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Send all manuscripts and related correspondence to the Editors. Information for "Seasonal Field Notes" should be sent to the Bird Reports Coordinator (see inside back cover). Art work and questions about the art should be sent to the Assistant Editor for art (see left column). Manuscripts that deal with Wisconsin birds, ornithological topics of interest to WSO members, and WSO activities are considered for publication. For detailed submission guidelines, please refer to "Guidelines for Authors and Artists," found near the back of this and following issues.

Front Cover: Pam Campbell shared her iconic breeding bird photo of a Grasshopper Sparrow carrying food, taken in Dunn County in July.

Combining Winter Birding with Citizen Science

It's easy to divide Wisconsin's year into two seasons: 1) Birding Season; and 2) Winter. Birding Season is a combination of the more traditional seasons of spring, summer, and fall. The birds are plentiful and we merrily chase after them. Winter is winter. The weather is often miserable, the birds are few and far between, and little daylight is left after our daily obligations. In short, conditions not conducive to widespread bird watching. A time when many of us hunker down and dream of the return of Birding Season. But there are indeed birds around, and occasionally a bit of our free time coincides with some decent weather, and we bravely venture forth.

I want to highlight three winter birding activities which help us both get outside and are valuable contributions to citizen-based science. One has been around for over a century, the other two are much more recent.

Volunteers are an integral part of monitoring hundreds of animal species and their habitats. This monitoring, when part of a focused program, is called citizen-based monitoring. It can contribute quality scientific data, while offering rewarding and educational outdoor opportunities for volunteers. It also promotes information sharing and collaborations between members of the public, researchers, and land managers. So, birders can both bird and collect useful information at the same time.

Many of us report our bird sightings on eBird, an awesome example of citizen-science. The unstructured nature of these entries, however, does place limits on how the data can be evaluated. The three projects below, based on their more rigorous observation requirements (specific dates, etc.) can be used in ways beyond what can be done with the basic eBird data.

Christmas Count:

Prior to the turn of the 20th century, hunters engaged in a holiday tradition known as the Christmas "Side Hunt." They would go afield in teams with their guns, those who shot the greatest number of birds won. Around the end of the 19th century many observers and scientists were becoming concerned about declining bird populations. Beginning on Christmas Day 1900, a new holiday tradition was started, an event to count birds during the holidays rather than hunt them, with 27 birders conducting 25 Christmas Bird Counts that day.

The data collected over the past century is a treasure of immense value. It contributes significant information about the long-term status of bird populations across North America. When combined with other surveys such as the Breeding

Bird Survey, it provides a picture of how the continent's bird populations have changed in time and space over the past hundred years.

Since its beginning with 25 counts in 1900, the count has grown by leaps and bounds. During the 2016 count period, a total of 2,505 circles was covered, with 1,902 counts in the United States, 471 in Canada, and 132 in Latin America, the Caribbean, Bermuda, and the Pacific Islands. In the U.S alone, there were 59,039 participants, with 52,771 counters traversing the fields and streams while 6,268 watched their feeders, tallying a total of 54,531,408 individual birds.

Project FeederWatch:

Project FeederWatch is a winter-long survey of feeder birds in backyards, nature centers, community areas, and other locales in North America. Counts are made periodically from November through early April. FeederWatch data help scientists track broad-scale movements of winter bird populations and long-term trends in bird distribution and abundance.

According to the Project FeederWatch coordinators (Cornell Lab of Ornithology and Bird Studies Canada) the massive amounts of winter data collected across the continent help scientists understand:

- long-term trends in bird distribution and abundance;
- the timing and extent of winter irruptions of winter finches and other species;
- expansions or contractions in the winter ranges of feeder birds;
- the kinds of foods and environmental factors that attract birds; and
- how disease is spread among birds that visit feeders.

Project FeederWatch was initially established in Canada 1978, spreading into the U.S. about 10 years later. In the winter of 2015-2016, there were 22,082 participants across North America, 140,034 checklists submitted, and 6,775,487 individual birds reported. In the Northeast region, which includes Wisconsin, with 6,948 feeder sites reporting, the most frequent birds were the chickadees (Black-capped and Carolina combined), seen at 97 percent of the sites. I was amazed that the 25th most frequent species was the Coopers Hawk, seen at 29 percent of the feeder sites and showing an increasing trend.

Great Backyard Bird Count:

The Cornell Lab of Ornithology and National Audubon Society launched the Great Backyard Bird Count (GBBC) in 1998. It was the first online citizen-science project to collect data on wild birds and to display results in near real-time. It is a four-day count each February to create an annual snapshot of the distribution and abundance of winter birds. And this project is worldwide.

Like the Christmas Count and FeederWatch, the GBBC is designed to allow participation by anyone with a basic knowledge of birds. Unlike the other two projects, the GBBC allows you to pick any location you want, as long as you spend at least 15 minutes in that spot, and you can survey multiple locations over the

four-day count period. The initial estimates for the February 2017 GBBC included 214,018 participants, 5,940 species, and 173,826 completed checklists.

My Efforts This Year:

I've been doing Christmas Counts off-and-on for over four decades. And I've been submitting observations to Project FeederWatch for a dozen. I haven't before this year participated in the Great Backyard Bird Count. This year I wanted to do all three, and do more than I did in the past.

Regarding the Christmas Count, I did the Poynette one with my long-time birding buddy. We've done this count for about a dozen years and know our area very well. We were joined this year by a 12-year old birder and his grandmother. I must say the young one put us to shame. What an inspiration, I'm glad we got to show him around some areas he hadn't been before. I also helped with the Columbus count, by myself and in an area I've never birded before. A very different feel to it, especially having to figure out on the fly how to cover a large area. And for my third Christmas Count of the year, I joined two others as they surveyed their usual area of the Oconomowoc count. Again, I've not birded this area in winter, but I got to sit in back, along for the ride. Each count was very different, and I enjoyed them all.

I also continued my off-and-on observations for Project FeederWatch. Some weeks I did well, but I wasn't always around much for other weeks. I still sent in my data and know it will add to the broad research objective of the project.

New for me this year was the Great Backyard Bird Count. I talked two friends into spending a day driving around the southern Kettle Moraine. We stopped in places we thought might be "birdy," some were and some weren't. We visited a number of fun spots, had a quick WSO committee meeting over supper, and got to see a wonderful evening presentation by WSO past-President Tom Schultz at the Ben Goss Bird Club. What a day.

Each of these three projects are great ways to get outside in the winter, have some fun, and at the same time make valuable contributions to important citizen-science efforts. Make it a point next year to help out with these wonderful winter birding adventures.

Michael John Jaeger, President

Jim Stewart found this Killdeer standing attentively at Horicon Marsh in Dodge County in early July.

From the Editors' Desk: On Uniformity

When you submit manuscripts for possible inclusion in *The Passenger Pigeon*, please first carefully review the most recent "Guidelines for Authors and Artists" at the end of each issue. We have noted a marked discrepancy with how the material appears. Citations, for one, have varied in format. Some appear with italics for cited material. Others do not. The ordering of elements and how the authors have been listed has differed from article to article.

In addition, received manuscripts have also varied in their general appearance. Some have come in double-spaced (we prefer that); others have arrived with single or other spacing. Authors have been listed differently—some, for example, with addresses that readers can use to contact the authors, and others lacking that. We won't trouble you with further specifics since all the details are in "Guidelines for Authors and Artists," but that should give you an idea of what our concerns are.

Our concern lies particularly with articles presented for peer-review. *The Passenger Pigeon* is a vehicle that represents the Wisconsin Society for Ornithology to the rest of the world, a sort of ambassador, if you will. Scientific articles sometimes have varied formats dependent on the disciplines represented, but within each discipline the format should be uniform. Failing consistency, to some eyes it can be distracting and thus detracting from the impact of the article. The "Guidelines" are just what the title suggests. Examples are given for how citations ought to appear as well as for other key elements.

Although not listed as such in the "Guidelines," we are looking for accuracy. Please, proofread your manuscripts at least twice to minimize errors. And, lastly, please double-check your citations against the material which you cite. Readers often wish to look further into a topic you present, and a faulty citation can be extremely frustrating.

A final word to artists: when you submit photographs or other artwork, please also submit a brief biographical statement along with your material. If your work is chosen, we will then use the "bio" in the "About the Artists" section of the journal. Examples of how the statement might appear can be found in past issues.

This is a plea. It may appear fussy. We will not argue that. It is. The content above is with readers in mind. Uniformity smoothes the path of reading so that readers are not distracted from the trail of your ideas and can reach the end of the journey with happy feelings. It also keeps the editors very, very content.

Chuck Heikkinen & Delia Unson

David Franzen imaged this juvenile Indigo Bunting in its nest in Vilas County in late June.

Bird Use of the Cedarburg Bog Important Bird Area during Spring and Fall Migration

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ABSTRACT

We studied bird use of three habitats within the Cedarburg Bog Important Bird Area during spring and fall migration. Weekly migration point counts were conducted for three years in the forested portions of the Cedarburg Bog, the adjacent Upland Habitat (including the Cedarburg Beech Woods, plus open fields and forest patches at the University of Wisconsin-Milwaukee Field Station) and on Mud Lake, the largest lake within the Cedarburg Bog. A total of 189 bird species was detected in the three habitats combined. Of these, 135 species were detected in the Bog, 117 species were detected in the Upland Habitat and 174 species were detected in the Mud Lake habitat. Sixty-two species (32.8% or nearly 1/3 of the total) are listed as being of conservation concern in Wisconsin and national plans, emphasizing the importance of this large protected area to birds during spring and fall migration.

Keywords: spring and fall migration, Cedarburg Bog Important Bird Area, stopover sites

Introduction

Migratory birds pose special challenges for conservation, because they need protected areas on their breeding grounds, their non-breeding (wintering) grounds, and on the areas that they visit in transit. A recent study found that only 9% of 1,451 migratory birds were adequately covered by protected areas across all stages of their lifecycle in comparison with 45% of non-migratory birds (Runge et al. 2016). Many migratory animals, including birds, are in decline, and loss of habitat is one important cause (Gilroy et al. 2016, Wilcove and Wikelski 2008, Robbins et al. 1989). Therefore the long-term availability of high-quality stopover habitat is critically important to the conservation of migratory birds. Suitable stopover sites provide places for birds to rest and feed, as well as provide shelter against adverse weather and predators (Moore 2000).

Wisconsin has an Important Bird Area (IBA) program to help identify and conserve essential habitat areas for birds. The IBA program is a global initiative that was begun in Europe in the mid-1980's, and has since been adopted in 47 U.S. states and over 200 countries (Wisconsin Important Bird Areas 2017). An IBA is identified according to a standard set of criteria, and to be named as an IBA a site must support endangered, threatened or vulnerable species. Sites can be designated because they offer habitat to birds during the breeding season, non-breeding season, or both. Currently there are 88 IBAs in Wisconsin (Wisconsin Important Bird Areas 2017).

The Cedarburg Bog in Saukville, Wisconsin (Ozaukee County) was named an Important Bird Area in 2006. The Cedarburg Bog IBA consists of about 1550 ha, and three state natural areas, the Cedarburg Bog, the Cedarburg Beech Woods, and the Sapa Spruce Bog are included within the Important Bird Area. The Cedarburg Bog is a large (886 ha), complex wetland that contains a number of different wetland vegetation types, islands supporting upland vegetation, and six lakes. A patterned fen, or string bog, occurs within the Bog and is believed to be the southern-most string bog in North America (Grittinger 1970). The adjacent Cedarburg Beech Woods (24 ha) is an upland forest dominated by sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*). The Cedarburg Bog was named as an IBA because it provides breeding habitat for multiple species of conservation concern and because of the long tradition of ornithological research conducted at the University of Wisconsin-Milwaukee (UWM) Field Station, whose property occurs within the IBA. While it was known that the site was important for migrating birds at the time that the Cedarburg Bog IBA was designated, there was much less data available regarding bird use during migration than there was for the breeding season. Most historical information on birds using the forested parts of the Cedarburg Bog and adjacent Cedarburg Beech Woods comes from research conducted by C. M. Weise, who conducted long-term surveys (1971–1996) of the breeding birds in these areas (Weise et al. 2004). More recent information on breeding birds of the Cedarburg Bog has been obtained from surveys conducted as part of the Wisconsin Breeding Bird Atlas. Information on migratory birds using the Cedarburg Bog is

much more limited. Weise conducted a weekly mist-netting and banding program during fall migration in the forested habitats in the Cedarburg Bog and Beech Woods (1965–1996). A report describing the results of the first 23 years of this study was published in Weise (1988). These migration data collected by Weise provide a starting point for understanding the value of the Cedarburg Bog as a stopover site, but gaps in our knowledge remain. First, Weise collected data only during the fall migration and did not include the spring. Second, Weise did not sample lake habitat within the Cedarburg Bog. Finally, Weise used mist-netting as a technique and was only able to record birds that can be captured in mist nets.

To expand on the migratory bird data collected by Weise, we conducted weekly point counts within the Cedarburg Bog IBA during spring and fall migration. We surveyed birds within three general habitats within the Cedarburg Bog IBA: the forested portions of the Cedarburg Bog, the adjacent Upland Habitat (including the Cedarburg Beech Woods, plus open fields and forest patches at the UWM Field Station) and on Mud Lake, the largest lake within the Cedarburg Bog (Figure 1). We collected 3 years of data in each habitat. Our goals were: 1) to document the species of migrant landbirds, waterbirds, waterfowl, shorebirds and secretive marsh birds that used these habitats for migration stopover in both spring and fall, 2) determine what proportion of these species are listed as being of conservation concern in Wisconsin, and 3) collect data to serve as a baseline for future studies by using comprehensive and repeatable methods. Our study supports the Wisconsin IBA program by better documenting the significance of the Cedarburg Bog IBA for migratory birds, and is the first standardized bird survey to be conducted on Mud Lake.

Methods

Study Site Description

The Cedarburg Bog counts were conducted from a boardwalk that extended from the edge of the wetland into the string bog habitat in the center of the Bog (Figure 1). Two islands within the Bog that were along the path of the boardwalk were also included in the counts. Five vegetation types were surveyed: bog conifer forest, swamp hardwoods-conifer forest, upland forest (on the islands), shrub-carr thicket and string bog. Bog conifer forest was dominated by northern white cedar (*Thuja occidentalis*) and tamarack (*Larix laricina*), swamp hardwoods-conifer forest by black ash (*Fraxinus nigra*) mixed with cedar and tamarack, shrub carr by red-osier dogwood (*Cornus stolonifera*), willows (*Salix* spp.), speckled alder (*Alnus incana*) and bog birch (*Betula pumila*). The upland hardwood forest on the islands included sugar maple (*Acer saccharum*) and basswood (*Tilia americana*). The string bog consisted of ridges of stunted cedars and tamaracks alternating with flatter, wetter areas dominated by sedges (*Carex* spp.).

The Upland Habitat included two points within the Cedarburg Beech Woods State Natural area and also open fields and forest patches at the UWM Field Station. The points within the Cedarburg Beech Woods sampled mature upland forest dominated by sugar maple, American beech, basswood, and white ash (*Fraxinus americana*). The other four points sampled forest edge,

wetland edge, fields, and forest fragments near the Cedarburg Beech Woods. One forest fragment occurred on abandoned agricultural land and consisted primarily of white ash and sugar maple, and another was a planted stand of white pine (*Pinus strobus*), red pine (*P. resinosa*) and jack pine (*P. banksiana*). The fields included planted prairie vegetation and both native and non-native forbs and grasses (Figure 1).

Mud Lake is a shallow (1.4 m maximum depth), muck-bottomed lake that is completely contained within the Cedarburg Bog. At approximately 100 hectares, it is the largest lake in Ozaukee County. Two upland islands formed from glacial till and several muck islands composed of vegetation occur within the lake. The counts were conducted mainly along the edges of the lake and five vegetation types were sampled: swamp forest on the edges of the lake, open water, upland island hardwood forest edge, emergent aquatic vegetation and muck islands within the lake (Figure 1). Upland forest and swamp forest were similar to the forests described previously. The stands of emergent aquatic vegetation along the shores of the lake included hard-stemmed and soft-stemmed bulrush (*Schoenoplectus acutus* and *S. tabernaemontani*), cattails (*Typha* spp) and water willow (*Decodon verticillatus*) (Reinartz 1985).

Point counts

From 2009–2011, point counts were conducted weekly in the Cedarburg Bog and Upland Habitat during spring (mid-April/early May through the first week of June) and fall (mid-August through mid-October). A total of 15 counts were conducted in 2009, 17 in 2010, and 16 in 2011. Six points were sampled in each habitat during each count. The points were marked with PVC pipe and GPS coordinates were recorded for each point.

During this three year period, the majority of counts were done by a single observer who is excellent at identification of birds by sight and sound (J. O'Donnell). Five other expert birders did the counts when this observer was unavailable and this occurred no more than twice in any year. Counts were conducted based on the methods of Ralph et al. (1993). The counts were of unlimited radius, and all species seen, heard or flying over during the 5-minute count period at each point were recorded. Species seen or heard while the observer was walking between points were also counted. "Pishing" was used to aid in detection of species at or near the point. We designed these methods to maximize the detection of bird species in order to document as many species as possible.

Our methods were very different from those used during breeding season point counts (Howe et al. 1997), as we did not record where and when each bird was first encountered, the sex and age or evaluate whether birds flying over were actively feeding in the count area or merely "flying over". The points chosen for our counts were not randomly selected, but chosen to sample the different vegetation types within each habitat, as birds are known to use diverse habitats during migration (Petit 2000).

Dunn (2005) describes daily migration counts as the number of birds resting in or passing through the count area that are detected. These counts can have a considerable day-to-day variation due to weather and the fact that

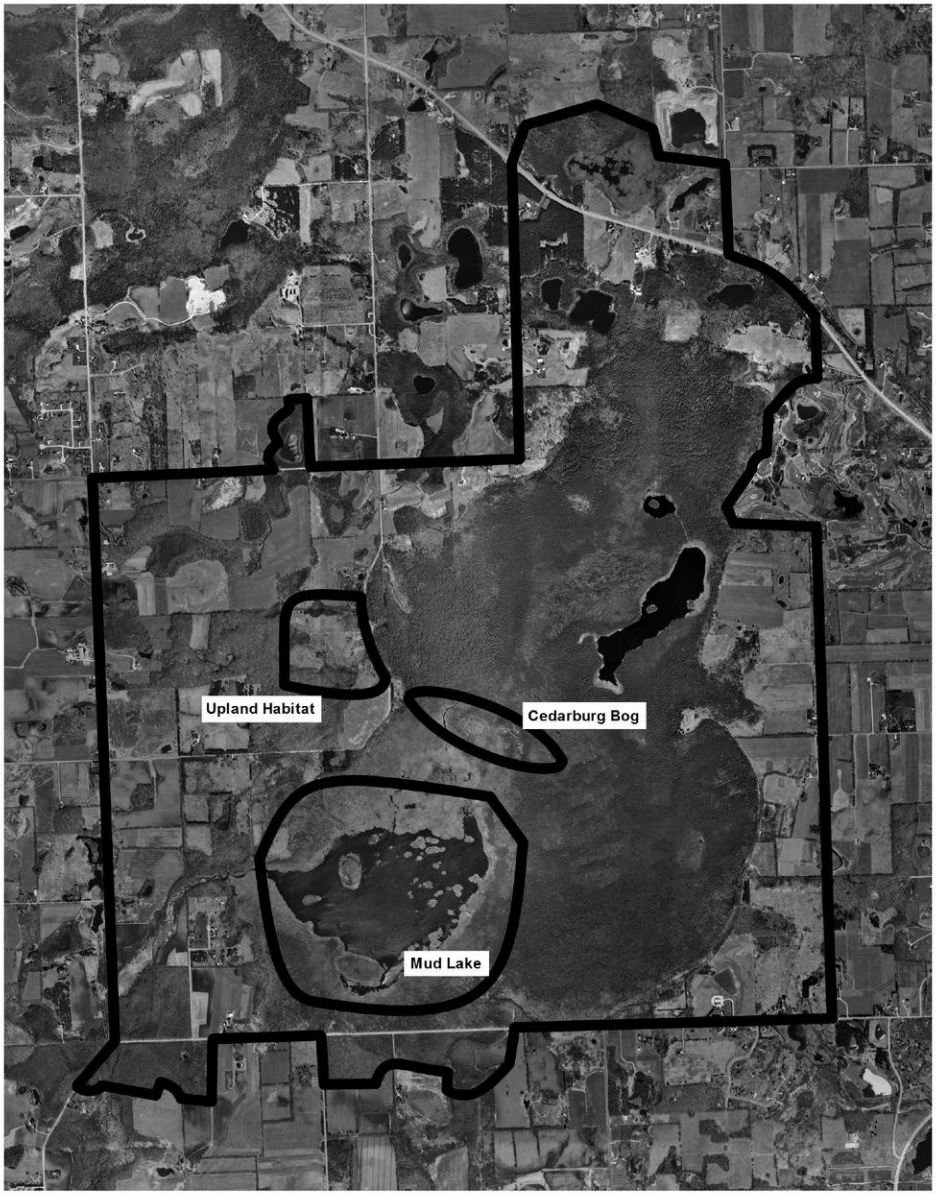

Figure 1. Map showing the Cedarburg Bog Important Bird Area (IBA) boundaries and the three habitats within the IBA in which the spring and fall migration counts were conducted. The Cedarburg Bog counts were conducted from a boardwalk that extended from the edge of the wetland into the string bog habitat in the center of the bog area. The Upland Habitat included two points within the Cedarburg Beech Woods State Natural area and also open fields and forest patches at the University of Wisconsin-Milwaukee Field Station. The Mud Lake counts were conducted by canoe or kayak along the edges of the lake and sampled swamp forest, open water, upland island hardwood forest edge, emergent aquatic vegetation and muck islands within the lake as well as the forested walk-in to the boat launch.

birds often come in "pulses". We did not conduct daily intensive counting but did counts once each week when weather conditions allowed for optimal bird detection. Therefore, our results represent only a sample of the birds present in each of the habitats on a given day and cannot be used to determine population estimates. We combined the spring and fall data from all of the points in a given habitat to determine the total species detected in each habitat (Table 1).

Counts were done only on days when weather conditions were satisfactory, i.e. good visibility, little or no precipitation and light winds (up to 15mph). The counts began at or within one hour of sunrise and were completed by 10 a.m. Both the Cedarburg Bog and the Upland Habitat were censused on each sampling day. To ensure that the start time did not affect the species detected, the habitat in which the counts started was rotated weekly.

Prior to the start of the 2009 research, point counts were conducted in these habitats on a less regular basis by other observers (William P. Mueller and Seth Cutright). In 2006, counts were conducted in fall and in 2007 and 2008 counts were conducted in spring.

From 2011–2013, point counts were conducted weekly on Mud Lake during spring (mid-March/mid-April through early-mid June) and fall (mid-August/early Sept. through mid/late October) migration. A total of 19 counts were conducted in 2011, 19 in 2012, and 17 in 2013. Six points were sampled by canoe or kayak using the methods described above. Species detected walking to the boat launch and between points were also counted. To maximize detection, playback for secretive wetland species (American and Least Bittern, Sora and Virginia Rails) was used three times in 2011, five times in 2012 and twice in 2013 when these species were not vocalizing. If a species was spontaneously vocalizing, playback was not used.

Weather conditions varied from year to year and affected the accessibility of the lake. In 2012, early ice melt made it possible to begin the counts in mid-March. That same year, low water levels in fall made the lake inaccessible by canoe or kayak, so counts were conducted from land at two of the six points that could be reached by walking.

We counted Alder and Willow flycatchers separately when birds could be positively identified through vocalization, and used the term Traill's flycatcher when these species could not be separated because they were not singing. Traill's flycatcher was not counted as a separate species in data summaries.

Data analysis

The Wisconsin status of each species was determined using the AOU Checklist (1998–2016) and Rappole (1995). Resident species do not migrate and are found in Wisconsin year-round. Short-distance migrants spend the non-breeding season north of the Tropic of Cancer, in the U.S., northern Mexico and the northern Bahamas. Neotropical migrants breed north of the Tropic of Cancer (mainly in North America), but spend the non-breeding season south of the Tropic of Cancer in southern Mexico, Central America, South America and the islands in the Caribbean Sea (Greater and Lesser Antilles). Some species have individuals that belong to more than one of these

groups. Breeding status of birds within the Cedarburg Bog Important Bird Area was determined from the bird checklist maintained by the UWM Field Station (UWM Field Station 2016).

The mean number of individuals of each species detected per year in each habitat was calculated. First, the total number of individuals for each species detected was summed across the 3-year study period. This sum included the number detected at each of the six points and the number detected walking between the points on each date. Spring and fall counts were combined for each year, and all three years were summed to yield the total number of individuals of each species detected for the Cedarburg Bog, Upland Habitat or Mud Lake counted during the entire study. We then calculated the mean number detected per year (± standard deviation) for each species in each habitat as follows: Number detected/Year (spring and fall data combined) = Total detected in 3 years/3).

We used frequency as a measure of relative occurrence of each species at the study site, calculated as follows: Frequency = [(number of days detected) / (number of counts conducted)*100]. We calculated the frequency using only the years in which the bird species was detected. We estimated the relative occurrence of each species in each habitat utilizing these frequency calculations. We designated relative occurrence as follows: high occurrence if a species was detected on ≥ 50% of days, moderate occurrence if detected on 20–49% of days and low occurrence if detected on < 20% of days.

To assess the conservation importance of the species detected in each habitat, we used both Wisconsin and national conservation plans. These included seven different plans. The Wisconsin Species of Greatest Conservation Need lists species that have low and/or declining populations and are in need of conservation action (Wisconsin Department of Natural Resources 2005). Species listed as Wisconsin Endangered Species have been determined to be in jeopardy on the basis of scientific evidence and those listed as Wisconsin Threatened Species may become endangered within the foreseeable future (Wisconsin Department of Natural Resources 2014). The Partners in Flight (PIF) Landbird Conservation Plans use the PIF Species Assessment Database (Partners in Flight Science Committee 2012) to assess the vulnerability of individual bird species. Vulnerability is determined using assessment scores which are calculated based on population size (PS, total number of adults in the global population), breeding distribution (BD, geographic extent of a species breeding range), non-breeding distribution (ND, geographic extent of a species nonbreeding range), threats to breeding (TB, effects of current and probable future conditions that threaten the ability of populations to survive and successfully reproduce), threats to nonbreeding (TN, effects of current and probable future conditions that threaten the ability of North American breeding populations to survive the nonbreeding season) and population trend (PT, changes in population size over the past 30 years) (Rich et al. 2004). These six assessment scores are then used to determine a combined score for each species which is calculated as PS + (highest of BD or ND scores) + (highest of TB or TN scores) + PT. Species were selected for the Watch List if they had a combined score

Table 1. Migration status, number, frequency and relative occurrence of bird species detected during point counts in three habitats in the Cedarburg Bog Important Bird Area.

		Number Detected/Year, Mean (S.D.)[b]			Frequency and Relative Occurrence at Study Site During Count Period					
					Frequency	Relative	Frequency	Relative	Frequency	Relative
Bird Species	Migration Status[a]	Bog	Upland Habitat	Mud Lake	(%)[c]	occurrence[d]	(%)	occurrence	(%)	occurrence
					Bog		Upland Habitat		Mud Lake	
Cackling Goose (*Branta hutchinsii*)	S	0	0	0.3 (0.58)	0	ND[e]	0	ND	5	Low
Canada Goose (*Branta canadensis*)*	R/S	228.0 (82.66)	0	745.3 (273.81)	71	High	0	ND	93	High
Trumpeter Swan (*Cygnus buccinator*)	S	0	0	3.0 (0.58)	0	ND	0	ND	5	Low
Tundra Swan (*Cygnus columbianus*)	S	0	0	2.7 (3.79)	0	ND	0	ND	6	Low
Wood Duck (*Aix sponsa*)*	S/N	5.3 (0.58)	1.0 (1.73)	83.7 (15.01)	17	Low	7	Low	84	High
Gadwall (*Anas strepera*)	S/N	0	0	26.0 (9.17)	0	ND	0	ND	28	Moderate
American Wigeon (*Anas americana*)	S/N	0	0	22.7 (33.38)	0	ND	0	ND	13	Low
American Black Duck (*Anas rubripes*)	R/S	0	0	1.0 (1.00)	0	ND	0	ND	5	Low
Mallard (*Anas platyrhynchos*)*	R/S	7.3 (2.52)	3.0 (2.65)	164.3 (114.74)	30	Moderate	24	Moderate	95	High
Blue-winged Teal (*Anas discors*)*	S/N	0.7 (1.15)	0	57.3 (22.23)	6	Low	0	ND	62	High
Northern Shoveler (*Anas clypeata*)	S/N	0	0	17.0 (15.00)	0	ND	0	ND	11	Low
Northern Pintail (*Anas acuta*)	S/N	0	0	3.7 (2.08)	0	ND	0	ND	5	Low
Green-winged Teal (*Anas crecca*)	S/N	0	0	14.3 (19.73)	0	ND	0	ND	15	Low
Canvasback (*Aythya valisineria*)	S/N	0	0	9.3 (12.86)	0	ND	0	ND	11	Low
Redhead (*Aythya americana*)	S/N	0	0	12.7 (17.79)	0	ND	0	ND	13	Low
Ring-necked Duck (*Aythya collaris*)	S/N	0	0	98.0 (141.18)	0	ND	0	ND	36	Moderate
Greater Scaup (*Aythya marila*)	S	0	0	4.3 (0.58)	0	ND	0	ND	9	Low
Lesser Scaup (*Aythya affinis*)	S/N	0	0	326.3 (437.94)	0	ND	0	ND	38	Moderate
Bufflehead (*Bucephala albeola*)	S	0	0	9.3 (4.04)	0	ND	0	ND	16	Low
Common Goldeneye (*Bucephala clangula*)	S	0	0	3.7 (4.04)	0	ND	0	ND	8	Low
Hooded Merganser (*Lophodytes cucullatus*)*	S	0	0	0.3 (0.58)	0	ND	0	ND	5	Low
Common Merganser (*Mergus merganser*)	S	0	0	2.7 (4.62)	0	ND	0	ND	5	Low
Red-breasted Merganser (*Mergus serrator*)	S	0	0	10.7 (9.81)	0	ND	0	ND	11	Low
Ruddy Duck (*Oxyura jamaicensis*)*	S/N	0	0	20.3 (1.53)	0	ND	0	ND	9	Low
Ruffed Grouse (*Bonasa umbellus*)	R	0.3 (0.58)	0	0	6	Low	0	ND	0	ND
Wild Turkey (*Meleagris gallopavo*)*	R	1.7 (0.58)	6.3 (1.53)	2.0 (1.00)	8	Low	14	Low	9	Low
Common Loon (*Gavia immer*)	S	0	0	0.3 (0.58)	0	ND	0	ND	6	Low
Pied-billed Grebe (*Podilymbus podiceps*)*	S/N	0.3 (0.58)	0	57.3 (25.77)	6	Low	0	ND	74	High
Horned Grebe (*Podiceps auritus*)	S	0	0	6.3 (2.89)	0	ND	0	ND	26	Moderate
Double-crested Cormorant (*Phalacrocorax auritus*)	S/N	0	0	10.0 (13.08)	0	ND	0	ND	7	Low
American Bittern (*Botaurus lentiginosus*)*	S/N	0.7 (0.58)	0	5.3 (4.16)	6	Low	0	ND	17	Low

