



Wind Energy Policy Update 2012

Friends of the Swainson's Hawk (FOSH) is striving to take a meaningful role in California on wind energy facility and avian interactions because wind energy development has had a significant impact upon raptor safety. California has a dense population of both nesting and wintering raptors and has significant raptor migration corridors. The cumulative impacts of all risks and threats to these species are considerable.

As wind projects have expanded into Swainson's Hawk habitat, FOSH has spent increasing amounts of time addressing issues and advocating for better mitigation and habitat protection. FOSH has found that in order to continue to engage on these issues and approach projects consistently and with the best information available, it helps to have a policy document. This document was first adopted in 2010, was updated early in 2012, and serves as the FOSH guidance on wind policy issues in California.

GEOGRAPHY

There are four major wind areas in California – Altamont Pass (Alameda and Contra Costa Counties); Montezuma Hills (Solano County), San Geronio (Riverside County); and Tehachapi Pass (Kern County). There are also turbines at Pacheco Pass (Merced County). Pacheco Pass is the smallest, and was a test area for turbines which has not been redeveloped. It is on land that is now a state park. Although these are the major wind areas, projects are proposed in many counties throughout California. Some projects being proposed are single or two turbine projects. Many times they are built to serve a business or provide electricity locally (called “distributed energy”).

WIND TURBINE LOGISTICS

According to the AWEA website [www.awea.org/learnabout/industry_stats/index.cfm], the fourth quarter of 2011 saw 3,444 megawatts (MW) of wind power capacity installed in the United States, bringing total installations in 2011 to 6,810 MW. The U.S. wind industry now totals 46,919 MW of cumulative wind capacity through the end of 2011. There are over 8,300 MW currently under construction involving over 100 separate projects spanning 31 states plus Puerto Rico. The U.S. wind industry has added over 35% of all new generating capacity over the past 4 years, second only to natural gas, and more than nuclear and coal combined. Today, U.S. wind power capacity represents more than 20% of the world's installed wind power. California installed 3,179 MW of wind energy capacity in 2011.

Wind turbines started out small and had reliability issues when they were first developed. They have over the last 40 years developed to be very large units and wind farms have been placed on large areas of land. Turbines have gone from a lattice to tubular design for safety and ease of maintenance (stairs are inside and can be accessed in inclement weather).

Industrial wind turbines have gotten a lot bigger over the years (drive on 12 through Suisun Marsh from Rio Vista to see them). The widely used GE 1.5-megawatt model consists of 116-ft blades atop a 212-ft tower for a total height of 328 feet. The blades sweep a vertical airspace of just under an acre. The 1.8-megawatt Vestas V90 from Denmark is also common. Its 148-ft blades (sweeping more than 1.5 acres) are on a 262-ft tower, totaling 410 feet. Another model being seen more in the U.S. is the 2-megawatt Gamesa G87 from Spain, which sports 143-ft blades (just under 1.5 acres) on a 256-ft tower, totaling 399 feet. Many existing models and new ones being introduced reach well over 400 feet high. A new project in Oregon – Shepard's flat will utilize 338 of GE's next-generation 2.5 MW turbines spread out across 30 square miles of terrain just south of the Columbia River in north-central Oregon. The farm is predicted to generate about 2 billion kilowatt-hours per year, enough power for 235,000 homes. The project will sell

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power to Southern California Edison. In the latest SMUD project EIR the blade tip speed was identified as 180 mph.

Transport of such large items and the cranes needed to assemble them often presents problems in the remote areas where they are typically built. Roads must be widened, curves straightened, and in wild areas new roads built altogether. Building roads results in an altered physical landscape that includes erosion and habitat fragmentation.

The steel tower is anchored in a platform of more than a thousand tons of concrete and steel rebar, 30 to 50 feet across and anywhere from 6 to 30 feet deep. Shafts are sometimes driven down farther to help anchor it. The platform is critical to stabilizing the immense weight of the turbine assembly.

Output depends on wind speed and the combination of blade diameter and generator size. Bigger blades on a taller tower can capture more wind to run a bigger generator, but they don't do so more efficiently than smaller models.

