WINDExchange
U.S. DEPARTMENT OF ENERGY

Northeast Wind Resource Center

Northeast Wind Resource Center Webinar

Interactions between Wind Turbines and Wildlife

Part 2

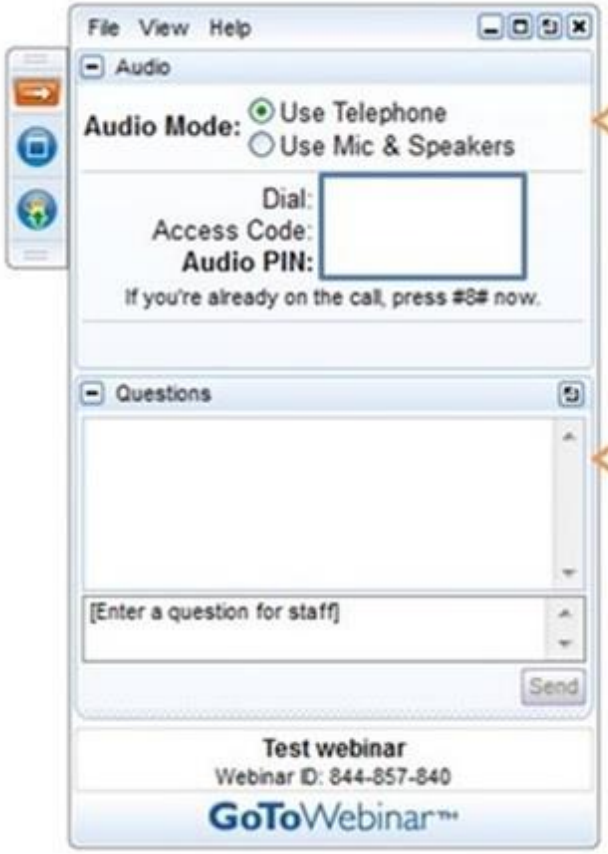
Hosted by
Warren Leon, Clean Energy Group
March 29, 2017

CleanEnergyGroup
Innovation in Finance, Technology & Policy

Sustainable Energy Advantage, LLC

MAINE OCEAN & WIND INDUSTRY INITIATIVE

Housekeeping



All participants are in "Listen-Only" mode. Select "Use Mic & Speakers" to avoid toll charges and use your computer's VOIP capabilities. Or select "Use Telephone" and enter your PIN onto your phone key pad.

Submit your questions at any time by typing in the Question Box and hitting Send.

