

MONITORING AND SPATIAL MAPPING OF MIGRATORY BIRD AND BAT POPULATIONS IN THE THOUSAND ISLANDS REGION OF NEW YORK

Kathryn A. Williams^{1*}, Evan M. Adams¹, David Yates¹, Thomas Kunz², Timothy Divoll¹, and David C. Evers¹

¹Biodiversity Research Institute; ²Boston University; *Kate.Williams@briloon.org

Introduction

Wind energy development promises to help reduce dependence on fossil fuels, but birds and bats are known to be killed by wind energy facilities in both forested and agricultural landscapes^{1,2}. Recent evidence from Ontario's Wolfe Island wind facility in the St. Lawrence River indicates that coastal and shoreline locations may also have high mortality rates³, and several other wind facilities have been built or are being considered in this region.

While the effects of wind power on migratory populations are still poorly understood, it is clear that siting of wind power facilities must take into account migratory routes if we are to minimize injury to these populations⁴. BRI is monitoring migratory bird and bat migration in the Thousand Islands region of New York using a variety of complementary methods to provide insight for state and federal agencies and industry to make informed decisions regarding the siting of wind power development. The identification of high use areas, and an increased understanding of migratory timing, weather effects, and other variables is critical to accurately assess risk and minimize impacts from wind energy facilities.

Objectives

The goal of this research is to develop a greater understanding of the migratory movements of birds and bats in priority areas of the coastal Great Lakes, in order to inform decision-makers in wind energy development.

This goal will be achieved by (1) Quantifying bird and bat migration on Grindstone and Carleton Islands during the autumn 2011 and spring 2012 migration seasons, including data on species distributions, abundance, timing, diel patterns, and weather effects; and (2) Applying newly developed analysis methods to NEXRAD radar images to characterize migration patterns at a regional scale, and to analyze arrival and exodus patterns at five high priority islands in eastern Lake Ontario and the St. Lawrence River.



