

The Power of Collaboration to Solve Wind-Wildlife Challenges



2017-2018 Progress Report





Bald Eagle. Eagle Research at NWTCC | NREL, Flickr

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Letter from AWWI Executive Director Abby Arnold

Reflecting on Our First Decade, Looking Forward to the Next ...

As AWWI collaborators talk about AWWI's value, I'm struck by how much we owe to the dedication, commitment, and passion of our Partners, who ventured into the unknown and invested in a unique start-up formed by the wind industry and conservation/science community.

AWWI is living proof of the power of collaboration and the benefit of leveraging resources across the wind industry and the conservation/science community to solve challenges.

We have achieved a lot in our first decade — **AWWIC**, a database that provides a good foundation to document where and why there is risk from wind energy to avian and bat species, **technology innovation** paving the way for “smart” turbines, and tools to **mitigate impact**. Our work now has the reputation for excellence and problem-solving, such that people are now coming to us for help finding answers. Central to our ability to tackle issues going forward is the industry's commitment to the **Wind Wildlife Research Fund**. Financed by leaders in the wind industry, the Fund represents a step-change in commitment to seek solutions to wind-wildlife challenges. Leveraging public investment

and conservationists' support, we have the road map to wind's full clean energy and conservation potential.

Now more than ever there is an urgency to reduce greenhouse gas emissions, to get more wind farms built, and to acquire the scientific knowledge that will enable us to make wind farms safer for wildlife. I used to think that lack of funding was our biggest challenge, but time has eclipsed it. Time is our number one challenge now, because good science takes time.

Looking forward, I am optimistic that with the ongoing commitment of current and future Partners, Friends, and supporters, we will be able to tackle the major challenges and meet our nation's growing demand for electricity by constructing additional gigawatts of wind energy that minimize impacts to wildlife.

Thank you for being part of this effort, and for all you do. If you are not yet part of AWWI or the Fund, I urge you to get involved — we can't do this without you!

Sincerely,



Abby Arnold, Executive Director



Auwahi Wind | AEP Renewables and BP Wind Energy

A Decade of Collaboration

AWWI's 10th Anniversary

In 2018, AWWI collaborators celebrated our 10th anniversary with a successful campaign of activities and events.

We published a series of [success stories](#) highlighting how important scientific discoveries and company actions are making wind energy safer for wildlife. Developed through extensive interviews with our founders, Partners, and stakeholders, these stories pay tribute to the dedication of all those who work to improve how wildlife interacts with wind energy.

We released a [video](#) that features insights and reflections from AWWI founders and supporters, and premiered it at celebratory events that honored our champions. At the [AWEA Clean Energy Executive Summit](#), we announced the launch of the Wind Wildlife Research Fund with leaders including Tristan Grimbert, President and CEO of EDF Renewables, and Greg Wolf, CEO of Leeward Renewable Energy. At the 12th [NWCC Wind Wildlife Research Meeting](#), leaders in wind-wildlife science were recognized and President and CEO of Defenders of Wildlife Jamie Rappaport Clark [spoke passionately](#) about the imperative of addressing climate change and the role of renewable energy.

We closed out our first decade with a special event to [honor the career and achievements](#) of the visionary behind AWWI, Dr. James A. Walker. Leaders from the wind energy and wildlife conservation communities came together to



Dr. James Walker, founder of AWWI; Abby Arnold, AWWI Executive Director; Wayne Walker, former AWWI Executive Director

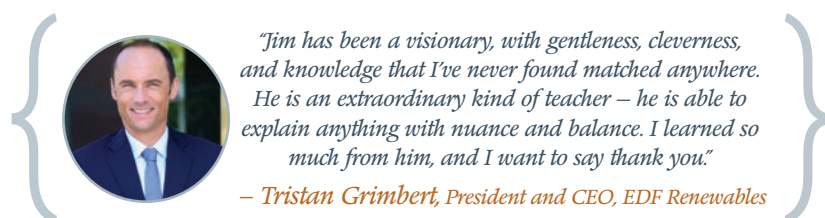


"10 years ago, wind energy cost more than conventional power. Today wind is one of the cheapest sources of electricity. 10 years ago we did not have AWWI. Today, this organization is widely accepted by agencies and environmental organizations as a source of peer-reviewed science that is being used to improve policies and practices, and helping to solve wind-wildlife conflicts. 10 years ago we did not have many solutions to wind-wildlife challenges. Today, new technologies are changing that. 10 or more years ago we could imagine a world without wind energy — today we cannot. 10 years ago we didn't know that we are in the middle of the sixth extinction, brought on by us. Sustainable development means meeting the needs of human beings while protecting the natural world. It's not a choice of the environment or people — we have to find solutions that work for both."

