Planning at multiple scales: translating regional conservation design for birds into local management decisions

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Introduction

Bird conservation is shifting from opportunistic approaches to strategic habitat conservation (SHC). SHC is a framework for setting and achieving conservation objectives at multiple scales based on the best available information and use of ecological models. This framework includes four elements: 1) biological planning, 2) conservation design, 3) conservation delivery, and 4) monitoring and research. SHC strives for more efficient use of conservation dollars to protect, restore, and enhance habitat for priority birds, while continually adapting via monitoring and research.

The Upper Mississippi River and Great Lakes Region Joint Venture (JV) recently completed a regional habitat Implementation Plan for all-birds. This plan includes population goals, habitat objectives to reach those goals, and decision-support tools (DST) for regional conservation of habitats. The JV Plan helps partners increase their potential value in regional bird conservation. The Upper Midwest Environmental Science Center resides within the JV region and produces DST at smaller scales, within bird conservation regions (BCR) and local levels for a set of priority birds. Working together our programs are able to assist land managers at improving the foundation for bird habitat management decisions.

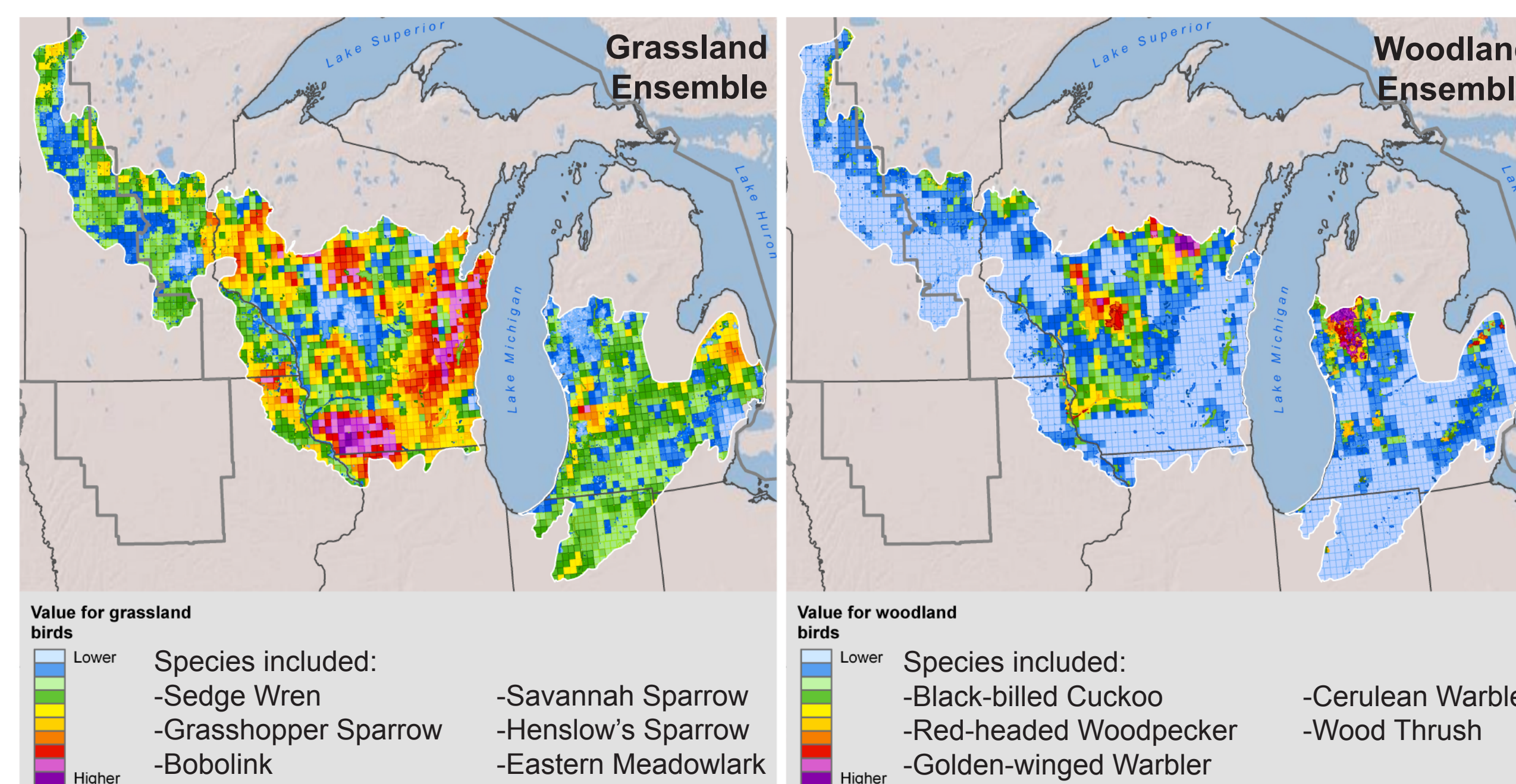## JV Regional Conservation Design
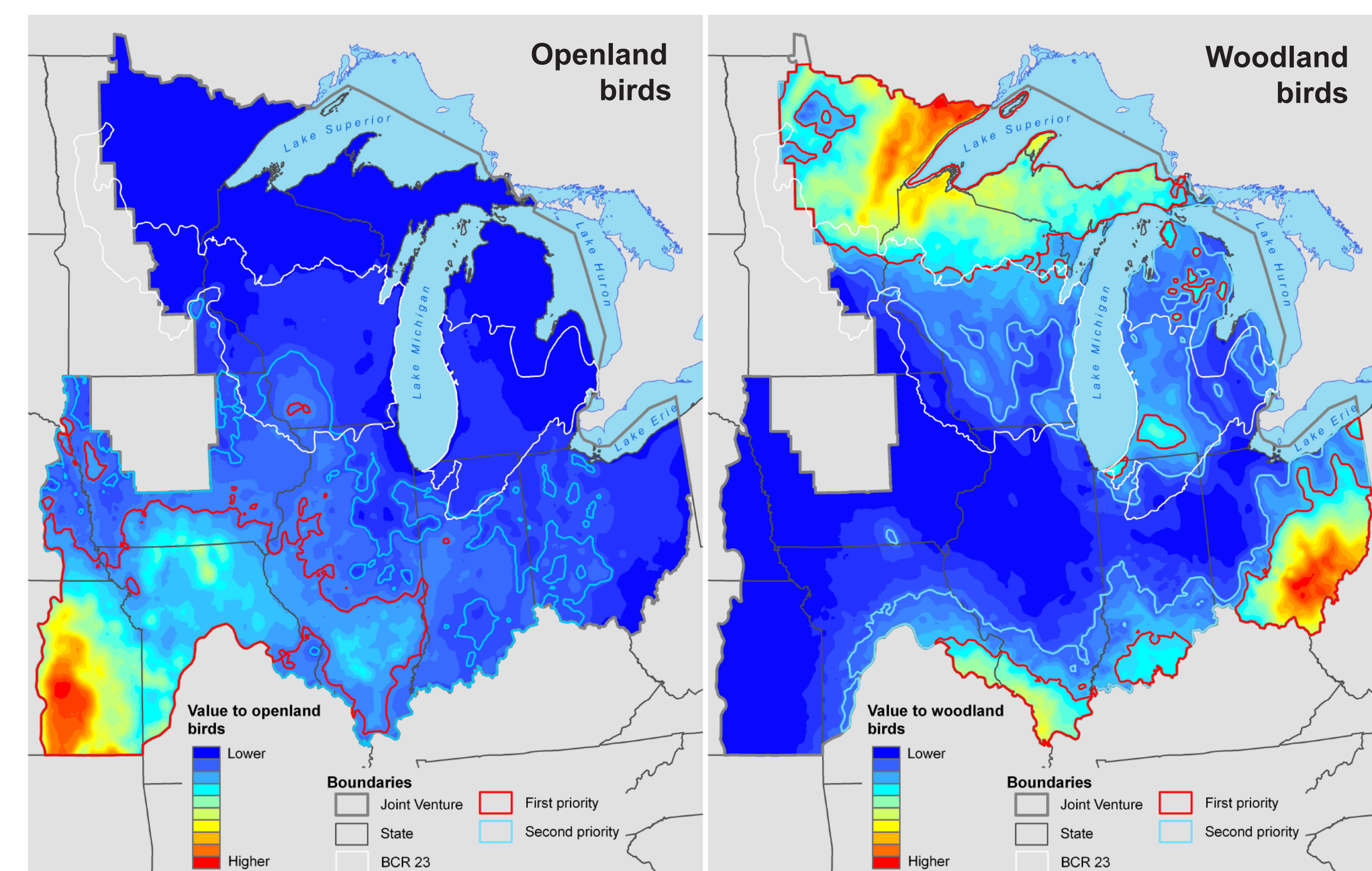
We created decision-support maps to assist JV partners in identifying areas most valuable to birds at a large regional scale and to better evaluate partner roles. Our objective was to identify areas within the region that are more suited to one cover type and bird association vs. another.