Least Bittern (*Ixobrychus exilis*)*	S/N	0.7 (1.15)	0	3.0 (1.73)	13	Low	0	ND	14	Low
Great Blue Heron (*Ardea herodias*)*	S/N	1.7 (1.15)	0	26.3 (6.51)	10	Low	0	ND	66	High
Great Egret (*Ardea alba*)	S/N	0	0	19.3 (31.77)	0	ND	0	ND	11	Low
Cattle Egret (*Bubulcus ibis*)	S	0	2.3 (4.04)	0	0	ND	6	Low	0	ND
Green Heron (*Butorides virescens*)*	S/N	2.3 (2.31)	0.3 (0.58)	2.7 (0.58)	12	Low	7	Low	15	Low
Black-crowned Night-Heron (*Nycticorax nycticorax*)	S/N	0	0	1.0 (1.73)	0	ND	0	ND	5	Low
Turkey Vulture (*Cathartes aura*)*	S/N	1.0 (1.00)	3.0 (2.65)	11.3 (5.51)	9	Low	10	Low	34	Moderate
Osprey (*Pandion haliaetus*)*	S/N	0.3 (0.58)	0	1.7 (1.53)	6	Low	0	ND	13	Low
Bald Eagle (*Haliaeetus leucocephalus*)	S	2.0 (2.00)	0	5.7 (2.08)	16	Low	0	ND	29	Moderate
Northern Harrier (*Circus cyaneus*)*	S/N	0	0	7.0 (1.73)	0	ND	0	ND	31	Moderate
Sharp-shinned Hawk (*Accipiter striatus*)*	S/N	4.3 (3.06)	1.3 (0.58)	1.3 (0.58)	19	Low	8	Low	7	Low
Cooper's Hawk (*Accipiter cooperii*)*	R/N	1.3 (0.58)	3.0 (3.61)	1.0 (1.00)	8	Low	23	Moderate	6	Low
Red-shouldered Hawk (*Buteo lineatus*)	S	0.7 (1.15)	0	1.3 (0.58)	13	Low	0	ND	7	Low
Broad-winged Hawk (*Buteo platypterus*)*	S/N	0.7 (1.15)	1.7 (1.15)	0.3 (0.58)	12	Low	6	Low	5	Low
Red-tailed Hawk (*Buteo jamaicensis*)*	R/S	1.7 (1.15)	5.7 (2.89)	7.0 (2.00)	11	Low	29	Moderate	35	Moderate
King Rail (*Rallus elegans*)	S/N	0.3 (0.58)	0	0	7	Low	0	ND	0	ND
Virginia Rail (*Rallus limicola*)*	S/N	2.3 (1.53)	0	5.0 (2.65)	13	Low	0	ND	18	Low
Sora (*Porzana carolina*)*	S/N	1.0 (0.00)	1.0 (1.00)	5.7 (3.21)	6	Low	10	Low	22	Moderate
American Coot (*Fulica americana*)*	S/N	0	0	1059.0 (556.78)	0	ND	0	ND	86	High
Sandhill Crane (*Grus canadensis*)*	S/N	23.7 (11.06)	19.7 (4.51)	84.3 (11.59)	50	High	44	Moderate	80	High
Black-bellied Plover (*Pluvialis squatarola*)	S/N	0	0	1.0 (1.00)	0	ND	0	ND	6	Low
Semipalmated Plover (*Charadrius semipalmatus*)	S/N	0	0	0.7 (1.15)	0	ND	0	ND	5	Low
Killdeer (*Charadrius vociferus*)*	S/N	0.3 (0.58)	1.3 (1.15)	4.0 (2.00)	6	Low	12	Low	16	Low
Spotted Sandpiper (*Actitis macularius*)*	S/N	0.3 (0.58)	0	2.7 (1.53)	6	Low	0	ND	13	Low
Solitary Sandpiper (*Tringa solitaria*)	S/N	1.0 (1.00)	0	0.7 (0.58)	9	Low	0	ND	6	Low
Greater Yellowlegs (*Tringa melanoleuca*)	S/N	0.7 (0.58)	0	2.3 (0.58)	6	Low	0	ND	13	Low
Lesser Yellowlegs (*Tringa flavipes*)	S/N	0	0	3.7 (2.89)	0	ND	0	ND	13	Low
Dunlin (*Calidris alpina*)	S/N	0	0	5.3 (9.24)	0	ND	0	ND	11	Low
Least Sandpiper (*Calidris minutilla*)	S/N	0	0	4.7 (4.51)	0	ND	0	ND	8	Low
Pectoral Sandpiper (*Calidris melanotos*)	N	0	0	2.3 (1.53)	0	ND	0	ND	7	Low
Wilson's Snipe (*Gallinago delicata*)*	S/N	2.3 (1.15)	0	2.7 (1.15)	13	Low	0	ND	14	Low
American Woodcock (*Scolopax minor*)*	S	3.7 (3.06)	0	0.3 (0.58)	14	Low	0	ND	5	Low
Ring-billed Gull (*Larus delawarensis*)	R/S	8.7 (6.35)	2.3 (2.52)	27.3 (21.22)	16	Low	12	Low	34	Moderate
Herring Gull (*Larus argentatus*)	R/S	0	0	3.0 (3.61)	0	ND	0	ND	17	Low
Caspian Tern (*Hydroprogne caspia*)	S/N	0	0	2.0 (2.65)	0	ND	0	ND	9	Low
Black Tern (*Chlidonias niger*)	N	0	0	0.7 (1.15)	0	ND	0	ND	5	Low
Forster's Tern (*Sterna forsteri*)	S/N	0	0	7.7 (12.42)	0	ND	0	ND	6	Low
Rock Pigeon (*Columba livia*)*	R	0	1.3 (2.31)	1.7 (1.53)	0	ND	6	Low	5	Low
Mourning Dove (*Zenaida macroura*)*	R	30.7 (14.74)	9.7 (0.58)	15.0 (8.54)	67	High	31	Moderate	38	Moderate

(Continued)

Table 1. *(Continued).*

Bird Species	Migration Status[a]	Number Detected/Year, Mean (S.D.)[b]			Frequency and Relative Occurrence at Study Site During Count Period					
		Bog	Upland Habitat	Mud Lake	Frequency (%)[c]	Relative occurrence[d]	Frequency (%)	Relative occurrence	Frequency (%)	Relative occurrence
					Bog		Upland Habitat		Mud Lake	
Yellow-billed Cuckoo (*Coccyzus americanus*)*	N	0	0.3 (0.58)	0.3 (0.58)	0	ND	7	Low	5	Low
Black-billed Cuckoo (*Coccyzus erythropthalmus*)*	N	0.7 (0.58)	1.0 (1.00)	2.3 (1.53)	6	Low	9	Low	11	Low
Eastern Screech-Owl (*Megascops asio*)*	R	1.0 (1.73)	0	0.3 (0.58)	7	Low	0	ND	5	Low
Great Horned Owl (*Bubo virginianus*)*	R	0	1.0 (1.00)	1.7 (1.53)	0	ND	9	Low	14	Low
Barred Owl (*Strix varia*)*	R	0.3 (0.58)	0.7 (0.58)	1.3 (0.58)	6	Low	6	Low	7	Low
Common Nighthawk (*Chordeiles minor*)	N	0.3 (0.58)	0	1.3 (2.31)	6	Low	0	ND	5	Low
Chimney Swift (*Chaetura pelagica*)*	N	1.0 (1.73)	1.7 (2.08)	1.7 (2.89)	7	Low	9	Low	16	Low
Ruby-throated Hummingbird (*Archilochus colubris*)*	S/N	0.3 (0.58)	3.3 (2.52)	0	6	Low	15	Low	0	ND
Belted Kingfisher (*Megaceryle alcyon*)*	S/N	2.0 (1.73)	0	9.7 (4.73)	12	Low	0	ND	34	Moderate
Red-bellied Woodpecker (*Melanerpes carolinus*)*	R	2.7 (3.79)	14.3 (1.15)	4.0 (2.65)	23	Moderate	52	High	20	Moderate
Yellow-bellied Sapsucker (*Sphyrapicus varius*)	S/N	1.7 (1.15)	4.0 (5.20)	3.7 (2.31)	8	Low	14	Low	12	Low
Downy Woodpecker (*Picoides pubescens*)*	R	21.0 (7.81)	19.7 (2.52)	7.0 (2.00)	71	High	79	High	37	Moderate
Hairy Woodpecker (*Picoides villosus*)*	R	15.7 (1.53)	10.0 (1.73)	5.3 (4.04)	69	High	55	High	29	Moderate
Northern Flicker (*Colaptes auratus*)*	R/S	20.0 (13.11)	25.0 (13.86)	13.3 (3.79)	63	High	64	High	55	High
Pileated Woodpecker (*Dryocopus pileatus*)*	R	4.3 (3.21)	7.3 (2.08)	3.3 (2.52)	25	Moderate	35	Moderate	16	Low
American Kestrel (*Falco sparverius*)*	R/N	0.3 (0.58)	0	1.7 (2.89)	6	Low	0	ND	12	Low
Merlin (*Falco columbarius*)	S/N	0.7 (0.58)	0	1.7 (0.58)	6	Low	0	ND	7	Low
Peregrine Falcon (*Falco peregrinus*)	S/N	0.3 (0.58)	0	0.3 (0.58)	6	Low	0	ND	5	Low
Olive-sided Flycatcher (*Contopus cooperi*)	N	0	0	0.3 (0.58)	0	ND	0	ND	5	Low
Eastern Wood-Pewee (*Contopus virens*)*	N	4.0 (1.73)	7.7 (5.03)	1.7 (0.58)	23	Moderate	32	Moderate	9	Low
Yellow-bellied Flycatcher (*Empidonax flaviventris*)	N	0.7 (0.58)	0.7 (1.15)	1.7 (1.53)	6	Low	13	Low	11	Low
Acadian Flycatcher (*Empidonax virescens*)*	N	0	1.0 (0.00)	1.0 (1.00)	0	ND	6	Low	8	Low
Alder Flycatcher (*Empidonax alnorum*)*	N	12.3 (3.51)	0.7 (1.15)	8.0 (4.36)	17	Low	7	Low	22	Moderate
Willow Flycatcher (*Empidonax traillii*)*	N	1.3 (1.53)	0.7 (1.15)	7.3 (2.08)	9	Low	13	Low	22	Moderate
Traill's Flycatcher (*Empidonax traillii/alnorum*)	N	1.0 (1.00)	0	0	6	Low	0	ND	0	ND
Least Flycatcher (*Empidonax minimus*)*	N	0.3 (0.58)	4.0 (4.00)	0.7 (1.15)	6	Low	35	Moderate	11	Low
Eastern Phoebe (*Sayornis phoebe*)*	S/N	1.3 (1.53)	3.3 (2.52)	4.7 (1.53)	12	Low	18	Low	24	Moderate
Great Crested Flycatcher (*Myiarchus crinitus*)*	S/N	8.7 (1.15)	15.7 (5.03)	3.7 (1.53)	30	Moderate	40	Moderate	15	Low
Eastern Kingbird (*Tyrannus tyrannus*)*	N	1.3 (1.15)	1.3 (2.31)	3.7 (0.58)	9	Low	27	Moderate	14	Low
Yellow-throated Vireo (*Vireo flavifrons*)*	S/N	1.0 (1.00)	1.3 (1.53)	0.3 (0.58)	6	Low	12	Low	5	Low
Blue-headed Vireo (*Vireo solitarius*)	S/N	0	1.7 (1.53)	1.0 (1.00)	0	ND	15	Low	6	Low
Warbling Vireo (*Vireo gilvus*)*	S/N	0	1.7 (1.53)	1.0 (1.00)	0	ND	13	Low	9	Low

Philadelphia Vireo (*Vireo philadelphicus*)	N	0.3 (0.58)	0	0.3 (0.58)	6	Low	0	ND	6	Low
Red-eyed Vireo (*Vireo olivaceus*)*	N	5.0 (2.65)	11.7 (6.11)	5.0 (2.65)	25	Moderate	38	Moderate	20	Moderate
Blue Jay (*Cyanocitta cristata*)*	R/S	101.3 (5.13)	77.7 (22.3)	29.3 (9.24)	96	High	81	High	59	High
American Crow (*Corvus brachyrhynchos*)*	R	25.0 (1.73)	53.0 (7.21)	39.7 (6.66)	60	High	87	High	66	High
Purple Martin (*Progne subis*)*	N	0	0.7 (1.15)	0	0	ND	6	Low	0	ND
Tree Swallow (*Tachycineta bicolor*)*	S/N	16.0 (18.36)	47.7 (6.43)	124.7 (33.50)	27	Moderate	46	Moderate	49	Moderate
Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)	S/N	0.3 (0.58)	0	4.3 (4.16)	6	Low	0	ND	11	Low
Bank Swallow (*Riparia riparia*)*	N	1.0 (1.00)	0	2.3 (1.53)	6	Low	0	ND	5	Low
Cliff Swallow (*Petrochelidon pyrrhonota*)*	N	0	0	10.3 (16.20)	0	ND	0	ND	11	Low
Barn Swallow (*Hirundo rustica*)*	N	2.0 (2.65)	4.0 (6.93)	33.0 (25.63)	12	Low	13	Low	50	High
Black-capped Chickadee (*Poecile atricapillus*)*	R	107.0 (6.24)	68.0 (4.58)	32.7 (13.32)	100	High	92	High	56	High
Red-breasted Nuthatch (*Sitta canadensis*)*	R/S	0.3 (0.58)	1.0 (1.73)	8.3 (8.74)	6	Low	12	Low	33	Moderate
White-breasted Nuthatch (*Sitta carolinensis*)*	R	6.0 (1.00)	21.0 (7.00)	9.3 (2.89)	33	Moderate	79	High	42	Moderate
Brown Creeper (*Certhia americana*)*	S	1.0 (1.00)	0.7 (1.15)	0.7 (0.58)	9	Low	12	Low	6	Low
House Wren (*Troglodytes aedon*)*	S/N	18.7 (8.14)	37.7 (0.58)	9.3 (5.51)	36	Moderate	65	High	33	Moderate
Winter Wren (*Troglodytes hiemalis*)*	S	2.0 (1.00)	1.0 (1.73)	0.3 (0.58)	12	Low	12	Low	6	Low
Marsh Wren (*Cistothorus palustris*)*	S	0.7 (0.58)	0	92.7 (14.98)	6	Low	0	ND	57	High
Blue-gray Gnatcatcher (*Polioptila caerulea*)*	S/N	3.7 (3.21)	8.0 (1.00)	1.7 (0.58)	28	Moderate	27	Moderate	9	Low
Golden-crowned Kinglet (*Regulus satrapa*)	S	6.7 (9.07)	5.3 (4.04)	8.7 (6.66)	12	Low	12	Low	16	Low
Ruby-crowned Kinglet (*Regulus calendula*)	S/N	4.0 (1.00)	4.0 (1.00)	4.7 (3.21)	21	Moderate	14	Low	14	Low
Eastern Bluebird (*Sialia sialis*)*	S	3.3 (2.08)	34.3 (16.44)	1.3 (1.15)	15	Low	67	High	11	Low
Veery (*Catharus fuscescens*)*	N	16.7 (4.04)	0.3 (0.58)	3.3 (1.53)	46	Moderate	6	Low	18	Low
Gray-cheeked Thrush (*Catharus minimus*)	N	0	1.0 (1.00)	0.7 (0.58)	0	ND	10	Low	6	Low
Swainson's Thrush (*Catharus ustulatus*)	N	2.3 (0.58)	4.0 (3.61)	2.3 (1.53)	14	Low	13	Low	7	Low
Hermit Thrush (*Catharus guttatus*)	S/N	10.3 (8.33)	6.0 (3.00)	2.3 (2.31)	25	Moderate	17	Low	9	Low
Wood Thrush (*Hylocichla mustelina*)*	S/N	1.7 (1.53)	8.7 (2.52)	1.7 (2.08)	12	Low	30	Moderate	11	Low
American Robin (*Turdus migratorius*)*	R/S	148.7 (116.04)	98.0 (52.85)	107.3 (64.44)	90	High	100	High	73	High
Gray Catbird (*Dumetella carolinensis*)*	S/N	20.0 (5.57)	14.3 (4.04)	8.0 (3.61)	61	High	48	Moderate	28	Moderate
Brown Thrasher (*Toxostoma rufum*)*	S	0.7 (0.58)	1.3 (1.53)	0.3 (0.58)	6	Low	13	Low	5	Low
European Starling (*Sturnus vulgaris*)*	R	1.0 (1.73)	20.0 (34.64)	2.3 (4.04)	18	Low	7	Low	11	Low
American Pipit (*Anthus rubescens*)	S/N	0	0	0.7 (0.58)	0	ND	0	ND	6	Low
Cedar Waxwing (*Bombycilla cedrorum*)*	S/N	49.7 (24.09)	36.3 (29.26)	21.0 (24.56)	50	High	42	Moderate	26	Moderate
Ovenbird (*Seiurus aurocapilla*)*	S/N	0.7 (0.58)	9.3 (4.73)	2.3 (2.08)	6	Low	27	Moderate	16	Low
Northern Waterthrush (*Parkesia noveboracensis*)*	S/N	8.0 (4.36)	2.0 (1.73)	3.0 (1.00)	23	Moderate	13	Low	14	Low
Golden-winged Warbler (*Vermivora chrysoptera*)	N	0.3 (0.58)	0.3 (0.58)	0.3 (0.58)	7	Low	7	Low	5	Low
Blue-winged Warbler (*Vermivora cyanoptera*)*	N	4.3 (2.08)	9.3 (5.13)	2.3 (2.52)	25	Moderate	29	Moderate	18	Low
Black-and-white Warbler (*Mniotilta varia*)*	S/N	4.3 (0.58)	1.3 (1.53)	2.0 (3.46)	25	Moderate	9	Low	26	Moderate
Tennessee Warbler (*Oreothlypis peregrina*)	N	6.7 (2.08)	1.3 (0.58)	0.7 (0.58)	23	Moderate	8	Low	6	Low
Orange-crowned Warbler (*Oreothlypis celata*)	S/N	1.0 (1.00)	0.3 (0.58)	0	9	Low	7	Low	0	ND

(Continued)

Table 1. *(Continued).*

Bird Species	Migration Status[a]	Number Detected/Year, Mean (S.D.)[b]			Frequency and Relative Occurrence at Study Site During Count Period					
					Frequency (%)[c]	Relative occurrence[d]	Frequency (%)	Relative occurrence	Frequency (%)	Relative occurrence
		Bog	Upland Habitat	Mud Lake	Bog		Upland Habitat		Mud Lake	
Nashville Warbler (*Oreothlypis ruficapilla*)*	S/N	12.7 (0.58)	5.3 (3.79)	2.0 (2.00)	35	Moderate	20	Moderate	13	Low
Connecticut Warbler (*Oporornis agilis*)	N	0	0	0.3 (0.58)	0	ND	0	ND	5	Low
Mourning Warbler (*Geothlypis philadelphia*)*	N	0.7 (0.58)	0.3 (0.58)	0.7 (0.58)	6	Low	6	Low	6	Low
Common Yellowthroat (*Geothlypis trichas*)*	S/N	59.3 (6.51)	31.0 (5.00)	82.0 (15.52)	67	High	58	High	51	High
American Redstart (*Setophaga ruticilla*)*	S/N	4.0 (1.00)	4.0 (2.65)	1.7 (1.15)	19	Low	21	Moderate	9	Low
Cape May Warbler (*Setophaga tigrina*)	N	1.0 (1.00)	0	0.7 (0.58)	10	Low	0	ND	5	Low
Northern Parula (*Setophaga americana*)	S/N	1.7 (0.58)	1.3 (2.31)	0.7 (0.58)	11	Low	6	Low	5	Low
Magnolia Warbler (*Setophaga magnolia*)	N	1.7 (1.15)	0.3 (0.58)	2.0 (2.00)	10	Low	6	Low	13	Low
Bay-breasted Warbler (*Setophaga castanea*)	N	0.7 (1.15)	0.3 (0.58)	0.7 (0.58)	12	Low	6	Low	5	Low
Blackburnian Warbler (*Setophaga fusca*)	N	1.0 (1.00)	1.0 (1.00)	1.0 (1.73)	10	Low	10	Low	11	Low
Yellow Warbler (*Setophaga petechia*)*	S/N	18.7 (6.35)	4.3 (2.31)	40.3 (9.45)	36	Moderate	19	Low	37	Moderate
Chestnut-sided Warbler (*Setophaga pensylvanica*)*	N	1.0 (1.00)	2.3 (2.52)	1.3 (1.53)	10	Low	23	Moderate	8	Low
Blackpoll Warbler (*Setophaga striata*)	N	2.0 (1.00)	1.7 (2.08)	0.3 (0.58)	12	Low	9	Low	6	Low
Black-throated Blue Warbler (*Setophaga caerulescens*)	N	0.7 (0.58)	0	0	6	Low	0	ND	0	ND
Palm Warbler (*Setophaga palmarum*)	S/N	5.0 (4.00)	1.0 (1.00)	7.3 (4.51)	21	Moderate	10	Low	18	Low
Pine Warbler (*Setophaga pinus*)*	S/N	1.3 (1.15)	0.7 (0.58)	0.3 (0.58)	10	Low	6	Low	5	Low
Yellow-rumped Warbler (*Setophaga coronata*)	S/N	26.0 (16.37)	16.7 (8.96)	10.3 (1.53)	29	Moderate	31	Moderate	26	Moderate
Black-throated Green Warbler (*Setophaga virens*)*	S/N	1.7 (2.08)	4.3 (2.08)	1.0 (1.00)	13	Low	19	Low	8	Low
Canada Warbler (*Cardellina canadensis*)	N	0.3 (0.58)	0	0.7 (0.58)	6	Low	0	ND	5	Low
Wilson's Warbler (*Cardellina pusilla*)	S/N	0.7 (0.58)	0.3 (0.58)	1.0 (1.00)	6	Low	7	Low	8	Low
Eastern Towhee (*Pipilo erythrophthalmus*)*	S	2.3 (3.21)	22.7 (9.07)	1.7 (1.15)	18	Low	70	High	9	Low
American Tree Sparrow (*Spizelloides arborea*)	S	1.0 (1.00)	0.7 (1.15)	1.0 (1.73)	6	Low	6	Low	5	Low
Chipping Sparrow (*Spizella passerina*)*	S	2.3 (2.52)	5.7 (2.08)	0.3 (0.58)	22	Moderate	29	Moderate	5	Low
Clay-colored Sparrow (*Spizella pallida*)*	S/N	0	0.3 (0.58)	0	0	ND	6	Low	0	ND
Field Sparrow (*Spizella pusilla*)*	S	1.3 (0.58)	22.7 (13.87)	0	8	Low	54	High	0	ND
Savannah Sparrow (*Passerculus sandwichensis*)*	S/N	0	2.3 (0.58)	0	0	ND	13	Low	0	ND
Henslow's Sparrow (*Ammodramus henslowii*)*	S	0	0.7 (0.58)	0	0	ND	6	Low	0	ND
Fox Sparrow (*Passerella iliaca*)	S	0.3 (0.58)	4.7 (7.23)	0	6	Low	15	Low	0	ND
Song Sparrow (*Melospiza melodia*)*	S	29.7 (3.51)	36.0 (5.20)	32.7 (8.50)	77	High	88	High	74	High
Lincoln's Sparrow (*Melospiza lincolnii*)	S/N	1.7 (0.58)	0.7 (0.58)	2.0 (1.00)	10	Low	6	Low	7	Low
Swamp Sparrow (*Melospiza georgiana*)*	S/N	34.7 (12.66)	2.0 (2.65)	169.0 (26.51)	69	High	6	Low	95	High
White-throated Sparrow (*Zonotrichia albicollis*)*	S	19.3 (4.16)	17.0 (9.85)	17.7 (24.54)	33	Moderate	29	Moderate	11	Low

White-crowned Sparrow (*Zonotrichia leucophrys*)	S/N	0.3 (0.58)	5.0 (1.00)	1.7 (1.53)	6	Low	14	Low	8	Low
Dark-eyed Junco (*Junco hyemalis*)	S	3.3 (4.16)	3.7 (4.04)	3.3 (3.21)	12	Low	18	Low	7	Low
Scarlet Tanager (*Piranga olivacea*)*	N	2.7 (2.08)	4.7 (4.04)	1.7 (0.58)	12	Low	13	Low	9	Low
Northern Cardinal (*Cardinalis cardinalis*)*	R	19.0 (8.72)	23.7 (5.77)	22.7 (7.23)	54	High	58	High	75	High
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)*	N	5.0 (1.00)	3.7 (4.04)	3.0 (1.00)	21	Moderate	25	Moderate	15	Low
Indigo Bunting (*Passerina cyanea*)*	S/N	0.3 (0.58)	3.0 (2.00)	0	6	Low	14	Low	0	ND
Bobolink (*Dolichonyx oryzivorus*)*	N	0	1.0 (1.73)	0	0	ND	12	Low	0	ND
Red-winged Blackbird (*Agelaius phoeniceus*)*	S	76.0 (6.24)	58.3 (14.05)	632.3 (198.12)	67	High	61	High	82	High
Eastern Meadowlark (*Sturnella magna*)*	S	1.7 (1.15)	6.3 (3.79)	0	11	Low	28	Moderate	0	ND
Rusty Blackbird (*Euphagus carolinus*)	S	2.0 (1.73)	0	7.7 (7.09)	6	Low	0	ND	8	Low
Common Grackle (*Quiscalus quiscula*)*	S	5.3 (3.79)	3.3 (2.31)	15.7 (14.22)	19	Low	14	Low	20	Moderate
Brown-headed Cowbird (*Molothrus ater*)*	S	7.0 (3.00)	37.3 (6.66)	6.7 (1.15)	25	Moderate	46	Moderate	20	Moderate
Baltimore Oriole (*Icterus galbula*)*	S/N	1.0 (1.00)	4.3 (3.51)	2.0 (1.00)	9	Low	21	Moderate	7	Low
House Finch (*Haemorhous mexicanus*)*	R	0	2.3 (2.08)	1.7 (2.89)	0	ND	18	Low	11	Low
Purple Finch (*Haemorhous purpureus*)	R/S	2.3 (1.15)	0.3 (0.58)	1.0 (1.73)	6	Low	6	Low	5	Low
Pine Siskin (*Spinus pinus*)	S	1.3 (1.53)	0.7 (1.15)	2.7 (4.62)	9	Low	6	Low	5	Low
American Goldfinch (*Spinus tristis*)*	R/S	69.0 (17.78)	87.7 (18.72)	34.7 (6.11)	82	High	98	High	44	Moderate

* Breeds in study area (http://www4.uwm.edu/fieldstation/datasets/species.cfm)

[a]R: Resident birds are present in Wisconsin year-round. They do not migrate.

S: Short-distance (temperate) migrants spend the non-breeding season north of the Tropic of Cancer, in the US, northern Mexico, and the northern Bahamas.

R/S: Resident/Short-distance migrants have some individuals that are present in Wisconsin year-round and others that spend the non-breeding season in the US, northern Mexico and the northern Bahamas.

N: Neotropical migrants breed north of the Tropic of Cancer, but spend in non-breeding season south of the Tropic of Cancer.

S/N: Short-distance/Neotropical migrants have some individuals that spend the non-breeding season in the US, northern Mexico and the northern Bahamas and others that can be found south of the Tropic of Cancer.

[b]Number detected/year (Spring and Fall data combined) = (Total detected in 3 years/3)

[c]Frequency= [(number of days detected)/ (number of counts conducted)*100] Note: Calculated using only the years in which the bird was detected.

[d]Relative occurrence: High = detected on ≥ 50% of days, Moderate = detected on 20–49% of days, Low = detected on < 20% of days

[e]ND = Not detected

of ≥ 14 or a combined score = 13 with PT = 5 (representing a 50% decline over 30 years) (Rich et al. 2004). Watch List species have "multiple reasons for conservation concern across their entire ranges" (Rich et al. 2004, Rosenberg et al. 2016).

The Shorebird Conservation Plan utilizes the criteria developed by Partners in Flight to assess shorebird population vulnerability (U.S. Shorebird Conservation Plan Partnership 2015). Shorebirds showing climate change vulnerability were assessed utilizing changes in breeding, migration and /or wintering habitat, dependence on ecological synchronicities, migration distance and habitat specialization (Galbraith et al. 2014). "Common birds in decline" are those which do not meet Watch List or climate change vulnerability criteria but have substantial population declines (U.S. Shorebird Conservation Plan Partnership 2015). "Common bird species" are those which can be found easily and with a high frequency by most birders (Barger 1988).

The Waterbird Conservation Plan also utilizes Partners in Flight assessment scores to determine species of continental concern (Wires et al. 2010). Waterbirds are assessed as being high, moderate or low risk or not currently at risk (Wires et al. 2010).

The North American Bird Conservation Initiative (NABCI) State of the Birds Report utilizes a Watch List, "the goals of which are to promote proactive conservation for species and to highlight the species most in danger of extinction without significant action" (Rosenberg et al. 2014). NABCI also described certain species as being common birds in steep decline, which are "common birds that do not meet Watch List criteria, yet according to long-term monitoring surveys are rapidly declining throughout their range. They have lost more than half their global population over the past four decades" (North American Bird Conservation Initiative, U.S. Committee 2014).

Results

Bird species detected in the three habitats studied

A total of 189 bird species was detected in the three habitats combined including 17 (9.0%) residents, 36 (19.0%) short distance migrants, 12 (6.3%) resident/short distance migrants, 39 (20.6%) Neotropical migrants, 83 (43.9%) short distance/ Neotropical migrants, and two (1.0%) resident/Neotropical migrants (Table 1). Of the 189 species detected, 107 (56.6%) have been documented as breeding in the Cedarburg Bog Important Bird Area (Table 1) (UWM Field Station 2016).

A total of 135 species were detected in the Bog; 117 species were detected in the Upland Habitat; and 174 species were detected in the Mud Lake habitat (Table 1). Numerous species were detected in all three of the habitats; however some species were unique to a particular habitat. Both the Bog and the Upland Habitat had a relatively small number of unique species: with three and six unique species respectively. Ruffed Grouse, King Rail, and Black-Throated Blue Warbler were found only in the Bog habitat (Table 1). A King Rail (associated with wetland habitats) was observed crossing the boardwalk that leads to the string bog. A Ruffed Grouse (not usually associated with wetland habitat) was observed in

nearly the same location on another date. The other species, the Black-throated Blue Warbler, was observed on one of the small upland forest islands near the string bog. In the Upland Habitat, the six species that were detected only in this habitat were Cattle Egret, Purple Martin, Clay-colored Sparrow, Savannah Sparrow, Henslow's Sparrow, and Bobolink (Table 1). The Cattle Egret and Purple Martin were fly-over sightings, unrelated to the Upland Habitat. The Clay-colored Sparrow, Savannah Sparrow, Henslow's Sparrow, and Bobolink were detected at a point at the edge of the woods along an old fallow agricultural field containing both native and non-native vegetation.

Mud Lake had the largest number of unique species, with 41 species detected only in this habitat (Table 1). These included 21 waterfowl species and six shorebird species. Other species detected only in the Mud Lake habitat included Common Loon, Double-crested Cormorant, Great Egret, Black-crowned Night Heron, Northern Harrier, American Coot, Herring Gull, Caspian, Black and Forster's Terns, Olive-sided Flycatcher, Cliff Swallow, American Pipit, and Connecticut Warbler. The majority of these species are associated with lake and wetland habitats. The Northern Harriers were consistently observed flying over the extensive cattail marshes surrounding the perimeter of Mud Lake. The Olive-sided Flycatcher and Connecticut Warbler were seen close to the boat launch on Mud Lake in a small mature forest plot surrounded by shrub-carr and other thicket types. The American Pipit was observed at the water's edge at the boat launch.

We calculated relative occurrence of bird species based on the criteria described above. Of the 135 species detected in the Bog, 18 (13.3%) were of high occurrence, 25 (18.5%) were of moderate occurrence, and 92 (68.1%) were of low occurrence. Of the 117 species detected in the Upland Habitat and adjacent areas, 18 (15.4%) were of high occurrence, 26 (22.2%) were of moderate occurrence, and 73 (62.4%) were of low occurrence. Of the 174 species detected in the Mud Lake habitat, 20 (11.5%) were of high occurrence, 31 (17.8%) were of moderate occurrence, and 123 (70.7%) were of low occurrence (Table 1).

Nine of the species detected were of high relative occurrence in all three of the habitats; these were the Yellow-shafted Flicker, Blue Jay, American Crow, Black-Capped Chickadee, American Robin, Common Yellowthroat, Song Sparrow, Northern Cardinal and Red-Winged Blackbird (Table 1).

Playback for secretive wetland species on Mud Lake

Playback was used to enhance detection of secretive wetland species when they were not vocalizing spontaneously. In 2011 the Least Bittern responded; in 2012 the Least Bittern, Sora and Virginia Rails responded, and in 2013 the American and Least Bittern responded.

Prior to the start of the 2009–2013 counts described in this report, the counts conducted on a less regular basis in the Bog and Upland Habitat (fall 2006, spring 2007 and 2008) resulted in the detection of 98 bird species. With the exception of Ring-necked Pheasant, all of these species were detected in the 2009–2013 point counts.

