In the Matter of the Appeals of Friends of the Columbia Gorge, Inc. and Save Our Scenic Area, Of a SEP A Determination of Nonsignificance

I, K. SHAWN SMALLWOOD, make this declaration based upon my personal knowledge and belief and declare as follows:

1. I am an ecologist with 23 years of experience as a researcher and consultant on issues related to wildlife and wildlife management and conservation problems. My qualifications for preparing this declaration are summarized in my curriculum vitae. I earned a Ph.D. degree in ecology from the University of California at Davis in 1990. Then I worked as a post-graduate researcher for four years in the Department of Agronomy and Range Science at UCD before working as a consulting ecologist. My clientele has included citizen groups, businesses, attorneys, and government agencies. Much of my work has been research and environmental review related to special-status species issues. I have worked directly with multiple endangered species. I have authored numerous papers on special-status species issues, including "Using the best scientific data for endangered species conservation," published in Environmental Management, and "Suggested standards for science applied to conservation issues" published in the Transactions of the Western Section of The Wildlife Society. My work also included hazardous waste management and human systems analysis. Also, I served as the
Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section, I am a member of the Society for Ecological Restoration and the Raptor Research Foundation, and I have been a part-time lecturer at California State University, Sacramento. For three years I was Associate Editor of wildlife biology’s premier scientific journal, The Journal of Wildlife Management, and I served as Associate Editor of Biological Conservation and as a Board member of Environmental Management.

2. I also have considerable experience with the biological impacts caused by wind turbines. I performed field work in the Altamont Pass Wind Resources Area (APWRA) for six years, and I senior authored many reports that followed. I consulted for the California Energy Commission on matters related to wind farm development. I have also consulted to wind farm developers, and helped project applicants obtain permits to develop the Buena Vista Wind Energy project in the Altamont Pass, California. I have also previously reviewed the effects of proposed wind power in Klickitat County, Washington. My contribution to wind energy development has been to produce research-based solutions to avoiding, minimizing, and reducing bird collisions with wind turbines.


2. I provided expert testimony on the Windy Point Wind Farm Environmental Review and 2006 EIS (14 pp and 36 Powerpoint slides in reply to responses to comments).


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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590

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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590

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3. At the request of Friends of the Columbia Gorge and Save Our Scenic Area, I reviewed Skamania County’s proposed zoning amendments and maps.

4. Zoning and map updates are precisely where the public can most effectively participate with the environmental review of possible future actions in the County. Wind power generation and hazardous waste management can vary greatly in their environmental impacts based on location. For example, the environmental impacts of a hazardous waste facility can vary based on the local soils, suite of native species of fossorial mammals, and exposures to winds and rainfall. Similarly, the environmental impacts of wind power generation can vary greatly based on the overlap of geographic ranges of special-status species, terrain, habitat, locations relative to migratory routes, and wind profiles. In either case, there are opportunities for the public to utilize emerging map-based planning tools to steer projects to the least environmentally harmful, most economically viable locations within the County. I have developed just these types of tools, including a map-based indicators approach for deciding where mitigation for residential and commercial development would be most effective within a County, a map-based indicators approach to decide where agricultural pesticide reduction efforts would most minimize exposures to special-status species of wildlife, and an indicators approach that...

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5 i.e., species susceptible wind turbine collisions, transmission line collisions, and avoidance of tall structures, as well as threatened or endangered species under State and Federal Endangered Species Acts, and species protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.


approach for assessing the impacts of wind power development on bird species at any location in California. Furthermore, I helped develop a map-based approach to minimize bird collision impacts within the area zoned for wind turbines in a County, so at the level of the individual turbines. These map-based indicators approaches can be developed for Skamania County so that the public and the County can together make intelligent decisions about where to encourage hazardous waste management facilities as well as wind, solar, bioenergy, and geothermal power generation facilities. They should form the bases of an EIS for the zoning and map adjustments proposed by the County.

5. Probable Environmental Impacts of Zoning Adjustments

6. The environmental checklist characterized the zoning adjustment as a non-project action, based on the assumption that site-specific projects will be required to conform to planning requirements detailed in the Environmental Impact Statement (EIS) prepared.