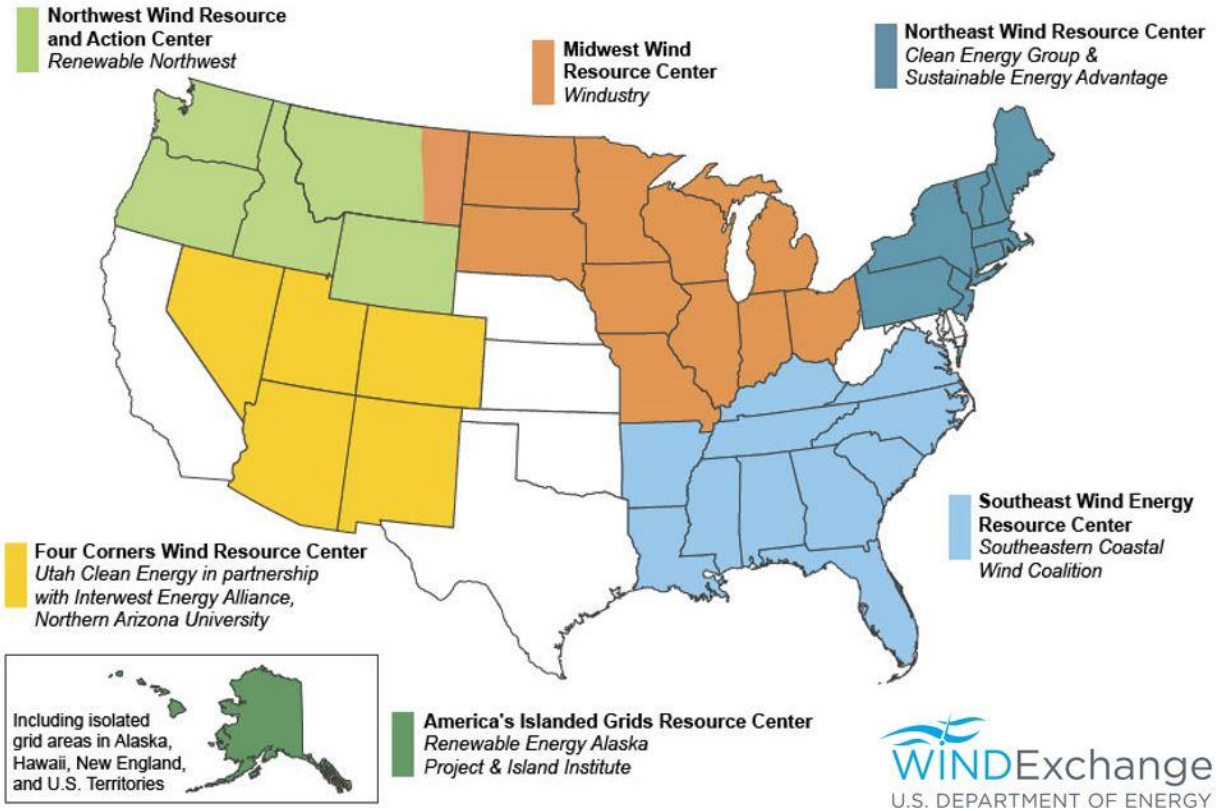
This webinar is being recorded.

You will find a recording of this webinar in the NWRC Resource Library at: www.northeastwindcenter.org/resource-library/

About WINDExchange

WINDExchange is the U.S. Department of Energy (DOE) Wind Program's platform for disseminating credible information about wind energy. The purpose of WINDExchange is to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by the best available information.

On March 11, 2014, the U.S. Department of Energy (DOE) announced six Wind Energy Regional Resource Centers that were selected through a competitive process administered by the National Renewable Energy Laboratory (NREL).



The Northeast Wind Resource Center

The Northeast Wind Resource Center (NWRC) is the regional epicenter for salient, unbiased information on land-based and offshore wind energy in the Northeastern United States. Published research, studies, and analyses associated with the issues impacting public acceptance of wind deployment are available in the NWRC Resource Library.

The NWRC is supported in part by a grant from the U.S. Department of Energy's WINDExchange program, and is managed by Clean Energy Group, with participation from Sustainable Energy Advantage and the Maine Ocean & Wind Industry Initiative.

www.northeastwindcenter.org

Panelists

Taber Allison

Director of Research and Evaluation
American Wind Wildlife Institute

Warren Leon

Executive Director
Clean Energy States Alliance

Facilitating timely and responsible development of wind energy

AMERICAN WIND WILDLIFE INSTITUTE

while protecting wildlife and wildlife habitat

Wind Energy and Wildlife

Question & Answer Presentation

Northeast Wind Resource Center

March 2017

Collisions and Turbine Height

- Barclay, R.M.R., Baerwald, E.F., Gruver, J.C., 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. Can. J. Zool. 85, 381–387. doi:10.1139/Z07-011
- Loss, S.R., Will, T., Marra, P.P., 2013. Estimates of bird collision mortality at wind facilities in the contiguous United States. Biol. Conserv. 168, 201–209. doi:10.1016/j.biocon.2013.10.007

Anthropogenic Sources of Avian Fatalities

Source	Number Birds per Year	Reference
Buildings	365 – 988 million	Loss, et al. 2014
Communication Towers	6.5 million	Longcore, et al. 2012
Transmission Lines – collisions and electrocutions	12 – 64 million	Loss, et al. 2014
Vehicles	89 – 340 million	Loss, et al. 2014
Wind Energy	214,000 – 368,000	Erickson et al. 2014
Cats	1.3 – 3.99 **billion**	Loss, et al. 2013