Assessing the conservation importance of the species detected in the three habitats studied

The three habitats studied were used during spring and fall migration by 62 species of conservation concern that are listed in Wisconsin and national plans (Table 2). These 62 species represent 32.8% of the total birds detected. While 33 species are listed in one conservation plan, 29 of these 62 species are listed in multiple conservation plans. Forty species are listed as Species of Greater Conservation Need (Wisconsin Department of Natural Resources 2005). Four species are listed as Wisconsin Endangered Species, and four are listed as Wisconsin Threatened Species (Wisconsin Department of Natural Resources 2014). Thirteen species are listed as Watch List species in the Partners in Flight North American Landbird Conservation Plans (Rich et al. 2004, Rosenberg et al. 2016). Utilizing U.S. Waterbird Plan assessments, 10 species are listed as being of continental concern: six species are listed as high priority and four species are listed as moderate priority (Wires 2010). Five shorebirds are listed as being species of conservation concern by the U.S. Shorebird Conservation Plan: three are Watch List species; one is a species of conservation concern due to climate change vulnerability; and one is listed as a common shorebird in steep decline (U.S. Shorebird Conservation Plan Partnership 2015). Twelve species are on the North American Bird Conservation Initiative (NABCI) State of the Birds Report Watch List (Rosenberg et al. 2014). Seventeen species are listed as being common birds in steep decline (North American Bird Conservation Initiative, U.S. Committee. 2014).

Discussion

We documented 189 bird species using the Cedarburg Bog IBA during spring and fall migration across all three habitats, indicating the importance of these areas to a diverse array of bird species during migration. Most of the species that we detected were short distance and Neotropical migrants or species in which some individuals are short distance migrants and others Neotropical migrants, with only a minority recorded as residents (9%). Just over half of the species detected (56.6%) have been documented as breeding in the Cedarburg Bog IBA, based on data collected during surveys for the Wisconsin Breeding Bird Atlas (UWM Field Station 2016). In spring, the individuals of breeding species detected during the counts may have been birds that remained in the area to breed and raise young or those that continued to migrate in order to breed in other areas. The individuals detected in fall may have been birds that bred in the area, birds that moved to the area after breeding, or individuals in the process of post-breeding dispersal. Many of the migrants detected in the Cedarburg Bog IBA during fall may have bred or hatched in northern forests, including the vast boreal forests of Canada, and then migrated great distances before stopping over in the IBA during migration.

The results presented in this study greatly expand on the number of species known to use the Cedarburg Bog IBA during migration. Previous research on migratory birds using the Cedarburg Bog and Upland Habitat

Table 2. Bird species of conservation concern detected during point counts conducted in three habitats within the Cedarburg Bog Important Bird Area.

Bird Species	Migration Status[a]	Wisconsin Species of Greatest Conservation Need[b]	Wisconsin Threatened (T) or Endangered (E) Species[c]	Partners in Flight Landbird Species of Continental Importance[d]	Waterbird[e] (W) or Shorebird[f] (S) Plan Risk Category	North American Bird Conservation Initiative (NABCI) State of Birds Watch List[g]	NABCI Common Birds in Steep Decline[h]
Trumpeter Swan (*Cygnus buccinator*)	S	X					
American Wigeon (*Anas americana*)	S/N						X
American Black Duck (*Anas rubripes*)	R/S	X					
Blue-winged Teal (*Anas discors*)*	S/N	X					
Northern Pintail (*Anas acuta*)	S/N						X
Canvasback (*Aythya valisineria*)	S/N	X					
Redhead (*Aythya americana*)	S/N	X					
Greater Scaup (*Aythya marila*)	S						X
Lesser Scaup (*Aythya affinis*)	S/N	X					
Common Loon (*Gavia immer*)	S				W-Moderate		
Pied-billed Grebe (*Podilymbus podiceps*)*	S/N				W-High		
Horned Grebe (*Podiceps auritus*)	S	X			W-High		
American Bittern (*Botaurus lentiginosus*)*	S/N	X			W-High		
Least Bittern (*Ixobrychus exilis*)*	S/N				W-High		
Great Egret (*Ardea alba*)	S/N	X	T				
Osprey (*Pandion haliaetus*)*	S/N	X					
Bald Eagle (*Haliaeetus leucocephalus*)	S	X					
Northern Harrier (*Circus cyaneus*)*	S/N	X					
Red-shouldered Hawk (*Buteo lineatus*)	S	X	T				
King Rail (*Rallus elegans*)	S/N	X			W-High	X	
Virginia Rail (*Rallus limicola*)*	S/N				W-Moderate		
Sora (*Porzana carolina*)*	S/N				W-High		
Black-bellied Plover (*Pluvialis squatarola*)	S/N			S-Climate Change Vulnerability			
Killdeer (*Charadrius vociferus*)*	S/N			S-Common Shorebird in Decline			
Solitary Sandpiper (*Tringa solitaria*)	S/N	X					
Lesser Yellowlegs (*Tringa flavipes*)	S/N				S-Watch List	X	
Dunlin (*Calidris alpina*)	S/N	X				X	

(Continued

Table 2. *(Continued).*

Bird Species	Migration Status[a]	Wisconsin Species of Greatest Conservation Need[b]	Wisconsin Threatened (T) or Endangered (E) Species[c]	Partners in Flight Landbird Species of Continental Importance[d]	Waterbird[e] (W) or Shorebird[f] (S) Plan Risk Category	North American Bird Conservation Initiative (NABCI) State of Birds Watch List[g]	NABCI Common Birds in Steep Decline[h]
Pectoral Sandpiper (*Calidris melanotos*)	N				S-Watch List	X	
American Woodcock (*Scolopax minor*)*	S	X			S-Watch List	X	
Herring Gull (*Larus argentatus*)	R/S						X
Caspian Tern (*Hydroprogne caspia*)	S/N	X	E				
Black Tern (*Chlidonias niger*)	N	X	E		W-Moderate		X
Forster's Tern (*Sterna forsteri*)	S/N	X	E		W-Moderate		
Yellow-billed Cuckoo (*Coccyzus americanus*)*	N	X					X
Black-billed Cuckoo (*Coccyzus erythropthalmus*)*	N	X		Watch List (WL)		X	
Common Nighthawk (*Chordeiles minor*)	N						X
Chimney Swift (*Chaetura pelagica*)*	N						X
Peregrine Falcon (*Falco peregrinus*)	S/N	X	E				
Olive-sided Flycatcher (*Contopus cooperi*)	N	X		WL		X	
Acadian Flycatcher (*Empidonax virescens*)*	N	X	T				
Willow Flycatcher (*Empidonax traillii*)*	N	X		WL			
Least Flycatcher (*Empidonax minimus*)*	N	X					
Bank Swallow (*Riparia riparia*)*	N						X
Veery (*Catharus fuscescens*)*	N	X					
Wood Thrush (*Hylocichla mustelina*)*	S/N	X		WL		X	
Brown Thrasher (*Toxostoma rufum*)*	S	X					
Golden-winged Warbler (*Vermivora chrysoptera*)	N	X		WL		X	
Blue-winged Warbler (*Vermivora cyanoptera*)*	N	X		WL			
Connecticut Warbler (*Oporornis agilis*)	N	X		WL		X	
Cape May Warbler (*Setophaga tigrina*)	N			WL			X
Bay-breasted Warbler (*Setophaga castanea*)	N			WL			
Blackpoll Warbler (*Setophaga striata*)	N						X
Black-throated Blue Warbler (*Setophaga caerulescens*)	N	X					
Canada Warbler (*Cardellina canadensis*)	N	X		WL		X	

Wilson's Warbler (*Cardellina pusilla*)	S/N					X
Field Sparrow (*Spizella pusilla*)*	S	X				X
Henslow's Sparrow (*Ammodramus henslowii*)*	S	X	T	WL		
Bobolink (*Dolichonyx oryzivorus*)*	N	X		WL	X	
Eastern Meadowlark (*Sturnella magna*)*	S	X				X
Rusty Blackbird (*Euphagus carolinus*)	S	X		WL		X
Common Grackle (*Quiscalus quiscula*)*	S					X
Pine Siskin (*Spinus pinus*)	S					X

* Breeds in study area (http://www4.uwm.edu/fieldstation/datasets/species.cfm)
[a]R: Resident birds are present in Wisconsin year-round. They do not migrate.
S: Short-distance (temperate) migrants spend the non-breeding season north of the Tropic of Cancer, in the US, northern Mexico, and the northern Bahamas.
R/S: Resident/Short-distance migrants have some individuals that are present in Wisconsin year-round and others that spend the non-breeding season in the US, northern Mexico and the northern Bahamas.
N: Neotropical migrants breed north of the Tropic of Cancer, but spend in non-breeding season south of the Tropic of Cancer.
S/N: Short-distance/Neotropical migrants have some individuals that spend the non-breeding season in the US, northern Mexico and the northern Bahamas and others that can be found south of the Tropic of Cancer.
[b]Wisconsin Department of Natural Resources. 2005
[c]Wisconsin Department of Natural Resources 2014
[d]Rich T.D. et al. 2004, Rosenberg, K.V. et al. 2016
[e]Wires L.R. et al. 2010
[f]U.S. Shorebird Conservation Plan Partnership. 2015
[g]Rosenberg K.V. et al. 2014
[h]North American Bird Conservation Initiative, U.S. Committee. 2014

was conducted by Weise (1988), who mist-netted during fall migration and captured and banded 101 bird species during the first 23 years of his study. We detected 96 of these 101 species during our point counts, but did not find the Long-eared Owl, Northern saw-whet Owl, Northern Shrike, Vesper Sparrow, or Common Redpoll, all of which were recorded by Weise. By conducting point counts we added 52 species to the list of migrants utilizing the Cedarburg Bog and Upland Habitat during migration. The majority of these new additions are most likely due to differences in methodology, rather than an increase in the number of species using these habitats. Mist nets operated at ground level sample birds that move within 2–3 m above the ground (Remsen and Good 1996). The nets used by Weise (1988) were operated at ground level, were 36 mm mesh size and designed to capture small songbirds. His results summarized mist-net captures to determine long-term trends of bird populations and did not include observations of larger birds or those flying over the site. These larger birds and flyovers, as well as smaller birds, can be detected by point counts, the methodology used in this report. In addition, our results represent new, baseline information on the species utilizing Mud Lake during spring and fall migration.

The Cedarburg Bog IBA provided migration stopover habitat for 62 bird species of conservation concern. These at-risk species represented 32.8% or nearly 1/3 of the total birds detected during this study (Table 2). This demonstrates the importance of this large area to migrants, especially since it occurs within a fragmented and developed landscape (Figure 1). Designation of a site as an IBA does not confer any legal protected status and management is under the control of the landowner. About half of the land in the Cedarburg Bog IBA (798 ha out of about 1550 ha) is owned by either the University of Wisconsin-Milwaukee (UWM) or the Wisconsin Department of Natural Resources, (DNR), which affords these lands protected status. The counts that we conducted in the Cedarburg Bog and Upland Habitat were on lands owned by the university where public access is limited to low-impact activities such as educational programs and guided hikes. These policies minimize disturbance to birds using these areas for rest and feeding during migration. The DNR-owned lands within the Cedarburg Bog, including Mud Lake, are open to the general public for hunting, fishing, and other recreational use. Most public use of the Cedarburg Bog State Natural Area occurs at the north end of the bog, where there is a public parking area, trails, and boardwalk leading to a fishing pier at Watts Lake. Mud Lake generally receives less public use, although it is used for duck hunting in the fall. In addition to the protected area owned by UWM and the Wisconsin DNR, there are a number of adjacent private landowners who manage their land to protect the native habitats present, which benefits the bird species using them.

Many species of migratory birds are declining (Gilroy et al. 2016, Robbins et al. 1989) and the protected areas within the Cedarburg Bog IBA provide necessary resources for migrants to stop, rest, feed, and shelter from weather and predators before continuing their migration. Mehlman et al. (2005) described terms denoting the function of three types of stopover sites

that a bird may use during migration. These terms are used for prioritizing and conserving stopover sites for forest-dwelling migratory landbirds. The terms are : "fire escapes" (infrequently used but vital in emergency situations), "convenience stores" (habitat patches of varying size within a generally inhospitable landscape where birds can briefly rest and replenish some reserves) and "full-service hotels" (an extensive area of predominately forested habitat which contains all necessary resources in abundance and can serve many individuals of many species). Based on the size and habitats present, the Cedarburg Bog Important Bird Area meets the criteria of a "full service hotel", where birds can stop during migration to rest and readily replenish necessary reserves before continuing their migration. In addition to its significance for protecting species of conservation concern during the breeding season, our results show that the Cedarburg Bog IBA also provides important habitat during migration.

Conclusions

We conducted weekly point counts for three years in three different habitats within the Cedarburg Bog IBA to determine the migratory bird species using these during spring and fall migration. During the study we detected 189 bird species: 135 were detected in the Bog, 117 were detected in the Upland Habitat and 174 were detected in the Mud Lake habitat (Table 1). Our results represent new, baseline information on the species utilizing Mud Lake during spring and fall migration and provide updated information on bird species using the Cedarburg Bog and Upland Habitat, which have not been studied in detail since 1996 (Weise 1988, Weise et al. 2004). Our results revealed that the Cedarburg Bog Important Bird Area supports a number of species of conservation concern during spring and fall migration (62 species total, representing nearly 1/3 of the total bird species detected). Our findings emphasize the critical importance of conserving, protecting, and increasing IBA habitats to aid birds during migration.

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A family of Gadwalls out for a swim, photographed by Michael Huebschen at Horicon Marsh in Dodge County in late July.

Jeff Galligan captured this image of an American White Pelican coming in for a landing in Sheboygan County in late June.

Piping Plovers Breeding in Brown County, Wisconsin, in 2016: Encouraging Signs of Population Expansion

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ABSTRACT

The Great Lakes Piping Plover (Charadrius melodus) *is re-established as a rare breeder in Wisconsin, confined almost exclusively to the Apostle Islands in Lake Superior after a 15-year absence from breeding in the state during the 1980s and 1990s. It was listed as state endangered in 1979, and became federally endangered in 1986. From the late 1990s until 2016, the only other breeding attempts in the state were one attempt in Door County in 2012 and two attempts in Marinette County in 2001 and 2008, all of which failed. In 2016, a pair of Piping Plovers nested and fledged three young at the Cat Island Chain Restoration, a dredge disposal and habitat restoration site in Lower Green Bay. This represents the first breeding record for the species in Brown County and the first successful breeding on Green Bay in 75+ years. We detail this banner nesting event and use of the site by Piping Plovers in the several years prior, explore the trends of this species as a migrant in Wisconsin in the past decade, and look to the future to evaluate the potential for Piping Plovers to expand their range and population in Wisconsin.*

INTRODUCTION

The Piping Plover (*Charadrius melodus*) was first discovered breeding in Wisconsin by Kumlien in the late 1800s in Jefferson County (Kumlien 1891). More detailed breeding records in the 1930s exist from beaches near Sheboygan and south of Kenosha, which were dominated by rolling dunes before suburbanization (Matteson 1996, Matteson 2007 et. al). More records exist at predeveloped Barker's Island in Superior for several decades until 1971 and again elsewhere in the Superior harbor, mainly in the late 1970s (Matteson et. al 2007).

Russell (1983) estimated that the historical Wisconsin Piping Plover popu-

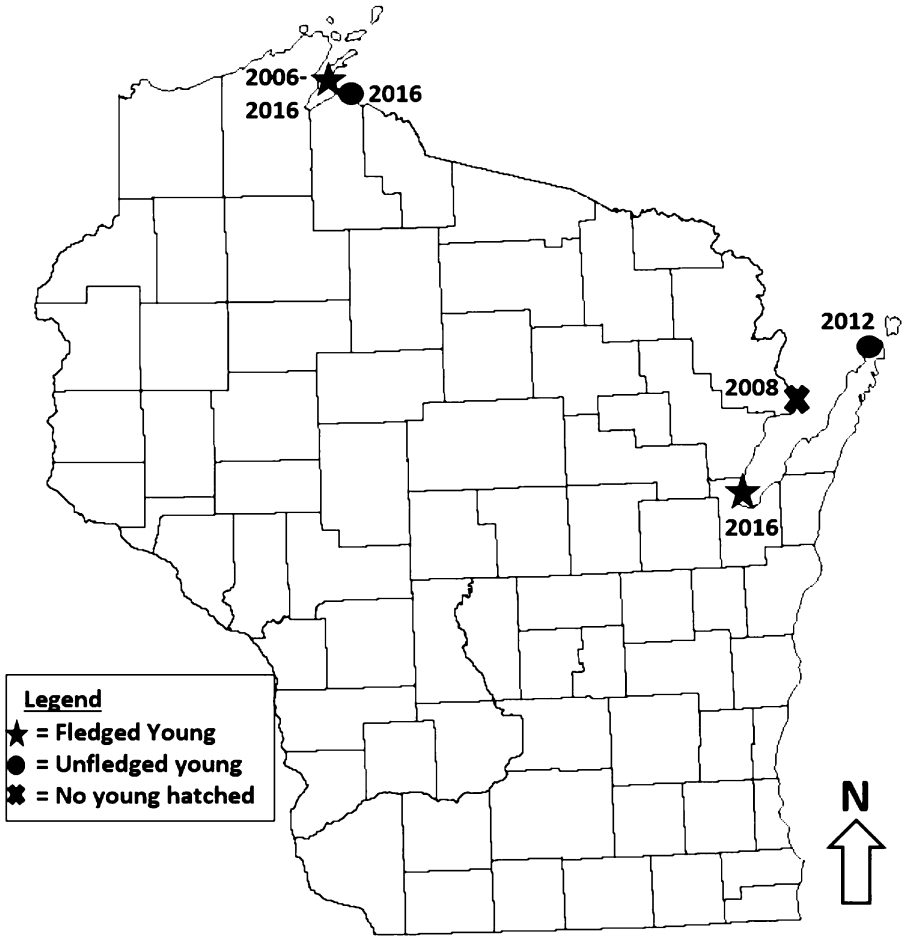

Figure 1. Piping Plover breeding attempts in Wisconsin 2006–2016.

lation was between 75 and 90 pairs. The species has experienced markedly unstable population trends in the Great Lakes, ultimately resulting in listing as a federally Endangered Species in 1986. At the time of federal listing, the Great Lakes population had plummeted to 17 nesting pairs, and has since fluctuated between 12 and 75 breeding pairs during 1986–2016 (USFWS 2003, V. Cavalieri pers. comm.) The federal recovery plan (USFWS 2003) has established a recovery goal of 150 nesting pairs over consecutive five years, with 100 designated for Michigan, and 50 to occur elsewhere in the Great Lakes.

Modern-day Wisconsin breeding populations have always been small and limited almost completely to Lake Superior (Matteson 2006). The stronghold is the Apostle Islands (Ashland County), where they returned as breeders in 1998 after a 15-year absence (Matteson et al. 2007). In 2016, three pairs nested on Long Island (a fourth pair nested unsuccessfully near the mouth of the Bad River) and produced five young (Mahr 2016); it was the 12th

Table 1. Migrant Piping Plovers detected in Wisconsin per year, 2006–2016. Spring is defined as observations before 15 June and fall is defined as observations after 15 June.

	Spring		Fall		Total
Year	# Indivs	Locations	# Indivs	Locations	Indivs
2016	8	7	4	4	12
2015	8	7	5	3	13
2014	11	9	5	4	16
2013	14	6	0	0	14
2012	5	3	1	1	6
2011	3	2	1	1	4
2010	4	4	0	0	4
2009	4	4	0	0	4
2008	7	5	3	2	10
2007	3	3	2	1	5
2006	1	1	4	2	5

year in a row that breeding was successful at Long Island (Matteson et al. 2007, eBird 2012). The only other Piping Plover nesting attempt in Wisconsin occurred in Lower Green Bay at the Cat Island Chain Restoration Project (CICRP)—one pair, bringing the total number of state breeding pairs to five for 2016 (Figure 1).

Piping Plover Migrants Increasing in Wisconsin, 2006–2016

A review of Piping Plover eBird records from 2006 to 2016 reveals some patterns. With 2008 as an outlier, sightings have been more frequent the past four years than the preceding years (Table 1). This mirrors an increase in Michigan population, where most of these migrants are coming from. We must keep in mind that although Piping Plover migrant detections have increased throughout the past decade, the popularity of eBird and the use of high-quality cameras has also increased, possibly significantly affecting the number of Piping Plover reports.

The repeated use of Lake Michigan sites during the past decade is especially noteworthy: North Beach (Racine County), the Manitowoc lakefront (Manitowoc County), and Seagull Bar (Marinette County) have produced plover sightings in more than half of the years, with more than one bird observed at least twice (Table 2). Wiscon-

Table 2. Wisconsin Locations with most recorded migrant Piping Plover sightings, 2006–2016.

Location	County	# Years	# Indivs	# Pairs
Meyers Park	Racine	4	6	1
North Beach	Racine	8	16	4
South Metro Pier	Milwaukee	2	2	0
Grant Park	Milwaukee	3	3	1
Sheboygan Lakefront	Sheboygan	3	4	1
Manitowoc Lakefront	Manitowoc	6	9	2
Seagull Bar	Marinette	6	9	2
Wisconsin Point	Douglas	5	5	0

sin Point (Douglas County) and Meyer's Park (Racine County) have produced sightings in half or nearly half of these years (Table 2). All of these locations have long, sand beaches where Piping Plovers could potentially nest if not disturbed. These are all popular locations, however, for human recreation—likely a reason the plovers are currently only migrants here.

Piping Plovers have been "eBirded" only once in the last decade at other locations along Lake Michigan and Lake Superior in all lakefront counties except Ozaukee and Oconto (eBird 2012). Flooded fields or wetlands have produced sightings of migrants in Trempealeau, La Crosse, Jackson, Dodge, Fond du Lac, Door, Sheboygan, Milwaukee, and Racine counties in the last decade, but not surprisingly only once at each location (eBird 2012).

History of Piping Plovers Breeding in the Green Bay Area

Although the vast majority of Wisconsin breeding Piping Plover records are from Lake Superior, records exist from both shores of Green Bay. Russell (1983) estimated a potential historical population of 25 pairs on the west shore of Green Bay but that potential has been largely lost by development and other shoreline changes. Historical records in the area include a pair with chicks on a sawdust deposition island in Oconto County in 1940 (T. Erdman pers. comm.) and a failed (1942) and a successful (1948) nest near Lily Bay in Door County (Matteson et. al 2007).

Piping Plovers nested 53 years later, when a nest was depredated at Seagull Bar in Marinette County in 2001. Another attempt there failed in 2008 and occasional presence of pairs of Piping Plovers continues to this day (Figure 1) (J. Trick unpub., eBird 2012). No successful nesting has occurred, likely due to shifting changes in water levels and habitat conditions at the location.

The most recent successful nesting in the Green Bay area before 2016 was in northern Door County in 2012, where a pair hatched 2–3 chicks that were ultimately lost in a severe storm (Figure 1) (Trick et al. 2012). These birds picked a relatively steep and narrow beach, composed almost exclusively of zebra mussel shells (Trick et al. 2012). Although it is an outlier for preferred habitat, it proves that nesting on this habitat, which is now common on the east shore of the bay, is possible.

The Cat Island Chain Restoration in Lower Green Bay

The CICRP represents a milestone in restoration of the Lower Green Bay ecosystem. The $18 million CICRP began in 2012 after decades of planning (Walter 2015), with construction of a 2.5-mile long wave barrier and 4.7 miles of island legs. First recommended by the 1988 Lower Green Bay Remedial Action Plan, this project has developed through partnerships involving the Port of Green Bay, Brown County, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Wisconsin Departments of Transportation and Natural Resources, Lower Fox River/Green Bay Natural Resources Trustee Council, UW Sea Grant, UW-Green Bay, and 14 port terminal operators (Walter 2015).

The recently completed foundation consists of a main spine (the wave barrier) and legs that divide the area into cells, which will eventually become three islands totaling 274 acres of is-

lands made from sediment dredged from the outer navigation channel (Walter 2015). The 2.5-mile rocky spine of the CICRP will serve as a wave barrier to protect these islands from severe storm surges and high water levels, which were responsible for eroding the previous island chain after the 1970s. The Cat Island chain historically supported the highest species diversity (13 species) of breeding waterbirds in the Great Lakes (USFWS). Another purpose of the CICRP is to expedite the restoration of approximately 1,225 acres of shallow-water wetland habitat in lower Green Bay (Walter 2015).

Dredge deposition at the CICRP began in early August 2014 in the western-most cell of the chain. A hydraulic method was used and by completion in November, more than 386,700 cubic yards covering approximately 42 acres was deposited, accounting for 40–45% of the capacity of this island and about 10% of the capacity for the entire facility (M. Walter pers. comm.). Unlike the high silt content of most dredge material, this first year's dredging placement was almost all sand because it came from an erosion deposit off Longtail Point. This sand basically turned the cell area into a large undisturbed beach, exactly what Piping Plovers require for breeding. There were no dredging operations at the facility during 2015 so the size of the deposit was the same during the 2016 breeding season as it was the year before (Figure 2). Woody vegetation dominated by cottonwood (*Populus deltoids*) sprouted during the summer of 2015, however, and increased rapidly in size and coverage during the rest of 2015 and 2016. In future years, the final 60% of the facility will be filled with dredge material,

Figure 2. Western half of Cat Island Chain Restoration Project in April 2015, facing west. Note fresh non-vegetated dredge material from fall 2014 deposition. Photo by USACE.

dramatically increasing the amount of available shorebird habitat.

Observations at the Cat Island Chain in 2013

T. Prestby (pers. data) first detected a pair of Piping Plovers using the CICRP at a shoal (*Willow Shoal*) on 19 May 2013. It is unknown if these were two males or a male and female. One bird was exhibiting courtship behavior, including courtship calling and aerial display flight. It also was seen chasing Herring Gulls (*Larus argentatus*), which have a nesting colony adjacent to where the birds were found. This presumed male was observed occasionally at the site until 10 June and the unknown sex bird was observed until 25 May.

Additional migrant Piping Plovers, which did not show any courtship or territorial behavior, were observed 26 May and 29 May-1 June. Surveys were conducted 2–3 times per week during this period, so it is unlikely additional birds or nesting behavior went undetected. It is presumed that the plovers moved on because the only available habitat was dominated by nesting and loafing Herring Gulls and American White-Pelicans (*Pelecanus erythrorhynchos*). None were seen during fall migration.

Observations at the Cat Island Chain in 2014

The year 2014 marked the beginning of a dramatic water level rise on Lake Michigan. Water levels rose almost a foot after ice-off, resulting in significantly less exposed sand and rock for shorebirds and waterbirds. Piping Plovers were detected at the CICRP again, originally on Willow Shoal, but then only on the gravel-topped spine of the wave barrier, possibly due to crowding of gulls and pelicans on the last available portions of Willow Shoal. Courtship behavior was exhibited again, as well as a possible broken-wing distraction display, on 13 May. Their stay was shorter than in 2014, arriving on 4 May and departing on 13 May. No observed band combinations matched birds that were detected in 2013.

Unlike in 2013, Piping Plovers were detected at the CICRP in fall migration. Two birds that acted like a pair were present from 10 July to 14 July. They only used the gravel spine but were observed successfully foraging for chronomids and other invertebrates. Band combinations revealed that that no birds were repeats from spring 2014 or 2013.

Observations at the Cat Island Chain in 2015

The construction of a sand dredge-deposit in fall of 2014 created new habitat for Piping Plovers at the CICRP. Although water levels on Green Bay continued to rise, the deposit created dramatically more habitat at the site than was present in 2013 and 2014.

The first Piping Plover was detected on this sand deposit on 30 April 2015. This bird did not show courtship behavior, and was documented infrequently until 9 May. On 7 May, two new Piping Plovers were found at the same location in the company of each other. This was assumed to be a pair because intense courtship behavior—including courtship flights and calling, chasing, mirroring, goose-stepping, and nest-scraping, was observed for the next several days (Figure 3). Band-combina-

Figure 3. Two second-year male Piping Plovers in courtship behavior at the Cat Island Chain Restoration Project in May 2015. Note bowing and tail-fanning of left-hand bird. Photo by Tom Prestby.

tions and photos, however, revealed that both birds were males. Correspondence with USFWS indicated that occasionally males in their first breeding season (as these birds were) exhibit courtship behaviors to each other (V. Cavalieri pers. comm.).

After courtship behavior ceased around 25 May, both birds were observed in consistent separate territories. A third male arrived on 12 June and claimed his own territory on the same sand deposit, and the three males coexisted in separate territories through at least 27 June. Although no more courtship behavior was observed, the birds defended their territories by chasing each other regularly. Unfortunately, no females were detected during this season. This is expected because there are more males in the Great Lakes Piping Plover population and young males are typically pioneers, finding new habitat before females (Saunders and Cuthbert 2015).

New migrants stopped at the site in fall 2015, an unidentified individual on 30 July and a second-year male from the Apostle Islands (information via leg bands) 2–11 August. All Piping Plover observations from 2015 occurred on or adjacent to the sand dredge deposit, none at Willow Shoal or adjacent areas.

Observations at the Cat Island Chain in 2016

No dredging operations occurred between fall 2015 and the beginning of spring 2016, so the amount of available

Figure 4. Piping Plover adult female at Cat Island Chain Restoration Project in June 2016. Photo by Tom Prestby.

habitat was the same as the year before. The first Piping Plover of the year was detected making courtship calls and flights on 4 May 2016, and this bird or another male was photographed several days later, and persisted on the sand dredge deposit.

On 16 May, another plover with a weaker chest band and face markings accompanied the continuing male (Figure 4). Photos and band combinations confirmed our observations that this bird was a female — a bird from North Manitou Island of Michigan's Sleeping Bear Dunes National Lakeshore that hatched out in 2015 (V. Cavalieri pers. comm.). In the following days, intense courtship was observed including chasing, tail-fanning, goose-stepping and nest-scraping by the male. The male was also observed guiding the female on tours of his "dummy" scrapes, which was noted on 20 May. Pictures of the male revealed that this was the second-year male hatched out in the Apostle Islands that stopped at the site in August of the previous year. On 21 May, another male arrived at the location, competing for but not receiving the attention of the female.

The evening of 24 May, Prestby carefully watched the pair in the area where they were spending most of their prior time; an area where we suspected nesting might occur when observed on 20 May. Prestby took photographs of the female with a DSLR camera from a distance when she was acting suspicious and while viewing them in the field, he observed at least two eggs that the female was tending. This represented the

Figure 5. Piping Plover nest with full clutch at Cat Island Chain Restoration Project in June 2016. Note nest lining of small mussel shells. Photo by Tom Prestby.

first Piping Plover breeding record in Brown County history (Figure 5).

The following day, USFWS staff placed a wire predator exclosure over the nest — a common practice now followed at all Great Lakes Piping Plover nests (Figure 6). Both birds returned to incubating the two eggs within minutes of the crew leaving the site. By 3 June, the nest contained four eggs, the typical Piping Plover clutch size (USFWS 2003).

Organized monitoring of the nest followed, with observations by Prestby and WDNR and USFWS personnel three times per week. The pair incubated regularly and the clutch survived thunderstorms, including one that produced a tornado warning for this portion of Brown County.

The pair received a unique breeding color-band combination from University of Minnesota Piping Plover biologists; this is a customary practice for breeding Piping Plovers. This pair's new jewelry was green and yellow, in honor of the city they chose to nest in and the largest building on its "skyline" (Figure 7).

The next monumental step occurred when the first chicks were observed hatching on 21 June. A day later, they were outside the nest exclosure. On 23 June, a third chick hatched and the fourth egg was abandoned. USFWS collected the egg and tests revealed that it was non-viable. Monitoring to confirm the well-being of the chicks and pair became a daily occurrence.

On 30 June, Matteson banded all three chicks with FWS steel bands and color bands (Figure 8).

Figure 6. Fenced exclosure over Piping Plover nest at Cat Island Chain Restoration Project in June 2016. Habitat consists of open sand beach with scattered gravel, cobble, and larger rocks as well as scattered cottonwood saplings and small sand dunes. Photo by Tom Prestby.

