

### American Wind Wildlife Institute Collaboration for Wind-Wildlife Solutions

June 2019

www.awwi.org



- Overview of AWWI: Partners & Friends, Board of Directors
- National Research Plan and Research Focus/Overlap with MAFWA States
- Overview of AWWI Program
- Sample Research Projects • Bats, Eagles, and Grouse
- Outreach Supporting Midwest States



### **Overview of AWWI**

#### Sustaining Partners & Friends



#### **Board & Leadership**







Chair: Jenny McIvor Vice Chair: Garry George

Kyle Boudreaux, NextEra Energy Rene Braud, Pattern Energy Group Christi Calabrese, EDP Renewables Alex Daue, The Wilderness Society Nathanael Greene, Natural Resources Defense Council Tim Hayes, Duke Energy Renewables Keith Harrison, Southern Power **Brad Loveless, Association of Fish &** Wildlife Agencies (Kansas) Treasurer: John Rogers

Secretary: Alyssa Edwards

Jim Murphy, National Wildlife Federation Laura Nagy, Ph.D., Avangrid Renewables Joy Page, Defenders of Wildlife Mark Rupp, Environmental Defense Fund Jessica Wilkinson, The Nature Conservancy Ken Young, Apex Clean Energy Tom Kiernan, American Wind Energy Association (Advisory Member) Terry Root, Stanford University (Advisory Member)



# To facilitate timely and responsible development of wind energy while protecting wildlife and wildlife habitat





- Synthesis of what we know and research priorities
- Developed in consultation with:

   Federal and state agency personnel
   Other scientists
   AWWI Partners and Friends
- Highlights priority questions and specific areas of research and outcomes for key species groups (birds, bats, grouse/habitat)





### Research Plan Guides AWWI Research Topic Priorities







MAFWA

- Indiana Bat
- Northern Long-Eared Bat

Installed Turbines . MAFWA



Golden Eagle

- Installed Turbines
- MAFWA
- Greater Sage Grouse
- Lesser Prairie Chicken
- Greater Prairie Chicken
  - Sharp-tailed Grouse

# AWWI's Programs

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to wildlife

WILDLIFE INSTITUTE



**Enabling Application** 

AMERICAN WIND WILDLIFE

### American Wind Wildlife Information Center (AWWIC) Database

- AWWIC Post-Construction Monitoring Database:
  - <u>Confidential</u> database that incorporates public and confidential data
- AWWI is analyzing fatality data for different species across multiple sites and regions to better understand wind's risks to wildlife
- First analyses for birds and bats now available

### AWWIC By the Numbers

- Estimated percentage of installed MWs (as of Q2 2018): 22%
- Number of U.S. projects (public and confidential): 157
- Number of post-construction studies: 243
- Total number of GWs represented: 18
- Total number of turbines searched: 6,800
- Total number of carcass searches: 285,000



### Sources

- Partner and Friend pledges
- State funds (CEC, other)
- Federal funding: grants/in-kind, US DOE, USGS
- Electric Power Research Institute (EPRI)
- In-kind from various collaborators
- Industry: Wind Wildlife Research Fund, sponsorships, and other
- Foundations
- Individual donors





### New in 2019: Wind Wildlife Research Fund



# Industry fund that pools investment and resources to advance research for solutions to wind-wildlife issues

- Launched in 2019; AWWI is secretariat
- 2019 projects underway
- 2020 and beyond: Proposals in response to an RFP

   Peer review in progress
  - $\,\circ\,$  Project selection will be completed this summer



- Using AWWIC to model bat fatality risk and improve curtailment strategies at wind facilities (WWRF)
  - $_{\odot}$  Modeling bat fatalities in the Midwest using landscape characteristics
  - **O** Modeling bat movement and migration using weather data
  - $\circ$  Comparing effectiveness of varying cut-in speeds
- Ongoing study in Illinois intended to identify actual time of bat fatalities and identify fine-resolution environmental correlates with bat collision risk (Industry)
- Upcoming evaluation in Iowa of Vestas Bat Protection System (VBPS), a smart curtailment system for bats (DOE/match)
- Upcoming evaluation, potentially in Iowa, of Turbine Integrated Mortality Reduction (TIMR), a smart curtailment system for bats (DOE/match)





