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**STATE OF CALIFORNIA  
ENERGY RESOURCES AND CONSERVATION  
AND DEVELOPMENT COMMISSION**

Development of Statewide ) Docket No. 06-OII-1  
Guidelines Reducing Impacts ) Developing Statewide Avian  
From Wind Energy Development ) Guidelines

Comments from the  
Center for Energy Efficiency and Renewable Technologies (CEERT)  
RE: Guidelines Draft #1

February 14, 2007

CEERT appreciates the opportunity to submit additional comments on the first draft of "Statewide Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" drafted jointly by the Energy Commission and the California Department of Fish and Game. It is encouraging that the staff has solicited very specific edits of their document and we continue to appreciate the efforts made towards collaboration in this process. The following comments build on CEERT's general comments submitted to the Docket on January 24<sup>th</sup>, 2007 (Attachment B). Additionally, CEERT solicited a technical review of the document by Wallace Erickson of WEST, Inc. (Attachment A) His professional biological opinion helped to form the foundation for CEERT's specific editorial recommendations.

CEERT remains supportive of this process and the development of guidelines as a tool which will help the wind industry to expand here in California. The Renewable Portfolio Standard (RPS) requires the state generate 20% of its electricity by 2010. That goal is already in jeopardy and wind energy must play a critical role in getting the RPS back on schedule. The guidelines as they are currently drafted, however, will not help wind. Rather the current guidelines represent an additional hurdle and another deterrent for expanded wind development in the state. CEERT strongly urges the Commission and staff to incorporate our suggestions.

Broadly, the goal of these editorial recommendations is to focus efforts of wind energy developers and lead permitting agencies on the most effective methods to study, minimize and mitigate the impacts of wind energy on bird and bat species. CEERT also recognizes that there are very likely to be new methods developed through on going research projects which will improve our understanding of these impacts. CEERT strongly supports these important research efforts. However, in editing the current set of guidelines, the staff should take great care to include only techniques which have been shown through research to effectively assess risk to birds or bats or to minimize or mitigate the impacts to those species. Techniques which have not yet been shown effective

through research studies should not be included as requirements or recommendations.

A number of the specific edits noted below are also related to comments made by WEST, Inc. or are based upon CEERT's first round of general comments (Attachment B). In such cases, the specific edit will be accompanied by a parenthetical note directing the reader to related comments in the other documents. Our specific recommended edits are as follows:

**p. E-1, 4<sup>th</sup> paragraph:** change "local agencies" to "lead agencies". This change should be made throughout the document.

**p. E-2, last paragraph:** Replace entire paragraph with "The [insert new name of Scientific Advisory Committee chapter – e.g. 'Outreach'] chapter encourages early outreach to DFG, USFWS, and stakeholders by the lead permitting agency and wind energy project proponent early in the pre-permitting process for input." (CEERT general comment #2)

**p. E-3, 2<sup>nd</sup> paragraph:** Remove the sentence beginning with "Acoustic monitoring". (WEST comments #14 and #15)

**p. E-4, 1<sup>st</sup> paragraph:** Remove this paragraph. Issues covered in chapter 6 are already addressed in chapters 3, 4 and 7.

**p. 1, 1<sup>st</sup> paragraph:** Delete, "before committing to substantial investments in a site."

**p. 3, 4<sup>th</sup> paragraph:** The word "substantial" should be replaced with "significant" in this paragraph and the range and average mortality rates across the US should be mentioned as a reference. (WEST comments #4 and #18)

**p. 3, "Data from Adjacent Wind Farms":** The first line should read "If the proposed site is *near or* adjacent to" and delete the word "adjacent" on lines 3 and 6. A new site should not have to be immediately adjacent to an existing site to benefit from existing data. (WEST comment #6)

**p. 3, "Site-Screening and Assessment":** Replace the word "substantial" with "significant", since "significant" is defined in CEQA and "substantial" is vague with no accepted definition. (CEERT general comment #4)

**p. 5, "Checklist to Evaluate Sensitivity of a Proposed Wind Resource Area":** The checklist is not a useful tool for screening, especially item #7, which would result in a "yes" answer each time. This should be used as a list of questions for the biologists to use as a guide with more focus on habitat. The "yes, no unknown" should be removed from the list. (WEST comment #1)

**p. 10:** Change all occurrences of “pre-permitting” to “pre-construction”. Pre-permitting implies that the surveys need to be completed prior to commencing or completing permitting activities. However, permitting activities should, and often do, commence while surveys are still in progress. In fact, lead agencies should (and currently do) have the discretion to issue permits before surveys are completed as long as the permit contains adequate provisions regarding the completion of the surveys and the measures that would be taken if the final survey results are in conflict with assumptions made during the permitting/CEQA process. (CEERT general comment #4)

**p.10, last paragraph:** Delete any reference to the age of the data in terms of its utility in supporting less than a full year of *pre-construction* studies (see comment above). Change sentence beginning on line 5 of this paragraph to: “Less *pre-construction* study *would* be sufficient for a [delete the word small] project *near or adjacent* to an existing, well-studied site for which there is *sufficient* [delete “a high level of”] knowledge about potential impacts to birds and bats and for which operations monitoring studies have *defined the* [delete “confirmed the low”] level of impacts *such that additional studies are not likely to significantly change the project’s risk profile or any mitigation measures the project proponent may have agreed to.*” (WEST comments #3 and #6; CEERT general comment #3)

**p. 12:** To the extent that BACI studies are kept in the guidelines, reference sites should not have to have a similar wind regime since such a site is likely to be a candidate for wind turbines. (WEST comment #8; CEERT general comment #5)

**p. 16, Raptor Nest Searches:** Nest surveys should typically be limited to any area within one mile of turbine locations to the extent feasible (as opposed to the three and five miles that the guidelines recommend), particularly if BUCs will be conducted at the site. Further limitations may also arise for example: if there is no legal land access or the area is already extensively disturbed, then the buffer should be reduced to take limitations into account. If breeding birds nesting further away are at risk, then they will be identified during the BUCs. The draft guidelines require “multiple surveys” beginning in March and ending in mid-June, and “regular visits” for the duration of the nesting season to confirm the status of each active nest. Instead of requiring “multiple surveys” and “regular visits”, which is vague and may or may not be necessary, the guidelines should state the goal of the nest surveys – i.e., to determine risk to breeding birds – and leave it to the County and its consultants to determine on a case-by-case basis if more than one nest survey is needed for a particular site in order to adequately assess the risk to breeding birds. (CEERT general comment #2)

**p. 19, last paragraph:** Delete the reference to bat mortality at the High Winds Power project. As written, it implies that the bat mortality at this project is high or possibly biologically significant and there is no basis for such an implication.

