

ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

MMS OCS Region: Atlantic

Title: Automated Analysis of Bird Vocalization Recordings

Total Cost: \$246,300

Period of Performance: FY 2009-2010

Conducting Organization: Cornell Lab of Ornithology

MMS Contact: Dr. James Woehr

Description:

Background MMS has identified impacts to birds from alternative energy development as a primary biological concern and has been seeking additional data to describe bird use of the OCS. With the publication of the MMS Framework for Renewable Energy Development on the U.S. Outer Continental Shelf, significant interest in leases for wind energy development on the OCS is anticipated and information on bird use of the OCS is now critically needed. Monitoring birds offshore has been limited worldwide due to difficulty of access and high cost. Boat transect surveys and “ships of opportunity” are subject to potentially large sampling error and are too slow and too limited in scope to provide sufficient information. Traditional aerial surveys are expensive and also subject to substantial sampling error. An effective way to monitor bird presence offshore would be to use specially designed, strategically positioned and remotely operated acoustic microphones attached to offshore structures such as meteorological towers, oil & gas platforms, or wind turbines. Acoustic microphones could monitor vocalizations of birds both day and night at all seasons of the year and in any weather conditions, including periods of low visibility that would prevent effective visual monitoring. To make remote acoustic monitoring efficient and economical, software must be developed to automate the analysis of digitally recorded bird vocalizations to identify bird species and vocalization counts and the times/dates when they occurred. This study would develop the software required to automate the analysis of recorded data.

Objectives The objectives of the study are to:

- 1) Develop the software needed to automate the analysis of recordings of bird vocalizations made over extensive periods of time with lengthy intervals between vocalizations such that the time, date and species of vocalizing birds can be determined efficiently and economically.
- 2) Develop an algorithm to relate call counts recorded to abundance and/or passage rates for bird species of the Atlantic and Gulf of Mexico Coasts.

Methods Software will be developed to automate the analysis of recordings of bird vocalizations by matching spectrograms of recorded vocalizations with expertly identified sounds in the world’s most extensive library of bird sounds at Macaulay Library of the Cornell University Laboratory of Ornithology. In addition, software algorithms will be developed to convert call counts to abundance and/or passage rates for each bird species.

Importance to MMS With the publication of the MMS Framework for Renewable Energy Development on the U.S. Outer Continental Shelf, significant interest in leases for wind energy development on the OCS is anticipated and information on bird use of the OCS is now critically needed for environmental analyses of proposed sites. Acoustic microphones could monitor vocalizations of birds both day and night at all seasons of the year and in any weather conditions, including periods of low visibility that would prevent effective visual monitoring. To make remote acoustic monitoring efficient and economical, software must be developed to automate the analysis of digitally recorded bird vocalizations to identify bird species and vocalization counts and the times/dates when they occurred. This project will develop the software required to automate the analysis of recorded data.

Current Status: The researchers are working on improving the acoustic software.

Final Report Due: July 2011

Publications: None.

Affiliated WWW sites: <http://www.birds.cornell.edu/>

Revised date: October 15, 2009