In the following weeks, the family survived more rounds of severe thunderstorms and at least one close encounter with a curious Herring Gull (Figure 9). The adult female was last observed on 14 July — it is typical for the female to depart for her wintering grounds just before the chicks fledge (USFWS 2003).

The following day was the last milestone, when at least one of the chicks was seen flying strongly (Figure 10). Therefore, 15 July was the defined fledge date for this brood. During subsequent days, all three chicks were seen flying. Fledging defines successful breeding, the first occurrence for Piping Plovers on Green Bay in more than 75 years. The adult male was last seen 25 July, and the first chick departed for its southerly migration on 29 July. The other two chicks were last seen 5 August 2016.

Remarkably, and thanks to colorbanding and the increase of birdwatchers with cameras, the story of the 2016 Green Bay Piping Plovers does not end there. The first chick that departed the CICRP was photographed 43 miles away at Nashotah Beach in Two Rivers, Manitowoc County, on 3 August and remained until 5 August. On 12 August, another juvenile from the brood (possibly the same bird but unknown) was photographed at Meyer's Park in Racine, Racine County. Even more surprising are probable sightings based on band combinations of one of the juveniles at a reservoir in Somerset, KY on 22 August and two juveniles near Jacksonville, FL on 12 October. We're thankful to diligent eBird reviewers and

Figure 7. University of Minnesota graduate student Jordan Rutter places breeding band color combination on breeding adult male Piping Plover at Cat Island Chain Restoration Project. Photo by Tom Prestby.

USFWS for relaying this exciting information.

Wisconsin Piping Plover Outlook

In 2016, successful Piping Plover breeding in Lower Green Bay was a milestone for the Wisconsin population, but the same threats that consistently limit breeding success for this species regionally need to be addressed at Wisconsin's Great Lakes sites, with some factors of greater concern than others depending on the locale.

High water levels and shoreline erosion, exacerbated by severe storm events, constitute the most serious threats, though this is not expected to be a serious concern at the CICRP because the site is built with a gradual slope at an elevation of eight feet above the high water mark. With habitat loss

Figure 8. After placing green color band on left leg and orange band on right leg, Matteson prepares to solder color band ends together without touching skin—both human and bird—with assistance from WDNR biologist Jeff Pritzl. Photo by Tom Prestby.

Figure 9. One of three Piping Plover chicks at Cat Island Chain Restoration Project. Chick is about a week old in late June 2016. Photo by Tom Prestby.

Figure 10. Juvenile Piping Plover in flight at Cat Island Chain Restoration Project in mid-July 2016, representing fledging and successful breeding. Photo by Joel Trick.

an historical concern, enhancing habitat conditions in the Duluth-Superior Harbor and at Seagull Bar in Marinette County offer a management opportunity to increase Wisconsin's breeding population. High water levels and severe storm events have led to a recent deterioration of the traditional Long Island/Chequamegon Bay breeding sites, but this location remains the most likely area for continued nesting success due to miles of undeveloped shoreline characterized by a dynamic and ever-changing beach-dune complex.

Other factors affecting breeding Piping Plovers are avian and mammalian predators, chiefly Merlin (Falco columbarius) and gulls (*Larus spp.*), and red fox (*Vulpes vulpes*), coyote (*Canis latrans*), and raccoon (*Procyon lotor*). Merlins have been managed at some Michigan sites (V. Cavalieri pers. comm.), but have not yet risen to the level of concern warranting management attention in Wisconsin. Gulls have not yet become a management concern on Long Island/Chequamegon Point, but at the CICRP large colonies of Herring Gulls (*Larus argentatus*) and Ring-billed Gulls (*Larus delawarensis*) occur about a mile east of the 2016 Piping Plover nest location, and since the construction of the Cat Island project, they have spread westward a few hundred meters per year. These colonies will likely keep spreading west and will need to be managed in future years if Piping Plovers continue to occupy the CICRP. Mammalian predators have not reached this area yet, but they have an unimpeded

path from land to do so. This path is supposed to be removed when island connections are broken at the end of the project dredging, but if they are not, mammalian predator control will likely be required.

Limited human disturbance is a unique advantage the CICRP and Long Island/Chequamegon Point have over other Piping Plover breeding sites in the Great Lakes. The CICRP is closed to the public because it is a dredge containment facility, so birds are not typically subject to human foot traffic, vehicles, or the presence of dogs, and Long Island/Chequamegon Point is a remote site accessed usually only by boat.

Vegetative succession at potential and extant breeding sites is another limiting factor that may require management. Vegetation management at the CICRP for example, will be extremely important for maintaining Piping Plover breeding success. The sediment is full of cottonwood and other seeds and these plants spread vigorously during 2016. The cottonwoods were leveled during fall 2016 in most locations, but with new seedlings they will continue to be a management concern. Succession is the most common way that productive dredge islands for breeding birds are lost (Scarton and Cecconi 2012), which is what happened across the bay channel a mile away at Renard Island.

The Great Lakes Piping Plover population reached a post-listing high in 2016 of 75 nesting pairs, and it is our hope that the number of breeding pairs at the CICRP, Long Island/Chequamegon Point, and some day at additional sites—perhaps at Seagull Bar and Duluth-Superior Harbor, will contribute to the ongoing efforts to restore the regional breeding population.

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Michael Huebschen was treated to a posing Spotted Sandpiper at Crex Meadows in Burnett County in early June.

50 Years Ago—Nancy Nabak

Excerpts from Summer 1967, Volume 29, Number 2

A large portion of the Summer 1967 *Passenger Pigeon* is dedicated to the birds of Douglas County, with an essay written by Richard F. Bernard. The 265 species in the report were documented by a specimen, recent sight records, or by a published record in *The Passenger Pigeon*. A separate "hypothetical list" of 13 additional species were included at the end of the paper along with remarks supporting the possibility of their occurrence in Douglas County.

A Ringed Turtle Dove was observed carefully on June 6 in the city of Horicon by Harold Mathiak. The bird appeared very light colored in flight. Sam Robbins notes that the identification was confirmed by his brother, Chandler, in November and that another bird was seen in Jefferson county this past winter.—Harold Mathiak, Horicon, WI

Bell's Vireo Nesting in Beloit: After having observed two pairs of Bell's Vireos for several days previously a nest was discovered on June 11, 1967. (At one nest) the bird is a consistent day long performer. Both nests were located in honeysuckle bushes just under two feet off the ground. One nest contained four eggs and the second was in the process of construction. The eggs of the first nest hatched on June 20.—Thomas Ellis, Beloit WI.

From the Summer Season report: Sam Robbins flushed a female Spruce Grouse in Sawyer county on July 19. It was as close as six feet, displaying rufous fringe on tail as it flew away.

This stunning image of a juvenile Bald Eagle was taken by Jim Stewart at Tower Hill State Park in Iowa County in early July.

The Summer Season: 2016

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Overview

Observers recorded 275 species during the season. The average for the previous five summer seasons is 273 species ranging from a high of 280 in 2014 to a low of 264 in 2011. In addition there were three hybrids including both hybrids of the blue-winged × golden-winged warbler and two introduced species that are not on the official state list (Great Tit and European Goldfinch). Three regions totaled over 200 species each with the east-central leading the way at 230 species followed by the north-central with 216 and the northwest with 215. The top three counties (and their species totals) were Manitowoc (178), Douglas (175), and Marathon (169). Note that these high species totals don't necessarily reflect the true "summer" diversity of an area relative to others with lower totals. To some degree, higher number of species also depends on other factors such as level of county coverage and presence or absence of late spring and early fall migrants moving through the region.

Weather

General comments on the summer weather come from the regional and overall state summaries provided by the Wisconsin State Climatology Office (WSCO). WSCO data consists of actual average temperature and precipitation as well as departures from historical norms (1981–2010). Statewide average precipitation was 1.5 inches above the long-term normal of four inches for the summer months. The north central and northeast regions of the state had a wetter June with two to three inches above normal. This wetter pattern then shifted to the northwest region in July. Central and southern regions of the state were just slightly higher than normal for precipitation, with the only exception being the SE corner of the state which was at or slightly below normal rainfall amounts. Average temperatures were only slightly higher than historical norms and were moderated by the cooling effect of adequate moisture in the soil this summer. Daryl Tessen writes that "occasional hot, humid weather was interspersed with less humid, cooler weather. Rainfall was abundant in June (8.5 inches in Appleton), while rainfall was less in July but still totaled 3.5 inches." The big weather story of the summer was the multiple rounds of thunderstorms that moved through northeast Minnesota and into the northwest part of Wisconsin on 11–12

July. This brought six to ten inches of rain in a 24-hour period with severe flooding and washed out roads which likely had an effect on ground breeders. The Saxon harbor area in northern Iron County was hit with severe downburst winds and major flooding from the many waterways flowing into it. Other notable weather stories of the summer were the 5 July squall line and tornadoes in Buffalo and Vernon County, the squall line which produced tree damage and power outages across northern Wisconsin on the morning of 21 July, and the four-day stretch of high heat and humidity across southern Wisconsin during 21–24 July.

Species Highlights

At the time of this writing, Wisconsin's official state checklist shows 437 species categorized by relative abundance as abundant/common, uncommon, rare/very rare but regular, and casual/accidental. The checklist also defines which species require documentation for review by the WSO Records Committee. These are marked here and in the species accounts that follow with a dagger symbol (†). There were thirteen reviewable species recorded this summer.

This season featured three species from the casual/accidental category: Whooping Crane, Swallow-tailed Kite†, and White-winged Dove†. The crane's status is in transition as it now is found annually and breeds in the state. The kite was only the fourth summer record and had not appeared in the summer season since 1982. The dove was found in two counties (tenth and eleventh summer record) with probable breeding noted in Lafayette County.

From the rare/very rare category there were nineteen species reported this summer: Spruce Grouse, Snowy Egret, Yellow-crowned Night-Heron†, Glossy/White-faced Ibis†, Mississippi Kite†, Yellow Rail†, Black-necked Stilt, Red-necked Phalarope, Little Gull†, Laughing Gull†, Arctic Tern†, Chuck-Will's-Widow†, Western Kingbird†, Loggerhead Shrike, Worm-eating Warbler, Kirtland's Warbler, Yellow-throated Warbler, Prairie Warbler, and Blue Grosbeak†.

Other highlights from the season included Greater White-fronted Goose (fourth summer record), Surf Scoter, Northern Bobwhite, Sharp-tailed Grouse, Red-necked Grebe, Rufous Hummingbird†, Piping Plover, Upland Sandpiper, Hudsonian Godwit, Marbled Godwit, Snowy Owl, Black-backed Woodpecker, Gray Jay, White-eyed Vireo, Boreal Chickadee, Northern Mockingbird, Kentucky Warbler, and Summer Tanager.

Daryl Tessen writes that "there were limited exciting birds around although a loggerhead shrike family (found by Ted Keyel), a singing worm-eating warbler (Baxter's Hollow) and of course the Arctic tern at Manitowoc AND the swallow-tailed kite in Door did get the adrenaline flowing."

Notes on the Second Wisconsin Breeding Bird Atlas (WBBA II)

The main focus of Wisconsin birders at this time remains the breeding bird atlas work being conducted statewide. 2016 marked the second year of this five year project (2015–2019). Highlights below are excerpted from news articles posted on the WBBA II eBird portal [Reference: http://ebird.org/content/atlaswi/]. For more information on protocol and ways to get in-

volved in the atlas project, please check out the website at http://wsobirds.org/atlas.

The number of atlasers has grown from 700+ in the first season to 1,100+ in year two. After two seasons the WBBA II confirmed species list has grown to 220 as compared to the 226 confirmations recorded during the six years of the first atlas. One species not confirmed in the first atlas but confirmed this summer was Blue Grosbeak which nested successfully in Sauk County. This is the first documented breeding in the state since 1970. Other exciting finds during the second summer season of atlas work included a brood of Horned Grebes at Crex Meadows, the successful nesting of Piping Plover in lower Green Bay for the first time in seventy-five years, probable breeding of White-winged Dove in Lafayette County, and a singing Summer Tanager in Sauk County. Additional details for these birds are included under the individual species accounts that follow.

Atlas data indicates that the nesting range of merlin has expanded to the south while Orchard Oriole and Tufted Titmouse are extending farther northward. The top ten species on the rise based on atlas numbers to date are Peregrine Falcon, Bald Eagle, Trumpeter Swan, Orchard Oriole, Tufted Titmouse, Lark Sparrow, Canada Goose, Sandhill Crane, Black-crowned Night Heron, and Wild Turkey. Three species that were confirmed in more than two blocks during the first atlas but remain unconfirmed to date for the second atlas are American Wigeon, LeConte's Sparrow, and White-winged Crossbill.

Two suggestions for improving the value of eBird submissions seem apparent when reviewing the data. First, adding details on the plumage of certain types of birds such as gulls and shorebirds would be of interest not only to someone using the data for research, but to the casual observer trying to relocate said species when following up on an eBird notification. Second, and maybe of more importance for reviewing results during the breeding season would be a breakdown of adults/young in the reported numbers. These types of information can be included by using the "Add Details" tab behind any species you add to your checklist.

The atlas team added point counts this season to help fill in the gaps and give better indication of numbers. These are ten minute counts at five specified locations within each of the 500+ atlas blocks throughout the state. Twenty-six surveyors completed a total of 4,037 point counts between 24 May and 7 July in the first year of this added effort. The point counts tallied a total of 90,838 individual birds of 192 species. Eventually this data will also be incorporated into the WBBA II eBird portal.

Breeding Bird Survey (BBS) Routes

There are 92 breeding bird survey routes in the state and each June volunteers complete the majority of them. In the previous five seasons (2011–2015) Wisconsin has an excellent record of a 93+% completion rate for these routes. The average annual result for this five-year period is a count of 70,853 individual birds of 176 species. At four to five hours per route this represents over 400 hours of observation across all regions of the state each summer. This is valuable data that I would have liked to include in this seasonal summary. However the data input, re-

view and validation process used by the US Geological Survey (USGS) is not completed in time to be available for inclusion in the same year's seasonal summary. Randy Hoffman (summer seasonal editor from 2008–2013) suggested that volunteers should enter their route data into eBird to make it more readily available for this review. A few observers have done this but not to any great extent to date. I will explore possibilities with the USGS and Wisconsin volunteers for ways to obtain more timely results for inclusion in future summer season summaries. At the least perhaps some comments can be made for the previous season if not the current one. This summer Daryl Tessen wrote "My one BBS route (last time this year; has been 50+ years) was unusually quiet. Could have been the weather. However, the limited times I was out this seemed typical, especially for "standard" birds."

In addition to BBS data, there are numerous other surveys conducted in the summer that are also of interest. This includes the annual bird survey conducted in the Nicolet National Forest in June and the Wisconsin Nightjar survey conducted on 50+ defined routes statewide in early to mid-June. However, these results are also not currently accessible on a timely basis for this summary.

County Coverage

Statewide county coverage has greatly increased in recent years due to the more widespread use of eBird and that is the major source of data for the species summaries that follow. In general, that expansion of eBird usage combined with the fact that we are in the middle of the statewide breeding atlas project means that the number of counties reporting a given species remains at the historically high levels noted in the 2015 summer report. When the current atlas project is completed in 2019, it will be interesting to compare pre and post atlas numbers to those experienced during the atlas period.

The average number of eBird contributors per county this summer was 43, ranging from a low of six in Menominee County to a high of over 200 in Dane County. In terms of the sheer volume of eBird submissions, the number of records submitted for the 2016 summer season grew by about 7.5% over the same period from 2015. The average number of individual species records submitted per county was 4,300+, ranging from a low of about 946 in both Iron and Marquette counties to a max of almost 28,000 from Dane County. However, there are some prolific eBirders in some counties so the number of observers doesn't always tell the full story of county effort. For example, Florence County only had eleven observers making submissions this summer but still had a total of 3,700+ species records filed, and 75% of them were filed by a single observer (Kay Kavanagh)!

Species Accounts

The individual species accounts that follow continue the tradition established in recent years to include comments on all the species found in the state during the season. On occasion there may also be comments on a species that was missed during the period. A dagger symbol (†) behind the species name indicates that documentation is required by the WSO Records Committee. For species requiring doc-

umentation I have noted the observers who submitted accepted reports in brackets at the end of that species account († = written documentation, ph = photo).

The taxonomic order used in the species commentary follows the major changes made in the 57th supplement (2016) to the AOU Checklist of North American Birds. These species accounts follow the same general format used by Alyssa DeRubeis for the 2014 and 2015 summer season summaries and include comments on total counties reporting, high individual counts, and counties that confirmed breeding for the second year of the statewide atlas. Confirmed breeding records noted in this summary are restricted to the months of June and July only.

Breeding confirmations that are new county records for atlas work are marked with an asterisk (*) by the county name. This was determined to the best of our current ability based on comparison to eBird records from 1991–2015. There is a small amount of possible inherent error in county records for the first atlas from blocks which were multi-county. This is because observations in those blocks were all assigned to the county at the center of the block.

Any comments on state distribution

follow the same nine regional areas used in the 2014 and 2015 summaries and are based on the delineation used by WSCO for climate records. These nine regions (and counties included in each) are referred to in the text as northwest (Barron, Bayfield, Burnett, Chippewa, Douglas, Polk, Rusk, Sawyer, and Washburn), north-central (Ashland, Clark, Iron, Lincoln, Marathon, Price, Oneida, Taylor, and Vilas), northeast (Florence, Forest, Langlade, Marinette, Menominee, Oconto, and Shawano), west-central (Buffalo, Dunn, Eau Claire, Jackson, St. Croix, LaCrosse, Monroe, Pepin, Pierce, and Trempealeau), central (Adams, Green Lake, Juneau, Marquette, Portage, Waupaca, Waushara, and Wood), east-central (Brown, Calumet, Door, Fond du Lac, Kewaunee, Manitowoc, Outagamie, Sheboygan, and Winnebago), southwest (Crawford, Grant, Iowa, Lafayette, Richland, Sauk, and Vernon), south-central (Columbia, Dane, Dodge, Green, Jefferson, and Rock), and southeast (Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Waukesha, and Washington).

Additions to 2015 Summary

Reports on canvasback (confirmed nesting) and worm-eating warbler from the 2015 summer season were submitted too late for inclusion in that previous seasonal report. Comments on those 2015 records have been included under the species summaries in this report.

Special Acknowledgement

This is my first effort at the summer season summary and I would like to thank and acknowledge the guidance provided by both past and present seasonal compilers. This includes the two previous summer season editors Alyssa DeRubeis (2014–2015) and Randy Hoffman (2008–2013); and current compilers Ted Keyel (winter), Sunil Gopalan (spring) and Robert Domagalski (fall). Special thanks to Sunil for help with eBird data extraction and analysis.

Species Accounts (1 June-31 July 2016)

Reference: eBird Basic Dataset. Version: EBD_relNov-2016. Cornell Lab of Ornithology, Ithaca, New York. November 2016. Any references to Robbins are taken from Robbins, S. D., Jr. 1991. Wisconsin Birdlife. University of Wisconsin Press, Madison, WI.

Abbreviations: DNR=Department of Natural Resources, NRF=Natural Resources Foundation, NWR=National Wildlife Refuge, SNA=State Natural Area, SP=State Park, SRA=State Recreational Area, SWA=State Wildlife Area, USFWS=US Fish & Wildlife Service, WBBA I=first Wisconsin Breeding Bird Atlas (1995–2000), WBBA II=second Wisconsin Breeding Bird Atlas (2015–2019).

m.ob. indicates many observers (three or more). Multiple observer names joined with slash marks indicates they were birding together as a group.

† = Dagger indicates species that require written documentation and also is used to note observers who submitted written documentation to the WSO Record Committee. [Documentation submitted to the committee is noted in brackets at the end of the species account, ph = photo]

* = Asterisk indicates a new county

breeding record for summer 2016 based against eBird records from 1991–2015.

Greater White-fronted Goose—Summer season records for this species are very few and far between. A single bird was found on the Great River State Park Trail in Trempealeau County in the early afternoon of 5 June (Waggoner). There are only three previous summer records with the most recent of those being 3 June 1990. It is of interest to note that a single bird was also reported later that same day about 200 miles to the north and just across the state line on Minnesota Point. That bird was thought to have arrived following thunderstorms and strong westerly winds.

Snow Goose—Not reported this summer following an early June observation last year. This species has been recorded in only three of the previous ten summer seasons.

Canada Goose—Reported from all counties with breeding confirmed in 67 counties including Menominee* (Steger). A maximum estimate of 500+ was reported from Dodge County on 10 June (Brinkman).

Mute Swan—Observed in seventeen counties which is significantly up from the five year low of seven counties reported last summer. The highest count was ten birds found at Meyers Park in Racine County on 9 July (Goldberg). Confirmed breeding was noted in Walworth County and Outagamie County.

Trumpeter Swan—Reported from 39 counties. Breeding was confirmed in twenty counties including Florence* (Kavanaghs). The highest numbers came from Necedah NWR in Juneau County with 50+ birds on a 16 July NRF field trip.

Tundra Swan—Janine Polk reported a continuing bird with a broken wing from Chippewa County on 22 June.

Wood Duck—Reported from all 72 counties with a high count of 250 from Zeloski Marsh in Jefferson County on 2 June (Stutz). Sixty-five counties had confirmation of breeding for the atlas.

Gadwall—The seventeen reporting counties climbed back to the level of 2014 after dropping to only eight counties last summer season. The most northerly report was from Ashland County on 8 July (Sharp). Breeding was confirmed in the following counties: Dodge (m.ob.), Dunn (Polk), and at Hope Marsh in Marquette* (Christensen). High counts of fifteen came from Horicon NWR in Dodge County on 20 June (Coulter) and Cat Island in Brown County on 17 July (Prestby).

American Wigeon—Observed in thirteen counties with a maximum of six reported from Mead SWA in Marathon County on 30 July (Belter). Breeding for this species remains to be confirmed for the second atlas project. Probable breeding was detected in Juneau County (Guth).

American Black Duck—Observers reported this species from seventeen counties. The largest number recorded was twelve from Bear Lake in Vilas County on 22 July (Thienemann). Breeding was confirmed in the following far north counties: Ashland (Kreiss), Burnett (Christensen), Oneida (Peczynski), and Vilas (Pritzl).

Mallard—Reported from all 72 counties with confirmed breeding in 63 of them. High count was 350 from Horicon NWR in Dodge County on 3 July (Howe and Wegner).

American Black Duck x Mallard—This hybrid was reported from seven counties last summer but there was only a single report this summer. This lone hybrid was found at Horicon Marsh in Dodge County on 28 July (Gray/Kavanagh/Maertz).

Blue-winged Teal—Reported from 50 counties with a high count of 75 coming from Horicon NWR (Dodge County) on 17 July (Sweets). Ziebell reported 44 adults and five nests from Rush Lake in Winnebago County on 16 June. Confirmed breeding in twenty-two counties including Forest* (Richmond), Iron* (NLDC), and Milwaukee* (MCPS).

Northern Shoveler—A good summer with reports submitted from twenty-one counties, up from the fifteen where noted last summer. Migration of this species can continue into early June. About half of these counties held summering birds based on reports into late June and July. Breeding confirmation came from three counties: Calumet* (Whitmores), Columbia (Martins), and Marquette (Christensen). The highest

number reported was eight from Hope Marsh in Marquette County on 23 July (Christensen).

Northern Pintail—Pintails were found in nine counties with multiple individuals reported from Horicon NWR (Dodge/Fond du Lac County) during late June and throughout July (m.ob.). A maximum of six were noted there on 25 July (Roti Roti). Single reports of three birds came from Paradise Valley SWA in Waukesha County on 3 June (Coulter), Cat Island in Brown County on 12 June (Prestby), and Necedah NWR in Juneau County on 23 July (Ellis III). A pair lingered until 7 June at Blakely Lake in Dunn County (Polk). Single individuals were reported in Douglas County on 7 June (Kraemers), Marathon County on 11 June (Belter), and Trempealeau County on 21 July (Zickuhr). Wisconsin lies on the southeastern fringe of the breeding range for this species. Burnett County and Brown County had the only two breeding confirmations during WBBA1.

Green-winged Teal—The number of reporting counties climbed from fifteen last summer to twenty-six this summer, matching the record high from 2013. The largest concentration was fifteen birds seen 8 July in Brown County (Prestby). Breeding was confirmed at Powell Marsh in Vilas County on 21 June (David). Probable breeding was reported from the additional counties of Burnett (Paulios and Morse), Outagamie (NWBC), and Sawyer (Dawson/Kibbe/Goldthwait).

Canvasback—The only location reported this summer was from Cat Island in Brown County where Prestby found one to two birds on five separate occasions between 1 June and 26 July. This is below the average level of five reporting counties**.** [Note: Tom Ziebell provided the first WBBA II breeding confirmation for this species at Rush Lake in Winnebago County on 16 June 2015. The report was not received in time for inclusion in last season's summer report and so is noted here.]

Redhead—Observations were reported from fourteen counties mostly in the south central and east central areas. The most northerly report was of a single bird from Ackley SWA in Langlade County on 4 July (Bergh). Confirmed breeding in four counties: Dodge (m.ob.), Dunn (Polk), Fond du Lac (Boehlke and Maurice), and Outagamie (Malcolm and R. Mueller). Joel Trick found 73 of them at the Manitowoc Impoundment on 9 June. Howe and Wegner counted 45 adults and 70 juveniles at Horicon NWR in Dodge County on 3 July.

Ring-necked Duck—Reported from twenty-two counties with a high count of at least 49 birds on 17 June at Crex Meadows in Burnett (K. Lund). Breeding confirmed in thirteen mostly northern counties including Bayfield* (Frank) and Washburn* (Berg) plus south to Monroe (Epstein) and Juneau (Volenec) in the central part of the state.

Greater Scaup—Observations came from six counties with no more than four individuals reported: Brown (Prestby), Door (Licata), Kewaunee (Swelstad and Zenner), Manitowoc (m.ob.), Marinette (Hurst), and Ozaukee (Schwartz). Birds apparently summered with reports throughout June in Manitowoc County and from late June though the end of July in Brown County. The other counties noted had single birds on a single date or one to two birds over a short period in June.

Lesser Scaup—Reported from ten counties which is average for recent summers. Twenty-four observers reported birds throughout June in Manitowoc with a high count of eleven. Lessers were reported throughout the season at Cat Island in Brown County with a high count of four. Other reports greater than just one or two individuals included five in June and eight in July from Navarino SWA in Shawano County (Brinkman) and four on 5 July at Thunder Lake in Oneida County (Peczynski).

Surf Scoter—A single adult male was reported from the Manitowoc impoundment on 5 June (Lupin) with continued observations by many other observers through 12 June. Individuals have been observed in four of the previous ten summer seasons. [†Wood]

Long-tailed Duck—A female with an injured left wing was found in Manitowoc County on 12 July (Sontag) and photographed that same day by Chuck Heikkinen. This bird was reported almost daily through July 22 by Sontag and then seen once more by him on 31 July. There were no reports of this bird lingering into August. Any previous summer season report for this species goes back to 2003 when individuals were found in both Manitowoc and Dane counties.

Bufflehead—Reports came in from three counties with individual females found on 2 June in Ashland (Evanson) and 16 June in Burnett (Schmoker) plus a single male reported from Manitowoc from 4 June through 8 July (Lupin). There were no reports of probable or confirmed breeding activity.

Common Goldeneye—The seven counties reporting "whistlers" this summer were Bayfield, Chippewa, Manitowoc, Oneida, Price, Sawyer, and Sheboygan. Atlas field workers confirmed breeding in Bayfield County (Miller), on Pelican Lake in Oneida County (Kempen), and in Price County (Dawson/Goldthwait/Kibbe). All breeding confirmations were of a female with young.

Hooded Merganser—Reported from 59 counties statewide except for the west central and southwest regions. Breeding was confirmed in 41 counties including Adams* (Evanson) and Milwaukee* (Wanger). Several reports had counts as high as twenty birds: Manitowoc (Collison), Oconto (Swelstad), and Vilas (Pritzl) counties.

Common Merganser—Reported in sixteen central and northern counties with a high count of 40 birds in late July on Trout Lake in Vilas (Stone). Breeding was confirmed in Door County (m.ob.) and St. Croix* County (Fredrickson) plus ten northern counties including Lincoln* (Haas).

Red-breasted Merganser—Sightings came from the following eight counties along the Great Lakes or Lake Winnebago: Ashland, Door, Douglas, Kewaunee, Manitowoc, Milwaukee, Sheboygan, and Winnebago. The highest reported total was 75 from Newport SP in Door on 3 June (Lind). Probable breeding was reported from two counties: courtship behavior at Weborg Point in Door County on 4 June (S. Peterson), a pair on Plum Island also in Door County on 10 June (Walsh), and a pair at Otter Island in Ashland County on 26 June (DeWitt).

Ruddy Duck—Observed in twenty-two counties which is a higher than average season and compares to twelve from last summer. The most northerly report was of a single bird at Crex Meadows in Burnett County on 2 June (Paulios and Morse). The high count of 70–80 came from Horicon in late July (Bridge and Christensen). Breeding confirmations for the following counties: Dodge (m.ob.), Dunn (P. Campbell), Fond du Lac (Wentz), Marquette* (Christensen), Sheboygan* (Schroeder), and St. Croix (Olyphant).

Northern Bobwhite—Wisconsin is at the northern end of the range for this game species. Over the previous ten summer seasons the average number of reporting counties is nine (ranging from five to fourteen). The eleven reporting counties this year is the same number as last year with only four counties in common to both years (Columbia, Iowa, Kenosha, and Sauk). Most of the reports were of a single bird with a high report of six from Richard Bong SRA in Kenosha County on 15 July (Wenzel). Most bobwhites reported are of unknown origin with possible sources including game farm release or hunting dog field trials. A quick internet search for game farms and dog training areas in the state located either or both of them in at least 57 counties distributed across all regions. DNR wildlife managers and volunteers have been running whistling counts in western and southern Wisconsin for over sixty years. These biennial surveys are conducted between 15 June and 5 July under defined weather conditions. The whistles per stop data for recent surveys are only a few percent of the long term average. The 2015 DNR report authored by Jes Rees concludes that "the continued declines of bobwhite quail in Wisconsin and nation-wide reflect factors beyond weather conditions. Such causative factors are thought to include habitat deterioration, predation, and possibly pesticides. Continued losses of grasslands and changes in land use threaten the future of quail populations in Wisconsin."

Gray Partridge—There were no reports for this summer season. This species was reported in eight of the previous ten summers but averaging just a single county per year with six counties represented over that decade (Columbia, Crawford, Dane, Grant, Iowa, and Manitowoc). Over that same decade the winter reports averaged between three and four counties a season with twelve counties on the combined list. Perhaps it should not be surprising that these birds are significantly more conspicuous in the winter months even though they are likely present year round in the same locations.

Ring-necked Pheasant—Reported from 48 counties with a high count of sixteen from Goose Pond in Columbia on 31 July (A. Holschbach). Sixteen counties had confirmed breeding including Burnett* (Hoefler). The summary of the

annual DNR rooster survey conducted in April showed similar overall statewide numbers to the 2015 survey, with higher numbers in the west central region and lower numbers in the south central (Pollentier and Hull).

Ruffed Grouse—Birds were reported in 42 counties with 95% of these from the central and northern regions. Breeding was confirmed in twenty-nine of these counties. Counts exceeding fifteen birds came from observations of hens with broods in two northern counties: Douglas (Nicoletti) and Price (Merkel). The 2016 annual DNR drumming survey (Brian Dhuey) indicated slightly higher numbers statewide than in 2015. The report concludes that numbers may now be increasing with the next decline of the cycle expected in 2021–2022. The report also notes that this nine to eleven year population cycle has an overall longer term downward trend. The highs in the cycle are not as high and the recovery is slower from the cyclic lows. These annual roadside surveys for drumming grouse have been conducted by the DNR between 1 April and 10 May since 1964. An annual census in the Sandhill SWA in Wood County tallied 62 drummers, a concentration of slightly less than two drummers per 100A.

Spruce Grouse—Observations from six counties where a hen with two young seemed to be the norm based on the following accounts. Breeding was confirmed in four of these counties, all by the fledged young breeding code. Keith Merkel encountered a female and two young birds in a spruce bog in Ashland County on 26 June. Shawn Miller flushed a female and two juveniles from a spruce bog in Douglas County on 16 July. Robert Spahn had a surprise encounter with a female and two young birds while driving home from dinner on 19 July in Vilas County. Then three minutes down the road he crossed paths with another family of three! Jeff Brinkman found six birds (adults and juveniles) gritting along the roadway leading into Lauterman Creek in Florence County on 25 July. Sightings also included a hen with two chicks in Sawyer County on 1 July (Keyel) and a male in Forest County on 2 July (Grossmeyer).