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**p. 28, paragraph 3:** Per FAA lighting recommendations and safety, turbines over certain heights require lighting plans. Flashing lights appear to be less of an attractant to nocturnal birds than steadily burning lights at night. Lighting at both O&M facilities and substations should be restricted to levels required to meet safety and security needs. The lighting design should consist of white lights (specific type undetermined). Sensors and switches will be used to keep lights turned off when not required. To minimize this potential impact, lights at O&M facilities will be hooded and directed to minimize backscatter, reflection, skyward illumination, and illumination of areas outside of the facility or substation. Additionally, lights will be turned off when not required to the extent feasible. Any lighting requirements from the FAA must be balanced with what is best for wildlife.

**p. 32 “Impact Avoidance and Minimization” paragraph 1:** Remove the statement “As discussed in previous chapters, absolute avoidance is required to be in compliance with certain state and federal laws.” It is important that this comment is placed in context. This topic is discussed in depth in Ch. 4 and should be limited to that chapter. (CEERT general comment #4)

**p. 33 “Reduce Artificial Prey Habitat at Turbine Base Area”:** Further explanation should be given for turbine pad construction which would minimize the amount of artificial habitat such as disturbed or unvegetated banks. (WEST comment #17)

**p. 33 “Avoid Lighting that Attract Birds and Bats”:** This section should incorporate the requirement for structures over 200 feet to consult with the FAA on a lighting plan. Any lighting requirements from the FAA must be balanced with what is best for wildlife.

**p. 34 “Compensation”:** The situation under which compensation should/would be used is vague. The idea that a 100 MW wind farm would have to compensate for cumulative impacts of a 1500 MW nearby wind farm is not reasonable and should be addressed. (CEERT general comments #1 and #5)

**p. 35, last paragraph, last sentence:** Delete this sentence, which discusses upfront or annual payments. It should be clear that the decision will be up to the developer in consultation with the lead agency and the amount of compensation would be conceptually the same. (CEERT general comment #1)

**p. 35:** In the discussion of mitigation banking as an acceptable form of compensation, the guidelines should state that mitigation banks may not need to be located near the project, or even in the same county, in order to constitute appropriate mitigation, especially at sites where a significant percentage of

avian/bat mortality is believed to be associated with migrants. (WEST comment #18; CEERT general comments #1 and #5)

**p. 35, last line:** Delete the last sentence – suggesting that compensation could be required “at a different level annually for the life of the project” implies that monitoring would take place for the life of the project. (WEST comment #18; CEERT general comment #1 and #3)

**p. 36, “Operations Impact Avoidance, Minimization, and Mitigation,” 1<sup>st</sup> paragraph:** Delete beginning with “During the bat migratory period . . .” through the end of that paragraph. Feathering and removal of turbines should not be considered an option (and certainly not the only option in certain circumstances as the last sentence states). Rather, project proponents should be required to conduct sufficient studies to assess a project’s risk and mitigate in the form of compensation (e.g., offsite mitigation) if deemed necessary. Guidelines that suggest that wind energy companies may have to shut down or remove turbines when mortality exceeds some undefined level could serve as a very real deterrent to wind energy development in California. Language in the second paragraph of this section begins to address this. Additional explanation and/or examples would be useful. (CEERT general comment #1)

**p. 36, “Adaptive Management/Effectiveness Monitoring”:** The guidelines state that adaptive management principles “must” be included in permit conditions. The language should be changed to suggest that adaptive management principles *may* be appropriate in certain situations – e.g., where there remains significant uncertainty regarding risk to birds and bats. This decision will be made at the discretion of the lead permitting agency. Language should also be added suggesting that if adaptive management-like provisions are included in permits, 1) any “triggers” that require a change in mitigation in the future should be very specific, 2) the cost of any potential change in mitigation (e.g., funding offsite mitigation or research) should be definable at the time of permitting, and 3) shutting down or moving turbines should not be an option. (CEERT general comment #1)

**p. 37, Chapter 6: Permitting:** This chapter should be removed. Issues covered in this chapter are already addressed in chapters 3, 4 and 7.

**p. 39, 3<sup>rd</sup> paragraph:** The draft guidelines suggest two years of post-construction monitoring is needed to capture variability between years. However, if the first year of monitoring shows a low enough level of mortality such that seasonal variability would not be expected to show a level that would significantly change the project’s risk profile or the mitigation required, then a second year of monitoring may very well not be warranted. The guidelines should have language suggesting that it may be appropriate to cease post-construction monitoring after a year in certain situations. (WEST comment #3; CEERT general comment #3)

**p. 39, 3<sup>rd</sup> paragraph, line 6:** Delete sentence beginning, "If pre-permitting studies indicate *high* potential for bird and bat impacts and *considerable* seasonal or annual variation in bird or bat use, a longer operations monitoring study may be required to determine if pre-permitting estimates of fatalities are accurate." First, the words "high" and "considerable" are not helpful as triggers for when longer operations monitoring would be required and should not be used. Further, higher pre-construction bird use does not necessarily require longer post-construction monitoring to confirm pre-permitting estimates. (CEERT general comments #3 and #5)

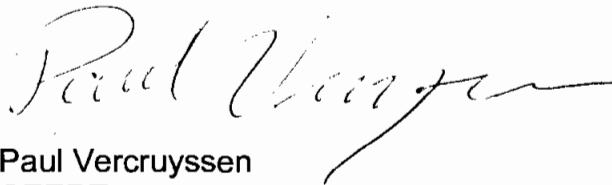
**p. 39, 3<sup>rd</sup> paragraph:** Delete reference to the Altamont Pass and the Smallwood and Thelander report, *Developing Methods to Reduce Bird Mortality in the Altamont Pass Wind Resource Area* (2004). All references to this document should be deleted from the guidelines based upon the CEC's most recent independent review of the report, released in December 2006.

