BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 2009-01 of WHISTLING RIDGE ENERGY LLC for WHISTLING RIDGE ENERGY PROJECT	EXHIBIT NO. 22.05 REBUTTAL TESTIMONY OF K. SHAWN SMALLWOOD, PH.D

REBUTTAL TESTIMONY OF WITNESS #22
K. SHAWN SMALLWOOD, PH.D

ON BEHALF OF

INTERVENORS FRIENDS OF THE COLUMBIA GORGE
AND SAVE OUR SCENIC AREA

Q. Have you reviewed the Prefiled Direct Testimony and Exhibits of Don McIvor (Witness #31) in this proceeding?

A. Yes.

Q. Do you generally agree or disagree with Mr. McIvor's testimony? If there are any specific areas of disagreement, please elaborate.

A. I agree with nearly all of Mr. McIvor's testimony. I do take issue with three of Mr. McIvor's conclusions, one regarding post-operation study, one regarding adaptive management, and one regarding the Washington Department of Fish and Wildlife Wind Power Guidelines. These conclusions are quoted and discussed below.

"Although the species [Northern goshawk] appears to occur in low numbers at the site, if the project were built it could provide an important opportunity to better understand how

forest raptors react and adapt to wind energy facilities." (Exhibit 31.00, page 9, line 13)

I disagree with this conclusion, because the sample size of fatalities would never be sufficient for hypothesis-testing that could lead to an understanding of whether or how northern goshawks would react or adapt to wind turbines. By way of example, after many years of monitoring and research in the Altamont Pass, our understanding remains poor on how any species of raptor are killed by wind turbines, and on how any species might have adapted to wind turbine operations. And our sample sizes in the Altamont Pass are much larger for some species than would ever be accumulated at Whistling Ridge for northern goshawk. For example, in the Altamont Pass, about 700 burrowing owls are being killed annually, yet we still don't know what time of day the fatalities are occurring, nor how many owls are actually struck by blades or are predated upon by Buteos hiding on derelict turbines. And we have no understanding of how burrowing owls have adapted to wind turbine operations. Based on these experiences, I expect that operation of the Whistling Ridge project would not provide an opportunity to understand anything about northern goshawks other than how many goshawks are killed by wind turbines on an annual basis, and this understanding would be restricted to the span of years that are monitored, and would be complicated by limitations such as searcher detection error, as discussed in my direct testimony.

"Adaptive management strategies should be developed and applied . . . ." (Exhibit 31.00, page 16, line 9)

I disagree with this recommended mitigation measure, because there is no precedent for any wind project successfully using adaptive management measures to mitigate bird and bat impacts caused by wind turbines. Few mitigation options are suitable for adaptive management in wind projects. The one wind resource area where adaptive management was most likely to succeed was the Altamont Pass, and it was allegedly going to be tried over the past five years. However, nothing resembling adaptive management took place in the Altamont Pass. I would make a more conservative recommendation regarding adaptive management. A conservative approach, for example, could identify the mitigation measures that are suitable for adaptive management, thus revealing the limitations of adaptive management in a wind project context.

"*Efforts should be made to ensure that the Applicant fully complies with all mitigation measures set forth in the latest editions of the USFWS and WDFW guidelines for wind power projects*." (Exhibit 31.00, page 15, line 4)

I warn that both the U.S. Fish and Wildlife Service and Washington Department of Fish and Wildlife Wind Power Guidelines are deficient, and therefore should not be relied on to ensure that all reasonable measures have been taken to avoid, minimize, and reduce

impacts. In particular, the Washington Department of Fish and Wildlife Wind Power Guidelines[1] (hereafter referred to as WDFW guidelines) are grossly deficient, lacking, among other things, key impacts assessment tools and mitigation measures. In the remaining paragraphs, I will discuss the deficiencies in the WDFW guidelines.

