

# Technology Innovation

AWWI's cutting-edge work in Technology Innovation is a catalyst and expert forum for the development of advanced technologies to avoid and minimize the impacts of wind energy on wildlife. By advancing these critical solutions, AWWI's focus on technology innovation supports maximizing power production and facilitating the expansion of wind energy while improving conservation outcomes.

## THE CHALLENGE: VERIFYING RESULTS

Technologies can provide solutions to avoiding and minimizing risk from wind energy operation to wildlife. Yet the technologies available or being developed are few, and of those that have undergone independent testing, only limited results are available. Given the expense, time, and uncertainty associated with use of

these technologies, regulators and wind energy companies are hesitant to use them without knowing their effectiveness. Testing technologies at multiple facilities will verify effectiveness in diverse environmental conditions, and establish statistically robust data from which to draw conclusions.

## THE APPROACH: TECHNOLOGY TO MINIMIZE IMPACTS

Technologies can avoid or minimize wildlife collisions with wind turbines through one or more of the following components:

- **Detect** approaching wildlife using cameras, radar, thermal imaging, or acoustic monitoring with sophisticated software or artificial intelligence.
- **Curtail** (automatically shut down) wind turbines when risk of collision is determined to be high for key species based on environmental factors or based on detection by a detection technology.
- **Deter** wildlife from approaching or draw the animal's attention to the turbine by deploying audible or visual deterrent signals.



Credit: NREL

## THE SOLUTION: TECHNOLOGY INNOVATION AND EVALUATION

AWWI engages with researchers to conduct scientific evaluations of emerging and available technologies at commercial wind energy facilities, raises project funding, and oversees the design and execution of the tests to ensure that results can be compared across multiple projects and are scientifically rigorous.

AWWI:

- Promotes transparency by ensuring test and evaluation results are peer-reviewed and made public by publishing results in scientific journals.
- Coordinates with the U.S. Fish & Wildlife Service and state wildlife agencies to ensure evaluations are carried out with their insights and input considered.

By pooling resources and expertise from wind industry partners, AWWI can coordinate and replicate rigorous verification studies, leading to more rapid and widespread adoption of successful technologies.

## COMPLETED EVALUATIONS

- **UV light as a potential deterrent for raptors:** Results published in the [Journal of Raptor Research](#) September 2015.
- **Proof-of-performance test of the IdentiFlight camera-based detection/curtailment system:** Results published online in the journal [Biological Conservation](#) May 2018.
- **Pilot test of the DTBird raptor detection-deterrent system:** Results published in the [AWWI Results Catalog](#) September 2018.



Bald Eagle. Credit: Jerry McFarland, Flickr

## CURRENT EVALUATIONS

### DOE-Supported Eagle Technology Projects

In 2017, AWWI was awarded funding from the U.S. Department of Energy for further evaluation of IdentiFlight and DTBird. The technologies will be evaluated over two years at multiple operational wind facilities in collaboration with scientific researchers, technology developers, and members of the wind industry. Both projects are underway.

### Bat Technology Evaluations

AWWI is beginning testing and evaluation of minimization technologies for bats. Technologies include ultrasonic acoustic deterrents and/or informed curtailment technologies intended to optimize production and reduce risk for bats.

## BROADENING THE REACH OF TECHNOLOGY INNOVATION

AWWI is working to expand the reach and increase awareness of technology innovations through outreach and strategic partnerships, such as through collaboration with the National Renewable Energy Laboratory (NREL) and EPRI. To promote both industry adoption of technologies and acceptance from broader stakeholder groups, AWWI will share objective, reviewed results and findings. Upcoming outreach activities include webinars and seminars for different stakeholder groups focusing on the bridge between technology, end-users, and biological objectives.

## AWWI TECHNOLOGY INNOVATION