- **Rene Braud**, Director, Environmental Policy and Compliance, Pattern Energy and AWWI Board member



Clockwise from above: Celebrating leaders in wind-wildlife science. AWWI founders: Dr. James Walker and Johanna Wald, formerly NRDC. Dr. James Walker; Mike Garland and Sarah Webster, Pattern Energy. Current and past Board members: Joy Page, Defenders of Wildlife; Genevieve Thompson, formerly National Audubon Society; John Rogers, Union of Concerned Scientists.



thank Jim for his dedication and vision, and we announced the *James A. Walker Future of Wind and Wildlife Fellowship*, which will help develop the next generation of wind-wildlife leaders.

Thank you to AWWI's founders, partners, and collaborators for 10 years of tremendous support. As part of this year-long celebration and thanks to generous pledges from organizations and individuals, AWWI's *Wind & Wildlife: Together* campaign raised nearly \$400,000 toward expanding outreach on wind energy and wildlife. With your ongoing help, today we stand poised to embark on our next decade, knowing that together, we can solve these challenges.

A Special Thank You to AWWI Board Members

AWWI wouldn't be where it is today without the guidance and stewardship of our dedicated Board members. We'd like to express our gratitude to everyone who has served on the Board over the past decade, and to give special thanks to our former and current Chairs and Vice Chairs.



Current Board of Directors

Kyle Boudreaux	NextEra Energy Resources
Rene Braud	Pattern Energy Group
Christi Calabrese	EDP Renewables
Alex Daue	The Wilderness Society
Alyssa Edwards	EDF Renewables
Garry George	National Audubon Society
Nathanael Greene	Natural Resources Defense Council
Keith Harrison	Southern Power
Tim Hayes	Duke Energy Renewables
Tom Kiernan	American Wind Energy Association
Brad Loveless	Association of Fish & Wildlife Agencies
Jenny McIvor	Berkshire Hathaway Energy
Jim Murphy	National Wildlife Federation
Laura Nagy	Avangrid Renewables
Joy Page	Defenders of Wildlife
John Rogers	Union of Concerned Scientists
Terry Root	Stanford University
Mark Rupp	Environmental Defense Fund
Jessica Wilkinson	The Nature Conservancy
Ken Young	Apex Clean Energy



"I am proud of what we have accomplished over the past decade in our understanding of wind and wildlife issues. Our collaboration through AWWI has been a big part of this success. Looking ahead, I am excited to continue this collaboration to focus on technological solutions to minimize our impacts to wildlife and to find innovative ways to use the data that we have collected over the 10 years to answer important questions. Together I know we will continue to accomplish our mission to develop wind energy while protecting wildlife and their habitats."

- **Christi Calabrese**, Director, Permitting and Environmental Affairs at EDP Renewables and AWWI Board member

"We've gotten a lot better at understanding and addressing risks to wildlife, and it's been exciting to see the range of deep contributions that AWWI has made. I think our future will involve not just continuing that good work, but also continuing to work hard to communicate those risks. That includes the risks to wildlife from developing wind power, and the risks from *not* developing wind power, given the tremendous challenge of climate change. We need the power sector to continue to lead on cutting carbon pollution, and we want to pave the way for a lot more wind power to make that progress possible."

- **John Rogers**, Senior Energy Analyst, Union of Concerned Scientists and AWWI Board member