Views from the migratory bird and bat banding stations on Grindstone Island

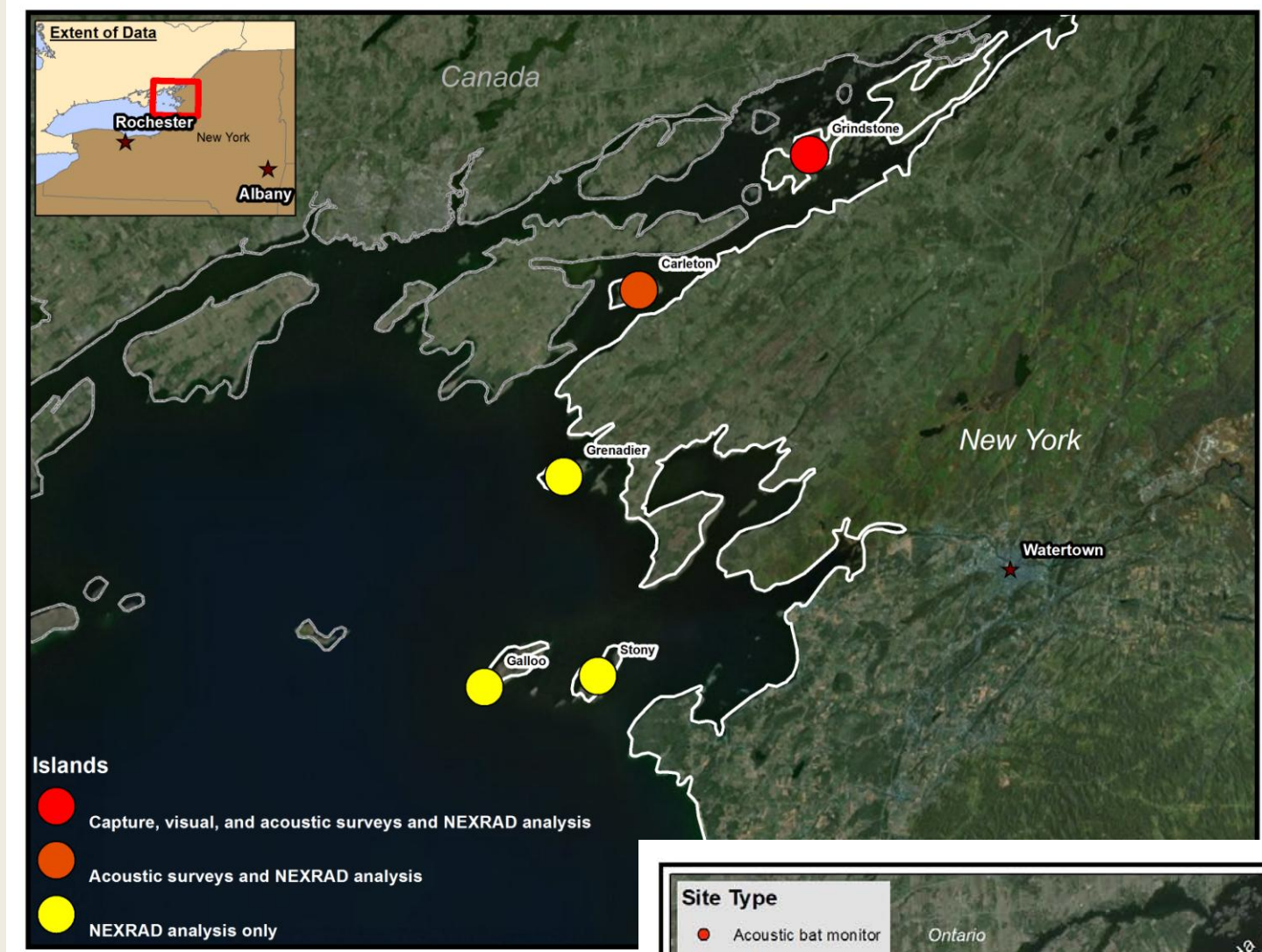
Study Area and Methods

We are conducting bird and bat banding, visual censuses (birds only), passive acoustic monitoring, and NEXRAD (Next-Generation Radar) analysis to study migratory patterns and abundance. This multi-tiered design allows for collection of detailed migratory data on high priority study islands, as well as for the examination of regional migration patterns throughout the study area.

