

Science Support for Regional and Refuge Bird Conservation Planning

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Abstract

The North American Bird Conservation Initiative (NABCI) is a new bird conservation effort that seeks to integrate various bird conservation plans and “deliver the full spectrum of bird conservation through regionally-based, biologically-driven, landscape-oriented partnerships” (<http://www.dodpif.org/nabci/index.htm>). This study will provide science support for the NABCI initiative in Region 3 of the USFWS, which includes the Upper Mississippi River Fish and Wildlife Refuge. We will develop GIS data layers and GIS management tools within the Prairie-Hardwood Transition Ecoregion that will allow refuge managers to incorporate regional and local bird information into refuge-specific planning. These GIS data layers and tools will be combined with land bird point count information from National Wildlife Refuges, Wetland Management Districts, State agencies, and universities to develop habitat models for multiple bird species. This study is a collaborative effort between the U.S. Fish and Wildlife Service Region 3, the USGS Upper Midwest Environmental Sciences Center, the USGS Patuxent Wildlife Research Center, and the USGS, Wisconsin Cooperative Wildlife Research Unit.

Study Objectives

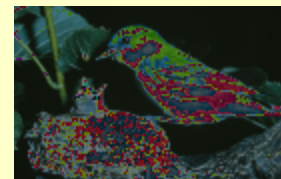
1. Develop GIS data layers of habitats and bird distributions within NABCI Bird Conservation Region (BCR) 23 in FWS Region 3.
2. Develop summary methods and GIS tools that allow refuge managers to incorporate regional and local bird information into refuge-specific planning.
3. Develop and apply models that allow prediction of the effects of local and regional management actions on distributions of high priority bird species or guilds.



Golden-Winged Warbler



Bird Conservation Region (BCR) 23

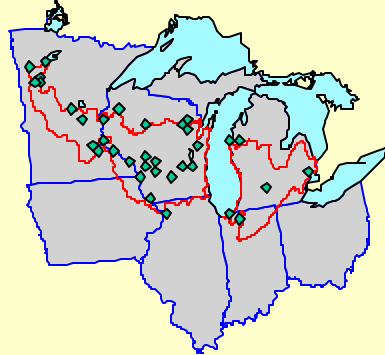


Cerulean Warbler

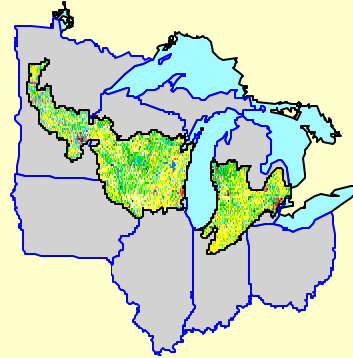
Because of their declining abundance, both the Cerulean Warbler and the Golden-Winged Warbler are considered species of high conservation priority. They are examples of species which we will focus on to develop habitat management models for the conservation efforts.

GIS Data Layers

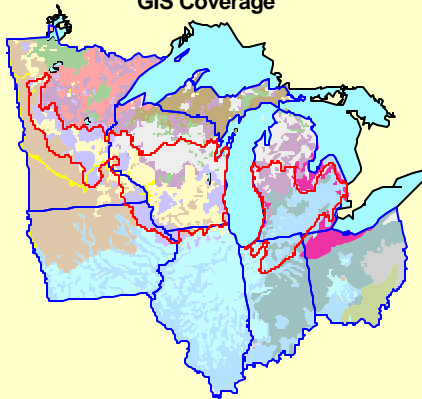
We will develop a GIS framework for regional bird conservation planning using a variety of available GIS coverages, including geographic features such as land cover, wetlands, rivers and streams, soils, digital elevation data, and others. We will also develop associated data layers of bird distributions using available data sets, including the Breeding Bird Survey (BBS) and point counts conducted on Federal and state wildlife refuges and from other sources.



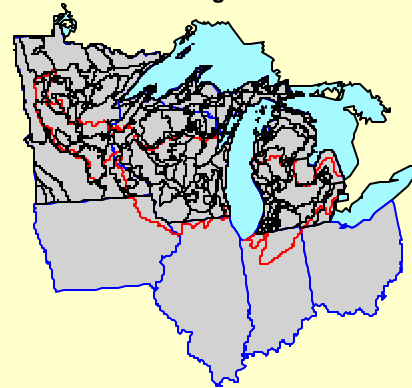
Federal Land in BCR 23
GIS Coverage



Current Land Cover of BCR 23
GIS Coverage



Historic Vegetation Cover
GIS Coverage



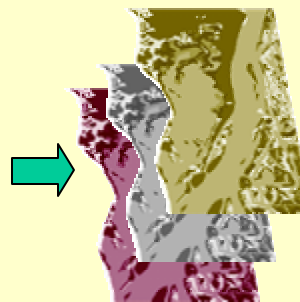
Ecoregions of BCR 23
GIS Coverage

GIS Tools

GIS data layers, combined with specific species information, will be used to develop GIS-based management tools. These tools are suitable for use by regional FWS staff, refuge managers, and scientists who want to be able to predict a species' probability of occurrence and other community attributes within a refuge or other wildlife area. Such tools will be used to test more advanced habitat models, plan future field research, propose new land acquisitions, and guide site-specific management and habitat restoration efforts.