Sharp-tailed Grouse—Two counties reported sharptails which is half of the record number of counties that reported in 2015. A single bird flushed out of a young jack pine stand in the Island Lake CE block in Bayfield County on 27 June (N. Anich and C. Christenson). Grouse were also reported from two locations in Burnett County. Six birds were observed on an NRF trip at a known lek in Crex Meadows SWA on 3 June (Paulios) and Carl Schroeder reported two to four birds at the same general location on 16–17 July. The other Burnett location was at Namekagon Barrens where seventeen birds were flushed from a dancing ground on 7 June (Hoefler). Hoefler reported two birds in the same general area on 26 July. Two of the Burnett sightings were coded as probable breeding but there were no confirmed reports of breeding this summer season.

Greater Prairie-Chicken—Reported from three counties in the expected grassland locations in the central part of the state. Breeding was confirmed in Marathon* County on 29 June with the observation of an adult female and three fledglings in the Mead SWA (Kozak and Zinda). A single adult male was reported on 10 July from Wood County (Widmann). Multiple observers submitted July reports from the Buena Vista grasslands in Portage County with one confirmed breeding report by Dadisman on 26–27 July. No reports from Leola Marsh in Adams County. Multiple DNR surveys conducted in March and April in central Wisconsin found a range of 217 to 260 males over 36 booming grounds (Lesa Kardash). All the survey areas have been relatively stable since 2010 and include Buena Vista Grasslands, Leola Marsh, Mead SWA, and Paul J. Olsen SWA.

Wild Turkey—Reported from all 72 counties with 65 confirming breeding including Menominee* (Prestby). The high count was twenty-nine birds in Florence County on 22 July where Brinkman observed five adults with twenty-four chicks.

Pied-billed Grebe—Reported from a record high 56 counties statewide upping last summer's record of 49. The high count came from an annual summer survey at Rush Lake in Winnebago County where Ziebell found 60 adults and 98 young on 16 June. Confirmed breeding took place in 36 counties including Barron* (Berg), Green* (Yoergers), Iowa* (Kivikoski), Pierce* (Grosse), and Washburn* (Berg).

Horned Grebe—The sole report was from Daryl Christensen who confirmed nesting at Crex Meadows in Burnett* County on 16 June. He and Sumner Matteson observed a female with two ju-

veniles while conducting atlas work and monitoring Black Terns. There was only one confirmation of breeding during the WBBA1 project (Langlade County). This species has been recorded in seven of the previous ten summer seasons.

Red-necked Grebe—Individual birds were reported from Bayfield County on 3 June (Brady), St. Croix on 4 June (Fredrickson), Douglas on 7 June (Kraemers), and Oneida on 3 July (Calavera). Birds were reported throughout the summer period in Burnett County with confirmed breeding (m.ob.). Rush Lake in Winnebago County held five adults and five young birds during a 16 June colonial water bird survey conducted by Tom Ziebell.

Western Grebe—There were no reports this summer season. This species was reported last summer and in four of the ten summer seasons between 2006 and 2015.

Rock Pigeon—Reported from all 72 counties with confirmed breeding in 49. The high count of 125 pigeons was noted at the Superior grain elevators in Douglas County on 3 July (Svingen).

Eurasian Collared-Dove—Present through the season with reports from eighteen counties mostly across the southern third of the state and northward into the west central and northwest regions along the Mississippi River corridor. The most northern report was a bird seen 26 June on a farm in Burnett County (Ohnstad per Berg). Breeding was confirmed in Barron* (Berg), Dunn (Polk), LaCrosse* (Calvetti), and Racine* (Weber) counties. The high count of seven birds came from Muscoda in Grant County (Ouren).

White-winged Dove†—This species was reported from Argyle in Lafayette County on 8 June (Q. Yoerger) with a last report filed from that location 23 July (Anderson). This was the first record of probable breeding for WBBA II. See "By the Wayside" for the account submitted on this bird. Another individual was reported from near Neillsville in Clark County on 4 July (Cameron). Both of these were accepted by the WSO records committee to become the tenth and eleventh summer records since 2000. This summer marked the sixth consecutive summer season for this species, and the third summer of the past four in which it has been reported from two counties. [Lafayette County: ph. †Q. Yoerger, ph. †Grossmeyer, ph. †Anderson; Clark County: †Cameron]

Mourning Dove—Reported from all 72 counties with breeding confirmation from 65. A high count of 60 doves was noted in Horicon Marsh on 19 June (Collison).

Yellow-billed Cuckoo—Reported from a record high 62 counties across all regions of the state. Several observers reported a high count of five birds. Breeding confirmed in sixteen counties including Ashland* (N. Anich), Douglas* (Nicoletti), Green* (Q. Yoerger), Price* (Krakowski), Rock* (Haycraft), St. Croix* (Persico), and Vernon* (Damro). Another nineteen counties detected probable breeding activity.

Black-billed Cuckoo—Reported from a record high 69 counties. The maximum count of six birds came on 18 July from Price County (Keyel). Breeding was confirmed in twenty-two counties including Buffalo* (Patterson). An additional twenty counties had reports of probable breeding.

Common Nighthawk—Reported throughout the period from 37 counties which is down considerably from the 48 counties of the previous summer season. Confirmed breeding was detected in six counties: Bayfield (J. Peterson), Jefferson* (Belzer), Lincoln* (Nemec), Marinette (Swelstad), Outagamie* (Erdman per R. Staffen), and Washburn* (Berg). A dozen individuals were reported flying over a clear cut in Vilas County on 8 July (Spahn). An additional fourteen counties had reports of probable breeding.

Chuck-will's-widow†—For the fifth consecutive year this goatsucker species spent part of the summer in the Kettle Moraine straddling the county line between Jefferson and Walworth counties along Young Road. The bird was present at the beginning of the period having arrived during May. The last report of the season was on 2 July calling from the Jefferson County side (Anderson). A total of twenty-one observers filed reports on this bird. Reports indicate that the bird first started calling between the hours of 20:00 and 21:30.

Eastern Whip-poor-will—Reported from 50 counties. The high number reported was fifteen birds on 16 June in the Quincy Bluff SNA of

Adams County (O'Donnell). Breeding was confirmed in three counties: Marinette* (5 June, Leitzke), Burnett (7 June, Hoefler), and Columbia* (29 June, Kehrli). Probable breeding was detected in an additional twenty-two counties.

Chimney Swift—Reported from 70 counties. Maximum count was from the Vernon County Museum with 298 birds on 17 June (Hayes). This is the same observer and location as the peak summer season count of 175 last year. Confirmed breeding in 27 counties.

Ruby-throated Hummingbird—Reported from all 72 counties. Confirmed breeding in 44 counties including Kewaunee* (Sinkula). High count was of 63 birds recorded on 16 July by Cynthia Bridge during banding operations in Washburn County.

Rufous Hummingbird†—A male rufous was reported by a home owner in Portage County on 29 July (Zinda and Kozak). The last summer season report was in 2012. This is the tenth summer season record with most sightings occurring in mid to late July in advance of the more expected fall migration. Two records exist in June from 1986 and 1999. [ph. †Kozak, ph. †Zinda]

Yellow Rail†—This secretive species went unreported for the 2013 and 2014 summer seasons but was found again this summer as in 2015. In the previous ten summer seasons it was reported just four times and in all cases from just a single county**.** This summer individual birds were detected by vocalization in three counties. Liu detected one mid-day on 3 June at Trempeleau NWR, Prestby at Oconto Marsh the evening of 12 June, and Schroeder in the evening hours of 16 July at Fish Lake SWA in Burnett. The Oconto County observation was the only one recorded as probable breeding behavior for the season.

King Rail—There were no reports for this species during the 2016 summer season. This largest of the state's rails has been reported in eight of the previous ten summer seasons (also missed in 2011 and 2013).

Virginia Rail—Reported from a record high 48 counties with Crawford the only county from the southwest region. The maximum count of eight birds (an adult pair with six chicks) was 23 July from Paradise Valley SWA in Waukesha County (Dabey). This rail species was confirmed as breeding in eleven counties including St. Croix* (Fredrickson) with all of these coming from observations of fledged young.

Sora—Reported from 50 counties with Sauk the only county from the southwest region. Breeding behavior was confirmed in thirteen counties including Outagamie* (Malcolm), Polk* (Maercklein), and Waushara* (Dadisman). Again, as expected for rails, these confirmations were almost all for fledglings with the exception of one observation of carrying food in Ozaukee County (W. Mueller). The high count reported was of thirty plus birds in Fond du Lac County on 18 July (Tessen).

Common Gallinule—Birds were found in a record high sixteen counties. The most northerly report was of two adults from North Honey Island Flowage in Marathon County on 30 July (Belter). A max high of fourteen individuals was reported from Old Marsh Road at Horicon NWR in Dodge County on 31 July (Wood). This more secretive marsh dweller was confirmed as breeding in only six counties: Brown (Swelstad), Columbia (Lisitza and Otto), Dodge (m.ob.), Fond du Lac (m.ob.), Outagamie (Malcolm), and Walworth (Wolff). An additional three counties had reports of probable breeding: Green Lake (Shealer), Sheboygan (Schroeder), and Waukesha (Mimier).

American Coot—Reports came in from thirty-one counties highlighted by an estimated 400 birds on 29 July at Horicon NWR in Dodge (Rueckheim), and 717 birds (586 adults and 141 young) at Rush Lake in Winnebago County on 16 June (Ziebell). Confirmations of breeding came from fifteen counties.

Sandhill Crane—Reported from all 72 counties with 65 providing confirmed breeding records including Pierce* (Wieland) and Washburn* (Morales and Julson). Stutz tallied a count of 300 birds in Dodge County on 28 July.

Whooping Crane—Sightings expanded to sixteen counties following reports from nine counties in the previous two summer seasons. Reports of as many as six birds came from Necedah NWR in Juneau County. Hillary Thompson (analyst with the International Crane Foundation) reports that the Whooping Crane Eastern Partnership estimated 90 cranes in Wisconsin this season. That number is comparable to numbers from that group in the 2014 and 2015 summer seasons.

Twenty-three wild chicks hatched, two to three of which fledged but none survived to migrate. Nesting was reported in Juneau, Adams and Wood counties.

Black-necked Stilt—At least fifty-three observers enjoyed these birds at Horicon NWR in both Dodge and Fond du Lac County. The number of stilts reported from the marsh peaked at twenty-two birds on 23 July (Tessen). Two stilts were reported from Jefferson County on 18 June (Stutz and Woods). Breeding was confirmed with fledglings from both the Dodge and Fond du Lac County sides of Horicon NWR in late July (m.ob.) while the Jefferson County location was coded as probable.

American Avocet—Found in two counties this year following the record high of eight counties noted last summer. Two individual southbound migrants were reported in July. One was observed on the beach at the mouth of the Poplar River in Douglas County on 13 July along with a flock of greater yellowlegs and a willet (Nicoletti). The other was sighted in Manitowoc County on 22 July (Sontag).

Black-bellied Plover—Late northbound birds were reported from the Apostle Islands in Ashland County (1 June, NRF field trip), the Kewaunee harbor (3 June, Sinkula), Cat Island in Brown County (4 June, Trick), and Washington Island in Door County (7 June, Noeldner). Two mid-summer reports included an adult alternate plumage bird at Cat Island in Brown County (26 June, Prestby) and an individual reported from Horicon NWR in both Dodge County (Grossmeyer) and Fond du Lac County (Huebners) on 28 June. The first fall migrant was noted on 26 July in Brown County (Swelstad).

American Golden Plover—The only report this season was a group of ten late spring migrants at Horicon NWR in Dodge County on 9 June (Zar). No reports of any early southbound fall migrants prior to the end of the period.

Semipalmated Plover—Reported from sixteen counties during the full season with a high count of twenty-one birds on 2 June in Dodge County (Tessen). Lingering spring birds were noted in ten counties with the latest being 18 June in Manitowoc (Rohrer). The only reports between 18 June and 6 July were of one or two birds at the Manitowoc lakefront. Fall migrants began to trickle into other locations the second week of July with one to three individuals noted in a total of ten counties by the end of the period.

Piping Plover—The state list classifies Piping Plovers as a species of greatest conservation need with endangered status. Observers submitted reports from three counties, half of last year's total. Participants on the 1 June NRF field trip to the Apostle Islands NL were treated to a scope view of an occupied nest on Long Island in Ashland County (Evanson and Kaehler). The most exciting summer activity took place at the Cat Island barrier island project in Brown County where a nest was found in May, four eggs were confirmed on 3 June, and chicks successfully hatched between 21–23 June (Prestby). For the full story of this exciting discovery read Tom Prestby and Sumner Matteson's account elsewhere in this issue. A single bird was also noted at South Metro Pier in Milwaukee County on 31 July (m.ob.).

Killdeer—Reported from every county except Menominee as was the case for the 2015 season as well. Confirmed breeding was noted in 61 counties. Counts of 50 or more birds were reported from Rock (Haycraft) and Winnebago (R. Mueller) counties in late July.

Upland Sandpiper—This state-threatened species was reported in nineteen counties from all regions but with only one to three counties per region. Six birds were reported from Thompson Prairie in Dane County on 11 June (Wroza and Henrikson) and seven from Green County on 24 June (Haycraft). Breeding was confirmed in Brown (Van Duyse), Green (Haycraft), and Marinette (K. Kavanagh) with probable breeding in six additional counties.

Whimbrel—There were no reports of migrants on either end of this summer season for the first time since 2007. This species was recorded during nine out of the ten previous summer seasons most often in the first two weeks of June on its way north but sometimes also as an early fall migrant later in the period.

Hudsonian Godwit—A single bird was discovered by Dick Verch in Ashland County on 3 June (per Brady). Another was observed at Blakely Lake in Dunn County on 7 June (Polk). Prestby observed a single in alternate plumage at Cat Island in Brown County 24–26 July. Records

indicate only half a dozen previous July records. The sighting frequency of this species over the previous ten summer seasons was six of ten times.

Marbled Godwit—The only reports were by Tom Prestby with a single bird appearing at Cat Island in Brown County on 12 June and seen again on 24–26 June. This species had been recorded during seven of the previous ten summer seasons.

Ruddy Turnstone—Early June northbound migrants were reported from the following seven counties with the last on 9 June in Brown County (Prestby): Ashland (Evanson and Kaehler), Brown (Prestby and J. Trick), Douglas (Grames), Manitowoc (m.ob.), Milwaukee (Wanger), Racine (Goldberg) and Sheboygan (Schroeder and Wood) A solo fall migrant was reported from the South Metro Pier in Milwaukee on 24 July (Wanger).

Stilt Sandpiper—Prestby reported the first fall movement of this species with three alternate plumage adults from his survey site at Cat Island in Brown County on 10 July. Six additional counties reported southbound migrants in July: Clark, Dane, Dodge, Fond du Lac, Manitowoc, and Winnebago. Highest count was 50+ birds at Horicon in Dodge County on 28 July (Gray/Kavanagh/Maertz).

Sanderling—Lingering northbound migrants were reported from seven counties with a max of fourteen birds reported from the Apostle Islands in Ashland County on 1 June (NRF field trip). The last departure for their nesting grounds on the high Arctic tundra was noted on 14 June from Marinette County (m.ob.). Fall migration commenced on 15 July with a report of ten birds from Brown County (Swelstad) and a high count of twenty-two birds in the same county on 17 July (Prestby). The only other July reports were from Manitowoc and Milwaukee counties.

Dunlin—Six counties reporting in early June with the last northbound migrant noted on 16 June from Manitowoc (Sontag). One bird (summer wanderer?) still lingered at Cat Island in Brown County on 26 June (Prestby). An early fall male in breeding plumage was found by Swelstad in the Green Bay West CE atlas block of Brown County on 15 July.

Baird's Sandpiper—Single birds still moving north to their high arctic breeding grounds were noted on 2 June in both Sheboygan (Grgic) and Waukesha County (Grossmeyer) with last date of 14 June in Marinette County (J. Campbell). The first fall arrival stopping over on its way back to South America for the winter was noted on 26 July at Mack SWA in Outagamie County (Gray) with reports from three additional counties by the end of the summer season.

Least Sandpiper—Reported from a total of twenty-two counties for the full summer season. Movement was a little better defined than for the Semi-sands. Northward departure extended into the first week or so of June with thirty birds noted in Douglas County on 3 June (Grames) and additional reports from Dodge and Sheboygan counties. There was then a lull in activity until later in June when reports of one to three birds started to come in from Manitowoc and then four other counties (Brown, Chippewa, Douglas and Outagamie) signaling the start of fall migration. Reports were noted from twenty counties as fall migration continued in July with high counts of 45 in Fond du Lac County (24 July, Bridge) and 50 in Waukesha County (28 July, Mertins).

White-rumped Sandpiper—Migration continued into June with reports from four counties. Two birds were seen at Samuel Meyers Park in Racine on 1 June (Goldberg) with another sighting from there on 11 June (Kinzer). Two birds were also found at Crex Meadows SWA in Burnett County on 3 June during an NRF field trip (Paulios). Two reports came from multiple observers at Seagull Bar SNA in Marinette County with a pair of birds on 7 June and a single bird on 21 June. The last departure date of the season came from Cat Island in Brown County where three birds were noted on 24 June (Prestby). There were no reports in July which might indicate that most birds made it to their typical breeding grounds in the arctic.

Buff-breasted Sandpiper—No reports of any end of July migrants this summer following the 2015 summer season when it was found in four counties. The bird has been noted in seven of the previous ten seasons between 2006 and 2015. In all cases these were early fall migrants seen in late July.

Pectoral Sandpiper—Two birds lagging behind the main migration north were reported

from Horicon Marsh in Dodge on 3 June (Anderson). The first fall migrants were noted on 10 July in Brown (Prestby) and Fond du Lac (Christian) counties. Southbound birds were reported from eleven central and eastern counties in July.

Semipalmated Sandpiper—Reported from a total of twenty-one counties for the full summer season. Observations were spread out through the entire months of June and July so when did late or lingering spring migrants finally depart and fall migration begin? One can only make an educated guess based on distribution and numbers. County distribution was more widespread with higher numbers until about 12 June. Prestby was still recording 40–70 birds from Cat Island in Brown County during 7–12 June. After 12 June numbers dwindled to one to three birds (along with reports from fewer counties) until about mid-July. Many of the continued reports of "summering" birds through mid-July were coming from areas being covered almost daily, such as Cat Island by Prestby and the Manitowoc Impoundment by Sontag. After 15 July numbers and more widespread county distribution returned indicating that the fall southerly movement was now well underway. Thirty-five were reported from Brown County on 15 July (Swelstad) and thirty from Dodge County a few days later on 19 July (Petherick).

Short-billed Dowitcher—A lingering late spring migrant was seen the first two days of June at Horicon Marsh in Dodge (Anderson, Malcolm/Miles, Tessen). The first fall migrant was found on 30 June in Manitowoc (Murkowski). Fall birds were found in ten counties with 80 birds on 26 July in Dodge (Tessen) as the high count.

Long-billed Dowitcher—There were two reports of fall migrants in July. A single bird from the Dodge County side of Horicon on 19 July (Petherick) and two birds from the Fond du Lac side on 30 July (Treves).

Wilson's Snipe—Reported throughout the summer season from a record high 40 counties. Found statewide in all regions but in only a single county from the west central and south central areas. All breeding confirmations were by distraction display or fledglings and came from Ashland (N. Anich), Bayfield* (McCaffery), Burnett* (Christensen), Douglas (Nicoletti), Portage* (Brocken and Janz), and Vilas (Christensen and Sheldon). The high count of nine birds was noted in Dodge County at Horicon NWR on 30 July (Treves).

American Woodcock—Reports from this year and last have been almost double the number of counties normally reporting in summer and this is likely due to the atlas effort. Timber doodles were reported statewide throughout the season from 48 counties. Lietz found two adults and a covey of six young birds in Oneida County on 11 June. Seventeen counties had confirmation of breeding birds including Adams* (Reed).

Spotted Sandpiper—Reported across all regions from a record high 64 counties. Breeding was confirmed in twenty-six counties including Calumet* (R. Mueller), Fond du Lac* (Baughman), Grant* (Ouren), Jefferson* (Scherer), Kewaunee* (Sinkula), Lincoln* (Haas), Manitowoc* (Pritzl), Rock* (Boone), and Washburn* (Berg). The high count for the season was twenty-seven birds on 4 July from Terrell Island in Winnebago County (Nussbaum).

Solitary Sandpiper—Reported from 40 counties during the complete season. A single northbound migrant was reported from the NRF field trip to Long Island in Ashland County on 1 June (Evanson and Kaehler). Single birds on 21 June in Dodge County (Bartholmais), and 25 June in St. Croix County (25 June) are considered the first fall migrants. Southbound birds increased in July and were noted in 39 counties by the end of the period.

Greater Yellowlegs—Twenty-five counties reported southbound migrants with no reports from the west central region. First reported on 21 June from Old Marsh Road in Horicon NWR (Wood) and continuing through the end of the period and into the fall season. The high count was 85 birds at Horicon in Dodge County on 22 July (Ellis III).

Willet—Reports came in from seven east central and northern counties. Prestby reported one at Cat Island in Brown County on 12 June with the number growing to four on 26 June and twenty-two on 12 July. Four observers reported Willets from Manitowoc County with a high of twenty-four birds on 26 June (Sontag). Fifteen were found at Terrell Island in Winnebago County on 26 June (Benson). One to three birds were noted at North Point in Sheboygan on 12–

14 July (m.ob.). Single birds were reported from Douglas County on 13 July (Nicoletti), Bayfield County on 18 July (Erickson and Kreiss), and Clark County on 19 July (Risch).

Lesser Yellowlegs—The only late spring migrant report came from Dodge County on 3 June (Nichols). Fall migration commenced later in June with the first bird found in Columbia County on 22 June (A. Holschbach). Southbound migrants were observed in twenty-nine counties by the end of the period with 120 in Fond du Lac County at Horicon NWR on 24 July (Bridge).

Wilson's Phalarope—Reported from eight counties with a max count of seventeen birds from Horicon in Dodge County on 28 July (Gray/Kavanagh/Maertz). There were numerous additional reports from Horicon NWR by more than twenty-five observers; mostly from mid-July through the end of the period. All other reports away from Horicon: A single male from Brown on 12 June (Prestby), a single bird from Crex Meadows in Burnett on 2 June (Morse and Paulios), a pair of birds from Killsnake SWA in Calumet on 5 June (Boland), a pair of birds on 22 June (A. Holschbach) and a single bird on 20 July (J. Schwarz) both in Columbia, a single bird 13–15 July in Manitowoc (Sontag), and another lone bird in Marathon on 30 July (Belter). There were no breeding confirmations during this summer's atlas work.

Red-necked Phalarope—Tom Prestby reported an alternate plumaged female on 26 June from Cat Island in Brown County. The bird falls in between the dates of the present spring departure record (25 June) and fall arrival record (3 July) extending the current spring departure record by one day. This bird has been on the summer season list nine out of the last ten years but most generally found in late July.

Bonaparte's Gull—Reported from fourteen counties. Species was present throughout the season in five counties along Lake Michigan from Sheboygan north to Door including Manitowoc, Kewaunee, and Brown. Dave Brasser reported an impressive total of 825 from the Sheboygan lakefront on 14 June during an alewife die off. Short stays of one to four birds were reported from Ashland, Bayfield, Columbia, Dane, Green, Milwaukee, Oneida, Ozaukee and Racine counties.

Little Gull†—This species is considered rare but regular along Lake Michigan in recent summers with reports from thirty-five observers and three counties this season. It was reported between 2 June and 21 July from North Point in Sheboygan with a high count of six by Tessen on that last date. Single birds were reported from Manitowoc on 8 June by Hurlburt and on 4 July and 15 July by Sontag. Prestby reported a single juvenile bird 9–12 June from Cat Island in Brown County. [ph. †Rohrer, †Wood]

Laughing Gull†—Many observers filed reports for this species from two locations where they had first appeared in late May. All reports from Manitowoc were of a single bird continuing through 13 July (Lupin and Sontag). One to three birds were continuing in Sheboygan through 24 June (Ayyash). [†Tessen]

Franklin's Gull—Birds arrived in late May at both Manitowoc and Sheboygan with reports of seven to eight birds at each location. Numbers at Manitowoc continued to build to eight to ten birds by the end of June and then peaking with twelve in early July (Sontag). Numbers then dwindled down to a few birds by the end of the period with a single bird continuing into August. One to four birds continued into June at Sheboygan with last report on 21 June (Sher and Tessen) and Tessen reporting eight birds on that date. The only report away from Lake Michigan was of a first summer bird on Lake Altoona in Eau Claire County on 10 June (Polk). More than fifty observers filed reports of the species this summer.

Ring-billed Gull—Present throughout the period across all regions and reported from 58 counties. Peak counts exceeding two thousand birds were noted in Brown (Prestby), Kenosha (Burruses), and Manitowoc (Bontly and Sontag). Counties with confirmed breeding: Brown (Prestby), Door (Whitney), Fond du Lac* (Sheldon), Green Lake (Owen), Kewaunee (Zenner), and Marinette* (Hurst). Probable breeding was noted in an additional three counties: Dane (Owen), Dodge (Vant Hoff), and Milwaukee (MCPS).

Herring Gull—Reported from 34 counties with 1,500 birds noted at Cat Island in Brown County in June (Prestby). Nesting confirmations were made in eight counties: Brown (Cat Island), Door (Rock Island), Kewaunee, Marathon (Lake

Beverly Engstrom found this female Eastern Bluebird perched on top of a mullein stalk and carrying food in Oneida County in early June.

Wausau), Marinette (Red Arrow Park), Milwaukee, Outagamie, and Winnebago (Terrell Island).

Lesser Black-backed Gull—An individual bird of unspecified age was reported by Sontag at Manitowoc between 12–28 June. This species was also reported from Sheboygan where it was present from the beginning of the season through 16 July (Anderson) with observations submitted by over thirty observers. Amar Ayyash reported an impressive concentration of twenty-three first, second and third summer birds on 24 June. Tessen noted that this had grown to an amazing total of 35 (!) birds on 27 June, and wrote that "I have never seen this many lesser black-backed gulls at one time. The gulls at North Point were most impressive." A major alewife die off was noted by Ayyash which no doubt was a major contributing factor to the excellent gull buildup at that location.

Glaucous Gull—There was one summer report of three individuals at Sheboygan on 14 July (Brasser).

Great Black-backed Gull— An individual bird of unspecified age was first reported by Sontag from Manitowoc on 12 June with the last report on 23 July (Sontag and Lau). Present at North Point in Sheboygan from the beginning of the season with a peak count of seven birds on 20 June (Schroeder). The last summer report from this location was of three birds on 25 July (Swelstad). Comments indicated that some of these Sheboygan birds were second and third summer cycle.

Caspian Tern—Reported from twenty-nine counties with only a single county each from the southwest and west central regions of the state. As expected there are more limited dates and numbers at locations away from Lake Michigan. Reports of greater than 100 terns came only from Manitowoc and Door counties. Prestby reported the high individual count with an estimate of 300 in the vicinity of Newport SP in Door County on 29 June. Breeding was confirmed in Brown (Prestby), Door (Cobb and Walsh), and Kewaunee (Zenner) counties.

Black Tern—This species was present from the beginning to end of the summer season and reported from 35 counties. Reports were spread across counties in all regions except the southwest and northeast corners of the state. Sara Kehrli conducted a Black Tern survey on Grassy Lake in Columbia County on 7 June and reported 59 terns. She found thirty nests (including eighteen on artificial platforms) with twenty-eight of them holding two to three eggs each and two empty. Tom Ziebell found 44 adults and five nests on Rush Lake in Winnebago County on 16 June. Confirmed breeding in seventeen additional counties.

Common Tern—Reported from fourteen counties which is average for recent years. The largest concentrations were of 50 birds at Cat Island in Brown County on 17 July (Prestby) and 60 birds on 3 June from North Point in Sheboygan (Sher and Cutright). The highest inland report was of twenty-five birds at Lake Puckaway in Green Lake County on 11 June (Owen). Confirmed breeding in Brown County (Prestby and Swelstad), Douglas County (Nicoletti), and Green Lake County (Owen).

Arctic Tern†—Tom Wood found this exciting and rare summer visitor on 27 June in the Manitowoc Impoundment. See "By the Wayside" for his accepted documentation account. It was enjoyed by many birders in the two-day period of 27–28 June. No additional reports until the bird returned for a one day encore on 6 July (Sontag). There are ten previous summer records. [ph. †Grossmeyer, ph. †Mooney, †Tessen, †Wood]

Forster's Tern—Present through the season in nineteen counties. High counts were of 55 individuals on 22 July at Horicon NWR in Dodge County (Ellis III) and 64 birds and eight nests on Rush Lake in Winnebago County on 16 June (Ziebell). Breeding was confirmed in Brown County (m.ob.), at Horicon NWR in both Dodge (Heikkinen and Wroza) and Fond du Lac (Maurice) counties, plus Lake Puckaway in Green Lake County (Owen). Probable breeding was noted in Winnebago County (Benson).

Red-throated Loon—Still moving through some northern counties in early June en route to their breeding grounds in coastal and far northern Canada. Four were seen moving north along Wisconsin Point in Douglas County on 2 June (Grames). The next day a single bird was reported from Bayfield County (Brady). Six were observed on 7 June at Wisconsin Point (Kraemers).

Common Loon— Reported from 36 counties which is down slightly compared to the record 41 counties from last summer. Breeding was confirmed in twenty northern counties plus Portage (Kozak and Zinda). Counts exceeding ten loons came from Crex Meadows SWA in Burnett County (Huber and Kinslow) and Trout Lake in Vilas County (Stone).

Double-crested Cormorant—This species was seen in 51 counties from all regions. Prestby estimated as many as 2,500 birds from Cat Island in early June. Confirmed breeding in Ashland (Younger), Brown (Prestby), Fond du Lac (Sheldon), Green Lake (Owen), Kenosha (Fronk and Lyons), and Racine* (Goldberg). Probable breeding reported from the Mead SWA in Marathon County (Belter).

American White Pelican—Reported from 42 counties across all regions of the state. Seen throughout the period at Cat Island in Brown with Prestby estimating a peak of 2,500 to 3,000 birds in early to mid-June. Breeding confirmations came from these south central and east central counties: Brown (Prestby), Columbia* (Persche), Dane, and Winnebago (Nussbaum). Probable breeding reported from Green Lake (Owen) and Waupaca (O'Connell) counties.

American Bittern—Reported from 44 counties across all regions. Breeding was confirmed in the following five counties: Ashland* (Merkel), Dodge (Frank), Florence (Kavanaghs), Forest* (Maertz and Gray), and Vilas (Christensen). Observers detected probable breeding in an additional eleven counties. A count of ten birds was submitted from Peshtigo Harbor SWA in Marinette County on 1 June (Gaul).

Least Bittern—Noted in twenty-three counties from all regions except the southwest. The Northeast Wisconsin Bird Club found six birds at Mack SWA in Outagamie during an 18 June field trip (King). Confirmation of breeding took place in Burnett* County on 23 June (Moffat) and Ozaukee County on 5 July (O'Donnell). An additional nine counties had reports of probable breeding,

Great Blue Heron—Reported from all counties except Iron. Fifteen counties reported confirmed breeding and an additional seven counties noted probable breeding. The high count of 50 came from Devil's Lake SP in Sauk on 18 June (Maskelony).

Great Egret—Reported from 36 counties in all regions except the northwest. The highest number was an estimated 350 seen at Horicon Marsh on 18 July (Tessen). Breeding was confirmed for the following four counties: Brown (Prestby), Green Lake (Owen), Marinette (J. Campbell and Hurst), and Waukesha (Dabey). Probable breeding was noted in an additional four counties: Columbia (Persche), Dodge (Herzmann), Door (Walsh), and Outagamie (R. Mueller and Robaidek).

Snowy Egret—A single bird was found along the highway 49 corridor in Horicon NWR on 28 June (Pope and Schwarz). It was seen by an additional six birders with the last report on 14 July (Benson and Wood). This species has been reported in nine of the ten previous summer periods with the only miss in 2011.

