Framework for the Midwest Coordinated Bird Monitoring Partnership: 2010-2012

December 2010

A regional network committed to informed bird conservation decisions through enhanced coordination and exchange of monitoring information

Katherine Koch, Tom Will, Gregory Souliere, Bill Bartush, Rua Mordecai, and Ryan Brady
Executive Summary

Using the Framework for Coordinated Bird Monitoring in the Northeast (Northeast Coordinated Bird Monitoring Partnership 2007) as a foundation, this document outlines the format for establishing and implementing a regional network to fully integrate monitoring programs into bird conservation decision making throughout the Midwest (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin). Operational elements for this framework include regular workshops, an interactive website, registry of Midwest bird monitoring programs, focused working groups, and a state-of-the-art system for archiving, analyzing, and accessing data. The ten highest priorities developed by Midwest partners provide the focus for highlighting recent progress and future steps toward more effective and efficient bird monitoring, conservation, and evaluation of success. The Midwest Coordinated Bird Monitoring Partnership aspires to effectively package monitoring information for managers and decision makers alike. Results of partner efforts thus far reinforce the importance of strategic monitoring as a key element in bird conservation and a means to help wildlife professionals better understand and interface with climate change, energy development, land use practices, and food production across the Midwestern landscape.


Acknowledgments

The Northeast Coordinated Bird Monitoring Partnership provided the leadership, clear guidance, and immediately useful products responsible for much of the Midwest's early success. The work of the Midwest Coordinated Bird Monitoring (CBM) Partnership would not be possible without the overwhelming support of the U.S. Fish and Wildlife Service (USFWS) Midwest Region’s Division of Migratory Birds (John Christian, Jane West, Barb Pardo, Steve Lewis, Tom Will and Robert Russell). Special thanks also to Deputy Regional Director Charles Woolley and Regional Director Tom Melius for championing our efforts with partners throughout the region and nationally.

The initial Midwest CBM Steering Committee provided valuable oversight, expertise, and support promoting monitoring efforts throughout the region: Bill Bartush (USDA Forest Service); Diane Granfors (USFWS), Socheata Lor (USFWS), Rua Mordecai (Southeast Partners in Flight), Andy Paulios (Wisconsin Bird Conservation Initiative), Grant Ballard (Point Reyes Bird Observatory), Greg Souliere (USFWS), Wayne Thogmartin (USGS), and Tom Will (USFWS).

All of the Midwest CBM Partnership affiliates have devoted innumerable resources to bird monitoring and conservation, and their ready acceptance of and participation in this framework for collaboration has been inspiring and has cemented our dedication to moving forward.
**Background**

Thousands of bird monitoring programs are currently operational throughout the United States. Monitoring can and should play an essential role in bird conservation planning, guiding design of on-the-ground activities and evaluation of implementation practices to inform adaptive management. In the recent past, bird monitoring programs have proliferated under the direction of government agencies, universities, and non-governmental organizations. Until the development of the Midwest Coordinated Bird Monitoring (CBM) Partnership, however, lack of coordination needed to integrate monitoring into decision making at multiple scales has limited the Midwest’s ability to leverage this hefty investment to advance efficient, effective, and strategic bird conservation.

The Midwest CBM Partnership is aligned to help biologists, biometricians, data managers, wildlife administrators, and citizen scientists achieve five overarching goals:

- Integration of monitoring into bird management and conservation;
- Broadening the scope of monitoring for species most at risk and for which we lack adequate information to make effective decisions;
- Coordination of programs among organizations and across spatial scales;
- Improvement of survey design, field methods, and data analysis; and
- Deployment of modern data management strategies.

These goals tier to those contained in *Opportunities for Improving Avian Monitoring* (NABCi 2007; [http://www.nabci-us.org/aboutnabci/monitoringreportfinal0307.pdf](http://www.nabci-us.org/aboutnabci/monitoringreportfinal0307.pdf)).

