

Development of Monitoring Protocols for Automated Radio Telemetry Studies at Offshore Wind Farms

Informational Webinar for Project Advisory Committee Invitees

Wed Aug 26, 1pm – 2pm (Eastern Time)



Project Team

USFWS Migratory Birds:

Pam Loring, Scott Johnston

Univ. of Rhode Island: Peter Paton

Biodiversity Research Institute:

Kate Williams, Evan Adams,

Andrew Gilbert

Birds Canada: Stu Mackenzie

NYSERDA (funding): Kate McClellan Press, Gregory Lampman



Automated Radio Telemetry Technology:

- **Radio transmitters:** aka "tags" attached to birds and bats
 - Coded on a shared frequency
 - Emit signals every 5-10 seconds
 - Weight range: 0.2 to 3 g
- **Receiving stations:** antennas and data-logger attached to a structure that record signals from any "tagged" bird or bat flying by (range varies, < 20 km)
- **Motus Network:** collaboration that coordinates data from tagged animals and receiving stations across the globe

Motus Wildlife Tracking System

- Collaborative network of automated radio telemetry studies
- > 800 collaborators
- > 900 tracking stations
- >23,000 animals
- >200 species



Project goal:

To develop standardized protocols for using automated radio telemetry to monitor bird and bat movements at offshore wind energy areas throughout the U.S. Atlantic.



Peter Paton, URI

Final Products:

- Monitoring Framework for offshore wind energy assessments
- Guidance Document for offshore receiving stations
- Online Study Design Tool
- Simulation Study
- Motus Data Framework



Credit: Getty Images/iStockphoto

Project Advisory Committee (PAC)

- Representation from stakeholders including: resource managers, research scientists, technical specialists, and offshore wind energy developers
- Organized into working groups based off of interest and expertise (will e-mail form to sign up after meeting)
- Provide input and expertise to development of study products, review drafts, and beta-test online tools

PAC Activities

- General time frame: Sept 2020 – Dec 2021
- Conference calls (quarterly)
- Review/feedback on draft products (2-3 rounds)
- Participate in up to three stakeholder webinars focused on development and implementation of study products (Fall 2020 – Fall 2021, 2-3 hrs each)

Working Group #1: 'Monitoring Framework'

Leads: USFWS and URI

Objectives:

- Comprehensive overview of radio telemetry for monitoring birds and bats at offshore wind projects in US Atlantic
- Recommendations for standardized methods for implementation across offshore wind energy areas

Monitoring Framework will include:

- Study design for pre- and post-construction monitoring
- Tracking ESA-listed species: Piping Plover, Roseate Tern, Red Knot, and Northern Long-eared Bat
- Protocols to collect specific data required by assessments, including Collision Risk Models
- Across site coordination and cumulative impacts analyses
- Integration with available and emerging technologies (e.g. satellite, gps, radar, high definition imagery)

OCS Study
BOEM 2019-017

Tracking Offshore Occurrence of Common Terns, Endangered Roseate Terns, and Threatened Piping Plovers with VHF Arrays



US Department of the Interior
Bureau of Ocean Energy Management
Office of Renewable Energy Programs



OCS Study
BOEM 2018-046

Tracking Movements of Threatened Migratory *rufa* Red Knots in U.S. Atlantic Outer Continental Shelf Waters



US Department of the Interior
Bureau of Ocean Energy Management
Office of Renewable Energy Programs



Working Group #2: Guidance Document for Deployment of Radio Telemetry Stations on Offshore Structures

Leads: USFWS and URI

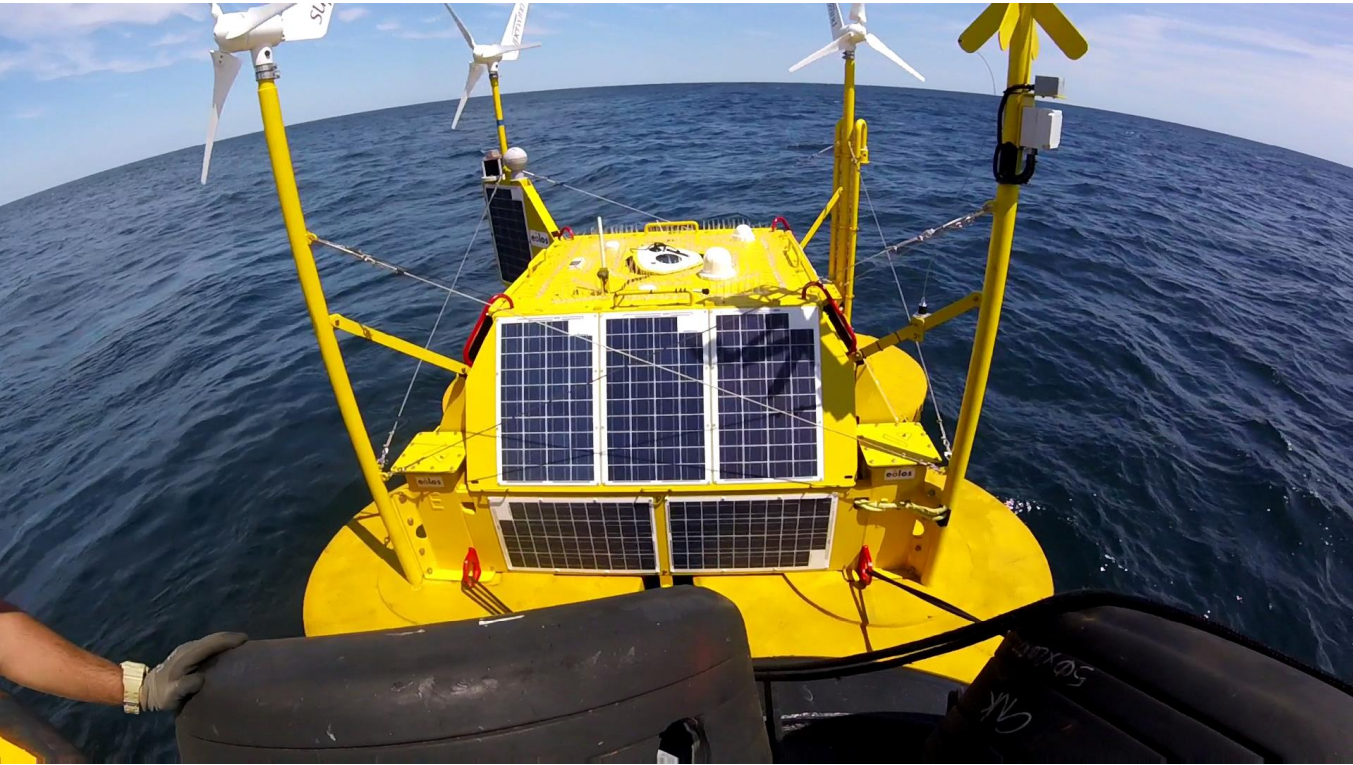
Objectives:

- Aid developers in deployment of radio telemetry stations within their specific lease areas
- Standardize tracking methods across lease areas

Guidance Document will include:

- Guidelines for deploying receiving stations on offshore structures, including buoys and wind turbines
- Recommended configurations of antennas and receivers
- Optimizing detection range and data quality
- A User Manual and training videos for operating receiving stations and data workflow

Piloting Offshore Tracking Stations on Wind Turbine and Buoys



Working Group #3: Online Study Design Tool and Simulation Study

Lead: BRI

Objectives:

- Develop a free online tool to help optimize site-specific study designs at offshore wind projects
- Conduct a simulation study that uses telemetry data to estimate detection probability for tracking different focal species (e.g. terns, shorebirds)

Study Design Tool will include:

- A user interface (UI), based on input from PAC and other stakeholders
- Inputs:
 - Bird data: species, flight height and movement patterns
 - Wind farm data: area (km²) and turbine configuration (size, spacing, #'s)
 - Station data: height (ASL) and antenna type
- Outputs:
 - Optimized configuration of receivers on wind turbines
 - Optimized number, distribution, and orientation of antennas at each receiver
- Back-end statistical model based on:
 - Location of tagged animal (height, distance, and angle) relative to receiving antennas
 - Height, type, orientation of antennas
 - Distribution of antennas in array
- User's Guide for the Study Design Tool as a .pdf document to accompany the tool

Simulation Study will include:

- Using existing tracking data from focal species (terns, shorebirds) to simulate movement tracks and estimate variation in detection probability at offshore wind energy areas
- Shorebird movement models are parameterized for migration using nanotag data (Piping Plover and Red Knots)
- Tern movement models are parameterized for both foraging and directed (staging or migratory) movements using GPS and satellite telemetry data
- Variables to assess detection probability will include:
 - Study design: number and distribution of receiving stations, configuration of antennas
 - Focal species: flight height, movement mode for terns (e.g., foraging vs. transiting), individual variation in movement behaviors
- Results of simulations will be used to estimate species-specific detection probability in Study Design Tool and published in a scientific manuscript

Working Group #4: Framework for data coordination with Motus

Lead: Birds Canada

Objectives:

- Develop a framework to coordinate and disseminate tracking data and metadata from all birds and bats detected by receiving stations in U.S. Atlantic

Motus
Wildlife Tracking System

BIRDS CANADA

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Become a Collaborator

Collaborators are individuals, researchers or organizations that are involved in the maintenance of one or more Motus stations, or researchers deploying tags on wildlife. As a collaborative automated radio telemetry network, Motus would not be possible without the support of collaborators across the hemisphere who have committed time and resources to maintain their own receiver infrastructure or operate their own research projects using the Motus system.

If you are interested in collaborating with the Motus network you can explore the local receiver station coverage in your area using the [Receiver Station Map](#). Full details on data sharing policies and registration fees can be found in the [Motus collaboration policy](#) and technical details for tags, stations and data analysis can be found in the [resources](#) section.

Collaborators setting up a Motus station in Colombia

To become a collaborator, you must first [register](#) with Motus. Once registered, you can create or join one or more projects.

[Receiver Locations](#) [Policies and Fees](#) [Resources](#) [Register](#)

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Bird Studies Canada P.O. Box 160, 115 Front St. East, Toronto, ON Canada M5E 1M0
Phone: 1-888-448-2473 ext. 102 Fax: 1-416-586-3532 E-mail: info@birdstudies.org

Motus Data Framework will include:

- Quarterly reports summarizing movements of birds and bats detected by the Motus Network in U.S. Atlantic, including:
 - Number of birds and bats detected at each station within U.S. Atlantic
 - Summaries of detection dates
 - Movement maps
- Coordination between offshore partners and PIs of various tagging projects throughout the network to facilitate analyses at site-specific and regional scales.

Next steps:

- Follow-up survey after meeting to:
 - Join PAC or be involved more informally (e-mail list)
 - Sign up for working groups (can sign up for more than one)
 - Monitoring Framework for offshore wind energy assessments
 - Guidance Document for offshore receiving stations
 - Simulation Study and Online Study Design Tool
 - Motus Data Framework
- Schedule first workshop (Nov 2020 – Jan 2021)
- Suggestions for key stakeholders to invite to workshops

Many thanks for your time and interest in the PAC.

For additional information, please contact:

- Pam Loring, USFWS (pamela_loring@fws.gov)
- Kate Williams, BRI (kate.williams@briloon.org)

Photo credit: Kate Sutherland

