

**U.S. Fish & Wildlife Service**  
**WIND TURBINE GUIDELINES ADVISORY COMMITTEE**

**Federal Advisory Committee Meeting**

**U.S. Fish and Wildlife Service**  
**4401 N. Fairfax Drive, Rooms 200 A&B**  
**Arlington, VA 22203**

**March 24-26, 2009**

**-Meeting Summary-**

On March 24-26, 2009, the Wind Turbine Guidelines Advisory Committee (FAC) convened its ninth meeting at the Fish and Wildlife Service Headquarters in Arlington, VA.

*For copies of the slides presented at the meeting and Attachments referred to herein, please visit the U.S. Fish & Wildlife Service Web site at [www.fws.gov/habitatconservation/windpower/wind\\_turbine\\_advisory\\_committee.html](http://www.fws.gov/habitatconservation/windpower/wind_turbine_advisory_committee.html).*

Meeting Objectives:

- Review Subcommittee reports and drafts and develop a proposal for moving forward with the FAC recommendations and guidelines.
  - Synthesis Workgroup Draft “One-Text”
  - Legal Subcommittee update
  - Incentives Subcommittee update
  - Scientific Tools & Procedures Subcommittee update
- Hear presentations from Sheri Lewin and Randy Wilgis, *National Mitigation Banking Association*, and from Ed Arnett, *Bat Conservation International*.
- Discuss milestones, timelines, and process steps.

**I. WELCOME AND OVERVIEW OF THE AGENDA**

Dave Stout, *USFWS/Committee DFO and Chairman*, welcomed all meeting attendees and asked them to introduce themselves (See Attachment A). He reminded the FAC that their Charter expires on October 24, 2009. Abby Arnold, *facilitator*, asked anyone with a public comment to sign up. Comments would be heard at the end of the second and third meeting days.

A.Arnold reviewed the agenda and it was approved by the FAC (see Attachment B). She emphasized the importance of having input and dialogue at this point in the FAC process on how the developing draft can be improved from the perspectives of all members.

## II. SUBCOMMITTEE PRESENTATIONS: OVERVIEWS, QUESTIONS TO THE FAC, AND NEXT STEPS

### A. Synthesis Workgroup

The FAC discussed ways of submitting comments on the Draft One-Text, as one FAC Member requested clearer protocols. Synthesis Workgroup members will continue to collect and compile comments from their caucus members to bring to the Synthesis Workgroup for review and incorporation into the Draft.

FAC Members Patrick Traylor, *Hogan & Hartson, LLP*, and Taber Allison, *Mass Audubon*, briefly presented the PowerPoint from the FAC webcast on March 13<sup>th</sup>. This PowerPoint provides an overview of the current Draft One-Text (See Attachment C). A. Arnold then went over the preliminary, suggested list of policy questions relating to the current draft of the One-Text, for the FAC's consideration. FAC Members were asked to highlight, throughout the course of the meeting, the aspects of the draft that they approve of and those they would like to see improved.

#### **Outline of the FAC Product:**

A. Arnold presented the Synthesis Workgroup's proposed outline for organizing the product that will be given to the Secretary of the Interior (Secretary) (See Attachment D). The outline proposes a cover letter to the Secretary stating the FAC's policy recommendations and that the recommended guidelines (Guidelines) are attached. Next would be a preamble summarizing the charge to the FAC, the FAC's Guiding Principles, and the rationale behind the Guidelines. The final section would be the Guidelines themselves, currently the Draft One-Text or portions thereof.

Appendices, glossary and a bibliography would be included at the end of the Guidelines. The proposal from the Synthesis Workgroup was to divide the appendices into two sections, one with documents on which the FAC reached consensus and the other with documents that they did not. This was proposed as one way to help the FAC provide a product within the given timeframe. However, a FAC Member cautioned against dividing the appendices because it would raise questions about the documents they didn't reach consensus on, and why they did not. The FAC agreed that this might create unnecessary confusion. It was also brought to the FAC's attention that using the terms "preamble" and "recommendations" as sections of the FAC product, and as chapters within the Guidelines themselves, seems duplicative and confusing. One option offered was to call Chapter Three of the Guidelines "A Description of the Tiered Approach to Siting Decisions" rather than "Recommendations."

#### Next Steps:

- The FAC agreed to use this framework or outline for their product, but rather than splitting the appendices into two different sections, they will try to reach consensus on all documents included in their product. If the FAC cannot reach consensus on a draft attachment, they will not include it. The Synthesis Workgroup will also consider new names for Chapter

Two (currently the “Preamble”) and Chapter Three (the “Recommendations”) of the Guidelines.

### **Overview of the Draft One-Text:**

The Synthesis Workgroup distributed the most recent draft of the One-Text (V2) on March 12, 2009, and gave an overview of the draft for FAC Members and interested parties during the March 13<sup>th</sup> webcast. This Draft was discussed at the meeting (See Attachment B) and includes:

- Chapter One: Introduction
- Chapter Two: Preamble to Recommended Guidelines
- Chapter Three: Recommendations
- Chapter Four: Mitigation
- Chapter Five: Advancing Use, Cooperation, and Effective Implementation of the Guidelines
- Chapter Six: Revisions to Recommendations
- Chapter Seven: Recommendations for Effective USFWS Administration of Recommendations

The primary additions to the V2 Draft since the January 27-29, 2009, FAC meeting are:

- The description of the context and need for the Guidelines (in Chapter 1.B)
- The inclusion of the FAC’s Guiding Principles (in Chapter 1.D)
- The benefits of using the Guidelines (moved from former Chapter 6 to Chapter 1.E)
- Descriptions of the Tiers (shortened in Chapter 2.C.2 and now described further in Chapter 3)
- Tiers 1, 2, and 3 definitions and the minimum questions for the developer to attempt to answer in each tier (in Chapter 3 Sections A-C)
- Advancing Cooperation, Use, and Effective Implementation of the Guidelines (Chapter 5)
- Revisions to the Guidelines (in Chapter 6)
- Recommendations for Effective Implementation of the Guidelines (in Chapter 7)

The main sections that remain unfinished in the V2 Draft are:

- Incentives for developers to use the Guidelines (to be drafted by the Legal Subcommittee)
- Tiers 1-3 Methods and Metrics (to be drafted by the Scientific Tools & Procedures Subcommittee)
- Tiers 4 and 5 (to be drafted by the Scientific Tools & Procedures Subcommittee)
- Complete Best Management Practices (to be drafted by the Scientific Tools & Procedures Subcommittee and/or the Synthesis Workgroup)

### Next Steps:

- The FAC agreed that the Synthesis Workgroup will send the next draft of the One-Text to their caucus members for comment on April 30, 2009. The V2 Draft will be edited to fit into the new outline of the FAC product that was discussed above, and will include a list of draft policy recommendations that the FAC may present to the

Secretary. The facilitation team will begin making this list using the policy recommendations that are already contained throughout the Draft One-Text. If FAC Members would like to suggest other policy recommendations that were not discussed at this meeting or not covered in the current draft, they may send them in to the facilitation team.

- After comments and new sections are incorporated into the V2 Draft One-Text, V3 of the Draft One-Text will be made public on June 12<sup>th</sup>, 2009. A public FAC webcast will be scheduled to review its contents prior to the June 30-July 2, 2009, FAC meeting.

#### **Premises:**

The FAC reviewed the premises language that was sent to FAC Members for comment on November 24, 2008. The FAC agreed to a set of principles to guide the FAC on July 24, 2008, and left the discussion of the premises to a future date. At the March 2009 meeting, the FAC debated the added value of including these premises. Several FAC Members expressed concern that the premises contain obvious statements and are not necessary to include in the guidelines themselves. One FAC Member suggested that the premises might also be used in unintended ways. However, the FAC concluded that presenting the initial goals of the FAC in the form of the premises will be a useful marker of the FAC's progress. The premises were edited and agreed upon (See Attachment E).

#### Next Steps:

- The edited premises and principles will be included in the Draft Preamble to the Recommendations to be submitted to the Secretary.

#### **Chapter Three, Sections A – E: Discussion of Decision or “Trigger” Points in the Tiers**

A number of FAC Members noted that the description of the Tiers needs to include better descriptions of how to make the decision to move to the next Tier. The FAC discussed the trigger points that indicate when a developer should make the choice to stop a project, conduct further studies to try to answer the questions in that Tier, or proceed to the next Tier. One FAC Member reiterated that developers could abandon sites at any point up to the middle of Tier Three, and this could be more explicit in the Tier description.

#### Next Steps:

- The Scientific Tools & Procedures Subcommittee will draft further guidance throughout the Tiers about when enough information has been gathered, and will propose clear language or mechanisms that can help a developer decide when a project should not proceed. The Subcommittee will also attempt to describe the expected level of effort needed to answer the questions.

#### **Chapter Three, Section A, Tier 1: Cumulative Impacts and Landscape-Habitat Level Review**

Some FAC Members sought to make it clearer in the Draft One-Text that Tier 1 is discretionary for the developer. Their concern was that the Guidelines could be interpreted to mean that developers are expected to conduct a Tier 1 analysis at every site. However, if Tier 1 is “optional but recommended”, this could imply that the other Tiers are *not* optional.

The Draft One-Text currently states that the entire Guidelines are voluntary, and it is understood as well as explicitly stated that not every Tier will be relevant at every site, including Tier 1. In addition, several FAC Members do not want Tier 1 to be singled out as more optional than the other Tiers, because Tier 1 is when landscape-level and habitat impacts can best be addressed.

In order to better include landscape-level and habitat concerns, the FAC would like the Draft Guidelines to include a forward-looking, strategic planning component. Tier 1 should direct federal and state agencies to make landscape-level and habitat information publicly available, and to analyze the data based on their knowledge of other existing and proposed development projects and of sensitive species and habitats. The FAC Members indicated that this information would be regional rather than site-specific. The goal is to encourage developers to use the resources made available by wildlife agencies when they are first considering a site, so that they are aware of particularly sensitive areas before they visit a FWS field office. Additionally, the draft guidelines should recommend that cumulative impacts be addressed in Tier 3.

A FAC Member pointed out that the Tiers are currently directed towards actions the developer should take. In order to incorporate the direction in the paragraph above, it was suggested that the Tiers should better describe the roles and responsibilities of the developer, FWS, the states, and others who will be using and implementing the guidelines. Thus, the Tiers should direct the government to make landscape-level and cumulative effects data available for developers to use.

Next Steps:

- A new section was drafted and reviewed on landscape-habitat effects analysis to include in Tier 1, and another on cumulative effects to include in Tier 3. These will be edited further and then submitted to the Synthesis Workgroup to incorporate into the Draft One-Text.

**Chapters Three and Four, Cost Effectiveness:**

The FAC confirmed that the costs to the developer of using the tiered approach must be considered if the Guidelines are to be followed. The Scientific Tools & Procedures Subcommittee, while continuing to focus on the scientific aspects of siting decisions, was asked to integrate cost effectiveness considerations into the proposed methods for answering the Tier questions. This occurs implicitly when using a prescriptive approach for these methods, as certain studies are recommended over others because they are effective methods, and consequently are likely to be worth the cost of conducting them. A small group was asked at the January 27-29, 2009, meeting to begin estimating the costs of conducting a sampling of the studies recommended in the tiers, and they will continue this work.

Next Steps:

- A subgroup of FAC Members and technical experts will prepare examples of the range of costs for various methods to present to the FAC at the June 30-July 2, 2009, meeting.

### **Chapter Two. C. 3. Adaptive Management:**

The FAC was presented with new language on adaptive management that incorporates the DOI adaptive management policy. FAC Members affirmed that the tiered approach is an embodiment of passive adaptive management, and the description of adaptive management should reflect that.

#### Next Steps:

- The adaptive management section in the Draft One-Text (Chapter 2.C.3) will be edited to recognize the DOI policy on adaptive management.

### **Chapter Four, Mitigation:**

FWS clarified that the FAC is not going to use the Council on Environmental Quality (CEQ) definition of mitigation, as this does not apply to the ESA. The FAC agreed that the term “mitigation” as used in the Guidelines will refer to “compensatory mitigation.”

#### Next Steps:

- The Draft One-Text will consistently refer to *compensatory mitigation*. Further, the Draft will include descriptions of how and when compensatory mitigation might apply under the ESA, MBTA, BGEPA and NEPA.

### **Chapter Five. D. Federal-Tribal Coordination:**

Language for Chapter 5, Section D of the Draft One-Text was submitted to the FAC by Member Jeri Lawrence, *Blackfeet Tribal Renewable Energy*. This new section covers sovereignty, treaty rights, executive orders, and the FWS role in dealing with tribes. J.Lawrence also provided and reviewed with the FAC some of the main concerns of the Tribal Caucus. She noted that the comments from her caucus may be useful for the FAC to see the reactions of people who have never read the Draft before. She also pointed out that the Guidelines should include recommendations for implementation at the tribal level similar to those recommended for the state level.

#### Next Steps:

- J.Lawrence will gather more specifics on the comments sent in from the Tribal Caucus as well as new comments from other tribes. She will also work with FWS to revise the section for Chapter 5 and send it to the Native American Advisory Committee for review. The revised language and comments will then be sent to the Synthesis Workgroup.

### **Chapters Five - Seven:**

The FAC briefly reviewed the remaining Chapters Five through Seven in the Draft One-Text. One FAC Member pointed out and the FAC agreed that Chapter Six of the Draft One-Text on Revisions to the Guidelines should recommend that revisions continue to use the principles and purposes of the FAC’s Guidelines.

#### Next Steps:

- The facilitation team and the Synthesis Workgroup will continue to edit and refine Chapters Five through Seven, and will incorporate the FAC direction noted above.

## **B. Legal Subcommittee**

Prior to the FAC meeting, the Legal Subcommittee presented questions to FWS on the different incentive options under the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act (See Attachment F).

### **Endangered Species Act (ESA)**

Rick Sayers, *FWS Endangered Species Program*, responded to questions on possible incentives under the ESA. The FWS preferred incentive option is a “general conservation plan” (GCP) also known as “Template Habitat Conservation Plans (HCPs),” where FWS writes the template and individual landowners apply for an incidental take permit under the plan. FWS would develop the GCP with interested parties, and it could take two to three years to develop. But the FWS is confident about how to implement them, and they are actual permits so they would provide a high degree of certainty and would include the “No Surprises Assurances.” The benefit of a GCP is that once FWS develops the template, it is much quicker for the applicant to receive a permit compared to the traditional HCP process. GCPs are also flexible because they can be negotiated with options that would allow individual applicants to choose from a suite of implementation choices.

The other options that the Legal Subcommittee asked FWS to consider included expanded authority for states under Section 6 of the ESA, and conservation agreements or Memorandums of Understanding (MOUs) between developers and FWS. Another possibility is to use the Information, Planning, and Consultation (IPaC) system, which FWS is developing for Section 7 consultation processes. R.Sayers confirmed that it could also be applied to Section 10. The system has three main components: (i) site locality information available in a geospatial format; (ii) conservation frameworks for the species covered that help elaborate on conservation needs and which activities are of concern; and (iii) providing appropriate best management practices (BMPs) to avoid or minimize the impacts of those activities and stressors. The benefit of creating a module for wind energy within IPaC is that it would allow developers to access information on their own and would expedite the permitting process. A FAC Member pointed out that use of the IPaC system could be used to address the questions posed in Tier 1.

Technical assistance letters might be a possibility, but they would not be issued automatically for developers who are following the Guidelines. The developer would have to demonstrate that the project has low effects. The letter could be used to show lenders, but it would not exempt the developer from prosecution.

### **Migratory Bird Treaty Act (MBTA)**

Clint Riley, *FWS Division of Migratory Bird Management*, responded to questions submitted by the Legal Subcommittee regarding the use of legal incentives under the MBTA. He verified that a permit would be necessary for FWS to issue a statement that a project is not in violation of the MBTA. C.Riley noted that creating a permitting process for wind power under the MBTA would provide the highest degree of certainty for the developer that they

would not be prosecuted, and recommended that a new regulation would be needed to establish such a process. He noted that the FAC could recommend developing a new regulation. The primary drawback of a new regulation is that it cannot be offered immediately, and this delay would be compounded by the time it would take to issue individual permits once the regulation is in place.

The second option that FWS could consider would be biological “endorsements” in the form of a letter from an FWS Field Supervisor recognizing that a developer’s project is consistent with established Guidelines. The biological endorsement would not say whether the project is or is not in violation of the MBTA however, and therefore would not itself be a promise not to undertake enforcement action if birds are taken. However, FWS would also have explicit law enforcement policy stating that FWS focuses its enforcement actions where the MBTA is disregarded, and where conservation measures are known but ignored.

The FAC asked FWS to consider using the special use permit authority under Section 21.27 of the MBTA for wind energy projects. A project could earn a permit by showing that it provides “benefits to the migratory bird resource” or another “compelling justification.” It could possibly be argued that climate change is a “compelling justification.” However, this regulation has never been used specifically regarding the renewable energy sector and there are many questions that would need to be addressed.

### **Bald and Golden Eagle Protection Act (BGEPA)**

C.Riley notified the FAC of the pending permitting program under BGEPA that will authorize take below the set threshold.

#### Next Steps for the Legal Subcommittee:

- The Legal Subcommittee will develop descriptions of the most feasible and useful incentives and submit them to the Synthesis Workgroup.

### **C. Incentives Subcommittee**

A.Arnold summarized the status of the Incentives Subcommittee’s work. The Subcommittee would like to develop linkages between financial incentives and ecological responsibility, and between renewable portfolio standards and ecological responsibility, but they have not come to a conclusion on which tools to recommend.

A FAC Member raised the question of incentives at the state level. The Guidelines are a package deal in which developers are agreeing to voluntarily meet high standards because of the incentives that the federal government will be offering. If states adopt the Guidelines wholesale, there should be some discussion of what state-level incentives could be offered to developers by states that would be comparable to the federal-level incentives that states may not have the authority to offer. The FAC acknowledged that state use or adoption of the Guidelines would need to include both the voluntary Guidelines and incentives for voluntary compliance.

#### Next Steps:

- The FAC will return to the discussion of incentives after the June meeting. The focus for incentives in the next Draft of the One-Text will be on those proposed by the Legal Subcommittee.

#### **D. Scientific Tools & Procedures**

T.Allison reviewed the materials provided by the Scientific Tools & Procedures Subcommittee for the FAC to review. The first document contains the draft methods for Tiers 1 and 2, which the FAC discussed and agreed to in content and level of detail (See Attachment G).

The second document (See Attachment H) contains:

##### **1) Example level of detail for Tier 3 methods**

The following is one section from the Subcommittee’s example of the level of detail that could used to describe how to conduct bird use counts.

**Sampling Duration/Frequency:** The sampling duration and frequency will be determined on a project-by-project basis. The most important consideration for sampling frequency is the amount of variation expected among survey dates and locations. It is common to conduct BUCs for 20 or 30 minutes once a week for a year in some locations and once a week during the migration periods and twice per month during other periods of occupancy in others. BUCs should cover most daylight hours and weather conditions. However, each project needs to be considered individually. Please refer to the NWCC revised M&M (2009) document for detailed discussions regarding protocols.

The question to the FAC was whether the example section from the Tier 3 methods contained an appropriate level of detail. The Subcommittee recommended this level of detail because it lays out the fundamental scientific principles for answering the questions in the tier, but leaves out specifics on how to do this. Sites vary significantly, so the specifics would not be applicable in most cases.

##### Next Steps:

- The FAC agreed to use the Scientific Tools & Procedures Subcommittee’s example level of detail. Tier 3 methods will be revised to match the example.

##### **2) Example of prescriptive versus descriptive approaches for Tier 3 methods**

The Subcommittee asked the FAC whether it prefers a prescriptive approach that promotes the “best” methods to use, or a descriptive approach that lays out different options. The following are sections from the examples provided to the FAC.