To complete this analysis priority bird species (high conservation concern) from four primary bird groups were placed into several general habitat categories, including openland and woodland. Abundance and distribution and or model-based habitat suitability data were combined for JV focal species to identify the relative importance and location of regional priority conservation areas (see maps above).

Bird Conservation Region 23
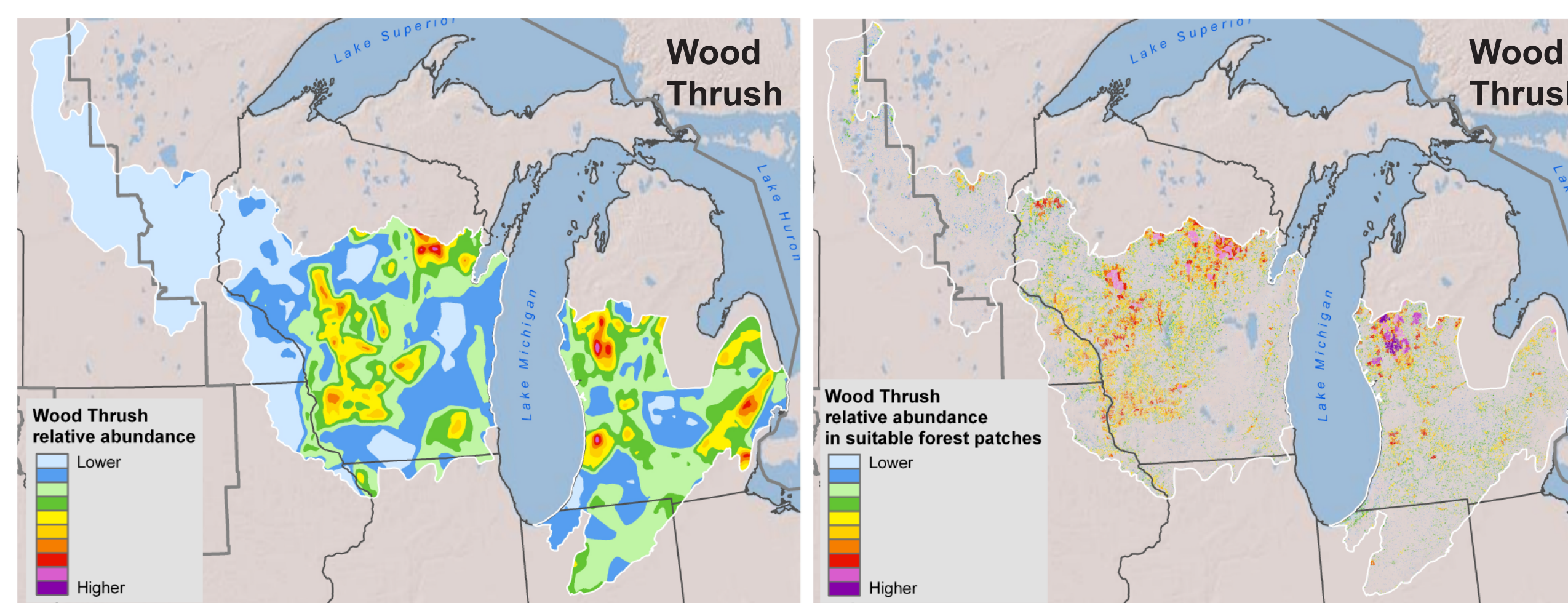
We used hierarchical spatial count models to predict relative abundances of rare birds at the BCR 23 scale. These models related environmental covariates associated with land cover composition and configuration, climatological, edaphic, and threats (e.g., competing species, cowbird parasitism, acid rain) to time series of Breeding Bird Survey route counts. We then use these predicted patterns in abundance to identify "hotspots" or concentrations of high abundance, which regional and local land managers can use to focus conservation for target species (see maps above).

The daunting task of identifying optimal landscapes for all bird species is one goal of conservation design. We created habitat-specific species ensembles of our hierarchical spatial count models. These ensembles are used to identify areas where we can most efficiently apply conservation for a large collection of priority species while assessing potential conflicting management prescriptions (e.g., grassland vs. forest focal areas).