Habitat	American Bittern
Seasonally Flooded Emergent Perennial	3
Semi Permanently Flooded Emergent Perennial	3
Semi Permanently Flooded Emergent Annual	2.5
Wet Meadow	2
Scrub/Shrub	0.5
Developed	0
Agricultural	0
Sand/ Mud	0
Wet Floodplain Forest	0
Floating Leaved Aquatic Bed	0
Submersed Aquatic Bed	0
Open Water	0

Species/Habitat Matrix



Multiple Spatial Data

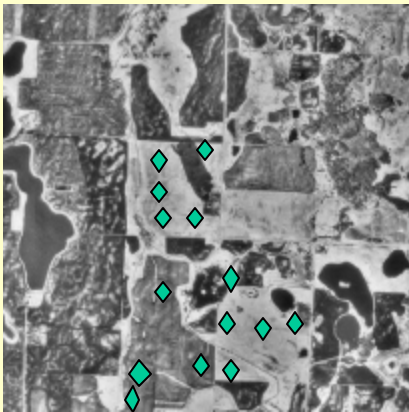
- New spatial data layers
- Text reports
- Tables
- Charts
- Maps

Model Development

As a first step in the process, we worked with wildlife refuges and the USGS Patuxent Wildlife Research Center to integrate point count data collected from USFWS Refuges into an MS Access database. The database mirrors the national Bird Point Count Database being developed at Patuxent. The database records the data and metadata needed for future use of the point count databases in modeling efforts. Incorporating data from multiple sources into a unified Access database without re-entering the data proved to be a major challenge. Problems included ambiguous mapping of point locations, bird names that did not match the master list, loss of metadata necessary for full understanding of the data, and differences in data collection methods and recording.

Species code and number				Radius and time of each count									
PtName	PtDesc	ViDate	sCode	CiAOU	Ct1R1	Ct1R2	CtTotal	Ptrad1	Ptrad2	PTTime1	UtmX	UtmY	
OW19	Oak Woods	21-Jun-01	HAWO	03930			1	1	50	100	5	437385.9	5041160
OW19	Oak Woods	21-Jun-01	RTHU	04280				1	50	100	5	437385.9	5041160
OW19	Oak Woods	06-Jun-95	GCFL	04520	1			1	50	100	5	437385.9	5041160
OW19	Oak Woods	15-Jun-94	GCFL	04520			1	1	50	100	5	437385.9	5041160
OW19	Oak Woods	06-Jun-95	EWPE	04610				1	50	100	5	437385.9	5041160
OW19	Oak Woods	15-Jun-94	EWPE	04610				1	50	100	5	437385.9	5041160
OW19	Oak Woods	21-Jun-01	EWPE	04610			1	1	50	100	5	437385.9	5041160

Portion of cells from Access database



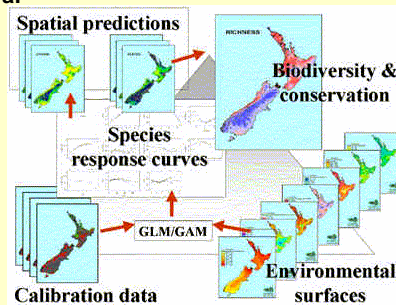
Map of Point Count Locations

Point counts must have UTM coordinates for each individual point to be entered into the database. The specific coordinates will be used to place each point in its proper position on GIS land cover maps.

Once completed, the Prairie-Hardwood (BCR 23) database will be useful for conservation planning at the refuge and regional scale, and the data will be available for use in modeling work. The database will also provide a template for future recording of point count data.

To date, point count data have been received from Minnesota Valley NWR, Litchfield WMD, Sherburne NWR, Crane Meadows NWR, Hamden Slough NWR, Horicon NWR, Fox River NWR, Leopold WMD, Necedah NWR, Upper Miss NWR, Rydell NWR, Fergus Falls WMD, and St. Croix WMD as well as point counts from state owned land in Southeast Minnesota and Northeast Iowa.

Simple GIS habitat models will be built to estimate the probability of occurrence of selected bird species, based on the literature. Then, we will build more advanced statistical models of habitat associations using Breeding Bird Survey (BBS) and point count data. We will also investigate the usefulness of habitat models for predicting community indices such as species richness.



Modeling Process

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