

Oceanic Records of North American Bats and Implications for Offshore Wind Energy Development in the United States

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Abstract

Offshore wind energy is a growing industry in the United States, and renewable energy from offshore wind is estimated to double the country's total electricity generation. There is growing concern that land-based wind development in North America is negatively impacting bat populations, primarily long-distance migrating bats, but the impacts to bats from offshore wind energy is unknown. Bats are associated with the terrestrial environment, but have been observed over the ocean. In this review, we synthesize historic and contemporary accounts of bats observed and acoustically recorded offshore over North American waters to ascertain the spatial and temporal distribution of bats flying offshore. We integrate these records with studies of offshore bats in Europe and of bat behavior at land-based wind energy studies to examine how offshore wind development could impact North American bat populations. We find that most offshore bat records are of long-distance migrating bats and records occur during autumn migration, the period of highest fatality rates for long-distance migrating bats at land-based wind facilities in North America. We summarize evidence that bats may be attracted to offshore turbines for roosting and foraging opportunities, potentially increasing their risk of collision, but that higher wind speeds offshore can potentially reduce the amount of time that bats are exposed to risk. We identify knowledge gaps and hypothesize that a combination of mitigation strategies may be the most effective approach for minimizing impacts to bats and maximizing offshore energy production.

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