[Estimated 10-20 billion land birds in North America]

Wind & Communication Towers

	Wind Turbines[1]	Communication Towers[2]
Total Estimated Mortality	214,000 to 368,000	6.5 million
Birds Per Structure/MW	3 – 5 per MW 3 – 15 per turbine	~90/tower
Black-throated blue warbler	0.029 – 0.043% of population/year	4.9% of population/year

[1] Erickson et al. 2014. A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. PLOS One 9 (9): 1-18.

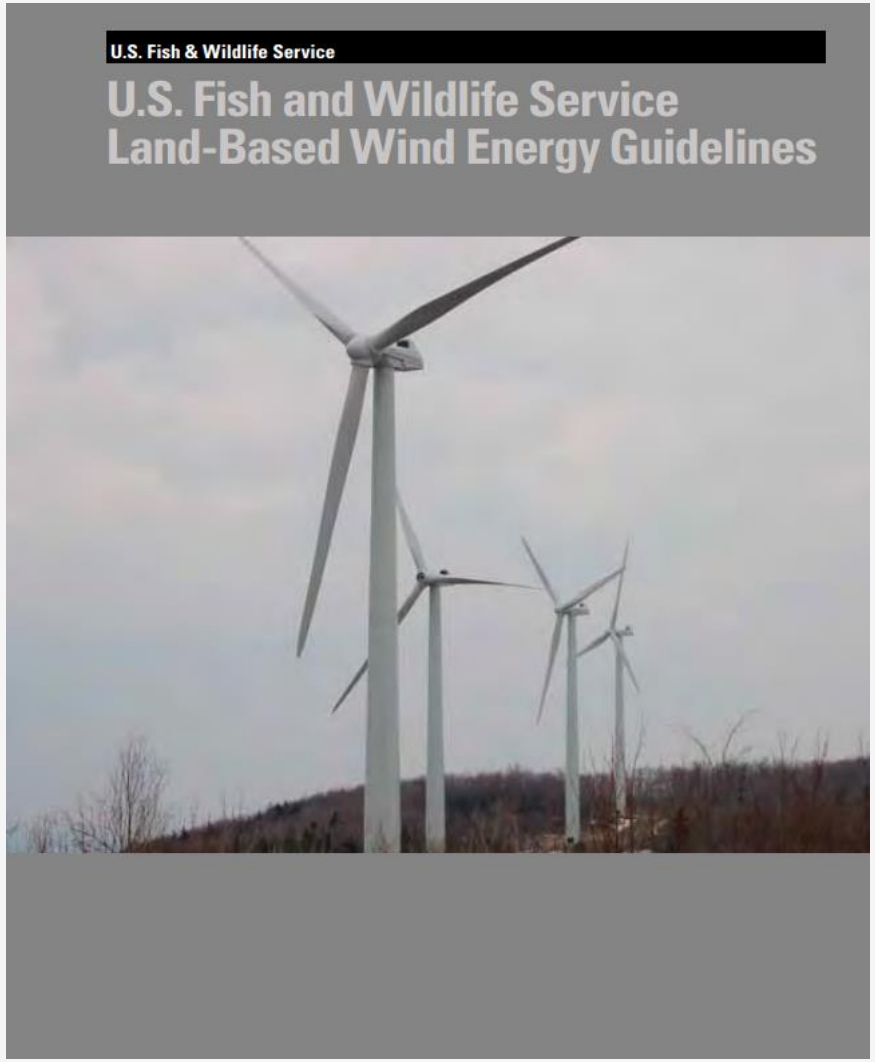
[2] Longcore, et al. 2012. An Estimate of Avian Mortality at Communication Towers in the United States and Canada. PLOS One. 7 (4): 1-17