**p. 40, 1<sup>st</sup> paragraph:** Delete this paragraph. Long term monitoring for the life of the project on a periodic basis (e.g., every 5 years) should not be required of any wind project. It was suggested at one of the guideline workshops that long term monitoring for the life of a project may be needed to ensure that significant changes in migratory bird behavior over time do not significantly change the risk profile of a project and, therefore, warrant a change in mitigation. However, wind projects should not be responsible for monitoring and responding to what is essentially a long term change in "background" conditions any more than conventional fossil fuel power plants are required to adjust their stack emission rates due to changes in background air quality caused by something other than the power plant. If shifts in migratory bird patterns and potential increases in mortality at wind energy facilities are concerns, then funding to detect those shifts should come from public sources or from industries that are responsible for the changing migratory bird habits. If, as a result of that monitoring, we learn that the risk is higher in certain areas than was previously established, that should be taken into consideration when permitting new wind energy projects or repowering existing projects in that area. (WEST comment #6; CEERT general comment #3)

**P. 40, Bird and Bat Use:** Collection of data on bird and bat abundance and site use should not be required to accompany all fatality studies as the draft guidelines suggest. Information on bird and bat avoidance may be important when conservation of sensitive habitats is a concern, but this is not the case at all sites. To the extent that there is a more general research gap associated with correlating pre-construction use to post-construction use, focused research projects at selected sites should be conducted rather than requiring such studies at all sites regardless of risk. (CEERT general comment #5)

CEERT greatly appreciates the consideration of our comments and looks forward to working with the Commission and staff on the second draft of these guidelines.

Respectfully submitted;



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**Comments on the California Energy Commission's  
Statewide Guidelines for Reducing Impacts to Birds and Bats  
From Wind Energy  
Docket # 06-OII-1**

**Prepared by  
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On behalf of the  
Center for Energy Efficiency and Renewable Technologies**

**February 14, 2007**

Comment #1 - Page 5 – This table has little value as a screening tool, since every site will likely have at least one yes answer (e.g. Q7, all sites have some birds that migrate over). The answers to these or other more relevant questions may be used to identify what data needs there are for a particular site.

Comment #2 - Page 6 – 3<sup>rd</sup> paragraph. The guidelines characterize wind energy impacts as unique because they are chronic. While wind energy impacts may be considered chronic in nature, impacts from most other developments are also chronic and thus wind power impacts are not unique. Habitat loss is chronic. Bird collisions with power lines, communication towers, windows, power plant stacks, vehicles, etc. are chronic impacts. Please elaborate or give examples of types of developments that would not be considered “chronic”.

Comment #3 - Page 10 – under Determining the Level of Pre-Permitting Surveys. First Paragraph, Last sentence. The example given suggests large variation in wintering raptor populations separated by more than a decade of time. While it is recognized that there can be high annual variation, this example poorly represents the point that variation may occur from one year to the next.

Comment #4 – Page 10 - Next Paragraph – A site larger than 500 acres is used in the guidelines to define a large project. This is less than one square mile, and given the typical 2-3 rotor diameters between turbines, and 7-10 rotor diameters between strings, any site with more than 7 turbines would likely be considered a large project. Given the range of bird mortality observed at western wind power projects (1 – 5 birds/MW/yr) and raptor mortality (0.01 – 0.4 raptors/MW/year), including sites like Solano County and Altamont, the total mortality for projects considered “large” by these standards would still be pretty low, even if you use the high end range of estimates.

Comment # 5 - Page 10 – Same paragraph. We would recommend that studies of habitat fragmentation and effects such as displacement be a focus of collaborative research studies funded by multiple stakeholders and would not necessarily be something to do at all “large” projects. The need for this type of research should be based on the species



potentially affected and the magnitude of the anticipated effect. Indirect effects like displacement and reproductive response are often difficult to measure and require large multi-year costly studies. These types of studies are important, but are probably best addressed in a collaborative research approach, preferable at more than one project site. Good examples include the Bat Wind Energy Collaborative that is focusing research on studying the impacts and potential mitigation options for high bat mortality at some wind projects and the Grassland Species Subgroup of the Wildlife Working Group of the NWCC, which is focusing research on the wind energy on grassland birds, especially prairie grouse.

Comment #6 - The guidelines identify some relatively restrictive cases where less pre-permitting studies might be appropriate “Less pre-permitting study might be sufficient for a small project adjacent to an existing, well-studied site for which there is a high level of knowledge about potential impacts to birds and bats and for which operations monitoring studies have confirmed a low level of impacts”. There are likely very few projects that would meet this criteria in California (<10 turbines, adjacent to well-studied sites). California Wind Resource Areas that we would characterize as having been well studied include Tehachapi Pass, San Geronio, Altamont and Solano County. Altamont and Solano County have been studied over the course of the last two decades, and have a large amount of avian use and behavior data, as well as mortality data for both smaller out-dated turbines and new generation turbines. If a new project that is >10 turbines is being constructed adjacent to Altamont or Solano County, additional avian use and behavior data may not be needed for predicting impacts. The other two areas (Tehachapi Pass and San Geronio) have been studied, but not at the same level, likely in part to the apparent lower use by raptors and other birds, and the lower mortality. Sites that are within or very near any of these WRA’s have existing information useful for aiding in predicting impacts to the new site. We recommend the guidelines establish the need for pre-permitting studies on the availability of data allowing evaluation of potential impacts rather than an arbitrary project size, the species potentially affected and the magnitude of the anticipated effect.