For more information, see
http://www.umesc.usgs.gov/terrestrial/migratory_birds/bird_conservation.html and
www.UpperMissGreatLakesJV.org

Necedah National Wildlife Refuge
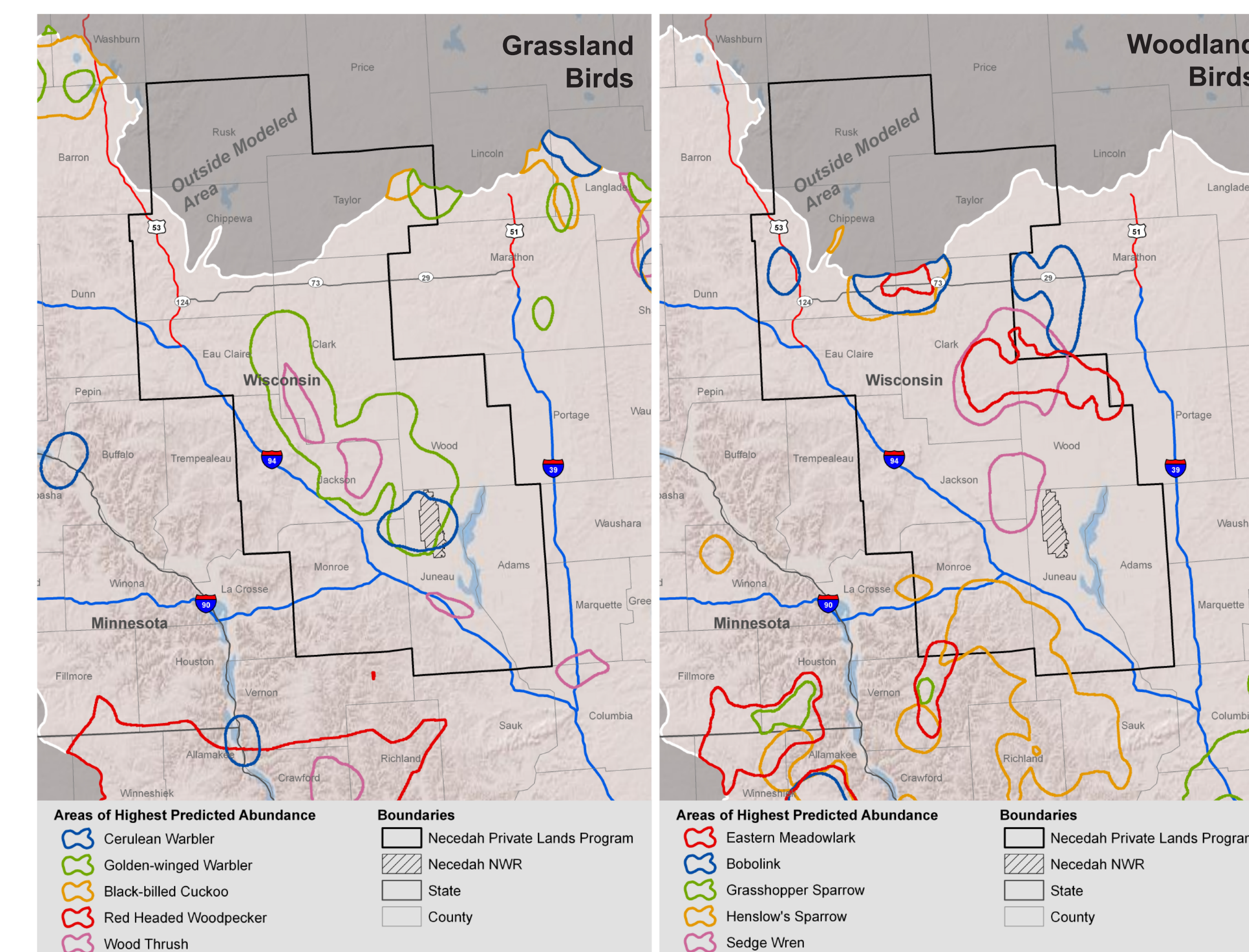
We offer Necedah National Wildlife Refuge as an example of how regional models may be useful for informing local conservation and management. The refuge has a private lands program that covers a 10 county area in Wisconsin. While the refuge itself is predicted to be a regional hotspot of abundance for Cerulean and Golden-winged Warblers, to most effectively direct conservation for these and other rare species, refuge staff should focus effort outside refuge boundaries. Concentrations of warbler and Wood Thrush habitat exist to the northeast of the refuge and high abundances of Red-headed Woodpecker are predicted to occur to the southwest. Formulating directed management for these species where they are predicted to be highest in abundance will help to insure sustainable populations while leading to more efficient application of scarce conservation resources.

Conservation design within the SHC framework requires:
- models describing species-habitat relationships
- development of species habitat DST
- combining appropriate species DST
- formulating habitat objectives
- identify program priority areas

We have used these principles to guide regional bird conservation planning at multiple spatial scales. Considerable challenges remain, particularly with regard to proper disbursement of regional population goals to local levels and with local management assessment to ascertain whether regional goals are being met.