A coordinated approach also increases our collective ability to detect spatial patterns and temporal trends while placing local results in a regional context. Additionally, gains in efficiency will reduce costs of monitoring and can enable greater attention to traditionally under-surveyed species.

To enhance the conservation value of bird monitoring, it may be necessary to modify and/or shift resources, on a case-by-case basis, from programs that do not meet basic criteria to those providing useful data at the appropriate geographic scale. These decisions can often be difficult because of prior investment in uncoordinated initiatives. However, CBM working groups are attempting to retain the value of previously established programs while incorporating recommendations where past monitoring has not met information needs. Thus, the Midwest CBM Partnership is poised to continue making vast improvements in the effectiveness, scope, utility, and efficiency of collective regional monitoring efforts.
Workshops and Events

In 2009, three sub-regional workshops were held to bring partners together, identify priority bird conservation and monitoring issues most in need of regional coordination (see Priorities on page 5), create working groups, and expand awareness of recommended monitoring programs. Travel restrictions among partner agencies necessitated placing gatherings at the borders of several states to reduce expenditures and increase participation.

We then hosted a one-half day Midwest CBM Symposium during the 70th Midwest Fish and Wildlife Conference in Springfield, Illinois, on 8 December 2009. The symposium was well-received, with approximately 150 people in attendance.

In 2010, we held two Midwest CBM Workshops. During these workshops, participants validated priorities and the future direction of the Partnership, shared updates from monitoring working groups, engaged additional partners in our collaborative projects, and shaped the expansion of the Midwest Avian Data Center to address regional needs. Two topics received extra attention with one- to two-day post-workshop meeting events: 1) coordinating our bird monitoring to inform conservation throughout the Great Lakes, and 2) Midwest grassland bird conservation and monitoring.

Detailed notes from all workshops held to-date are available at http://midwestbirdmonitoring.ning.com/group/workshopstuff.

Future Workshops and Events

Midwest CBM partners are playing a key role in development of a one-day symposium at the 71st Midwest Fish and Wildlife Conference to be held in December 2010, in Minneapolis, Minnesota - The Power of Partnerships for Midwest Bird Conservation. During this celebration of the 20th Anniversary of Partners in Flight, we plan to take a retrospective view of PIF and coordinated conservation activities and integrate insights from the species prioritization process, strategic conservation, coordinated bird monitoring, and full life-cycle stewardship to improve efficiency of future actions. One symposium focus will be the importance of sharing sound biological information in formats useful to managers and decision makers.

In 2011 we plan to host only one Midwest CBM workshop, at a centralized and relatively convenient location for travel and at a time that minimizes overlap with the field season. During the next two years, potential also exists for hosting one-day focused training sessions throughout the region (e.g., MAPS training, data integration with the Midwest Avian Data Center, integrated forest bird management, etc.). We also plan to host one large Midwest workshop again in 2012 (stay tuned to http://midwestbirdmonitoring.ning.com/events).
Priorities

At the five workshops held in 2009 and 2010 and through discussions on the website, Midwest partners have articulated a list of the Midwest's highest CBM priorities, 2009-2012. These priorities are ordered below according to progress made thus far; they are subject to review and revision on a three-year basis. Collectively, Midwest CBM partners would like to:

1. Develop a website promoting collaboration throughout the Midwest region.
2. Create a comprehensive Registry of Midwest Bird Monitoring Programs.
3. Implement the National Secretive Marshbird Monitoring Program in every Midwestern state (including gathering information for conservation modeling and evaluation).
4. Expand the Midwest Nocturnal Bird Monitoring Program throughout the region to gather scalable baseline information, further our understanding of habitat requirements and availability, and identify opportunities for conservation or restoration.
5. Establish a Midwest Grassland Bird Working Group to evaluate our conservation efforts to date, forge a strategic plan for implementing source grassland bird landscapes, and coordinate evaluation of the success of our collective conservation delivery efforts.
6. Develop a centralized data repository to increase access to and use of bird monitoring datasets for regional conservation planning, area landscape design, and bird habitat delivery evaluation.
7. Further our understanding of the ecology of migrating birds in order to guide conservation, management, and energy development decisions. Specifically, inform wind energy development plans by organizing existing monitoring datasets and coordinating efforts designed to fill information gaps and document bird movements.
8. Develop a system of demographic monitoring for focal\(^1\) species in the Midwest to identify source populations and better evaluate our conservation effectiveness in terms of meeting bird life history needs.
9. Develop a coordinated approach to evaluating collective management activities along successional gradients as they relate to sustaining source forest bird populations.
10. Integrate with and inform climate change assessment activities throughout the region as they relate to birds and wildlife habitat.

\(^1\) In this instance, “focal species” refer to species that have been selected because they are easy to monitor, respond rapidly to management activities, are indicators of overall ecosystem function, or are strongly tied to specific ecosystem conditions.
Progress to Date

*Collaborative Midwest CBM website (Priority #1)*

Workshop participants strongly recommended development of a website that promotes networking and sharing of information, provides a sense of regional identity, allows administrator access for frequent updating, offers diverse functionality, and is easy to use. In December 2009, following the example of the Avian Knowledge Alliance, we used the Ning software platform to create an interactive website for the Midwest CBM Partnership (http://midwestbirdmonitoring.ning.com/).

Our website provides instant access to approximately 200 individual members, focused monitoring working group sections, a real-time calendar of events, Registry of Midwest Bird Monitoring Programs, bird conservation updates and discussion forums, and the developing Midwest Avian Data Center. Partner feedback has been extremely positive, and we continue to improve our ability to provide one-stop access to Midwest bird monitoring and conservation information.

*Registry of Midwest Bird Monitoring Programs (Priority #2)*

The Registry of Midwest Bird Monitoring Programs presently lists more than 170 monitoring initiatives along with their sponsoring institutions and principal investigators. Most entries list contact information and web links to facilitate communication and public access to monitoring results. Many of the records also include information on survey scope, frequency, and methods. Inevitably there are programs that have escaped attention, so we invite additions from initiatives or partners who know of initiatives. The registry is currently available at http://midwestbirdmonitoring.ning.com/page/registry-of-midwest-bird and will be updated regularly. Conservation practitioners are currently engaged in discussions about how to make subsequent versions of the registry more user-friendly and easy to print.

*Secretive Marshbird Monitoring (Priority #3)*

Secretive marshbirds such as rails, bitterns, coots, and grebes are among the most poorly monitored bird groups in North America. The National Secretive Marshbird Monitoring Program is predicated on key components: a well-tested protocol (Conway 2009), statistically-based sampling framework (Johnson et al., 2009), and coordination among many partners at multiple spatial scales.

In 2008, Wisconsin became the first state in the U.S. to pilot the National Secretive Marshbird Monitoring Program, and in 2009, several states outside of the Midwest region also adopted the pilot program. Iowa began using the standardized protocol for marshbird surveys throughout the state. Also in 2009, the Midwest National Wildlife Refuge Inventory and Monitoring Team initiated a review of marshbird data collected on Refuges since 1998. In 2010, with the support of the USFWS and many partner organizations, Michigan became the
second Midwest state to join the pilot effort, and Wisconsin is expanding its efforts to private lands. The Midwest secretive marshbird working group webpage contains additional information and regular updates:

http://midwestbirdmonitoring.ning.com/group/midwest_secretive_marshallids

Nocturnal Bird Monitoring (Priority #4)

Owls and nightjars are not well-monitored through large-scale, standardized programs (e.g., Breeding Bird Survey (BBS), Christmas Bird Count, etc.), and several have been identified in the Midwest as being species of greatest conservation need. Perceived declines in nightjar populations across the region (Common Nighthawk, Chuck-will’s-widow, Whip-poor-will), along with a lack of baseline information for owl populations, have consistently made nocturnal bird monitoring a priority for many state and regional bird conservation plans.