Comment # 7 Page 11 – We believe that some of the basic objectives for a pre-project assessment of bird impacts should be:

1. Identification of species and habitats potentially affected by the project, including the species most likely affected. For example, the sites should be characterized as high, moderate or low raptor use relative to other projects.
2. Provide an estimate of the range of anticipated bird or bat mortality from a wind power project by comparing potential wildlife resources to other sites with wind power facilities.
3. Identification of potential design and mitigation measures that could be used to reduce impacts.

Pre-project data should be collected in such a way that the information can expect to be related to wind power development impacts and that can be compared to other similarly

collected data at other wind facilities. Unfortunately, many of the techniques for determining indices to abundance at a site listed in the guidelines have not been shown to be useful at this point in answering important questions such as those above. For example, capture rates of birds or bats in mist-nets (see page 16 and page 21) has not been demonstrated to be a risk predictor. Because of limitations and biases associated with mist-netting, the primary objective for mist net surveys is capture of individuals and not estimating relative abundance or frequency. Mist-netting is fraught with biases such as: the height of the nets relative to the height of the turbines; mist-netting is difficult in high wind conditions; capture rates of individuals and species are extremely variable; mist-netting confirms presence but not absence of a species; and, sampling is limited to very small areas. The additional information gained from mist-netting for birds might be detection of a handful of species that were not found during regular diurnal surveys but this additional information does not provide quantitative information that would change estimates of risk and may not warrant the additional expense in most situations. We suggest that you indicate that the use of all methods may not be appropriate at each site and the method or methods used in pre-project studies should be based on the site and the level of concern for species potentially effected. We also suggest you refer the reader to scientific literature and to the NWCC guidelines for the appropriate setting and proper application for the various methods.

Comment # 8 – page 12 - BACI Designs – We recommend discussing impact gradient designs (Morrison et al. 2003) as well as BACI designs. In addition, referring to BACI designs prior to discussing the methodologies, gives the impression that a BACI design should be used at all proposed wind projects with all the methods described. However, the BACI or impact gradient designs have typically been applied in select cases where specific research hypotheses are being addressed such as displacement or avoidance of birds or bats. For predicting potential impacts prior to construction, the most common approach has been to collect information on the project site to compare to similarly collected information at other existing or proposed wind project sites. Erickson et al. (2002) summarized large bird avian use estimates from many proposed and existing wind projects in the U.S., and avian use estimates from a new proposed project can be compared to those numbers. For comparing avian use metrics, these projects should be considered “reference” sites comparison to the proposed project sites. More recently, an association between standardized metrics for raptor use and mortality from new generation wind projects has been suggested. A regression plot figure illustrates an apparent association between raptor use and mortality for new generation projects (Figure 1).

We recommend that BACI or impact gradient analysis designs be considered for testing research hypotheses such as displacement and avoidance in specific situations, but should not necessarily be a standard in all Pre-Project Assessment.

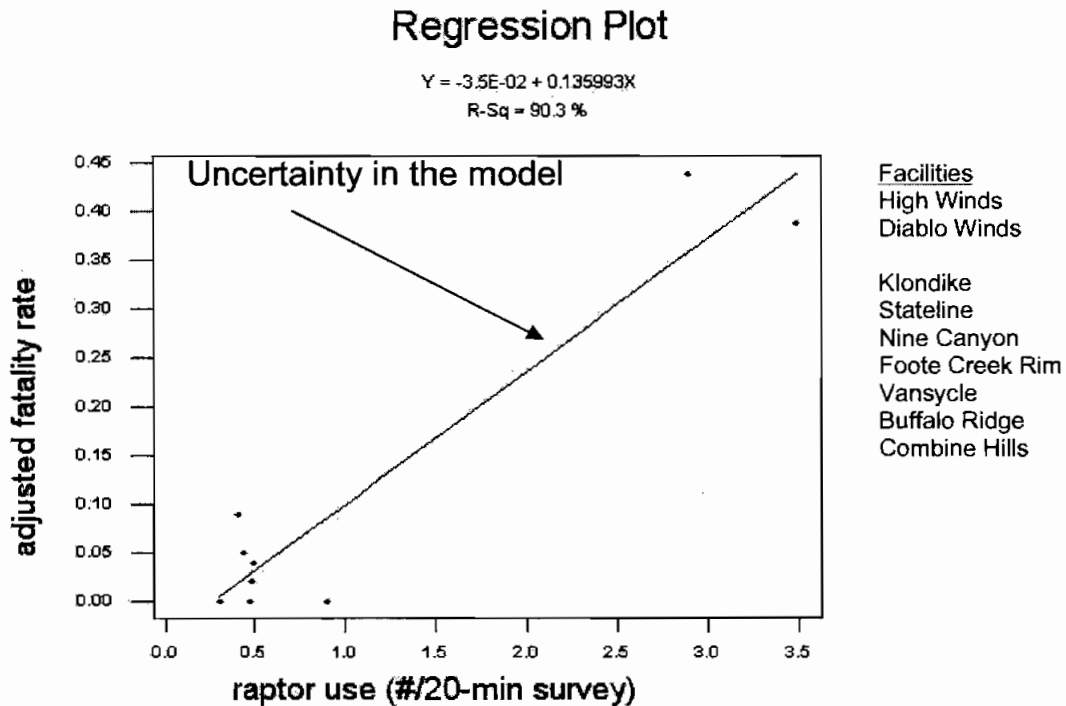


Figure 1. Regression analysis between standardized estimates of raptor use and raptor mortality for new generation wind projects where both types of information have been gathered using similar methodologies.

Comment #9– Page 14 – The guidelines state “Using both BUCs and distance sampling, it is possible to make density and population estimates (Somershoe et al., 2006)”. This is typically true only for the case of breeding songbirds with small home ranges with data collected during the breeding season. BUC’s and distance sampling cannot be used to estimate density for birds with larger home ranges (e.g., raptors) or when surveying in the non-breeding season without marked individuals. Metrics such as use estimates (e.g., observations/unit time) are a better measure of relative abundance and density and provide comparable results for many other studies where impact data are available.

