Wind Wildlife Research Meeting IX

Presented by

November 27, 2012: Wind Energy Guidelines Training
November 28-30, 2012: Wind Wildlife Research Meeting

Broomfield, Colorado

Program

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About

The biennial Wind Wildlife Research Meeting provides an internationally-recognized forum for researchers and wind-wildlife stakeholders to hear contributed papers, view research posters, and listen to panels that synthesize the most recent wind power-related wildlife research, including assessing risks and impacts, estimating fatalities, planning for cumulative impacts, offshore wind energy siting and assessment, and syntheses across projects.

The meeting and agenda were planned by the American Wind Wildlife Institute (AWWI) with support from a Planning Committee of volunteers from the National Wind Coordinating Collaborative (NWCC) Wildlife Workgroup (see acknowledgements page). Dr. Taber Allison, AWWI's Director of Research and Evaluation, is Chair of the Planning Committee and meeting.

The NWCC is funded by the U.S. Department of Energy's Wind and Water Technologies Program through the National Renewable Energy Laboratory and is facilitated by AWWI. This year's Wind Wildlife Research Meeting is funded by AWWI with the generous support from meeting sponsors.

Thank you to AWWI's Sustaining Partners and Friends. Without their support of AWWI, a meeting of this caliber would not be possible:

AWWI Sustaining Partners:

- American Wind Energy Association
- Association of Fish & Wildlife Agencies
- BP Wind Energy
- Defenders of Wildlife
- EDF Renewable Energy
- EDP Renewables
- Environmental Defense Fund
- First Wind
- GE Energy
- Iberdrola Renewables
- National Audubon Society
- National Wildlife Federation
- Natural Resources Defense Council
- NRG Systems
- Pacific Gas & Electric Co.
- Pattern Energy Group
- RES Americas
- Shell WindEnergy
- Sierra Club
- The Nature Conservancy
- Union of Concerned Scientists
- Vestas Americas

AWWI Friends:

- AES Wind Generation
- AWS Truepower
- Clean Line Energy Partners
- Clipper Windpower
- Duke Energy Renewables
- Edison Mission Energy
- Element Power
- Ridgeline Energy
- Terra-Gen Power

Acknowledgements

We wish to thank all members of the **Wind Wildlife Research Meeting Planning Committee**, who contributed extensive volunteer hours in planning this meeting, as well as all others who provided input:

- John Anderson, American Wind Energy Association
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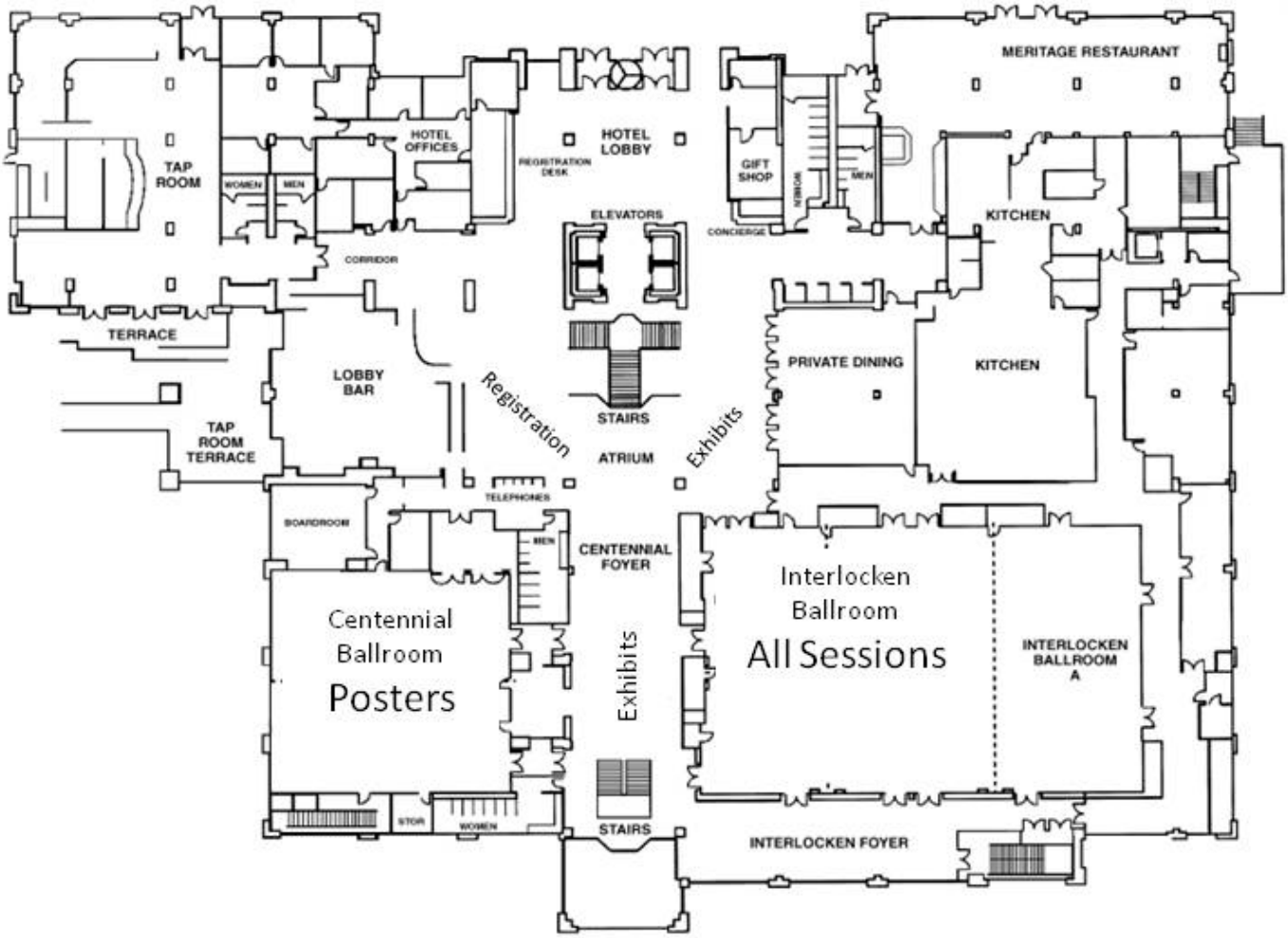
- Hugo Costa, bio3
- Wing Goodale, Biodiversity Research Institute
- Celia Greenman, Colorado Parks and Wildlife
- Tim Hayes, Duke Energy
- Bronwyn Hogan, U.S. Fish & Wildlife Service
- Manuela Huso, U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center
- Caroline Jezierski, Nebraska Cooperative Fish & Wildlife Research Unit
- Christy Johnson-Hughes, U.S. Fish & Wildlife Service
- Kim Peters, Mass Audubon
- Jerry Roppe, Iberdrola Renewables
- Jill Shaffer, U.S. Geological Survey, Northern Prairie Wildlife Research Center
- Lynn Sharp, Tetra Tech EC, Inc.
- Karin Sinclair, National Renewable Energy Laboratory
- Dale Strickland, WEST, Inc.
- Bob Thresher, National Renewable Energy Laboratory
- Kim Wells, BP Wind Energy
- Jim Woehr, Bureau of Ocean Energy Management
- Terry Yonker, Great Lakes Wind Collaborative