##### **Example of “Descriptive” Methods**

Mist-netting is sometimes used to augment observational bird data. Mist-netting cannot generally be used to develop indices of relative bird abundance, nor does it provide an

estimate of collision risk. However, it can document fallout or heavy use by migrants at migrant stopover sites in or near proposed turbine sites. Operating mist-nets is expensive and requires considerable experience, as well as state and federal permits. If mist-netting is to be used, follow procedures for operating nets and collecting data in accordance with Ralph et al. (1993).

### **Example of “Prescriptive” Methods**

We do not recommend mist-netting as a technique for estimating relative bird abundance as the result does not lead to a meaningful estimate of collision risk. The technique is expensive and requires considerable experience to use effectively and minimize stress to the animals.

#### Next Steps:

- The FAC agreed to the prescriptive approach. All Tier 3 methods will be revised to incorporate it.

### **3) Tiers 4 and 5**

The Subcommittee also asked the FAC which approach the Subcommittee should use to structure Tiers 4 and 5. In the original approach, used in previous drafts of the One-Text, Tier 4 contains fatality studies and Tier 5 contains habitat and indirect impact studies. Tier 4 and 5 can occur *at the same time* in this approach. The division of the Tiers is based upon a progression from easier, quicker, cheaper studies, to harder, longer, more expensive studies. In the second, alternative approach, the division of the Tiers is chronological - based upon when they occur. Tier 4 includes all studies that begin during the first year of a site's operation, including both fatality and habitat studies. Tier 5 describes multiple-year studies that begin *after* Tier 4 studies are completed, if they are necessary.

One FAC Member pointed out that part of the reason some members of the Subcommittee preferred the alternative approach was to ensure that habitat-related impacts were not secondary to other impacts. If these habitat impacts are considered later on in the process than other impacts, it is often too late to effectively minimize them. However, this is less of a concern with the new language on landscape and habitat review that was developed for Tier 1 during this FAC meeting.

#### Next Steps:

- The FAC agreed to retain the original approach, with Tier 4 as fatality studies and Tier 5 as habitat and indirect impacts studies.

## **III. PRESENTATIONS**

### **A. Sheri Lewin, *President, National Mitigation Banking Association (NMBA)* and Randy Wilgis, *Conservation Banking Committee* (See Attachment I for PowerPoint and Attachment J for Handouts)**

Sheri Lewin and Randy Wilgis are part of the National Mitigation Banking Association, which advocates on behalf of its members for mitigation and conservation banking, and the strong regulation of aquatic resources and species habitat. Mitigation banks are permanent reserves of land created to protect endangered, threatened, and other at-risk species. FWS

approves a defined number of habitat or species credits based on the natural resource values of the land, and bank owners may sell these credits to developers to compensate for the environmental impacts of their projects. Mitigation banks offer a landscape-scale approach to conservation, and a way of offsetting the environmental impacts of inevitable and necessary economic development. There are currently 113 endangered species conservation banks in 12 states protecting over 80,600 acres of critical habitat for 87 different species.

**B. Ed Arnett, *Bat Conservation International* (See Attachment K for PowerPoint)**

Ed Arnett described the results of a recent study that took place at Iberdrola's Casselman, Pennsylvania wind project. The study was conducted to quantify reductions in bat fatalities relative to economic costs of curtailment. The study was conceived based on evidence that bat behavior around wind turbines differs from that of birds, and in particular, that bat fatalities appear to increase on nights with relatively low wind speeds. The question that the study was designed to answer was then, will changing the cut-in speed of turbines reduce bat fatalities? The results were a 73 % mean reduction in bat fatalities at turbines that were curtailed in comparison with turbines that were fully operational. Depending on whether turbine cut-in speeds are set at 5 meters per second versus (m/s) 6.5 m/s, costs of curtailment were estimated to be 0.3% or 1% of the annual total costs, respectively. The study's conclusions were that curtailment on nights with low wind speeds result in significant reductions in bat fatalities. This pattern is similar to conclusions of studies at other sites. There are plans to continue a second year of study at the Casselman site, and to duplicate this study at other sites. Lastly, E.Arnett discussed the possibility of habitat enhancement/protection as a mitigation option for certain species of bats. This option may be useful for cave-hibernating bats, but would not be beneficial for the migratory and tree-roosting bat species that are more frequently killed by wind turbines.

#### IV. ATTACHMENTS

**A:** List of Participants

**B:** Agenda

**C:** Second Draft One-Text (March 12, 2009)

**D:** Proposed Outline for Final Product

**E:** FAC Premises, as adopted at March 24-26, 2009 Meeting

**F:** Legal Subcommittee: Questions Regarding Incentives

**G:** Scientific Tools & Procedures: Proposed Methods for Tiers 1 & 2

**H:** Scientific Tools & Procedures: Proposals for Tiers 3-5

**I:** Presentation: *Conservation Banking*, Sheri Lewin and Randy Wilgis, *National Mitigation Banking Association*

**J:** National Mitigation Banking Association Handouts

**K:** Presentation: *Reducing Bat Fatalities at Wind Energy Facilities by Changing Turbine Cut-In Speed*, Ed Arnett, *Bat Conservation International*

**WIND TURBINE GUIDELINES ADVISORY COMMITTEE:  
FEDERAL ADVISORY MEETING # 9**

**March 24-26, 2009  
Arlington, VA**

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## Attachment A

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## Attachment B

### WIND TURBINE GUIDELINES ADVISORY COMMITTEE FEDERAL ADVISORY COMMITTEE MEETING #9

#### AGENDA

U.S. FISH & WILDLIFE SERVICE  
4401 N. FAIRFAX DRIVE, ROOM 200 A&B  
ARLINGTON, VA 22203

MARCH 24-26, 2009

#### WIND TURBINE GUIDELINES ADVISORY COMMITTEE MEETING

- Review Subcommittee reports and materials, and develop proposal for moving forward with recommendations.
  - Synthesis Subcommittee Draft One-Text of Recommendations
  - Legal Subcommittee update
  - Incentives Subcommittee update
  - Scientific Tools & Procedures Subcommittee update on Methods and Metrics
- Agree on steps to further develop the Synthesis Draft One-Text of Recommendations, for the FAC to review and discuss June 30-July 2, 2009
- Discuss milestones, timelines, and process steps for any additional items

#### Comments Protocol for FAC Meeting

*If you are a member of the public and would like to submit a comment to the FAC, please sign up on the “Comment Sign-Up Sheet” at the registration desk. Comments will be heard at the designated time on the agenda. Comments may need to be held to three minutes, depending on the number of parties who request time to comment. If time does not allow for all comments, then members of the public will be asked to write their comments down and submit them to the FWS staff at the registration desk. All comments will be part of the public record and will be electronically distributed to all FAC members after the FAC meeting.*

#### Day One: Tuesday, March 24, 2009

11:00 – 11:30

**Welcome & Overview of Agenda** D.Stout, DFO/USFWS / A.Arnold, facilitator

- Introductions of all FAC members
- Opening comments from D.Stout
- Review and agree on meeting purpose and agenda

11:30-12:30

#### **Overview of the Draft One-Text**

*Objective of this session: Review main changes in Synthesis Draft One-Text since the last FAC meeting.*

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- Propose format and outline for the FAC product (D.Stout)
  - Provide overview of the Synthesis draft
- 12:30-1:30      **Lunch**  
*(on your own)*
- 1:30-3:20  
*(including break)*      **Overview Subcommittee Reports**  
*Objective of this session: Progress reports from Subcommittees; walk through products; obtain FAC direction and next steps.*
- Scientific Tools & Procedures
  - Legal
  - Incentives
- 3:20-3:40      **Review Premises Language**
- 3:40-5:00      **Synthesis Workgroup Process and Draft**  
*Objective of this session: review each section of the Draft One-Text in more detail; receive feedback from the FAC*
- FAC members identify
    - What do we like about the draft?
    - What questions do we have?
    - What sections we can't live with and why?
- 5:00      **Presentation** Sheri Lewin and Randy Wilgis, *National Mitigation Banking Association*  
Mitigation Banking
- 5:30      Next Steps and Adjournment
- I.
- II. Day Two: Wednesday, March 25, 2009
- 8:00-8:15      **Review and Approve Agenda**  
*Agenda is subject to change dependent upon the needs of the FAC*
- 8:15-11:45      **Review and Discuss Draft One-Text, continued**  
*Objective of this session: Discuss Synthesis Draft One-Text.*
- FAC members identify:
    - What do we like about the draft?
    - What questions do we have?
    - What sections we can't live with?

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- 11:45-12:45      **Lunch**  
*(on your own)*
- 12:45-4:30  
(including break)      **Review and Discuss Legal Subcommittee Report and/or Draft One-Text,**  
*continued*  
*(Note: the Committee may break into caucuses or Subcommittee discussions)*  
*Objective of this session: Discuss Policy Questions and Synthesis draft.*
- 4:30-5:00      **Presentation**      Ed Arnett, *Bat Conservation International*  
Casselman Curtailment Study
- 5:00-5:15      **Public Comment**  
*Members of the public are invited to speak to the FAC. Please sign up on the Public Comment Form. Each party will be asked to keep their comments to three minutes each, time permitting. Written comments will be accepted by the Committee.*
- 5:15-5:45      **Reflections on Discussion, What Do We Need To Do Tomorrow, Review Next Steps**      *A.Arnold, facilitator*
- Based on conversation regarding the Draft One-Text, what is our guidance to the Scientific Tools & Procedures, Legal, and Incentives Subcommittees?
  - Review agenda for Day III in light of progress made on Day II; decide if need to meet in subcommittees tomorrow morning
- 5:45      **Adjourn for evening**
- III. Day Three: Thursday, March 26, 2009
- 8:00-8:15      **Review Day's Agenda**
- 8:15-10:15      **Plenary or Subcommittees Meet in Person**
- *Continue with discussion from prior day, as needed*
  - *What is missing? What do we need to work on?*
- 10:15 – 12:00  
(including break)      **Plenary: Return to Discussion of Draft One-Text**
- *What is missing? What do we need to work on?*
- 12:00-1:15      **Lunch**  
*(on your own)*

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1:15-2:00

### **Plenary: Return to Discussion of Draft One-Text**

- *What is missing? What do we need to work on?*

2:00-2:15

### **Review Outstanding Items and Today's Reflections from Chairman/DFO**

*Objective of this session: clarify outstanding issues, direction, and next steps for FAC.*

- Hear from DFO on reflections of the meeting and next steps....

2:15–2:45

### **Review of Next Steps**

- Review list of outstanding items; what are the next steps for those items?
- Review next steps and activities between now and June and schedule FAC webcasts
- Confirm location, starting and ending times for June 30 – July 2 Meeting, and dates for August or September meeting
- Develop timeline with milestones through October 2009
- Agenda items for June

2:45-3:00

### **Public Comment**

3:00

### **Adjourn FAC Meeting**

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**U.S. Fish and Wildlife Service**

**Wind Turbine Guidelines Advisory Committee Recommendations**

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66 (WTGAC) Other Models Subcommittee Matrix October 21-23, 2008  
67 B. WTGAC Legal Subcommittee White Paper October 21-23, 2008  
68 C. WTGAC Landscape/Habitat Subcommittee, "Mapping Tools Case Studies" October 21-  
69 23, 2008 (will be attached)  
70 D. WTGAC Landscape/Habitat Subcommittee, Summary of Metadata for Data Layers  
71 Mapped, October 21-23, 2008  
72 E. WTGAC Scientific Tools & Procedures Subcommittee, General Framework for  
73 Minimizing Impact of Wind Development on Wildlife in the Context of the Siting and  
74 Development of Wind Power, October 21-23, 2008  
75 F. First Draft Recommended Elements of an Avian and Bat Protection Plan, October 21-23,  
76 2008  
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U.S. Fish and Wildlife Service

Wind Turbine Guidelines Advisory Committee Recommendations

March 13, 2009

Executive Summary: *(to be written)*

Chapter 1: Introduction

A. Background

In response to the nation’s growing demand for production of electricity by wind power and in recognition of the U.S. Fish and Wildlife Service (USFWS) mission “Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people,” the Secretary of the Interior (Secretary) authorized USFWS to charter the Wind Turbine Guidelines Advisory Committee (Committee) to recommend effective measures to avoid or minimize impacts to wildlife and their habitats related to land-based wind energy facilities.

Herein are Committee’s recommendations (Recommendations) based on two-years of deliberations and judgments regarding siting large wind developments while minimizing impacts to wildlife and their habitat. The Committee is composed of a broad array of representatives selected for their outstanding experience on these issues and are among the most informed in the country. These Recommendations are the Committee’s best attempt to present the most effective, feasible and appropriate approaches that are available to the Department of the Interior (DOI), states, local jurisdictions, and the wind industry, to address USFWS responsibilities to protect wildlife resources while encouraging responsible siting of wind energy projects.

B. Description of context and need for Recommendations

As of the end of 2007, the United States has the second highest cumulative wind capacity globally. Wind development in the United States was expected to increase by 25-30% in 2007, but it increased by 46% (NREL 2008). This rate of development is expected to continue, and perhaps to accelerate, as United States energy policy emphasizes independence from foreign oil. USFWS recognizes that wind-generated electrical energy is renewable, produces no emissions, and is considered to be generally environmentally-friendly technology.

Wind energy is a clean, renewable energy source that produces electricity without air pollution, greenhouse gas emissions, water consumption, or the mining, drilling, refining, and waste storage problems associated with most traditional forms of energy generation. Wind power has recently garnered increased attention because of two major advantages that it affords over other types: 1) it is a domestic source of energy and therefore not subject to geopolitical interference, and 2) carbon dioxide emissions from the combustion of fossil fuels is the leading cause of anthropogenic climate change that is likely to have serious negative impacts on ecosystems and wildlife (Intergovernmental Panel on Climate Change 2007). The U.S. Department of Energy (DOE)

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132 estimates that a single 1.5 MW wind turbine displaces 2700 metric tons of CO<sub>2</sub> per year compared  
133 with the current U.S. average utility fuel mix (20% Wind Energy by 2030 2008). Due to these  
134 advantages, wind is expected to play an increasingly important role in meeting the Nation's energy  
135 goals in the coming years.

136

137 Nevertheless, wind energy production can negatively impact wildlife and their habitat. As the U.S.  
138 moves to expand wind energy production, it also must maintain and protect the Nation's wildlife  
139 and their habitat. With proper diligence to siting, operations and management, it is possible for  
140 facilities to avoid, minimize and mitigate these impacts. As with all responsible energy  
141 development, wind power facilities should be required to adhere to high standards for  
142 environmental protection. The Committee recommends that USFWS develop and implement its  
143 wind power siting and operation policies and guidelines with joint emphasis on minimizing  
144 wildlife impacts from wind energy development, and realizing the potential of wind energy to  
145 minimize the environmental impacts of energy production and mitigate climate change.

146

147 The Committee recommends that the Secretary apply the USFWS guidelines for review of wind  
148 power development, and make management and mitigation decisions, with appropriate  
149 consideration of wind energy's carbon reduction benefits. In addressing wind project impacts on  
150 wildlife, the Committee urges the Secretary to consider the larger effects of climate change that are  
151 posing significant and growing threats to birds and other wildlife species. For example, the IPCC  
152 recently concluded that climate change caused by human activity is likely to seriously affect  
153 terrestrial biological systems (IPCC 2007).

154

155 USFWS released voluntary, interim guidelines in July of 2003. The interim guidelines were  
156 opened to public comment to help inform the revision process. In March of 2007, USFWS  
157 published a notice in the *Federal Register* to announce the establishment of the Committee to  
158 provide advice and Recommendations on developing effective measures to avoid or minimize  
159 impacts to wildlife and their habitats related to land-based wind energy facilities. It is anticipated  
160 that the Committee's advice and Recommendations will be used by the Secretary to develop final  
161 national recommendations.

162

163 Pursuant to the requirements of the Federal Advisory Committee Act (FACA), the Committee  
164 Charter was signed by the Secretary on October 24, 2007, and was filed with the Library of  
165 Congress; Committee Management Secretariat; General Services Administration; the Committee  
166 on Environment and Public Works, United States Senate; and the Committee on Resources, United  
167 States House of Representatives and became effective on October 26, 2007. The Charter states the  
168 Committee's scope and objective:

169

### 170 **Wind Turbine Guidelines Advisory Committee Charter (October 24, 2007):**

171

172 **“Scope and Objective:** The Committee will provide advice and recommendations to the  
173 Secretary of the Interior (Secretary) on developing effective measures to avoid or  
174 minimize impacts to wildlife and their habitats related to land-based wind energy  
175 facilities.”

176

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177 Consistent with FACA, the Charter will expire on October 26, 2009, two years from the date it was  
178 filed. The Committee will be terminated at that time unless the Charter is renewed. The Committee  
179 Charter is included as Appendix --.

180

### 181 **Overview of members of FAC**

182 FAC members are composed of a broad group of stakeholders carefully selected by the Secretary  
183 from a large pool of candidates.

184

### 185 **C. Guiding Principles**

186 In its development of these Recommendations, the Committee accepted by consensus the  
187 following principles and recommend these be incorporated into the final guidance published by  
188 the USFWS. The Guiding Principles were adopted on -----, **2008**):

189

190 1. The Guidelines should provide a consistent methodology for conducting pre-construction  
191 risk assessments and post-construction impact assessments to guide siting decisions by  
192 developers and agencies

193

194 2. The Guidelines should encourage communication and coordination between the  
195 developer and relevant state and federal agencies during all phases of wind energy project  
196 development

197

198 3. The Guidelines should provide mechanisms to encourage their adoption and use by all  
199 federal agencies, as well as the wind energy industry, while recognizing the primary role  
200 of the lead agency in coordinating specific project assessments

201

202 4. The Guidelines should complement state and tribal efforts to address wind/wildlife  
203 interactions and provide a voluntary means for these entities to coordinate and  
204 standardize review of wind projects with the USFWS

205

206 5. The Guidelines should provide a clear and consistent approach that increases  
207 predictability and reduces the risk of liability exposure under federal wildlife laws

208

209 6. The Guidelines should provide sufficient flexibility to accommodate the diverse  
210 geographic and habitat features of different wind development sites

211

212 7. The Guidelines should present mechanisms for determining mitigation, when appropriate,  
213 in the event of unforeseen impacts to wildlife during construction or operation of a wind  
214 energy project

215

216 8. The Guidelines should define scientifically rigorous and cost-effective study designs that  
217 improve the ability to predict direct and indirect wildlife impacts locally and regionally

218

219 The Guidelines should include a formal mechanism for revision in order to incorporate  
220 experience, technological improvements, and scientific advances that reduce uncertainty in the  
221 interactions between wind energy and wildlife

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**D. Benefits of using the recommended Guidelines**

As our Nation moves to achieve its renewable energy commitments, it must also maintain and protect our wildlife resources. It is intended that the Committee’s recommended guidelines will facilitate wind energy development and while protecting wildlife and habitats. The guidelines will provide best management practices for wind energy-wildlife issues and result in greater regulatory certainty for the developer by:

**Reducing Ecological Impacts**

The guidelines offer a science-based reference for use by industry, federal, state, tribal and local agencies, and other stakeholders, in the siting and permitting of wind projects. The guidelines focus on reducing bird and bat collisions with wind turbines, and minimizing other potential impacts to wildlife and habitats, by describing the kind of information needed to adequately identify, assess, mitigate, and monitor the impacts of developing new wind energy projects and repowering existing facilities. The recommended guidelines will promote scientifically sound, cost-effective study designs; produce comparable data among studies throughout the nation; allow for analyses of trends and patterns of impacts at multiple sites; and ultimately improve the ability to estimate and resolve impacts locally and regionally.

**Increased Compliance and Reduced Regulatory Risk**

This document is a tool to facilitate compliance with relevant laws and regulations by recommending methods for conducting site-specific, scientifically sound biological evaluations. The recommended guidelines provide standardized guidance on how to collect information on potential wildlife impacts will facilitate compliance with state and federal wildlife laws. Because this document complements existing NEPA guidance, following the guidelines supports NEPA compliance, facilitates permit review, and provides a measure of regulatory certainty for wind energy developers. Using the methods described in the *Guidelines* will provide information for impact assessment and mitigation (if needed) for the application of wildlife protection laws and will demonstrate a good faith effort to develop and operate wind projects consistent with the intent of local, state, and federal laws. Such good faith efforts would be considered by the USFWS before taking enforcement actions for violation of wildlife protection laws.

