Wind Operational Issue Mitigation
Project ID #M1

Cris Hein

National Renewable Energy Laboratory

Silver-haired bat (Photo by Cris Hein)
### FY17-FY18 Wind Office Project Organization

**“Enabling Wind Energy Options Nationwide”**

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**Analysis and Modeling (cross-cutting)**
**Project Overview**

**M1: Wind Operational Issue Mitigation**

### Project Summary

- Facilitate the reduction in environmental constraints to wind energy deployment
- Support advancement of early-stage technological solutions that reduce impacts to wildlife
- Oversee research-based collaboratives focusing on outreach and stakeholder engagement

### Project Objective & Impact

- Leveraging national and global stakeholders to identify high-priority issues, conduct research, and disseminate science-based information about the environmental impacts of wind energy and how they can be reduced
- Reducing the levelized cost of energy and constraints to expanded wind energy development
- Conducting and disseminating science-based research

### Project Attributes

**Project Principal Investigator(s)**
- Elise DeGeorge
- Cris Hein
- Karin Sinclair
- Bethany Straw

**DOE Lead**
- Jocelyn Brown-Saracino

**Project Partners/Subs**
- American Wind Wildlife Institute
- Bat Conservation International
- International Energy Agency
- Pacific Northwest National Laboratory
- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- Bureau of Ocean Energy Management
- National Oceanographic and Atmospheric Administration

**Project Duration**
- FY 2016–FY 2020
Technical Merit and Relevance

Wildlife impacts can delay or prohibit development, or curtail operations

The project:

— Collaborates with key stakeholders to leverage expertise and identify research priorities
— Evaluates early to mid-level technologies to advance them toward commercial testing and implementation
— Disseminates scientifically based information to target audiences
Approach and Methodology

Technology Development and Innovation (TD&I)

The project:
- Identifies technology innovators through competitive funding solicitations
- Supports the advancement of emerging technologies using infrastructure at the National Wind Technology Center and expertise across NREL
Accomplishments and Progress

Technology Development and Innovation (TD&I)

The project has:

- Hosted two open-house events with potential technology providers
- Selected two projects (e.g., Monitoring Strikes Using Radar and Ultraviolet Deterrents), obtained NEPA approval, installed systems, and began monitoring
- Organized a webinar detailing goals and methodology of projects

Photo by Paul Cryan

Photo by Michael Schirmacher
Land-Based Collaborative (LBC)

The project:
- Supports leading collaboratives (e.g., National Wind Coordinating Collaborative and Bats and Wind Energy Cooperative) to identify priorities focused on bats, grouse, and eagles
- Convenes bimonthly calls and annual in-person meeting
- Oversees research, outreach and engagement

Hoary bat (Photo by Cris Hein)  
Golden Eagle (Photo by John De La Rosa)
Accomplishments and Progress

Land-Based Wind Collaborative (LBC)

The project has:
- Supported science-based solutions to quantify and reduce the impact of wind turbines on bats, eagles, and grouse
- Completed the development of an unbiased mortality estimator
- Hosted the 5th Bats and Wind Energy Cooperative Science Meeting and sponsored the production of a proceedings document
- Supported the National Wind Coordinating Collaborative, including the 12th Wind Wildlife Research Meeting and webinar series
Approach and Methodology

Task 34: Working Together to Resolve Environmental Effects of Wind Energy (WREN)

The project:

- Coordinates activities among 11 international partners (Belgium added in 2019 increasing total nations to 12)
- Oversees production of work products (e.g., white papers)
- In partnership with the Pacific Northwest National Laboratory, facilitates information exchange through Tethys
Accomplishments and Progress

Task 34: Working Together to Resolve Environmental Effects of Wind Energy (WREN)

The project has:

- Increased member nations from 10 to 12 (at beginning of FY19)
- May et al. 2018. Considerations for upscaling individual effects to population-level impacts. Journal Environmental Management
- 1st Expert Forum—Bats and Barotrauma
- Organized 6 webinars, including Adaptive Management, Smart Curtailment, and Environmental Impacts of Offshore Wind Energy
## Accomplishments and Progress

- **Slipped milestones and schedule** - All milestones were completed.
  - **FY17**: Summarized objectives for field research related to bat behavior at wind turbines; Developed fact sheet for National Wind Coordinating Collaborative
  - **FY18**: Selected 2 subcontracts and hosted an open house for TD&I; Identified research priorities for the Bats and Wind Energy Cooperative
- **Go/no-go decision points**
  - **FY17**: Work with collaborators to develop 4-year plan (i.e., LBC) with collaborative that aligns with DOE’s Environmental Strategic Plan. **GO**
  - **FY17**: WREN extension for Phase II? **GO**
  - **FY18**: Determine whether to release a second solicitation for TD&I. **GO**

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Communication, Coordination, and Commercialization

Technology Development & Innovation
— Advance technologies beyond early- to mid-Technology Readiness Levels

Land-Based Collaborative
— Coordinate with collaborators on outreach and engagement activities to industry, government agencies, researchers, and other stakeholders
— National Wind Coordinating Collaborative ([www.nationalwind.org](http://www.nationalwind.org)) and the Bats and Wind Energy Cooperative ([www.batsandwind.org](http://www.batsandwind.org)) websites

Working Together to Resolve Environmental Impacts of Wind Energy
— Tethys ([https://tethys.pnnl.gov/about/about-wren](https://tethys.pnnl.gov/about/about-wren)) and International Energy Agency ([https://community.ieawind.org/task34/home](https://community.ieawind.org/task34/home)) websites

Publishing and Conferences
— Documents published in various outlets to a variety of audiences
— Conference on Wind Energy and Wildlife Impacts
— National Wind Coordinating Collaborative’s Wind Wildlife Research Meeting
Upcoming Project Activities

The plans for upcoming tasks and completion of the project:

- Technology Development and Innovation
  - Completing data collection and analysis for existing projects
  - Announcing second request for proposals
- Land-Based Collaborative
  - Initiating year 3 (of 4) to support activities by the National Wind Coordinating Collaborative and Bats and Wind Energy Cooperative
  - Planning workshops for the Generalized Fatality Estimator
Upcoming Project Activities

The plans for upcoming tasks and completion of the project:

- Working Together to Resolve Environmental Impacts of Wind Energy
- Completing white paper on *Risk-Based Management*
- Conducting webinars—*Multiple Uses for Offshore Space, and Griffon Vultures and California Condors*
- Conducting expert forums —*Offshore Wind and Birds: Collision Risk vs. Avoidance*
- Finalizing short science summaries on European wolves, bats, soaring birds, and European grouse