A huge thank you also to the reviewers who volunteered their time to review submitted abstracts and the meeting volunteers who offered their time to support the meeting logistics.

Map

All sessions take place in the Interlocken Ballroom. Posters are on display in the Centennial Ballroom.



About

Registration

Registration is located in the Atrium, off of the Centennial Foyer. Please stop by registration when you arrive to check in and pick up your meeting materials. Registration tables will be staffed at the following times:

- Tuesday, November 27: 8:30 am – 5:00 pm
- Wednesday, November 28: 7:30 am – 5:00pm
- Thursday, November 29: 7:30 am – 5:00 pm
- Friday, November 30: 7:30 am – 11:00 am

Meeting Materials
Unless you ordered a binder, all meeting materials will be distributed via a website, which has been shared with all attendees by email. This website will be updated with all information available at the time of the session.

If you ordered a binder during the meeting registration process, you will receive this when you register. Some presentations were not available at the time of printing and will be available on the meeting materials website.

Some presentations contain proprietary or preliminary information and will not be distributed.

Materials for the Wind Energy Guidelines Training will be provided to all training attendees at registration.

Ground Rules

In 2012, the NWCC adopted new participation guidelines, which include operating principles. All participants at the meeting are asked to follow these principles, which will allow for constructive and respectful engagement among all meeting attendees.

Ground Rules

- Respect each other's various points of view.
- Avoid personal attacks.
- Be considerate of time so all can share their perspectives.

Confidentiality
No party will characterize the position of any other party in public statements or in discussions with the press. If approached by the press, participants in NWCC activities may speak on behalf of their organization but not on behalf of the NWCC or other participants in NWCC activities.

Preliminary Information
Note: Some information presented at this meeting is preliminary and has not been published or peer reviewed. Therefore, any information taken from this meeting should not be quoted or cited without permission from the author. Meeting proceedings will be prepared and released publicly in early 2013.

Schedule-at-a-Glance

Tuesday, November 27

10:00am - 5:30pm	Training Session: U.S. Fish & Wildlife Service Land-Based Wind Energy Guidelines (separate agenda provided to training registrants)

Wednesday, November 28

7:30am	*Continental Breakfast*
8:30am	**Welcome; Updates on Policy & Regulations and the Wind Industry**
9:50am	**Assessing Risk to Birds and Bats**
10:55am	*Break and Light Refreshments*
11:15am	**Birds and Wind Energy: Assessing Habitat-based Impacts**
12:30pm	*Lunch*
1:25pm	**Raptors and Wind Energy**
2:40pm	*Poster Session, Break, and Light Refreshments*
3:25pm	**Eagles and Wind Energy**
5:30pm	*Poster Session and Reception*

Thursday, November 29

7:30am	*Continental Breakfast*
8:30am	**Updates from the U.S. Department of Energy**
9:05am	**Estimating Fatalities of Birds and Bats**
10:25am	*Break and Light Refreshments*
10:45am	**Planning for Cumulative Impacts**
11:45am	*Break and Pick Up Box Lunch*
12:15pm	**Avoiding the Unmanageable: Renewable Energy Siting and Biodiversity in a 4° C World** (over lunch)
1:00pm	**Bats and Wind Energy: Assessing Risks and Impacts**
2:50pm	*Poster Session, Break, and Light Refreshments*
3:50pm	**Offshore Wind Energy: Siting and Assessment**
5:30pm	*Poster Session and Reception*

Friday, November 30

7:30am	*Continental Breakfast*
8:30am	**Lessons Learned: Syntheses Across Projects**
10:10am	*Break*
10:30am	**Lessons Learned: Key Meeting Takeaways**
12:00pm	*Adjourn*

Refreshment and Meal Schedule

Tuesday, November 27

Lunch and light refreshments will be provided for attendees of the Wind Energy Guidelines Training. Breakfast will not be provided.