IMPACTS ON BATS AND BIRDS

Bird kills in California have been well known since the 1980s when wind farms started being monitored. While some of the mortality is not considered significant because the species are plentiful, raptor mortality in general, and special status species raptor mortality in particular, is very significant. For example, golden eagle mortality in both Altamont and Tehachapi corridors is high. In the Montezuma Hills Corridor, it is estimated that 219 raptors a year are killed by wind operations.

Dead bats were first found by accident in Virginia and it was thought that it was an isolated event from a bat migration. More recently, carcass surveys in Montezuma Hills started finding bats as well as birds. Bat carcasses are now found in most places where people are looking. While bird and bat mortality occurs from blade impact, bats are also killed by barotrauma. Bats are being killed by barotrauma caused by rapid air pressure reduction near the moving turbine blade. This results in lung damage because there is air in the lungs which can't be exhaled fast enough to meet the outside air pressure, resulting in hemorrhaging. Birds are less susceptible to barotrauma than mammals are.

Bird and bat impacts have been addressed inconsistently throughout California. Projects are usually permitted locally (County or City), by the local utility (SMUD) or sometimes through a federal agency (Bureau of Indian Affairs). A lot of research has been done, and continues to be done at the Altamont Pass where raptor kills are higher than anywhere else in California. They have an ongoing working group that addresses issues such as repowering, research needs, methodology reviews and meeting set goals for reducing bird kills. Solano County has a Technical Advisory Group that meets infrequently and reviews monitoring reports. Solano County through the CEQA process requires mitigation for lost foraging area equivalent to the rotor swept area. They have not monitored impacts to the extent that projects in the Altamont Pass have monitored. In southern California it was thought that raptor mortality was relatively low, but Pine Tree wind development in the Tehachapi Mountains has had a very high rate of mortality for Golden Eagles. Projects have also been built on Native American Reservations (Bureau of Indian Affairs oversight of Kumeyaay Wind Project in San Diego County).

SITING GUIDELINES

The key issue in avoiding impacts is siting. California Department of Fish and Game and California Energy Commission adopted statewide recommended guidelines for siting and monitoring wind turbines in 2007. They are recommendations for voluntary compliance. However, these guidelines can be very helpful in assessing a project in the CEQA process. Found at www.energy.ca.gov/2007publications/CEC-700-2007-008/CEC-700-2007-008-CMF.PDF

The US Fish and Wildlife recently issued revised voluntary guidelines and a program for mandatory eagle take permits. www.fws.gov/habitatconservation/wind.pdf.

Non-profit and citizens groups are becoming more educated about the potential impacts from wind development. As a result there are higher expectations for better siting, better monitoring, better disclosure about impacts and monitoring results and better mitigation. Projects that are being proposed in areas where impacts will be high are starting to meet resistance and in some cases do not get the approvals necessary to proceed, or are facing litigation.

ACTIONS THAT FOSH WILL ADVOCATE

Building alliances to support raptor safety and fair mitigation for impacts

FOSH will work with national groups as well as grassroots organizations to carry out our actions.

Insisting on better siting decisions.

Review proposed projects and oppose project sites that contradict state or federal guidelines. Advocate for alternatives analysis with independent, publicly reviewed, scientific avian and bat population studies at each location as part of project Initial Study under CEQA. FOSH will advocate for appropriate setbacks or no development in areas that have high bird use and/or high avian mortality. FOSH will also advocate stopping development in natural areas, protected areas or have high biological values in a given region (such as riparian areas, protected areas, State and National Parks, set aside areas). Use guides such as Audubon's important bird areas to limit/stop development in key bird/bat use areas.

Asking for "take" permit requirements in the CEQA process when Swainson's Hawks are subject to risk of mortality from a project

Supporting stronger federal regulation under the Migratory Bird Act Treat, such as proposed by the American Birding Conservancy, and other campaigns to reduce wind and wildlife interactions

FOSH supports the American Bird Conservancy petition for USFWS to make wind – wildlife guidelines mandatory, requiring a permit for impacts on all migratory birds. This framework can lead to better permitting and more oversight of projects in California. We support federal guidelines, the California guidelines and issuance of take permits – and their implementation and proper use— as the tools available now. But these tools lead to a piece meal regulatory environment that is not good for industry or protection of the environment, and place too much reliance on local planning officials and local elected officials who lack the expertise to evaluate and judge mitigation and monitoring programs.

