

# Guiding Principles for Wind Energy Development

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**Prairie Pothole**  
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## Purpose

Wind-based energy is an abundant source of electricity with low greenhouse gas emissions and is anticipated to continue to grow substantially across the Prairie Pothole Region (PPR) and Northern Great Plains over the next several decades. Wind energy infrastructure does, however, have measurable effects on birds – and other wildlife – and is an additional stressor to other forms of grassland and wetland habitat loss in the region. Given the projected growth of wind energy, the potential for cumulative effects may be substantial for some species. As most grassland birds continue to decline, providing compensatory habitat is needed to address habitat losses from energy development. Deliberate coordination and collaboration is needed among industry, natural resource agencies, and permitting sectors to minimize conflicts with birds and their habitats and achieve optimal outcomes among stakeholders for wind energy projects.

The [Prairie Pothole Joint Venture](#) (PPJV) has identified several guiding principles as common points of agreement shared among the partnership for responsible wind energy development. While many important taxa other than birds are also affected by wind energy development, these Guiding Principles focus on birds and their habitats consistent with the PPJV mission. These Guiding Principles are provided to support wind energy development that minimizes effects on priority birds and to help facilitate communication and collaboration among stakeholders.

## Guiding Principles for Wind Energy Development

- Consultation and coordination with State Fish and Wildlife Agencies as early as possible in the exploration of siting for wind energy projects can help avoid or minimize unintended effects on birds and their habitats.
- Wind energy infrastructure has direct and indirect effects on birds and concerns for species and their habitats
- Consider priority bird species and their habitats, which will vary by locality, when siting wind energy projects and designing offsets.
- Encourage wind energy development in areas with relatively low effect to birds.
- Collaborative approaches led by natural resource agencies for siting wind development projects and designing offsets can help achieve optimal project outcomes among stakeholders.
- Design offsets for wind turbine infrastructure effects based on biologically equivalent habitat values for birds.
- The PPJV partnership is committed to developing, providing, and using regional species-habitat models and decision-support tools that provide a consistent, transparent, and scientific basis for evaluating and minimizing biological effects of wind energy infrastructure on priority bird species.

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## Guiding Principles Rationale

Consultation and coordination with State Fish and Wildlife Agencies as early as possible in the exploration of siting for wind energy projects can help avoid or minimize unintended effects on birds and their habitats.

State Fish and Wildlife Agencies (SFWA) are charged with the regulation, management, and conservation of public-trust wildlife populations within their state governments. They possess and have access to a wealth of local and regional information for those populations and are therefore critical for the energy industry, contractors, permitting entities, and other stakeholders to engage and consult with early in the exploration of potential projects. These local agencies can convey bird and habitat related concerns within and near a project siting area. Although many tools are publicly available to inform coarse scale exploration of wind energy projects relative to potential effects on birds, continued consultation with individual SFWAs will ensure local scale information and state priorities are adequately considered. Failure to engage with SFWAs greatly increases the potential that energy projects may encounter significant wildlife related conflicts, project delays, or cost overruns. Early and continued engagement with SFWAs can help to avoid or minimize bird-related project conflicts and identify solutions to minimize or offset those effects that may not be avoidable. Public Utility/Service Commissions typically have regulatory or permitting authority over energy development in their states. Consequently, there is also considerable value for Public Utility/Service Commissions to consult with SFWAs to improve understanding of potential effects to public-trust natural resources from energy development projects. Regular and frequent consultation with SFWAs by energy companies, their contractors, permitting entities, and other stakeholders will inherently lead to improved opportunities to minimize effects on birds and achieve optimal outcomes among stakeholders from wind energy projects.

Wind energy infrastructure has direct and indirect effects on birds and concerns for species and their habitats will vary by localities and seasonally.

Sensitivity to wind development among bird species and their habitat types can vary considerably. Birds experience direct mortality by colliding with turbines or other facility infrastructure and can also experience important indirect negative effects due to their avoidance of wind facilities<sup>1,2</sup>. Behavioral avoidance of wind facilities by birds can result in complete displacement of individuals from an area or reduced use of habitats in proximity to facilities (e.g., fewer birds/acre). These avoidance patterns can vary by species. Additionally, presence and abundance of species and habitat types can vary

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widely among localities. While some species may be abundant in a particular landscape, a certain locale within that landscape might represent a high proportion of that species' critical habitat. Conversely, some species are not abundant at any local scale, but instead are more broadly distributed, or simply not abundant even in important areas. Given the variability in bird species distribution, abundance, habitat use, and effects from energy infrastructure, SFWAs should be consulted early and regularly in the exploration of wind project developments. Each SFWA has expert knowledge, data, and tools to inform stakeholders about landscape and local scale patterns for priority bird species.

## Wind energy project siting and offsets should consider priority bird species and their habitats and those priorities will vary by locality.