**Improved Predictability of Wildlife and Habitat Impact**

The goal of the recommended guidelines is to provide a relatively consistent, predictable approach to assessing impacts to biological resources from wind energy projects, while still providing sufficient flexibility to accommodate the unique circumstances of each project. As comparable information from projects using consistent and standardized methods and protocols becomes available from projects around the Nation, meta-analysis will increasing provide information that allows better predictive modeling. This growing database will assist in valuable information on “use” of wind energy sites by and potential impacts to birds and bats. Over time this growing database should decrease the need for some monitoring studies.

**Cost Savings**

Using the protocols recommended herein will promote scientifically sound, cost-effective study designs; produce comparable data among studies within the nation; allow for analyses of trends and patterns of impacts at multiple sites; and ultimately improve the ability to predict and resolve

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268 impacts locally, regionally and nationally. This will reduce the need for some monitoring studies  
269 and will reduce project costs. Further, initiating pre-construction surveys early will help to avoid  
270 unnecessary and costly delays during permitting. The guidelines advise cost-benefit  
271 considerations when developing the monitoring efforts needed for each project site. Some  
272 monitoring methods and/or technologies are expensive and should only be recommended when  
273 necessary.

274

### 275 **Chapter 2: Preamble to Recommended Guidelines**

276

#### 277 **A. Intended use of these recommended Guidelines**

278 The Recommendations described in this report are intended to be used by all prospective  
279 developers of wind energy projects. The Recommendations also are intended to provide a  
280 useful, suggested approach for local and state officials.

281

282 The primary purpose of these Recommendations is to outline the nature of information typically  
283 needed to identify, assess, mitigate and monitor the potential adverse effects of wind energy projects  
284 on wildlife and their habitat, especially migratory birds, bats and species at risk, in order to:

285

- 286 • Guide the wind energy industry to make the best possible choices on wind energy installation  
287 location, design, and operation to minimize the risks to wildlife and their habitat.
- 288
- 289 • Ensure that the responsible regulatory agency or advisory agency for any wind energy installation is  
290 aware of and can consider the factors that present risks to wildlife and their habitat in order to  
291 ensure that the best possible advice can be given and the optimal mitigation suggested.
- 292
- 293 • Specify the types and amount of baseline information that is required for adequate review of a wind  
294 project; and describe the likely extent of follow-up that would be necessary after construction.

295

296 Other purposes include:

297

298

- 299 • To promote responsible development of wind facilities across the country;
- 300
- 301 • To enable states, USFWS, developers and stakeholders to share information and  
302 data regarding avian and bat studies, mitigation and siting practices, and  
303 monitoring of habitat/species impacts to increase understanding of risks and the  
304 effectiveness of siting decision-making;
- 305
- 306 • To develop effective, consistent, cost-effective methods and protocols to guide  
307 project-specific studies to improve assessment of risk and impacts by producing  
308 comparable data; and
- 309
- 310 • To allow for comparison among field studies from around the country.

311

312 The Committee's Recommendations have been written to be as specific as possible with regard  
313 to the expectations, requirements, and assessment need for developing a wind energy project.

314 They, must, however, apply to a large diversity of projects in many different habitats. The  
315 Recommendations are intended to provide flexibility in their application and not be rigidly

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314 applied in every situation, but rather applied in a way that is appropriate to the context for project  
315 specific factors.

316

### 317 **B. Mitigation policies and principles**

318 These Recommendations contain scientifically valid, economic and technically feasible and  
319 effective methods and metrics intended to evaluate risk and estimate impacts to wildlife, inform  
320 permitting decisions, and satisfy environmental assessment processes. The objectives of  
321 mitigation are to avoid or minimize impacts to fish, wildlife and their habitats, and, if necessary,  
322 to compensate for those impacts not avoided or minimized. Wind projects should be planned,  
323 developed, and operated with consideration of the overall mitigation policy of the USFWS  
324 (USFWS Mitigation Policy, 46 FR 7656 (1981)). The policy preamble describes the effect of the  
325 policy as not dictating actions or positions that wind developers must accept. However, the  
326 USFWS policy provides a common basis for mitigation decision-making and facilitates earlier  
327 consideration of wildlife values in wind project planning. The fundamental principles that will  
328 guide mitigation sequencing and recommendations by the USFWS are reflected in Chapter 4.  
329 Wind developers also should consult with appropriate state agencies to ensure compliance with  
330 state mitigation requirements.

331

### 332 **C. Introduction to the decision-framework using a tiered approach**

333 (Please see Appendix -- for DOI WTGAC Scientific Tools & Procedures Subcommittee General  
334 Framework for Minimizing Impact of Wind Development on Wildlife in the Context of the  
335 Siting and Development of Wind Power, October 21-23, 2008).

336

337 To evaluate and minimize the risk of potential wind projects to wildlife the Committee  
338 recommends using a tiered approach. The tiered approach is a decision framework for collecting  
339 information in increasing detail to minimize risk and make siting decisions. The tiered approach  
340 provides opportunity for evaluation and decision-making at each tier, enabling a developer to  
341 abandon or proceed with project development, or to collect additional information if required.  
342 This approach does not require that every tier, or every element within each tier, be implemented  
343 for every project. Instead, a tiered approach allows an efficient utilization of developer and  
344 wildlife agency resources with increasing levels of effort until sufficient information and the  
345 desired precision is acquired for the risk assessment.

346

### 347 **Application of the tiered approach and possible outcomes**

348

349 We have defined five tiers that comprise the preconstruction risk assessment and post-  
350 construction impact assessment phases of a wind project. Tiers 1-3 would occur as pre-  
351 construction activities and are typically sequential investigations. Tiers 4-5 occur as post-  
352 construction activities and may occur simultaneously.

353

354 The tiered approach is an iterative process for quantifying the risks to wildlife of a potential wind  
355 energy project. At each tier, problem formulation guides the decision process. This formulation  
356 includes the need for additional data collection and identification of potential problems  
357 associated with developing or operating a project. If sufficient data are available as a result of  
358 the analysis at a tier, the following outcomes are possible based on the analysis of information

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359 gathered: 1) the project is abandoned because the risk is considered unacceptable, 2) the project  
360 proceeds in the development process without additional data collection, or 3) an action or  
361 combination of actions, such as project modification, mitigation, compensation or specific post-  
362 construction monitoring, is indicated. If sufficient data aren't available at a tier, more intensive  
363 study is conducted in the subsequent tier until sufficient data are available to make a decision to  
364 proceed or abandon the project, modify a project, or expand a project. The tiers are listed as  
365 follows:

366

- 367 ✓ Tier 1 - Preliminary evaluation or screening of potential sites
- 368 ✓ Tier 2 - Site characterization
- 369 ✓ Tier 3 – Quantitative metrics for predicting risk and estimating impact
- 370 ✓ Tier 4 – Post-construction fatality studies
- 371 ✓ Tier 5 – Other Post-construction Studies

372

### 373 2. Research Questions

374

375 Much uncertainty remains about predicting risk and estimating impacts of wind energy  
376 development on wildlife. It is in the interests of wind developers and wildlife agencies to  
377 improve these assessments to better avoid and minimize the wildlife impacts of wind energy  
378 development. The committee recommends research that improves predictions of pre-  
379 construction risk and estimates of post-construction impact. One potential purpose of research is  
380 to provide data on operational factors (e.g. wind speed, weather conditions) that are likely to  
381 result in fatalities. Research would usually result from collaborative efforts involving appropriate  
382 stakeholders, and could include studies of cumulative effects of multiple wind projects, or the  
383 comparisons of different methods for assessing avian and bat activity relevant to predicting risk.  
384 Research projects may occur at the same time as project-specific Tier 4 and Tier 5 studies.

385

### 386 3. Adaptive Management (AM): definition of active versus passive AM and 387 applicability of AM to the decision framework and tiered approach.

388

389 Adaptive management is a series of scientifically driven management actions (within economic  
390 and resource constraints) that use monitoring and research results to test priority hypotheses  
391 related to management decisions and actions, and apply the resulting information to improve  
392 management. Adaptive management (AM) can be categorized into two types: "passive" and  
393 "active" (Walters and Holling 1990, Murray and Marmorek 2003). In passive AM, alternatives  
394 are assessed and the management action deemed best is designed and implemented. Monitoring  
395 and evaluation then lead to adjustments as necessary. In active AM, managers explicitly  
396 recognize that they do not know which activities are best, and they then select several alternative  
397 activities to design and implement. Monitoring and evaluation of each alternative helps in  
398 deciding which alternative is more effective in meeting objectives, and adjustments to the next  
399 round of management decisions can be made based on those lessons. The Committee is not  
400 advocating that active AM be implemented at wind energy projects. Active AM may be  
401 appropriate if there is a specific research objective, and the Committee recognizes that  
402 accomplishing those objectives is outside the decision framework and would involve multiple  
403 stakeholders and funding sources.

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405 Passive AM is the typical application of AM to wind energy development, and it can be readily  
406 integrated into the proposed decision-framework because the tiered-approach is an adaptive  
407 process. In the pre-construction environment, analysis and interpretation of information gathered  
408 at a particular tier influences the decision to proceed further with the project or the project  
409 assessment. If the project is constructed, information gathered in the pre-construction  
410 assessment guides possible project modifications, or the need for and design of post-construction  
411 studies. Analysis of the results of post construction studies tests design modifications and  
412 operational activities to determine their effectiveness in avoiding, minimizing, and mitigating  
413 impact.

414  
415 For passive AM to work there must be agreement to adjust management and/or mitigation  
416 measures if the goals are not met. The agreement should include timeline for periodic reviews  
417 and adjustments as well as a mechanism to consider and implement additional mitigation  
418 measures as necessary after the project is developed.

419

#### 420 4. **Confidentiality of site evaluation process as appropriate**

421 Some aspects of the initial pre-construction risk assessment including preliminary screening and  
422 site characterization occur early in the development process, when land or other competitive  
423 issues limit developers' willingness to share information on the project with the public and  
424 competitors. Any consultation should include confidentiality agreements as described earlier in  
425 the Recommendations.

426

### 427 **Chapter 3: Recommended Guidelines for Wildlife Assessment and Siting Decisions**

428

429 The first three tiers describe studies in the pre-construction phase, and at each of the three tiers a  
430 set of questions is listed that we recommend developers attempt to answer for predicting the risk  
431 of a potential project. Some of these questions are repeated at each tier. Given the nature of the  
432 tiered approach, each additional tier represents a greater investment in data collection, which  
433 may be required to answer certain questions. For example, while Tier 1 and 2 investigations may  
434 discover some existing information on federally listed species and their use of the proposed  
435 development site, it may be necessary to collect empirical data in Tier 3 studies to determine the  
436 presence of federally or state-listed species.

437

#### 438 **A. Tier 1 - Preliminary evaluation or screening of potential sites**

439 For many wind energy projects, the first stage in the assessment of potential risk to wildlife is to  
440 conduct a preliminary regional evaluation of potential site(s) for the purposes of identifying sites  
441 to avoid and sites to review further. Tier 1 questions are suggestions to developers for the kinds  
442 of studies to be pursued at this stage. Project developers would answer these questions by  
443 conducting a regional evaluation of potential sites using credible publicly available information.  
444 Developers are encouraged to consult with appropriate wildlife experts, who may include  
445 government agencies, the academic community, and/or local conservation organizations. The  
446 analysis of site suitability would be based on a blend of the information available.

447

448 As a result of this review developers may determine whether suitable sites are available in the  
449 region, and they can then decide whether to proceed to further tiers (See Tier 2-5 below).

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1. Are there known threatened, endangered, federal "sensitive", state-listed, or other special status species present on the proposed site, and/or is habitat present for these species?
2. Does the landscape contain any areas of special designation, including, but not limited to, 'area of scientific importance'; 'of significant value'; federally-designated critical habitat; high-priority areas for non-government organization; or other local, state, regional, federal, tribal, or international categorization that may preclude energy development?
3. Are there known critical areas of wildlife congregation, including, but not limited to, maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance?
4. Are there large areas of intact habitat or the potential for fragmentation of large habitat blocks, with respect to species with needs for large contiguous blocks of habitat?

### *Tier 1 Methods and Metrics to be inserted*

#### **B. Tier 2 - Site characterization**

At this stage the developer has narrowed consideration down to specific sites, and additional data may be necessary to conduct a more detailed site characterization for a sufficient risk assessment. A distinguishing feature of Tier 2 studies is that they focus on site specific information and should include at least one visit to each of the prospective sites. Questions suggested for Tier 2 can be answered using credible publicly available information that includes published studies, technical reports, databases, and information from agencies, local conservation organizations, and/or local experts. Developers or consultants working on their behalf should contact the federal, state, tribal, and/or local agencies that have jurisdiction over the potential project.

1. Are threatened, endangered, federal "sensitive", state listed species, or other special status species present on or likely to use the proposed site?
2. Are there rare or unusual plant communities present or likely to be present at the site, or plant communities that otherwise have a special designation?
3. Which species of birds and bats, especially those known to be at risk of colliding with wind turbines, are likely to use a proposed site based on an assessment of site attributes?
4. Are there known critical areas of wildlife congregation, including, but not limited to, maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance associated with the proposed site(s)?
5. Are there large areas of intact habitat or the potential for fragmentation of large habitat blocks, with respect to species with needs for large contiguous blocks of habitat?

### *Tier 2 Methods and Metrics to be inserted*

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### 494 **C. Tier 3. Field studies to document site wildlife conditions and predict project** 495 **impacts**

496 The need for Tier 3 studies should be determined from the results of site characterization at Tier  
497 2. The primary purpose of Tier 3 studies is to provide quantitative data useful in designing a  
498 project to avoid and/or minimize risk. They may also allow a pre-construction prediction of risk,  
499 and may provide data useful in evaluating predictions of impact and risk through post-  
500 construction comparisons of estimated impacts to predicted impacts and risk (i.e., Tier 4 and 5  
501 studies). Tier 3 studies provide information useful in the development of mitigation measures, if  
502 needed. The results of these particular Tier 3 studies also may determine that post-construction  
503 studies are unnecessary.  
504

- 505 1. Do field studies indicate that threatened, endangered, federal "sensitive", state listed  
506 species, or other special status species present on or likely to use the proposed site?
- 507 2. Do field studies indicate that there are large areas of intact habitat or the potential for  
508 fragmentation of large habitat blocks, with respect to species with needs for large  
509 contiguous blocks of habitat?
- 510 3. What is the distribution, relative abundance, behavior, and site use of wildlife  
511 determined to be of interest in Tiers 1 or 2, and to what extent do these factors expose  
512 these species to risk from the proposed wind power project?  
513

514 In answering the above questions developers should collect sufficient data to enable analysis that  
515 answers the following questions:  
516

- 517 4. What are the potential risks of impacts of the proposed wind energy project to individuals  
518 and local populations. When appropriate (e.g., rare and/or endangered species)  
519 assessment of risk may also include possible impacts to entire species and their habitats.
- 520 5. If significant impacts are predicted, especially to wildlife of interest, can these impacts be  
521 avoided, minimized, or mitigated?
- 522 6. Are there studies that should be initiated at this stage that would be continued in either  
523 Tier 4 or Tier 5?  
524

### 525 ***Tier 3 Methods and Metrics to be inserted*** 526

### 527 **D. Site construction - site development and construction best management practices** 528 **(BMPs)**

529 During site development, significant attention should be given to reducing risk of adverse  
530 impacts to wildlife from turbines and associated infrastructure through careful site selection and  
531 facility design. The following best management practices can assist a developer in the planning  
532 process to reduce potential wildlife impacts. Use of these BMPs should ensure that the potential  
533 adverse impacts to most wildlife and habitat present at many wind development sites would be  
534 reduced, although additional mitigation may be required at a project level to address site-specific  
535 concerns and pre-construction study results.  
536

537 These BMPs will evolve over time as additional experience, learning, monitoring and research  
538 becomes available on how to best minimize wildlife and habitat impacts from wind facilities.  
539 USFWS will work with the industry, stakeholders and the states to evaluate, revise and update

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540 these best management practices on a continual basis and to maintain a readily available  
541 publication of recommended, generally accepted best practices.

542

- 543 1. Minimize, to the extent practicable, the area disturbed by pre-construction site  
544 monitoring and testing activities and installations.  
545
- 546 2. Avoid locations identified to have the potential for high risk to birds and bats  
547
- 548 3. Avoid using or degrading high value or large intact habitat areas, as identified in state  
549 wildlife action plans, etc.  
550
- 551 4. Use maps that show the location of sensitive resources and the results of Tier 3  
552 studies to establish the layout of roads, fences, and other infrastructure. Avoid using  
553 invasive species to the area for seeding or planting.  
554
- 555 5. To reduce avian collisions, place low and medium voltage connecting power lines  
556 associated with the wind energy development underground to the extent possible,  
557 unless burial of the lines is prohibitively expensive (i.e., where shallow bedrock  
558 exists) or where greater impacts to biological resources would result.  
559
  - 560 a. Overhead lines may be acceptable if sited away from high bird crossing  
561 locations, such as between roosting and feeding areas or between lakes, rivers  
562 and nesting areas.
  - 563 b. Overhead lines may be used when they parallel tree lines, employ bird flight  
564 diverters, or are otherwise screened so that collision risk is reduced.
  - 565 c. Above-ground low and medium voltage lines, transformers and conductors  
566 should comply with the Avian Power Line Interaction Committee (APLIC)  
567 “Suggested Practices for Avian Protection on Power Lines.”  
568
- 569 6. Communication towers and permanent meteorological towers should not be guyed at  
570 turbine sites. If guy wires are necessary, bird flight diverters or high visibility  
571 marking devices should be used.  
572
- 573 7. Use construction and management practices to minimize activities that may attract  
574 prey and predators to the wind turbine site.  
575
- 576 8. FAA visibility lighting of wind turbines should employ only red or dual red and white  
577 flashing lights, not steady burning lights.  
578
- 579 9. Keep lighting at both operation and maintenance facilities and substations located  
580 within ½ mile of the turbines to the minimum required to meet FAA guidelines and  
581 safety and security needs.  
582
  - 583 a. Use lights with sensors and switches to keep lights off when not required.
  - 584 b. Lights should be hooded and directed to minimize horizontal and skyward  
585 illumination.

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586 c. Minimize use of high intensity lighting, steady-burning, or bright lights such  
587 as sodium vapor or spotlights.

588  
589 10. Establish non-disturbance buffer zones to protect raptor nests, bat roosts, areas of  
590 high bird or bat use, or specials-status species habitat identified in pre-construction  
591 studies. Determine the extent of the buffer zone in consultation with USFWS and  
592 state, local and tribal wildlife biologists, and land management agencies (e.g., BLM).

593  
594 11. Locate turbines to avoid separating birds and bats from their daily roosting, feeding,  
595 or nesting sites if documented that the turbines' presence poses a risk to species.

596  
597 12. Use tubular towers (as opposed to lattice towers) or best available technology to  
598 reduce ability of birds to perch and to reduce risk of collision.

599  
600 13. Minimize the number and length of access roads, use existing roads when feasible.

601  
602 Where high impacts are expected or sensitive species will be impacted beyond a level of  
603 significance, develop a project-specific habitat conservation or restoration plan to avoid or  
604 minimize negative impacts on vulnerable wildlife while maintaining or enhancing habitat  
605 values for other species.

606  
607 **E. Site operation - conduct Tier 4 and Tier 5 studies, as appropriate** (Post-construction  
608 fatality studies and other post-construction studies )

609  
610 *Tier 4 and 5 Questions to be inserted*

611  
612 *Tier 4 and 5 Methods and Metrics to be inserted*

613  
614 **F. Retrofitting** – Retrofitting is defined as replacing portions of existing wind turbines or  
615 project facilities so that at least part of the original turbine, tower, electrical infrastructure or  
616 foundation is being utilized.