Cattle Egret—The bird was found at its typical haunts around Horicon NWR and Lake Winnebago but reported by a fewer number of observers than last year. Only four reports were received from Horicon with a single bird near the beginning (2 June, Grossmeyer) and end (30 July, Treves) of the period. Four to five birds reported as northbound flyovers from there on 3 July (Howe and Wegner) and again on 14 July (Rambo). Other reports came from two east central counties bordering Lake Winnebago. There were four July reports from the Brothertown area in Calumet County with a high count of fifteen egrets there on 20 July (Tiede). Two reports came from across Lake Winnebago (Winnebago County) where Ziebell had four birds on 16 June and Tiede reported two on 2 July. No reports of breeding activity.

Green Heron—Reported from all counties except Lafayette with a max of fifteen birds on 20 July in the Northport CE block of Waupaca County (O'Connell). Breeding confirmed in twenty-eight counties including Adams* (O'Donnell), Rusk* (Stutz), and Sawyer* (Merkel). The level of county reporting was similar to last year.

Black-crowned Night-Heron—Sightings reported from nineteen central and eastern counties. Ziebell tallied 440 adults, 120 young and 350 nests at Rush Lake in Winnebago County on 16 June. Breeding was also confirmed at Cat

David Franzen captured this image of an adult Red-eyed Vireo holding a meal for its young waiting in anticipation in Vilas County in early July.

A mid-July, brilliantly-colored Purple Finch, as photographed by David Franzen in Vilas County.

David Lund spotted this Northern Flicker displaying its feathers in Eau Claire County in mid-June.

Island in Brown (Prestby), Kewaunee* Marsh (Zenner), the Menominee River rookery in Marinette (Hurst), Mack SWA in Outagamie (Kavanagh and Maertz), and Paradise Valley SWA in Waukesha (Dabey). Also noted as breeding by many observers in several Milwaukee parks with most confirmations coming from the Juneau Park Lagoon where the main target was likely the more sought after night-heron species noted in the following account. Probable breeding was noted at Marytown Marsh in Fond du Lac County (R. Mueller).

Yellow-crowned Night-Heron†—The more uncommon of the night-herons has appeared in five of the previous ten summer seasons. This summer a juvenile made an appearance at the Juneau Park Lagoon in Milwaukee where it was discovered by Jennifer Ambrose on 25 July. It was enjoyed by many observers through the end of the summer period. A second juvenile was reported from Forest Beach in Ozaukee County on 31 July (Strelka). Sightings at Juneau Park continued until late in August with some reports of two birds there the first week of that month (perhaps joined by Ozaukee bird?). See "By the Wayside" for one account of this bird. [ph. †Grossmeyer, ph. †Mooney, †Wood)]

Plegadis sp†.—Rob Pendergast observed two ibis kettling above the highway east of Stevens Point in Portage County on 8 July but was unable to discern if these were glossy or white-faced. He felt these birds may have been displaced by the diffuse weather systems moving through the area from the west. This observation closely followed the squall line and tornados which had passed through Buffalo and Vernon County on 5 July. Ibis have been found in five of the previous ten summer seasons.

Turkey Vulture—Reported from all 72 counties. Breeding was confirmed in fourteen counties including Iron* (Daulton), Jackson* (Patterson), Manitowoc* (Domagalski and J. Trick), Pepin* (Patterson), Richland* (Duerksen), and Vilas* (Peczynski). The various nest sites included mention of a hollow stump, loft of an old barn, an abandoned house, and a tree cavity!

Osprey—Ospreys were reported from 57 counties in all regions of the state with fewer counties from the southwest corner. Breeding was confirmed in 39 counties including Adams* (Hannah). Seventy-nine observers confirmed breeding for this species, no doubt a tribute to the prevalence of nesting platforms and cell towers where nests and young are easily detected!

Swallow-tailed Kite†— Eighteen observers reported this individual during the period of July 26–28. Ann Gamble first found this rare summer visitor near Juddville in Door County on or near 16 July. It was last reported the morning of 28 July (m.ob.). This is only the fourth summer record with the most recent previous summer record going back to 1982 when one spent nine days in Waukesha County. See "By the Wayside" for selected accounts of these sightings. [ph. †Belter, ph. †Brasser, ph. †Grossmeyer, †Tessen, †Wood]

Mississippi Kite†—Scott Weberpal observed an individual near Janesville in Rock County on 29 July. It was observed soaring and swooping in an attempt to catch cicadas and dragonflies in residential parkland with a relatively dense tree canopy. Observations at this location continued into the fall period. This represents the eighth summer record for this species following the most recent previous report from July 2008. [ph. †Weberpal]

Bald Eagle—Reported from all counties except Kenosha. Forty-one counties outside of the southeast region confirmed breeding activity this summer.

Northern Harrier—Reported from 55 counties with no reports exceeding four birds. Breeding was confirmed in fourteen counties representing all regions except the southeast.

Sharp-shinned Hawk—Reports came from twenty-nine counties and were all outside of the southwest and south central regions. The most southerly report came from Milwaukee County on 7 June (Petherick). Breeding was confirmed from the northwest region in Bayfield County (Kalligher) and Douglas County (Collins and Nicoletti).

Cooper's Hawk—Reported from 61 counties which matches the record high total from last season. Well distributed across all regions of the state. Breeding behavior was confirmed in thirty counties.

Northern Goshawk—Single birds were observed in seven counties: Douglas (Collins and Nicoletti), Florence (Peczynski and Kavanaghs),

Forest (m.ob.), Iron (N. Anich), Jackson (Reed), Marinette (Kavanaghs and Wenzel), and Oneida (Davis).

Red-shouldered Hawk—Atlas activity raised reports to a new record high level of 40 counties compared to a pre-atlas average near twenty-five. Over 40% of these reporting counties were in the central tier with 35% from the north and less than 25% from the south. Breeding was confirmed in ten counties including Menominee* (Prestby) and Juneau* (T. Hahn/Prestby/Q. Yoerger and Reed). High counts of four individuals came from Outagamie County (O'Connell) and Waupaca County (R. Mueller).

Broad-winged Hawk—As in the case for the red-shouldered hawk, county reports for this species have also risen significantly in the last two years with atlas activity. Reports came from a new high of 57 counties compared to a more typical pre-atlas average of less than 40. The high number reported was fifteen birds in a kettle of late migrants in Ashland County on 5 June (Anich). Breeding confirmations came from twenty-nine counties including Dunn* (Hogseth), Juneau* (Reed), and Wood* (Merkel).

Red-tailed Hawk—Reported from 69 counties with no report exceeding five birds. Seventy different observers confirmed breeding in a cumulative 46 counties.

Eastern Screech-Owl—This species was located in a record high eighteen counties this past summer. The farthest north was found near Navarino SWA in Shawano County on 24 June where Prestby commented that it was in good habitat at the edge of their range. Breeding confirmed in five counties: Brown (Van Duyse), Columbia (Skaar), Dodge (Mittelstadt), Milwaukee (Howski), and Trempealeau* (Patterson). Probable breeding was detected in an additional six counties.

Great Horned Owl—Reported from 49 counties from all regions of the state. Breeding was confirmed in twenty-two counties with an additional seven counties noting probable breeders.

Snowy Owl—Two birds showing great reluctance to leave the state were reported this season. An Ashland County bird was present at the beginning of the period and reported through 19 June on Madeline Island (ph Wilmoth and Blake). An adult male was hit by a vehicle in Iowa County on 26 July and taken to a rehab center.

Barred Owl—Reported from a record high 64 counties. Breeding was confirmed in twenty-five counties including Kewaunee* (Sinkula).

Long-eared Owl—There were no reports for this season. Reporting frequency has been seven of the previous ten summer seasons although for one of those seasons the only report was a dead bird found on a highway in Dunn County.

Short-eared Owl—The only report this season was of a single bird seen mid-morning on 13 July near Witches Gulch in Adams County (Norris).

Northern Saw-whet Owl—Individual birds were detected in six counties. Property owners found an owlet on the ground in Jackson County on 8 June and it was transferred to the Raptor Education Group in Antigo (Fisher). All other reports were evening detection by ear between the hours of 20:00 and 01:00 in the following counties: Juneau (Stevenson, 19 June), Bayfield (Puchalski, 5 July), Iowa (Persche, 6 July), Menominee (Prestby, 23 July), Marinette (Lafkas, 26 July), and Jackson (Patterson, 31 July).

Belted Kingfisher—Reported from 72 counties with confirmed breeding in 46 of them. No report exceeded the count of twelve birds observed in Fond du Lac County during a canoe trip down the Sheboygan River on 18 July (Vaughan).

Red-headed Woodpecker—Reported from 56 counties with statewide distribution. Two observers commented on results of surveys conducted in Juneau County. A 16 June survey in the Cutler CE atlas block (managed barrens) yielded twenty-five birds and a conservative estimate of half a dozen active cavities (Epstein). A 30 July survey in the Cutler CW pine savanna habitat in the same county yielded twenty-eight birds with comments that this was about half of the birds found in the previous four years of this annual survey. Breeding was confirmed in 32 counties this summer including Ozaukee* (W. Mueller).

Red-bellied Woodpecker—Reported in every county except for Ashland and Price in the north central region of the state. This result is

Christ West photographed this Blue-winged Warbler in Richland County in early June.

Kelly Vils captured this intimate family moment among Baltimore Orioles in Outagamie County in early July.

A Common Yellowthroat singing on a slender branch, as found by Jeff Galligan at Indian Lake in Dane County on Independence Day.

A female Indigo Bunting feeding young-in-nest, as memorialized by David Franzen in late June in Vilas County.

similar to last summer when Ashland and Iron counties had no reports of this species. Fitzpatrick noted sixteen separate singing males while kayaking the St. Croix River in Polk County on 17 June. O'Connell tallied twelve birds in Waupaca County on 3 June while doing atlas work around Lebanon Marsh. Fifty-seven counties confirmed breeding including Taylor* (Mauer). The first breeding bird atlas (1995–2000) left thirteen counties in the northern part of the state without breeding confirmation. The first two years of WBBA II have brought breeding confirmation to eight of these counties. The counties remaining without any atlas breeding confirmation are the four north central counties of Ashland, Iron, Oneida, and Price plus Menominee in the northeast region.

Yellow-bellied Sapsucker—Reported from a record high 64 counties. Most of the nine regions had this species county wide except for the southeast. Nicoletti counted eleven individuals in each of three different locations in Douglas County between 16 June and 29 June. Haas also recorded eleven on 17 July in Lincoln County. Breeding confirmed in 53 counties including Green* (Q. Yoerger and Haycraft), Lafayette* (Boone), and Rock* (Cullum).

Downy Woodpecker—Reported from all 72 counties. Breeding was confirmed in 67 counties.

Hairy Woodpecker—Reported from all 72 counties. Breeding was confirmed in 62 counties.

Black-backed Woodpecker—A single bird was heard giving its "pik" calls on 19 July in Vilas County (Spahn). Two birds were reported from Florence County on 22 July (Brinkman). Two reporting counties are equal to the 2013 and 2014 seasons, but down from the five counties reporting this species last summer. There were no reports of probable or confirmed breeding this summer. This species was a confirmed breeder in seven counties during WBBA1. Through two years of the second atlas the only confirmed breeding report so far came from Vilas County last summer.

Northern Flicker—Reported from 72 counties. A high count of seventeen birds including fledglings was reported from Bayfield County on 19 July (Brady). Confirmed breeding in 67 counties.

Pileated Woodpecker—Reported from all counties except Kenosha. This exceeds the previous high of 66 counties from last summer. The thirty counties which confirmed breeding included Kewaunee* (Sinkula) and Rock* (Q. Yoerger and Cullum). A count of six birds in Marinette County on 24 June was the high number (Wenzel).

American Kestrel—Reported from 69 counties. Hottman counted thirteen of these falcons on the utility wires and on a broken tree near Spring Green Preserve in Sauk County on 12 July. Breeding was confirmed in 50 counties including Washburn* (Berg).

Merlin—Thirty-three counties harbored Merlin this summer. Two-thirds of these counties were in its normal summer resident range in the northern counties. The only report from the southern third of the state was a single bird from Timber Coulee in Vernon County on 16 July (N. and R. Mueller). No more than a total of four birds for the high count and this generally consisted of a mated pair with two chicks. Confirmed breeding in fourteen mostly northern counties including new breeding records for Brown* (Prestby), Langlade* (Haas), Price* (Szymczak), and Shawano* (Robaidek). WBBA II results to date indicate a southward expansion of the merlin's breeding range since the initial atlas work in 1995–2000. WBBA1 nesting was confined to less than a dozen northern counties.

Peregrine Falcon—Reported from nineteen counties with no reports from the northeast region. Breeding was confirmed in Ashland (N. Anich) and Manitowoc (Woodcock) counties with probable breeding noted in an additional seventeen counties. The previous comments are based on eBird reports only. The 2016 Wisconsin Falconwatch nesting season report (compiled by Greg Septon) concluded that 103 young were produced at 34 nest sites in the state. This infers a conservative estimate of at least 68 adults present statewide.

Olive-sided Flycatcher—Reported from nineteen counties during the full two-month season which includes late spring migrants. No reports exceeded a total of three birds. In early June some birds are already on territory in the north while other late migrants are still moving that way. *Wisconsin Birdlife* (Robbins, 1991) lists spring migration dates through mid-June. Nine

counties that reported birds in the period from 1 June to 11 June are outside the expected breeding range and are considered to be cases of late northbound migrants: Dane, Dodge, Grant, Kewaunee, Marathon, Milwaukee, Sauk, Sheboygan, and Waupaca. Another single bird seen at the Mack SWA in Outagamie County on 18 July (Brinkman) was the latest migrant of the season. Reports for the following nine counties are considered within the expected breeding range: Bayfield, Door, Douglas, Florence, Forest, Iron, Oneida, Price, and Sawyer. Confirmed breeding reports came from the following three counties (all in July): Bayfield (McCaffery), Florence* (Kavanaghs), and Price (Krakowski). Probable breeding was noted on Rock Island in Door County (m.ob.) and Spider Lake in Sawyer County (Schaefer and Szymczak). There were no reports outside the expected summer range of counties in July to indicate any early fall movement.

Eastern Wood-Pewee—Reported from all 72 counties. The high count of twenty was found on a WBBA II kickoff canoe trip on the Bark River in Jefferson County on 11 June (E. Hahn and Stutz). There were 53 counties with confirmed breeding this summer.

Yellow-bellied Flycatcher—This uncommon summer resident was observed in twenty-six counties overall including both migrant and summer resident reports. This flycatcher has a very brief summer residence. The atlas breeding guidelines suggest the first two weeks of June and the last week of July as transition times that could be migration or breeding. Reports of late spring migrants through 11 June came from Dodge, Kenosha, Milwaukee, Ozaukee, and St. Croix counties. Summer range reports came from nineteen counties distributed evenly across the northern region. The first atlas confirmed breeding in ten of these northern counties. This summer breeding was confirmed in seven counties: Ashland (Sharp and Merkel), Bayfield (Bartelt), Burnett* (Packett, Paulios), Rusk* (Collins), Taylor* (Keyel), Vilas (Spahn), and Washburn* (Berg). An additional five counties reported probable breeding. Two other observations of interest came from Dan Belter and Gerry Janz. Belter had two different singing birds in the early June transitional period at Norrie Bog in Marathon County and suspects breeding at that location but could not confirm. Janz observed a singing bird in black spruce and tamarack habitat in the Mead Conifer Bogs SNA in northwest Portage County on 20 June. The first atlas had a record of probable breeding from Dewey Marsh in Portage County. Perhaps ongoing atlas work will confirm this species as nesting in one of these central Wisconsin bogs with suitable habitat. The report from Door County at Ridges Sanctuary on 23 July is presumed to be an early fall migrant.

Acadian Flycatcher—Reported from a record high thirty-one counties. The observations were equally distributed from east to west but with over half the counties that reported from the southern geographic regions. Michael Gray tallied a season high 35 individuals while walking the length of Long Valley Road at Wyalusing SP (Grant County) on 11 July. Confirmed breeding in these eight counties: Dane (m.ob.), Fond du Lac* (Jeff Baughman), Grant (Coglan and Gray), Green Lake (Schultz), Jefferson* (Bridge), Milwaukee (Szymczak), Walworth (Marrari), and Waukesha (m.ob.). The three most northern observations, all of single singing birds came from Chippewa (9 June, DNR Staff), Menominee (14 July, Prestby), and Taylor (19 July, Keyel) counties.

Alder Flycatcher—Alders were reported from 60 counties. Only a quarter of these were reports from the southern counties with the rest split equally between central and northern counties. Many of the early June reports from the southern half of the state could still be migrants based on the distribution of counties that confirmed breeding. Confirmed breeding took place in twenty-one counties with only three of these counties (Crawford, Juneau, and Washington) outside the northern third of the state. Four counties recorded first atlas records of confirmed breeding: Chippewa* (Swartz-Myrman), Juneau* (Reed), Polk* (Berg), and Washington* (Frank). As expected, the highest number counts were reported from northern counties where many observers had more than ten and Nicoletti and Keyel each tallied fifteen birds in Douglas County and Price County, respectively.

Willow Flycatcher—Reported from 53 counties with no reports exceeding five birds. The regional distribution of the willow is the reverse of the alder with higher county representation in the south as opposed to the north. Distribution by region of number of reporting counties (and possible counties) was twenty out of twenty in the south, twenty-five out of twenty-seven in the central, and eight out of twenty-five in the north.

Jeff Galligan imaged this Caspian Tern as it plunged headlong after food at North Point Park in Sheboygan in late June.

An immature male Mourning Warbler perches inquisitively in this photo by Jeff Galligan, taken at Emmons Creek in Portage County in early June.

Confirmed breeding in twenty-six counties including new atlas records for the northern counties of Marathon* (Widmann) and Oconto* (Robaidek). The geographic distribution of these confirmations was fifteen southern, nine central, and two northern.

Alder/Willow Flycatcher—Forty-four counties reported both the alder and willow flycatcher. Of these, Washington is the only county where both species were confirmed breeding this summer with both of those by James Frank.

Least Flycatcher—Reported from 70 counties. More preferred habitat as move north in the state and this is reflected in both the number of birds reported and confirmation of breeding. High individual counts were generally less than five birds in the south but many were in the ten to fifteen range in the central and northern counties. Confirmed breeding in twenty-nine counties with more than half of these from the three northern regions.

Eastern Phoebe—Reported with confirmed breeding in all 72 counties this summer. Highest count was nineteen birds on 30 July in Oconto County (Swelstad).

Great-crested Flycatcher—Reported from all 72 counties. The high count of eighteen birds was noted on a four mile canoe trip down the Bark River in Jefferson County on 11 June (E. Hahn and Stutz). Confirmed breeding in 51 counties including Walworth* (Marrari).

Western Kingbird†—The recent annual frequency of this species has been of reports in only two of the previous ten summer seasons (2011 and 2014). There were reports from three counties this summer. The first was 3 June in Douglas County where it was seen hanging out with an Eastern Kingbird (Nicoletti). The second one was observed six days later on 9 June at Little Trout Lake in Vilas County (Woodford). The third report came from a cemetery in Mercer in Iron County on 24 June (N. Anich). See "By the Wayside" for the documentation submitted on this Iron County bird. [Douglas County: ph Nicoletti, Vilas County: ph. †Woodford; Iron County: †N. Anich]

Eastern Kingbird—Reported from all 72 counties. As noted elsewhere, birding by kayak or canoe can produce good results. In this case it produced reports of twenty-five kingbirds while kayaking Sunset Lake in Portage County on 30 July (Kozak and Zinda) and by paddling the Namekagon in Washburn County on 11 June (Calvetti). Confirmed breeding in 69 counties.

Loggerhead Shrike—The "summer shrike" was reported from three counties this season. The most viewed and documented birds were in Taylor* County where Ted Keyel first found a bird on 10 June. He reported a pair by 8 July and was able to confirm breeding with a nest and two young on 15 July. Activity at this location was last reported on 25 July (Tessen). Other sightings were comprised of five birds at a nest site in Iowa County on 25 June (Kivikoski) and a single bird in Sauk County on 2 July (Barzen).

White-eyed Vireo—Two counties reporting birds which is half the number reported last summer. Anne Moretti first detected a bird at Beulah Bog SNA in Walworth County by ear while conducting a breeding bird survey on 17 June. The secretive bird was noted by her and a handful of other birders mostly by its distinctive complex song, abbreviated alternate phrasing and call notes through 14 July. Most observers mentioned the dense foliage and difficulty in getting a good look at this individual. Tom Wood described this location as being thick diverse vegetation on a bluff overlooking a tamarack bog with several species of oak, shagbark hickory and ash with blackberries and smooth sumac in the understory. Eric Epstein reported two singing males at Kiep's Island dike in Trempealeau NWR on 23 June. This observation was in a dense thicket of two to three meter high black locust. As in the case of the other bird, this identification was made mostly from the unmistakable song with brief glimpses of the diagnostic eye and yellow spectacles. The Walworth bird was recorded as a probable breeder for singing in the same area for an extended period of over seven days

Bell's Vireo—Reported from thirteen counties which is down slightly from the fifteen counties noted in the 2015 summer season. This season reports came from five west-central counties (Buffalo, Dunn, LaCrosse, St. Croix, Trempealeau), four southwest counties (Crawford, Grant, Iowa, Sauk), two south-central counties (Dane and Green), plus Fond du Lac and Waupaca. The most reported location was at the highway 45 wayside in Fond du Lac County where the species has been found each summer since 2012. The last re-

port for the summer season was from Sauk County on 20 July (Anich) with fall departure dates extending well into August. Breeding was confirmed in three counties: 8 June in Sauk* (A. Holschbach), 14 June in Crawford* (Kirschbaum), and 13 July in Grant (Haseleu).

Yellow-throated Vireo—This vireo species was found in a record high 70 counties with reports only lacking from Iron and Kewaunee. Up to nine individuals were reported from a Marathon County atlas block on 18 June (Belter) and the same number from point counts in Polk County on 29 June (R. Staffen). Breeding was confirmed in twenty-seven counties from all regions including a county record from Menominee* (Prestby).

Blue-headed Vireo—There were 33 reporting counties with well over half of the counties from the northern third of the state. The most southerly report was from the Albany bike trail in Green County on 14 July (Wroza). Nancy Richmond tallied a season high eight of these birds while paddling around the shoreline of Lake Julia in Forest County on 3 June. Breeding was confirmed in seven northern counties: Ashland (Merkel), Bayfield (Frank and McCaffery), Douglas (m.ob.), Marinette (Wenzel), Menominee* (Prestby), Sawyer (Schaefer and Szymczak), and Vilas (Parker).

Philadelphia Vireo—No reports of any late spring migrants this season. It has been reported in four of the previous ten summer seasons and typically only during the first week of June. This species was confirmed as breeding in only two northern counties (Pierce and Bayfield) in the first statewide atlas and none to date for the first two years of WBBA II.

Warbling Vireo—Reported from all counties except Menominee. Jack Fry reported the high count of twenty-five birds from the High Cliff SP butterfly trail on 1 June. Reported breeding in 37 counties.

Red-eyed Vireo—Reported from all 72 counties as in 2015. There were two separate reports from Door County with 40 birds each at Peninsula SP on 21 June (Wiktor) and Newport SP on 29 June (Prestby). Breeding confirmed in 63 counties including Kenosha* (Dixon).

Gray Jay—Reported from seven northern counties which matches the 2015 season. Mike Peczynski had great success by locating this species in three counties - a single bird in Vilas County (5 June), two dark gray juveniles in a spruce-fir bog in Florence County (6 July), and three birds on Stone Lake Road in Oneida County (19 July). Merkel had an adult and developing bird of the year in a black spruce–tamarack bog in Ashland County between 8 June and 23 July. Single birds were reported from Douglas County on 16 July (Svingen and R. Johnson) and Forest County on 22 June (Rueckheim). Bockhop reported four birds (a resident pair with two juveniles) showing up at their Iron County home on 11 June. There were two additional reports from Florence County. One was of a single bird at Lake Emily on 4 July (Paynter). The other was of two birds observed by Sarah Besadny while kayaking around Lake Seventeen on 18 July. She was first alerted to the presence of these birds when she observed one chasing after a gull! Breeding was confirmed for Ashland, Iron, and Florence Counties as detailed above with probable breeding noted in Vilas County.

Blue Jay—Reported from all counties with breeding confirmed in 70 of them. There were two reports of late migratory flocks of 50+ birds moving along Lake Michigan on 4–5 June.

American Crow—Reported from all 72 counties with no reports exceeding a hundred birds. Sixty-seven counties confirmed breeding including Pepin* (Schwartz).

Common Raven—Reported from a total of 42 counties with twenty-five from northern and seventeen from central regions. Alex Lehner submitted a conservative estimate of 100 of these corvids feasting on cicadas in burn areas of the Moquah Barrens in Bayfield County on 16 June. Twenty-nine counties confirmed breeding including Adams* (Reed), Dunn* (P. Campbell), Eau Claire* (Chrousers), and Juneau* (Reed).

Horned Lark—Reported from a record high 51 counties with 43 of these from the southern two-thirds of the state. The most northern report was of a single bird at Crex Meadows in Burnett County on 26 July (Detwiler). Aaron Haycraft estimated a high count of 60 birds in a harvested field in Rock County on 31 July. There were confirmed breeding reports from 36 coun-

Michael Huebschen photographed this Black-crowned Night-Heron in breeding plumage at Horicon Marsh in Dodge County in early July.

A Red-necked Grebe is reflected in the water of Crex Meadows in Burnett County in this shot by Michael Huebschen at the beginning of June.

Jim Stewart imaged this Black-crowned Night-Heron beginning a dive at Horicon Marsh in Dodge County in early July.

ties including Racine* (Cyr) and Shawano* (Prestby).

Purple Martin—This species is listed as one of special concern and greatest conservation need. The number of counties reporting martins was up slightly to a new high of 53. Breeding was confirmed in 39 counties including Adams* (Svetich) and Lafayette* (Gray/Kavanagh/Maertz). Two locations reported totals of 100+ individuals. One was a report of 128 birds from Adams County on 16 June consisting of twenty-four nesting pairs and 80 young with additional eggs yet to hatch (Svetich). The second was a report of 150+ birds from Collins Marsh SWA in Manitowoc County on 8 July (Domagalski). Richard Nikolai provided the generalized comments that follow on behalf of the Purple Martin Association and are based on his analysis of input from colony landlords. In general, it seems that the poor spring weather patterns adversely affected this species in a similar manner to that of the Eastern Bluebird population as noted under that species account. Nesting and egg-laying was delayed seven to ten days, fewer eggs were laid per colony per pair, and a large percentage of the eggs were addled statewide. Richard estimated that fledgling rate (versus 2015) was down in the southern and east central regions while up in the northeast and north central. He estimates the statewide average per colony at fifteen pairs of martins. The largest colonies in central Wisconsin included 70+ pairs in Wood County and 100+ pairs in Adams County which are near wetlands and cranberry marshes. Some of the largest martin colonies are located in the east central counties of Kewaunee, Sheboygan, and Calumet near lakes Michigan and Winnebago with populations approaching 150 pairs.

Tree Swallow—Reported from all 72 counties. The Mack SWA in Outagamie County harbored a five-species mix of 3,500+ swallows on 26 July of which 2,000 were estimated to be of this species (Gray). Trail box monitors for the Bluebird Restoration Association of Wisconsin reported 12,246 swallow fledglings. This was about twenty-eight percent of the total birds of all species that fledged from the trail boxes. This number is down slightly from 2015 results (Sample). Confirmed breeding in 67 counties.

Northern Rough-winged Swallow—Reported from 68 counties. Breeding was confirmed in 39 counties with Barron County (Berg) the only one in the northwest region. The highest count was estimated at 100 birds observed while canoeing at Wyalusing SP in Grant County on 30 July (Anderson-Brickers).

Bank Swallow—Reported from 65 counties. Five separate counts of post-breeding flocks of adults and juveniles taken at the Cat Island site in Brown County between 30 June and 17 July were in the range of 600 to 800 birds (Prestby). This is less than half of the number reported from there in 2015 and likely attributed to more vegetation and less open sand at the site. Confirmed breeding in 37 counties.

Cliff Swallow— Reported from a record high 70 counties. The largest estimate was of 500 birds at the Mack SWA in Outagamie County on 26 July (Gray). Confirmed breeding in 66 counties.

Barn Swallow—Reported from 72 counties with confirmed breeding in 68. The largest estimate was of 1,000 birds in a large mixed swallow species flock at the Mack SWA in Outagamie County on 26 July (Gray).

Black-capped Chickadee—Reported and confirmed breeding in all 72 counties. The two high counts were of 76 birds in Jefferson County on 5 June (Hale) and 50 birds in Sauk County on 21 July (Bennett). The Bluebird Restoration Association of Wisconsin trail box monitors reported 1,487 chickadee fledglings this season which is up slightly from 2015 results (Sample). This was about three percent of total birds of all species that fledged from the boxes.

Boreal Chickadee—Reports from two or three counties is typical in summer. Two counties provided reports of the "brown-capped" chickadee this season. A single bird was found on FR2182 in Forest County on 18 June (Prestby and Brotske). Rueckheim reported three birds from the same road on 22 June and another single bird on FR2176 the following day. Two birds were reported as probable breeders from Vilas County on 8 July (Peczynski). There were no confirmed breeding reports this summer following last summer's confirmation from Forest County.

Tufted Titmouse—Reported from 42 counties. Atlas results to date for WBBA II (two years) indicate expansion of the summer range into central counties up the Wisconsin River such as

Adams and Wood, and east-central counties such as Marquette and Green Lake compared to the results of WBBA1. The number of counties with confirmed breeding for the current atlas already exceeds that for the first atlas which was twenty-one counties. This season alone there was confirmed breeding in twenty-five counties including Marathon* (Belter), Pepin* (Betchkal), and Sheboygan* (Frank).

Great Tit—This introduced species was noted in two counties with no reports of confirmed breeding following last summer's confirmation in Ozaukee County. A single bird was found in Ozaukee County in June (Sommer) and up to four birds from Indian Mound Park in Sheboygan County in July (Baumann/T. Hahn/Sher). [Note: This species is not included on the most current AOU North America or official Wisconsin state lists.]

Red-breasted Nuthatch—Reported from 63 counties statewide but birds are more numerous as they move north. For the number of reports exceeding five birds, there were none from southern counties, three from central counties, and over fifty reports from northern counties. Nicoletti had fifteen birds in Douglas County on 29 June. Breeding confirmed in 40 counties including Columbia* (Martins), Jefferson* (Stutz), and Trempealeau* (Patterson).

White-breasted Nuthatch—Reported from all 72 counties and confirmed breeding in 69. The highest count was twenty at Rock Island SP in Door County on 18 July (Collison).

Brown Creeper—Reported from a new record 38 counties with the majority of these in the central and northern tiers. No reports exceeded six birds. Thirteen counties were confirmed as having breeding birds with most of these in the northern tier of counties. The most southerly confirmation of breeding was in Dodge County (Schaefer). In addition the counties of Buffalo (Betchkal), Sawyer (Collins and Keyel), and Sheboygan (Frank) had reports of probable breeding. There have been no confirmations to date for WBBA II in the bottomland forests along the Mississippi and Wisconsin River corridors in the southwest part of the state where it had been confirmed during the first atlas project.

House Wren—Reported from all 72 counties. Confirmed breeding in 64 counties. The Bluebird Restoration Association of Wisconsin reported 4,045 wren fledglings which were about nine percent of total birds of all species that fledged in bluebird boxes this season. This production is down slightly from 2015 results (Sample).