Past Board Members



Jan Blomstrann	Formerly NRG Systems
John Calaway	Formerly Pattern Energy Group
Dave Cowan	Formerly SunEdison
Scott Davis	Formerly The Nature Conservancy
Jim Eisen	Formerly BP Wind Energy
Roy Elicker	Formerly Association of Fish & Wildlife Agencies
Julie Falkner	Formerly Defenders of Wildlife
Peter Frumhoff	Union of Concerned Scientists
Brandy Gibson	Formerly BP Wind Energy
Joe Grennan	Formerly RES Americas
Tom Hiester	Formerly RES Americas
Eric Holst	Environmental Defense Fund
Mike Horn	Formerly GE Renewable Energy
Paul Johansen	Association of Fish & Wildlife Agencies
John Kostyack	Formerly National Wildlife Federation
Ginny Kreidler	Formerly National Audubon Society
Julia Levin	Formerly National Audubon Society
Andy Linehan	Formerly Avangrid Renewables
Ed Lowe	Formerly GE Renewable Energy
Jim Lyon	National Wildlife Federation
Kelley Myers	Formerly Association of Fish & Wildlife Agencies
Dave Phillips	Formerly Apex Clean Energy
Alan Pollom	Formerly The Nature Conservancy
Rich Rayhill	Formerly Ridgeline Energy
Roby Roberts	EDP Renewables
Mark Salvo	Defenders of Wildlife
Stacy Small-Lorenz	Formerly Environmental Defense Fund
Genevieve Thompson	Formerly National Audubon Society
Jeff Vonk	Formerly Association of Fish & Wildlife Agencies
Johanna Wald	Formerly Natural Resources Defense Council
James Walker	Formerly EDF Renewables
Stu Webster	Formerly Avangrid Renewables
Justin Wheating	Formerly NRG Systems
Gary Yohe	Wesleyan University



Profile of a Visionary

Dr. James A. Walker

AWWI was founded by leaders. In 2006, Dr. James A. Walker made a presentation to his fellow board members at the American Wind Energy Association on wind-wildlife issues; Jim understood the potential for these issues to be one of the industry's greatest challenges.



"Jim understood that if the industry was going to achieve its potential and build gigawatts of generation, we needed to approach the challenge of understanding how wildlife interacts with wind farms on a similar scale," recalled Tristan Grimberty, President and CEO of EDF Renewables. "He made the case that there was a need for an independent body to bring stakeholders from industry and the conservation/science community together to work on these issues."

AWWI was formed in 2008, and since its inception, Jim has been one of its greatest champions. He served on the AWWI Board from 2008-2018, the longest of any founding member, and has worked tirelessly to unite the conservation/science community and wind industry around the shared goal of fighting climate change.

AWWI would not be where it is today, and would not have achieved as much as it has, without Jim's vision and passion.

Jim's legacy will continue to inspire and influence our work for years to come. We thank Jim for his countless contributions, and wish him well in his future endeavors.



Program Highlights

Red Winged Blackbirds | Alberto_Vo5, Flickr

National Wind Wildlife Research Plan



In 2017, the AWWI Board directed staff to document what is known about avoiding and minimizing wind energy's impacts to wildlife, and to identify research needs and set priorities in a [National Wind Wildlife Research Plan](#).

"The National Research Plan guides AWWI's research priorities and sets goals for the next three years for reducing uncertainty and advancing knowledge and solutions to wind-wildlife challenges," says Dr. Taber Allison, AWWI Director of Research, pictured at left.

Technology Innovation: Machine Learning to Reduce Risk

AWWI's [Technology Innovation program](#) is an expert forum that brings together leaders and innovators to collaborate on the development and testing of advanced technological solutions, such as machine learning and artificial intelligence, to make wind farms safer for wildlife. Examples of technologies the program has helped evaluate include IdentiFlight and DTBird, and 2018, AWWI published the results from pilot tests of these technologies, both of which are designed to reduce risk for eagles. Further evaluations will be conducted through 2021 with support from the U.S. Department of Energy. AWWI received U.S. DOE funding to test two smart curtailment technologies for bats, one in partnership with EPRI (the Electric Power Research Institute), and the other in partnership with Vestas. AWWI also supports the National Renewable Energy Laboratory's Technology Development and Innovation Program in their development, testing, and integration of early-stage technologies.

AWWI Partner the National Audubon Society featured an article titled [How New Technology is Making Wind Farms Safer for Birds](#) in their Spring 2018 magazine. The piece, which discusses [AWWI's testing of IdentiFlight](#), details how technology is being used to monitor and protect California condors and bald and golden eagles, while emphasizing the importance of responsibly sited renewable energy as a tool to fight the biggest threat to avian species — climate change.



AWWIC: Applying Big Data to Understand Risk

Big data is critical to advancing our understanding of the risks wind energy poses for wildlife. The [American Wind Wildlife Information Center \(AWWIC\)](#) is the most complete database of wildlife mortality at wind energy facilities in the U.S. It captures datasets from both public and confidential sources in a format that can be analyzed

and compared. In 2018 and early 2019, AWWI released scientifically robust reports that provided the first analyses of bird and bat fatality data from AWWIC, demonstrating that the quantity and quality of AWWIC data is sufficient to support the development of reasonable hypotheses regarding the impacts of wind energy on bird and bat species in the U.S.