Wednesday, November 28

7:30am – 8:30am	Continental Breakfast
10:55am – 11:15am	Break and Light Refreshments
12:30pm – 1:25pm	Buffet Lunch
2:40pm – 3:25pm	Poster Session, Break, and Light Refreshments
5:30pm – 7:30pm	Poster Session and Reception

Thursday, November 29

7:30am – 8:30am	Continental Breakfast
10:25am – 10:45am	Break and Light Refreshments
11:45am – 12:15pm	Lunch (please pick up box lunch prior to presentation)
2:50pm – 3:50pm	Poster Session, Break, and Light Refreshments
5:30pm – 7:30pm	Poster Session and Reception

Friday, November 30

7:30am – 8:30am	Continental Breakfast
10:10am – 10:30am	Break and Light Refreshments

Detailed Agenda

Note: Agenda for training on November 27 provided to training attendees separately.

Wednesday, November 28

7:30am	Conference Registration and Continental Breakfast	
8:30am	**Welcome Updates on Policy & Regulations and on the Wind Industry**	
	Welcome and Opening Remarks	AWWI Staff
	Policy and Regulatory Updates	David Cottingham, U.S. Fish & Wildlife Service John Emmerich, Wyoming Game & Fish Department
	Wind Industry Updates	John Anderson, AWEA
9:50am	**Assessing Risk to Birds and Bats**	
	Session Introduction	Moderator: David Brandes, Lafayette College
	Using Spatial Models to Predict Relative Collision Risks of Horned Larks and Hoary Bats at Wind Farms in the Central United States	Greg M. Forcey, Normandeau Associates
	Competing Resource Selection Modeling Predicts Risk for Preventing and Mitigating Impacts to Flying Birds from Industrial Wind Energy Developments	Tricia Miller, West Virginia University & Riparia, The Pennsylvania State University
	Using Avian Radar to Quantify Bird and Bat Migration along the Shoreline of Lake Michigan and Implications for Analysis and Pre-construction Surveys	Jeffrey Gosse, U.S. Fish and Wildlife Service
	Questions and Answers/Discussion (@ 10:40am)	
10:55am	Break and Light Refreshments	
11:15am	**Birds and Wind Energy: Assessing Habitat-based Impacts**	
	Session Introduction	Moderator: William Burnidge, The Nature Conservancy
	Effects of Wind Power Development on Greater Prairie-Chickens in Kansas	Brett K. Sandercock, Kansas State University
	Avoidance of Wind Turbines by Grassland Birds	Douglas Johnson, U.S. Geological Survey

Understanding Greater Sage-Grouse Response to Wind Energy Development at a Landscape Scale:	NWCC Sage-Grouse Research Collaborative:
Short-Term Impacts to Greater Sage-Grouse from Wind Energy Development *(accompanied by poster)*	Chad W. LeBeau, University of Wyoming & WEST, Inc.
Ecology of Male Greater Sage-Grouse Before Wind Energy Development in South-Central Wyoming	Christopher P. Hansen, University of Missouri
Questions and Answers/Discussion (@12:10pm)	

12:30 Lunch

1:25pm Raptors and Wind Energy

Session Introduction	Moderator: Todd Mabee, ABR Inc.
A Review and Standardizing of Raptor Fatality Estimates at Wind Energy Facilities in the Columbia Plateau Ecoregion	Kim Bay, WEST Inc.
Factors Affecting Bird Mortality in Wind Farms, and Mitigation Measures: the State of the Art in Spain	Miguel Ferrer, Doñana Biological Station
Condor Detection and Alert System	Crissy Sutter, Normandeau Associates
Questions and Answers/Discussion (@2:20pm)	

2:40pm Poster Session, Break, and Light Refreshments

3:25pm Eagles and Wind Energy

Session Introduction	Moderator: Kevin Martin, Terra-Gen Power
Meteorological and Topographic Drivers of Migratory Flight of Golden Eagles: Implications for Wind Energy Development	Todd Katzner, West Virginia University & USDA Forest Service, Timber and Watershed Laboratory
Eagle Risk Models	
The Bayesian Eagle Risk Model: Input Implications, Study Design, and Fatality Estimates	Chris Farmer, Tetra Tech EC
Understanding the USFWS Golden Eagle Collision Risk Model	Kenton Taylor, WEST, Inc.
Power Pole Retrofitting as a Compensatory Mitigation Option for Eagle Take: Opportunities, Constraints, and Logistical Considerations	Sherry Liguori, PacifiCorp & Avian Power Line Interaction Committee
Potential Compensatory Mitigation Options for Golden Eagles	Laura Nagy, Tetra Tech
Navigating the USFWS Eagle Guidance with Respect to Bald Eagles	Mike Morgante, Ecology and Environment, Inc.
Questions and Answers/Discussion (@5:00pm)	

