Wisconsin Birding: The Habitat Way

Wisconsin’s Bird Habitats: Introducing a New Series

by Michael J. Mossman and Paul E. Matthiae

This is the first in a series of articles on the birds of various environments or “habitats” in Wisconsin, with an emphasis on breeding species. This information should be useful to birdwatchers, who are often interested in knowing what species they can expect to find in a particular habitat. Knowledge of the habitat requirements of birds is equally important from the standpoint of conservation, for it can be a crucial factor in guiding land-use decisions.

Wisconsin’s list of breeding birds currently comprises some 237 species, the highest tally of any state east of the Mississippi River (DeSante and Pyle 1986). In the North American Breeding Bird Survey (Robbins et al. 1986), Wisconsin ranks among those states and provinces with the highest number of bird species recorded per roadside route. This rich avifauna results from a number of factors, probably the most important of which is the state’s location at the juncture of 3 major North American ecosystems or biomes: eastern deciduous forest, mixed hardwood-coniferous forest, and prairie. In addition to the influences of these biomes, a myriad of other factors such as topography, soil type, wetland features, and various human modifications of the landscape combine to produce a unique and interesting variety of bird habitats. The major natural-habitat divisions of Wisconsin are mapped and described in Figure 1.

Although this series will describe the birds of both natural and altered habitats, it focuses on relatively undisturbed natural areas. Natural areas represent the scattered remnants of our presettlement past; they include the native communities of plants and animals that have escaped human disturbance and still function as parts of relatively natural ecosystems. Although many of Wisconsin’s breeding bird species have adapted to the dramatic changes that have occurred in the landscape since European settlement, some species depend largely on natural areas in which to nest and raise their young, for example the Worm-eating, Cerulean, Kentucky, and Hooded Warblers (southern hardwood forests), Yellow-bellied Flycatcher (lowland coniferous forest), LeConte’s Sparrow (sedge meadow),

43
and Red-necked Grebe ("prairie" bulrush marsh). Continued threats to natural areas dictate that we identify those species currently dependent on natural conditions, and that we identify critical habitat features that might be restored to support these sensitive species. Natural areas not only help to protect our full heritage of plant and animal species in their natural state, but they are also important sites for restoration work.

One important aspect of this series is that it begins to describe the breeding bird components of Wisconsin’s native plant and animal communities, which have heretofore been defined almost exclusively on the basis of vegetational features and floral lists. Because birds depend on specific features of their breeding habitats, such as particular vegetational structures and prey populations, they can serve as indicators of habitat quality—in particular, the quality of sites being considered for protection as natural areas. With baseline information on what constitutes the avifauna of each natu-
ral community, we can better ensure the selection and protection of those areas with the most “intact” communities. This is done by evaluating bird-survey data from candidate sites in the same way that botanical information has traditionally been compared with the baseline data presented in Curtis’ (1959) The Vegetation of Wisconsin.

Each of the ensuing articles in this series will describe the vegetation, distribution, and breeding birds of a different community type or of a group of closely related types, and discuss the habitat features that appear to be important for certain bird species. Wintering birds will be discussed when appropriate, and special articles will concentrate on important migration areas. Authors will list specific examples of the community type and describe the best sites in detail, including directions for visiting.

WISCONSIN’S NATURAL BIOTIC COMMUNITIES

It is through visits to natural areas across the state that you will be exposed to Wisconsin’s bird habitats. Twelve terrestrial communities and groups of communities will be described, together with several aquatic and special interest areas. These communities are largely based upon John T. Curtis’ descriptions of Wisconsin’s plant communities as defined in his book, The Vegetation of Wisconsin (Table 1).

Prairies.—Once occupying two million acres but now consisting of little more than 2,000 acres, the prairies are home for grassland birds. This bird community, though declining because of the loss of pasture lands and prairie and frequent mowing of hayfields, can be observed in a number of prairie remnants that are still large enough to support a typical bird community. Dry and dry-mesic prairies will be considered together, as will wet-mesic and wet prairies, and the closely related fen community. Mesic (moderately moist and well drained) prairies were once the most common grassland in Wisconsin. Today, the remnants are too small and scattered to support grassland bird populations.

Southern dry, dry-mesic and mesic forests.—Dry and dry-mesic forests, dominated by white, bur, black and red oaks, will be considered together, while the southern mesic forest (Figure 2), dominated by sugar maple, basswood, and sometimes beech, will be treated separately. Once regionalized in large patches of tens of thousands to a million acres in size and distributed from southeastern to west central Wisconsin, these communities persist today mostly as small isolated woodlots. Only a few tracts of public and private forest reach thousands of acres in size.

Southern floodplain forests.—These forests, consisting of the southern wet-mesic and wet forest communities, contains a rich avifauna where tracts large enough to maintain sufficient forest interior persists. Common trees are silver maple, cottonwood, green ash, and swamp white oak. Never a very large component of presettlement landscapes, these communities tend to be linear in configuration, following major water courses. Because of logging, grazing, drainage, and damming, the floodplain forests have been dramatically reduced in size and quality.
Only a few sites retain their presettlement condition and structure.