Future steps for AWWIC include updating the technical reports on bat and avian species with new data and analyses that examine specific questions.



Spotlight on Bats

Finding ways to make wind energy safer for bats is one of AWWI's highest priorities. AWWI works closely with stakeholders across multiple sectors to advance understanding of the risks posed to bats by wind farms and to reduce risk through detection or deterrence.

AWWI's own research is helping. AWWI's 2018 white paper, [Bats and Wind Energy: Impacts, Mitigation, and Tradeoffs](#), provides an overview and discussion of what is known about wind energy's impacts to bats. [AWWI's Bat Technical Report](#), which analyzed data from the [American Wind Wildlife Information Center \(AWWIC\)](#), yielded valuable insights and set the foundation for further studies into which species are at risk, where, and why. This analysis is informing work by AWWI and others on smart curtailment and deterrent technologies that may minimize risk for bats.



Mexican Free-Tailed Bats Exiting Bracken Bat Cave | USFWS, Flickr



"What we have learned in the last decade is that we must get off our fossil-fuel addiction as quickly as we can. To do this we *must* significantly increase our use of wind power. Over the past decade we have learned how to significantly decrease bird strikes—even the National Audubon Society strongly supports the expansion of responsibly sited wind farms in order to avoid extinctions of species due to climate change. We know how and where to build wind farms, and now we just have to do it as fast as we possibly can."

- **Dr. Terry L. Root**, Senior Fellow Emerita, Stanford Woods Institute for the Environment and AWWI Advisory Board member

"Over the last 10 years, we've learned that by coming together, engaging in frank and productive dialogue that involves active listening, and coalescing around a common interest in addressing the challenge of climate change, we can make significant advancements in the science and research that ensure we develop clean wind energy in a manner that protects wildlife. Going forward, AWWI's work holds the promise that by continuing to engage collaboratively to responsibly develop wind, we can advance wind energy at the pace and scale needed to address the climate crisis while protecting cherished wildlife and habitat along the way."

- **Jim Murphy**, Director, Legal Advocacy at National Wildlife Federation and AWWI Board member



12th Wind Wildlife Research Meeting

The 12th [NWCC Wind Wildlife Research Meeting](#) (WWRM), organized by AWWI, was held in St. Paul, MN, in November, 2018, and drew more than 400 attendees from around the world. Academics, researchers, conservationists, consultants, federal and state agency staff, and wind industry professionals [came together](#) to synthesize, share, and learn about recent scientific research and progress on solutions that balance wind energy development and wildlife conservation. Presentations focused on improved methods for assessing and minimizing risk for key species, and other current research that advances understanding of wind-wildlife interactions. Pre-meeting workshops provided training on new tools and addressed key issues for offshore wind energy and wildlife in the U.S. and abroad.

In the opening panel, a cross-sector discussion looked at the relationship between wind-wildlife science and policy. Keynote speaker Dr. John Yarbrough of the National Renewable Energy Laboratory discussed how [computer vision](#), cheap data storage, and artificial intelligence can "revolutionize the use of these libraries of data we've been collecting." The closing panel kicked off a conversation first introduced at the 2012 WWRM on relative risks to wildlife from wind energy and a changing climate, as well as implications for how to expand wind power and manage the risks while uncertainty remains.



Top to bottom: Jenny McIvor, Berkshire Hathaway Energy. Mary Boatman, BOEM, presents at the Offshore Wind Energy Workshop. Plenary session audience.



Wind energy and wildlife leaders convene for the 2017 CEO and Executive Leadership Forum.

CEO and Executive Leadership Forums

AWWI's CEO and Executive Leadership Forums provide leaders from the wind industry and the conservation/science community an opportunity to enhance relationships, share perspectives on wind development, and identify opportunities for collaboration on wind-wildlife challenges. The active participation of these executives is essential to achieving AWWI's mission of bringing together stakeholders committed to making wind energy safer for wildlife.

"AWWI's CEO Forums are a unique opportunity for leaders from different sides of the issue to come together and discuss wind-wildlife challenges with their peers, and get motivated to effect change," said Garbriel Alonso, an executive with Quantum Energy Partners and former CEO of EDP Renewables who co-chaired the most recent Forum, held in 2017, with Jamie Rappaport

Clark, President and CEO of Defenders of Wildlife.