The WDFW guidelines provide inadequate guidance on the most fundamental scientific investigations directed toward impacts assessment and mitigation of wind energy projects. The guidelines provide inadequate guidance on assessing project site alternatives, on performing pre-construction surveys to assess potential project impacts, on performing post-construction monitoring of fatalities and wildlife use of the project area and vicinity, and on mitigating project impacts and how to assess the effectiveness of mitigation measures. These deficiencies have left wind company consultants free to implement substandard investigative methods in the State of Washington. In fact, according to the WDFW guidelines, no oversight is introduced to the investigations until a Technical Advisory Committee (TAC) is appointed after the wind company selects its preferred project site and the consultants have performed pre-construction surveys, predicted impact levels, and formulated the mitigation plan and post-construction monitoring plan. The TAC has no role in the project until all of the most important elements of the project that they should influence have already been decided. Furthermore, the guidelines provide no minimum qualifications for the TAC members to ensure they have adequate expertise. In short, the guidelines are nearly completely ineffective at minimizing wildlife impacts caused by wind energy projects.

Project Site Alternatives

The WDFW guidelines are vague on how to assess project site alternatives. The only real guidance is the statement, "*Avoid high bird and bat aggregation areas, and areas used by sensitive status species*" (page 5). To be scientific, however, systematic bird and bat surveys are needed to characterize relative abundances across regions to be able to determine whether a proposed wind energy project is being proposed in a high bird and bat aggregation area. Otherwise, the basis for determining whether a site supports high bird and bat aggregations will be anecdotal and inconclusive. At a minimum, lists of potential species occurring at alternative project sites should be compiled based on habitat associations, and the species on these lists should be evaluated for susceptibility to collide with wind turbines and known history of wind turbine collisions. Systematic bird and bat surveys across entire regions should be performed. So should surveys to characterize behavior patterns, because flight behaviors inform vulnerability to collision and avoidance effects (*i.e.*, habitat loss).

[1] The 2009 WDFW guidelines are available at wdfw.wa.gov/publications/pub.php?id=00294.

Pre-Construction Surveys for Utilization and Behaviors

The WDFW guidelines recommend a minimum of only one year of avian use surveys in many cases (page 4). One year of pre-construction surveys for avian species utilization of a project site is grossly insufficient. Inter-annual variation in avian abundance is too high at wind resource areas to justify such a short duration of surveys. Pre-construction surveys of avian use should be performed over three years at a minimum.

The infilling provision is also deficient. Birds are very sophisticated in how they use the airspace over terrestrial habitat. It is for this reason that micro-siting has emerged as the most important mitigation strategy in the Altamont Pass Wind Resource Area. It should not be assumed that bird utilization of the airspace over an infill project will mirror the flight patterns of existing projects. In fact, there is ample evidence demonstrating shifts in flight patterns to avoid wind turbines, so as wind turbines are installed, "infill" areas may receive much more bird traffic than occurred prior to wind turbine installations.

The WDFW guidelines do not provide any guidance on what measures to use to characterize nocturnal bird use of a project site.

The WDFW guidelines recommend raptor nest surveys (page 4). Whereas I concur that raptor nest surveys should be performed, I would recommend that the surveys be performed for more than a mile buffer around a wind project boundary. I would have required at least three miles, and six miles in the case of eagles. In addition, the WDFW guidelines fall short in explaining what to do with the raptor nest surveys.

The WDFW guidelines make bat surveys optional (page 5). Bat surveys using state-of-the-art detection technology should be mandatory, and not based on guessing whether bat impacts might be high. The guidelines recommend the same approach for deciding whether diurnal bird surveys should last longer than one year. It is unscientific of the guidelines to recommend surveys on the basis of guessing whether impacts might be significant. Adequate surveys are needed to determine whether impacts might be significant.

Impacts Assessment

The WDFW guidelines provide no guidance on how to predict or assess project impacts. What is one supposed to do with pre-construction monitoring data? What are the minimum standards for making predictions of project impacts or for making conclusions about post-construction impacts? In fact, I have reviewed all of the available reports on wind energy projects in Washington, as far as I am aware. I found that in nearly all cases for which predicted impacts were followed up by reports of estimated fatality rates, the impact predictions were too low, often astonishingly low. I also found that reported fatality rate estimates were almost always lower than the estimates I derived using the same data.