**Oak and pine barrens.**—Despite commonly held beliefs, the northern two-thirds of Wisconsin, at the time of settlement, was not a vast unbroken forest of hardwoods, hemlock, and giant white pine. Rather, it was broken into a number of plant communities. Oak and pine barrens were open savanna-like areas with scattered trees and shrubs. Once occupying over 4 million acres, these communities were maintained largely by the occurrence of natural wild fires. Since settlement most of these barrens that escaped agricultural development have been lost to forest encroachment, a result of fire prevention and control. Today, only a few examples remain, largely in areas managed for Sharp-tailed Grouse or on sites maintained as State Natural Areas. A related community that will be considered together with barrens is oak opening. Although it dominated much of the southern Wisconsin landscape at the time of settlement, only a few small tracts have survived fire control and the plow.
Northern dry and dry-mesic forest.—These forests, dominated by jack, red, and white pine, and Hill’s and red oaks, occupied over 2 million acres of the northern forest region at settlement (Figure 3). Today, remnants are interspersed within the much larger northern mesic forest community, separated by changes in soil type. Because of the lack of natural fire and a combination of historical and modern forest management practices, these communities have diminished in both size and quality of composition. We will describe several remnants that retain presettlement character and their associated avifauna.

Northern mesic forest.—These forests, dominated by sugar maple, yellow birch, basswood, and in some cases hemlock and beech, will be discussed separately. This community, which today ranges across the northern third of Wisconsin in a nearly continuous forest of 9 million acres, is proportionately among the most disturbed. Historic and modern forestry, agriculture, urbanization, and rural recreational settlement have greatly altered the structure and age of this community. Today, lacking old growth structure and averaging about 85 years of age, this community has few remnants in which to study the dynamics of the forest-interior birds.

Northern wet-mesic and wet forests.—These communities together occupied over a million acres of the northern forest region at settlement. The wet-mesic type consisted of white cedar, balsam fir, hemlock, yellow birch, and black ash. The wet forest was dominated by black spruce, tamarack, white cedar, and balsam fir. While a number of these communities in the southern part of their Wisconsin range have been drained, most of the northern sites remain intact. Logging and high deer
populations have caused changes in the structure and species composition of some of these sites.

**Northern and southern sedge meadows.**—These communities are dominated by various sedge species but also typically include a variety of other wet-ground forbs and grasses (Figure 4). Although northern and especially southern meadows have been reduced and degraded by drainage, artificial flooding, grazing, and conversion to other land uses, some large tracts of both types have survived intact. Our tour of bird habitats will also take us to other wetland communities dominated by dense shrubs: the southern shrub-carr composed mainly of willows and dogwoods, and the more northern alder thicket.

**Boreal forests.**—These forests were never well represented in Wisconsin. In the past, as now, they clung to the Lake Superior and northern Lake Michigan shoreline areas. Stands of fir, spruce, cedar, white pine, and white birch were extensively logged. Today, this community is found in only a few locations and, therefore, provides little of the habitat associated with the extensive boreal forest of northern Minnesota, Michigan, and Canada. Our remnants will, however, prove to be unique bird haunts.

Other articles in this series will address aquatic communities, waterfowl and crane staging areas, and other minor terrestrial communities, such as the unique northern relics of the driftless area of southwestern Wisconsin.

**The Wisconsin Natural Areas Program**

We owe much to Wisconsin's early conservationists, who in 1951 recognized the problem of dwindling natural areas and established Wisconsin's Scientific Areas System, the first state natural areas preservation program in the United States. In recent years this program has been incorporated into the Wisconsin Department of Natural Resources' (WDNR) Bureau of Endangered Resources (BER), and it has been renamed the Wisconsin Natural Areas Program. It is guided by an advisory board, the Natural Areas Preservation Council.

The mission of the program is to locate and preserve a system of State Natural Areas that will protect examples of all types of biotic communities and other significant natural features native to the state. The areas are used for education, research, and most importantly to secure long-term protection of the state's biotic diversity for the benefit of future generations. They are not intended for intensive recreational uses, like picnicking or camping. These precious areas are often the last refuges for rare and endangered plants and animals. Unique and significant geological and archaeological features are frequently included within their

Figure 4. An extensive sedge meadow, Marquette County.
boundaries. Because these areas still function as relatively natural ecosystems, they provide a standard by which human modifications of the landscape can be evaluated.

High-quality natural areas are identified and evaluated by BER staff and the Council. Preservation is accomplished by designating tracts already in public ownership through cooperative management agreements or by acquiring privately owned tracts, often in close cooperation with The Nature Conservancy. Once protected, many sites are actively managed; for example, prairies must be burned to prevent encroachment by trees and shrubs. These formidable tasks succeed only through substantial assistance from a number of individuals, public agencies, and private organizations, especially The Nature Conservancy. Today, there are 216 official State Natural Areas in this system (Figure 1), including the Wisconsin Society for Ornithology's (WSO) Honey Creek site.