Adjusted Diurnal Raptor Fatality Estimates

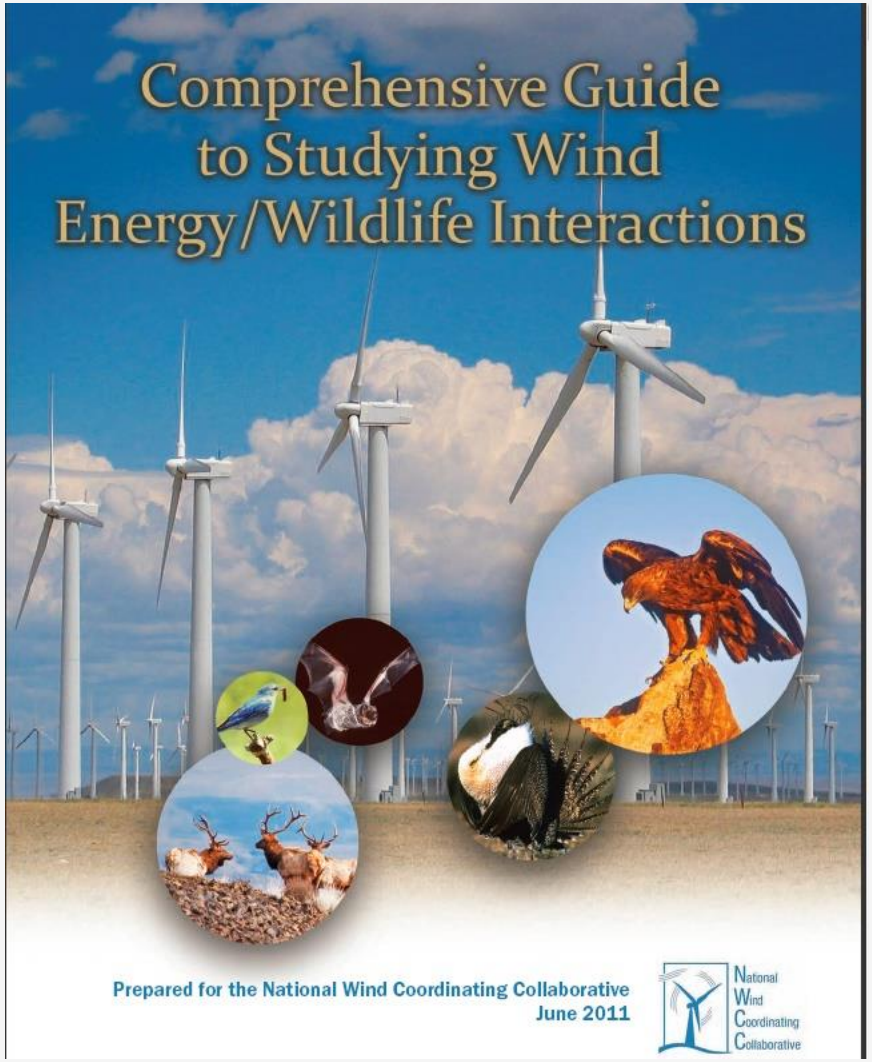
		Total Carcasses per Year	
Region	Total MW in Region	Low	High
East	13,363	944	1,954
West	62,226	7,287	15,727
Overall	75,589	8,281	17,681

