combined with that of wetland habitat.

ODFW recommends that mitigation for riparian habitat be combined with that of wetland habitat, preferably as part of the Grande Ronde Model Watershed mitigation option.

Note: Inaccurate information regarding fish use within the project boundary is provided in the ASC. On pages P-35 and P-65 a statement is made that, “ODFW does not currently have any data on the seasonal presence/absence of redband trout or other native migratory species within the Site Boundary”. Assistant District Fish Biologist Nadine Craft conducted a fish salvage project resulting from a fuel spill on Ladd Canyon (Brush Creek) in August of 2010 in the vicinity of Exit 273. She collected approx. 25 *Oncorhynchus mykiss*, 50-60 mm long from Ladd Canyon (Brush Creek). Therefore, redband trout are present and spawning occurs as these juveniles would not have been able to pass upstream through downstream passage barriers on Brush Creek. On page P-36 the document states that suitable spawning habitat is not present within the site boundary. This is incorrect per Nadine’s finding.

Recommendation: Monitoring of stream and wetland mitigation sites should occur for the first five years post enhancement, with periodic monitoring and inspections of mitigation sites for the life of the wind project every three to five years.

The Applicant indicates that monitoring of any stream and wetland mitigation will be conducted for a period of up to 5 years following completion of mitigation activities to meet the monitoring requirements of ODFW, ODSL, and other applicable agencies (Page P-78). ODFW believes 5 years of monitoring may be insufficient. Recovery of plant species can take several years. To verify in-kind mitigation has been achieved, mitigation will be necessary for the life of the Project. Therefore, ODFW recommends periodic monitoring and inspections of mitigation sites for the life of the wind project to ensure mitigation is achieved.

Wetlands

Recommendation: The Applicant should consult with ODFW and the Grande Ronde Model Watershed to identify, implement, and fund 1 acre of wetland restoration project(s) in the Grande Ronde Basin to mitigate for impacts of the ARWF on wetland and stream habitat.

The Project will impact 0.28 acres of potentially jurisdictional wetlands and waters due to the need to cross them with access roads and culverts. These crossings will require a total of 384 cubic yards of fill in wetlands and 1,135 cubic yards of fill in streams (Page J-6). The Applicant proposes wetland restoration, creation, and enhancement or wetland conservation to offset functional losses associated with proposed impacts to 0.28 acres of wetlands and waters.

The Applicant’s preferred method of mitigation is to contribute funding to the GRMW for a stream and wetland restoration project to be located in the same watershed as the Antelope Ridge project impact sites, as an in-proximity mitigation that would have great ecological benefits by

providing mitigation in the context of a larger mitigation project site than is required to mitigate for the Antelope Ridge project.

The Applicant indicates it met with the GRMW to discuss the proposed project partnership on April 14, 2010 and November 11, 2010 and received a positive reception during both meetings. Also, that in the Applicant's meeting with DSL and GRMW held November 16, 2010, the DSL gave a positive reception to the prospective partnership between GRMW and Applicant.

As a secondary option, the Applicant proposes meeting its compensatory wetland mitigation (CWM) obligations through the payment-in-lieu program. In the conversations referenced previously on September 13, 2010 and November 16, 2010, DSL indicated that payment-in-lieu would be an appropriate option for CWM for the Facility due to the small amount of impacts.

ODFW considers wetlands Category 2 habitat because they are essential for fish and wildlife species and limited in the Project area (Mitigation Policy OAR 635.415-0000-0025). Mitigation of impacts, if unavoidable, should occur through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality. Contributing funding to at least one acre of wetland restoration project(s) in the Grande Ronde Basin mitigates for impacts of the ARWF on wetland and stream habitat

Weed Control Plan

Recommendation: A Weed Control Plan developed in consultation with ODFW and Union County and approved by ODOE prior to commencement of construction.

A Weed Control Plan should be developed and implemented to prevent, suppress, contain, and eradicate nonnative invasive plants and noxious weeds in the Project area. The Plan should include inventory, prevention and early detection, treatment and restoration, and monitoring and evaluation.