The 2017 Forum covered topics including policy uncertainty and forecasts for industry growth, the importance of leveraging AWWI's growing data resources to support conservation strategies, and the need for coordinated advocacy and outreach. Attendees also explored ideas for engaging new collaborators to support research on innovative technologies as well as mutually beneficial wind-wildlife policies.

"Well-sited wind energy is critical to combatting climate change and safeguarding wildlife for future generations. AWWI's CEO Forums support essential conversations among decision makers," said Collin O'Mara, President and CEO of National Wildlife Federation. "These frank, open exchanges about choices and tradeoffs are critical to finding win-win wind-wildlife solutions."



"In the past decade U.S. wind capacity has more than doubled to over 96,000 MW, and more than 30 states now benefit from large-scale wind farms. AWWI's confidential database (AWWIC) has shown the value of peer-reviewed data and science, and will continue to grow in the coming years. We have begun to see the potential for cost-effective, validated detection and deterrence technologies, and in the future we will see such technologies become part of standard tool kits. There will be a need to improve regulatory processes to keep up with the increasing scale and pace of development. Offshore wind will come into the mainstream, presenting a new set of wildlife issues. We have learned much, but we have much more to learn."

- **Dr. James A. Walker**, Senior Advisor to EDF Renewables and former CEO of its predecessor, enXco, Inc., and former AWWI Board member

"Over the last 10 years we have learned that there are paths forward to resolving wind and wildlife issues with good research and science. Most notable recently is the development and implementation of new technologies for monitoring, detection and avoidance, and smart curtailment that is making wind safer for birds."

- Garry George, Director of Renewable Energy, National Audubon Society and AWWI Board member



2017 Open House

AWWI hosted an open house in November 2017, bringing together wind energy developers, conservationists, biologists, engineers, and wildlife managers and regulators to discuss issues related to wind energy and wildlife conservation. The event, which was held at the National Wildlife Federation's Washington DC office, featured opening remarks from AWWI Partners and Friends, followed by a panel discussion among respected experts about technologies that can minimize the risks wind farms pose to certain species of wildlife.

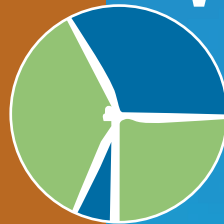
Key takeaways from the discussion were that more work is needed to increase research and

understanding on how wildlife interacts with wind farms, address engineering challenges, and reduce the costs of implementation. This underscored the importance of AWWI's work to create a collaborative environment where diverse stakeholders can exchange ideas and information.

"AWWI has shown us what can be achieved when we join forces to work toward shared goals," reflected Jan Blomstrann, former CEO of NRG Systems, one of AWWI's Founders, and a former Chair of AWWI's Board, who spoke at the open house. "It raised our expectations, and inspired us to accomplish even more in the years ahead."

In December 2018, wind industry leaders announced the launch of the Wind Wildlife Research Fund, a new initiative to finance research on wind-wildlife issues. Housed within AWWI, the Fund will pool resources to speed research on priority issues and deployment of innovative solutions to the biggest wind-wildlife challenges. With 30 companies on board, projects are underway for 2019, and intensive planning is informing research slated for 2020 and beyond. The Fund's activities and priorities are determined by an Advisory Council comprised of the Fund's major contributors.

"This fund is the first of its kind, and we really believe it will be a game changer in terms of developing science-based approaches to reducing the impact of wind farms on wildlife," commented John Di Donato, Vice President of Development and Origination at NextEra Energy Resources. "Our industry is committed to continuing to expand the body of scientific knowledge regarding how wildlife interacts with wind farms."



Wind Wildlife Research Fund



Oregon, Renewable | Shella Sund, Flickr



"We have learned a great deal in the past decade about wind energy's impacts on wildlife. A tremendous amount of time and resources have been spent understanding the impacts to wildlife by wind energy. This industry, through collaboration facilitated by AWWI, has really stepped up in this area and I'm really proud to be part of it. I think the future holds great promise. As we learn more, we are starting to drill down to the details. What is most exciting, through some advanced technology development, is we are coming up with real solutions to some of the impacts we have identified."