Comment #10 – Page 14. The guidelines recommend that the number of observation stations for the large bird surveys be related to the number of turbines in a site. While this is intuitive, the guidelines for the number of stations would involve significant overlap in viewsheds with an 800 m viewshed. For example, the Diablo Winds Project has 31 Vestas 660 kW turbines. Existing studies identified 8 stations to survey for bird use and behavior during the post-construction period (Figure 2). Using an 800 m buffer, 8 stations cover all turbines, with some significant overlap in survey areas. According to the protocol, 12-13 stations would have been required. With an 800 m max viewshed, one raptor/large bird station every 1-1.5 square miles might be better guidance

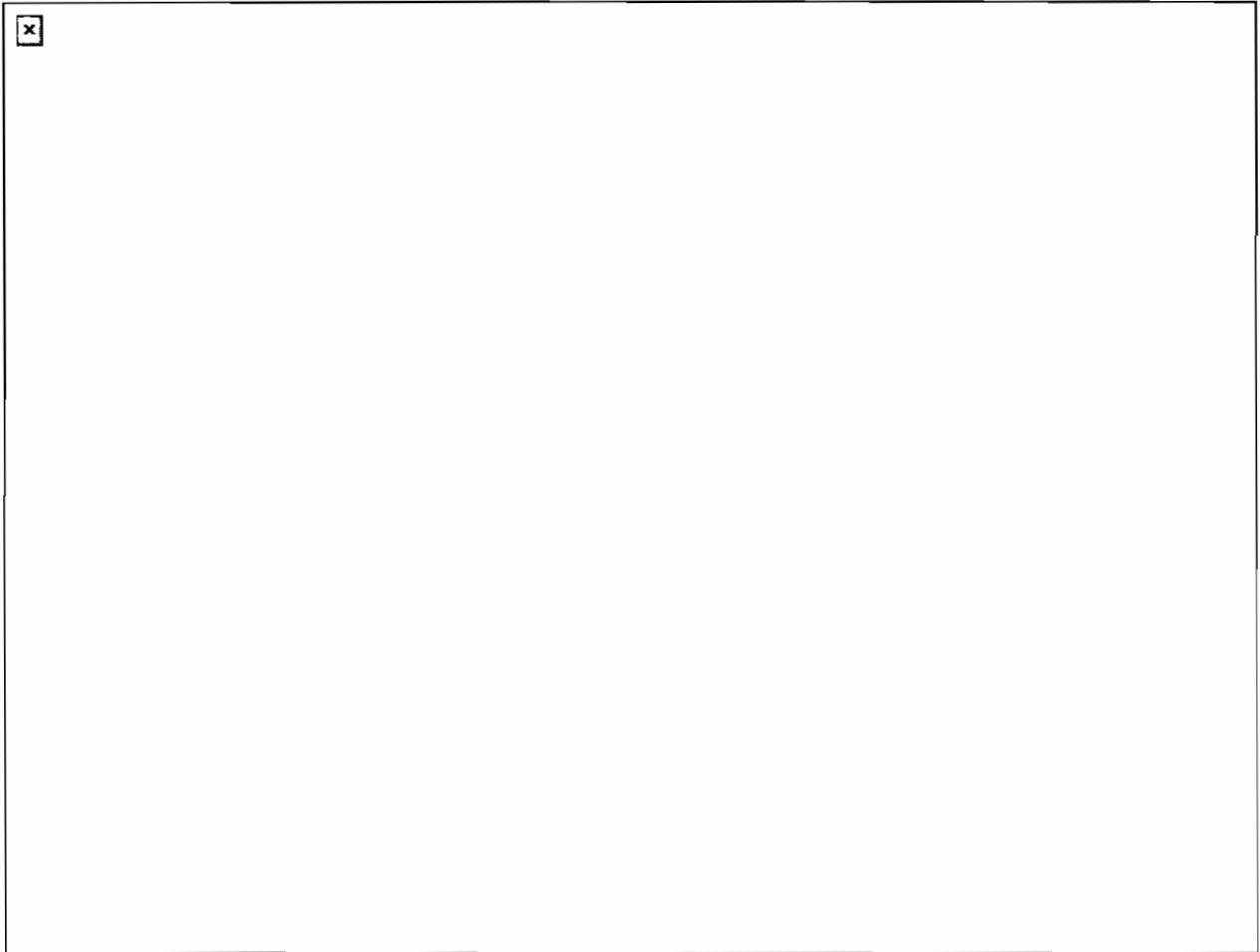


Figure 2. Diablo Winds Project turbine locations and survey stations.

Comment #11 – Page 15 – Small bird counts. The guidelines recognize the limited use of SBC’s in evaluating risk, and states that “The SBCs are only used in special cases, such as when there is concern for loss of special-status bird breeding habitat and are not typically used to assess the status of migratory songbirds in a project area.” The guidelines call for specific criteria of points spaced every 250 m to avoid double counting and get complete coverage of the area. This may be fine if the goal is to achieve complete coverage of the site, and it is necessary to determine presence of a species on site. However, in some cases, sampling the area (versus complete coverage) may be a reasonable option, if, for example, the goal may be to understand potential displacement impacts for songbirds(see Comment #8). Area searches and impact gradient designs might also be a reasonable alternative. If SBC’s are to be conducted, we would suggest sticking with either 5 minutes or 10 minutes, to make sure data can be compared among sites.

Comment # 12 - Page 17 - 2<sup>nd</sup> Paragraph - The guidelines include a discussion of California being part of the Pacific Flyway. It should be made clear that the Pacific Flyway encompasses the area from the California Coast to the west slope of the Rocky Mountains.