Fatality estimates < 0.5% of breeding population total for all raptor species

Guidelines



2012



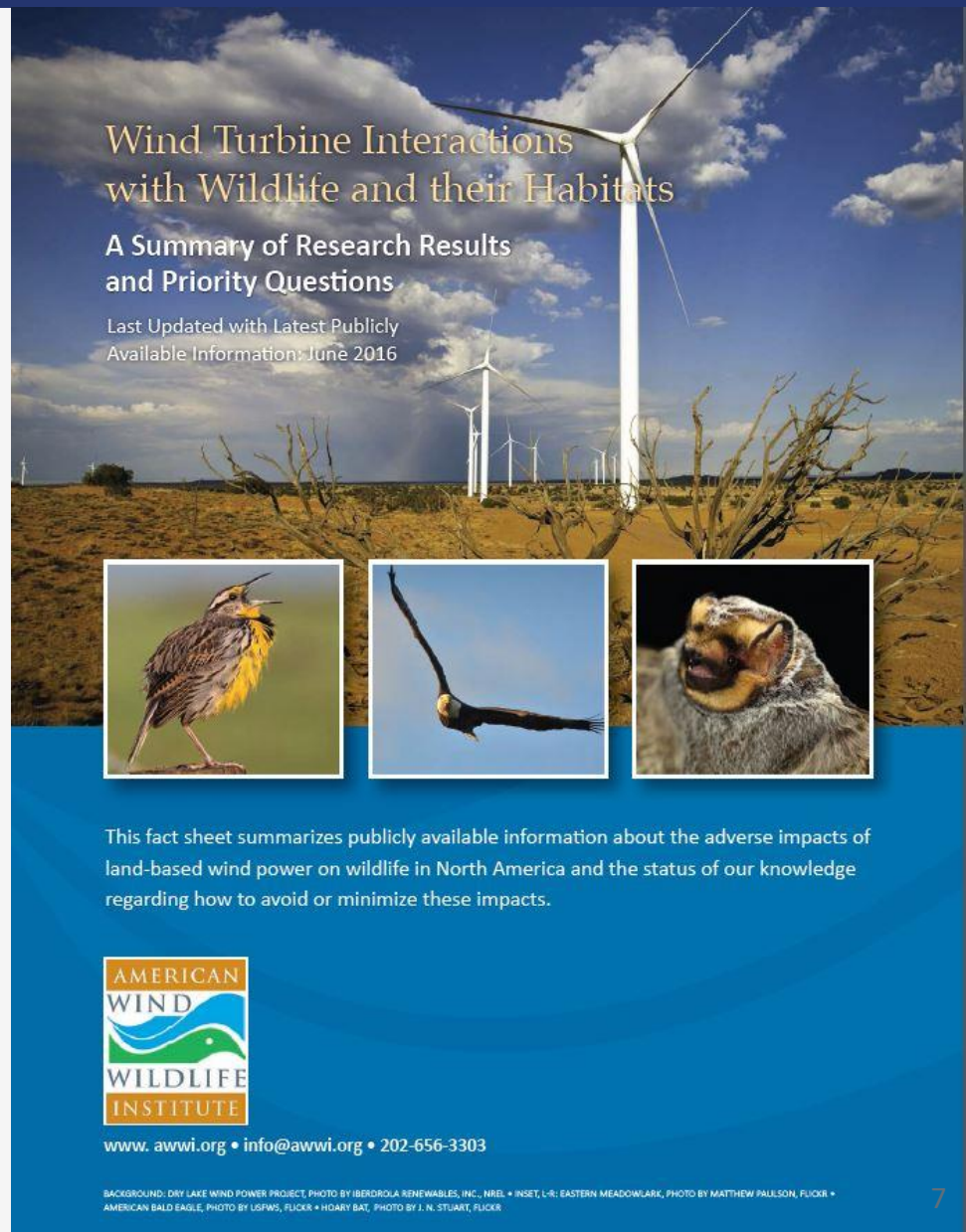
2011

Status of Research on Wind-Wildlife Interactions