Noxious weeds have the potential to displace native or desired vegetation and plant communities. Project area operations and maintenance, trails, roadways and traffic are considered primary contributors to the spread of noxious weeds. Ground disturbance associated with the Project will provide favorable habitat for the establishment and spread of noxious weeds. Movement of Applicant or contractor vehicles and machinery around the Project area greatly increases the potential for introduction of new weeds. Transmission lines also provide ready pathways for translocation of weed seed to other areas.

Revegetation Plan

Recommendation: Implementation of the Revegetation Plan in consultation with ODFW.

This plan describes the onsite activities that the certificate holder will undertake during construction and immediately after construction of the ARWF to address temporarily disturbed

areas. This Revegetation Plan focuses solely on the revegetation efforts of the temporarily disturbed locations.

An inventory/survey of current native vegetation would help determine which native species are likely to survive and are best used for revegetation. This inventory should assess all or a majority of the plant species present. If the site is primarily composed of noxious weeds, the pre-construction inventory should note that and rehabilitation efforts must be designed to address those issues.

Recommendation: ODFW recommends using native seed, with introduced species only used in small quantities as necessary.

The appropriate seed mix to use in restoration of each habitat type should contain native species. ODFW believes native seed will be available, though use of some introduced species can be beneficial if used in small percentages.

Recommendation: All bare soil and disturbed areas should be restored and reseeded to prevent the introduction and spread of invasive species and noxious weeds.

The Applicant indicates that after construction activities are completed, disturbed areas will be evaluated to determine whether restoration seeding is needed. ODFW believes any disturbance in this area will encourage the establishment and spread of invasive species. Therefore, the applicant should reseed all disturbed areas.

The Applicant also indicates that seeding will not be done in areas where the pre-construction condition was bare soil. Construction activities will involve moving from site to site with the potential to spread weed seed. Therefore, ODFW recommends that the applicant reseed all bare soil areas.

ODFW believes the applicant should emphasize fall or early winter seeding, depending on moisture availability.

Recommendation: Restored and reseeded sites should be inspected annually with fixed photo points with follow up treatments as needed.

The Applicant indicates that following seeding, sites will be examined after the first growing season, then at year three and year five to determine the success of the restoration. ODFW believes annual inspections with fixed photo points are needed and would be more beneficial. Following inspections, follow up treatments should be conducted on an as needed basis.

Recommendation: Revegetation and monitoring reports should be provided annually to ODFW.

The Applicant indicates that revegetation records will be available to ODOE at the time the annual report is submitted, as required under the certificate. The Applicant should provide ODFW annual revegetation records including dates the construction activity was completed in

the area to be restored, a description of the affected area (location, acres affected and pre-disturbances condition), the date the revegetation work began, and a description of the work done within the affected area.

Management of Hazardous Substances

Recommendation: A Spill Prevention and Control Plan should be developed in consultation with ODFW and approved by ODOE prior to commencement of construction.

The Applicant indicates that it anticipates a Spill Prevention Control Plan will be submitted and approved by EFSC prior to commencement of construction. Spills and mismanagement of hazardous substances can have catastrophic impacts on aquatic and terrestrial habitats and species utilizing those habitats. Therefore, ODFW believes it is important for the Certificate Holder to consult with ODFW and also ODEQ on development of a Spill Prevention Control Plan and have that plan approved by EFSC before any construction begins on the Project.

Decommissioning

Recommendation: Financial security for decommissioning of facilities should be provided to ensure they will be removed when the facility reaches the end of its useful operational period of time.

Recommendation: The certificate holder should consult with ODFW to determine appropriate site restoration actions upon Project retirement.

In response to OAR 345-021-0010(1)(w) the Applicant includes Exhibit W, Facility Retirement and Site Restoration in its Final ASC. Exhibit W includes specific actions and tasks the certificate holder will undertake to restore the site to a useful, non-hazardous condition. At Project retirement, ODFW should be consulted to ensure site restoration is accomplished and meets ODFW standards.

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