Nocturnal bird monitoring has occurred in parts of the Midwest since 2004, when Michigan conducted targeted surveys in support of their second Breeding Bird Atlas effort (Barton, 2007). Since 2004, Hawk Ridge Bird Observatory and the Wisconsin Bird Conservation Initiative have led the Western Great Lakes Owl Survey. In 2007, the Wisconsin Nightjar Survey effort began in conjunction with the Northeast Nightjar Survey Program and Bird Studies Canada, and it is still active at present. In 2009, Illinois began the Monitoring of Owls and Nightjars (MOON) program, a citizen-based effort to ascertain the current status of nocturnal birds and prioritize opportunities for conservation actions. Michigan began conducting volunteer-based nightjar surveys using the same protocol as Illinois and Wisconsin in 2010. Since 2007, the U.S. Nightjar Survey Network (coordinated through College of William and Mary’s Center for Conservation Biology) also has initiated volunteer-based survey efforts throughout the Midwest region. The Midwest CBM Partnership is currently developing a strategy to better coordinate these efforts in order to avoid duplication and ensure greater consistency in methodology and information sharing.

The Midwest nocturnal bird working group formed to begin providing standardized status and trend information, causes of population changes, evaluation of conservation efforts, and data-driven conservation design (http://midwestbirdmonitoring.ning.com/group/midwest_nighthbirds).

Grassland Bird Working Group (Priority #5)

As grassland bird populations continue to decline throughout large portions of the Midwest and elsewhere, focused conservation attention for this group becomes more and more essential. Most scientists agree that population objectives for grassland birds cannot be met by the capacity of publicly-owned lands alone. Thus, habitat assessment and conservation on private lands is essential to grassland bird conservation success. We are beginning to link individual grassland managers together to form a Midwest grassland bird working group aligned with the National Bobwhite Conservation Initiative and Southeast partners to assess the value of our existing data and to prioritize what information is still needed to guide strategic conservation.
We have also created a Midwest grassland bird conservation working group webpage: http://midwestbirdmonitoring.ning.com/group/midwest_grasslandbird.

Beginning in 2010, the Illinois Natural History Survey is leading an effort to aggregate and synthesize results of wide-ranging grassland studies and monitoring programs from throughout the Midwest. Datasets will be shared via the Midwest Avian Data Center to promote hypothesis building, validation of assumptions, identification of information gaps, and evaluation of conservation actions. In 2010, Wisconsin received funds to create a digital land cover layer that allows for classification to determine (1) meaningful population goals for focal grassland bird species, (2) evaluation of bird habitat change within priority areas over time, (3) relationships between focal species populations and habitat changes, and (4) broader evaluation of the Grassland Bird Conservation Opportunity Area concept. The project is intended to serve as a foundation for region-wide planning, implementation, and evaluation.

In cooperation with Ohio State University, we are also investigating the effects of cat feeding colonies on urban grassland bird reproductive success. As urbanization expands, once important grassland bird strongholds, under increasing pressure from subsidized predators like cats, may no longer be sufficient to provide source populations. Through an experimental design that monitors actual cat activity patterns, researchers will be able to document the extent to which food provisioning and the presence of cat colonies influences the density and reproductive success of grassland birds. The project will inform policy and management decisions at a larger (i.e., regional) scale as well as help guide strategic placement of urban interface grassland restoration given confounding predator communities.

*Centralized Data Repository (Priority #6)*

The model for how aggregations of data can be used in bird conservation in the U.S. has evolved over the last ten years from centralized *data management* to centralized *data sharing*, and the main hub for data sharing is the Avian Knowledge Network (AKN), supported by the Cornell Lab of Ornithology and its partners. The AKN establishes a common set of data elements and methods; for example, the Bird Monitoring Data Exchange (BMDE) allows partners to support their own data management needs and coordinate regionally while using a centralized system for sharing information more broadly.

