

**Texas Parks and Wildlife Department
Voluntary Recommendations for Wind Energy Development**

February 2008

I. INTRODUCTION

The following Voluntary Recommendations for Wind Energy Development (herein referred to as Recommendations) were developed by Texas Parks and Wildlife Department and do not necessarily represent the opinions of the wind industry or non-governmental organizations.

The purpose of these recommendations is to establish best management practices (BMP) for development of wind energy in Texas, promote the continued responsible development of wind facilities across the state, and enable Texas to develop its wind resources in a manner that minimizes adverse impacts to wildlife, habitats and natural resources of Texas through proper pre-project risk assessment, good project design and operation, and effective adaptive management practices.

II. BACKGROUND

Texas became the number one state in the U.S. for installed wind energy capacity in 2006. Texas citizens and their elected officials strongly support the continued expansion of wind generation to supply an increasing portion of the State's electric generation portfolio for many reasons, including:

- wind energy is an inexhaustible natural resource, and greater utilization of wind energy promotes Texas energy independence, directly offsetting the need for mining of lignite coal in Texas and other types of coal elsewhere, and decreasing the need for transportation of such fossil fuels by rail and truck, thereby reducing harmful impacts on wildlife, the environment, and human health caused by such activities
- wind turbines, once constructed and operational, consume no fuel and have no air emissions, directly decreasing the emissions of mercury, CO₂, NO_x, SO_x and other harmful emissions associated with combustion-generated power, which contribute to global warming and adversely impact all wildlife and humans
- wind turbines consume no water and emit no wastewater, helping conserve Texas' scarce water resources for wildlife and human consumption and preserving the purity of Texas groundwater and surface waters, to the benefit of Texas wildlife and humans

As the State adds new transmission infrastructure to support additional wind energy resources, the parties involved in developing these Recommendations recognize the importance of responsible development, construction, operation and eventual re-powering or potential decommissioning of wind projects.

These Recommendations are intended to ensure wildlife and habitats are protected throughout the project life by encouraging and facilitating continued responsible practices and promoting development of wind resources in a manner that minimizes adverse impacts on Texas wildlife.

III. RECOMMENDATIONS

Mitigation measures are recommended to occur in four general stages:

- A. The first stage involves project siting and development, where mitigation should focus on avoiding and/or reducing potential adverse impacts of a site before the facility is constructed.
- B. The second stage is construction where careful planning should avoid important habitat and reduce disturbance by conducting construction at appropriate times of year when practicable, and away from sensitive habitat areas.
- C. The third stage is operations, where measures should be implemented to minimize ongoing impacts.
- D. The fourth stage is the decommissioning stage at the end of the project's useful life, where restoration measures should be implemented to return the project area largely to its pre-construction state in accordance with landowner requests and contracts.

A. DEVELOPMENT PHASE BMP

1. Developers will collaborate early in the process with qualified expert consultants and relevant regulatory agencies to identify potential environmental concerns, such as the presence of Federal and State listed endangered and threatened species, wetlands, archeological and historical sites and similar issues, and to ensure compliance with all applicable laws and regulations, such as the Endangered Species Act, the Migratory Bird Treaty Act and all Texas laws governing the protection of threatened and endangered species. Developers will use qualified local expert consultants with specialized knowledge of local conditions when available and appropriate.

2. Developers or their consultants will contact TPWD Wildlife Habitat Assessment Program to gather information about habitat or the presence of sensitive species in a proposed project area.

3. Prior to construction, developers should contact TPWD to obtain a list of qualified experts with relevant expertise for specific project areas, if available. Information should be shared with such experts subject to signed confidentiality agreements.

4. Developers will, in collaboration with consultants and agencies, develop appropriate measures to assess the significance of such issues for a given project site, and appropriate means to minimize adverse impacts. Such assessments may include studies on archeological and cultural resources, navigable waterways and wetlands delineation, a Phase 1 environmental site assessment, and similar analysis appropriate for specific projects. For avian and other wildlife species, such assessment measures include pre-construction monitoring surveys, literature surveys, and may include raptor nest surveys, radar monitoring and similar approaches as appropriate for individual projects, and in consideration of the level of pre-existing development in the region.

5. Developers will collect appropriate and pertinent information suitable for identifying the risk of potential impacts of the project on wildlife and habitat. This information would include avian use surveys conducted for a minimum of a twelve month period that take into consideration factors associated with region and habitat and designed to capture species, occurrence and abundance during all four seasons of the year. These studies are to be conducted on representative areas of the site that are expected to include wind turbines, unless not necessary due to availability of sufficient studies which have already been completed for other projects or phases in the region. Information should be collected that considers the following issues as appropriate:

- Identify avian use of a project area by species;
- Understand potential impacts from construction and operation of the proposed site;
- Determine seasonal variation, if any; and
- Collect data to aid in the analysis of impacts such as topographic features and weather conditions.