Comment #13 – Page 17 - The guidelines state that if “preliminary information indicates potential risks to nocturnal migrants at a proposed wind energy site, radar and other nocturnal study methods may be employed to determine species composition, abundance, and flight altitude of birds passing through the site”. We believe that there will be some mortality of nocturnal migrants at most wind projects, and therefore some risk. This in part is because most nocturnal migration is a broad front phenomenon influenced more by favorable weather patterns than site specific topography or habitat. Past studies have consistently supported this broad front migration and the recent studies using Dopplar and marine radar have supported this theory of nocturnal migration.

Marine radar surveys have been conducted in some cases at proposed wind projects, especially those located in the east, where higher numbers of songbirds migrate compared to the west. In general, results of these studies have predicted low risk to migrants based on the characteristics of migration over any given site. They have generally shown consistent patterns in that a very high percentage of the targets detected are well above turbine heights and a generally low percentage pass through the zone of risk (Table 1). All sites studied, over a wide variety of land cover types and topographic features had relatively high numbers of targets observed during the nighttime supporting a broad front theory, variable in time and space. The few radar studies that have been conducted in the west indicate relatively low passage rates compared to eastern projects, and few targets at the heights of the turbines, further bringing into question the utility of this method as a risk assessment tool. Additional technology development and research is needed such as concurrent radar and fatality monitoring to determine whether radar is a useful tool at predicting risk.

We advocate collaborative research using existing Dopplar radar in California to answer questions related to when heavy movement of migrants would occur (e.g., weather patterns conducive to migration). Nighttime marine radar studies may be useful in unique cases such as coastal situations or to monitor movement of threatened or endangered species (e.g. marbled murrelet), but we believe results of existing studies do not differentiate among sites in terms of nocturnal migrant mortality or risk.

Table 1.  
Results of Radar Studies at Proposed and Existing Wind Project Sites in the U.S.

Site	Passage Rates (targets/km/hr)		Mean Flight Height (m)		% Targets below 125 m		Mean Flight Direction		Reference
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	
Clinton County, NY	110	197	338	333	20	12	30	162	(Mabee et al. 2006)
Dairy Hills, NY	117	94	397	466	15	10	14	180	(Young et al. 2006)
Prattsburgh, NY	170	200	319	365	18	9	18	177	(Mabee et al. 2004, 2005)
Chautauqua, NY	395	238	528	532	4	5	29	199	(Cooper et al. 2004a,b)
Flat Rock, NY		158		415		8		184	(Mabee et al. 2005)
Wetherfield, NY		168						179	(Cooper and Mabee 2000)
Harrisburg, NY		122						181	(Cooper and Mabee 2000)
Copenhagen, NY	192	225					12	184	(Cooper et al. 1995)
Cape Vincent, NY	192						18		(Cooper et al. 1995)
Marlinsburg, NY		230						191	(Cooper et al. 1995)
Deerfield, VT	404	178	523	556	6	4	47	203	(Roy and Pelletier 2005, 2005)
Sheffield, VT	199	109	522	566	6	1	40	200	(Roy et al. 2005, 2006)
Marlindale, PA		187		436		8		188	(Plissner et al. 2005)
Casselman, PA		174		448		7		219	(Plissner et al. 2005)
Mount Storm, WV		199		410		16		184	(Mabee et al. 2004)
<b>Mean - East Studies</b>	<b>222</b>	<b>180</b>	<b>437</b>	<b>452</b>	<b>11.5</b>	<b>8</b>	<b>26</b>	<b>188</b>	
Cotterel Mountain, ID		32		565		3		155	(Cooper et al. 2004)
Stateline, OR/WA	50	23	625	470	16	6	9	165	(Mabee and Cooper 2002)
Nine Canyon, WA	98	31	472		15	8	23	181	(Mabee and Cooper 2000, 2001)
Buffalo Ridge, MN	93								(Hawrot and Hanowski 1997)
<b>Mean - West Studies</b>	<b>80</b>	<b>29</b>	<b>548</b>	<b>517</b>	<b>5.5</b>	<b>5</b>	<b>16</b>	<b>167</b>	

Comment #14 – Acoustics, Tads, and Ceilometers

Acoustics, Ceilometers, and Moonwatching have not been demonstrated to be useful in predicting collision risk at a wind farm. At best, these methods might be used in tandem with radar at sites identified as unique (e.g., coastal) to verify the presence of different taxa (e.g., birds, bats, and insects) but in general the value of these methods are limited and have numerous biases. Thermal Animal Detection Systems can be quite an expensive method, with limited range of view. We believe TADS are most applicable for research studies looking at the interaction of bats and birds and wind turbines after a project is built to understand behavioral avoidance. TADS have not been shown to predict impacts pre-project. Acoustics have limited range of detection and only detect individuals producing sound audible to the equipment. Ceilometers have been shown to attract nocturnal migrants (likely due to the light) and thus bias the sample.

Comment # 15 Bats – Acoustic Detection

The guidelines call for year-round acoustics surveys for bats. The use of acoustic detection for assessing risks to bats is currently being researched by the BWEC. Its utility in quantifying risk to bats at a site pre-project is not yet understood, and this should be indicated in the document. The guidelines call for year-round surveys at all

sites. Certain areas (higher elevations and Northern California) would not need information during the winter. Obtaining bat species information from passive sampling with detectors is difficult at best due to the range of detectors, short duration of recorded calls and high variability in bat calls in general. The primary use of this information would be to determine how the call rates at a proposed site compare to call rates from other sites and thus a standardized sampling regime should be employed. Also, if bat acoustic surveys are required at 30 m heights, the guidelines should describe acceptable methods for getting the detectors up on the met towers.

#### Comment # 16 - Bats – Thermal Imaging

As with birds, thermal imaging is not a proven technique for assessing risk to bats pre-project. It has the most utility in answering research questions such as behavior of bats around turbines post-construction.