State Fish and Wildlife Agencies have noted relatively few wind projects have compensated for effects to habitat or species not regulated by federal Endangered Species Act or Clean Water Act provisions<sup>3</sup>. Importantly, each state has species of conservation concern that may or may not be federally co-managed. Therefore, concerns by SFWAs may not be restricted to species with federal listing status. Research has clearly demonstrated measurable effects to priority bird species other than Threatened & Endangered Species from wind and non-renewable energy projects<sup>2</sup>. Consequently, energy development represents an additional stressor to both federal and state trust wildlife resources. These wildlife are held and managed by state and federal agencies for the public trust and possess a range of economic, social, ecological, and intrinsic values at the local, state, and national scales. Hence, direct and indirect effects to birds, particularly for species of conservation concern, should also be adequately considered and compensated for due to their public values. Many



*Photo Credit: Jim Williams*

bird species affected by energy development are already experiencing population declines from a variety of anthropogenic and environmental stressors. In particular, grassland bird populations in North America are experiencing steep and decade's long population declines and several species are likely to be scrutinized for federal Threatened and Endangered Species designations<sup>4</sup>. Therefore, natural resource agencies such as SFWAs may prioritize additional species beyond federally listed Threatened and Endangered Species that would be beneficial to consider in the exploration of siting wind energy projects and designs for offsets.

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## Encourage wind energy development in areas with relatively low effect to birds.

Wind energy has many environmental benefits but does have measurable direct and indirect effects on birds. Historic grassland and wetland losses have been extensive in the PPR and grassland loss continues at an alarming pace in addition to the escalation of wetland consolidation and drainage in recent decades<sup>5,6</sup>. Because energy development is an additional stressor to other forms of grassland and wetland habitat loss in the region, the projected expansion of renewable energy increases the potential for cumulative, or synergistic, effects on bird populations and may be substantial for some species<sup>7</sup>. Therefore, strategies are desired that encourage wind energy development in areas where biological effects are likely to be relatively low. However, “low” or “high” effects are relative and can vary by species and locality. Continual consultation and coordination with SFWA can aid in interpretation of measurable effects at locale and landscape scales within each state. There is likely considerable opportunity to support wind industry growth in relatively low effect areas. For example, The Nature Conservancy has recently estimated that potential low-effect areas across 17 Wind Belt states are capable of yielding approximately more than 10 times the current U.S. wind capacity<sup>8</sup>. Continual consultation and coordination with SFWAS can ensure additional local scale or sensitive information and state priorities are fully considered when evaluating potential project areas with low effects.



*Photo Credit: Chuck Loesch*

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## Collaborative approaches led by natural resource agencies for siting wind development projects and designing offsets can help achieve optimal project outcomes among stakeholders.

An inconsistent patchwork of guidelines and regulations for wind turbine siting and operations likely exacerbates unintended effects on birds in the region. Many components of designing offsets are voluntary and can lead to wide discrepancies in whether offsets occur and their degree of effectiveness. Thus, many state and federal policies emphasize the value of coordination between agencies and the value of working cooperatively with wind energy and permitting entities to achieve optimal outcomes for projects<sup>9</sup>. Given the variability in species-habitat patterns, priorities, and regulations at state and local scales, the fostering of communication and collaborative approaches between individual SFWAs, wind energy industry, contractors, permitting entities, and other stakeholders is likely to yield the best optimal outcomes among stakeholders for wind development projects. Individual SFWAs are well positioned to facilitate collaborative approaches among private and public stakeholders. Effectiveness will be particularly enhanced when outreach and engagement is achieved early in the exploration of siting wind projects and design of offsets.

## Design offsets for wind turbine infrastructure effects based on biologically equivalent habitat values for birds.

When effects are unavoidable a biologically based currency for offsets is needed to ensure they provide equivalent values to those of affected areas. Ideally, a framework should be used that quantifies the amount of habitat needed to provide equivalent biological values effected by energy infrastructure. For example, the avian-impact offset method described by [Shaffer et al. \(2019\)](#)<sup>2</sup> provides energy developers, regulators, and conservation professionals a science-based tool that calculates biological values (i.e., avian density) lost by development in a spatially explicit manner. This method's output converts biological value to the traditional unit of measure in which land is purchased or sold such as the number of wetlands or acres of grasslands with specific characteristics. While this example is focused on bird-habitat relationships and energy effects, the framework is



*Photo Credit: Shawn May, USFWS*

applicable to other wildlife and disturbance factors where reliable information is available. Calculation of habitat offsets based on biological parameters are advantageous to industry in providing a way to quantify environmental risk and providing transparency between regulators, industry, and conservation organizations to achieve neutral or positive outcomes through offsets and conservation investments. Use of a biological equivalency framework ensures

wildlife offset projects adequately address the effects on birds and their habitats from energy infrastructure. However, science to produce reliable estimates may be lacking for many species in the region and consultation with SFWAs is recommended to address these uncertainties.

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The PPJV partnership is committed to developing, providing, and using regional species-habitat models and decision-support tools that provide a consistent, transparent, and scientific basis for evaluating and minimizing biological effects of wind energy infrastructure on priority bird species.

Minimizing the effects of energy development on priority birds can be achieved through a strategy that first encourages energy development in areas where biological effects are likely to be relatively low and encourages designing offsets that equitably address the biological effects of development<sup>10</sup>. Effective employment of such strategies requires spatially explicit decision support tools developed from a robust and transparent science foundation for species-habitat relationships. Evaluations of energy siting and offsets should be based on reliable information developed from a transparent and peer reviewed body of science. A substantial and growing body of science for priority birds including their abundance, distribution, demographics, and effects from energy development has been supported by the PPJV partnership. The PPJV will continue to support such science investments including updates and refinements to bird species-habitat models and decision support tools that incorporate the best available science. These models and tools are used throughout the PPJV partnership to inform various conservation programs and management decision and can be used to inform wind energy stakeholders through coordination with SFWAs.



*Photo Credit: Neal Mishler*

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