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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590

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specifically for each project. However, in my experience, zoning decisions are environmental actions, and can quickly lead to site-specific and cumulative project impacts. The planning for a site-specific project tends to be restricted to the project at the site preferred by the applicant, and may only address cumulative impacts in a cursory manner, whereas a county-wide zoning change can more effectively address cumulative impacts and project alternatives, including site alternatives. The zoning adjustment is therefore an action, because it includes a decision over whether site-specific projects will be considered in a piecemeal fashion, i.e., in separate EISs, or within a county-wide framework that already addressed project alternatives and their environmental impacts based on location attributes.

7. Because the environmental checklist portrays the zoning adjustment as a non-project action, it repeatedly claims that there will be no environmental impacts associated with the zoning adjustment, even though the adjustment would most probably encourage applications for the construction of power plants and hazardous waste management facilities. The claims of no environmental impacts are misleading. For example, section B.1.e. of the environmental checklist states, “No filling and grading are proposed with this non-project action.” The types of projects allowed in the zoning adjustment, however, would result in substantial filling and grading. Hazardous waste facilities typically include cribs or trenches to bury waste (Figure 1). Wind power projects require extensive grading, including cutting into slopes for the many access roads that will be needed (Figures 2 and 3).
Figure 1. Buried waste trenches at Hanford Nuclear Reservation, Washington. Grading and fill are typical of hazardous waste management facilities.

Figure 2. Grading for Buena Vista Wind Energy project in Contra Costa County, California (two photos), including slope clearing and cutting into slopes for access roads.
Figure 3. Access roads to wind turbines in the Altamont Pass Wind Resource Area, California.

8. In another example, section B.1.f. of the environmental checklist states, “No clearing, construction, or uses are proposed with this non-project action.” The zoning adjustment will probably result in considerable clearing of vegetation for the construction of transmission lines, wind turbines, and other facilities. In the Altamont Pass Wind Resource Area, annual grasslands are routinely cleared around all electric distribution poles, transmission towers, electric transfer boxes, and most wind turbines in order to protect the facilities from grass fires (Figure 4). In most of Skamania County, this type of clearing will result in loss of forest cover, resulting in habitat loss for many plant and animal species. The probable increase in fire suppression as a means to protect the constructed wind power projects will result in habitat degradation due to the suppression of the natural fire cycle. If an EIS is not prepared as part of the proposed zoning adjustment, then the types of map-based planning tools I described earlier will probably never be used in Skamania County, because doing so would be atypical of a site-specific project EIS.
Figure 4. To protect against fire damage, annual grassland is cleared around electric distribution poles and other electric generation and transmission facilities in the Altamont Pass Wind Resource Area, California.

9. **Hazardous Waste Management**

10. Hazardous waste facilities cause a variety of environmental impacts, which can vary considerably based on location. Rocky Flats Plant in Colorado, for example, was constructed on brittle, clay soils which cracked and leaked contaminants in solar evaporation ponds into the aquifer. Rocky Flats Plant was also exposed to seasonally strong winds, which entrained contaminated soil particles that had been excavated by fossorial mammals. As a result, weapons grade plutonium and many other hazardous materials were transported both vertically through the soil and laterally through ground water and winds to locations where the contaminants were out of the control of the managers. Property values declined in communities downwind and downstream.

11. Hanford Nuclear Reservation was based on sandy soils, where groundwater leaching and soil bioturbation took hazardous wastes out of the reach of management. An estimated 2.2 metric tons of weapons grade plutonium ended up in the soils around Hanford Nuclear Reservation, and 1.5 metric tons was labeled MUF – materials unaccounted for. Those who established Hanford Nuclear Reservation and Rocky Flats Plant grossly underestimated the

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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590
ability of microbes, insects, mammals and plants to access and transport the hazardous waste stream. Harvester ants, pocket gophers, ground squirrels, prairie dogs, and American badgers were able to access and transport plutonium that had been buried at depths to 5 meters below grade. Therefore, it is critical to plan alternative locations and management options for hazardous waste management facilities. Zoning should discourage such facilities where the soils are more susceptible to leaching or preferred by fossorial animals, or where winds are strong or sensitive habitats will be intolerably fragmented by the facility. It must also be kept in mind that eradication efforts are often directed to wildlife on hazardous waste management facilities, so constructing such a facility where special status species are likely to reside can result in periodic takings under the Endangered Species Act, Migratory Bird Treaty Act, or other environmental laws.