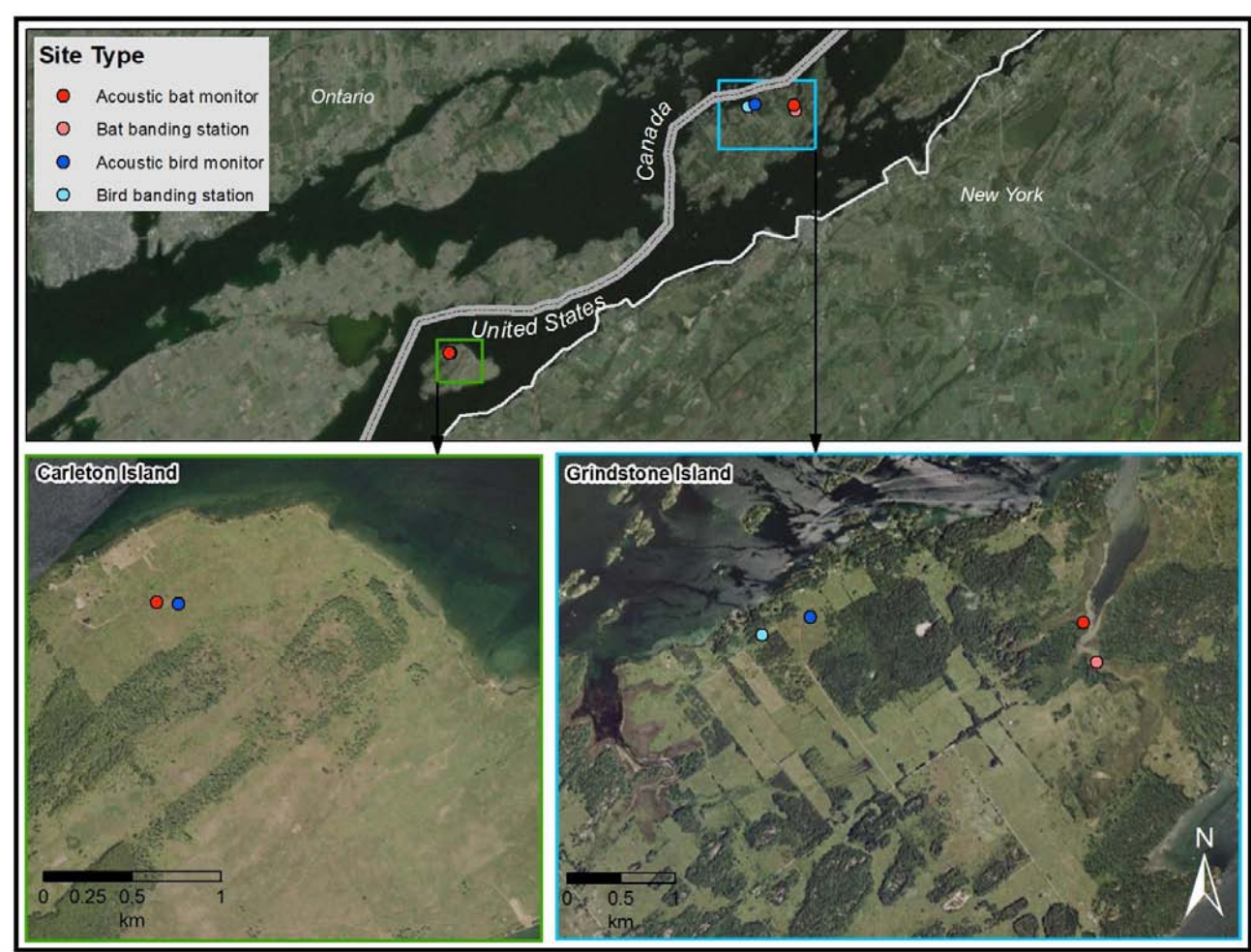
We are conducting all of the above types of monitoring on Grindstone Island (see map); passive acoustic and NEXRAD studies on Carleton Island; and NEXRAD studies throughout the Thousand Islands region of New York state, including several other islands in eastern Lake Ontario (Grenadier, Galloo and Stony). Migratory bird and bat banding stations were open for several months between mid-August and late October of 2011, and will reopen for four to six weeks in the spring (Apr.-May 2012). The recordings from passive acoustic monitoring arrays on Grindstone and Carleton Islands will allow us to identify migrating species of birds and bats (via the flight calls and echolocation they utilize at night). NEXRAD data are publicly available, and by using geographically specific techniques we can estimate nightly migratory bird and bat exodus from islands in the St. Lawrence River and Lake Ontario as well as examine weather-dependent migratory patterns.



Avian acoustic monitoring system on Grindstone Island, NY (with Fox Sparrow and Sharp-shinned Hawk)