We have partnered with the Informatics Division of PRBO Conservation Science (founded as Point Reyes Bird Observatory) to begin development of the Midwest Avian Data Center, a new regional node to the Avian Knowledge Network. We will make avian monitoring data and analyses readily accessible to habitat managers, conservation practitioners, scientists, decision makers and the public. Midwest bird conservation partners will be able to compare bird population trends from several large datasets at multiple scales (e.g., Bird Conservation Region, State, County, and between months/years). There will also be potential to elucidate further conservation value of a given site as additional datasets are incorporated.
We are also working with Patuxent Wildlife Research Center to connect the Point Count and Marshbird Databases presently housed there with the Midwest Avian Data Center (and thus the entire international AKN community). Connecting these data management centers to the AKN provides incentive to share data as well as become part of a complete data management solution. Most importantly, the connection will help resolve the issue Midwest partners presently face regarding where to house their landbird point count and secretive marshbird data (e.g., individual database connected to MWADC or Point Count Database) since they will now be part of a greater shared network.

Migration Ecology (Priority #7)

Information about migration ecology and wintering bird concentrations, both around the Great Lakes and throughout the Midwest is becoming increasingly important as decisions are made regarding wind power development, impacts from Botulism E outbreaks, proposed conversion of stopover habitat to residential or other development uses, and acquisition of land for conservation. Information about the pelagic distribution of waterbirds and waterfowl during migration and wintering periods is sparse. Datasets on landbird and shorebird migration are widely scattered and in different forms (i.e., hand-written data sheets, excel spreadsheets, well-organized databases), making organization and use of these data in quick response decision making nearly impossible. The Great Lakes Coastal Bird Monitoring Advisory Group webpage contains additional information and regular updates: [http://midwestbirdmonitoring.ning.com/group/greatlakesbirdmonitoring](http://midwestbirdmonitoring.ning.com/group/greatlakesbirdmonitoring).

In 2010, the Great Lakes Bird and Bat Research and Advisory group formed under the direction of Bill Mueller to 1) provide discussion, recommendations, and guidance for survey methodology; 2) ensure quality assurance and evaluation for projects; and 3) foster collaboration among agencies, academia, and private entities. Two complimentary projects to assess pelagic bird distributions along Lake Michigan began in 2010. The first, led by Kevin Kenow (USGS), will employ aerial surveys to determine distribution and abundance of waterbirds in selected areas of Lake Michigan as well as habitat associations for significant waterbird concentrations. The second project, led by Bill Mueller, will use aerial surveys to determine species distributions at least one mile offshore in portions of Lake Michigan, measure seasonal timing and temporal limits of species use of open waters, and identify significant bird concentrations in open waters. The Ohio Division of Wildlife has also used a zigzag aerial transect method to begin mapping bird use of the open waters of western Lake Erie.

Demographic Monitoring (Priority #8)

Beginning in 2010, we partnered with the Institute for Bird Populations (IBP) to assess the regional value of existing bird demographic data from the Monitoring Avian Productivity and Survivorship (MAPS) network within the Midwest. We will use these data to develop tools
informing regional landbird conservation, management, and policy decisions for a suite of species of management concern, including Neotropical migrants. These tools will include: 1) baseline demographic parameter estimates (including survivorship and productivity), 2) maps of protected lands indexed by their potential to provide source habitat, 3) GIS tools allowing managers to analyze landscapes and extract specific spatial statistics for input to models, and 4) species management guidelines for creating or maintaining source habitat. We will also be able to explore the influence of seasonal weather on population dynamics of Neotropical migrants and resident species that breed in the Midwest. IBP will generate regional MAPS data through the MAPS Portal of the Avian Knowledge Network (in collaboration with PRBO) and prepare one or more manuscripts presenting the demographic data and landscape-level habitat models in the peer-reviewed avian conservation literature.