**Sources of Data**

Information for “Wisconsin Birding: The Habitat Way” comes mainly from data collected in the WDNR’s Natural Areas Breeding Bird Survey program, which was initiated jointly with the WSO in 1971. The survey provides data on the abundance of nearly all Wisconsin breeding bird species at specific sites of interest, especially State Natural Areas and other potentially valuable natural areas. The results of these surveys can be used for several purposes:

1. To provide site-specific inventory data useful in evaluating the impacts of proposed developments or management activities.

2. To correlate bird species with habitat types and help determine habitat features necessary for maintaining breeding populations of each species.

3. To better determine the status and specific locations of breeding populations of bird species, especially those that are endangered, threatened, or of special concern.

4. To evaluate the ecological integrity of the plant and animal communities on specific natural areas and, thus, help establish preservation and management priorities.

5. To monitor breeding bird populations over the long term on natural areas that experience little habitat change, and to determine the effects on bird populations of natural vegetational succession, natural catastrophes, and management options.

The field surveys of this ongoing program are carried out by volunteers and WDNR cooperators. Until 1978, cooperators used a variety of survey methods, but since that time nearly all terrestrial surveys have used the “walk-5/stand-5” method: recording all birds seen or heard, while alternating 5-minute periods of walking and standing along a prescribed route. This simple procedure has been used successfully in other studies of Wisconsin bird communities (Bond 1957, Beals 1960, Mossman and Lange 1982). It allows a simple, quantitative comparison among bird communities and of the relative abundance of particular bird species among different sites. Surveys of aquatic sites have most often been done by canoe. Whenever possible, surveys are run between 1 June and 4 July, and during the period beginning ½ hour before sunrise and ending 4 hours after sunrise. Bird numbers are reported on standard
data sheets, along with wind and sky codes, temperature, and time at the beginning and end of the survey. Cooperators are encouraged to record bird data by habitat when a particular survey area comprises more than one community type. Cooperators also include a map and description of the survey route, and comments on unusual findings, bird-habitat associations, evidence of breeding, and site conditions, such as evidence of recent or past disturbance. Permanent routes have been established for many of the State Natural Areas. Detailed survey instructions are available from BER.

The survey program has been coordinated by Evelyn Batchelor (1971–78), Bill Tans (1978), Mossman (1979–86), and Randy Hoffman (1987–88). Coordinators have completed several summary reports, (Mossman 1983, 1984, Hoffman 1988), and a major analysis and program evaluation (Mossman 1980).

Since 1971, over 100 cooperators have conducted counts on a total of 193 (90%) of Wisconsin’s 216 State Natural Areas (Figure 5), and on over 300 other natural and managed sites. Many areas have been surveyed more than once, and 4 have been surveyed every year, 1971–87. Data are maintained in manual files, and are computer-indexed by site name, county, legal description, date, observer, and habitat type.

Survey results have been used frequently in BER’s impact assessment procedures and master-plan evaluations, as well as in helping set preservation priorities for unprotected sites. Hundreds of records of critical species have been contributed to BER’s Natural Heritage and Endangered Species programs. Information on population trends has been analyzed only in a preliminary manner, for example in showing an increase in Blue-winged Warblers and a decrease in Golden-wings in the Baraboo Hills (Mossman and Lange 1982). Mossman (1982) and Mossman and Lange (1982) used portions of the survey data to determine habitat distributions of Wisconsin bird species, and to analyze the structure and relationships of breeding bird communities. During 1983, the program emphasized data collection from unprotected sites, and in 1987 it began to focus more on long-term monitoring, as part of a larger plan to monitor all major biota on State Natural Areas (Hoffman 1987).

In addition to the Natural Areas Breeding Bird Survey data, “Wisconsin Birding: The Habitat Way” will incorporate information from other published studies on Wisconsin birds and from other sources, such as WDNR’s grassland bird study and colonial-bird nesting studies.

**Summary**

Natural areas provide habitat for a rich variety of birds, including many
rare and unusual species. Furthermore, they are important in determining bird habitat needs and in providing a standard against which to evaluate human modifications of the landscape. The WDNR, The Nature Conservancy, and other agencies currently protect 216 State Natural Areas and many other relatively undisturbed sites representing all of Wisconsin’ natural communities. Breeding-bird survey data from these and other managed sites will be used in this series to describe the communities and habitat associations of Wisconsin’s birds, with an emphasis on breeding species. Besides providing information useful for birdwatching, we hope this ecological perspective will help foster a greater awareness of the importance of bird habitats, increase knowledge of specific habitat needs, and further the appreciation of natural and wisely managed lands in Wisconsin.

ACKNOWLEDGMENTS

The Natural Areas program and Breeding Bird Survey rely on the energy, dedication, and expertise of volunteer and agency cooperators too numerous to list. We extend a sincere thanks to them all and hope that this series will help demonstrate the value of their efforts. Special appreciation is due the WSO, Evelyn Batchelor for helping initiate the survey program, and Stanley Temple for encouraging the publication of this series.

LITERATURE CITED


Michael J. Mossman
DNR Bureau of Research
3911 Fish Hatchery Road
Fitchburg, WI 53711

and

Paul E. Matthiae
DNR Bureau of Endangered Resources
Box 7921
Madison, WI 53707
Eastern Bluebirds by Thomas R. Schultz