#### Comment # 17 - Page 33 – “Reduce Impacts with Appropriate Turbine Layout”.

It is recommended that pre-permitting studies be sufficiently detailed to establish normal movement patterns of birds and bats to inform micro-siting decisions about turbine configuration. We contend that technology for determining normal patterns of bats has not been sufficiently developed. Such a statement might be relevant if your site was near a bat roost or hibernacula. In addition, bird behaviors such as raptors using the windward side of ridges, and the use of saddles in ridges to cross are two examples that may be applied to sites, using pre-project data to confirm such patterns.

Comment #18 – Page 35 – The guidance document refers to bird and bat impacts from turbine collisions as unusual. We would not characterize bird kills from wind turbines as unusual, when compared to other development. Many types of development and human activities result in mortality of birds. Roads and vehicles result in large numbers of bird deaths, including raptors. Tall structures such as communication towers and buildings result in bird kills. Agricultural practices (e.g., pesticide use, tilling and plowing) results in bird kills. Windows in tall buildings and even houses are responsible for large numbers of bird kills.

One method of mitigation we have noted is the practice of compensation for bird mortality when mortality exceeds a certain threshold, which can be determined by establishing an acceptable range based on existing data across the country and in consultation with the wildlife agencies. The resulting funds are then used for mitigation such as habitat improvement.

Comment #19 – Page 36. 3<sup>rd</sup> paragraph. The guidelines state that, in some cases, such as mortality in violation of state or federal laws, operational and facility changes may be the only option. Since the MBTA protects all migratory birds from incidental take, this statement, as written, would suggest any time a bird is killed at a wind project, operational and facility changes may be the only option. We assume the authors of the guidelines did not intend the statements to be interpreted that way.

Comment #20 – Page 39 – The first paragraph provides some context for conducting carcass monitoring study. The primary objectives that should be met at a minimum with most post-construction mortality studies should include:

- determine whether overall avian and bat fatality rates or raptor fatality rates are low, moderate, or high relative to other projects
- Determine whether predicted mortality is a reasonable estimate
- Determine if the level of fatalities warrant corrective action

Comment #21 – The guidelines recommend acoustics studies for bats post-project at all wind projects. While we agree there needs to be research into the relationship between acoustics surveys for bats and mortality, we do not believe the guidelines should require such surveys at every project. The methods have not been shown to necessarily be useful in estimating risk or evaluating impact and more research is needed.

Comment #22 – We have used the maximum tip height of the turbines as a guide to the maximum radius of a carcass search plot.

Comment # 23 - page 43 under “Frequency of Carcass Searches” We recommend that if the search interval is 7 days or greater at a project, that the searches of the turbines be conducted over multiple days to better account for temporal variation in fatality rates. This approach in part relaxes the assumption that fatalities occur at uniformly distributed, independent random times between search days.

Comment #24 – At sites with low searcher detection, consideration should be given to mowing, or otherwise improving detection rates in search plots. This has also been used at some sites where a turbine is subsampled (not all area searched) to increase the number of turbines searched for the same effort.

Comment #25 – There is a recommendation to include daily searches at 1/3 of the turbines if there is concern over bat impacts. Daily searches do provide some information regarding the association of weather with fatality rates. However, it is not a necessary requirement to obtaining a reliable estimate of bat mortality in most cases. Furthermore, sampling 1/3 of the turbines on a daily basis is a huge increase in effort and costs. The following table shows some examples of improvements in precision of fatality estimates for different project sites. The coefficient of variation is a measure of the precision in the estimates. In the first part of the table, we show the improvement in precision in the bat mortality estimates for daily searches versus weekly searches at two bat high mortality sites in the Northeast. In this example, a two-fold increase in precision was achieved, but with 7 times the search effort. Sampling interval should depend on desired precision, scavenging rates, study objectives and other factors.



Project	Search Interval	Study Period	No. Turbines	trial N	scav rate	cv
<b><u>bats</u></b>						
Mountaineer	1	42	22	200+	high	0.11
Mountaineer	7	42	22	200+	high	0.22
Meyersdale	1	42	10	200+	low	0.11
Meyersdale	7	42	10	150+	low	0.24
<b><u>birds</u></b>						
Stateline	14/28	365	150	160+	low	0.12
Nine Canyon	14/28	365	37	80	low	0.33
Buffalo Ridge	14	200	40	160+	mod	0.35
Mountaineer	7/27	200	44	30+	high/mod	0.50



January 24, 2007

The Honorable Jackalyne Pfannenstiel, Chair  
The Honorable John L. Geesman, Commissioner  
The California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

**Re: Draft – Statewide Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development**

Dear Commissioners Pfannenstiel and Geesman:

It has been one year since the California Energy Commission (CEC) jointly sponsored a conference in Pasadena to better understand wind energy's impact on avian and bat species. Since that time, thanks in no small part to the Commission's leadership on this issue, great strides have been made toward addressing wildlife impact concerns while increasing wind development in California.

Commission staff has engaged in an open and collaborative effort to develop statewide guidelines with constructive input from all stakeholders. This has been part of a much broader shift in what was a very negative and combative dialogue between conservation groups and wind energy developers. Again, it is to the credit of the Commission that these groups have been able to come together and work constructively towards their common goals. The clearest sign of this progress occurred recently when wind energy companies operating in the Altamont Pass reached a settlement in their lawsuit with several Bay Area Audubon chapters and Californians for Renewable Energy. This ongoing and once bitter dispute had slowed the development of wind energy across the state and elsewhere and now has offered hope that this debate can move forward with a positive dialogue.

The first draft of the CEC and California Department of Fish and Game (CDFG) voluntary Statewide Guidelines document is another positive indicator of progress. Each stakeholder involved in the workshop process has contributed constructively and the debate has been forward thinking. The result is a very comprehensive draft document that may very well be a step forward in the understanding of avian and bat impacts from wind turbines and the broad array of measures available to address those impacts. However, without changes to

the current draft which (1) offer more certainty on pre-construction development schedule and post-construction costs, and (2) better link study requirements to actual risk at each site, the guidelines may very well serve to discourage new wind development in California.