- *Tim Hayes, Director, Environmental, Duke Energy Renewables and AWWI Board member*

Delivering Results

AWWI Publications Since Founding

2018

White Paper: Integration of Wildlife Detection and Deterrent Systems in Wind Power Plants

White Paper: Bats and Wind Energy: Impacts, Mitigation, and Tradeoffs

Report: Evaluating a Commercial-Ready Technology for Raptor Detection and Deterrence at a Wind Energy Facility in California

Journal Article: Modeling Golden Eagle-Vehicle Collisions to Design Mitigation Strategies

Report: A Summary of Bat Fatality Data in a Nationwide Database

Journal Article: Automated Monitoring for Birds in Flight: Proof of Concept with Eagles at a Wind Power Facility

Report: Update to Wind Turbine Interactions with Wildlife and Their Habitats

2017

Journal Article: A Review of Options for Mitigating Take of Golden Eagles at Wind Energy Facilities

Report: National Wind Wildlife Research Plan

Report: Update to Wind Turbine Interactions with Wildlife and Their Habitats

2016

Journal Article: Predicting Eagle Fatalities at Wind Facilities

Report: Update to Wind Turbine Interactions with Wildlife and Their Habitats

2015

Journal Article: Modeling with Uncertain Science: Estimating Mitigation Credits from Abating Lead Poisoning in Golden Eagles

Journal Article: Do Raptors React to Ultraviolet Light?

Report: Update to Wind Turbine Interactions with Wildlife and Their Habitats

2014

Journal Article: A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities

Journal Article: Thinking Globally and Siting Locally: Renewable Energy and Biodiversity in a Rapidly Warming World

Research Framework: Developing a Research Framework for Increasing Understanding of Interactions between Eagles and Wind Energy

Report: Update to Wind Turbine Interactions with Wildlife and Their Habitats

2013

Report: Wind Turbine Interactions with Wildlife and Their Habitats

2012

White Paper: Eagles and Wind Energy: Identifying Research Priorities

"AWWI represents a remarkable co-joining of groups that are not overtly naturally aligned in their goals. Certainly the greater good achieved by moving from fossil fuel energy production to renewable sources is consistent with the desire of all parties, but what we have learned in the last 10 years is the need to keep in sight the greater good of AWWI's mission as we face short term obstacles. The willingness of all participants to communicate openly and honestly, combined with everyone's commitment to stay engaged, has enabled AWWI to be effective. The impact AWWI can have over the next 10 years will be a critical part of the overall efforts to reduce the effects of climate change on our planet and its occupants."

- **Justin Wheating**, former President & CEO, NRG Systems and former AWWI Board member



Your Generosity Powers AWWI's Unique Mission

The American Wind Wildlife Institute exists today because of the vision, leadership, and financial support of a diverse group of funders including: science and environmental organizations, government agencies, wind companies, manufacturers, and utilities, and individuals and foundations. We thank you for your generosity.

2017-2018 Funders

Wind Industry Partners

Apex Clean Energy
Avangrid Renewables
Berkshire Hathaway Energy
DTE Energy
Duke Energy Renewables
EDF Renewables
EDP Renewables
NRG Systems
Pattern Energy Group
RES Americas
Southern Power

Wind Industry Friends

American Wind Energy Association
Clean Line Energy Partners
Enel Green Power
Engie
EverPower Wind Holdings
GE Power & Water
Geronimo Wind Energy
IdentiFlight
Infinity Renewables
Innogy
MAP Energy
NextEra Energy
NRG Energy
Portland General Electric

Puget Sound Energy
RES (Renewable Energy Systems)
Semptra Energy
Siemens Gamesa
Tradewind Energy
Vestas Americas

Science and Environmental Partners

Defenders of Wildlife
Environmental Defense Fund
National Audubon Society
National Wildlife Federation
Natural Resources Defense Council
The Nature Conservancy
The Wilderness Society
Union of Concerned Scientist

Individual Donors

Gabriel Alonso
Anonymous Donor
Abigail Arnold
Jan Blomstrann
Erica Brand
Rene Braud
Christina Calabrese
Edgar DeMeo
John Eber

Anne Flinn
Lauren Flinn
William & Mary Ann Flinn
Quentin Foster
Peter Frumhoff
Marie Gatch
Bob Gates
Garry George
Nathanael Greene
Janice Hamrin
Cynthia Harrell
Tim & Pam Hayes
Thomas Hiester
Eric Holst
Paul Johansen
Thomas Kiernan
Jennifer McIvor
Beth Meltzer
Danielle Osborn Mills
James Murphy
Laura Nagy
David Phillips
John Rogers
Terry Root
Mark Salvo
Michael Skelly
James Smith
Jacob Susman
Randall Swisher



"AWWI has proven itself in the last 10 years. By bringing the wind industry and environmental groups together, it has shown that true collaboration can and does work when solving difficult problems. Having established a model for success, AWWI can now build on this strong foundation and continue to answer questions, expanding the science and supporting the development of technology that will help address interactions between wind and wildlife."