5:30pm Poster Session and Reception

Thursday, November 29

7:30am	Conference Registration and Continental Breakfast	
8:30am	**Updates from U.S. Department of Energy**	**Jose Zayas, U.S. DOE**
9:05am	**Estimating Fatalities of Birds and Bats**	
	Session Introduction	Moderator: Bronwyn Hogan, U.S. Fish and Wildlife Service
	An Empirical Approach to Fatality Estimation at Wind Energy Facilities	Shay Howlin, WEST, Inc.
	Statistical Examination of the Efficacy of Road and Pad Searches for Post-construction Monitoring	Michelle Sonnenberg, WEST, Inc.
	Evaluating the Validity of a Protocol for Long-term, Post-construction Fatality Monitoring to Assess Wildlife Impacts that Integrates with Operation's Activities and Personnel	Jerry Roppe, Iberdrola Renewables
	Improving Methods for Estimating Fatality of Birds and Bats at Wind Energy Facilities: Modeling Time Dependence Due to Searcher Proficiency and Carcass Persistence and Implications for Monitoring Design	William Warren-Hicks, EcoStat/Cardno Entrix
	Questions and Answers/Discussion (@10:05am)	
10:25am	Break and Light Refreshments	
10:45am	**Planning for Cumulative Impacts**	
	Session Introduction	Moderator: Justin Allegro, National Wildlife Federation
	Part 1: Collaborative Landscape, Conservation Approach, and Benefits of the of the Great Plains Wind Energy HCP (GPWE HCP) *(accompanied by poster)*	Karen Tyrell, BHE Environmental
	Part 2: Collaborative Landscape Conservation Approach: Modeling Potential Impacts to Migratory Whooping Cranes from Wind Power Development *(accompanied by poster)*	Christopher Nations, WEST, Inc.
	Lessons Learned from the Frontline: Challenges and Solutions to Habitat Conservation Planning for Indiana bats	Cara Wolff Meinke, WEST, Inc.
	Questions and Answers/Discussion (@11:30am)	
11:45am	Please Pick Up Box Lunch and Return to Meeting Room for Presentation	
12:15pm	Presentation over Lunch: Avoiding the Unmanageable: Renewable Energy Siting and Biodiversity in a 4° C World	Taber Allison, AWWI

1:00pm Bats and Wind Energy: Assessing Risks and Impacts

Session Introduction	Moderator: Amanda Hale, Texas Christian University
A Computational and Analytical Study of Bats Flying Near Wind Turbines: Implications Regarding Barotrauma	Daniel R. Houck, National Renewable Energy Lab, National Wind Technology Center
Regional Analysis of Wind Turbine-caused Bat Fatality	David Drake, University of Wisconsin-Madison
Modeling the Environmental Conditions that Predict Bat Activity at Wind Energy Facilities Can Improve Mitigation Efficiency	Theodore J. Weller, USDA Forest Service, Pacific Southwest Research Station
The Influence of Specific Atmospheric Variables on Fall Bat Activity Varies Among Geographic Regions and Species	Lauren Hooton, Normandeau Associates
Wind Development in a Post-white Nose Syndrome World	Bradley J. Steffen, BHE Environmental, Inc.
Questions and Answers/Discussion (@2:20pm)	

2:50pm Poster Session, Break and Light Refreshments

3:50pm Offshore Wind Energy: Siting and Assessment

Discussion Question: To What Extent Does our Experience Siting Wind on Land Inform Siting of Offshore Wind Energy?

Moderator: Steve Pelletier, Stantec

Panel:

- Caleb Gordon, Normandeau Associates
- Eric Kershner, U.S. Fish and Wildlife Service
- Kate Williams, Biodiversity Research Institute
- Jim Woehr, Bureau of Ocean Energy Management
- Terry Yonker, Great Lakes Wind Collaborative

Questions, Answers, and Discussion with Audience

5:30pm Poster Session and Reception

Friday, November 30

7:30am Continental Breakfast

8:30am Lessons Learned: Syntheses Across Projects

Session Introduction	Moderator: Taber Allison, AWWI
Relating Pre-Construction Bat Activity and Post-Construction Fatality To Predict Risk at Wind Energy Facilities	Cris Hein, Bat Conservation International
Assessing the Impact of Wind-Energy Facilities on North American Songbirds	Wallace Erickson, WEST, Inc.
Operational Mitigation of Wind Turbine Generators To Avoid Bat Fatalities: A Synthesis of Existing Studies	Ed Arnett, Theodore Roosevelt Conservation Partnership
Estimating direct fatality impacts at wind farms: How far we've come, where we have yet to go	Manuela Huso, USGS Forest and Rangeland Ecosystem Science Center
Questions and Answers/Discussion (@9:40am)	

10:10am Break

10:30am Lessons Learned: Key Meeting Takeaways

Facilitated Discussion	Moderator: Abby Arnold, AWWI

12:00pm Adjourn

Posters

Posters are on display throughout the meeting in the Centennial Ballroom. Breaks and receptions will be held among the poster displays at the following times:

- Wednesday, November 28: 2:40pm – 3:25pm & 5:30pm – 7:30pm
- Thursday, November 29: 2:50pm – 3:50pm & 5:30pm – 7:30pm

The posters presented at the meeting are listed below. Poster presenters, whose names are listed in bold text, have been asked to be near their posters at the times listed.