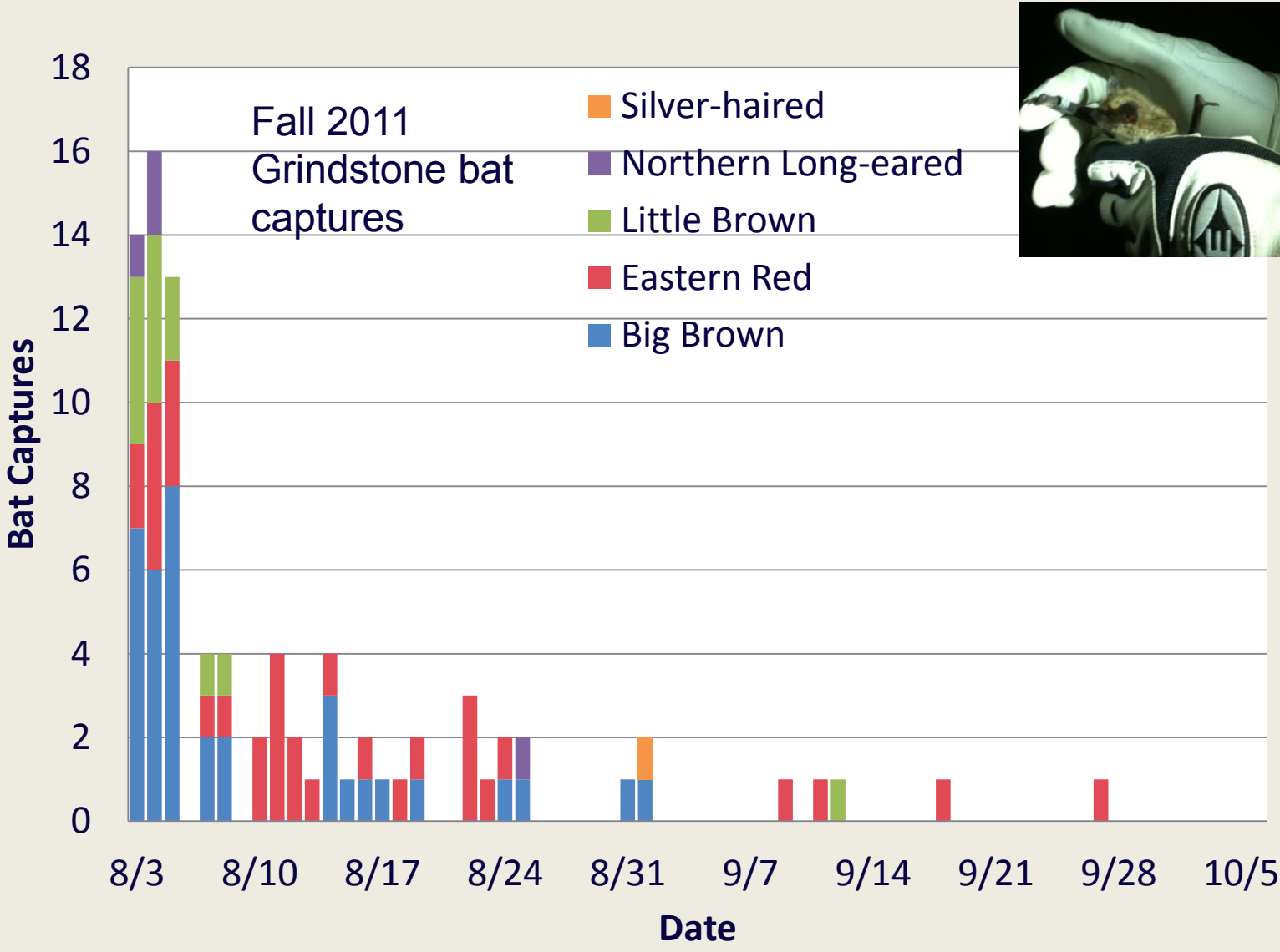


Study sites and types of monitoring being conducted at each location (produced by Ian Johnson, BRI)



Preliminary Results

The first season of bat captures occurred from August 3rd to October 7th. Capture numbers on Grindstone Island were much lower than expected, with only 76 new bats banded (87 total captures) in 53 nights of effort (using three triple-high mist net arrays). Though acoustic data have yet to be analyzed for species composition, the total number of acoustic files indicates similarly low detection rates on Grindstone. Carleton Island's acoustic detector logged a greater number of recordings for the same time period. Anecdotal evidence suggests that Grindstone bat populations have been decimated by white nose syndrome in recent years.



Bird migration was more active, with 1429 birds from 69 species banded between Sep 1 and Oct 7 (the season ran through late October), at a capture rate of 0.6 birds/net hour. of the ten most commonly caught species were warblers, including several declining species. Rare species such as Cerulean Warblers and Black-billed Cuckoo were also detected on the island.

Top Ten Species	Number caught (to 10/7/11)
Myrtle Warbler	496
Magnolia Warbler	199
Nashville Warbler	85
Blackpoll Warbler	70
Golden-crowned Kinglet	59
Tennessee Warbler	52
Ruby-crowned Kinglet	46
Black-throated Blue Warbler	45
Black-throated Green Warbler	42
Common Yellowthroat	41

Next Steps

This study will continue in spring 2012, and acoustic and NEXRAD data from autumn 2011 will be analyzed this winter. All data will be submitted to the Avian Knowledge Network and will be publicly available at the end of the study, expected to be in December 2012.

Acknowledgments

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