- Jan Blomstrann, former CEO of NRG Systems and former AWWI Board member

"The future is sure to bring new challenges that will push us to work together faster and better if we are to meet our conservation and clean energy demands. AWWI will ensure that we see a lot more wildlife-friendly wind and conservation success stories."

- **Katie Umekubo**, Senior Attorney, Nature Program, NRDC



Suzanne Tegen
Genevieve Thompson
Robert Thresher
Mary Umekubo
Johanna & Michael Wald
James Walker
Wayne Walker Conservation Consulting
Carl Weinberg
Anna West
Justin Wheating
Jessica Wilkinson
Ryan Wiser

Foundations

Duke Energy Foundation
Jan Blomstrann Fund of the Vermont Community Foundation
Joseph H Thompson Fund
Turner Foundation

Sponsors: Wind Wildlife Research Meeting, 10th Anniversary, and Others

American Wind Energy Association
Apex Clean Energy
Burns & McDonnell
Common Ground Capital
Minnesota Department of Commerce
DTE Energy
Ecology & Environment
Electric Power Research Institute
ENERCON
Energy Renewal Partners
Environmental Resources Management
IdentiFlight
Invenergy
JP Morgan Chase
Longroad Energy
National Renewable Energy Laboratory

NextEra Energy
Nossaman LLP
Natural Resource Solutions
Olsson
Orsted Wind Power
Pattern Energy Group
Shoener Environmental
Stantec
SWCA Environmental Consultants
Tetra Tech
Tradewind Energy
U.S. Geological Survey
Western Ecosystems Technology

Government

National Renewable Energy Laboratory
U.S. Department of Energy
U.S. Geological Survey

Science Advisors and Research Collaborators

Science Advisors

Amanda Hale, Texas Christian University
Douglas Johnson, U.S. Geological Survey
David Nelson, University of Maryland
Leslie New, Washington State University, Vancouver
Terry Root, Stanford University
Dale Strickland, WEST, Inc

Research Collaborators

Erin Baerwald, University of Regina
Kim Bay, WEST, Inc.
Pete Bloom, Bloom Consulting
Clint Boal, Texas Tech University
Jean Cochrane, Independent Consultant
Tara Conkling, U.S. Geological Survey

Dan Dalthorp, U.S. Geological Survey
Jay Diffendorfer, U.S. Geological Survey
Adam Duerr, West Virginia University
Wally Erickson, WEST, Inc
Andrew Farnsworth, Cornell Lab of Ornithology
Mark Hayes, Normandeau Associates
Cris Hein, National Renewable Energy Laboratory
Catherine Jardine, Bird Studies Canada
Todd Katzner, U.S. Geological Survey
Dylan Keon, Oregon State University
Mike Kochert, U.S. Geological Survey (retired)
Karl Kosciuch, WEST, Inc.
Eric Lonsdorf, University of Minnesota
Scott Loss, Oklahoma State University

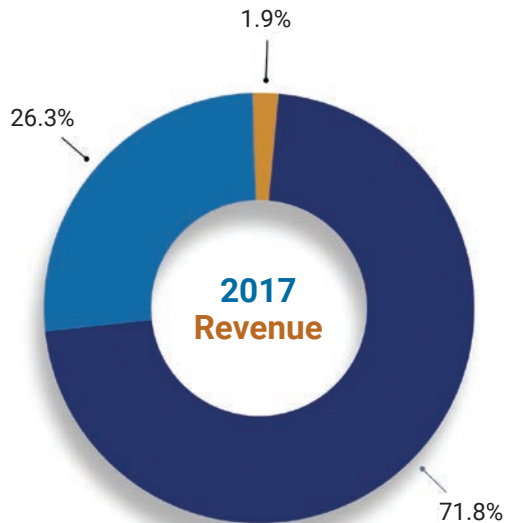
Chris McClure, The Peregrine Fund
Tricia Miller, West Virginia University
Brian Millsap, U.S. Fish & Wildlife Service
Kristen Nasman, WEST, Inc.
Leslie New, Washington State University
Christian Newman, Electric Power Resource Institute
Kimberly Peters, DNV GL
Paul Rabie, WEST, Inc
Jerry Roppe, Avangrid Renewables, LLC.
Michael Schirmacher, Bat Conservation International
Jeff Smith, H.T. Harvey & Associates
Leigh Ann Starcevich, WEST, Inc.
Dale Strickland, WEST, Inc
Kate Williams, Biodiversity Research Institute