Withholding support for any federal/state tax credits under regulatory framework is in place.

We don't support federal subsidies for wind energy until guidelines are mandatory to provide fair mitigation and site turbines only in places that are not going to impact significant or threatened populations of birds. We encourage industry to support regulation as a fairer approach, more consistent with the long term health of the industry as a whole.

Advocating for mitigation measures in project CEQA documents that can be used to lower impacts

Seasonal shutdowns should be a project mitigation measure included in all permit or CEQA mitigation measures in case monitoring shows high mortality. Provisions for take permits, additional monitoring, cut-

out controls such as feathering or applying a brake, and lock down when turbines are not generating, should all be included in the mitigation list for use on an as needed basis. Habitat land conservation to offset impacts and monitoring with adaptive management components that continue monitoring as needed should be required. Support development of bat and avian protection plans and plans to protect special status species prior to projects operating and impacts occur. Training for wind personnel on what to do if they find a carcass or injured bird during maintenance visits (incidental finds).

Ensure that promised mitigation measures are delivered

FOSH has consistently been concerned that mitigation measures promised to offset impacts of projects on Swainson's Hawks are capable of implementation and are implemented. (See our research program) With regard to wind projects, we are presently seeking to verify that Solano County has obtained the conservation easements required by approvals for wind energy projects in the Montezuma Hills area.

Supporting better monitoring and reporting

Post-Construction Monitoring should include multiple years of surveys and improved methodologies. All wind projects should conduct multiple years of post-construction monitoring for all turbines every year (most guidelines only recommend one year). Multiple years of surveys will increase the likelihood that impacts to rarer species, or rare events will be captured and will also address annual changes in bird use. Shorter survey intervals, carcass surveys and searcher bias surveys should all be conducted and use of publicly available statistical programs used (such as the USGS model).

All monitoring and research information should be made available to the public. Survey methodologies and results should be made available to the public. In cases where there are questions about the methodologies, make them available to comment through a Wind TAC (like Altamont or Solano County) or open meeting. All monitoring reports, databases, incidental bird kills or injuries, monitoring plans and research results should be made public. Promote outside review of survey methodologies and post construction monitoring reports conducted by wind company consultants.

Support raptor and bat rehabilitation centers, particularly the California Raptor Center to offset mortalities.

The wind energy industry should voluntarily provide operational support to raptor and bat rehabilitation efforts to help counteract the cumulative impact of mortalities on these populations in California.

Support research efforts and access to sites for researchers: There is a difference between "monitoring" and "research" – with most wind areas in California conducting post construction surveys to determine the level and species of bird and bat kills. FOSH seeks more scientific research to find ways to reduce and avoid impacts of wind energy development on birds, particularly raptors, and bats.

Other Organizations' Wind Policies and Procedures

FOSH considered the policy statements and activities of several large national environmental organizations on wind energy issues in preparing this document. One of our concerns has been what has appeared to be a blanket endorsement by national environmental groups of all green energy projects. Over the last few years, FOSH has become concerned that oversight of the biological impacts of wind energy development is missing. In recent months, we have noticed and learned about more activity by fellow environmental groups to seek better protection of avian and bat resources.

US Fish and Wildlife Service - USFWS has new guidelines out for siting wind turbines called the USFWS Voluntary Land-Based Wind Energy Guidelines. They were issued April 4, 2012, and replace the 2003 guidelines. The USFWS had assembled a Federal Advisory Committee and then used the recommendations to develop their own guidelines. The first several drafts were not well received by the

wind industry. The USFWS received quite a few comments recommending that the guidelines be made mandatory. The USFWS has updated the guidelines to include more methods and metrics. The guidelines are not as strong from a regulatory perspective as they could be; instead they allow the wind developer to determine how a project proceeds. The guidelines are intended to help wind developers identify species of concern and impacts such as collisions, loss and degradation of habitat, fragmentation of habitat, displacement and behavioral changes and indirect effects. The guidelines address preliminary site evaluation, site characterization, field studies to document site wildlife and habitat and predict project impacts, post-construction studies to estimate impacts, and other post-construction studies and research. See <http://www.fws.gov/windenergy>.