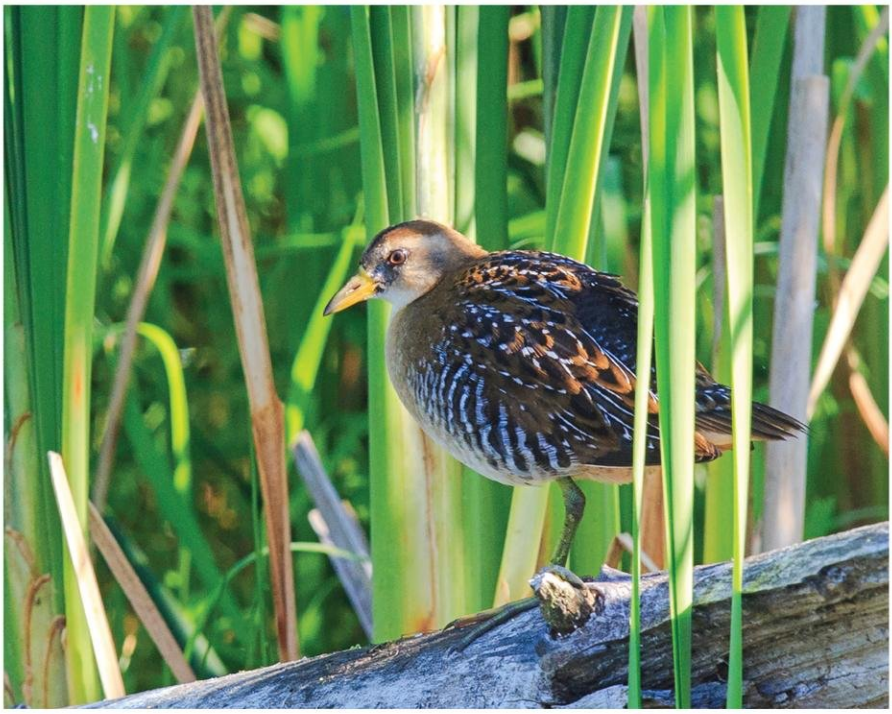
Winter Wren—Observed in thirty counties with twenty of these in the northern tier. Breeding was confirmed in the six northern counties of Ashland (Merkel), Douglas (Collins and Nicoletti), Florence (K. Kavanagh), Forest (Spahn), Oconto (Cleereman), and Price (Krakowski and Merkel). Breeding was noted as probable in nine additional northern counties plus Door, Kewaunee, Manitowoc and Pierce. Eight birds were noted in Price County on 30 June (Krakowski).

Sedge Wren—Reports were submitted from 69 counties in all. Breeding was confirmed in twenty-eight counties including Adams* (Reed), Juneau* (Reed), Racine* (Howe), Rock* (Cullum), Trempealeau* (Patterson), and Washington* (Frank). Twenty-seven birds were counted at Crex Meadows SWA in Burnett County on 17 June (K. Lund).

Marsh Wren—Reports were submitted for a record 63 counties distributed across all regions. Ziebell counted 1,369 on his survey of Rush Lake in Winnebago County on 16 June. Breeding was confirmed in eighteen of these counties including Dunn* (P. Campbell) and Milwaukee* (MCPS).

Carolina Wren—Reported from thirteen counties. The farthest north counties were single birds from Green Lake (Schultz and Cochran), Marathon (Hoeft), Outagamie (Brinkman), Portage (Zinda), and Trempealeau (Betchkal). Southern counties providing reports of single birds were Dane (m.ob.), Green (m.ob.), Iowa (Kivikoski), Milwaukee (Gitre and Wilson), and Sauk (McNair). Two birds were found at La Riviere Park in Crawford County (Haseleu) and Big Hill Park in Rock County (Boone). The only breeding confirmation was in Grant* County on 29 June where Aaron Haycraft observed adults with a young bird. Single birds were also noted by others in Grant County (Aufmann and Coglan) and Rock County (Cullum).

Blue-gray Gnatcatcher—Reports came from 58 counties which included all 47 counties from the central and southern tiers. Washburn County



A Sora peers out from marsh growth at Horicon Marsh in Dodge County in this late July photo by Jim Stewart.

Rita Wiskowski garnered this image of a female Dickcissel carrying food in Milwaukee County in mid-July.

A fledgling Loggerhead Shrike stands on pavement in Taylor County in this late July photo by Bill Grossmeyer.

A Trumpeter Swan family at swimming practice photographed by Michael Huebschen at Crex Meadows in Burnett County in early June.

was the farthest north of the eleven counties where they were found in the northern tier. The high individual count of twenty-one birds came from the Schlitz Audubon Nature Center in Milwaukee County on 18 June (Collison). Forty-three counties confirmed breeding including Kewaunee* (Sinkula).

Golden-crowned Kinglet—Noted within normal range - nineteen northern counties plus Door County. Merkel counted twelve total birds in three family groups with juveniles from a black spruce-tamarack bog north of FR182 in Ashland County on 3 July. The June birds found in Norrie Bog (Belter and Hurlburt) and Mission Lake Bog (Barker and Hurlburt) in Marathon County were the farthest south. There were no major outlier counties as were found in 2015 when these kinglets were confirmed as breeding in Racine and Waukesha County. Fourteen counties confirmed breeding including Washburn* (Berg).

Ruby-crowned Kinglet—Reported from these seven northern counties within normal summer range: Ashland (m.ob.), Douglas (m.ob.), Forest (Peczynski), Iron (N. Anich), Oneida (m.ob.), Price (Merkel) and Sawyer (Dawson/Kibbe/Goldthwait). A late migrant was reported on 3 June from Oak Creek Parkway in Milwaukee County (Lubahn). The only nesting confirmation for the summer was by Keith Merkel in Ashland County on 3 July. He spent several hours tromping through a black spruce tamarack swamp and observed a pair of birds both scolding and carrying food. No reports exceeded a count of three birds.

Eastern Bluebird—Present in all 72 counties with confirmed breeding reports only lacking from Kenosha and Menominee. Steve Sample of the Bluebird Restoration Association of Wisconsin (BRAW) reports 26,352 bluebirds fledged which is close to 60% of the total fledglings for all species that used the trail boxes. The balance of the fledglings was composed of Tree Swallows, House Wrens, and Black-capped Chickadees. This data was provided by the collective effort of 412 monitors tracking 9,163 trail boxes. The number of bluebird fledglings was down significantly compared to the 2015 season due to hot-cold weather patterns in April and May which led to many failed bluebird eggs. Bluebirds were not able to recover from this set-back before Tree Swallows arrived to compete.

Veery—Reported from 66 counties statewide but ranging from common in the north to uncommon and more local in the south. High counts ranged from ten or less in the south, ten to fifteen central, and fifteen to twenty-five in the north. Nicoletti tallied twenty-five birds on 3 June in the northwest corner of an atlas block in Douglas County. Calvetti found the same number while paddling the Namekagon in Washburn County on 11 June. The total number of counties confirming breeding was thirty-one including Kewaunee* (Zenner).

Gray-cheeked Thrush—The only report was of a late northbound migrant that took a rest stop in Daryl Tessen's yard in Outagamie County on 1 June.

Swainson's Thrush—All reports were from these five counties within the expected breeding range in the north: Ashland (Aniches and Sharp), Bayfield (Brady and N Anich), Douglas (Collins), Menominee (Mead and Prestby) and Vilas (Lapin). No late spring or early fall migrants were reported. The first breeding confirmation for WBBA II came from Ashland County on 1 July where Nick Anich heard singing and then "encountered two adults giving persistent liquid whip notes" and carrying food.

Hermit Thrush—Reported from 35 counties including all twenty-five counties from the northern tier and ten central counties south to Juneau and Adams. Ted Keyel counted twenty birds in an atlas block in Taylor County on 24 June. Confirmed breeding took place in eighteen counties.

Wood Thrush—Reported from Menominee County and Vilas County this summer to complete the statewide sweep of all 72 counties versus last year's record of 70. Again this result is a testament to the atlas effort when compared to typical pre-atlas reporting from less than 60 counties. Eleven birds including a juvenile were reported from an atlas block in Crawford County on 26 July (Kirschbaum). Sixteen counties confirmed breeding including Burnett* (Paulios and Packett) and Dunn* (P. Campbell).

American Robin—Reported and confirmed breeding from all 72 counties which is only right and fitting for the state bird of Wisconsin! About three hundred different observers confirmed breeding for this species.

Gray Catbird—Reported from all 72 counties and confirmed breeding in every county except Rusk. Aaron Holschbach counted 33 in the Sauk Prairie Recreation Area on 23 June.

Brown Thrasher—Reported from 71 counties as in the previous summer. Last summer there were no reports from Rusk County and this time it was Forest County that again kept it from being an all-county slam. Reports of ten or more birds came from Bayfield (Brady), Douglas (Nicoletti), and Sauk (A. Holschbach). Breeding confirmed in 53 counties including Lincoln* (Edlund).

Northern Mockingbird—Reported from nine counties. These were all June sightings of single birds except for the pair that successfully bred in Portage County. Two single birds in the southwest at Wyalusing SP in Grant County on 1 June (Skutek) and near Dodgeville in Iowa County on 13 June (Kivikoski). Three reports of single birds from the northern tier were found at Moquah Barrens in Bayfield County on 2 June (Lehner); the same day at Wisconsin Point in Douglas County (Stensaas per Svingen and R. Johnson); and in Marathon County on 9 June (Peck). Single birds were also reported in the east-central region near New Holstein in Calumet County on 2 June (Whitmores) and on Rock Island in Door County on 12 June (m.ob.). In the central part of the state there was a single bird near Devil's Elbow in Adams County on 22 June (Reed) and another single bird was first reported in the Buena Vista Grasslands of Portage County on 13 June (Pendergast). Breeding was confirmed in Portage* County with a pair carrying food on 1 July (R. Mueller) and a fledgling first noted with the pair on 10 July (Sehloffs). Reports continued from Portage County through 22 July (Anderson and Prestby) when four birds were noted.

European Starling—Reported from all 72 counties with confirmed breeding in 69 of them including Menominee* (Prestby). The high count of 1,000 birds came from Jefferson County on 18 June (Turkalj).

Cedar Waxwing—Reported from all 72 counties. Confirmed breeding in 65 counties. Brandon Prim estimated 100 birds at Kohler-Andrae SP in Sheboygan County on 24 July.

House Sparrow—Reported from all counties except Rusk and Washburn with breeding confirmed in 64. The high individual count of 250 birds was noted on Urban Ecology Center bird walks at Three Bridges Park in Milwaukee County in late July.

House Finch— Reported from 64 counties with eight northern counties lacking reports: Iron, Lincoln, Menominee, Oneida, Price, Rusk, Vilas, and Washburn. Breeding was confirmed in 49 counties.

Purple Finch—Observed in 36 counties including all those from the northern region and slightly less than half of the central (no southern). Nineteen counties confirmed breeding. Cynthia Bridge counted ten individuals while conducting hummingbird banding in Washburn County on 16 July.

Red Crossbill—Reported from ten counties: Bayfield (m.ob.), Door (Winze), Douglas (m.ob.), Forest (Richmond and K. Kavanagh), Marathon (McGivern), Menominee (Prestby), Portage (Pendergast), Rusk (Collins), Sawyer (Schaefer and Szymczak), and Shawano (Rutherford). Breeding confirmation in three counties: Marathon* County and Portage County as credited above plus Douglas County (Nicoletti, R. Johnson-Svingen). They were also noted as a probable breeder in Menominee County (Prestby). The high individual count was seventeen birds (fourteen adults plus young) from Lake DuBay Dike in Portage County on 7 June (Pendergast).

White-winged Crossbill—Audible detection of flyovers was noted in four counties with no probable or confirmed breeding activity. All reports: Bayfield on 2 July (Brady) and 4–5 July (Puchalski), Douglas on 30 June (Brady) and 27 June – 6 July (Collins), Forest on 23 July (Seeger), and Menominee on 29 July (Prestby).

Pine Siskin—This nomadic finch (irregular and unpredictable) was reported from twenty-two mostly northern and central counties. This is down somewhat from last summer's record high twenty-nine counties. The most southern report was of a single bird flyover in Racine County on 6 June (Howe). Brady reported a high count of 35 birds migrating down shore to the west in Bayfield County on 3 June. Breeding was confirmed in only two counties (versus eight last summer)

Jeremy Meyer caught this strikingly beautiful male Cerulean Warbler on the ground at Wyalusing State Park in Grant County in mid-June.

A Barn Swallow feeds a young bird in this shot by Jim Stewart, taken at Horicon Marsh in Dodge County near the beginning of July.

A perched Kentucky Warbler sings in this photo by Jeremy Meyer, taken at Wyalusing State Park in Grant County in mid-June.

Jeremy Meyer photographed this image of one of Wyalusing State Park's most sought-after species, the Yellow-throated Warbler, in mid-June.

with a bird carrying nesting material in Dodge* County (Pritchard, 5 June) and a juvenile bird at a feeder in Marathon County (Widmann, 11 June). Murray Berner noted in the species account for the first atlas book that interpreting siskin breeding behavior can be tricky due to "false nesting" behavior which includes courtship, copulation, and nest building.

American Goldfinch—Reported from all 72 counties with confirmed breeding from 56. Totals of forty or more birds were reported in July from Door (Collison), Milwaukee (Collison), and Washington County (Denzin-Weber).

European Goldfinch—This introduced species was reported with confirmed breeding from three southeastern counties: Kenosha (Pratt), Milwaukee* (Mishefske), and Racine (m.ob.). This species is on the AOU list for North America but not yet included on the official Wisconsin state list.

Evening Grosbeak—Reported from eight counties: Ashland (N. Anich and Sharp), Douglas (Berg and Nicoletti), Florence (confirmed breeding, Kavanaghs), Forest (m.ob.), Lincoln (Martin), Marinette (confirmed breeding, Rock), Oneida (confirmed breeding, Engstrom), and Vilas (confirmed breeding, Andrews and Marsh). Maximum count reported was six birds in Forest County on 19 June by Bob and Kay Kavanagh.

Ovenbird—Reported from 70 counties with a density gradient of increasing abundance from the southern to northern tier of counties. Keith Merkel counted 35 on 9 June while walking Kenyon Road in an Ashland County atlas block. Breeding was confirmed in 32 counties from all regions except the southwest where it was noted as probable.

Worm-eating Warbler—Daryl Tessen provided only the third summer season report since 2008 with a bird heard at Baxter's Hollow in Sauk County on 16 June. [Note: Single birds were noted in two counties during the 2015 summer season: At Pine Glen SNA in Sauk County on 17 June 2015 (Mossman) and in Wyalusing SP in Grant County on 30 June 2015 (A. Holschbach). Those two reports were not received in time for inclusion in last season's summer report and so are noted here.]

Louisiana Waterthrush—Reports came from eight counties with no more than three birds noted: Burnett (Maercklein), Grant (Coglan), Iowa (Hurlburt), Ozaukee (Huf), Sauk (m.ob.), St, Croix (Olyphant), Vernon (Duerksen and Epstein), and Waukesha (Coulter and Winze). Confirmed breeding came from along the Little Oconomowoc River in Waukesha County on 5 June (Winze) and from Baxter's Hollow in Sauk County on 17 June (A. Holschbach). Probable breeding was noted for St. Croix County (Olyphant).

Northern Waterthrush—The new high of 33 counties is similar to last year and almost twice the expected pre-atlas normal. Two-thirds of these county reports came from their expected breeding range in the northern tier. The most southerly report was one singing in Washington County on 21 June in an atlas block where the species was previously confirmed in WBBA1. Breeding confirmation was noted in seven counties: Ashland (Merkel), Lincoln (Haas), Manitowoc (J. Trick), Marathon (Backus), Marinette (Rock), Menominee (Prestby), and Price* (Krakowski). Trick noted that the bird he observed was feeding a fledgling cowbird.

Golden-winged Warbler—The 34 counties reporting exceeded last year's record high of thirty and are all in the central, west central, and northern regions. Twenty counties had breeding confirmations including Juneau* (Reed) and Shawano* (Prestby). Three reports exceeding ten birds were all from the northwest including a Bayfield County observation of fourteen males on 19 June (McCaffery).

Blue-winged Warbler—Reported from a new high 56 counties in all regions with three-fourths of these in the central and southern tiers. Calvetti recorded twenty in the Coulee Experimental State Forest in LaCrosse County on 4 June. Confirmed breeding in 32 counties including Douglas* (Nicoletti), Kewaunee* (Zenner), Marathon* (Janz), Menominee* (Prestby), and Pepin* (Schwartz-Geraghty-Rasmussen). The Douglas County breeding confirmation is farther north than any previous atlas record.

Vermivora overlap. There were twenty-five counties that reported both the Golden-winged Warbler and Blue-winged Warbler. Eleven of these central and northern counties had confirmed breeding for both species: Adams, Clark,

Douglas, Dunn, Jackson, Juneau, Marathon, Menominee, Monroe, Portage, and Shawano.

Brewster's Warbler (hybrid)—The two reports of this hybrid came from near Spur Lake in Florence County on 23 June (Kavanaghs and Gray) and at Willow River SP in St. Croix County on 26 June (Umlauf and Olsen-Hodges). The Florence County bird was noted as singing but no specific comments were made on the song type.

Lawrence's Warbler (hybrid)—Eric Epstein observed a female foraging near Warner Creek in Vernon County on 13 June. This is only the second summer report for the last decade along with the one from 2012.

Black-and-white Warbler—Reported from a record high 56 counties including all twenty-five counties in the northern three regions. Nicoletti found fifteen birds in the Snake Lake area of Douglas County on 8 June. Atlas workers confirmed breeding in twenty-two counties. The most southerly reports of confirmed breeding came from Devil's Lake SP in Sauk County (Herbert) and Cedarburg Bog in Ozaukee County (O'Donnell).

Prothonotary Warbler—Observed in nineteen counties mostly in the southern half of the state but as far north as Marathon (Belter and Peck) and Polk (Maercklein). Kirschbaum recorded sixteen birds while visiting three sites in the Prairie du Chien CE atlas block of Crawford County on 13 June. Nine counties confirmed this species as breeding including Green* (Q. Yoerger). The farthest north confirmation was in Buffalo County (Bontly and Schwartz). Three additional counties recorded probable breeding activity.

Tennessee Warbler—Late spring migrants were reported in Dane County (m.ob.) and Milwaukee County (Bontly, Zehner) during the first week in June. The first fall migrants were found in mixed flocks in Douglas County on 8 July (Eckert) and Bayfield County 18-19 July (Brady). Several additional reports of fall migrants came late in July from Outagamie, Shawano, and Trempealeau counties. Merkel had an intriguing report of a male singing from tall tamaracks on 3 July in an Ashland County bog. This date falls within the last week considered as breeding before a long transition period begins (per WBBA II breeding guidelines chart). This behavior (singing from prominent tree, not foraging in mixed fall flock) suggests possible breeding but the species went undetected in earlier (8 June and 26 June) as well as later (24 July) visits to the same location. Best guess may be a transient male looking for a mate. There has been no confirmed nesting of this species in either atlas project. The only confirmed state nesting noted by Robbins in *Wisconsin Birdlife* was from Oak Island (Apostle Islands) in June 1977.

Nashville Warbler—Reported from 39 counties in the central and northern regions plus Grant and Ozaukee in the south. Counts of twenty-five or more birds came from Douglas County (Nicoletti) and Taylor County (Keyel) in June. Breeding was confirmed in twenty-one mostly northern counties including Menominee* (Prestby) plus a few central counties.

Connecticut Warbler—This was a typical summer with five reporting counties. A late female migrant was found in Racine County on June 2 (Wegner). In Oconto County a pair with nesting material was seen on 5 June (Stojak) and a single bird on 27 June (Straub). Reports from two locations in Bayfield County with three birds on 18 July (Kreiss) and a single bird noted the next day (Christensen). A singing male was heard in Vilas County on 27 June (Kalenic). Multiple reports from Douglas County: One to three birds were detected on three June point counts at two different locations (Collins); three birds were found at an undisclosed location in the town of Highland on 18 June (Svingen and R. Johnson); and three adults were reported on 17 July (Kreiss). The Bayfield birds observed by Kreiss included young and provided the only breeding confirmation for the summer.

Mourning Warbler—Reported in 57 counties from all regions including every county in the northern tier, most counties from the central tier, and about half of the counties in the southern tier. The highest number reported was fifteen by observers in the counties of Ashland (9 June, Merkel) and Langlade (6 July, Lafkas). Twenty-three counties reported breeding confirmations including Green Lake* (T. Schultz). The only breeding confirmation in the southern regions was in Washington County (Frank).

Kentucky Warbler—Reported from only two counties last summer season (Grant and Vernon) as well as this season (Grant and Crawford).

A Great-crested Flycatcher pauses on a branch on its way to feed young, as imaged by Jim Edlhuber in Walworth County in late June.

Jim Edlhuber captured this photo of a Chimney Swift tending its nest in an Ozaukee County barn silo in mid-July.

Bill Grossmeyer captured the distinctive field marks of this Lark Sparrow sitting on a branch near Spring Green in Sauk County in mid-June.

Eric Preston photographed this perched, observant male Bobolink in early June in Iowa County.

Kirschbaum heard calls from two locations in the Rush Creek DNR property in Crawford County on 26 July. Sixteen observers reported birds from its traditional haunts in Wyalusing SP (Grant County) between 2 June (Wood) and 24 July (Resch) with a maximum of three birds heard singing on 13 July (Haseleu). Another Grant County location was at Cassville Bluffs SNA where Costanza observed one carrying a caterpillar on 15 July.

Common Yellowthroat—Reported from all 72 counties with 69 having confirmed breeding activity including Pepin* (Patterson). The only counties without breeding confirmation were Grant, Iron and LaCrosse. They certainly lived up to their "common" namesake on 5 June when Stutz estimated 80 of them at the Zeloski Marsh Unit of the Lake Mills SWA in Jefferson County.

Hooded Warbler—Reported from twenty counties mainly from the south but extending into east central, west central, and northeast regions. Many reports came from various north and south units of the Kettle Moraine SF. The farthest north was a male found singing in Marinette County on 11 June (Leitzke). The high count of eight birds came from the Little Prairie NE block in Jefferson County on 26 June (Szymczak). Breeding was confirmed in the Kettle Moraine SF in Jefferson (Szymczak) and Waukesha (A. Holschbach) counties, Point Beach SF in Manitowoc County (Watson), and Mangan Woods in Milwaukee County (MCPS). Eight additional counties provided records of probable breeding.

American Redstart—Reported from all 72 counties with breeding confirmation in 55. High counts were reported on 21 June with 43 at Wyalusing SP in Grant County (K. Lund) and 59 at Peninsula SP in Door County (Wiktor).

Kirtland's Warbler—Comments in this species account are drawn from the Wisconsin KIWA 2016 Season Report compiled by Kim Grveles (WDNR) and Sarah Warner (USFWS). This was the ninth year of monitoring in Wisconsin. The first 2016 arrival in Adams County was noted on 13 May (Hannah). The 2016 statewide census for singing males was conducted 6–20 June surveying a total of 54 stands located in these six counties: Adams, Bayfield, Douglas, Jackson, Marinette, and Vilas. The 2016 survey detected a total of thirty singing males, up significantly from nineteen in the 2015 survey. These were distributed between twenty in Adams, three in Bayfield, six in Marinette, and one in Vilas. Two of these males at the Adams site did not remain for the entire breeding season, leaving a count of twenty-eight total males in the study areas. Adding seventeen females brings the total adults in the state to 45. There were seventeen warbler pairs and twenty-one total nests with seventeen nests in Adams, three in Marinette, and one in Bayfield. Ten of these nests were successful (seven in Adams, two in Marinette, and one in Bayfield), fledging a total of 34–38 offspring. The Bayfield location was a new nesting site. Two of the causes identified for nest failure were depredation and cowbird parasitism. A total of 266 cowbirds were captured in the five traps located at the Adams County breeding site which was the third largest total since 2009. Also of note is that Alyssa DeRubeis found Adams County birds at another location outside of the main site during the June census and nesting was confirmed there in subsequent visits. The Wisconsin summer of 2016 was another successful breeding season for this federally endangered bird!

Cape May Warbler—Twelve counties contained birds, one short of last summer's record high, and about twice the normal level for years prior to WBBA II activity. The counties reporting were Bayfield, Douglas, and Sawyer from the northwest; Ashland, Iron, Oneida, Price, Taylor, and Vilas from the north central; Forest and Oconto from the northeast; plus Door. Breeding activity was confirmed in Ashland* County on 8 July (Sharp) and in Price County on 1 July (Krakowski and Merkel).

Cerulean Warbler—Twenty-one counties harbored this species with over twenty observers filing reports from one of its most reliable locations in Wyalusing SP in Grant County. The high count of twelve individuals came from that park on 17 June (Ollie). The most northerly reports came from Chippewa and Marathon counties. Breeding was confirmed along the White River in Green Lake County (T. Schultz), Wyalusing SP in Grant County (Haseleu), and at Avon Bottoms in Rock* County (Perlberg). Seven additional counties had probable breeding.

Northern Parula—Reported from a new record high of twenty-seven counties with over two-thirds of these from the three northern regions. Observations away from the north and not

clearly migrants included the following. Barzen reported an adult male singing in the same general area of Sauk County on several occasions between 11 June and 21 June. [Baxter's Hollow in Sauk County hosted the only confirmed breeding away from the northern counties during WBBA1.] Birds were reported from two locations in Grant County: two birds at Wyalusing SP on 21 June (K. Lund) and a single bird at Nelson Dewey SP on 8 July (Costanza). An interesting mid-summer report away from the expected northern breeding range came from Pepin County where one was found singing in the Tiffany SWA on 29 June (Betchkal). The high number reported was six birds at Dunn Lake SNA in Vilas County on 30 June (Lapin). Breeding was confirmed in these seven northern counties plus Door (Cobb): Ashland (Merkel), Bayfield (Miller), Douglas (Collins and Nicoletti), Forest (Maertz and Gray), Oconto* (Lafkas), Price (Merkel and Krakowski), and Sawyer (Collins).

Magnolia Warbler—Reports came from nineteen counties. Fifteen of these counties span the northern tier within normal breeding range. There were three reports from the east central region. Single birds at Bailey's Harbor in Door County (24 June) and Point Beach SF in Manitowoc County (8 June) were possible summer residents since breeding was confirmed in those locations during WBBA1. A bird in the Kettle Moraine SF in Fond du Lac County on 4 June was likely a late migrant. There were also two reports from Milwaukee County. A bird seen at Schlitz Audubon NC on 3 June makes sense as a late migrant. However, another single bird observed in Grant Park on 11 June is more enigmatic. Breeding was confirmed from the following five northern counties: Ashland (Merkel), Bayfield (Miller), Florence (K. Kavanagh), Price (m.ob.), and Vilas (Peczynski and Spahn); and from Point Beach SF in Manitowoc County (Watson).

Bay-breasted Warbler—A late spring migrant was found on 4 June in Marathon County (Belter and McGivern), and a putative fall migrant in Douglas County on 8 July (Eckert). The latter seems early for a fall migrant but it was observed flocking with other species including a Tennessee Warbler. Nesting of this species remains undocumented in Wisconsin although records exist from northern Minnesota and the Michigan U.P.

Blackburnian Warbler—Reported in twenty counties spread across the northern tier where it is an expected summer resident. There were also reports from four counties outside the northern range. Multiple observers reported one to two birds from numerous locations in Door County where it was confirmed as breeding in the first atlas. Presumably late spring migrants were noted with four birds in Iowa County on 12 June (Beheler) and a single bird in Juneau County on 2 June (Epstein). Szymczak noted a single bird in the Kettle Moraine SF in Waukesha County on 8 June with comments that it is a rare summer visitor in this location. Breeding was confirmed from a dozen counties across all three northern regions including Oconto* (Maertz and Gray) and Washburn* (Berg).

Yellow Warbler—Reported from 72 counties. Nussbaum estimated fifty birds in the southern portion of Terrell Island in Winnebago County on 3 July. Breeding was confirmed in 67 counties this season.

Chestnut-sided Warbler— Reported from a new high 64 counties statewide including all northern counties. Nicoletti recorded thirty or more in two locations in Douglas County during June. Confirmed breeding in twenty-nine counties this season including Green Lake* (T. Schultz) and Rock* (Haycraft). Only three of the confirmations came from the southern tier counties and included Dane (Kreitinger and Matteson) and Waukesha (Szymczak) in addition to Rock.

Blackpoll Warbler—There were no reports for the season. More typical is detection of a few late spring migrants in the first week of June as was the case in eight of the ten previous summer seasons. There are occasional summer records in northern counties but no confirmed breeding records. This species is a later fall migrant and not expected back through the state until August.

Black-throated Blue Warbler—Reported from a record high sixteen mostly northern counties. Four of these counties were outside the north and harbored a mix of late spring migrants and possible summer residents. Spring migrants in the first few days of June included single birds in Winnebago County (Benson), at Parfrey's Glen SNA in Sauk County (McNair), and a female at Schlitz Audubon NC in Milwaukee County (Bontly). Two reports from Door County

Jim Stewart caught a male Yellow-headed Blackbird perched at Horicon Marsh in Dodge County in early July.

where breeding was confirmed in the first atlas comprised of two birds at Newport SP on 10 June (Wheeler) and a single bird the following day at the Ridges Sanctuary (Licata). A single singing male at Cudahy Woods SNA in Milwaukee County on 16 June (MCPS) is more enigmatic as is the bird reported in Sauk County as detailed below. The high count of four birds was noted on FR2182 in Forest County in early June (Cyganowski). Breeding confirmations from five northern counties: Ashland (Merkel), Bayfield (McCaffery), Douglas* (Collins), Florence* (K. Kavanagh) and Vilas (Parker). Probable breeding was reported from three other northern counties plus an interesting observation in Sauk. Sauk is well out of the expected breeding range but singing and agitated behavior was noted at Baxter's Hollow on 17 June (A. Holschbach).

Palm Warbler—This uncommon summer resident was found in twelve northern counties in its expected breeding range. Totals of seven birds came from a jack pine plantation in Douglas County in June (Berg) and a family noted in Vilas County in July (Spahn). Breeding confirmed in seven northern counties of Ashland (Miller), Bayfield (N. Anich), Douglas (Svingen and R. Johnson), Oneida (Spahn), Price (Dawson-Goldthwait-Kibbe), Vilas (Spahn), and Washburn* (Berg).

Pine Warbler—Birds were present through the season and reported from 56 counties. Found in all counties in the northern tier plus scattered areas of known populations in suitable habitat such as the Kettle Moraine and Point Beach state forests among others. The high count of fifteen birds was found in Juneau County on 23 July (T. Hahn/Prestby/Q. Yoerger). Breeding confirmed in twenty-seven counties including Menominee* (Prestby), Milwaukee* (K. Johnson), Washburn* (Berg), and Waushara* (Dadisman).

Yellow-rumped Warbler—Reported from thirty-one central and northern counties south to Juneau (Reed) and Adams in the Kirtland's pines habitat (m.ob.). The only east central area harboring them was Door County with many locations (m.ob.). Eau Claire (Chrousers) and Jackson (Keyel) counties were the only ones reported from the west central region. Numbers greater than fifteen were recorded during June visits to Douglas County (Nicoletti) and Price (Merkel) counties. Breeding confirmed in nineteen counties south to Toft Point SNA in Door (Prestby) and Jordan Park in Portage (Kozak).

Yellow-throated Warbler—All reports were from Grant County where birds had arrived in April. Ten observers reported birds at Wyalusing SP through 22 July (Griffis) and one report of a single bird at Nelson Dewey SP on 17 July (Costanza). No confirmed breeding reports.

Prairie Warbler—Reported only from Waukesha County where Szymczak reported the species as ongoing since early May in the Kettle Moraine SF. There were nine observers reporting this bird during the month of June from either the Scuppernong Ski and Hiking Trail or the D.J. Mackie Picnic Area with the last report on 21 June (Miller). This is the seventh consecutive summer that a cooperative singing male has been found in the state forest there. Gustafson also reported a single bird from western Muskego on 4 June.

Black-throated Green Warbler—Reports came from 32 counties with three-fourths of them from the east central and northern areas. The only part of the state with no reports was the west central region of ten counties. Farthest south were areas of the Kettle Moraine SF in Jefferson and Waukesha counties. A season high thirty birds were found at Whitefish Dunes SP in Door County on 13 July (Winze). Breeding was confirmed in fourteen counties including Jefferson* (Szymczak) and probable in an additional nine mostly northern counties.

Canada Warbler—Noted in a record number of twenty-eight counties with three-fourths of those from the northern regions. Observations outside the northern counties are a combination of late spring migrants in early June and disjunct populations in suitable habitat in various southern and central locations. The high count of eight birds came from Sawyer County on 22 June (Rutherford). Confirmed breeding in the four northern counties of Douglas (m.ob.), Oconto* (Lafkas), Price (m.ob.), and Rusk (Collins) plus in the central county of Portage* (Janz). Four additional northern counties plus Door had evidence for probable breeding.