617  
618 1. Retrofitting of turbines should use installation techniques that minimize new site  
619 disturbance, soil erosion, and removal of vegetation of habitat value

620 2. Retrofits should employ shielded, separated or insulated electrical conductors that  
621 minimize electrocution risk to avian wildlife

622 3. Retrofit designs should prevent nests or bird perches from being established in or on  
623 the wind turbine or tower

624 4. FAA visibility lighting of wind turbines should employ only red or dual red and white  
625 flashing lights, not steady burning lights.

626 5. Lighting at operation and maintenance facilities and substations located within ½ mile  
627 of the turbines should be kept to the minimum required to meet FAA guidelines and  
628 safety and security needs. Use lights with sensors and switches to keep lights off  
629 when not required. Lights should be hooded and directed to minimize horizontal and

## Attachment C

630 skyward illumination. Minimize use of high intensity lighting, steady-burning, or  
631 bright lights such as sodium vapor or spotlights.

632 6. Remove wind turbines when they are no longer cost effective to retrofit so they  
633 cannot present a collision hazard to birds and bats.

634

635 **G. Repowering Existing Wind Projects:** Repowering may include removal and  
636 replacement of turbines and associated infrastructure.

637

638 1. To the greatest extent practicable, existing roads, disturbed areas and turbine strings  
639 should be re-used in repower layouts.

640 2. Roads and facilities that are no longer needed should be stabilized and re-seeded with  
641 native plants appropriate for the soil conditions and adjacent habitat and of local seed  
642 sources where feasible, per landowner requirements and commitments.

643 3. Existing substations and ancillary facilities should be re-used in repowering projects  
644 to the extent practicable.

645 4. Existing overhead lines may be acceptable if located away from high bird crossing  
646 locations such as between roosting and feeding areas, or between lakes, rivers and  
647 nesting areas. Overhead lines may be used when they parallel tree lines, employ bird  
648 flight diverters, or are otherwise screened so that collision risk is reduced.

649 5. Above-ground low and medium voltage lines, transformers and conductors should  
650 comply with the Avian Power Line Interaction Committee (APLIC) “Suggested  
651 Practices for Avian Protection on Power Lines.”

652 6. Guyed structures should be avoided unless guy wires are treated with bird flight  
653 diverters or high visibility marking devices, or are located where known low bird use  
654 will occur.

655 7. FAA visibility lighting of wind turbines should employ only red or dual red and white  
656 flashing lights, not steady burning lights.

657 8. Lighting at operation and maintenance facilities and substations located within ½ mile  
658 of the turbines should be kept to the minimum required to meet FAA guidelines and  
659 safety and security needs. Use lights with sensors and switches to keep lights off  
660 when not required. Lights should be hooded and directed to minimize horizontal and  
661 skyward illumination. Minimize use of high intensity lighting, steady-burning, or  
662 bright lights such as sodium vapor or spotlights.

663

## 664 **H. Decommissioning**

665 During decommissioning, contractors and facility operators should apply best management  
666 practices in grading and native plant reestablishment to ensure that erosion and overland flows  
667 are managed to restore pre-construction landscape conditions. The facility operator, in  
668 conjunction with the landowner and state and federal wildlife agencies, should restore the natural  
669 hydrology and plant community to the greatest extent practical.

670

671 1. Decommissioning methods should minimize new site disturbance and removal of  
672 native vegetation, to the greatest extent practicable.

673 2. Foundations should be removed to a depth of two feet below surrounding grade, and  
674 covered with soil to allow adequate root penetration for native plants and so that  
675 subsurface structures don't substantially disrupt ground water movements.

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- 676 3. If topsoils are removed during decommissioning, they should be stored and vegetated  
677 until they can be replaced.
- 678 4. Soil profiles should be restored so that topsoils will establish and maintain pre-  
679 construction native plant communities to the extent possible.
- 680 5. Soil should be stabilized and re-vegetated with native plants appropriate for the soil  
681 conditions and adjacent habitat and of local seed sources where feasible, per landowner  
682 requirements and commitments.
- 683 6. Surface flows should be restored to pre-disturbance conditions, including removal of  
684 stream crossings, roads, and pads.
- 685 7. Surveys, by qualified experts, should be conducted to detect invasive plants, and  
686 comprehensive approaches to controlling any detected plants should be implemented  
687 and maintained as long as necessary.
- 688 8. Overhead pole lines that are no longer needed should be removed.
- 689 9. After decommissioning erosion control measures should be installed in all  
690 disturbance areas where potential for erosion exists.
- 691 10. Fencing should be removed unless the land owner will be utilizing the fence
- 692 11. Petroleum product leaks and chemical releases that constitute a Recognized  
693 Environmental Condition should be remediated prior to completion of  
694 decommissioning.
- 695

### 696 **Chapter 4: Mitigation**

697 The objectives of mitigation are to avoid or minimize impacts to fish, wildlife and their habitats,  
698 and, if necessary, to compensate for those impacts not avoided or minimized.

#### 700 **A. Impact Avoidance and Minimization**

701 State and federal wildlife laws and policies focus on avoidance and minimization of project  
702 impacts. Impact avoidance and minimization is often best achieved early in the project planning  
703 and design process, during pre-site selection planning (macro-siting) and during site layout  
704 planning (micro-siting). However, if these measures are demonstrated to be insufficient in  
705 avoiding or minimizing impacts, then additional measures such as adaptive management or  
706 compensation may be needed.

#### 708 **B. Compensation**

709 A project developer should ensure that appropriate measures are incorporated into the planning  
710 and construction, and operation of a project to avoid and minimize impacts as much as possible.  
711 If these measures are insufficient to avoid or minimize estimated impacts to birds, bats and  
712 habitat, however, compensation may be one of the appropriate strategies to mitigate or offset  
713 such impacts, including cumulative impacts.

714  
715 Development of effective compensation measures and recommendations should consider  
716 USFWS recommendations under its mitigation policy and involve consultation with the  
717 appropriate state agencies. Because a project's operational fatalities cannot be forecast with  
718 precision, it may not be feasible to make compensation decisions until monitoring data is  
719 collected. However, the application, general terms, and commitments for potential future  
720 compensatory mitigation and the triggers or thresholds for implementing such compensation

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721 should be determined before a project goes forward. If operational impacts exceed the expected  
722 levels, adaptive management strategies or additional compensatory mitigation may be necessary.  
723 However, additional compensatory mitigation and potential adaptive management strategies  
724 beyond that recommended prior to project construction should be well defined and feasible to  
725 implement, so that the developer will have an understanding of any potential future mitigation  
726 requirements.

727

728 The following potential compensation options may appropriate for consideration:

- 729 • Offsite and on-site conservation and protection of habitat
- 730 • Offsite and on-site conservation and habitat restoration
- 731 • Offsite and on-site habitat enhancement

732

733 Regardless of the form of compensatory mitigation, there should be a nexus between the level of  
734 impact and the amount of compensation. Any compensation should be biologically based and  
735 reasonable.

736

### 737 **C. Mitigation Plans**

738 Development of a formal mitigation plan should be an integral part of a wind energy facility  
739 project and completed prior to project construction. Mitigation plans are not necessary for low-  
740 risk projects or common species. A mitigation plan should include some or all of the following  
741 elements: mitigation measures, goals and objectives, implementation plan, performance  
742 standards, operation and maintenance plans, monitoring and evaluation plans, and plans for  
743 adaptive management. Mitigation plans directed at birds and bats may be in the form of an Avian  
744 and Bat Protection Plan (ABPP) designed to address project impacts to birds, bats, and their  
745 habitats. A sample ABPP can be found in Appendix.

746

## 747 **Chapter 5: Advancing Use, Cooperation, and Effective Implementation of the** 748 **Recommended Guidelines**

749

750 The Committee recommends that USFWS collaborate and coordinate with other federal and state  
751 agencies to streamline and encourage consistent review of wind energy projects. It further  
752 recommends that USFWS develop best management practices that can be adopted by other  
753 federal and state agencies, and encourage consistent data collection methodology and reporting  
754 while also addressing individual site circumstances and practical limitations. USFWS should  
755 also establish a process to allow the national guidance to be used by interested state and local  
756 governments.

757

758 Further, the Committee recommends that the USFWS establish several specific mechanisms to  
759 promote wind industry use of the recommended guidelines (note: the Legal Subcommittee is  
760 exploring incentives under the MBTA, ESA, and BGEPA and the Incentives Subcommittee is  
761 exploring a few other mechanisms).

762

### 763 **A. Recommendations on Incentives for Use of Guidelines (currently being drafted by** 764 **Subcommittee):**

- 765 • ESA

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- 766 • MBTA
- 767 • BGEPA
- 768 • Other?
- 769

### **B. Federal-federal coordination and cooperation**

771 USFWS should employ the following strategies to streamline the review and permitting process  
772 for wind projects by federal agencies:

- 773
- 774 1. Establish an interagency working group or advisory committee to develop specific  
775 recommendations and establish joint protocols to ensure federal coordination and use of  
776 the USFWS national guidelines. This will advance consistency and avoid duplication in  
777 the federal permitting process as it relates to wind development.  
778
- 779 2. Work with other federal agencies to ensure that, to the extent practicable, other  
780 federal agencies use the USFWS national guidance as a foundation or resource for their  
781 approach to addressing wind development and wildlife interactions. Among other  
782 activities, the USFWS should work with other federal agencies to provide incentives for  
783 adoption and use of USFWS guidance, encourage early coordination with the USFWS for  
784 projects that may potentially affect wildlife resources, and use interagency meetings to  
785 promote consistency among agency approaches.  
786
- 787 3. Develop and maintain interagency best management practices. USFWS should  
788 establish a national repository of best management practices for wind/wildlife  
789 interactions. A single repository where this information could readily be accessed would  
790 help to increase efficiency, interagency coordination, and state and developer use of best  
791 management practices.  
792
- 793 4. Coordinate with other agencies that require data collection at a wind energy site to  
794 promote consistent methodology and reporting requirements, while also accommodating  
795 individual site conditions and practical limitations.  
796

### **C. Federal-state coordination and cooperation**

798 USFWS should work with states with the goal to increase compatibility between state and  
799 federally recommended wildlife protocols, data collection methods, and requirements relating to  
800 wildlife and wind energy. These wind energy guidelines contain recommendations that are  
801 generally applicable at the federal, state and local levels across the country, as well as policies,  
802 measures and incentives that are focused on USFWS policies, procedures, goals and regulations,  
803 and those of other federal agencies. Some of the specific recommendations may not be  
804 applicable at the state and local government level. Those states who desire to or who have  
805 formally adopted wind energy siting, permitting or environmental review regulations or  
806 guidelines should contact USFWS for assistance in order to minimize conflicting or unnecessary  
807 requirements resulting from different state versus federal practices. In addition, USFWS should  
808 confer, coordinate and share its expertise with interested states when a state lacks its own  
809 guidance or program to address wind/wildlife interactions.

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811 The Committee recommends that USFWS establish a voluntary state/federal cooperation  
812 program to advance cooperation and compatibility between USFWS and interested state and  
813 local governments for coordinated review of wind projects under both federal and state wildlife  
814 laws. Formal agreements between USFWS and states may be explored. Cooperation between  
815 states and USFWS could include the following elements:  
816

- 817 • Cooperation agreements with interested state governments to ensure coordinated,  
818 consistent review of wind projects for compliance with state and federal wildlife laws.  
819
- 820 • Joint agency reviews, and other appropriate measures to reduce duplication and increase  
821 coordination between state agencies and USFWS in reviewing wind projects.  
822
- 823 • Communication between States and USFWS to ensure that the party first obtaining the  
824 information about a prospective wind project will notify the other party to enable joint  
825 planning on how to coordinate review of the project.  
826
- 827 • Identification of a lead state agency designee responsible to work with the USFWS  
828 regional office to coordinate review of proposed wind activities under wildlife laws.  
829
- 830 • Establishment of consistent and predictable joint protocols, data collection methodology,  
831 and study requirements that can be used by USFWS and state agencies to satisfy wind  
832 project permitting and environmental review requirements.  
833
- 834 • Designation of a USFWS management contact within each regional office (or nationally)  
835 who is available as a resource to the field offices to work with states and local agencies to  
836 resolve significant wildlife-related issues that may arise at wind energy projects that  
837 cannot be resolved at the field office.  
838
- 839 • As part of USFWS/state cooperation, the law enforcement authorities of USFWS and  
840 interested states will cooperate in the identification, resolution, and enforcement of  
841 violations of state and federal wildlife law applicable to wind projects.  
842
- 843 • Cooperative state/federal/industry research agreements relating to wind project-wildlife  
844 interactions.  
845
- 846 • Notification by USFWS to the state wildlife agency prior to issuing any incentives or  
847 written assurance to developers pertaining to the likelihood of enforcement under the  
848 ESA, BGEPA, and MBTA. State agencies should have the opportunity to ensure  
849 developers are considering state resources that may be at risk and to ensure that state  
850 regulatory processes or mitigation requirements are being addressed in project  
851 development.  
852

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- 857       • **Additional Optional Arrangements between States and USFWS:**  
858       USFWS should support and promote the establishment of negotiated agreements with  
859       interested states that specifies additional coordination, review and compliance responsibilities  
860       for ensuring wind project compatibility with wildlife laws.<sup>1</sup>

861  
862       In administering this state/federal partnership program, the Committee recommends that USFWS  
863       and the states play differing but complementary roles:

### 864 865       USFWS Role

- 866       • Provide training to states
- 867       • Support and/or manage a national database for reporting of mortality data on a consistent  
868       basis.
- 869       • Establish and maintain national “best management practices” for wind project siting and  
870       operation based on project experience and learning
- 871       • Establish and revise recommended guidance on study protocols, study techniques, and  
872       measures and metrics for use by all jurisdictions
- 873       • Assist in identification and pursuit of funding for national research priorities

### 874 875       States and Local Role

- 876       • Employ national guidance as minimum foundation of state approach to wind/wildlife  
877       review
- 878       • Report project monitoring data and results received from the project developer to national  
879       database at USFWS

880  
881       See Appendix --: *Sample Memorandum of Understanding Between USFWS and State*

### 882 883       **D. Federal-tribal coordination and cooperation (*to be inserted*)**

### 884 885       **E. USFWS-developer coordination and cooperation (*incomplete section: remainder is*** 886       *being drafted*)

- 887  
888       • Project-Specific Agreements

889  
890       USFWS should encourage the negotiation of basic contracts with interested project proponents  
891       through a memorandum of understanding in which USFWS endorses a project plan in exchange  
892       for a developer’s commitment to implement the voluntary guidelines, best management  
893       practices, and/or an ABPP. The agreement would provide the developer with written assurances

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<sup>1</sup> For example, under this kind of voluntary, negotiated framework, USFWS could agree to give primary programmatic review responsibilities for the implementation of the national guidelines to the state to review proposed developments and ensure wind energy compliance with state and federal wildlife laws. This state “primacy” arrangement could be predicated on: (1) a state adopting wind energy and wildlife guidance or program that is consistent with or more stringent than USFWS national guidance; (2) USFWS setting forth appropriate measures and incentives intended to encourage following the voluntary guidelines that can be feasibly implemented by the state; (3) the state agreeing to implement its program with a good faith effort; (4) in order for this approach to be successful, there would need to be adequate funding to support personnel, and technical expertise resources, and (5) the state reporting periodically to USFWS on how the program is working. The state and USFWS would retain discretion to discontinue the formal coordination arrangement at any time. Under such agreement USFWS would not relinquish its jurisdiction or enforcement authority with regard to federal laws and regulations.

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894 by USFWS that compliance with the guidelines, best management practices, and/or ABPP will  
895 result in use of enforcement discretion and reduced threat of enforcement under the MBTA.

896  
897 While each agreement would be tailored to the particular project, an agreement could include the  
898 following elements:

- 899  
900 • A developer commitment to share all relevant information concerning the wildlife  
901 resources in the project area and the potential impacts to these wildlife resources. Shared  
902 information should include all known, publicly available data and pre- and post  
903 construction study results related to the proposed project.
- 904  
905 • A developer commitment to use due diligence to comply with USFWS guidelines and  
906 best management practices, subject to appropriate modification based on the  
907 characteristics of the proposed project site and consultation with USFWS.
- 908  
909 • A USFWS commitment to use its enforcement discretion provided the developer remains  
910 in compliance with the terms and conditions of the agreement, and the developer has  
911 made a good faith effort to avoid and minimize potential adverse impacts by way of  
912 implementing USFWS guidelines and best management practices.
- 913  
914 • A developer commitment to provide coordinated access, upon prior notice, to the wind  
915 energy project as requested by USFWS staff in order to ensure compliance with the  
916 agreement, provided that such access was coordinated in advance as much as possible  
917 and subject to normal safety precautions implemented by the developer/project owner.

### 918 919 **F. Use of Avian and Bat Protection Plans**

920 USFWS should support the use of Avian and Bat Protection Plans as one tool that can be useful  
921 as a proactive and innovative approach to reducing risk to bird and bat and associated habitat in a  
922 project specific and/or company wide context. An ABPP is a purely voluntary project or  
923 company-specific program of best management practices designed to protect and conserve birds  
924 and bats. Based on compliance with an approved ABPP, USFWS would agree to provide  
925 assurances to use its enforcement discretion and not recommend prosecution under the MBTA.

926  
927 An ABPP can be either a company-specific or project-specific document. In either context, the  
928 ABPP delineates a program designed to reduce the risks that result from avian interactions with  
929 wind facilities. A company-wide ABPP provides an opportunity for a company to address bird  
930 and bat issues on a broader scale than afforded by a project by project approach. It would  
931 establish company policies and processes that will help the company ensure compliance with  
932 wildlife laws. A project ABPP, on the other hand, provides more site-specific best management  
933 practices and measures to minimize impacts to wildlife resources at a particular project site. A  
934 project-specific ABPP may or may not supplement a company ABPP.

935  
936 Recommended elements for an ABBP and a sample ABBP can be found in Appendix --

937  
938  
939

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### 940 **G. NGO Actions**

941 There are a variety of non-governmental organizations that have an interest in improving siting  
942 procedures for wind energy projects. Some groups, such as industry trade organizations, support  
943 expanded wind energy development, and other groups have primary interest in reducing wildlife  
944 impacts of wind energy development – these groups are not mutually exclusive.

945 Such groups do not have a formal role in the assessment of specific projects but can play a useful  
946 role in a variety of ways including providing information for the assessment of individual  
947 projects, particularly at the preliminary site screening phase to help steer development away from  
948 sensitive sites, by helping to design mitigation or offset strategies that lead to faster project  
949 review and approval, or to help define and fund research priorities that lead to improve  
950 predictions of risk and impact assessment and ultimately more cost-effective evaluation of wind  
951 project development that minimizes impact to wildlife.

952

### 953 **Chapter 6: Revisions to Recommendations**

954 This document reflects the current state of knowledge about the interactions of wind turbines  
955 with birds, bats and wildlife in general. Ongoing and future research and actual experience in  
956 Preliminary Site Screening and Evaluation and Selection, Project Design and Permitting Process,  
957 Site Build-out and Operations Post-construction Evaluation of wind energy projects will refine,  
958 expand and alter that knowledge. The document will be reviewed and revised, as necessary,  
959 approximately every five years. During the five-year period between revisions, if substantive  
960 new information becomes available it should be utilized immediately, and an addendum will be  
961 posted on the web-site updating the USFWS guidelines. Interested parties will have the  
962 opportunity to participate in the update and revision process. Consult the USFWS web page for  
963 information about proposed updates, revisions and participation (*include web hyperlink*). For  
964 questions about this document or to contribute information to the current body of knowledge,  
965 please contact the U. S. Fish and Wildlife Service at 703-358-2161.

