NATIONAL WILDLIFE FEDERATION

Offshore Wind Energy & Birds

Responsibly developed offshore wind energy is a important renewable energy opportunity to address the challenges sea, migratory, and coastal birds face from climate change.


Credit: Saliva Jorge

Impacts in Context

The health of seabirds and shorebirds species has been greatly affected by climate change, but the transition to renewable energy offers an important pathway to confront the climate crisis. Since 1970, North America has lost one out of every four birds with an additional **two-thirds of bird species facing significant range loss and potential extinction unless we reduce greenhouse gas pollution**. Shorebirds and seabirds in particular face unique threats from climate change. Increased intensity and more frequent extreme weather events, sea level rise, ocean acidification, shoreline erosion, and marine heatwaves disrupt the migratory, breeding, and foraging patterns of bird species. **When developed responsibly and in partnership with communities, offshore wind energy is a key renewable energy solution that reduces dependence on fossil fuels.** The Intergovernmental Panel on Climate Change states that we must advance offshore wind energy to address the climate crisis and work to mitigate any negative impacts on bird species, especially the most vulnerable species from past and ongoing human action. **Without responsible mitigation, bird species may face the following threats from offshore wind development.**

1. Collisions

Birds may collide with offshore wind infrastructure, but a species' vulnerability to collision depends on:

- Flight Altitudes: Birds that fly at the same height (rotor swept zone) and distance from shore as turbines are more vulnerable to collision.
- Avoidance Abilities: Different species show macro-avoidance (avoiding turbine areas completely), meso-avoidance (avoiding turbines within wind projects areas), and micro-avoidance abilities (last-minute movements to avoid collision with rotor blades).

2. Transmission Lines

Transmission lines and facilities pose a relatively limited additional risk to the coastal ecosystems of shoreline birds that have already been negatively impacted by increased coastal development, rising sea levels, and erosion of nesting spaces due to climate change and other human activity.

3. Attraction

While the majority of birds avoid collisions effectively, some species exhibit attraction to turbines and related infrastructure, potentially elevating risk of interaction. This risk can increase during nocturnal migration or poor weather. Offshore wind turbine structures can support increased reefs and fish at their base, which can also attract more foraging seabirds.

4. Barrier Effect & Displacement

Birds may be negatively impacted by spending extra energy avoiding offshore wind facilities. Avoidance can impact routine movements between breeding and foraging areas, but has a smaller impact on migratory birds that only alter their routes seasonally. The threat of displacement, when birds avoid an area near offshore wind turbines previously used for feeding, resting, or migrating, depends on whether species have a limited range or are generalist feeders.

NO NET NEGATIVE IMPACT WITH THE MITIGATION HIERARCHY

The mitigation hierarchy used by BOEM systematically addresses potential environmental impacts by first avoiding sensitive areas, then minimizing effects through project design and operations, and finally implementing mitigation measures and monitoring to manage any remaining impacts.

1 AVOID...

critical areas for the most vulnerable species during siting:

- **Broad scale:** Using spatial data on birds and maps of oceanographic conditions, scientists work with developers and federal agencies to identify areas within the leasing zones that are most important to seabirds. These areas are removed from the greater leasing area.
- **Finer scale:** From there, more specific datasets (local analyses, more detailed data about the distribution and movement of individual species, and collision risk and population models) are used to identify where risks to vulnerable species can be avoided by rearranging the spatial distribution of turbines within lease areas.

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2 MINIMIZE...

risks by altering structures or temporarily changing operations during periods of high risk. There are a variety of techniques used to minimize risks if they cannot be avoided altogether, including:

- **Altering the layout of the turbines** within the lease area to create 'flight corridors' to accommodate recorded flight patterns of migratory birds.
- **Reducing vessel and noise-related disturbances during installation** by postponing construction activities during sensitive periods (ex. nesting, staging, migration, etc.), refraining from the use of particularly noisy construction techniques, avoiding driving vessels though aggregations of birds, light abatement, and oversight from wildlife biologists.
- **Lowering risk of collision with rotor blades by increasing the visibility of the blades** with achromatic, high-contrast or ultra-violet light visible paint, temporarily slowing or stopping the operation schedule of the turbines during critical periods such as extreme weather or high-density nocturnal migrations.
- **Utilizing Federal Aviation Administration and U.S. Coast Guard compliant lighting and aircraft detection systems** on and around the turbines which include bird-safe features.
- **Including visual, audible, and physical anti-roosting and perching devices** on turbines.

3 MITIGATE...

any additional impacts to birds with compensatory mitigation strategies: If there are negative impacts that cannot be avoided through avoidance and minimization strategies, offshore wind projects can offset impacts by implementing **positive conservation actions at other sites to formulate a net zero change** to the species. These strategies include:

- **Investing in stewardship activities to improve reproductive success at nesting colonies** such as reducing human and invasive species impact on beach-nesting birds and vegetation management.
- **Re-establishing nesting seabird colonies where they have deteriorated** due to the impact of climate change on nesting sites, food availability, and weather patterns.

4 MONITOR...

before, during, and after offshore wind project construction to quantify the impacts and evaluate the degree to which mitigation efforts have attained the desired outcome. Some strategies include:

- **Utilizing radar, thermal detection, ranger finders, and cameras to improve collision risk models.**
- **Evaluating long-term trends of bird populations** tracked by BOEM's biological monitoring, and research from Audubon's Seabird Institute, Biodiversity Research Institute, The Nature Conservancy, and more.
- Requiring **Protected Species Observers** to be present throughout all stages of construction and use of offshore wind projects.

SOURCES: Bateman, Brooke L., Chad Wilsey, Lotem Taylor, Joanna Wu, Geoffrey S. LeBaron, and Gary Langham. 2020. "North American Birds Require Mitigation and Adaptation to Reduce Vulnerability to Climate Change." Conservation Science and Practice 2 (8): e242. https://doi.org/10.1111/csp2.242.
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