- Evaluations of DTBird, detection and deterrent technology for eagles
  - Completed pilot test in CA in 2018 (Industry)
  - Ongoing, federally funded, multi-year multi-site study evaluation in CA and WA (DOE/match)
- Evaluations of IdentiFlight, detection and informed curtailment technology for eagles
  - Completed pilot test in WY in 2017 (Industry)
  - Ongoing, federally funded, multi-year multi-site study evaluation in WY and OR (DOE/match)
- Improving carcass persistence estimates (WWRF)
- Improving curtailment algorithms of IdentiFlight technology (WWRF)
- Developing options for compensatory mitigation (AWWI)
  - Lead poisoning reduction (published)
  - Vehicle collision reduction (published)
  - Habitat enhancement (draft report in progress)



#### Assessment on what's needed and how to organize research

- Conducted stakeholder interviews to inform next steps for grouse
- Grouse white paper and workshop (AWWI/NWCC)
  - $_{\odot}$  White Paper on state-of-science grouse and wind power
  - Workshop stakeholder feedback on white paper and explore research priorities

### **Meta-Analysis**

- Report drafted: Effects of Wind Energy Turbines on Grouse: A Review of Survival and Displacement (WEST, Inc)
  - Expert review and publish as NWCC report
  - Develop manuscript for submission to peer-reviewed journal
- Multi-year assessment of species response at a KS wind energy facility (WWRF)









### www.awwi.org/results-catalog/

AWWIC Bird Technical Report	Published
Technology Integration White Paper	Published
Bat White Paper	Published
Eagle Mitigation Model: Reducing Vehicle Strikes Publication	Published
AWWIC Bat Technical Report	Published
IdentiFlight Publication and DTBird Technical Report	Published
Wind-Wildlife Technology Catalog *AWWI Partner & Friend Exclusive*	Updated for 2019
Issues in Ecology issue on Wind & Wildlife	Summer 2019
Bat Deterrent Technology Tests	Submit Summer 2019
Eagle Mitigation Model: Habitat Enhancement Technical Report	Summer 2019
Bayesian Risk Analysis of AWWIC Database	Submit Summer 2019
Bat Landscape Risk Model	Submit Summer 2019
Grouse and Wind Energy White Paper	Fall 2019

## **Enabling Application**

• Webinars

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- AWWIC, Wind 101, Technology Innovation, Updates on WWRM Research, Grouse Paper Results
- State-Specific Training
  - Curriculum on state-of-the-science; cross-sector perspectives and dialogue
  - Can provide in your state!



- Opportunities to support Midwest Landscape Initiative?
- Biennial Wind Wildlife Research Meeting (WWRM) 2020





### **AWWI Board Members Representing AFWA**

Current: Brad Loveless, KS Former: Roy Elicker, formerly OR Paul Johansen, WV Kelley Myers, formerly IA Jeff Vonk, formerly SD

### AWWI 10<sup>th</sup> Anniversary Video: www.vimeo.com/304420920





2019

### AWWI Program Updates: Summer 2019

AWWI is **producing the results** for wind energy to achieve full conservation value through **innovative programs** and **unprecedented collaboration** 

#### AWWI'S PROGRAM AREAS

#### **Assessing Risk**

The **AWWIC database** is a confidential database of post-construction monitoring data from wind projects across the U.S. Using AWWIC, AWWI is analyzing fatality data for different species across multiple sites and regions to **better understand wind's risks to wildlife** and reduce uncertainty; inform permitting, siting, and operation; and improve conservation.

#### **Developing Solutions**

The **Technology Innovation Program** is a catalyst that brings together creative ideas and informed investment. It provides **independent evaluation of technologies and strategies** intended to detect, deter, and/or curtail, making it possible to reduce risk for birds and bats. AWWI research also develops tools and mitigation options for eagles, bats, and grouse.