California Department of Fish and Game. Collaborated with California Energy Commission in publishing voluntary guidelines for the wind industry in 2007 entitled **California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development**. See <http://www.energy.ca.gov/windguidelines/index.html>

American Bird Conservancy – ABC has taken a leading position in advocating more protection for birds and bats. Their “bird smart wind policy” found here http://www.abcbirds.org/abcprograms/policy/collisions/wind_policy.html. In December 2011, ABC petitioned the USFWS to make draft guidelines mandatory. The petition is here http://www.abcbirds.org/abcprograms/policy/collisions/wind_farms.html. They make a case that cumulative impacts are significant with hundreds of thousands of birds being killed in the US due to turbines. They also make the case that USFWS has the responsibility to regulate under the Migratory Bird Treaty Act, and if the USFWS protected species under the Migratory Bird Treaty Act they wouldn't have to list them under ESA due to declines.

AWEA – American Wind Energy Association represents the producers. It is pushing back on the USFWS and wants to maintain voluntary guidelines. The executive summary of their comment letter on the May version of the draft guidelines stated “The wind energy industry wants to do the —right thing with respect to environmental and wildlife protection. But, the current draft USFWS guidelines are, simply stated, unworkable. Industry will not be able to comply with the guidelines as currently drafted; therefore, they—like the 2003 Interim Siting Guidelines—will remain largely unused. If that occurs, the conservation benefits of adopting the highly workable program recommended by the FAC would be lost. In order to avoid that occurrence, AWEA respectfully requests that the USFWS incorporate the revisions described in these comments, which generally follow the original FAC recommendations.”

Audubon California - Believes that global warming is the biggest environmental threat, but the organization is working to ensure that the development of wind (and other renewable energy) is conducted in a responsible manner that minimizes impacts on birds and their habitats. Audubon is supportive of state and federal efforts to expand renewable energy while advocating that the projects must be properly planned and sited to minimize impacts on birds. Support Important Bird Area maps. Local chapters have taken leadership roles with respect to specific projects and have been very prominent in the Altamont and Pine Tree battles, including litigation. Audubon California Staff member Garry George is highly knowledgeable, representing Audubon in the Desert Renewable Energy Conservation Plan process, and coordinates and supports chapter activists.

Sierra Club – The Club developed its first policy supporting wind energy in 1973. Their policy in part states that

“Because wind projects tend to be large industrial developments with inevitable adverse impacts, the choices are complex. All new energy supply carries with it environmental risk. The Sierra Club strongly supports the development of substantial wind resources for electricity generation. Wind power is a reliable, clean, renewable resource that can help reduce our dependence on polluting fossil fuels (coal, oil, and natural gas) and nuclear power for

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electricity. The consequences of our continued dependence on burning fossil fuels for electricity include global warming, acid rain, smog, increased incidence of asthma and other respiratory diseases, and other forms of pollution and natural resource damage, including mountaintop removal and strip mining. The Sierra Club believes that in most instances many of the negative impacts of wind can be managed. The most important management measures are site selection and careful site evaluation. We believe that with adequate site planning the benefits of wind power in reducing the threat of global warming and pollution will substantially outweigh wind's negative impacts."

They then list certain categories (avian, visual, land use, etc.) and state what they think the rules of wind development should be. More recently, the Club joined with Defenders and Center for Biological Diversity to challenge approval of the North Sky River Project in Kern County in an important bird migratory corridor. The project has impacts on golden eagle, California condor, southwestern willow flycatcher and sensitive bat species.

NRDC – Natural Resources Defence Council Policy includes:

"Wind power is an affordable, efficient and inexhaustible source of electricity. It's pollution-free and cost-competitive with energy from new coal- and gas-fired power plants. Bird and bat safety must be fully addressed. The wind industry has made great strides in locating wind farms to prevent harming birds in flight; now attention is turning toward bats. Project developers must work with local bird and bat experts to avoid migration routes, and use new technologies to help flying creatures steer clear of turbines. Future innovations should make this even easier. Certain sensitive lands -- such as parks, monuments and wildlife conservation areas -- and ecologically sensitive marine areas are not appropriate for energy development. In some of these places, energy development is prohibited or limited by law or policy, and in others it would be highly controversial. NRDC does not endorse locating energy facilities or transmission lines in such areas. Siting decisions must always be made extremely carefully, with impacts mitigated and operations conducted in an environmentally responsible manner."