Wind Turbine Interactions with Wildlife and their Habitats

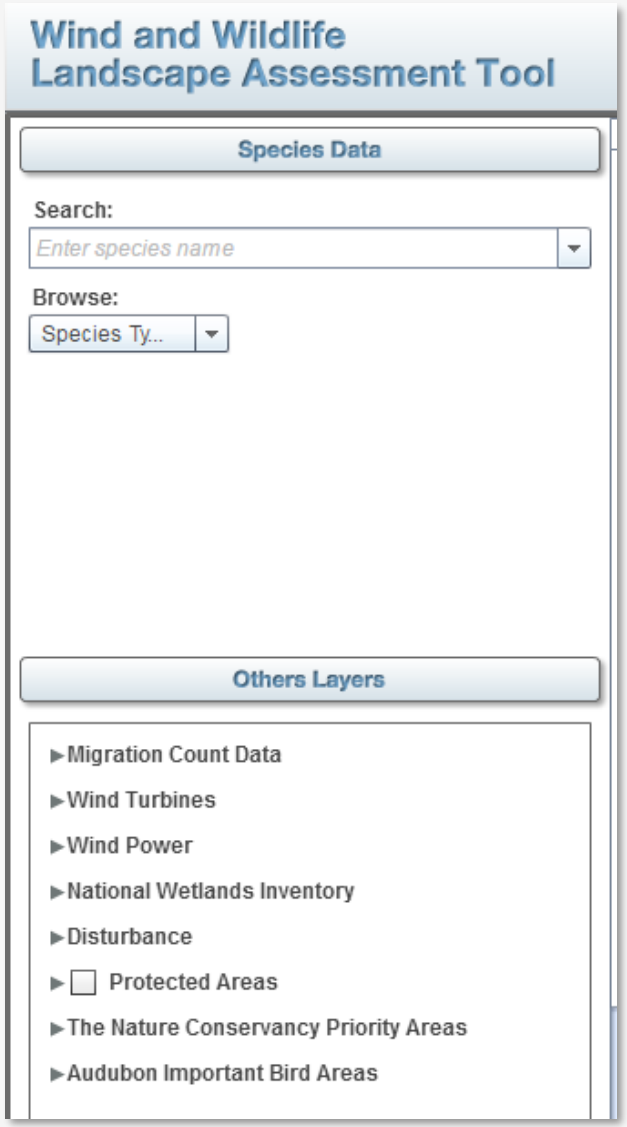
- Collision Mortality
- Direct and Indirect Habitat Effects
- Cumulative Impacts
- Avoiding and Minimizing Impacts