Each poster has a designated number (listed after the title), which will help you locate it in the poster room. Posters are not grouped by session in the room.

Assessing Risk to Birds and Bats

Comparison of banding, acoustic, and NEXRAD radar data for studying passerine migration in upstate New York: A complementary approach (#1)
Evan M. Adams, K.A. Williams, C. Anderson, J. Fiely, R. Lambert, D. Yates (Biodiversity Research Institute); P.B. Chilson, C.M. Kuster (School of Meteorology and Atmospheric Radar Research Center, University of Oklahoma)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

The Role of Population Modeling in Risk Assessment at Wind Energy Facilities (#4)
Robert A. Pastorok, Damian V. Preziosi, **Matthew E. Behum** (Integral Consulting)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Reproductive success of birds in relation to wind turbine proximity in Iowa (#24)
Molly K. Gillespie, Stephen J. Dinsmore (Iowa State University Department of Natural Resource Ecology and Management)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Bird responses to wind turbine proximity in Iowa (#25)
Molly K. Gillespie, Stephen J. Dinsmore (Iowa State University Department of Natural Resource Ecology and Management)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Understanding migration corridors along the Great Lakes (#26)
Jeffrey Gosse, David Larson, Daniel Nolfi, Nathan Rathbun, Rebecca Horton, Tim Bowden, Erik Olson (U.S. Fish and Wildlife Service)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Wind turbines and birds: A phylogenetic and morphological approach (#30)
Leonel Herrera-Alsina, Héctor Arita (Centro de Investigaciones en Ecosistemas Universidad Nacional Autónoma de México)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Effects of wind energy development and ranch management on greater prairie-chickens in the Flint Hills of Kansas (#32)
Greg Johnson (WEST, Inc.); Jerry Roppe (Iberdrola Renewables)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Bird and bat movement patterns and mortality at the Montezuma Hills Wind Resource Area, California (#33)
Dave Johnston, Judd Howell, Scott Terrill, Jim Castle, Nellie Thorngate, Jeff Smith (H. T. Harvey & Associates); Todd Mabee (ABR Inc.)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

A comparison of pre- and post-construction avian use at a northern Arizona wind energy facility (#37)
Thomas J. Koronkiewicz, L. Dickson, E. Koster (SWCA Environmental Consultants)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

A critical review of the Effects of Tall Structures on Birds (#38)
Karl Kosciuch, Jason Jones (Tetra Tech); Kim Walters (HEMMERA)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Reactions to turbines by birds and bats, an objective assessment (#40)
Ronald P. Larkin (Illinois Natural History Survey)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Short-Term Impacts to Greater Sage-Grouse from Wind Energy Development (accompanies a presentation) (#41)
Chad W. LeBeau (Department of Ecosystem Science and Management, University of Wyoming & WEST, Inc.); Jeffrey L. Beck (Department of Ecosystem Science and Management, University of Wyoming); Gregory D. Johnson (WEST, Inc.); Ryan M. Nielson (WEST, Inc.); Matt J. Holloran (Wyoming Wildlife Consultants, LLC)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Minnesota Department of Natural Resources Guidance For Commercial Wind Energy Projects (#44)
Kevin Mixon (Minnesota Department of Natural Resources)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

The Conservation of Airspace and Habitat in a Major Bird Migration Corridor (#53)
Anna Peterson (Conservation Biology Program, University of Minnesota); Gerald J Niemi (Natural Resources Research Institute, University of Minnesota); Douglas H. Johnson (U.S. Geological Survey; Dept. of Fisheries, Wildlife, and Conservation Biology, University of Minnesota)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Research Priorities for Wind Energy and Migratory Wildlife (#54)
Martin D. Piorkowski (Arizona Game and Fish Department); Ronald W. Rohrbaugh, Andrew J. Farnsworth, Kenneth V. Rosenberg, John W. Fitzpatrick (The Cornell Lab of Ornithology); Michael Fry (U.S. Fish and Wildlife Service)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

A synthesis of bird and bat fatalities in Quebec wind facilities between 2008 and 2011 (#65)
Junior A. Tremblay (Ministère des Ressources naturelles et de la Faune)
Not attending

Estimating Fatalities of Birds and Bats

"Catch you scavenger!", camera trapping of carcass removal by scavengers at two Portuguese wind farms (#7)
João Paula, Pedro Pereira, **Joana Bernardino**, Hugo Costa, Miguel Mascarenhas (Bio3)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Siting wind farms for wildlife: Predicting bird and bat fatality risk at prospective wind farm sites using acoustic detectors (#28)
Kevin Heist (University of Minnesota Conservation Biology Graduate Program); Douglas H. Johnson (Northern Prairie Wildlife Research Center)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