"Over the past decade, we've learned the power that can be wielded when we come together to drive the conversation surrounding wind-wildlife interactions and the science that guides our decision-making."

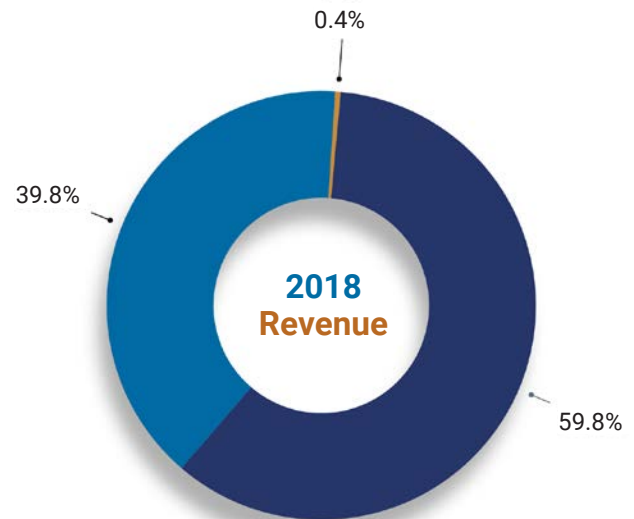
- **Nathanael Greene**, Senior Renewable Energy Advocate, Climate & Clean Energy Program, NRDC and AWWI Board member

2017 Financials

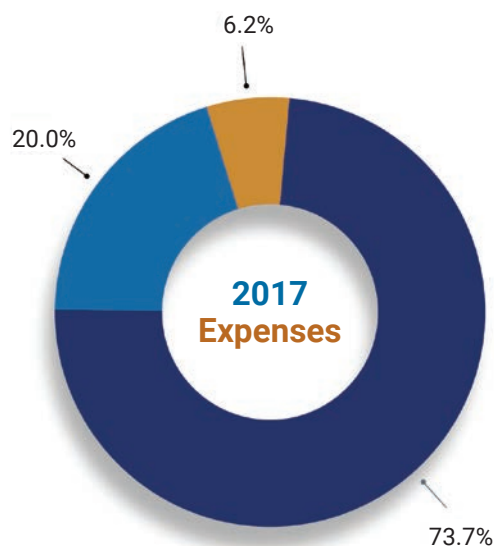


Contributions	\$ 974,336
Contract Revenue	\$ 356,483
Other Income	\$ 26,257
Total	\$ 1,357,076

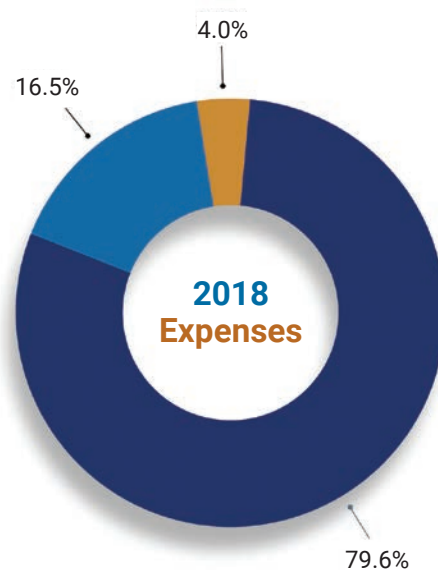
2018 Financials



Contributions	\$1,561,008
Contract Revenue	\$ 1,037,023
Other Income	\$10,815
Total	\$2,608,846



Program Services	\$ 1,157,674
General & Administration	\$ 314,732
Fundraising	\$ 97,623
Total	\$ 1,570,029



Program Services	\$1,800,932
General & Administration	\$ 372,824
Fundraising	\$ 89,865
Total	\$ 2,263,621

**Thank you to our collaborators for
supporting our mission, 2008-2018:**

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



Spring Valley | Pattern Energy



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