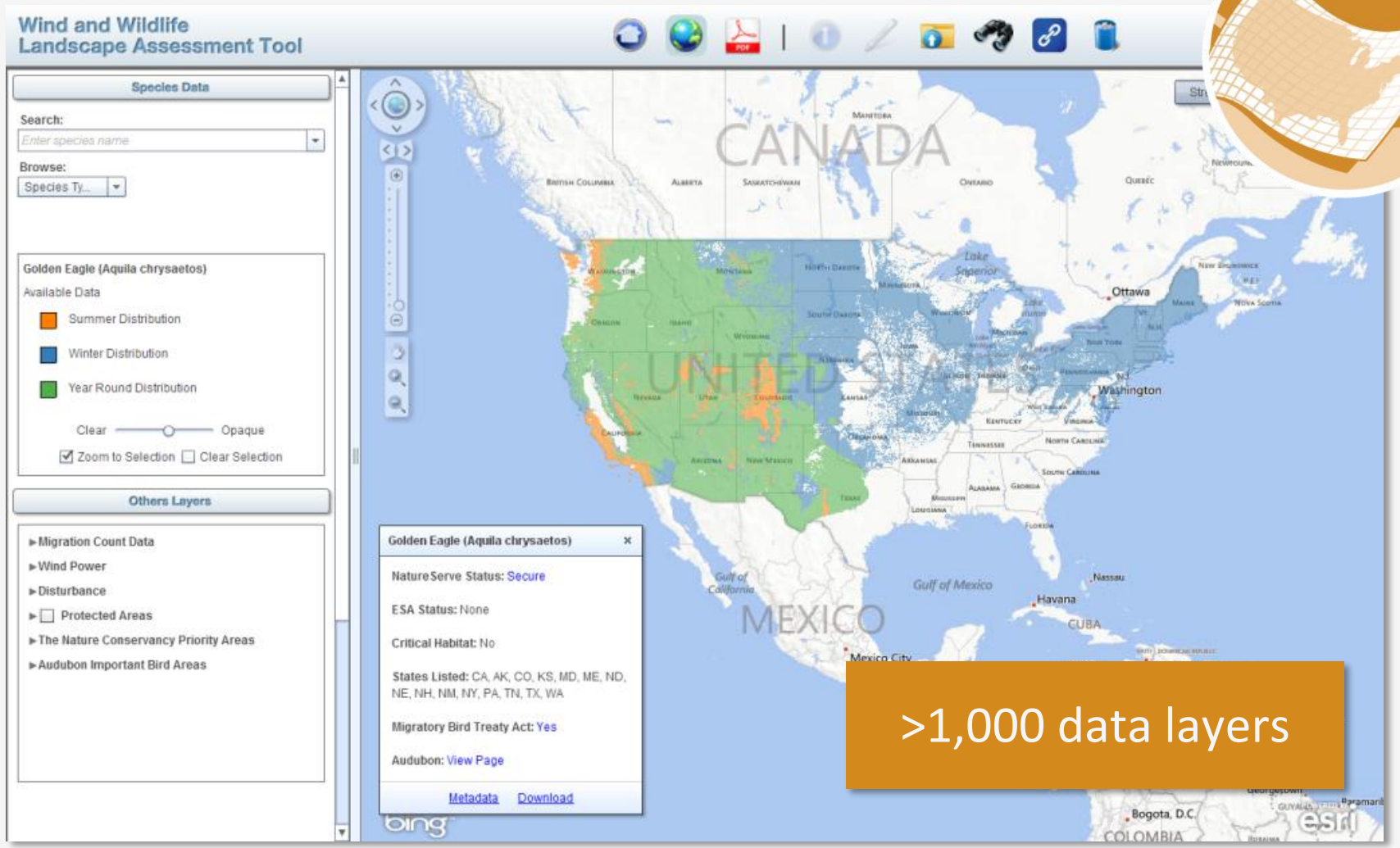
https://awwi.org/resources/summary-of-wind-wildlife-interactions-2/

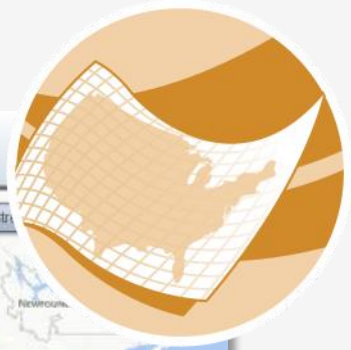


Technological Innovations

Landscape Assessment Tool







>1,000 data layers

Wind Turbine Passerine Mortality: Population Impacts[1]

Species	North American Population Estimate	% population affected (high estimate)
Black-throated blue warbler	2,100,000	**0.043%**
Tree swallow	17,000,000	**0.043%**
Horned lark	80,000,000	**0.038%**
Brown thrasher	4,900,000	**0.035%**
Yellow-throated vireo	3,500,000	**0.035%**
Spotted towhee	2,200,000	**0.033%**
Sedge wren	6,200,000	**0.028%**
Bushtit	2,300,000	**0.025%**
Western meadowlark	30,000,000	**0.020%**
Rose-breasted grosbeak	4,100,000	**0.020%**

[1] Erickson et al. 2014. A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. PLOS One 9 (9): 1-18.

WINDExchange
U.S. DEPARTMENT OF ENERGY

Northeast Wind Resource Center

Thank you for attending our webinar

Warren Leon
Clean Energy Group/
Northeast Wind Resource Center
wleon@cleanegroup.org

Northeast Wind Resource Center: www.northeastwindcenter.org

DOE Wind Exchange: http://energy.gov/eere/wind/windexchange

CleanEnergyGroup
Innovation in Finance, Technology & Policy

Sustainable Energy Advantage, LLC

MAINE OCEAN & WIND INDUSTRY INITIATIVE