A Projectile Motion Modeling Approach for Estimating Carcass Distributions of Avian and Bat Fatalities at Wind Farms (#49)
Adam Miyamoto, **Ling Ong**, Chad Cross (SWCA Environmental Consultants); Dave Cowan, Robert Roy, Greg Spencer, Mitchell Craig (First Wind)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Post-Construction Monitoring at Arizona's First Commercial Wind Farm (#63)
Joel Thompson, Kimberly Bay (WEST, Inc.)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Scavenger removal: Bird and bat carcass persistence in a tropical wind farm (#66)
Rafael Villegas-Patraca, Samuel Macías-Sánchez, Ian MacGregor-Fors, Carlos Muñoz-Robles (Instituto de Ecología, A.C.)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Improving Methods for Estimating Fatality of Birds and Bats at Wind Energy Facilities: Evaluation of accuracy of existing equations, including assumptions and statistical bias (#68)
Robert Wolpert (Duke University); **William Warren-Hicks** (EcoStat/Cardno Entrix); Brian Karas, Loan Tran (EcoStat, Inc.); James Newman (Normandeau Associates)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Raptors and Wind Energy (Including Eagles)

Long term survey of wind farms impacts on Common Kestrel's populations and definition of an appropriate mitigation plan (#8)
Ana Cordeiro, **Joana Bernardino**, Hugo Costa, Miguel Mascarenhas (Bio3)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Implementation of compensation and offset measures for large birds of prey (#9)
Joana Santos, Ana Teresa Marques, Anabela Paula, **Joana Bernardino**, Miguel Mascarenhas, Hugo Costa (Bio3)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

High-resolution Modeling of Updrafts to Investigate Griffon Vulture (Gyps fulvus) Collision Risk with Wind Turbines (#16)
David Brandes (Department of Civil & Environmental Engineering, Lafayette College); Luis Barrios (Greensigns S.L.); Alejandro Rodríguez (Department of Conservation Biology, Estación Biológica de Doñana CSIC)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Ridgetop Modeling: Identifying Critical Raptor Migration Corridors for Conservation and Wind Development Planning (#22)
Markus Mika, **Kylan Frye Christensen**, Steven J. Slater, Shawn Hawks (HawkWatch International)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Flight behavior of Griffon Vultures near wind turbines in Tarifa, Spain (#17)
Brian A. Cooper, Robert H. Day (ABR, Inc.); Richard C. Curry (Curry & Kerlinger LLC)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Impacts of wind turbines on Buteo hawk fledgling mortality in the Columbia Plateau Ecoregion (#36)
Patrick Kolar, Marc Bechard (Department of Biology Boise State University)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Bald Eagle Flight Path Data Comparison (#39)
Scott Schubbe Krych, Bruce Jon Moreira (HDR Engineering)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Raptor behavior at a wind power project in Oaxaca, Mexico: implications for U.S. species (#42)
Todd J. Mabee (ABR Inc.); Rafael Villegas (Instituto de Ecologia)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Bald Eagle Breeding Habitat Model (#57)
Jon Schubbe, Sean Tuohey, Scott Krych, Bruce Moreira (HDR Engineering)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Bald eagle behavior before and after construction of the Pillar Mountain Wind Project at Kodiak, Alaska, and its effect on modeled collision risk (#58)
Lynn Sharp, Christina Herrmann, Robert Friedel, Chris Farmer (Tetra Tech); Richard MacIntosh
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

A Roadmap for Mitigating Raptor Risk at Windfarms: Application of Advanced Avian Radar Technology (#67)
Karen Voltura, Adam Kelly, Tim West, Jesse Lewis, Jenny Davenport (DeTect, Inc.); Andreas Smith, Javier Vidao (DeTect EU)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Bats and Wind Energy: Assessing Risks and Impacts

Can resource and activity hotspot mapping predict bat fatalities at wind turbines? (#5)
Victoria J. Bennett, Amanda M. Hale (TCU)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Can bat fatality be predicted from bat acoustic activity within the rotor-swept zone? (#6)
Victoria J. Bennett, Amanda M. Hale (Dept of Biology, TCU); Crissy Sutter, Allison Costello (Normandeau Associates); Kevin W. Heist (Conservation Biology Graduate Program, University of Minnesota)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

First approach to pre-construction bat monitoring at 5 South African Wind Farms: initial results and potential issues at a regional level (#10)
Karen Jodas, Robyn Kadis (NatureCounts); Bárbara Monteiro, **Joana Bernardino** (Bio3)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Variation in bat activity in Portuguese uplands: effects of wind speed, temperature and moonlight in different biotopes (#11)
Bárbara Monteiro, Rita Ferreira, Joana Santos, Teresa Marques, **Joana Bernardino**, Miguel Mascarenhas, Hugo Costa (Bio3)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Meteorological Data and Bat Activity: Developing Conservation Measures for Wind Energy (#14)
Tim Bowden, David Larson, Jeffrey Gosse, Daniel Nolfi, Rebecca Horton, Nathan Rathbun, Erik Olson (U.S. Fish and Wildlife Service)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Reduction of Myotis activity relative to total bat activity in long-term acoustic bat surveys pre- and post-exposure to white nose syndrome (#15)
Sarah Boyden, Trevor Peterson, Kristen Watrous (Stantec)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Use of pre-construction acoustic bat and meteorological data to design and forescast site-specific curtailment scenarios (#18)
Trevor Peterson, **Jessica Costa**, Kristian Omland (Stantec Consulting)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