EDF – Environmental Defense Fund does not seem to have a policy, wind webpage or campaign for clean energy, but is supportive of wind and all renewable energy development. EDF seems to be more responsive to news items and energy happenings than to have a stated policy. They do have a couple of fact sheets that use the same information provided by the wind working group. Examples of poorly supported or misleading facts, including: "housecats kill more birds than wind turbines", and "birds infrequently collide with wind turbines." It doesn't appear that their fact sheets have been updated since 2003.

Additional Comments on Monitoring and Research

- There is a need to compare preconstruction surveys to post construction mortality estimates and continually improve risk assessment methodologies, making pre and post construction estimates as accurate as possible.
- The State of California should continue to require funding for PIER for research in California on the best statistics to use, methodologies to accurately assess numbers of birds killed, field techniques. Bat Conservation International, Bats and Wind Energy Cooperative, and consultants are also adding to the information available.
- Research has not moved towards developing and testing ideas on how to reduce the impact for projects under operation. The exceptions:
 - Study in Pennsylvania showing cut in speed reduced bat kills

- Seasonal shut downs in Altamont (50% less fatalities at shut down turbines?). Problems with the study design.
- The role of technology has also increased in understanding bat and bird movements, especially at night. In some cases radar can be used to understand at what level birds and bats are migrating and when, and whether there are weather events that can predict when fatalities may occur. An acoustic detector is a recording device which uses an ultrasonic microphone and can record bat calls. These require trained technicians to tell the bat calls apart. They can help identify which species are occurring at a site. Also acoustic detectors are being tested on met towers to determine where they should be placed.
- Dogs are being used at some sites for carcass surveys. They are more accurate than people, but still don't smell all dead birds and bats.
- Off-shore wind energy development is unlikely in California due to the shelf not being shallow enough for installations. On the east coast and Gulf of Mexico offshore wind is beginning to be discussed and permitted. Permitting off-shore energy development is regulated by the Bureau of Ocean Energy Management (part of US Department of Interior).
- Birds are also killed at Met Towers (Solano Study of Met Towers).
- Suggestions for Additional Information Needs or Questions that could change Mortality Counts
 - Does scavenger removal change over time as scavengers learn that dead birds/bats are available and roads make access easier? Should surveys be conducted at a newly constructed project and then again 10 years later to see if scavenger rates change over time? Is that an important question if the goal is just to get scavenger rates right?
 - In some of the older studies the confidence intervals around the estimated mean mortality numbers were large. The low vs. high range were a big difference. One of the goals to bettering the study designs should be to decrease that range. The tighter the range the more accurate the number is. From Wikipedia: "In statistics, a confidence interval (CI) is a particular kind of interval estimate of a population parameter and is used to indicate the reliability of an estimate. It is an observed interval (i.e. it is calculated from the observations), in principle different from sample to sample, that frequently includes the parameter of interest, if the experiment is repeated." It is usually represented by a line through a point on a graph.

SAMPLE OF REFERENCES FOR MORE INFORMATION

- Wind Energy Resource Atlas: http://rredc.nrel.gov/wind/pubs/atlas/atlas_index.html
- American Wind Energy Association (AWEA): www.awea.org/
- National Wind Coordinating Collaborative has a wildlife subgroup that attempts to tackle wildlife issues pertinent to the whole US. Also has some publications on wind/wildlife interactions: www.nationalwind.org
- A summary of wind resources, studies and impacts is at www.energy.ca.gov/2005publications/CEC-700-2005-015/CEC-700-2005-015.PDF
- California Wind Energy Collaborative – reporting on wind development, puts on workshops <http://cwec.ucdavis.edu/>
- CalWEA - www.calwea.org/

This policy document was prepared by Melinda Dorin Bradbury Consulting and approved by the Friends of the Swainson's Hawk board at its February 2012 meeting.