966

### 967 **Chapter 7: Recommendations for Effective USFWS Administration of** 968 **Recommendations**

969

#### 970 **A. Consistent application**

971 The Committee recommends that USFWS inform all Regional and Field staff of the philosophy,  
972 premises and principles with which these Recommendations were developed. It is anticipated  
973 that USFWS will provide guidance to the field for the implementation of final USFWS  
974 guidelines to promote their consistent application, and to facilitate agency and industry  
975 understanding of recommended actions. Such guidance should include the need for flexibility to  
976 address diverse geographic regions, habitat types, and wind energy development projects.

977

978 USFWS should continue to be involved with the development of best practices for project  
979 design, operation and mitigation, based on best available science and information and intended to  
980 minimize impacts to birds and bats from wind projects. Best practices will be reviewed  
981 periodically and revised as necessary to reflect new knowledge gained from current science,  
982 monitoring results, and experience with constructing and operating wind projects. All USFWS  
983 staff involved in review of wind projects should be trained in use of the best practices.

984

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### 985 **B. Training**

986 USFWS should provide training to ensure that all Regional and Field staff have the knowledge,  
987 skill, and ability to accurately implement the final wind turbine guidelines developed in  
988 accordance with the Committee's Recommendations. Training will be provided through a series  
989 of hands-on workshops conducted in each USFWS Region, with priority for the first series of  
990 workshops to be scheduled in areas of high wind energy development activity. Each workshop  
991 should be open to participants from USFWS, industry, states, tribes and other appropriate  
992 participants, with the goal of developing partnerships to minimize impacts to wildlife and their  
993 habitats while allowing flexibility for wind energy development.

994

### 995 **C. Staff support**

996 USFWS should work within its budget constraints to provide staff support to review wind energy  
997 development projects in a timely and efficient manner. To supplement its staff efforts, USFWS  
998 will assist and encourage state cooperative arrangements and participation in review of the  
999 potential impacts of wind energy projects on wildlife. USFWS encourages wind energy project  
1000 proponents to coordinate early in the project development process to facilitate timely  
1001 involvement and feedback. USFWS should also explore the option of co-locating additional  
1002 staff in BLM offices for renewable energy. USFWS should continue to explore cutting edge  
1003 technological applications to further streamline the review process.

1004

### 1005 **D. Research**

1006 Bird and bat interactions with wind turbines are an area of active research and collaboration. For  
1007 example, the National Wind Coordinating Committee, the Bat and Wind Energy Collaborative,  
1008 the American Wind Wildlife Institute, and the California Energy Commission's Public Interest  
1009 Energy Research Program all support research in this area. USFWS should promote  
1010 collaboration and information sharing with these and other research efforts to advance science on  
1011 wind/wildlife interactions. Subject to appropriations, USFWS should work with other federal  
1012 agencies, stakeholders, and states to develop a national research plan, to identify research  
1013 priorities designed to reduce impacts to wildlife resources while allowing construction and  
1014 operation of wind facilities. The research plan should include a description of major research  
1015 issues and recommendations for support of specific research activities. The research plan can be  
1016 used to identify opportunities to leverage research funding and support collaborative efforts with  
1017 stakeholders, including states, conservation groups, and industry.

1018

#### *IV. List of Appendices (incomplete)*

- A. Department of the Interior (DOI) Wind Turbine Guidelines Advisory Committee (WTGAC) Other Models Subcommittee Matrix October 21-23, 2008
- B. WTGAC Legal Subcommittee White Paper October 21-23, 2008
- C. WTGAC Landscape/Habitat Subcommittee, "Mapping Tools Case Studies" October 21-23, 2008 (will be attached)
- D. WTGAC Landscape/Habitat Subcommittee, Summary of Metadata for Data Layers Mapped, October 21-23, 2008
- E. WTGAC Scientific Tools & Procedures Subcommittee, General Framework for Minimizing Impact of Wind Development on Wildlife in the Context of the Siting and Development of Wind Power, October 21-23, 2008

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- F. First Draft Recommended Elements of an Avian and Bat Protection Plan, October 21-23, 2008
- G. Glossary (to be written)

DRAFT

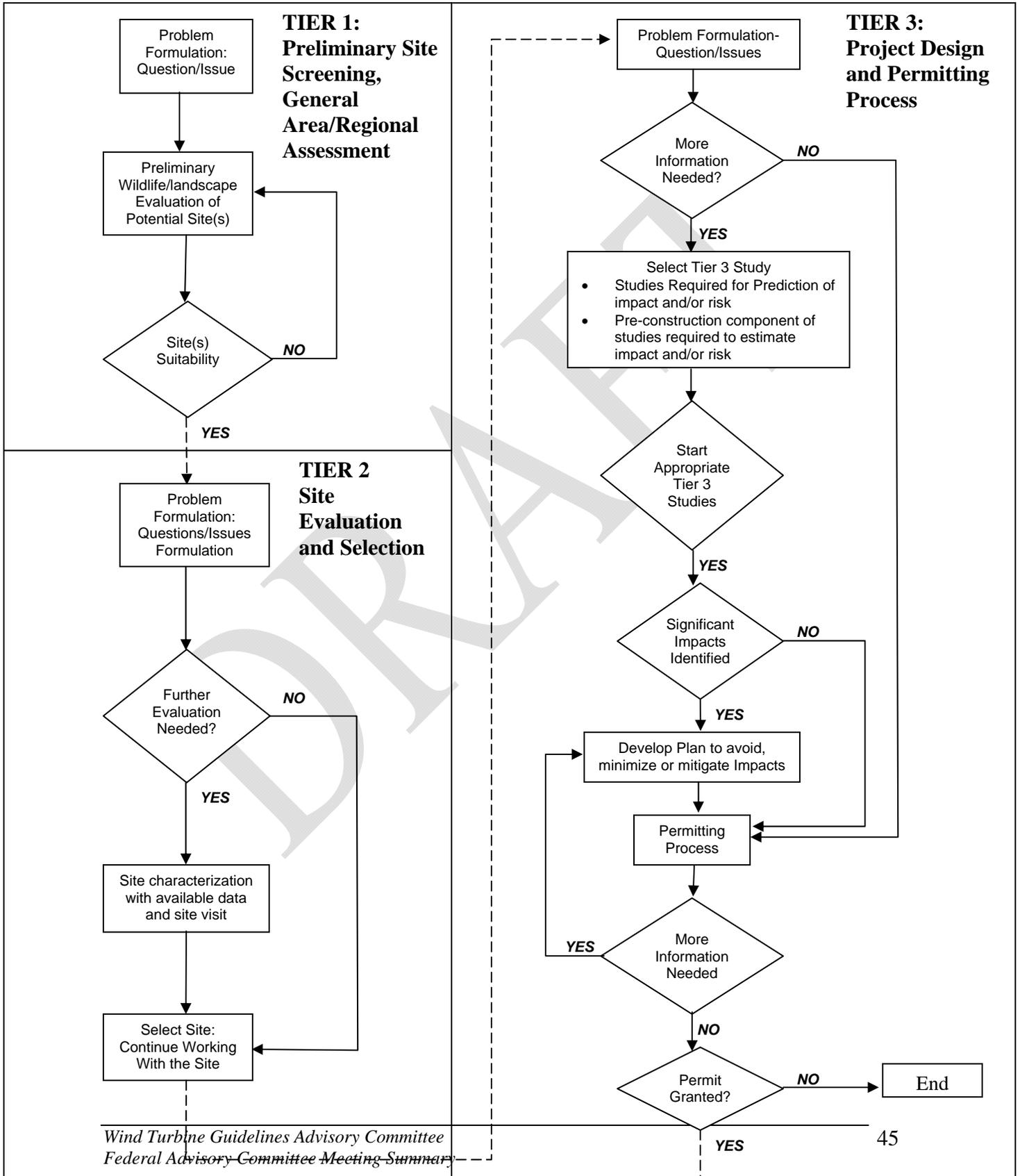
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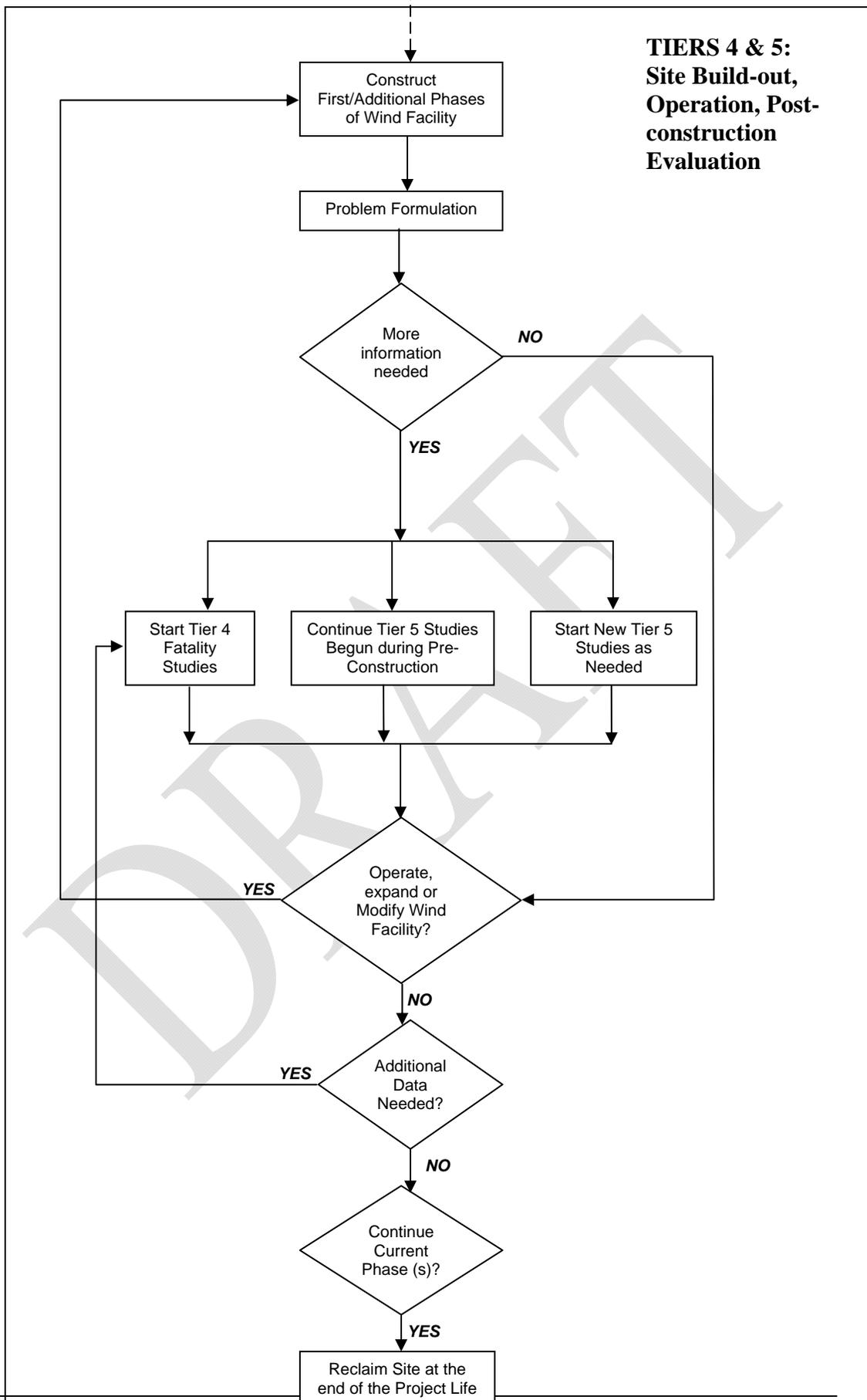
### Appendix D. WTGAC Landscape/Habitat Subcommittee, Summary of Metadata for Data Layers Mapped, October 21-23, 2008

<b>Organization Managing File(s)</b>	<b>Map/Database Title</b>
<b>Existing information</b>	
The Nature Conservancy	Portfolio Sites
The Nature Conservancy Platt/DOE/Local transmission councils	Great Plains Untilled Landscapes Current and Proposed Transmission
Unknown	Current and Proposed Wind Farms
National Atlas	Bat Distributions
National Audubon Society Natural Resources Conservation Service	Important Bird Areas Natural Resources Inventory (NRI) Environmental Conservation Online System (ECOS)
Fish and Wildlife Service	Habitat and Population Evaluation Team (HAPET) modeling Preliminary topographic and wildlife feature GIS screening
Fish and Wildlife Service	Wind & wildlife resource maps - Great Plains
The Nature Conservancy	
<b>Forthcoming:</b>	
Western Governors Association	Wind-wildlife transmission maps
Audubon/NRDC	Western resources maps
North American Grouse Partnership	Prairie grouse habitats Wind & wildlife resource maps - balance of US
The Nature Conservancy	
Am. Wind & Wildlife Institute	Wind & wildlife resource maps
Playa Lake Joint Venture	Playas
Prairie Pothole Joint Venture	Prairie Pothole habitats

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Appendix E. WTGAC Scientific Tools & Procedures Subcommittee, General Framework for Minimizing Impact of Wind Development on Wildlife in the Context of the Siting and Development of Wind Power, October 21-23, 2008





**TIERS 4 & 5:  
Site Build-out,  
Operation, Post-  
construction  
Evaluation**

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Appendix F. First Draft Recommended Elements of an Avian and Bat Protection Plan, October 21-23, 2008

The following are key elements that should be considered in developing an ABPP that are designed to ensure that the plan merits USFWS assurances regarding prosecutorial discretion. Not all of the recommended elements would need to be included in every ABPP because of the specific circumstances of a project or geographical area, and the adequacy of the ABPP should be determined by the site conditions or actual project performance with respect to wildlife impacts.

### Corporate Policy

In the ABPP, a company should provide a commitment to develop and implement a specific company policy to address wind/wildlife issues. An ABPP should include a statement of company policy confirming a commitment to work cooperatively with state and federal agencies towards the protection of relevant avian species. The ABPP should institute clear and consistent procedures to minimize impacts to relevant avian species and their habitats, and to address impacts where they are identified. The ABPP should include commitments to:

- Implement and comply with the ABPP
- Ensure company actions comply with the Wind Turbine Recommendations and applicable wildlife laws
- Monitor and document bird and bat mortalities and injuries in order to assess project performance and implement adaptive management actions if warranted
- Provide training and information to staff on the ABPP and its implementation
- Take reasonable and appropriate efforts to construct and alter infrastructure and project operations to reduce the incidence of avian and bat mortality.

### Compliance with Wildlife Laws & Permits

An ABPP should identify and implement a process under which a company will obtain and ensure compliance with applicable federal, state and tribal laws related to wildlife.

#### a. Risk Assessment Methodology, Site Selection, and Preconstruction Studies

In an ABPP, a company should agree to implement a rigorous method for evaluating avian and bat risks and to use an effective risk assessment methodology in making siting decisions. The risk assessment methodology should be used to identify sites where wind power development would pose high mortality risks or fragmentation of important habitats, and these sites should be avoided. A company should agree to assess risk to birds and bats from development at a wind project site(s) in order to avoid, minimize, and mitigate adverse impacts.

As a general matter, an ABPP should include a method for evaluating the risks posed to birds and bats in a manner that identifies areas and issues of particular concern. A risk assessment study should begin with a preliminary site assessment. The process then should include pre-construction surveys for avian and bat use, according to protocols and time frames recommended by states and national guidance. Finally, an avian and bat

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mortality reporting system should be an integral component of the risk assessment methodology.

### b. Site Design and Development Practices

In the ABPP, a developer should agree to implement best site design, construction and management practices as identified by states and the USFWS. As appropriate to the project, the company should consider avian and bat interactions in micro-siting, design and installation of new facilities, as well as in the operation and maintenance of existing facilities. The company also should agree to use all reasonable and feasible generally accepted best management practices during construction and operation of the facility.

### c. Consultation & Information Sharing

In the ABPP, a company should agree to share relevant non-proprietary site and study data and to work cooperatively with USFWS or relevant state wildlife agencies. Specifically, the company should agree to share relevant, non-proprietary information concerning wildlife resources in and around a wind project area and the potential adverse impacts to those resources. Shared information should include publicly available data from monitoring efforts and pre and post-construction study results relative to the project area. In the ABPP, a company should agree to work cooperatively with the USFWS or relevant state wildlife agencies in the future to avoid and minimize impacts to wildlife resources as new relevant project information becomes available.

### d. Post-construction Monitoring and Avian/Bat Reporting System

In the ABPP, a company should commit to establish post-construction monitoring and a mortality reporting system. A company should agree to voluntarily monitor relevant avian and bat interactions, including mortalities, through the development of a formal avian and bat fatality reporting system. For example, the ABPP could identify thresholds of fatalities above which responses to reduce rates of avian fatalities would be implemented. A company also should agree to make the data reasonably available to the USFWS and the states, as much as possible in a compatible format to advance adaptive management, and site/regional comparison. The company also would commit to make specimens collected on site reasonably available to the state and/or USFWS. An ABPP should provide for the development of such a reporting system, which can help a company pinpoint areas of concern by tracking both the specific locations where mortalities may be occurring and the extent of such mortalities. Data collected by company personnel should include avian and bat mortalities or injuries, as well as remedial actions taken.

### e. Mortality Reduction Measures and Mitigation

In the ABPP, a company should agree to use the results of a risk assessment to revise siting decisions and identify and undertake appropriate mitigation. A company also should commit to review and provide post-construction mortality monitoring data and to

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work cooperatively with the states and the USFWS to take action if the data indicate a significant problem. In an ABPP, a company should commit to identify appropriate adaptive management mortality reduction or mitigation measures when an operating project results in unexpectedly high mortality or unexpected impacts to protected species or their habitats.

### f. Quality Control & Adaptive Management

I

In the ABPP, a company should provide for future revisions or updating as new scientific methods and techniques become available. An ABPP should include a mechanism to provide periodic review of existing practices, ensuring quality control and effective management.

### g. Sample ABBP

Appendix G. Glossary (to be written)

**DRAFT Outline of Wind Turbine Guidelines Advisory Committee Product to  
Secretary of the Interior**

- **Cover Letter** (*to Secretary*)
  - *Signed by FAC members*
- **Preamble**
  - Summary of charge, report, rationale for attached guidelines (Synthesis draft, Chapter I, Sections A,B)
  - Guiding Principles (Chapter I, Sections C)
- **Policy Recommendations** (*for example*):
  - Implement the guidelines
    - *How much detail?*
    - *Summary of recommendations*
  - Benefits of wind power
  - For those impacts need to avoid, minimize, compensate for wildlife impacts
  - Importance of need for coordination within/across agencies
  - Effective use and implementation of guidelines
  - Coordination with developers, conservation groups, and state, local, and tribal governments
  - Legislation/Regulation/Policy changes
  - Research
  - Other?
- **Recommended Guidelines**
  - Executive Summary
  - Chapter Two: Preamble
  - Chapter Three: Recommendations
  - Chapter Four: Mitigation
  - Chapter Five: Advancing Use, Cooperation, and Effective Implementation of the Guidelines
  - Chapter Six: Revisions to Recommendations
  - Chapter Seven: Recommendations for Effective USFWS Administration of Recommendations
  - **Appendices**
    - Legal White Paper
    - Glossary
    - ABPP
    - Mapping Tools Case Studies
    - Summary of Metadata for Data Layers Mapped
    - Existing Guidelines Subcommittee Recommendations
  - **Bibliography**

**Wind Turbine Guidelines Advisory Committee  
Premises, as Adopted at March 24-26, 2009, Meeting**

1) The Committee acknowledges the Service definition of wildlife (see glossary). The Committee recognizes that different species and species groups have different levels of protection under tribes, federal and state wildlife statutes (See Legal White Paper).

It is the Committee's intention to identify, evaluate and recommend approaches to assessing risk and impacts to wildlife associated with wind energy development which are useful regardless of the regulatory status of any particular species, and that are particularly focused on those species most likely to be affected by wind energy development.