The Effects of Weatherproofing on Acoustic Bat Detection (#19)
Allison Costello, Lauren Hooton, Crissy Sutter (Normandeau Associates)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Comparing the Efficacy of Various Monitoring Technologies for the Detection of Bats on Wind Farms (#23)
Presenter: **Robert Gierschick**; Authors: Ian Agranat, Sherwood Snyder (Wildlife Acoustics)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Can genetics and stable isotopes be used to gain geographical insights into the seasonal movement patterns and population structure of eastern red bats (Lasiurus borealis)? (#27)
Amanda M. Hale, Jennifer M. Korstian, Victoria, J. Bennett, Dean A. Williams (Dept. of Biology, TCU)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Novel Approach to Bird and Bat Mortality Reduction Using High Intensity Ultraviolet Lights (#55)
Donald Ronning (Lite Enterprises, Inc); Steve Pelletier, Trevor Peterson (Stantec Consulting Services)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Relating Post-Construction Bat Activity and Fatality at a Pennsylvania Wind Power Project (#56)
Cris Hein, **Michael Schirmacher** (Bat Conservation International); Manuela Huso (US Geological Survey Forest and Rangeland Ecosystems Science Center, Forest Sciences Lab); Ed Arnett (Theodore Roosevelt Conservation Partnership)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Activity Rates and Call Quality by Full-Spectrum Detectors (#59)
Donald I. Solick, Christopher S. Nations, Jeffery C. Gruver (WEST, Inc.)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Indiana bat home range size and habitat use in a Midwestern project area dominated by agriculture (#60)
Bradley J. Steffen, Andrew R. Carson (BHE Environmental, Inc.); Timothy C. Carter, (Department of Biology, Ball State University)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

A Data Visualization Tool for Incorporating Migratory Bat Records into Wind Energy Development Siting Decisions (#69)
Theodore J. Weller (USDA Forest Service, Pacific Southwest Research Station)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Planning for Cumulative Impacts

Compliance Management System (#3)
Tina Bartunek, Nadine May (Iberdrola Renewables)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Wind & Biodiversity project: integrated solutions for managing biodiversity in wind farms (#12)
Miguel Mascarenhas, Hugo Costa, **Joana Bernardino** (Bio3); José Vieira, Carlos Bastos (IEETA – Instituto de Engenharia Electrónica Telemática de Aveiro); Maria João Pereira, Carlos Fonseca (Departamento de Biologia & CESAM, Universidade de Aveiro)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Wind Development and Wildlife Mitigation: A Primer (#31)
Anne Jakle (Ruckelshaus Institute of Environment and Natural Resources, University of Wyoming)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Facilitating Progress: Wildlife Monitoring and Mitigation Measures for Wind Energy in the United States (#34)
Nathan Jones, Liba Pejchar (Colorado State University)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

APLIC Recommendations for Power Pole Configurations at Wind Energy Projects (#43)
Andrew Milner, Jerry Roppe (Iberdrola Renewables); Sherry Liguori (PacifiCorp); Mike Best (Pacific Gas and Electric); Jim Burruss (Cardo Entrix); Jim Lindsay (Florida Power and Light)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Part 2: Collaborative Landscape Conservation Approach: Modeling potential impacts to migratory whooping cranes from wind power development (*accompanies a presentation*) (#47)
Christopher S. Nations, Shay Howlin, David P. Young (WEST, Inc.)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Part 1: Collaborative Landscape, Conservation Approach, and Benefits of the of the Great Plains Wind Energy HCP (GPWE HCP) (*accompanies a presentation*) (#46)
Karen Tyrell, Kely Mertz (BHE Environmental); Abby Arnold, Elana Kimbrell (Kearns & West)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Offshore Wind Energy: Siting and Assessment

Guidelines for offshore renewables in the Portuguese Pilot Zone based on a pre-construction assessment (#13)
Helena Coelho, Rita Ferreira, Sandra Rodrigues, **Joana Bernardino**, Miguel Mascarenhas, Hugo Costa (Bio3); Ruth De Silva, Chris Pendlebury, Richard Walls (Natural Power Consultants)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Monitoring and Mitigation Alternatives for Protection of North Atlantic Right Whales during Offshore Wind Farm Installation (#20)
Presenter: **Corey Duberstein** (Pacific Northwest National Laboratory); Authors: Andrea Copping, Tom Carlson, Shari Matzner, Michele Halvorsen, Jessica Stavole (Pacific Northwest National Laboratory)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Avian Risk Assessment for Offshore Wind Projects (#48)
Christopher S. Nations, Dale M. Strickland (WEST, Inc.)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Update on Current Progress of Offshore Bat Research Activities in Atlantic and Great Lakes Regions (#50)
Steve Pelletier, Trevor Peterson, Kristian Watrous, Sarah Boyden (Stantec)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 5:30pm – 6:30pm

Integrated Ecological Monitoring Plans (IEMP) for Offshore Wind Projects (#52)
Chris Pendlebury, Jane Lancaster, Sarah Canning, Kate Grellier, Richard Walls (Natural Power Consultants)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Selection of mixed effects models for bird and marine mammal analysis undertaken for Robin Rigg offshore wind farm, Solway, Scotland (#51)
Chris Pendlebury, Gillian Lye, Sarah Canning, Richard Walls (Natural Power Consultants); Sally Shenton (EON Climate & Renewables)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