12. **Wind Power Generation**

13. Wind turbines kill thousands of birds and bats each year in the U.S., and the fatality rates caused by wind turbines pose an emerging environmental crisis with the proliferation of wind power generation. In the Altamont Pass Wind Resource Area alone, I conservatively estimated the 580 MW (megawatts) of rated power capacity kills 2,710 to 11,520

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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590

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birds per year, including 1,127 to 2,277 raptors per year. More recent estimates from another team of researchers produced even higher estimates than mine, amounting to 6,186 to 13,768 birds, including 1,702 to 3,325 raptors per year. Whereas some have attempted to portray the Altamont Pass Wind Resource Area as unique or anomalous, there is no reason to conclude that other wind farms could not kill just as many birds. The construction of wind turbines within the Columbia River Gorge, which the environmental checklist acknowledged is a migratory route, could kill just as many raptors and other birds as the Altamont Pass, on a per MW basis.

14. Fatality monitoring in the Altamont Pass Wind Resource Area has documented the deaths of 81 bird species and 3 bat species, and more species are found dead the longer we search for carcasses. Birds killed by wind turbines have included about 67 golden eagles per year, as well as peregrine falcons, prairie falcons, red-tailed hawks, Swainson's hawks, ferruginous hawks, burrowing owls, great horned owls, barn owls, sandhill cranes, and many other special status species. In Skamania County, special-status species of birds that will be vulnerable to wind turbine collision would include the federally threatened or endangered northern spotted owl, brown pelican, marbled murrelet, and snowy plover, the state threatened or endangered American white pelican, sandhill crane, streaked horned lark, upland sandpiper,

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SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590

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ferruginous hawk, sage grouse, and sharp-tailed grouse. Sensitive species that will be vulnerable
to wind turbine collision in Skamania County would include bald eagle, common loon, and
peregrine falcon, and candidate species would include golden eagle, burrowing owl, flammulated
owl, Lewis' woodpecker, pileated woodpecker, loggerhead shrike, merlin, northern goshawk,
and others. Raptors would be particularly vulnerable, including owls such as spotted owl.

15. Once wind turbines are installed and operating, there appears to be little that can
be done to reduce bird and bat collisions. Few mitigation measures in the Altamont Pass have
been regarded as potentially effective, and almost none have been implemented.¹⁴ The wind
companies have resisted seasonal shutdowns of wind turbines, removal or relocation of wind
turbines from particularly dangerous locations, and other measures recommended by various
researchers, including by me and the Alameda County Scientific Review Committee. Careful
siting of wind power projects as well as of wind turbines within projects is essential to
minimizing bird and bat collisions, because little can or will be done once the wind turbines are
installed. Furthermore, based on my experience in the Altamont Pass, it is essential that a
substantial performance bond be secured prior to the operation of the wind turbines, to ensure
permit compliance and the capacity to provide offset or compensatory mitigation for impacts to
birds and bats.

16. Bat collisions are of growing concern to conservationists and ecologists, because
in some places the fatality rates of bats have far exceeded those of birds in the Altamont Pass. A

¹⁴ Smallwood, K. S. 2008. Wind power company compliance with mitigation plans in the Altamont Pass Wind
recent study using thermal imaging found that bats forage around moving turbine blades. These bats were not just flying through the rotor plane, but actually chasing insects around the moving blades. Bats also investigated the turbine blades, sometimes alighting on them when they were not moving. More recently yet, Baerwald et al. (2008) found that most bats died of lung hemorrhaging due to the sudden drop in pressure behind the rotor plane. In other words, bats usually do not even need to collide with the turbine blades to get killed by the wind turbines.

Bat species that could be threatened by the zoning adjustment leading to the installation of wind turbines include the state sensitive Townsend’s big-eared bat and Keen’s myotis.