2) The Committee recognizes that among different wind energy projects there will be varying degrees of potential impact to wildlife as well as varying degrees of certainty associated with the assessments of that potential impact. Thus varying levels of effort will be appropriate in assessing the risk of potential projects and how or whether the projects are developed

3) The Committee recognizes that it is possible and essential to avoid, minimize, and mitigate negative impacts on wildlife populations and habitats while balancing expected impacts with the costs of undertaking necessary studies and monitoring.

## Attachment F

### FWS Wind Turbine FAC Legal Subcommittee Questions to Help Inform Discussion of Incentives

#### I. Background

In October 2008 the FWS FAC adopted a “White Paper” summarizing the laws that directly apply to land-based wind energy facilities and which are relevant to developing recommendations to the Secretary for how to avoid and minimize impacts to wildlife and their habitats.

The Legal Subcommittee (Subcommittee) of the Federal Wind Turbine Guidelines Advisory Committee (FAC) has been considering possible incentives to secure wind energy project proponents’ adherence to the voluntary wildlife protection guidelines (Guidelines) which the FAC is developing. The Subcommittee has discussed incentives under the Endangered Species Act (ESA) the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGE). These incentives focus on time- and cost-effective procedures to avoid or minimize wind energy projects’ potential liability for unintended violations of those laws. The Subcommittee has concluded that the MBTA provides more opportunities to develop entirely new incentives than does the ESA, for which a significant number of incentives have already been established by statute, regulations, and guidance documents. The greater historical attention to ESA incentives is likely due in large part to the much more rigorous enforcement regime for violations under the ESA, including the authorization and frequent use of citizen suits. The Subcommittee recognizes that the existence of this broader ESA enforcement interest in the Fish and Wildlife Service (FWS) and the potential for citizen litigation would make incentives under the ESA attractive to the wind energy industry and could therefore increase use of the Guidelines by proponents of projects that might affect endangered or threatened species (listed species).

The Subcommittee is at a point in its deliberations where it would benefit from guidance from the FWS. Therefore, this memorandum identifies questions under the three laws, in some cases lifting the descriptions from the White Paper, adds where appropriate further commentary, and then poses a number of questions for which answers from FWS would be helpful.

The questions are not meant to be exclusive. They are meant to generate discussion so that the FAC is informed on what options to pursue and why. The Subcommittee would benefit from any other thoughts which the FWS might have on each of these incentives.

## II. Endangered Species Act

### 1. General Conservation Plans (also known as “Template HCPs”).

As described in the White Paper, a “general conservation plan (“GCP”) allows the FWS to develop a Section 10(a)(1)(B) conservation plan suitable for the needs of a local area, complete all NEPA requirements for a Section 10(a)(1)(B) ITP issuance, and then issue individual permits to landowners who wish to apply for an ITP and demonstrate compliance with the terms and conditions of the GCP. The development of a GCP is undertaken by the FWS, rather than an individual applicant, and is ideally based upon a conservation strategy for the species and addresses the needs of the local community. Basically, the GCP has everything that is contained in a traditional HCP, including No-Surprises assurances, except the names of the applicant and future permittees. The GCP is not a substitute for a regional multiple action HCP which a county or other jurisdiction may use. Such a large-scale effort would be better developed using the traditional HCP approach because of the complexity of fully analyzing all activities under a regional multiple action HCP.”

The Subcommittee is concerned about the lack of experience of either the FWS or stakeholders with GCPs (established by then FWS Director Dale Hall in an October 5, 2007 “Final General Conservation Policy” memorandum to Regional Directors). That fundamental fact leads to the following questions for the FWS:

- a. What GCPs have been completed or are in preparation? How many listed, proposed, or candidate species are addressed in each GCP? What is the size of the area covered by each GCP? Are the GCPs activity-specific or do they cover multiple types of ground-disturbing activities?
- b. What have been the durations and costs of the preparation processes for GCPs? Would it make a difference if the GCP – perhaps broad in coverage of species and territory – was limited in coverage to a single type of activity, i.e., wind energy projects?
- c. How broad, in both number of listed species and geographical extent, does the FWS believe the coverage of GCPs could be? Most particularly, with experience does the FWS still believe the cautionary note in the Hall memorandum and the White Paper description as to the poor fit of the GCP concept to regional, multiple-species circumstances?
- d. As GCPs are prepared by the FWS and given the agency’s lack of abundant funding and staff resources, what could the wind energy industry and other stakeholders expect as to the number and frequency of GCPs should this instrument become a principal ESA incentive?
- e. How “easy” is the process to obtain individual permits under a GCP? Is it similar to a certificate of inclusion based on a commitment to adhere to the terms of the GCP? Or does it require additional paperwork and analysis focused on site-specific factors?
- f. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

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g. Are there any other questions we should have asked? What would be the FWS response?

### 2. Species-Specific Section 6 State Cooperative Agreements.

As described in the White Paper: “Section 6 of the ESA provides for substantial federal funding of State conservation programs benefiting listed species. Section 6(c) of the ESA authorizes the Secretary to enter into a cooperative agreement with any State or territory which establishes and maintains an adequate and active program for the conservation of endangered species and threatened species. States with cooperative agreements approved by the FWS are eligible to receive funds from the Cooperative Endangered Species Conservation Fund (CESCF) established pursuant to Section 6 of the ESA up to specified limits.

“The ‘adequate and active programs’ established by the States to secure funding under the CESCF are usually skeletal in substance and do not contain provisions for the protection of any specific listed species. These State programs provide no basis for securing take liability immunity. However, Section 6(c) does provide for cooperative agreements with States when ‘plans are included under which immediate attention will be given to those resident species of fish and wildlife [and, in a similar provision, for resident species of plants] which are determined by the Secretary [of the Interior] or the State agency to be endangered or threatened and which the Secretary and the State agency agree are most urgently in need of conservation programs.’ If such a species-specific cooperative agreement is developed, the State, and private landowners or project proponents who enroll in the program, can secure incidental take immunity through an incidental take statement issued by the FWS. The FWS’ decision to approve the species-specific cooperative agreement is a Federal agency action that is subject to the Section 7(a)(2) process; if that process includes formal consultation, the FWS issues an incidental take statement (ITS). For example, the State of Idaho and the Federal government (the FWS and National Marine Fisheries Service) are working on a cooperative agreement specific to listed salmonids in the Snake River basin in which irrigators and private timberland owners could voluntarily enroll and obtain certificates of inclusion that would secure for them the immunity of the ITS if they abide by the agreement’s salmon protection provisions.”

The Subcommittee views this incentive as of possible value in not only providing incidental take protection for wind energy projects but also facilitating State or local permitting of those projects, particularly in States which do not have comprehensive regulatory regimes governing wind energy and which host a limited number of listed species that could be problematic for those projects. The Subcommittee also recognizes that species-specific State cooperative agreements (SCAs) have even less of a track record than may GCPs. The Subcommittee’s questions for FWS are:

- a. To the extent it can be disclosed, what is the status of the proposed Idaho SCA? Again, if possible, could the FWS share with the Subcommittee the basic documentation for the Idaho SCA?
- b. The prior Administration held high hopes for SCAs. However, to the Subcommittee’s knowledge only one – the Idaho SCA – is in preparation and the processing has now consumed five or more years. Is this an “invent the wheel”

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issue, allowing future SCAs to realize the cost- and time-efficiencies originally hoped for, or do SCAs have serious or fatal flaws that would prevent realization of those efficiencies or that cause the preparation to be so protracted?

c. Is it likely to result in undertaking or reinitiating section 7 consultations every two years when an SCA is reviewed and approved? What other specific SCA issues have been identified and have they been resolved?

d. What might be the FWS's expectations as to length of time and cost (since project proponents who expect to enroll will want to participate and, therefore, will likely need, or be invited by the State and/or FWS, to invest in the process) for a "typical" SCA covering one or more listed species and wind energy development?

e. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

f. Are there any other questions we should have asked? What would be the FWS response?

### 3. Conservation Agreements and Memoranda of Understanding.

As described in the White Paper: "A few FWS Regions have experimented with a basic contract between the FWS and a landowner-called a 'conservation agreement' or memorandum of understanding ('MOU') which describes land use activities the landowner intends to take and methods the landowner will use to provide protection for potentially affected listed species. The FWS' signing of a conservation agreement or MOU constitutes an agency action which permits the FWS to issue a biological opinion and ITS which provides incidental take immunity to the landowner as well as the FWS. This technique to secure incidental take immunity was found valid by the Ninth Circuit Court of Appeals in a citizen suit challenge to the Plum Creek conservation agreement. This technique benefits the landowner by requiring significantly less time and fewer procedural steps to secure the incidental take immunity than does an ITP, but it lacks the No-Surprises assurances landowners obtain with an ITP."

The Subcommittee understands that this option has been rarely employed and has not received FWS-wide endorsement or guidance. However, the Subcommittee remains intrigued by its possibilities. First and foremost could be the reduction in cost and time as compared with the procedure-laden HCP process. Second is the perceptual advantage of what the conservation agreement or MOU is not: it is not an HCP. Only two HCPs have ever been prepared on U.S. land-based wind energy projects; none in the coterminous States. The Subcommittee recognizes that the lack of experience with HCPs in the wind energy industry and the known (and the perceived to be increasing) heavy investments in time and funding required to participate in the HCP preparation process have made HCPs a suspect, if not wholly unacceptable, option for the industry.

As a predicate to the questions, the Subcommittee understands that Region 8 has formally recognized conservation agreements in an August 2, 2004 memorandum from Steve Thompson (then Manager of California and Nevada Operations Office) to the field, entitled "Updated Guidance for Designating Critical Habitat on Private Lands on California and Nevada." However, during a working session, the Subcommittee was

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informed by an official from Region 8 of the Region's views as to the option's limitations: e.g., it is used primarily if not exclusively in the context of critical habitat designations; is employed principally for small-scale projects that may not have significant overall impact on listed species; and might not realize the cost- and time-efficiencies over HCPs when applied to larger activities or a large number of activities. However, the Subcommittee is also aware of use of the conservation agreement or MOU option outside of Region 8 in circumstances which have not experienced these perceived weaknesses/limitations: the Plum Creek Timber Company/ FWS/ State conservation agreement covering the grizzly bear and timber harvesting in Swan Valley, Montana; the Stimson Lumber Company/FWS conservation agreement concerning the grizzly bear and timber access roads and harvesting in the LaClerc Bear Management Unit in the Selkirk Mountains, Idaho, and the Georgia Pacific/FWS MOU covering the red-cockaded woodpecker and timber harvesting on all company lands in the Southeast. The Swan Valley conservation agreement was challenged and upheld in a 9th Circuit unpublished opinion, Friends of Wild Swan v. Babbitt, 168 F.3d 498 (table) (text available at 1999 WL 38606) (9th Cir. 1996). The Selkirk Mountains conservation agreement was upheld in Selkirk Conservation Alliance v. Forsgren, 336 F.3d 944 (9th Cir. 2003).

The Subcommittee's questions are:

- a. First and foremost, would the FWS entertain the possibility of adopting officially and "perfecting" the conservation agreement/MOU option for possible application to wind energy projects? Is a Conservation Agreement/MOU a good fit with wind development?
- b. Each wind energy project might be regarded as discrete enough to fit within the Region 8 usage limitations. However, even a streamlined conservation agreement/MOU option is likely to be most attractive to wind energy project proponents when the possibility of affecting listed species is not remote or highly speculative and when incidental take immunity (not avoidance of critical habitat designation) is sought. Could this option be used in circumstances similar to the Swan Valley and Selkirk Mountains conservation agreements and Georgia Pacific MOU where the principal purpose is to secure such immunity and the possibility of incidental take is recognized?
- c. Could the cost- and time-efficiencies perceived by Plum Creek, Simpson, and Georgia Pacific be replicated with wider use of conservation agreements/MOUs?
- d. Does the FWS see any limitations to use of a conservation agreement/MOU.
- e. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?
- f. Are there any other questions we should have asked? What would be the FWS response?

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### **4. “Maximum Take Avoidance/Minimization Habitat Conservation Plans” or Any Other More Descriptive Appellation.**

ESA Section 10(a)(1)(b) and (2) provide for the issuance of incidental take permits (ITPs) to parties proposing ground-disturbing projects that do not involve federal authorizations or funding. Regulations enhance the desirability of such ITPs for proponents by providing No Surprises assurances. Although seeking an ITP is a voluntary action, to qualify for an ITP, the applicant must prepare a habitat conservation plan (HCP) covering the listed species that might be affected by the applicant’s project. The joint FWS/ National Marine Fisheries Service Habitat Conservation Planning Handbook describes certain expedited procedures for “Low-Effect” HCPs. During early discussions concerning ESA incentives, the question was raised whether a similar set of expedited procedures could be offered for wind energy projects that adhere to all Guidelines and any other general FWS protocols for protection of the potentially affected listed species, particularly in those instances where the likelihood of ESA “takes” is, by circumstances or due to application of the Guidelines and protocols, remote or not significant. No further discussion of this incentive option was pursued, but not due to lack of interest. Rather, it was because the option needed an immediate response to a single question from the FWS – i.e., is such a concept one the FWS would consider workable?

- a. Does the FWS view the concept as potentially workable for wind energy?
- b. If so, what general ideas might FWS have as to how broad or limited the circumstances (species, geographic area, type of facility, etc) might be in which this concept could be applied?
- c. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?
- d. Are there any other questions we should have asked? What would be the FWS response?

### **5. Information Processing and Consultation System (IPAC).**

The FAC had the opportunity to view a demonstration of IPAC on March 6, but the Subcommittee is not in a position to evaluate IPAC’s potential to be an ESA incentive for adoption of the Guidelines until more is known about how it works. However, the Subcommittee has been briefed on the IPAC process and is intrigued. The Subcommittee understands that, at present, IPAC is intended to be used only to streamline the Section 7 consultation process, and that it does not have a wind energy component. As a predicate to the questions, the Subcommittee is aware that most wind energy projects lack the “federal nexus” to constitute federal agency actions that are subject to Section 7. Even those projects which require a Clean Water Act 404 permit (typically for access roads) are not amenable to the Section 7 process since the position of the Corps of Engineers is it will only consider adding to the permits those FWS recommendations arising from the Section 7 process that relate to fish or riparian species associated with “waters of the United States” (thus limiting incidental take statement applicability to those listed species least likely to be affected by wind energy projects).

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The Subcommittee's questions for FWS are:

- a. Is it possible (and likely) that a wind energy module would be developed under the IPAC process?
  - b. Can FWS use the IPAC to streamline ESA section 10 processes? What it might look like?
  - c. Could IPAC be utilized in a non Section 7 or Section 10 context?
  - d. If so, does the FWS believe the IPAC process could be structured to include a wind energy module and that module could be designed to incorporate applicable aspects of the Guidelines?
  - e. Given that the IPAC is still in an experimental, or at best nascent, stage, what would be a realistic time horizon to tailor IPAC for application to the wind energy industry?
  - f. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?
  - g. Are there any other questions we should have asked? What would be the FWS response?
- 6. For projects that comply with the FWS guidelines adopted pursuant to the FAC recommendations, can the FWS issue written statements that bird and bat collisions with wind turbines are not considered a violation of the ESA?**
- a. Under what specific circumstances would the Service be able to do this? Are there preconditions that would need to be met, other than compliance with the FWS guidelines?
  - b. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?
  - c. Are there any other questions we should have asked? What would be the FWS response?
- 7. For projects that comply with the FWS guidelines adopted pursuant to the FAC recommendations, will the FWS be able to issue a Technical Assistance Letter that the project is deemed to have marginal or negligible effects on listed species or species of special interest, or is not likely to adversely affect said species?**
- a. Under what specific circumstances would the Service be able to do this? Are there preconditions that would need to be met, other than compliance with the FWS guidelines?
  - b. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

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c. Are there any other questions we should have asked? What would be the FWS response?

### **8. What experience does the FWS have with ESA permits where thresholds are not set?**

a. What are the pre-conditions under which FWS can issue a permit without specific thresholds?

b. How would the FWS recommend setting set thresholds in the absence of population viability studies?

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### III. Migratory Bird Treaty Act

*(These questions presume FWS guidelines would be issued pursuant to the FAC recommendations)*

**1. For projects that comply with the FAC guidelines, can the FWS issue written statements that migratory bird collisions with wind turbines are not considered a violation of the MBTA?**

a. What would the Service need to know about the project, in order to give that assurance?

**2. In a regulation-based approach, how would an incidental take permit under the MBTA be worded given that specific incidental take thresholds are impractical because of the large number of species and the differences in abundance (or status) of species covered by this statute?**

a. What experience does the FWS have with issuing MBTA permits without specific thresholds?

b. How would the FWS recommend setting set thresholds in the absence of population viability studies?

c. What are the pre-conditions under which FWS can issue a permit without specific thresholds, including but not limited to compliance with NEPA in connection with adoption of an incidental take regulation and issuance of incidental take permits?

d. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

**3. For projects that comply with the FAC guidelines, can the FWS issue statements of enforcement assurance to a wind energy developer with respect to a particular project, and how would such enforcement assurance letters be worded?**

a. In the event that the staff explores an enforcement assurance-based approach, what project specific notice and other requirements might be applicable?

b. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

**4. Are there any other questions we should have asked? What would be the FWS response?**

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### IV. Bald and Golden Eagle Protection Act

*(These questions presume FWS guidelines would be issued pursuant to the FAC recommendations)*

**1. For projects that comply with the FAC guidelines, can the FWS issue written statements that eagle collisions with wind turbines are not considered a violation of the B&GEPA?**

a. What would the Service need to know about the project, in order to give that assurance?

**2. For projects that comply with the FAC guidelines, can the FWS issue statements of enforcement assurance to a wind energy developer with respect to a particular project, and how would such enforcement assurance letters be worded?**

a. In the event that the staff explores an enforcement assurance-based approach, what project specific notice and other requirements might be applicable?

b. How feasible would it be to implement this approach? What is the level of confidence of the Service with this option?

**3. Are there any other questions we should have asked? What would be the FWS response?**

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### V. Other

**1. Self-certification protocol:** In general, could the FWS agree to a "self-certification" process that establishes conformance with the guidelines (similar to CWA Section 404 Nationwide Permit self-certification)? [Assume there would be appropriate objective thresholds, applicable BMP's, guideline Tier 1 through 4 requirements, objective criteria for evaluation and disapproval by US FWS (i.e., a project would not qualify if it doesn't meet threshold criteria), and an appeal process if FWS says no.]

**2. Mitigation offset incentive:**

The description of a mitigation offset incentive is appended to this list of questions. This incentive provides recognition that wind power offsets emissions from conventional energy sources, "externalities" and that this offsetting has wildlife direct and indirect benefits. This incentive would establish a financial offset that could be used by a project developer. In order to develop and use such an incentive would a new regulation be required? How feasible would it be to implement this approach?

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### Scientific Tools & Procedures Subcommittee DRAFT Tier 1 and Tier 2 Methods

March 24-26, 2009

**Tier 1 Methods: to be inserted in “Second Release Draft One-Text from Synthesis for FAC Briefing 3-13-09\_Sent 3-12-09” at Line 464.**

Answers to the above questions may determine whether suitable sites are available in the region where development is being considered and developers can then decide whether to proceed to further tiers (See Tier 2-5 below) as they plan for development of those sites. Developers should review the publicly available data, and the analysis of available sites in the region of interest will be based on a blend of the information available in published and unpublished reports, wildlife range distribution maps, and other such sources.

The purpose of this tier is assist the developer in identifying wind energy development sites with few if any potential conflicts with wildlife. A developer’s decision to proceed with further review of potential sites with “yes” answers to any or all of the above questions will entail more detailed studies in Tier 2 and Tier 3 for species considered at risk from the development. Yes answers will also usually result in stronger scrutiny from those state, federal, and tribal agencies that have responsibility for protecting wildlife resources.

While the answer of “no” to the questions where data exists may be encouraging to a developer, an answer of “no” in the absence of data will not necessarily indicate an absence of wildlife conflicts. If a site is selected for further analysis in the absence of data adequate to definitively answer the questions, the developer should attempt to locate the data necessary to answer the questions posed in Tier 2.

