

Report on Bird Fatality Data in AWWIC

An AWWI Technical Report from an analysis of the American Wind Wildlife Information Center (AWWIC) database summarizes bird fatality rate (birds per MW per year) and fatality incident (individual fatalities) data from wind energy facilities in the U.S. AWWIC is the most comprehensive database of post-construction fatality monitoring data from U.S. wind projects, incorporating both publicly available and contributed data. This report sets the foundation for further studies of what bird species are at risk, and where and why they are at risk.

The full report is available online at www.awwi.org/awwic-bird-technical-report/.

ANALYSIS APPROACH

Many post-construction fatality monitoring (PCM) study data are publicly available, but some are confidential and unavailable for analysis. AWWIC maintains data confidentiality, encouraging voluntary data contributions from wind energy projects across the U.S. The result is more data available for analysis, including meta-analysis of post-construction fatality data from multiple wind energy projects. For each study, PCM data include project site, adjusted fatality estimates, and species fatality incidents. AWWIC also captures useful supporting data from PCM studies on methodology and details of fatality incidents. This detailed picture of how each study was conducted and its findings facilitates a greater ability to compare results between wind energy projects.

This analysis focuses on birds and wind energy, and aims to answer the questions:

- Does adding more data from additional sources change what we know about the timing and distribution of bird fatalities at wind farms?
- Do species or groups of species differ in their fatality risk at wind farms?



KEY TAKEAWAYS

- **AWWIC has sufficient data, with enough geographic coverage, for us to pose reasonable hypotheses about the impacts of wind energy on birds in the U.S.** These hypotheses can be evaluated with data from additional PCM studies.
- **A total of 281 of more than 600 North American bird species were recorded as collision fatalities** in scheduled searches reported in studies contained in AWWIC. **One hundred and eight (38%) of the reported species had three or fewer collision fatalities** reported in all scheduled searches contained in AWWIC
- **Fifteen species account for nearly half of the fatality incidents in AWWIC.** Whether these collision fatalities pose a population-level threat to these species is unknown.
- Because of their life history attributes, **diurnal raptors are a group of concern.** Collision risk appears to vary considerably within this group, and this variation will be evaluated with additional data and further analysis.
- **Increased investment in fatality monitoring may lead to diminishing returns in finding new species.**

NEXT STEPS

We are continuing to add data to AWWIC and anticipate regular evaluation, analysis, and updates to the information contained in this report. We will be evaluating the following topics:

- Evidence exists that a significant level of background mortality is recorded as collision fatalities for some groups of species. Further evaluation of background mortality would be useful to increase the accuracy of bird fatality estimates.
- A new “generalized estimator” has been released that is intended to provide less biased adjusted fatality estimates and improve comparability among studies. We will investigate the feasibility of recalculating fatality estimates in AWWIC using this new estimator.
- Accurate fatality estimates will enable more reliable evaluation of temporal and regional trends in bird fatalities and the number of studies needed to accurately and reliably estimate bird collision fatalities within a region.
- We will further evaluate interspecific variation in fatality risk, focusing on diurnal raptors, by adjusting fatality incidents for differences in detection and representation.

STUDY DESIGN

AWWI compiled and evaluated 193 PCM studies for inclusion in this report from both publicly available and contributed sources. Studies were included that met criteria for a basic level of standardization. Fatality rates used in this report are adjusted for detection biases and are “as reported,” with no additional adjustments to correct for among-study variation in sampling period, plot size, or estimator

used in the adjustments made to raw counts.

We summarized and plotted protocols, species composition, and fatality rates by avifaunal biome (bird habitat areas), USFWS Region, and bird group. By observing the variation of results in each biome we gained insights on patterns that will spur future data collection and research.

STUDY RESULTS

Data in this report represented ~19.3% of installed U.S. wind capacity. Representation varied across avifaunal biomes, from 7.6% of installed capacity in the Southwest to 72.8% in the Pacific. Of a total of 4,340 turbines, 1.7% had ≥10 bird carcasses found and the most carcasses found at a single turbine was 31. Of all species reported as fatalities, the 15 most reported of these (5.3% of all species reported) constituted 48.8% of all fatality incidents. For 108 species (38.4% of all species reported), ≤ 3 fatalities were reported. Cumulatively, these 108 species account for < 3% of all fatalities. Small passerines constituted the largest percentage of fatalities among 19 aggregated bird groups, followed by diurnal raptors, doves/pigeons, and upland game birds. Studies conducted over longer periods of time revealed seasonal patterns in fatalities for small passerines and diurnal raptors with peaks in spring, fall, or both. The median

fatality estimate for all birds was 1.8 birds per MW per year, although 75% of studies reported < 3.1 fatalities per MW per year and 26.9% estimated < 1 fatality per MW per year. Among bird groups, median fatality estimates were 1.2, 0.22, and 0.06 fatalities per MW per year for small birds, large birds, and raptors, respectively. Among USFWS Regions, median bird fatality estimates were highest in the Midwest and Northeast and lowest in the Mountain-Prairie.

Avifaunal Biome	Fatality Rate <i>Birds per MW per year</i>		
	Median	Range	# of Studies
Eastern	2.7	0.11-6.91	28
N. Forest	2.6	0.75-5.44	16
N. Rockies	1.7	0.17-5.71	40
Pacific	2.2	0.5-8.91	15
Prairie	1.5	0.07-9.1	61
Southwest	1.4	0.56-11.8	7

ACKNOWLEDGEMENTS

AWWI would like to thank the wind companies who voluntarily contributed data to AWWIC, our Partners and Friends, and reviewers.