# Monitoring and Mapping of *Avian Resources* over the Great Lakes to Support Management

## *Goal*

The main goal is to develop predictive models of water bird distributions and densities across the Great Lakes to support decision-making and conservation planning. The second goal is to establish a foundational data management system and that can foster a community of researchers that contribute data to the system beyond the life of the project.

## *Background*

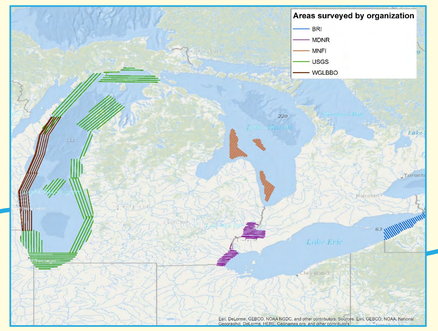
With 10,000 miles of shoreline and a watershed area of more than 300,000 square miles (including land and water), the Great Lakes region provides important breeding, feeding, and resting areas for many birds. Much of the Great Lakes coastal aquatic and terrestrial landscapes that once supported migrating birds have been lost or degraded, yet the region supports hundreds of millions of migrants during both spring and fall migration. To assist in managing these bird populations and conserving the habitats that support them, the best information available on how these populations use the Great Lakes is needed.

## *Informing Management and Conservation*

This project makes significant contributions toward filling critical data gaps in our knowledge of avian distributions and abundances in the open waters of the Great Lakes. These data can be used to inform future management and conservation decisions related to activities that might affect waterbirds through their life cycles. The growing database can contribute to many management and conservation activities, including but not limited to:

- Increased understanding of the drivers of spatio-temporal use of Great Lakes by waterbirds
- Designing of the next generation of survey methodologies, and providing training and ground-truthing data for large-scale spatial models of bird abundance
- Addressing specific research and monitoring needs of the Upper Mississippi River and Great Lakes Region Joint Venture.
- Increased understanding of critical areas, habitats, resources, and times for waterbirds in the Great Lakes, including the identification of Important Birding Areas (IBAs), and enhancing state coastal and marine spatial planning efforts.

Armed with this knowledge, natural resource managers, conservationists, and other stakeholders can make better-informed decisions about habitat restoration investments and identify important over-lake habitats that should be protected from human impacts, closely monitored, and carefully managed.





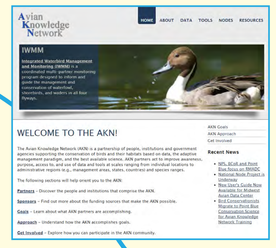




**Figure 1.** Aerial survey locations for the first two phases of the project (2012-2014). BRI: Biodiversity Research Institute, MDNR: Michigan Department of Natural Resources, MNFI Michigan Natural Features Inventory, USGS: U.S. Geological Survey, WGLBBO: Western Great Lakes Bats and Birds Observatory

## *Developing Predictive Species Models*

From 2012 to 2014, the Great Lakes Commission and the U.S. Fish and Wildlife Service coordinated five research entities to conduct aerial surveys of selected areas of Lake Michigan, Lake Huron, Lake St. Clair, and Lake Erie during the non-breeding season (see fig. 1). Building on the effort of these first two phases, a modeling team will develop predictive models to better serve and inform conservation and planning efforts through the collaborative work with natural resource managers and other stakeholders.

The desired outcomes of the modeling effort are to:

- Determine the sampling and modeling priorities for the next phases of the project
- Inform current water bird conservation priorities
- Inform management decisions on wind energy development in the Great Lakes

Approaches used include the identification of "hotspot" and "coldspot" locations, identification of relationships between water bird occurrences, abundances, and relevant environmental covariates, and integrating observation models across differing sampling protocols.

## *Developing a Data Management System for Great Lakes Researchers*

The Midwest Avian Data Center (MWADC) is a node of the Avian Knowledge Network (AKN). The AKN supports a network of people, data, and technology to improve bird conservation, management, and research across organizational boundaries and spatial scales. The MWADC provides the platform to manage scientific data, foster meaningful data visualizations, and coordinate partnerships around conservation questions. MWADC users can manage point counts, aerial transects, area search and other types of data through on-line tools. By making the data discoverable, users can navigate through the database and visualize the information through different outputs.

Available at: http://data.pointblue.org/partners/mwadc/index.php

**For more information on the project, visit:**
**http://glc.org/projects/habitat/avian-resources**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