The Midwest Demographic Monitoring working group webpage contains additional information and regular updates: 
http://midwestbirdmonitoring.ning.com/group/midwest_bird_demographics.

Forest Bird Conservation (Priority #9)

Developing a coordinated approach to forest bird monitoring and conservation faces many challenges: varying forest ownerships, multiple forest use objectives, competing successional stage needs for forest birds, and different approaches to forest bird and habitat monitoring. The National Wildlife Refuge System is adopting a standardized Landbird Monitoring Protocol (Knutson et al. 2008). It includes birder certification; clearly articulated data management practices; training and personnel needs; a protocol that measures abundance, density, occupancy, and species richness of breeding landbirds on National Wildlife Refuges; and clearly written standard operating procedures. In 2010, the National Park Service Great Lakes Monitoring Network also published a standardized landbird monitoring program (Gostomski et al. 2010) compatible with the Knutson et al. (2008) protocol. Additionally, several Great Lakes National Forests are convening in early August 2010 to develop a more consistent approach to forest bird monitoring in the context of other regional programs.

Standardized landbird monitoring is also important among citizen science efforts. The Mississippi River Twin Cities Important Bird Area (IBA) has established a landbird monitoring program that has since served as the foundation for National Audubon’s IBA Assessment Program. This protocol (Homayoun and Blair 2009) allows IBA managers to estimate long-term relative abundance and understand habitat associations during breeding, migration, and wintering periods. Project coordinators have more recently developed a web-based interface (http://www.ibamonitoring.org/Default.aspx) to allow citizen scientists to upload monitoring data into a centralized database. This tool will be an early feature of the Midwest Avian Data

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Species management guidelines will result from an interactive process that includes agency managers and expert opinion and will ultimately be evaluated by future data collection.
Center to encourage sharing of IBA monitoring data and comparisons with other large landbird monitoring datasets.

A project in the Lower Wisconsin Riverway will develop a protocol for evaluating the impact of forest management on riverine system birds that can be expanded to partners throughout the Midwest (e.g., Upper Mississippi River Forest Partnership). Additionally, researchers are determining the habitat characteristics of Cerulean Warbler occupancy to guide future planning and management in similar riverine systems.

**Climate Change (Priority #10)**

Almost every conservation partner in the Midwest is developing an approach for incorporating climate change into conservation planning. In 2010, the USFWS initiated formation of Landscape Conservation Cooperatives (LCCs), science partnerships that inform integrated resource management actions addressing climate change and other stressors within and across landscapes. Within the Midwest region, five LCCs are presently identifying priorities and collaborating with partners to begin addressing climate change science needs—the Upper Midwest and Great Lakes, Appalachian, Eastern Tallgrass Prairie and Big Rivers, Gulf Coastal Plains and Ozarks, and Plains and Prairie Potholes LCCs. Joint Ventures are playing an active role in the early development of LCCs, and we have the opportunity to engage LCCs in addressing our bird conservation science needs with respect to climate change. We also have vast resources available (i.e., monitoring datasets and existing partnerships) to help LCCs provide information that is readily useable for bird and wildlife habitat conservation.

Because birds occur in almost every terrestrial and aquatic environment, they serve as good indicators of environmental condition. Therefore, modeling predicted changes in bird distribution and behavior should reveal how ecosystems are likely to respond under accelerated climate change scenarios (NABCI 2010). Uncertainty can be reduced by developing and implementing effective programs to monitor how birds respond to climate change—focusing on birds that are most sensitive to climate change and evaluating our practices to mitigate climate-induced effects. In order to inform bird conservation practices in the context of climate change, we will need to improve the design of programs to allow analyses that differentiate the influence of climate on population changes from impacts caused by other factors (e.g., land use changes, habitat fragmentation, direct and indirect mortality) and identify synergistic interactions between them (NABCI 2010).
Future Plans (2011-2012)

Secretive Marshbird Monitoring (Priority #3)

