Science for Wildlife Conservation and Wind Energy Development

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WREN Meeting
Energy & Wildlife Program Science Strategy

Science Strategy

1. Understand Risk
2. Measure Impacts
3. Inform Solutions

Research Report for 2019
Impacts and Bat Population Trends

Advances in Mortality Estimation

• GenEst – Generalized Estimator of Mortality
• Mortality estimation using carcass searches limited to roads and pads

North American Bat Monitoring Program - NABat

• Continent-wide monitoring of bat population and distribution trends at local, regional, and range-wide scales
• Status and trend assessments for hoary bats in WA/OR

Bat Population Trends using Genomics

• Using genomics to determine the history and trends of hoary bat population from >150 carcasses collected at a wind energy facility
• Assembling a high quality hoary bat genome
Informing Solutions
Project 1: Refining and Testing UV Light as a Bat Deterrent

UV lights installed 20 m up turbine tower; on at night
Flickering UV light is imaged with UV-sensitive camera; control (unlit) tower on right
Thermal video cameras record birds, bats and insect activity

Project 2: Can NEXRAD be leveraged for smart curtailment?
Understanding Risks and Impacts to Birds

Risk

• New insights into flight behavior of raptors using GPS telemetry

Impacts

• Developing and testing a framework for assessing population-level impacts from mortality at wind/solar facilities
• Approach integrates stable isotope data, integrated population models, and existing demographic and distribution information
Pre-construction Risk Evaluation

Modeling Raptor Take Rates

- Collision risk model (CRM) used to predict eagle fatalities to guide take permits
- At the request of the USFWS, we have adopted a formal adaptive management process for updating the initial take estimates based on post-construction fatality monitoring
- This will improve the models USFWS uses to predict fatalities for take permits
Indirect Effects on Grassland Birds

Estimating Offsets for Avian Displacement

- Tool for offsetting behavioral displacement: Avian-impact offset method (AIOM)
- Habitat needed to provide equivalent biological value for birds displaced by development
- Worksheet and geospatial decision support tool to identify habitat for mitigation fulfillment and forecasting mitigation costs

Big-Game Winter Ranges and Migration Corridors

- S.O. 3362 “Improve habitat quality and western big-game winter ranges, stop-over areas and migration corridors”
- Pronghorn responses to wind energy facilities within critical winter range for pronghorn in Wyoming (before and after)
- Wind energy land-surface disturbance mapping
Offshore Wind Energy
Automated Detection and Classification of Wildlife at Sea

- Collaboration with BOEM, USFWS and UC Berkley Computer Science Vision Group
- Developing deep learning algorithms for processing aerial images of wildlife at sea
- Inform offshore energy development (Atlantic and Great Lakes)
Offshore Wind Energy

Marine Bird and Mammal Surveys

• Surveys to help inform planning and permitting of offshore projects (Pacific Coast)

• At-sea behaviors for 5 Hawaiian seabirds -- distribution, habitat utilization, and ranging behaviors within near-island waters and outer continental shelf waters (Hawaii)

• Telemetry of brown pelican movement and behavior (Atlantic)

USGS Energy and Wildlife Research Annual Reports

Summary of projects on the interactions of fish and wildlife with energy infrastructure; tools and technologies to inform siting and reduce impacts

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