The Mid-Atlantic Baseline Studies Project: Study design and results to date, with a focus on high-definition aerial surveying and video analysis (#70)
Kathryn A. Williams, Iain J. Stenhouse, Evan M. Adams (Biodiversity Research Institute); Andrew Webb (HiDef Aerial Surveying, Ltd.); Emily Connelly (Biodiversity Research Institute)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Offshore Wind Development in the United States: A Review of Known and Hypothesized Impacts to Wildlife and Current Research Needs (#71)
Kathryn A. Williams, Wing Goodale (Biodiversity Research Institute)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Emerging Issues

Integrating Sportsmen's Values and Outdoor-Based Economic Analyses into Landscape-Scale Wind Energy Planning (#2)
Ed Arnett, Neil Thagard, Tom Franklin, Steve Belinda (Theodore Roosevelt Conservation Partnership)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Whooping and Sandhill Crane Use Monitoring at Five Operating Wind Facilities in North and South Dakota (#21)
Clayton Derby, Terri Thorn, Melissa Wolfe (WEST, Inc.)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

The impacts of wind power on terrestrial mammals – a review (#29)
Jan Olof Helldin (Swedish Biodiversity Centre, SLU, Uppsala); Jens Jung (Dept of Animal Environment and Health, Swedish SLU,Skara); Jonas Kindberg (Dept of Wildlife, Fish and Environmental Studies, SLU,Umeå); Niklas Lindberg (Enetjärn Natur, Umeå); Wiebke Neumann (Dept of Wildlife, Fish and Environmental Studies, SLU, Umeå); Mattias Olsson (EnviroPlanning, Gothenburg); Anna Skarin (Dept of Animal Nutrition and Management, SLU, Uppsala); Fredrik Widemo (Swedish Association for Hunting and Wildlife Management, Nyköping)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

The Impact of Energy Sprawl on Biodiversity and Ecosystem Services: A Landscape Scale Assessment in Colorado and Wyoming (#35)
Nathan Forrest Jones, Liba Pejchar (Colorado State University)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Whooping and sandhill crane behavior at an operating wind farm (#45)
Laura Nagy, Karl Kosciuch, Jenny Taylor (Tetra Tech)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Ecological Impacts of Wind Farms on Mammalian Mesocarnivores (#61)
Brian P. Tanis, Elmer J. Finck (Fort Hays State University, Department of Biological Sciences)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 5:30pm – 6:30pm

Winter survival risk for pronghorn encountering wind energy development in south-central, Wyoming (#62)
Katie L. Taylor, Jeffrey L. Beck (Department of Ecosystem Science and Management, University of Wyoming)
Wednesday, November 28: 6:30pm – 7:30pm & Thursday, November 29: 6:30pm – 7:30pm

Black bear use response to a wind energy facility in Vermont (#64)
David Tidhar, Cecily Costello, Trent McDonald (WEST, Inc.); Forrest Hammond (Vermont Fish and Wildlife Department, Vermont Agency of Natural Resources)
Wednesday, November 28: 5:30pm – 6:30pm & Thursday, November 29: 6:30pm – 7:30pm

Sponsor & Exhibitor Directory

American Wind Wildlife Institute

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The American Wind Wildlife Institute has a two-part mission: To facilitate timely and responsible development of wind energy, while protecting wildlife and wildlife habitat. AWWI was created and is sustained by a unique collaboration of environmentalists, conservationists, state wildlife agencies, and wind industry leaders. Our purpose is to help lay the scientific groundwork and best practices for wind farm siting and operations, through targeted initiatives: wind-wildlife research, landscape assessment, mitigation, and education.

BHE Environmental

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DeTect offers the MERLIN Avian Radar System, the most advanced and proven system available for windfarm bird and bat preconstruction mortality risk assessment and operational risk mitigation with over 70 units worldwide. With the MERLIN SCADA feature, the radar automatically provides turbine curtailment to mitigate bird and bat mortality risk.

Duke Energy Renewables

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Email: tim.hayes@duke-energy.com
Web: www.duke-energy.com/commercial-renewables/default.asp

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EDP Renewables, North America

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EDP Renewables North America (EDPR NA) develops, constructs, owns, and operates wind farms throughout North America. Based in Houston, Texas, with 19 offices and 28 wind farms across the United States, EDPR NA has developed approximately 3,700 megawatts (MW) and operates more than 3,400 MW of wind farms.

Hamer Environmental

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Hamer Environmental is an environmental services company specializing in renewable energy projects; including a decade of work with wind developments. Among these projects are initial siting and risk assessments, site screening, stakeholder consultations, ESA consultations, and threatened and endangered species studies.

Invenergy LLC

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Invenergy develops, owns, and operates renewable and natural gas-fueled power generation facilities. We have developed over 6,600 MW of utility-scale facilities in North America and Europe and are the largest independent wind energy generation company in North America.

National Renewable Energy Laboratory

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NextEra Energy Resources, LLC

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Tetra Tech, Inc.

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Titley Scientific

Kim Livengood
601 Business Loop 70 West; Suite 105; Columbia, MO, 65203-2546
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Email: kiml@titley-scientific.net
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Titley Scientific is the leader in acoustic bat monitoring and has set the industry standard for recording bats at wind installations. The SD2 detector provides a low power and efficient datalogger for bat call information that can be stored locally or transmitted remotely via the cellular network.

U.S. Geological Survey

Laurie Allen
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Email: lkallen@usgs.gov
Web: www.usgs.gov

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