As we transition from the pilot stage (2008-2011) into full implementation of this program nationwide beginning in 2012, our success hinges on agreement from flyway, regional, state, federal, and non-governmental partners. Coordinated monitoring of secretive marshbirds to gain status and trend information, determine sustainable harvest limits for hunted species, and evaluate effectiveness of wetland conservation and restoration is a shared priority for our collective efforts. We are currently discussing expansion of the pilot program to additional Midwest states in 2011 and plan to host a web-based seminar to engage current and potential partners in a discussion about implementing this program region-wide. We are actively seeking financial resources to help states ground truth survey locations (the largest start-up investment needed) and build the capacity to continue to coordinate surveys. Studies are also planned to improve our ability to monitor difficult-to-detect species (e.g., Yellow and Black rails). We also need to refine regional-scale conservation questions in order to develop explicit evaluation programs—e.g., sustainable harvest rates, success of wetland management practices, and identification of source populations.

Nocturnal Bird Monitoring (Priority #4)

We will continue to coordinate closely with the Northeast Nightjar Survey Network, Bird Studies Canada, and the U.S. Nightjar Survey Network to ensure consistency, data sharing, and opportunities to manage for and conserve nocturnal species. During initial development of the Midwest Avian Data Center, we will form a centralized data repository for the Midwest Nocturnal Bird Monitoring Program. We also intend to conduct statistical analyses (2011-2012) of both the monitoring protocol and sampling design for owls and nightjars to determine how well the current program meets our needs; modifications to ensure greater inference and standardization will be identified. Consulting professionals throughout the U.S. and Canada, we also plan to improve and standardize owl monitoring practices, seeking opportunities to leverage existing volunteers and surveys to achieve greater efficiency and program coverage.

Grassland Bird Working Group (Priority #5)

We will continue developing a common vision for building regional-scale source landscapes for grassland birds as the working group incorporates coordinated evaluation and engages implementation partners. Priorities include informing Grassland Bird Conservation Opportunity Area (GBCA) approaches with the newest science and management strategies and assessing coordination opportunities with other grassland bird partners (e.g., National Bobwhite Conservation Initiative, Southeast Grassland Bird Working group, Joint Ventures, and University of Tennessee). Beginning in 2011, we will explore development of a replicated, experimental monitoring program to evaluate performance of GBCAs as cornerstones for creating sustainable grassland bird populations and the possibility of securing a full-time technical coordinator to work with other initiatives to facilitate Eastern nongame grassland bird conservation.
Centralized Data Repository (Priority #6)

We will continue our efforts to connect local and regional datasets to the AKN via the Midwest Avian Data Center (MWADC). The Steering Committee will also review recommendations for near-term development of MWADC and prioritize outyear work accordingly. Several opportunities exist for relatively rapid and cost-effective development of decision support systems specifically focused on key conservation concerns in the Upper Midwest (e.g., agricultural and grassland systems, wind power development, forest management, and climate change). Using R-Avian and other analytical frameworks, we can build specific analysis tools (customized queries, summary tables, and illustrative graphics) to meet communication and decision support needs as they are defined by our partners.). Ultimately, we intend to develop a partnership strategy to ensure continued maintenance and evolution of the Midwest Avian Data Center into the foreseeable future.

Migration Ecology (Priority #7)

Many conservation opportunities, including informed wind power development, will be contingent on well-coordinated and inter-connected bird monitoring programs and sound data management. We recognize the need to further our collective understanding of migratory corridors and stopover concentrations, particularly along Great Lakes coastlines and inland riverways. Additionally, we anticipate increasing priority for supporting studies linking Midwest breeding landbird populations with non-breeding habitats as we work to conserve birds throughout their full life cycles. The Partners in Flight Tri-National Vision for Landbird Conservation (2010) highlights the need to work with international partners in order to maintain sustainable landbird populations. By monitoring a select suite of landbird species throughout their full life cycle, we can begin to infer linkages and identify where birds are most limited in order to provide truly strategic conservation actions.