Post-Construction Monitoring

The WDFW guidelines provide no guidance on how to perform post-construction monitoring. The monitoring reports I have reviewed for projects in Washington have demonstrated that unrealistic assumptions are being repeated in post-construction monitoring. For example, the searcher detection trials have used intact bird carcasses, even though carcasses found by searchers should be expected to be dismembered and weathered. After search intervals of 15 and 28 days, which are typical search intervals in Washington, finding fresh, intact carcasses will be rare compared to finding scavenged and decayed carcasses. The latter type of evidence bleeds into the vegetation and presents faded colors and reduced reflectivity. In short, the carcasses found are typically harder to detect than are the carcasses repeatedly being used in searcher detection trials.

After having reviewed many reports from Washington, I can also say that the scavenger removal trials have not been realistic representations of the species deposited by wind turbines or of the condition of the deposited carcasses. Inappropriate species are often used, as well as carcasses that have been in the freezer or have been dead long enough to have affected the removal curve or mean days to carcass removal.

In addition, the maximum fatality search radius has been insufficient. I have fitted logistic functions to cumulative counts of bird carcasses found at one-meter increments from the turbines, and I have found that the expected asymptote of the counts is higher than the realized asymptote, indicating that the search area is usually not large enough.

Inter-annual variation in fatality rates has also been very high, yet most monitoring efforts last only a year or two years. Post-construction monitoring programs need to last longer, with three years as the minimum. However, the WDFW guidelines make no mention of any of these issues.

The WDFW guidelines also make no mention of post-construction utilization surveys. These surveys are essential for assessing avoidance impacts, which equal habitat loss. They are also essential for interpreting post-construction fatality monitoring results.

While the WDFW guidelines identify which organizations might be represented by TAC members (page 6), they do not provide any guidance on minimum qualifications of membership. TAC members should be technically skilled and experienced with data and issues related to bird and bat collisions with wind turbines.

Mitigation Plan

The WDFW guidelines provide only cursory guidance on mitigation planning, make misleading statements regarding factors affecting collision rates, and neglect to mention the most important measures of all.

For example, the following guideline is misleading: "*Use tubular towers to reduce the likelihood that birds will perch on towers and to possibly reduce the risk of collision. Avoid use of lattice towers, particularly those with horizontal cross-members*" (page 6). This measure adds nothing of value, because modern wind turbines are no longer mounted on lattice towers. Furthermore, the evidence has so far indicated that birds do not perch on turbines or their towers while the turbines are operating. Perching does not appear to be a significant precursor to collisions with wind turbines.

In another example, the WDFW guidelines state the following: "*Avoid using permanent tower types that employ guy wires. If guy wired towers are approved, encourage the requirement of bird flight diverters on the guy wire*" (page 6). However, modern wind turbines are not supported by guy wires.

The guidelines are deficient by inadequately recommending careful siting of wind turbines to minimize collisions. Strong patterns have emerged between collision rates and landscape features and between collision rates and turbine arrangements. Wind turbines should not be sited in ridge saddles, notches in hills, or other sudden breaks in elevation. Wind turbines should not be sited next to or upslope of significant rock formations, nor near trees. They should not be sited near ponds or wetlands. They should not be sited on the windward aspects of slopes facing the prevailing wind direction(s), most especially not downslope of the ridge crest or hill peak of such windward-facing slopes. Most importantly, wind turbines should not be sited at the apex of concave-shaped slope features such as ravines, troughs, or other features that would funnel slope-deflected winds from the prevailing wind direction(s) toward the apex of the slope.

The WDFW guidelines should discourage the siting of isolated wind turbines, or wind turbine arrangements that expose birds and bats to numerous end-of row turbines or turbines bordering gaps in normal turbine spacing. Turbines should not be allowed to operate next to broken turbines. Turbine rows should not zigzag in alignment.

Guiding principles

The WDFW guidelines state, "*As a renewable source of energy, with specific consideration to avoid or minimize environmental impacts, wind power can have a lesser impact on the environment compared to most conventional energy sources*" (page 2). This guiding principle appears to be a statement of faith, as it was not based on any scientific comparison of impacts. To be meaningful, the statement would need to specify which environmental impacts are lessened by wind power. Certainly, the statement does not extend to bird and bat collisions, nor does it extend to wildlife habitat destruction.