#### **Enabling Application**

AWWI **synthesizes results** and **collaborates with experts** from the wind industry, the conservation/science community, and state and federal decisionmakers to ensure tools and solutions are applied to maximize conservation outcomes.

#### RECENT AND UPCOMING RESULTS: www.awwi.org/results-catalog

AWWIC Bird Technical Report and Bat Technical Report	Published	
Bats and Wind Energy: Impacts, Mitigation, and Tradeoffs White Paper	Published	
Eagle Mitigation Model: Reducing Vehicle Strikes Publication	Published	
IdentiFlight Publication and DTBird Technical Reports	Published	
Wind-Wildlife Technology Catalog *AWWI Partner & Friend Exclusive*	Updated for 2019	
Bat Deterrent Technology Tests	Submit Summer 2019	
Eagle Mitigation Model: Habitat Enhancement Technical Report	Summer 2019	
Bayesian Risk Analysis of AWWIC Database	Submit Summer 2019	
Bat Landscape Risk Model	Submit Summer 2019	
Grouse and Wind Energy White Paper	Winter 2020	
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#### Project Highlights-View Published Results at www.awwi.org/results-catalog

#### SAMPLE PROJECTS: BATS

- Using AWWIC to model bat fatality risk and improve curtailment strategies at wind facilities
  - ° Modeling bat fatalities using landscape characteristics
  - ° Modeling bat movement and migration using weather data
  - <sup>2</sup> Comparing effectiveness of varying cut-in speeds
- Ongoing study to identify environmental correlates with bat collision risk
- Evaluation of Vestas Bat Protection System (VBPS), a smart curtailment system for bats
- Evaluation of Turbine Integrated Mortality Reduction (TIMR), a smart curtailment system for bats

#### SAMPLE PROJECTS: EAGLES

- Evaluations of DTBird, a detection and deterrent technology for eagles
- Evaluations of IdentiFlight, a detection and informed curtailment technology for eagles
- Improving carcass persistence estimates
- Improving curtailment algorithms of IdentiFlight technology
- Develop options for compensatory mitigation
  - Lead poisoning reduction (published)
  - Vehicle collision reduction (published)
  - Habitat enhancement (draft report in progress)

#### SAMPLE PROJECTS: GROUSE

- Developing grouse white paper on the state-of-science of grouse and wind power
- Conducting workshop for stakeholder feedback on white paper and to explore research priorities
- Meta-Analysis: Effects of Wind Energy Turbines on Grouse: A Review of Survival and Displacement (NWCC report and manuscript in progress)
- Multi-year assessment of lesser prairie-chicken response at an operating wind energy facility







#### LEARN MORE ABOUT AWWI

Watch our 10th Anniversary Video at: www.vimeo.com/304420920

#### AWWI PARTNERS AND FRIENDS

American Wind Energy Association ~ Apex Clean Energy ~ Association of Fish & Wildlife Agencies ~ Avangrid Renewables ~ Berkshire Hathaway Energy ~ Clearway Energy ~ ConnectGen ~ Defenders of Wildlife ~ DTE Energy ~ Duke Energy Renewables ~ EDF Renewables ~ EDP Renewables ~ Enel Green Power North America ~ ENGIE ~ Environmental Defense Fund ~ IdentiFlight ~ Innogy ~ Invenergy ~ Leeward Renewable Energy ~ MAP Energy ~ NextEra Energy ~ National Audubon Society ~ National Wildlife Federation ~ Natural Resources Defense Council ~ NRG Systems ~ Orion Renewable Energy Group ~ Pattern Energy Group ~ Portland General Electric ~ Puget Sound Energy ~ RES (Renewable Energy Systems) ~ Scout Clean Energy ~ Siemens Energy ~ Sierra Club ~ Southern Power ~ sPower ~ The Nature Conservancy ~ Tradewind Energy ~ Union of Concerned Scientists ~ Vestas Americas ~ The Wilderness Society

American Wind Wildlife Institute | www.awwi.org | info@awwi.org | 1110 Vermont Avenue, NW, Suite 950, Washington, DC