CEERT has narrowed the list of primary concerns down to five topics listed below. In addressing these concerns it is important to keep in mind that a balance must be struck between offering developers a level of certainty for their costs in developing a project while at the same time allowing for flexibility in determining what steps will be most effective for a given project to avoid, minimize and mitigate significant impacts to bird and bat populations. It is also crucial for the guidelines to provide for creativity in resolving environmental issues at each project with solutions not included in the guidelines document.

### **1. Boundaries on mitigation costs**

The guidelines should set boundaries on impact mitigation which will allow a developer to anticipate this cost in project planning. These boundaries would be in effect so long as impacts from post-construction monitoring are within a reasonable range of anticipated impacts determined in pre-construction studies and mitigated for in the project permit. The range of acceptable impacts should be outlined in the project permit.

### **2. Science Advisory Committee structure**

A formal Science Advisory Committee (SAC) should not be a requirement of guidelines compliance. Rather early consultation with pertinent agencies and conservation groups should be strongly recommended. If the lead permitting agency and the project developer mutually determine that the formation of an SAC would be beneficial then one may be formed. In their current form, the guidelines rely too heavily on the input of SACs when the formation of such a body would likely encounter many hurdles including: a lack of agency staffing, increased costs to the project developer, disagreements among SAC members and limited availability of scientific input from local conservation organizations.

### **3. Long-term operations monitoring regimes**

Continued periodic monitoring is not the sole responsibility of the project developer/owner operator nor is it necessary at every site. In determining the need for continued periodic monitoring, probable cause must be shown. The argument has been made that continued periodic mortality monitoring (five year cycles were used as an example) for the life of a wind project might be justified. The draft guidelines state that this decision would be up to a SAC. The primary reason for this monitoring would be the effects of global warming which could alter bird behavior and bring new species into a wind resource which previously had little impact on birds. This was compared to the idea of continued pollution

emissions monitoring for power plants. However, if impacts from a wind farm increase due to a new species moving into the area because of climate change, the wind farm operators should in no way be accountable for this. Wind energy by the very nature of the technology, is fighting climate change. Therefore the impacts from the new species in the area could not be attributed to the wind farm at all but to the consumption of fossil fuels. To impose additional cost to monitor the effects of global warming on a technology that is fighting global warming simply does not make sense. Additionally, pollution monitoring presumes that the way in which a power plant is operated can increase impacts (i.e. if pollution scrubbers are not maintained on a natural gas power plant, pollution may exceed permitted levels). Periodic monitoring for wind farms would presumably not be to ensure that the farm was being operated properly, but that factors outside of the project manager's control (climate) were not increasing (or decreasing) impacts. Alternative funding sources should be sought if this kind of monitoring and research is determined to be necessary. Some possible sources include utility public benefits charges, Public Interest Energy Research (PIER) funds, or depending on the implementation of the California Global Warming Solutions Act, money may be generated from taxes or other fees on climate polluters to investigate climate impacts from global warming pollution.

#### **4. Goal of guidelines should be further clarified**

The question has continued to surface as to whether compliance with these guidelines are aimed at avoiding significant impacts as defined by California Environmental Quality Act (CEQA) or whether the goal is also to attempt to address strict liability laws such as the Migratory Bird Treaty Act (MBTA). Though the point has been made by some in the process that compliance with all state and federal laws is required under CEQA, clearly there is always the possibility that some incidental take of protected species may occur despite a developer's best efforts to avoid that situation. CEERT believes that the guidelines should represent a substantive measure of best management practices and all practical efforts to comply with the spirit of all laws protecting avian and bat species and should be explicitly recognized as such. Additionally, these guidelines will necessarily guide the use of prosecutorial discretion for regulatory agencies. Language to this effect should be inserted into the document's abstract, the executive summary as well as chapter 4: Impact Analysis and Conformance with Laws.

#### **5. Improve context for guidelines application**

In place of the required use of an SAC, the guidelines must offer stronger context in all sections for how the guidelines should be applied in the real world on actual projects. Under the proposed guidelines, each survey method or site condition appears to be given equal weight or priority. The types of studies required seem to be driving at scientific certainty rather than assessing the risk of a proposed

project. In most, if not all cases, the cost of additional study beyond what is necessary to assess risk could be better spent on mitigation to the benefit of avian species and project developers. In order to give the guidelines more utility, they must include a description of what survey and study methods are most useful as well as clearly defined objectives for each of the field methods that are described. Also, many of the techniques discussed in the document (i.e. bird acoustic surveys and nocturnal surveys) have not been shown to be associated with predicting impacts or risk and this should be explicitly recognized. At the request of the CEC and CDFG staff, CEERT, with the help of our member organizations, is working to formulate hypothetical project scenarios which will illustrate how the guidelines can be used in practice. These scenarios will be included in our second and more detailed round of comments.

Additionally, the guidelines should encourage cooperative, jointly funded mitigation and research efforts. Because questions still exist around the ways that birds and bats interact with wind turbines, comprehensive research and mitigation projects whose cost is infeasible for a single developer could instead be funded by multiple developers in combination with federal, state or local agencies. There would be enormous public benefit in the development of this knowledge in addition to the benefit that the wind industry would gain towards understanding better ways to reduce their impact on wildlife. Such research could also help to understand the impacts of climate change on avian and bat species as well as increasing knowledge of species population levels and fluctuations. The idea of an experimental mitigation fund has been discussed in past workshops. We encourage continued investigation of this idea either for inclusion in the guidelines or as a next step after the guidelines have been finalized.

With the help of a biological consultant and our member companies, CEERT is currently working on a second, more detailed round of comments on the draft guidelines. These comments will be submitted before the Committee Workshop on February 5, 2007. However, to ensure you have sufficient time to review our comments before that workshop I have compiled here our organization's primary concerns and suggestions for ways these concerns can best be addressed. CEERT appreciates the Commission's consideration of our views. We look forward to further collaboration with you and your staff as this process moves forward.

Sincerely,

Paul Vercruyssen  
Development Coordinator