6. In areas of significant identified raptor activity, a minimum of one raptor nest survey is recommended to be conducted during breeding season and up to within 1-mile of proposed wind turbines location when possible and where appropriate to determine the location and species of active nests potentially disturbed by construction activities, and to identify active and potentially active nest sites with the highest likelihood of impacts from the operation of the wind plant.

7. There is not a consensus on which methodology is effective in predicting bat impacts for pre-construction studies. Wind energy representatives commit to continue to work with bat organizations and scientists to implement methodologies to assess potential bat mortality at prospective wind project locations in sensitive areas. In areas of known bat concentrations or near sensitive bat habitat, information should be collected that considers the following issues as appropriate:

- Seasonal patterns of abundance and use of a prospective site by bats; and
- Roosting areas and daily movement patterns.

8. If existing information suggests the probable occurrence of state and/or federal threatened or endangered species or their habitat on the project site, focused surveys may be recommended by the project's consultants and/or relevant regulatory agencies during the appropriate season to determine the presence or likelihood of presence of the species. For listed species, US Fish & Wildlife Service survey protocols should be followed, if available.
9. Preconstruction assessments may use existing information from comparable projects in comparable habitats within the same region for the relevant issues of concern. Preconstruction assessments should be compared with post construction monitoring data to assess the effectiveness of the guidelines.
10. Turbines should be located in consideration of topographic features that serve to concentrate birds or wildlife at particular areas within the site if determined during pre-construction assessment, or mitigation should be provided that addresses significant impacts.
11. Use of disturbed lands, if feasible, should be considered for priority siting (i.e. developed, cultivated, or otherwise disturbed by road or other development) unless these areas exhibit high use by birds or other wildlife species that are likely to be adversely affected by wind projects.

B. CONSTRUCTION PHASE BMP

1. Use reputable construction contractors and subcontractors, and adhere to best practices in wind project construction.
2. During construction, avoid areas of high risk potential to birds, or other species of concern that are likely to be adversely affected
3. Use tubular towers and avoid creating perching spots on wind turbines.
4. Electrical collection systems between turbines should be buried when feasible and environmentally sound, and bird flight diverter markings used where appropriate when overhead collection lines are used.
5. Use raptor protection measures such as adequate conductor spacing, perch guards and insulated jumper wires.
6. Limit substation and other associated facility pads to as small an area as is practical.
7. Ensure appropriate replacement of topsoil to the surface post-construction and use of best practices to minimize erosion.
8. Locate linear facilities (such as collector cable routes, transmission line routes, or access roads) in or adjacent to existing disturbed corridors or in areas of low habitat value in order to minimize habitat fragmentation and degradation;

9. When feasible, use existing surface roads and align roads to limit habitat fragmentation and erosion;
10. Use pilot warning and obstruction avoidance lighting as recommended by the FAA;
11. Avoid permanently installed upward-firing lighting for substation and O&M building lighting, when possible.
12. Stormwater runoff management plans should be developed to comply with stormwater runoff management plan requirements and all other applicable laws and regulations relating to stormwater.

C. OPERATIONS PHASE BMP

1. Post vehicle speed limits to minimize avian and wildlife mortality.
2. Follow construction, reduction of project road rights-of-way to extent practical and consistent with safety needs and code requirements and the requests of the landowner.
3. Revegetate reclaimed project road rights-of-way with appropriate site-specific native species, unless otherwise directed by the landowner based on prior land use, and properly maintain such rights-of-way in accordance with recommendations of qualified environmental consultants.
4. Implement 12 months of post-construction carcass studies that account for searcher efficiency and scavenging. The duration and intensity of such studies will vary by region, project and various factors such as site sensitivity and pre construction determination of bird and wildlife density, and pre existing information from comparable projects in comparable habitats for the relevant species of concern.

D. DECOMMISSIONING PHASE BMP

1. Developers will commit, as addressed in the landowner agreements, to removal of turbines, towers and all above-ground equipment, and proper disposal of same, through recycling where possible.
2. Remove foundations to an appropriate depth, consistent with local conditions and land uses, and properly dispose of same through recycling where possible in accordance with landowner requests and agreements. To the extent possible, return the project site to its pre-construction condition through filling in foundation excavations, and reseeding with appropriate native species, unless otherwise directed by landowner.

3. Remediation of Recognized Environmental Conditions at the Project Site (*e.g.*, lubricant leaks, etc) caused by the wind facility or its operation.

E. PROSPECTIVE USE OF BMPs

Wind representatives and other stakeholders are cognizant of the fact that developers must place turbine orders and other long-lead equipment orders well in advance of the expected delivery dates for such equipment, and will have invested significant sums, time and effort in development of projects prior to adoption of these BMPs. Nothing herein is intended, nor should be construed, to suggest that projects already under development and with construction timelines dictated by equipment orders already placed, should be in any way delayed or impacted by wind representative's endorsement of these BMPs. It is expected that these BMPs will serve as a tool to help facilitate the continuation of responsible wind project development in Texas. Therefore, it is expected these BMPs to be effective for all projects that reach commercial operations date ("COD") after December 31, 2008.

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