**Tier 2 Methods: to be inserted in “Second Release Draft One-Text from Synthesis for FAC Briefing 3-13-09\_Sent 3-12-09” at Line 491.**

Obtaining answers to Tier 2 questions will involve a more thorough review of the existing site-specific information. It is expected that the developer will make contact with federal, state, tribal, and/or local agencies that have jurisdiction over the project or information about the potentially affected resources. In addition, because key non-governmental organizations (NGOs) and relevant local groups are often valuable sources of relevant local environmental information, we recommend that developers contact NGOs, even if the developer is not able to identify specific project location information at this stage due to confidentiality concerns. These contacts also provide an opportunity to identify other potential issues and data not already identified by the developer.

A distinguishing feature of Tier 2 site characterization is that it involves one or more visits to the prospective sites. In particular, a site visit will normally be conducted to

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confirm the presence of habitat suitable for species of special interest (e.g., Federal and state listed species, species of conservation concern, species considered at high risk to collisions, etc.), the quality of the habitat, the presence of unique topographic or botanical features and an early indication of the potential for avoidance or mitigation of unavoidable impacts. A sample Site Characterization Study Scope of Work is provided in the Appendix (see attached).

As with Tier 1, “yes” answers to any or all of the above questions would indicate potential wildlife conflicts that might preclude or substantially increase the difficulty of wind energy development. Developers should also evaluate whether the data collected from a more detailed site characterization are adequate to evaluate risks to wildlife resulting from the potential wind energy development. For example, do the available data adequately characterize the presence and abundance of wildlife species of interest and their habitat? Furthermore, does information exist that allows the evaluation of risk to the same or similar species? The most likely source of this information is impact assessments from existing wind facilities operating in similar landscape types.

A developer may decide to abandon the project after Tier 2 analysis, or s/he may decide that potential conflicts can be easily avoided or minimized by the project design. Alternatively, the available data may not be sufficient to characterize the site and/or evaluate risk. If the developer wishes to pursue the potential development of the site then s/he should proceed to the more detailed field studies in Tier 3.

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### Scientific Tools & Procedures Subcommittee March 24-26, 2009

Attached please find three topics from the Scientific Tools & Procedures Subcommittee for FAC consideration.

1. Tier 3 Methods:
  - a. Example of level of detail
  - b. Example of prescriptive v. descriptive
2. Methods for Post-Construction Fatality Studies
3. Two Options for Structuring Tiers 4 and 5

#### ❖ **Topic One: Tier 3 Methods**

The Scientific Tools & Procedures Subcommittee has drafted recommended methods for Tier 3. These methods are not included in the current draft of the One-Text. The Subcommittee would like the FAC's guidance on several questions prior to revising the methods, agreeing on them, and sending them to the Synthesis Workgroup to be incorporated into the One-Text.

The level of detail for the recommended studies varies throughout the Subcommittee's draft Tier 3 Methods. Therefore, the Subcommittee selected one section of the Tier 3 Methods that they propose as an example of the desired level of detail. They would like the FAC's feedback on this section's level of detail and on the criteria that should be used for determining the level of detail, both for commonly used studies and less-commonly used studies. The introduction to the Tier 3 Methods is also included here, followed by the section to be examined.

The Scientific Tools & Procedures Subcommittee also requests feedback from the FAC on whether the methods should be *prescriptive* (for example, the FAC would recommend the "best tools" for each study) or *descriptive* (the FAC would describe all the tools that are commonly used for a study without advocating aggressively for one in particular). The Subcommittee has illustrated these different options by using one section of the Tier 3 Methods and writing it first in a prescriptive way and then in a descriptive way, so that the FAC can compare the two. The approach preferred by the FAC will then be utilized throughout the rest of the methods document.

#### **Introduction to Tier 3 Methods (to be inserted in Chapter 3, Section C, p. 12 of the Second Release Draft One-Text)**

Information in the *Recommendations* is specifically designed to be flexible to accommodate local and regional concerns. The decision to conduct a Tier 3 study depends on whether or not additional data are necessary to answer questions of interest.

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For example, if adequate data are available from nearby sources and/or from studies of the site being evaluated, then additional studies may be unnecessary.

The specific protocol used in Tier 3 studies depend on the question being addressed. Additionally, a reduced level of survey effort may be warranted for certain projects, such as infill development, some repowering projects, or projects contiguous to existing low-impact wind facilities provided these projects have sufficient credible information regarding impacts. When additional studies are warranted, the selected protocols will need to be adjusted to accommodate unique, site-specific conditions such as the species of birds and bats using the site, the frequency and type of bird and bat use, landscape characteristics of the site including terrain and vegetation. One year of pre-permitting surveys are typically adequate to answer Tier 3 questions. In some cases depending on the species involved, issues and the question to be answered, sample design, survey duration and intensity may need to be expanded. Decisions on the level of survey effort need to be made in discussion with industry, the lead agency, state wildlife agencies, U.S. Fish and Wildlife Service, and local conservation groups as appropriate.

The tier 3 level is the first level in which scientifically rigorous studies may need to be conducted. In most cases we recommend the use of common methods and metrics for understanding the bird and bat activity at a site and for answering the questions provided at the beginning of Tier 3 discussion. Standard methods and metrics provide great benefit over the long-term, allowing for comparisons among projects (e.g., meta-analysis) and for certainty regarding what will be asked of industry in general for each project. Varying from the standard methods we recommend should be carefully considered, scientifically justified and vetted with the USFWS, the permitting agency, state wildlife agencies and other involved stakeholders.

This document does not discuss all the methods and protocols established for terrestrial species of special interest, their habitats and important natural communities. Often special interest species and communities have specific protocols required by local, state or federal agencies. The need for special surveys and mapping should be discussed with the appropriate stakeholders in order to address all species and situations adequately.

The answer to Tier 3 questions may also require more complex study designs requiring preconstruction data, for example Before-After-Control-Impact (BACI) study. Even though they begin in Tier 3, these studies are considered Tier 5 studies because they are completed following a year or more of turbine operation.

The discussion below therefore does not make specific recommendations on duration or frequency of sampling or study design. Instead, scientists experienced with the techniques must tailor the study design and sampling protocol to the unique features of each site and to the specific questions to be answered.

It is unlikely that a single method can adequately assess potential collision for birds and bats. For example, answering questions regarding nocturnally active avian species such as migrating passerines are likely to require a combination of remote sensing tools such

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as marine and NEXRAD radar and indirect inference from diurnal surveys during the migration period.

Many of the methods used to answer Tier 3 questions are areas of active research and worthy of investigation by collaborative, public-private research partnerships with federal and state agencies, wind energy developers and non-governmental organizations interested in wind-wildlife interactions. While we recommend the use of standard methods we also recognize the need to use the results of this research when existing methods are improved or new methods are developed.

Below are questions that should be considered for Tier 3. The questions are stated and answered in general. In some cases greater detail is given regarding more common methods and metrics

### **a) Example of Proposed Level of Detail to include in Tier 3 Methods**

#### **Birds**

##### **Standardized methods and metrics**

The standardized data collection method for diurnal birds is the bird use count following a scientific protocol. Depending on characteristics of a proposed project site and the bird species potentially affected by the project, additional pre-permitting study methods may be necessary.

For nocturnal migratory birds, conduct additional studies as needed if characteristics of the project site and surrounding areas potentially pose a high risk of collision to migrating songbirds and other species. This document discusses some of the primary tools available to study nocturnal birds ( for example radar, acoustic monitoring, visual monitoring) but does not provide standardized recommendations on duration or frequency of sampling or study design.

Early discussions with the permitting agency, USFWS, state wildlife agency and local interested conservation organizations is a crucial step in designing pre-permitting studies and deciding whether or not modifications to the standardized methods are warranted.

##### **Bird Use Counts**

The primary diurnal avian survey technique for pre-permitting studies at wind energy project areas is the bird use count (BUC). Small bird counts (SBCs), area searches, raptor nest searches, and a variety of other methods may also be needed if BUCs are not adequate to answer questions about bird use and potential impacts. BUCs estimate the spatial and temporal use of the site by all birds, including large birds such as raptors, vultures, corvids, and waterfowl, as well as songbirds and other small species.

All of these survey techniques require experienced surveyors who are skilled at identifying the birds likely to occur in the project area and who are proficient at accurately estimating vertical and horizontal distances.

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The bird use count (BUC) may be a modified point count that involves an observer recording bird detections from vantage points throughout the potential area being considered for development for a specified time period. In some landscapes, such as open prairies, belt transects can be used in place of point counts. The BUC provides information regarding bird species and their use of the project site.

**Sampling Duration/Frequency:** The sampling duration and frequency will be determined on a project-by-project basis. The most important consideration for sampling frequency is the amount of variation expected among survey dates and locations. It is common to conduct BUCs for 20 or 30 minutes once a week for a year in some locations and once a week during the migration periods and twice per month during other periods of occupancy in others. BUCs should cover most daylight hours and weather conditions. However, each project needs to be considered individually. Please refer to the NWCC revised M&M (2009) document for detailed discussions regarding protocols.

**Number/Distribution of Sample Points:** A systematic sample of points is recommended to allow for statistical extrapolation of data to the area of interest. Alternatively, one can approximate a census of the areas proposed for a development. For large birds, select BUC sample sites at vantage points that offer relatively unobstructed views of the surrounding terrain for a radius of approximately 800 meters. For the census of an area sites should be approximately 5,200 feet (1,600 meters) apart throughout the proposed facility, coinciding with proposed turbine sites. Distribute sample points to cover areas of the project site where turbines will be located. In the case of small birds the plot radius should be approximately 50 m and a sample survey of the development site will be required (see discussion below for small bird count s). Refer to NWCC revised M&M (2009) document for more detailed discussion of sampling plans.

**Variables:** For each observation period record number and species of birds observed, distance from bird to observer, flight height above ground at the location of the bird, and environmental variables that are likely to affect bird use (for example, wind speed). Refer to the NWCC revised M&M document for detailed discussion of data documentation.

**Metrics:** The metric for all bird use may be expressed a number of ways. Thus, recording the total number of birds seen during each survey period, the total number of birds seen at each altitude band, and the total amount of time for each sample survey point and the area surveyed should allow for comparisons with scores of studies around the nation. For large birds we recommend that the amount of time each observed bird spends in the surveyed area for the entire survey period be recorded. Thus, the amount of time a bird spends in the zone of risk can be quantified resulting in a better estimate of risk.

### **b. Examples of Prescriptive vs. Descriptive Language in Tier 3 Methods**

- **Tier 3, Question 1:** Do field studies indicate that threatened, endangered, federal "sensitive", state listed species, or other special status species present on or likely to use the proposed site?

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### Methods

#### **Original Language: Descriptive**

In some situations mist-netting bats is required by state agencies and the USFWS to determine the presence of threatened, endangered or otherwise rare species. As with acoustic surveys, both spatial and temporal variation should be accounted for by conducting surveys several times across the breeding and migratory seasons. Combining acoustic monitoring using time-expansion detectors with mist-netting is recommended when the objective is to determine presence of threatened, endangered or otherwise rare species.

#### **Alternative Language: Prescriptive**

We do not recommend mist-netting as a standard method for assessing risk of wind development to bats for the following reasons: 1) the technique yields captures of bats per unit effort, therefore only providing an index of abundance; 2) not all proposed or operational wind energy facilities offer conditions conducive to capturing bats and often the number of suitable sampling points is minimal; and 3) netting efforts often occur at water sources offsite or harp trapping at nearby roosts, and the results may not reflect species presence or use on the site where turbines are to be built.

Nevertheless, mist-netting bats is required in some situations by state agencies and the USFWS to determine the presence of threatened, endangered or otherwise rare species, and in these cases this technique should be combined with acoustic monitoring using time-expansion detectors. Trapping efforts should concentrate on potential commuting, foraging, drinking, and roosting sites. Methods for assessing colony size, demographics, and population status of bats can be found in O'Shea and Bogan (2003). Kunz et al. (1996) provide detailed guidelines on capture techniques for bats, including mist-nets and harp traps.

- **Tier 3, Question 3:** What is the distribution, relative abundance, behavior, and site use of wildlife determined to be of interest in Tiers 1 and 2, and to what extent do these factors expose these species to risk from the proposed wind power project

### Methods

#### **Birds - Original Language: Descriptive**

Mist-netting is sometimes used to augment observational bird data. Mist-netting cannot generally be used to develop indices of relative bird abundance, nor does it provide an estimate of collision risk. However, it can document fallout or heavy use by migrants at migrant stopover sites in or near proposed turbine sites. Operating mist-nets is expensive and requires considerable experience, as well as state and federal permits. If mist-netting is to be used, follow procedures for operating nets and collecting data in accordance with Ralph et al. (1993).

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### **Birds - Alternative Language: Prescriptive**

We do not recommend mist-netting as a technique for estimating relative bird abundance as the result does not lead to a meaningful estimate of collision risk. The technique is expensive and requires considerable experience to use effectively and minimize stress to the animals.

### **Bats – Original Language: Descriptive**

Bat biologists and experts generally do not consider mist-netting for bats to be an effective method for assessing potential risk to bats at a proposed wind energy site (Kunz et al. 2007). Mist-netting bats yields captures of bats per unit effort, and only serve as an index to abundance. However, not all proposed or operational wind energy facilities offer conditions conducive to capturing bats and often the number of suitable sampling points is minimal. Sometimes netting efforts occur at water sources offsite or harp trapping at nearby roosts, which may not reflect species presence or use on the actual site where turbines are to be built.

Mist-netting and acoustic monitoring are complementary techniques that, used together, can provide an effective means of inventorying the species of bats present at a site (O'Farrell et al., 1999). If mist-netting is to be used to augment acoustic monitoring data at a project site, trapping efforts should concentrate on potential commuting, foraging, drinking, and roosting sites. Methods for assessing colony size, demographics, and population status of bats can be found in O'Shea and Bogan (2003). Kunz et al. (1996) provide detailed guidelines on capture techniques for bats, including mist-nets and harp traps.

### **Alternative Language: Prescriptive**

For the reasons described in the methods for question 1 above, mist-netting should not be used to assess bat collision risk at a wind energy site. Mist-netting is best used in combination with acoustic monitoring to inventory the species of bats present at a site (O'Farrell et al., 1999).

### **❖ Topic Two: Methods for Post-Construction Fatality Studies (to be inserted in Chapter 3, Section E, p.14 of the Second Release Draft One-Text)**

These methods focus specifically on post-construction fatality monitoring and involve searching for bird and bat carcasses beneath turbines to determine overall fatality rates, and to answer other questions regarding species composition of fatalities, relationships with site characteristics, comparison of fatalities among facilities, comparison of actual and predicted fatality rates estimated in previous tiers, and determining if fatality rates warrant corrective management or mitigation measures. The level of effort and seasonality of studies may vary depending on several factors, including site sensitivity and risk level, amount and quality of existing data from nearby sites, seasons of occupancy, and affected species of interest. The questions and methods described here generally assume at least two years of post construction data. The suggestion of two years

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of study is consistent with most state guidelines and provides some indication of variation among years.

### **Methods for Estimating Fatality Rates**

More detailed descriptions and methods of fatality search protocols and can be found in the California (California Energy Commission 2007) and Pennsylvania (PGC 2007) state guidelines and the following publications: Kunz et al. (2007), Smallwood (2007), and the revised methods and metrics document (citation coming soon). Protocols should be standardized to the greatest extent possible, especially for common objectives and species of interest. However, some situations warrant exceptions to standardized protocol, and the responsibility of proving that an exception is appropriate and applicable should be on the stakeholder attempting to justify increasing or decreasing the duration or intensity of operations monitoring.

**Duration and Frequency of Monitoring:** Duration and frequency of fatality searches within a year will vary depending on a number of factors, but especially the questions to be answered, species and seasons of interest and carcass removal rates. Search intervals may vary from 1–7 days or longer, as long as standard search methods are employed and sampling biases (search efficiency and scavenger removal) are adequately accounted for (see below). For example, if the primary objective of fatality searches is fatalities of large raptor and carcass removal is low, then longer frequency between searches (e.g., 14 days) could be warranted. If, however, bats and small birds in areas where carcass removal is high is the primary objective, then shorter search intervals will be needed. We suggest that each search plot should be divided into oblong subplots or belt transects and that each subplot be carefully searched. The objective is to find as many carcasses as possible so the width of the belt will vary depending on the ground cover and how it influences visibility of carcasses.

**Number of Turbines to Monitor:** If existing data from facilities in similar conditions in the same region are available, these data should be used to determine variability among turbines to determine needed sample size (see M&M). If data are not available, then a sufficient number of turbines should be selected via a systematic sample with a random start point. Sampling plans can be varied (e.g., rotating panels [M&M update]) to increase efficiency as long as a probability sampling approach is used. If the project contains less than 10 turbines, all turbines in the project area should be searched unless otherwise agreed to by the regulating agencies.

**Delineation of Carcass Search Plots, Transects, and Habitat Mapping:** Evidence suggests that >80% of bat fatalities fall within  $\frac{1}{2}$  the maximum distance of turbine height to ground (Erickson 2003 a, b), and a minimum plot radius of 60 m from the turbine should be established for bat carcass searches at sample turbines. Plots will need to be larger for birds (up to the maximum distance of turbine height to ground) and consideration of the objective for the fatality survey and consultation with the regulating agency is recommended. However, searchable area within the theoretical maximum plot size varies and heavily vegetated areas (e.g., eastern mountains) often do not allow

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surveys to consistently extend to the maximum plot radius; thus, the searchable area of each turbine must be delineated and mapped to adjust fatality estimates based on the actual area searched. If needed, habitat visibility classes should be established in each plot to account for differential detectability. It may be necessary to develop visibility classes for different landscapes (e.g., rocks, vegetation) within each search plot. For example, PGC (2007) identified 4 classes based on the percentage bare ground.,

The use of visibility classes will require that detection and removal biases be estimated for each class. Fatality estimates would be made for each class and summed for the total area sampled. Global positioning systems (GPS) are useful for accurately mapping the actual total area searched and area searched in each habitat visibility class, which can be used to adjust fatality estimates. The width of the belt or subplot searched may vary depending on the habitat and species of interest; the key is to determine actual searched area and area searched in each visibility class regardless of transect width.

**General Search Protocol Guidance:** Trained searchers should look for bird and bat carcasses along transects within each plot and record and collect all carcasses located in the searchable areas. A complete search of the area should be accomplished and transect width should be adjusted to compensate for detectability differences in the search area. Search plots should be closer together when vegetation makes it difficult to detect carcasses, conversely, search plots can be wider in open terrain. Search plot width can vary depending on the size of the species being looked for, for example, small species such as bats may require narrower search plots than larger species such as raptors. Data to be recorded includes date, start time, end time, observer, which turbine area was searched and weather data for each search. When a dead bat or bird is found, the searcher should place a flag near the carcass and continue the search. After searching the entire plot, the searcher returns to each carcass and records information on a fatality data sheet, including date, species, sex and age (when possible), observer name, turbine number, distance from turbine, azimuth from turbine, habitat surrounding carcass, condition of carcass (entire, partial, scavenged), and estimated time of death (e.g.,  $\leq 1$  day, 2 days). Rubber gloves or an inverted plastic bag should be used to handle all carcasses to reduce possible human scent bias for carcasses later used in scavenger removal trials. Carcasses should be placed in a plastic bag and labeled. Fresh carcasses, those determined to have been killed the night immediately before a search, should be redistributed at random points on the same day for scavenging trials.

**Field Bias and Error Assessment:** It has long been recognized that during searches conducted at wind turbines, actual fatality is incompletely observed and that carcass counts must be adjusted by some factor that accounts for imperfect detectability. Important sources of bias and error include: 1) fatalities that occur on a highly periodic basis; 2) carcass removal by scavengers, 3) detectability by different searcher, often referred to as searcher efficiency, 4) failure to account for the influence of site (e.g. vegetation) conditions in relation to carcass removal and searcher efficiency, and 5) fatalities or injured bats that may land or move outside search plots.