The Integrated Management and Monitoring of Waterbirds in the East (http://iwmmprogram.ning.com/) is a program under development aimed at helping land managers sustain healthy populations of shorebirds, waterbirds, and waterfowl that migrate long distances. Managers and scientists are using adaptive decision making in an innovative way that incorporates management expertise with new conservation planning and modeling tools. We will continue to provide technical input to the project’s steering committee and serve as a liaison with Midwest CBM partners as they engage in this program.

Demographic Monitoring (Priority #8)

Following our analysis of historical MAPS data, we will identify the key questions that will drive the development of a demographic monitoring network in the Midwest. Coordination of banding projects and MAPS stations and increased support for researchers to analyze existing demographic datasets will be crucial to this effort. Because demographic monitoring typically requires more resources than other monitoring methods (such
as point counts), we recognize the need to balance practical program decisions with the growing awareness that demographic information is essential for strategic conservation of many of our most vulnerable species.

We will continue to emphasize linkages among breeding, wintering, and stopover studies of priority Midwest bird species to help us target conservation actions where they can have the greatest population impact. Presently, most methods employed to understand linkages are expensive (e.g., stable isotope analysis, satellite transmitters, and geolocators) and subject to further testing; however, migratory connectivity can also be inferred with some certainty from MAPS and MOSI data. Midwest partners have repeatedly emphasized the need to shift from counting birds to measuring demographic response to management, so these and other investigations will prove essential for fully achieving success in conservation practices throughout the full life cycles of priority species.

*Forest Bird Conservation (Priority #9)*

Several projects are planned to advance our ability to cooperatively manage and evaluate conservation of forest landbirds. The UMRGLR JV Science Office is currently developing a model to identify and prioritize management for area- and edge-sensitive birds in the Upper Midwest and Great Lakes Region. Along with IBP, we plan to identify source population areas requiring conservation and buffering activities as well as potential source habitats in need of targeted management and restoration. Wisconsin will be partnering with USDA Forest Service staff to develop a tool relating forest birds and habitat characteristics so that forest managers can predict impacts of management decisions on forest bird species or target practices toward species of conservation concern. Indiana partners will begin evaluating approaches to integrate forest bird monitoring programs so that data collected on IBAs can be compared with other forest bird monitoring datasets. The Central Hardwoods JV provides a great model for evaluating the feasibility of meeting present forest bird population goals given current and projected future landscape composition; they have created maps and other decision support tools highlighting opportunities for conservation of priority forest bird species ([http://www.chjv.org/CHJV_Conservation_Planning.html](http://www.chjv.org/CHJV_Conservation_Planning.html)). Following the lead of the Central Hardwoods JV, we are considering hosting a workshop dedicated to developing a coordinated management plan for maintaining and evaluating suitable forest bird habitat in dynamic seral stages across large landscapes (e.g., Bird Conservation Regions).

*Climate Change (Priority #10)*

Broad-scale coordinated bird monitoring will be critical to understanding conservation needs and the usefulness of management actions under changing climatic conditions. We are pursuing development of a decision support system that uses our bird monitoring data and resources to produce interactive maps and other query and display tools to enable users to explore questions about climate change and its potential impacts on bird populations. The California Avian Data Center has already produced such tools for bird conservation practitioners on the West Coast ([http://data.prbo.org/cadc2/index.php?page=climate-change-distribution](http://data.prbo.org/cadc2/index.php?page=climate-change-distribution)), and they are exploring options to import similar decision support to other regions. We will
continue to develop our capacity to provide Landscape Conservation Cooperatives with the avian data and tools needed to inform strategic landscape conservation actions under a changing climate (along with other broad-scale stressors of bird populations). Additionally, as the Midwest Avian Data Center expands, both researchers and conservation practitioners will have access to historical and real-time bird monitoring datasets to validate and improve predictive models for conservation under accelerated climate change scenarios.

### Partnership Affiliates To-Date

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Literature Cited


