

U.S. Fish and Wildlife Service Priority Issues, Questions, and Concerns for Post Construction Monitoring Panel Discussion¹

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DURING- AND POST-CONSTRUCTION NEEDS

A. Impacts to Wildlife Trust Resources

- 1) What tools are available to credibly count carcasses – *e.g.*, linear and concentric circular transects (with use of dogs), catchment nets, thermal imagery validation, Bird Strike Indicator technology, others?
- 2) What metrics are most comparable between sites for assessing mortality at different wind facilities – *e.g.*, birds and/or bats killed/turbine; birds and/or bats killed/kWh; birds and/or bats killed per rotor swept area; height comparisons of the rotor swept areas above ground level (AGL); size comparisons of the rotor swept areas; comparison between sites of weather conditions such as rain, fog, drizzle, clouds, cloud ceiling height, wind speed and direction, and arrival and departure of frontal systems; or another variable?
- 3) Do these metrics (above) account for variability of documented mortality within a specific facility such as increased mortality at end-of-row turbines, turbines in gaps, and turbines on steep slopes?
- 4) How and why are birds, bats and insects attracted to turbines (if they are)? What appears to be the specific mechanism? What role, if any, do blade-tip vortices, clear-air turbulence, inclement weather, lighting, sound, and other conditions play in attracting “flying vertebrates” and insects?
- 5) Is there a difference in the mechanism(s) of attraction for raptors, passerines, waterbirds, and other suites of avifauna?
- 6) What happens to small birds and bats when they are struck by rapidly moving blades, and what roles do wind vortices and wind shear play in affecting these species near blades?

¹ This document has been vetted to and peer-reviewed by several USFWS staff wildlife biologists and a manager in Region 5, including in New York State. The document represents issues of particular interest, concern, and need within Region 5 and New York State (as well as nationwide) which the Service wishes to present in regard to discussions on monitoring wind sites within New York. It is intended for inclusion in the NYSERDA meeting packet for discussion at the August 2-3, 2006, meetings in Albany.

- 7) How helpful are trained dogs in finding dead bird and bat carcasses and injured animals? Is dog use a scientifically valid procedure?
- 8) How quickly do scavengers (*e.g.*, crows, ravens, foxes, coyotes, skunks, and bears) learn that turbines may equate to “meals” regarding the presence of bird and bat carcasses due to strikes?
- 9) Does the size, composition, and state (*i.e.*, frozen or thawed) of species used in scavenger removal and searcher efficiency trials matter for these trials? Is there a “best” surrogate? Should killed birds be left in place during scavenger removal studies? Would this confound scavenger removal results?
- 10) What is the most scientifically sound protocol(s) for comparing pre-construction assessment data to post-construction impact monitoring when attempting to validate or refute whether pre-construction risk and impact assessments/estimates were actually scientifically valid? Should weather variables (from 2 above) be considered as part of this protocol(s)?
- 11) How can we better link pre-construction assessments to post-construction monitoring of mortality to help determine the selection of the most suitable habitats for siting wind facilities based on pre-construction monitoring and risk assessment? What, if any, pre-construction research protocol(s) is available to better predict post-construction impacts?
- 12) Does the Before-After Control Impact (BACI) design allow for determination of significant changes in bird and bat behavior once wind facilities are installed? Specifically, does BACI design allow for determination of changes in bird and bat migration, nesting/brooding, feeding/foraging, resting, and loafing? Do we need grid sampling and territory mapping during pre- and post-construction monitoring? Do we need sampling for 3-5 years post-construction to determine in a quantitative fashion what the effect is on an area, and the effect(s) is on tall-structure-sensitive species?
- 13) What duration, frequency, and size of studies are most scientifically valid and appropriate for assessing mortality at a site? What are acceptable scavenging removal and searcher efficiency (*i.e.*, based here on the duration between carcass searches) biases?
- 14) How does the scientific community including biometricians feel about large interval searches?
- 15) What levels of “take” are being documented regarding [2003] *Birds of Conservation Concern* and Breeding Bird Survey long-term-declining species frequently retrieved during post-construction mortality studies? Is this mortality additive to existing natural mortality to these trust species? What are the cumulative impacts of wind facilities on birds and bats (if these impacts can be determined)?

16) Why does the British Government require 3-5 years of post-construction monitoring as a condition of permitting wind energy offshore on Crown Lands? What is the rationale for this time interval?

17) What type and level of data must be collected to trigger a turbine shutdown or feathering of the blades if substantial bird and bat kills are discovered, or if verified “targets” are documented to be approaching a wind facility?

18) Can pre- and post-construction radar monitoring accurately predict and portray wildlife mortality from wind turbines?

19) Can weather conditions be used to accurately predict mortality events at wind projects, and if so, what weather variables should be monitored?

B. Impacts to Habitats and Indirect Impacts to Wildlife

1) In addition to direct mortality impacts, have post-construction assessments been viewed in light of indirect impacts – *e.g.*, reduced nesting/breeding density, loss of population vigor and overall density, habitat and site abandonment, increased isolation between patches, fragmentation, loss of refugia, attraction to modified habitats, effects on behavior (stress, interruption, and modification), disturbance, avoidance, displacement, and habitat unsuitability? Specifically, what variables have been analyzed? Could their impacts be quantified?

2) What studies have been performed to assess indirect impacts from wind facilities, especially to grassland/sage/steppe obligate songbirds and “prairie grouse” (or Ruffed Grouse and Spruce Grouse in New York)?

3) What are the long-term impacts of wind facilities on avian and bat populations (*e.g.*, 2004 Univ. Birmingham, UK, studies raise troubling concerns about long-term impacts of wind facilities on avian populations in Europe)?

C. Post-construction "Mid-course Corrections"

1) What changes/corrections have been made at wind facilities based on pre-construction monitoring that minimize impacts to bird and bat species, habitats, or indirect effects on species/habitats that benefit trust resources -- *e.g.*, ridge set-backs, replacing end-of-row turbines with pylons, blade feathering, other steps?