17. In addition to wind turbine collisions, wind turbines also displace multiple bird species, which have demonstrated aversion to the presence of wind turbines. Some raptor...
species have demonstrated high turbine avoidance behaviors at wind farms, including an
estimated 100% avoidance by northern harriers at 6 sites in the US, 99.8% at one site, and 93.2%
at another site. Kerlinger et al. (2005) compared post-construction bird activity to pre-
construction activity in the High Winds Wind Project area in Solano County, California. They
reported substantial reductions in bird use of the project site for numerous species. Compared to
pre-construction activity levels, post-construction activity declined 75% for golden eagle and
horned lark, 82% for American crow, 91% for cliff swallow, 81% for house finch, 33% for
killdeer, 55% for northern mockingbird, 100% for rough-legged hawk, Say’s phoebe, long-billed
curlew, chipping sparrow, song sparrow, white-crowned sparrow, scrub jay, and tricolored
blackbird, as well as for other species. These levels of apparent avoidance of the project site due
to the installation of wind turbines represent reductions of habitat suitability, and ultimately
habitat loss for these species.

18. Large areas within Skamania County may be inappropriate for zoning for wind
energy generation or hazardous waste management. Ironically, section A.8. of the
environmental checklist references the Final Environmental Impact Statement (FEIS) for the
energy overlay zone in Klickitat County, although it is unclear to me why the FEIS was
referenced. What is ironic about the reference to Klickitat County’s FEIS, however, is that (1)

Petersen, I. K., T. K. Christensen, J. Kahlert, M. Desholm, and A. D. Fox. 2006. Final results of bird studies at
the offshore wind farms at Nysted and Horns Rev, Denmark. National Environmental Research Institute,
Ministry of the Environment, Denmark.

Whitfield, D. P., and M. Madders. 2006. A review of the impacts of wind farms on hen harriers Circus cyaneus
and an estimation of collision avoidance rates. Natural Research Information Note 1 (revised). Natural
Research Ltd., Banchory, United Kingdom.

Kerlinger, P., L. Culp and R. Curry. 2005. Year one report: Post construction avian monitoring study for the
High Winds Wind Power Project, Solano County, California. Unpublished report prepared for High Winds,
LLC and FPL Energy, 70 pp.

DECLARATION OF K. SHAWN
SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590
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the FEIS (page 2-15) concluded that forested areas support higher concentrations of owls and
other sensitive species than other areas; (2) use of forested areas by large falcons was
significantly higher than in other cover types in the county (FEIS page 3-53); (3) after screening
of the alternatives, the FEIS recommended exclusion of large forest tracts from the geographic
scope of the Overlay Zone due to the forest’s support of more sensitive species; and (4) the
Limited Geographic Alternative was developed in response to comments (FEIS page G-43), with
the intent to encourage wind power development where the transmission infrastructure already
exists. Skamania County is largely forested, so much of it may be unsuitable for wind power
development and probably should not be zoned for it.

19. My assessment of potential impacts of wind farm development at multiple
locations in California came to the same conclusion as the Klickitat County FEIS that forested
areas support more special-status species that would be vulnerable to wind turbine collisions.\textsuperscript{20}
Specifically, my colleagues and I identified coastal oak woodland as the vegetation cover type
that would cause the greatest bird impacts in California, if wind turbines were sited there. Siting
wind farms in Pinyon-Juniper forests would lead to the third greatest level of impacts, and siting
wind farms in redwood forests would lead to the fifth greatest level of impacts. Scrubs and
chaparrals were least susceptible to bird collision impacts due to wind farm siting.

20. At a minimum, an EIS is needed for the zoning adjustments in Skamania County.
The EIS should make use of the scientific tools and understanding of environmental impacts that
are available, such as using a map-based indicators approach to help the public participate with

\textsuperscript{20} Smallwood, K. S., K. Hunting, L. Neher, L. Spiegel and M. Yee. In review. Indicating Threats to Birds Posed by
New Wind Power Projects in California. Final Report to the California Energy Commission, Public Interest
an intelligent zoning that truly minimizes the environmental impacts of future site-specific
projects. Such tools are relatively easy to develop and use, and the framework I helped develop
for California wind farm siting can be updated and improved as more is learned about the
interactions of birds and bats with vegetation cover, landscapes, and wind turbines.

21. I declare under penalty of perjury that the foregoing is true and correct to the best
of my personal knowledge, information, and belief.

Executed in Davis, California this 2nd day of September, 2008.

K. Shawn Smallwood

SCOPE Law Firm, PLLC
PO Box 22091
Seattle, Washington 98122-0091
(206) 420-1590