## Attachment H

All fatality studies must conduct carcass removal and searcher efficiency trials using accepted methods discussed in the revised methods and metrics document (citation coming soon). Bias trials should be conducted throughout the entire study period and searchers should never be aware which turbines are to be used or the number of carcasses placed beneath those turbines during trials. Prior to a study's inception, a list of random turbine numbers and random azimuths and distances (m) from turbines should be generated for placement of each bat or bird used in bias trials. Data recorded for each trial carcass prior to placement should include date of placement, species, turbine number, distance and direction from turbine, and visibility class surrounding the carcass. Trial carcasses should be distributed as equally as possible among the different visibility classes throughout the study period and study area. Studies should attempt to avoid "over-seeding" any one turbine with carcasses by placing no more than one or two carcasses at any one time at a given turbine. Before placement, each carcass must be uniquely marked in a manner that does not cause additional attraction and have its location recorded. There is no agreed upon sample size for bias trials, though some state guidelines recommend 200 carcasses and a minimum of 50 be used seasonally (PGC 2007). Most researchers agree that sample size of carcasses used for bias trials should be maximized to the greatest extent possible. Some fatalities may occur on a highly periodic basis creating a potential sampling error. We recommend that sampling be scheduled so that some turbines are searched most days so that episodic events are more likely detected, regardless of the search interval. Carcasses or injured bats may land or move outside the search plots. This potential sampling error can be estimated by sampling outside the standard search plot for a subsample of turbines.

**Estimators of Fatality:** If there were a direct relationship between the number of carcasses we observe and the number that were killed, there would be no need to develop a complex estimator that adjusts observed counts for detectability, and observed counts could be used as a simple index of fatality. But the relationship is not direct and raw carcass counts recorded using different search intervals and under different carcass removal rates and searcher efficiency rates are not directly comparable. Only the most contemporary equations for estimating fatality should be used, as some original versions are now known to be extremely biased under many commonly encountered field conditions; the revised methods and metrics document should be used as a current source for estimators of fatality (citation coming soon).

### **Objectives and Metrics used for Fatality-Related Questions**

1. What is the bird and bat fatality rate for the project?

The primary objective of fatality searches is to determine the overall estimated fatality rate for birds and bats for the project. These rates serve as the fundamental basis for all comparisons of fatalities and if studies are designed appropriately they allow the development of relationships with site characteristics and environmental variables, and evaluation of mitigation measures. Fatality rates should be expressed on a per turbine and per MW basis.

2. What are the fatality rates of those species determined to be of special interest?

## Attachment H

This analysis simply involves calculating fatalities per turbine and per MW of all species of interest at a site when sample sizes are sufficient to do so.

### 3. How do the estimated fatality rates compare to the predicted fatality rates?

There are a number of ways that predictions can be assigned and later evaluated with actual fatality data. During the planning stages in Tier 2, predicted fatalities may be derived from existing data at similar facilities in the region. In Tier 3, metrics derived from pre-construction assessments for an individual species or group of species, usually an index of activity or abundance could be used in conjunction with fatalities at other facilities to develop a model for predicted estimating fatalities at other facilities. Several statistical methods can be found in the revised methods and metrics document (citation coming soon) and used to evaluate predictions. Metrics derived from Tier 3 pre-construction assessments may be correlated with fatality rates, and using the facility as the experimental unit, in Tier 5 studies it should be possible to determine if different preconstruction metrics can in fact predict fatalities and, thus, risk. There are two approaches to estimating fatalities, model based and the use of fatality rates at existing facilities in similar landscapes with similar bat or bird use. Additionally, if differences in use among the assessment area pre and post-construction exist, these differences can be used to adjust the predicted fatalities.

### 4. How do the fatality rates compare to the fatality rates from existing facilities in similar landscapes with similar species composition and use?

Comparing fatality rates among facilities with similar characteristics is useful to determine patterns and broader landscape relationships. Fatality rates should be expressed on a per MW or some other standardized metric basis for comparison with other facilities, and can be correlated with site characteristics such as proximity to wetlands, riparian corridors, mountain-foothill interface, or other broader landscape features using regression analysis. Comparing fatality rates from one project to fatality rates of other projects provides insight into whether a project has relatively high, moderate or low fatalities. Comparing fatality rates for a project with other project fatality rates that also have BUC data will further aid the prediction of fatalities in future projects.

### 5. Do bird and bat fatalities vary within the facility in relation to site characteristics?

Turbine-specific fatality rates can be related to site characteristics such as proximity to water, forest edge, or other key resources and this relationship may be estimated using regression analysis. This information is particularly useful to determine future micro-siting options when planning a facility or, at a broader scale, in determining the location of the entire facility.

### 6. What is the composition of fatalities in relation to migrating and resident birds and bats at the site?

## Attachment H

The most simplistic way to address this question is to separate fatalities per turbine of known resident species (e.g., big brown bat, prairie horned lark) and those known to migrate long distances (hoary bat, red-eyed vireo). These data are useful in determining patterns of species composition of fatalities and possible mitigation measures directed at either residents, migrants, or perhaps both and can be used in the assessment of potential population effects. This approach assumes that resident and migratory species are different, a difficult assumption to defend with a widely dispersed species. More detailed investigations using stable isotope and genetic analyses may be conducted in Tier 5.

### 7. Do fatality data suggest the need for mitigation measures to reduce risk?

Fatality rates that trigger specific mitigation measures have not yet been established, but should be on a more local scale such as the state or by broad habitat types with similar risk levels (e.g., forested ridges). Evaluation of mitigation methods would occur in Tier 5, if there was uncertainty about whether the mitigation measure would meet the objective of reducing risk of fatalities.

### ❖ **Topic Three: Options for Structuring Tiers 4 and 5 (Chapter 3, Section E, p.14 of the Second Release Draft One-Text)**

#### **Original Approach to Tiers 4 and 5: Summary**

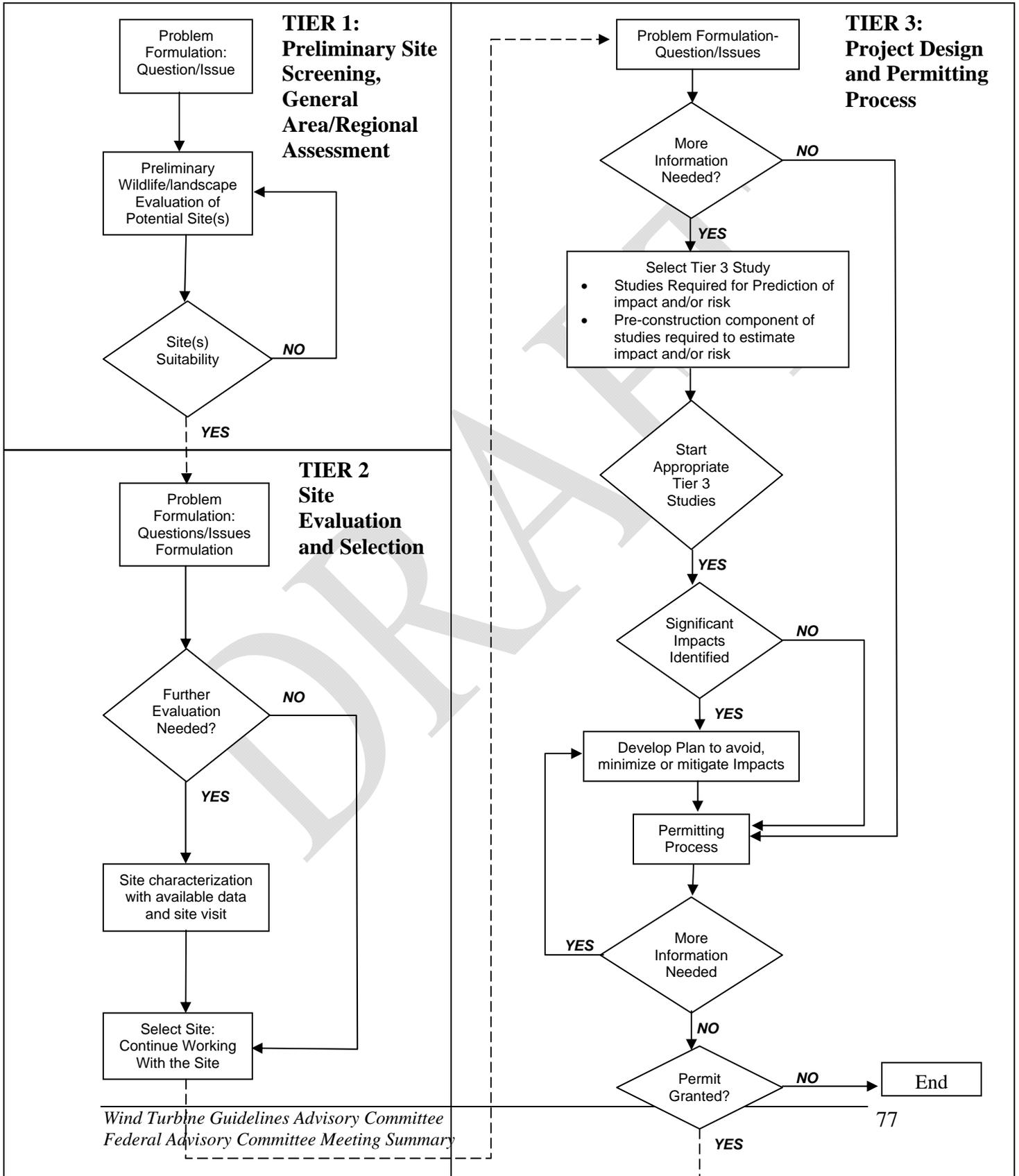
**Rationale:** The original five tiers were designed such that each additional tier represents a greater investment in data collection, which may be required to answer certain questions. Tiers 1-3 are pre-construction activities and are typically sequential investigations. Tiers 4-5 occur as post-construction activities and may occur simultaneously. In the original approach, the definitions of Tier 4 and Tier 5 are consistent with the philosophy of the tiered approach - of going from easier, simpler, quicker, and less expensive, to harder, more complicated, more time consuming and more expensive studies. Tier 4 will occur at most sites and Tier 5 may occur at most but not all sites.

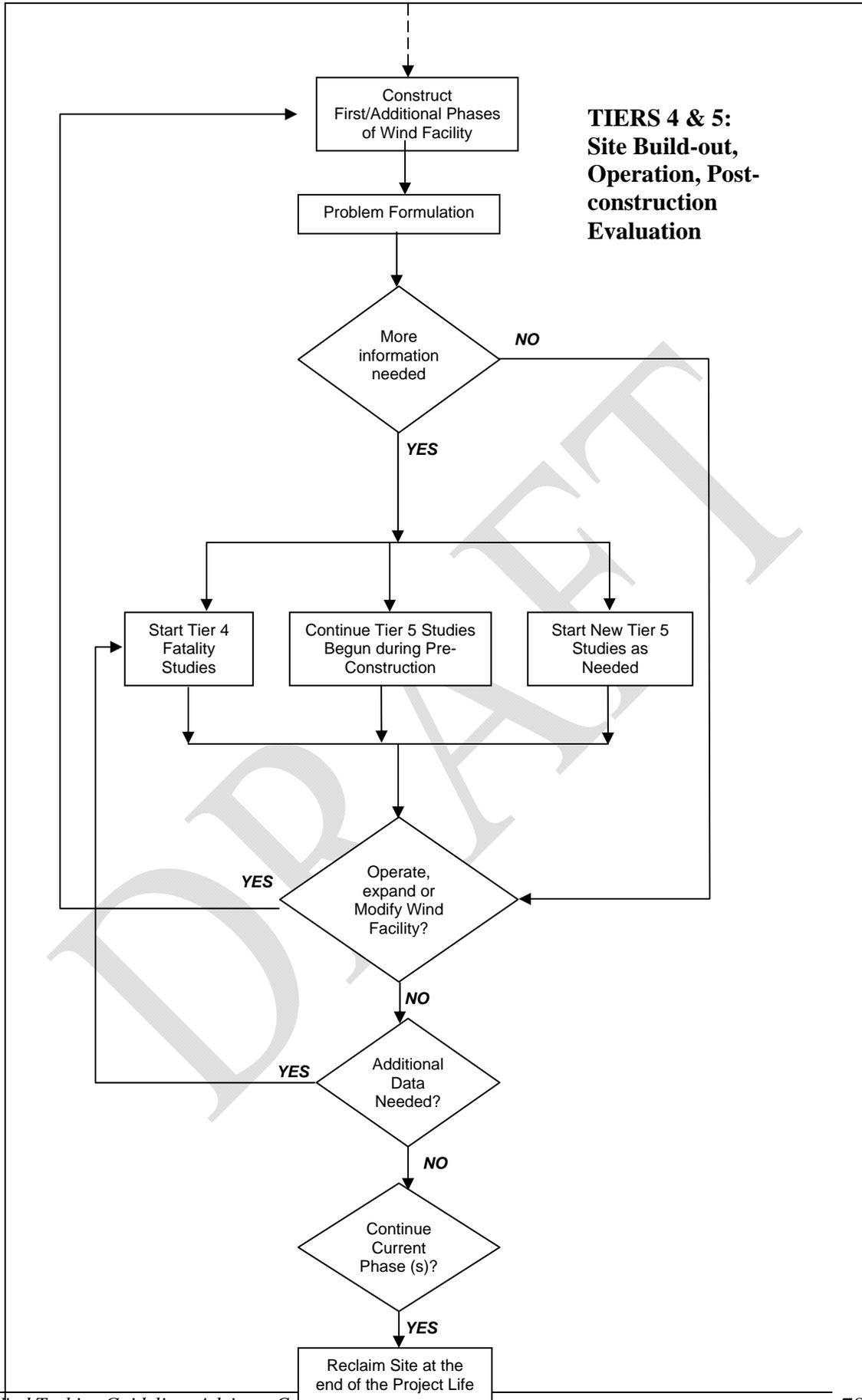
**Attachment H**

<b><u>Tier 4: Post-construction estimate of fatalities</u></b>	<b><u>Tier 5: Post-construction estimates of habitat impacts; evaluation of mitigation plans</u></b>
<ul style="list-style-type: none"> <li>- May happen at the <i>same time</i> as Tier 5</li> <li>- Commonly conducted at most wind facilities</li> <li>- Begin during the first year of operation</li> <li>- Occur for a minimum of one year</li> <li>- Use common methods and metrics</li> <li>- Address a ubiquitous concern</li> </ul>	<ul style="list-style-type: none"> <li>- May happen at the <i>same time</i> as Tier 4</li> <li>-Occurs at most but not all sites, when habitat impacts are a concern AND/OR when fatality or habitat impacts suggest additional mitigation measures are needed</li> <li>- Usually occur for multiple years</li> <li>- May have a preconstruction component</li> <li>- Use methods and metrics unique to the site and the question</li> <li>- May begin the first year of operation (e.g., habitat impact evaluation and evaluation of pre-construction required mitigation measures) OR later (e.g. when fatalities suggest additional risk reduction measures are necessary).</li> <li>- May also include a continuation of studies begun in Tier 3 (e.g., BACI-type studies)</li> </ul>

**Attachment H**

**Original Framework for Minimizing Impact of Wind Development on Wildlife in the Context of the Siting and Development of Wind Power (Appendix E from First Release Draft One-Text)**





**TIERS 4 & 5:  
Site Build-out,  
Operation, Post-  
construction  
Evaluation**

**Attachment H**

**Alternative Approach to Tiers 4 and 5: Summary**

<b><u>Tier 4: Post-construction estimate of fatalities and habitat impacts</u></b>	<b><u>Tier 5: Other Studies</u></b>
<ul style="list-style-type: none"> <li>- Comes <i>before Tier 5</i> and includes <i>all</i> immediate post-construction monitoring</li> <li>- Usually occur for multiple years</li> <li>- May have a preconstruction component</li> </ul> <p>Uses a mixture of common and unique methods and metrics Occurrence at facilities variable</p> <ul style="list-style-type: none"> <li>- Addresses both fatalities, habitat, and indirect impacts</li> <li>- Begins the first year of operation (e.g., habitat impact evaluation and evaluation of pre-construction required mitigation measures)</li> </ul>	<ul style="list-style-type: none"> <li>- Comes <i>after Tier 4</i></li> <li>- Extended studies: usually occur for multiple years</li> <li>- Use methods and metrics unique to the site and the question</li> <li>- Begins after Tier 4 projects are complete, usually after the first year, but could be later (e.g. when fatalities suggest additional risk reduction measures are necessary).</li> </ul>

- **Tier 4 – Post-construction estimate of fatalities and habitat impacts**
- **Tier 5 – Other studies**

**Rationale:**

As originally conceived, the ‘Tiered Approach’ includes only fatality studies (direct impacts) in Tier 4, and all other post-construction studies are relegated to Tier 5. We suggest that both direct and indirect impacts be included in Tier 4, and extended studies be conducted, where needed, in Tier 5. We believe this will help avoid confusion and will more clearly address habitat and displacement impacts.

In Tiers 1 through 3, the Science Tools & Procedures (ST&P) subcommittee has approved a simple logical framework for pre-construction phases of wind power projects. Each Tier includes the elements necessary to complete a full assessment of risks appropriate do that stage in development. Each Tier includes the elements necessary at an appropriate depth of analysis, and timing in the planning stage, to reach informed decisions. A project developer or consultant can “check off” items within the Tier and proceed to the next Tier. This logic should be continued into Tier 4, the immediate post-construction phase of projects. Logical continuity will help avoid confusion for developers and consultants using USF&WS guidelines.

## Attachment H

Tiers 4 and 5, as currently written, have already resulted in significant confusion among members of the ST&P subcommittee as evidenced by lengthy discussions. Repeatedly, there has been confusion whether Tier 4 precedes Tier 5, or whether they are addressed simultaneously. This raises the possible misinterpretation that Tier 5 studies do not need to be undertaken if Tier 4 studies provide mortality results “within expectations”. While we understand that the likelihood of misinterpretation might be reduced through careful wording in the narrative, we believe it is best to avoid the potential confusion by continuing the logic contained within the preceding pre-construction Tiers 1 through 3. Tier 4 should include all elements needed in the immediate post-construction monitoring of wind power projects.

The ST&P subcommittee has agreed that indirect effects such as habitat impacts, landscape fragmentation, and avoidance behaviors are important factors that need to be included in the Tiered Approach. In fact, several ST&P subcommittee members believe that these impacts may have greater importance than direct impacts (fatalities). The current content of Tier 4 (addressing only fatality issues) and Tier 5 (“all other questions requiring additional study or resources”) may inadvertently devalue displacement and/or avoidance studies within Tier 5. Tier 5 studies, as currently written, include a mix of habitat-related questions and research questions. Research questions, the ST&P subcommittee agrees, are not necessarily the responsibility of individual developers. However, by placing these research questions within the same Tier as indirect impacts (such as habitat impacts, fragmentation, and avoidance behaviors), we are concerned that these important indirect effects will be de-emphasized or possibly overlooked by many developers. Thus, to ensure that equal consideration is given to direct and indirect impacts, we strongly recommend that direct and indirect impacts be incorporated within the same Tier.

And finally, ‘cost’ and ‘intensity of study’ have been raised as potential impediments to including indirect impacts within Tier 4. While we appreciate that cost is a significant consideration for developers, we believe that measuring indirect impacts is not always more costly or more intensive than adequately measuring fatalities at wind power projects. And, it is extremely important that the USFWS assess all impacts that are relevant to wildlife. Incorporating direct and indirect impacts into a single Tier, with equal weight given to each, allows post-construction monitoring studies to evolve as our understanding of impacts evolves.

Thus, for clarity and emphasis on relevant impacts, we recommend that Tier 4 addresses both direct and indirect impacts. Tier 5 should become a logical extension of Tier 4, i.e., extended studies designed specifically to increase our knowledge of impacts and establish a scientific foundation for the development of adaptive management tools that can be used to avoid and minimize negative impacts on wildlife in the future.