Wilson's Warbler—Single late spring migrants were found in five counties over the first five days of June. Wanger found birds in Door County at Cave Point on 1 June and the next day

at Ridges Sanctuary. Cameron noted one at Wisconsin Point in Douglas County on 4 June. One turned up at Wyalusing SP in Grant County on 2 June (Jacobson). In Ozaukee County there was one at Lion's Den on 3 June (Petherick) and another one at Forest Beach Migratory Preserve on 5 June (Sommer). Milwaukee County also had two reports: one was reported by the Urban Ecology Center staff at Riverside Park on 2 June and Lubahn noted another at Grant Park on 4 June.

Yellow-breasted Chat—Chats were found in six southern counties which is typical for recent summers that have followed the outbreak in fifteen counties that occurred in 2012. Dane County led the way with one to two birds at two locations where chats had shown up at the end of May. Last reports were on 21 July from Cherokee Marsh (Axelson) and on 28 July from Brooklyn SWA (Gray/Kavanagh/Maertz). Also reported from the following locations: Wyalusing SP in Grant (Haseleu), Albany SWA in Green (Yoergers), Chiwaukee Prairie SNA in Kenosha (Howe), Ash Creek Community Forest in Richland (Duerksen and Furchgott), and Sauk (Flynn and A. Holschbach). Breeding was confirmed at Chiwaukee Prairie SNA in Kenosha county* (Howe) and Brooklyn SWA in Dane County (Hottman).

Eastern Towhee—Reported from 70 counties with breeding confirmed in 39 of them including Price* (Keyel) and Sawyer* (Dawson/Goldthwait/Kibbe). Nicoletti had thirty birds in Douglas County on a 6 June visit.

Chipping Sparrow—Reported from all 72 counties with confirmed breeding in all except Kenosha. Reports of thirty or more birds came from Grant County in June (Jacobson, K. Lund) and Jackson County in July (Patterson).

Clay-colored Sparrow—Reports came from 66 counties statewide with fewer counties from the southwest region. A count of twenty-eight was recorded in the Buena Vista Grasslands in Portage County on 4 July (Haas). Breeding confirmed in 37 counties including Calumet* (Whitmores).

Field Sparrow—Reported from 62 counties statewide but with fewer north central counties reporting than elsewhere. The highest number of individuals was thirty on 10 July in Sauk County (Furchgott). Thirty-nine counties had confirmed breeding reports including all ten from the west-central region.

Vesper Sparrow—Reported from a record high 62 counties statewide from almost all counties in the central regions and slightly fewer north and south. Greg Cleary reported a season high count of fifteen at the Douglas County SWA on 16 July. Observers confirmed breeding in twenty nine counties including Walworth* (Haycraft) and Wood* (Reed). About half of the total confirmations came from central and west-central counties.

Lark Sparrow—Half of the twenty counties reporting this species were in the southwest and west-central regions. Reports from the counties of Burnett (m.ob.) and Chippewa (Umlauf) are at the northern edge of their expected range. Gorzo and Schilke provided a conservative estimate of twelve birds at the Spring Green Preserve in Sauk County on 14 July. Breeding was confirmed at three locations in Sauk County: Spring Green Preserve (m.ob.), Cassel Road grasslands (A. Holschbach), and Sauk Prairie canoe landing (Walsh). Confirmed breeding was also documented in these additional five counties: Adams* (Reed), Buffalo* (Betchkal), Crawford (Kirschbaum), Dunn (P. Campbell), and Waukesha* (Szymczak). Probable breeding behavior was noted in LaCrosse (Teskie) and Rock (Boone and Cullum) counties.

Savannah Sparrow—Found in all counties except Menominee with a high count of 45 birds from the Buena Vista Grasslands in Portage County on 4 July (Haas). Breeding was confirmed in 50 counties evenly distributed across all regions.

Grasshopper Sparrow—The number of reporting counties increased by ten over last year to a total of 50. One-third of these counties are located in the west-central and central regions. A high count of thirty birds was reported during grassland bird research in Monroe County on 1 June (Graham and Timms). Breeding confirmations came from sixteen counties including Chippewa* (Swartz), Kenosha* (Goldberg), Milwaukee* (Wanger), and Waukesha* (Szymczak). Fourteen additional counties provided probable breeding records.

Henslow's Sparrow—Noted in 41 mostly southern and central counties but also in six

northern counties following only one from that part of the state last summer. Unusually far north are the reports from Ashland and Douglas counties. Nick Anich found the Ashland bird hiccupping the evening of 1 June and it continued the next two days as well (Brady and Oksiuta). In Douglas County, Peder Svingen and Robbye Johnson found single birds at two locations on 25 June and 30 June and two birds from a third location in the county on 3 July. The high number of twelve birds came from both Grant County (23 June, Coglan) and Sauk County (10 July, Furchgott). Breeding was confirmed in the following six counties: Buffalo* (Betchkal), Dane* (Liu), Ozaukee* (Sommer), Rock* (Cullum), Sauk (Fischer and Furchgott), and St. Croix* (Collins). Twenty-one other counties reported probable breeding.

Le Conte's Sparrow—Reported from the following six northwest and north central counties: Barron (Loon Lake WA by A. Staffen), Bayfield (Hatchery Road by Brady), Burnett (two to four birds at Fish Lake SWA by Hoefler and Saur, Crex Meadows by Milender), Douglas (six birds at Chaffey Road by Berg, Bennet CW block by Brady, WI 13 by R. Johnson and Svingen), Oneida (two birds at Thunder Lake SWA by Spahn), and Vilas (Powell Marsh by m.ob., Eagle River East NW block by Spahn). High number was the six birds found by Berg along a wet ditch in an abandoned hayfield in Douglas County on 23 June. No confirmed breeding. Birds detected in Douglas County (Berg on 23 June, R. Johnson and Svingen on 30 June) and Burnett County (Hoefler on 7 July) were coded as probable breeders.

Nelson's Sparrow—There were no reports this summer. The bird has been reported in six of the previous ten summer seasons at Crex Meadows in Burnett County. Two birds were found at that location last summer but WBBA II is still lacking a probable or confirmed breeding record.

Song Sparrow—Reported with breeding confirmation in all 72 counties. Stutz estimated 100 birds at the Zeloski Marsh Unit of the Lake Mills SWA on 5 June.

Lincoln's Sparrow—Reported from thirteen northern counties in its expected breeding range plus two birds noted at the Necedah NWR in Juneau County on 8 June (Carol Wolf). Eight birds were found at Thunder Lake SWA in Oneida County on 30 June (NLDC). Breeding confirmation reported from the counties of Ashland (Merkel and Sharp), Douglas (m.ob), Price (m.ob.), Vilas (m.ob.), and Washburn* (Berg). Probable breeding was recorded for an additional six northern counties.

Swamp Sparrow—Reported from 67 counties. Fifty or more reported from Horicon NWR in Dodge County on 3 July (Howe) and Terrell Island in Winnebago County on 3–4 June (Nussbaum). Forty-seven counties provided breeding confirmations including Milwaukee* (MCPS) and Pepin* (Betchkal).

White-throated Sparrow—Reported from 33 counties with two-thirds of this total from the northern tier. Twenty-five or more birds were found in Langlade County on 21 June (Lafkas) and Jackson County on 24 July (T. Hahn/Prestby/Q. Yoerger). Breeding was confirmed in eighteen counties spaced across the three northern regions plus the Warrens quad in the west-central county of Jackson as noted above. Probable breeding was noted in a few additional northern counties and extending south into bog habitat in the central counties of Fond du Lac and Portage.

White-crowned Sparrow—Most reports were of single individual late spring migrants moving north in the first week of June in the counties of Door (m.ob.), Milwaukee (Wanger and MCPS), and Washington (Persche and Navine). The exception was an apparent oversummering individual in Milwaukee County where Mike Wanger observed this bird foraging on a gravel path in Oak Creek Rawson Garden on 5 July.

Dark-eyed Junco—The species was reported from ten northern counties with no report of more than three individuals. All counties: Ashland (Sharp), Bayfield (m.ob.), Door (Wiktor), Douglas (Kreiss), Forest (Spahn), Langlade (Nussbaum), Marinette (m.ob.), Oneida (Backus and Swift), Taylor (Keyel), and Vilas (m.ob.). Confirmed breeding in four northern counties all by use of the fledgling code: Ashland* (Sharp, 30 July), Bayfield (Brady, 19 July), Marinette* (K. Kavanagh, 14 July), and Oneida (Backus, 11 July). Probable breeding was noted in Vilas County at two locations on 21 June (Peczynski).

Summer Tanager—Aaron Holschbach encountered a first year male singing by the Prairie du Sac dam in Sauk County on 9 June. This is only the seventh summer record since 1900 but the third one in the last five years including previous reports from 2012 and 2014.

Scarlet Tanager—Reported from all 72 counties. Patterson encountered several pairs with fledglings plus additional birds calling for an estimate of sixteen total tanagers in Jackson County on 27 July. Confirmed breeding in 43 counties including Fond du Lac* (Baughman), Pepin* (Betchkal), and Richland* (County Atlas Administrator).

Northern Cardinal—Reported from all 72 counties with breeding confirmation in 55 of them including Menominee* (Prestby). Breeding was confirmed in nine northern counties but only as far north as Polk, Lincoln, and Marinette. Reports of probable breeding included an additional six northern counties as far north as the state border in Bayfield (Burkman). The high estimate for the season was of 45 birds in Jefferson County on 18 July (Volenec).

Rose-breasted Grosbeak—Reported from every county with an estimated high of 32 birds from a Clark County location on 1 July (J. Lund). Observers were able to confirm breeding activity in 66 counties.

Blue Grosbeak†—This species returned to Sauk County again this year after an absence of reports in 2015. The first report was of an immature bird observed by Jeb Barzen on 6 July about seven miles east of the Spring Green Preserve. The initial report from Spring Green Preserve came on 10 July when Henrikson and Wroza noted territorial behavior with an adult male chasing an immature male (see "By the Wayside" for a full commentary). Reports of a single male continued between 11 July and 24 July. Breeding was confirmed by John Kivikoski on 28 July when he observed four birds, a pair with the male carrying food and begging behavior by two immatures. Reports from the location continued through mid-August. Although not a new breeding record for the state, it was one of the new species that received atlas confirmation during this second season of the WBBA II project. The species had not been confirmed as a breeder in the state during the initial atlas work (1995–2000). [ph. †Henrikson, ph. †Grossmeyer, ph. †Rueckheim, †Wood]

Indigo Bunting—Reported from all 72 counties. The high count was twenty-five buntings at Zeloski Marsh in Jefferson County on 10 June and again on 11 July (Stutz). Atlas workers were able to confirm breeding in 65 counties.

Dickcissel—An excellent year for this species that Audubon knew as the black-throated bunting with reports from 64 counties, up significantly from 2015 (49). They were reported from all southern and central counties plus seventeen of twenty-five in the north. The average number of reporting counties in the previous decade is 46. Within that span the 2016 total is second only to the unprecedented event of 2012 when they appeared in every county in the state. Jane Furchgott reported what she called "Dickcissel central" in Sauk County with a conservative estimate of 45 birds while driving roads around the Lone Rock airport block on 20 June. Thirty-two counties compared to only eleven last summer were found to have confirmed breeding including Clark* (Meyer), Crawford* (Kirschbaum), Marathon* (Belter), Marinette* (Lafkas), Price* (Krakowski), Racine* (Kinzer), Rusk* (Stutz), and Taylor* (P. Campbell).

Bobolink—Reported from all 72 counties. Maximum count was 50 birds at the Buena Vista Grasslands in Portage County on 8 June (Carol Wolf). Fifty-one counties confirmed breeding for this second year of atlas work including Iron* (N. Anich) and Pepin* (Rasmussen).

Red-winged Blackbird—Reported with breeding confirmation from all 72 counties with an estimate of 6,000 birds at the Mack Wildlife Area in Outagamie County near the end of the period on 26 July (Gray).

Eastern Meadowlark—Found statewide in 67 counties Three counties clustered in the north central region had no reports (Vilas, Oneida, and Lincoln). Jack Coulter provided a conservative estimate of twenty birds from the Spring Green Preserve in Sauk County on 3 July. Forty-seven counties confirmed breeding for the summer season.

Western Meadowlark—Observers found this species in twenty-two counties this year. The distribution of these reports was dispersed across two to three counties in most regions except for

east central (one county) and southeast (none). The high count was six birds in Grant County on 19 July (Haycraft). June and July breeding confirmations came from only three counties: Adams (Reed), Grant (Haycraft), and Green (Haycraft and Q. Yoerger). For WBBA II to date there have been no breeding confirmations from the ten west central counties whereas eight of these counties had confirmed breeding in WBBA I. This is likely just one example of the coverage gaps that still exist in certain counties at this point in the current atlas effort.

Yellow-headed Blackbird—Noted in thirty counties with confirmed breeding in seventeen including Calumet* (Nikolai). The only report from the southwest region was from Yellowstone Lake SP in Lafayette County (Cerny). The highest number of individuals reported was an impressive 1,088 birds (796 adults and 292 young) at Rush Lake in Winnebago County on 16 June (Ziebell). Two additional counties reported breeding in the probable category.

Brewer's Blackbird—Noted in twenty-nine counties. Rock County was the only one reporting from the three southern regions, with two west-central counties and then the main number distributed over the other central to east-central and northern counties. No reports exceeded twenty-five birds. Fifteen counties confirmed breeding with an additional six noting this as probable only.

Common Grackle—Reported with breeding confirmation from all 72 counties. Gray estimated fifteen hundred birds at the Mack SWA in Outagamie County on 26 July.

Brown-headed Cowbird—Reported from 72 counties with a high individual estimate of one hundred birds at the Bark River Unit of Paradise Valley SWA in Waukesha County on 3 June (Coulter). Breeding confirmed in 65 counties.

Orchard Oriole—Noted in 50 counties this season. All reports were for less than ten birds. Northward movement of this species was noted with data from the first atlas project when compared to the distribution map in *Wisconsin Birdlife* (Robbins, 1991). Results for the first two years of the second atlas project (WBBA II) indicate that this range resurgence has continued. This is most apparent in the central region of the state where four counties have been added to the confirmed breeding range in the first two years of new atlas effort (Adams, Juneau, Portage, and Waupaca). Four additional counties from other areas have also been added: Chippewa from the northwest, Pierce and Buffalo from the west-central, and Kewaunee from the east-central regions. Thirty-nine counties provided a confirmed breeding record this summer including Buffalo* (Patterson), Chippewa* (Swartz), Juneau* (Epstein), Kewaunee* (Zenner), and Pierce* (Wieland). Breeding is yet to be confirmed from any north central county for either atlas project.

Baltimore Oriole—Reported from all counties with breeding confirmed for every one of them as well. Fitzpatrick tallied the high individual count of 51 while kayaking the backwaters of the St. Croix River in Polk County on 17 June.

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Jeremy Meyer spotted this male Horned Lark displaying its "horns" at Bong State Recreational Area in Kenosha County in mid-June.

A Great Egret with full breeding plumage displayed struck a pose for Michael Huebschen in the Fond du Lac County section of Horicon Marsh in early July.

"By the Wayside"—Summer 2016

Seasonal highlights include these reports of White-winged Dove, Arctic Tern, Yellow-crowned Night-Heron, Swallow-tailed Kite, Western Kingbird and Blue Grosbeak.

"By the Wayside" is intended to show select documentation that successfully won acceptance from the WSO Records Committee. The accounts are presented as submitted by the authors.

White-winged Dove

8 June 2016, Argyle, Lafayette County

Tan dove appeared larger than Mourning Dove but smaller than Eurasian Collared Dove, both of which were in the area. White leading edge to the wing. Red eye surrounded by blue skin. Dark line/patch below the eye. Collared Doves are larger and more cream colored. Mourning Doves are smaller with dark spots. Neither of these have the white leading edge in the wing. Call sounds very similar to the Eurasian Collared-Dove with additional notes at the end. The ending was not as rhythmic as the first several notes of the call. [*Quentin Yoerger, Evansville, WI*]

Arctic Tern

27 June 2016, Manitowoc Impoundment, Manitowoc County

This medium-sized tern was seen almost exclusively on the ground near a spur of water in the Manitowoc impoundment. When I scanned across the large flock of gulls, and saw the red bill and gray underparts, my first impression was that one of the Common Terns had returned. What jumped out at me was that the gray underparts nearly matched the gray upperparts, and there was a distinct white horizontal band across the bottom of the face. This reminded me of the Arctic Terns I had seen in Churchill, Manitoba many years ago. Further study revealed that the bill was solid red with no trace of black. This bird required even further study! I looked closely at the upperparts and noticed that there was no contrast between the wingtips and the rest of the upperparts. There was a silvery coloration to the primary tips at certain angles. Most importantly, the wingtips did not reach the end of the tail. The black cap on this bird, nearly reached the gape of the bill, so there was far less white in the resulting gap than would be seen on a Forster's Tern, and probably not as much as on a Common Tern although none were present for direct comparison. The legs were very short, but mostly covered with mud, so it was hard to judge color, but what color I could see was pink.

Although this bird flew several times, I always lost it in the masses of gulls and Caspian Terns, so I was unable to get a definitive look at the underwing. [*Thomas Wood, Menomonee Falls, WI*]

Yellow-crowned Night-Heron

26 July 2016, Veteran's Park Lagoon, Milwaukee County

An immature Black-crowned Night-Heron was perched on a nearby branch in the same tree, allowing easy comparison views of the two species. Mid-sized, chunky heron. Plumage overall light brown, with small pale spots and thin pale edges to wing coverts. Plumage indicates this is an immature bird. Oval head; longish, thin neck; and long legs. Narrow streaking on breast. Bill all dark, relatively short, thick, and dully pointed. Irises red. Differentiated from similar immature Black-crowned Night-heron, which exhibits shorter, thicker neck; longer, more pointed bill with considerable yellow on lower mandible; shorter legs; much larger pale spots on wing coverts; broader, blurred streaking on breast. Only other similar species would be American Bittern, which differs by having no light spots on its brown back and wings; has a proportionately longer, tapered neck with bold white and brown stripes on throat; and longer, pale, sharply pointed bill. [*Jym Mooney, Milwaukee, WI*]

Swallow-tailed Kite

27–28 July 2016, Juddville Road, Door County

We watched this bird for more than ten minutes. It came from southwest of us, over a line of trees, and continued to approach until it flew right over us as we stood on the road. It flew slowly and circled over us for a good length of time, so we were able to get excellent looks with our 10×42 binoculars and 20–60× spotting scope. The bird was a medium-sized raptor, with long narrow wings and a long "swallow" tail. The head, underparts, and wing linings were white; the upperparts were black, except for the head. Distinguished from other Kites by the "swallow" tail and distinctive black-and-white pattern. Continual flight, mostly gliding on light breeze; eventually "thermaled" to a great height before flying off. [*David and Margaret Brasser, Sheboygan,* WI]

Select comments from other observers . . .

> *This bird was seen in flight for the entire time I observed it. Its flight was very agile and graceful, often soaring around in circles at a fairly low altitude. [Dan Belter, Wausau, WI]*

> *Only saw it flap its wings a handful of times, mainly stuck to gliding. Looked like in the morning (with light rain and cooler temps) it was swooping down on the tree tops and grabbing insects off of the leaves. [William Grossmeyer, Nashotah, WI]*

> *This striking black and white raptor was quite large, about the size of a Red-tailed Hawk, but with a much smaller head and bill. When a Kestrel harassed the Swallow-tailed Kite, the former appeared tiny by comparison. The deeply forked tail was unique and quite obvious. [Thomas Wood, Menomonee Falls, WI]*

> *At 8:50 the Swallow-tailed Kite was spotted working the tree lines around a*

wheat field. It proceeded to look for dragonflies amongst the tree tops and over the field. [Daryl Tessen, Appleton, WI]

Western Kingbird
24 June 2016, Cemetery in Mercer, Iron County

I was doing an atlas point count when a flycatcher flew west across the field. It was approximately Eastern Kingbird sized. I got my binoculars on it in flight and observed it from slightly underneath, noting the yellow belly, white on the lower front cheek contrasting with a gray head, and white outermost sides of a dark tail. The bird then landed high in a row of trees. I looked for it but did not see it perched. After 2 minutes it headed back out the way it came. I did not get many details on it during this observation, as within several seconds I was looking into the sun, but I did again note the yellow belly and greenish-gray back color, and the flared tail, which was slightly round (that is, the center feathers were a hair longer than the outer feathers, not dramatically so).

Similar Species: An Eastern Phoebe would be smaller, the yellow belly would be less vivid, the flight would be a bit less strong, and the head would show a dark cap. A Great Crested Flycatcher would show orange in the wings, brown on the back, and a more tufted head shape. An Eastern Kingbird would be similarly proportioned but would have a darker back and an obvious white tip to the tail. Other yellow-bellied kingbirds are ruled out because I noted the white outer tail feathers. [*Nicholas Anich, Ashland, WI*]

Blue Grosbeak
7 July 2016, Spring Green Preserve East, Sauk County

We actually heard the bird singing at about 8:30am and it continued for a long time, maybe an hour. We were on the east-west path at the preserve and the bird was singing near the junction of the flat area (plain) with the rising hill (bluff) to the north. We searched with our binoculars but could not find it. We gave up our search, walked the path to the top of the bluff. When we came back down we again heard the song in about the same location. This time, about 11:00am, we saw the bird. From quite a distance we could see that it was a mostly blue bird similar to that of the Indigo Buntings we had been seeing. However one big difference was the presence of some obvious rusty patches on its wings (wing bars) which Indigo Buntings do not have. These morphological features along with the song strongly indicated that this was an adult male Blue Grosbeak (BLGR). My birding partner, Stan Wroza, was able to obtain a documentary photo of the perched bird from some distance. It also seemed like a larger bird than the Indigo Bunting but from quite a distance size was difficult to determine. This time also the bird started moving around to small bushes and oak saplings no more than 10–20 feet high and scattered widely apart. It did get close once and we could see a large, conical beak. At one point the adult male BLGR was joined by another BLGR which we felt based on color pattern was a first summer (born the previous summer) immature male. It was similar in size to the adult male, had a mostly blue head, variously brown shaded body and wings and a dark tail.

Stan was able to take a photo of the immature BLGR but this time in flight. The two grosbeaks chased each other for a short time then separated. Although Stan saw the adult male BLGR carrying what appeared to be food we are not sure enough that this proves confirmed breeding. To be safe we are saying that it is probable and hope others can visit the site and confirm breeding. [*Charles Henrikson, Madison, WI*]

Jeremy Meyer froze this Black-crowned Night-Heron in mid-flight at Horicon Marsh in Dodge County at the beginning of July.

WSO Records Committee Report: Summer 2016

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The WSO Records Committee reviewed 42 records of 15 species for the Summer 2016 season, accepting 37 of them (88%). Seven reports reviewed this season were from prior seasons and years including a May 2000 picture of a Green-tailed Towhee. Highlight of the Summer season was the Swallow-tailed Kite in Door County and a nesting pair of Mississippi Kites in Janesville.

Accepted Records

Table 1 provides a list of records accepted by the WSO Records Committee during the Summer 2016 season. Information on each record, such as species, location, observer(s), and date(s), is accompanied by the tally of votes made by the five-person committee. Records with one or fewer dissenting votes are accepted into the state records.

Records Not Accepted

In the header for each record, voting tallies are shown in parentheses. Votes to accept are listed first. Two or more dissenting votes from the five-person committee results in a Record Not Accepted.

Chuck-wills-widow—

Jefferson/Walworth County, 17 May 2016 (2-3).

The report received was: "Heard call twice at approximately 9:05 which I was told was late for the bird to start calling. We did not hear the full song as several whip-poor-wills were calling at the same time. As a result, we did not hear the 'chuck' part of the call but heard a very clear 'will's-widow'."

Members of the committee feel that this very brief description does not adequately contrast the call of Chuck-wills-widow against the call of a Whip-poor-will to successfully rule out the Whip-or-will. The report relies entirely upon mnemonics to describe the call instead of discussing which syllables with the call are emphasized.

Chuck-wills-widow—

Jefferson County, 14 June 2016 (0-5).

The description given in the report was ". . . listened for a few minutes with the bird probably within 50 yards of the

Table 1. Records accepted by the WSO Records Committee.

Species	Date	Observer	Location	County	Notes	Vote
Green-tailed Towhee	5/31/2000	Joe Palzkill	23402 190th Ave.	Chippewa	Photo	5 - 0
Slaty-back Gull	01/09	William Grossmeyer	Kohl's Parking lot	Jefferson	Photo	5 - 0
Say's Phoebe	03/28	William Grossmeyer	Goose Pond	Dane	Photo	5 - 0
Smith's Longspur	04/25	William Grossmeyer	Brooklyn State Wildlife Area	Dane	Photo	5 - 0
Little Gull	05/21	William Grossmeyer	Manitowoc Impoundment	Manitowoc	Photo	5 - 0
White-winged Tern	05/21	William Grossmeyer	Manitowoc Impoundment	Manitowoc	Photo	5 - 0
Arctic Tern	06/27	William Grossmeyer	Manitowoc Impoundment	Manitowoc	Photo	5 - 0
Arctic Tern	06/27	Daryl Tessen	Manitowoc Impoundment	Manitowoc		4 - 1
Arctic Tern	06/27	Thomas Wood	Manitowoc Impoundment	Manitowoc		5 - 0
Arctic Tern	06/28	Jym Mooney	Manitowoc Impoundment	Manitowoc	Photo	5 - 0
Blue Grosbeak	07/10	Charles Henrikson	Spring Green Preserve - East	Sauk	Photo	5 - 0
Blue Grosbeak	07/12	William Grossmeyer	Spring Green Preserve East	Sauk	Photo	5 - 0
Blue Grosbeak	07/15	Thomas Wood	Spring Green Preserve East	Sauk		5 - 0
Blue Grosbeak	07/19	Kelly Rueckheim	Spring Green Preserve East	Sauk	Photo	5 - 0
Little Gull	06/21	Daryl Tessen	North Point in Sheboygan	Sheboygan		5 - 0
Little Gull	06/05	Thomas Wood	Deland Beach to North Point.	Sheboygan		5 - 0
Little Gull	06/20	Thomas Wood	Sheboygan's North Point	Sheboygan		5 - 0
Little Gull	06/10	Thomas Wood	North Point in Sheboygan	Sheboygan		5 - 0
Little Gull	06/22	Chris Rohrer	North Point	Sheboygan	Photo	5 - 0
Mississippi Kite	07/29	Scott Weberpal	Janesville	Rock	Photo	5 - 0
Rufous Hummingbird	between 7/29–8/2	Katie Kozak	Marges Lane in Stevens Point	Portage	Photo	5 - 0
Rufous Hummingbird	07/30	Brad Zinda	Marges Lane in Stevens Point	Portage	Photo	5 - 0
Surf Scoter	06/12	Thomas Wood	Manitowoc Impoundment.	Manitowoc	Late	5 - 0
Swallow-tailed Kite	07/27	Dan Belter	Juddville Rd 1/2-mile west of Cty Tk A	Door	Photo	5 - 0
Swallow-tailed Kite	07/28	David & Margaret Brasser	Juddville Rd 1/2-mile west of Cty Tk A	Door	Photo	5 - 0
Swallow-tailed Kite	07/28	William Grossmeyer	Juddville	Door	Photo	5 - 0
Swallow-tailed Kite	07/28	Daryl Tessen	Juddville	Door		5 - 0
Swallow-tailed Kite	07/28	Thomas Wood	Juddville Road .4 miles west of CTH A	Door		5 - 0
Western Kingbird	06/09	Michele Woodford	NW side of Little Trout Lake	Vilas	Photo	5 - 0
Western Kingbird	06/24	Nicholas Anich	Cemetery in Mercer, WI	Iron		5 - 0
White-winged Dove	06/08	Quentin Yoerger	Argyle - Lafayette & Milw St	Lafayette	Photo	5 - 0
White-winged Dove	07/17	William Grossmeyer	Argyle - Lafayette & Milw St	Lafayette	Photo	5 – 0
White-winged Dove	07/23	Rick Anderson	Argyle - Lafayette & Milw St	Lafayette	Photo	5 - 0
White-winged Dove	07/04	Rory Cameron	Pine Valley Road	Clark		4 - 1
Yellow-crowned Night Heron	07/26	William Grossmeyer	Veterans Park Lagoon, Milwaukee	Milwaukee	Photo	5 - 0
Yellow-crowned Night-heron	07/26	Jym Mooney	Veterans Park Lagoon, Milwaukee	Milwaukee	Photo	5 - 0
Yellow-crowned Night-Heron	07/26	Thomas Wood	Veterans Park Lagoon, Milwaukee	Milwaukee		5 - 0

house. We could hear all notes of his song clearly . . . We are familiar with whip-poor-wills and we regularly hear a few different owl species. This song had the repetitiveness of the whip-poor-will, but it was a different song."

Nowhere in this report is the call of the bird described. When attempting to identify a bird exclusively by call, a detailed description of the call needs to be included.

American Tree Sparrow—

Bayfield County, 23 June 2016 (0-5).

The report is of a bird described as "Reddish crown, gray superciliary stripe, reddish eyeline, black arrow chest spot, grayish throat, whitish/lighter abdomen, dark legs, buffy upper side color becoming chestnut anterior to the shoulder." The report also included as discussion of similar species such as: "Chipping Sparrow—smaller than ATSP and has white supercilium and black eyeline—observed bird had gray supercilium and chestnut/reddish eyeline. Clear pale gray breast - no arrow as noted on observed bird. Eliminated by field mark comparison."

The committee found this to be a very interesting report that warranted further research and discussion. Using eBird it was determined that this would be the only documented American Tree Sparrow in the lower 48 in June. An early June sighting could be a very late migrant, but in late June it would probably not be a migrant. The report of the bird observed fails to mention certain fieldmarks that would help eliminate other sparrow species. Members of the committee indicated they would like to see additional detail in the report regarding the wings/wingbars, bill color, and a description of the tail.

Boreal Owl—

Chippewa County, 02 June 2016 (0-5).

The very brief report is of an "owl" described as "Brown grey white" vocalizing with a "Hoot call".

The report lacks detail necessary to identify the bird down to a specific species. The call of a Boreal Owl is not a hoot.

Neotropic Cormorant—

Milwaukee County, 01 June 2016 (0-5).

The observer reported that "I saw four cormorants fly out from behind the bluff above me. They caught my eye immediately because one bird was definitely a cormorant in shape and flight pattern, but was very noticeably smaller than the other three. It appeared overall much slimmer, both in its body and its neck and head. The wings were shorter, less broad, and more pointed than those of the other cormorants (DCCOs show a broader 'hand' in flight). Compared to the other three cormorants, this bird was almost delicate looking. A DCCO has a heavy neck and head, whereas this bird's neck and head were so slim as to give it a 'pencil-necked' appearance compared to the other birds. While there is an easily discerned distinction between the heavy neck and the larger head of a DCCO, the neck and head of the NECO joined with almost no observable junction. I judged the NECO overall to be only three-fourths the size of the other cormorants. I tried to get a look at the tail, but was unable to get a good look before all four birds wheeled back over the bluff and out of sight. All four birds appeared to be all

dark (no pale breasts), so probably not juveniles."

The committee found this report to be highly suggestive of a Neotropic Cormorant but the failure to note any details regarding the tail is a concern. For a bird that would be a second state record the committee expects to have all the details noted that would differentiate it from another very similar species. Tail shape and size should be one of the most obvious fieldmarks on a cormorant in flight.

A Bald Eagle beginning a search at Nebish Lake in Vilas County as seen through the lens of Michael Huebschen in late June.

About the Artists

Pam Campbell is a lifelong resident of northwestern WI, who is retired and living in Menomonie. She is an avid birder who enjoys amateur bird/nature photography, hiking and snowshoeing. She considers herself fortunate to be able to travel to the tropics a few times to add to her "life" list.

Beverly Engstrom is a retired elementary school teacher who lives on the Wisconsin River in Oneida County on property that is protected through a conservation easement with Northwoods Land Trust. She enjoys many outdoor activities, especially nature photography.

Jim Edlhuber, a lifelong native of Wisconsin, has been photographing wildlife for over 20 years. He considers himself an avid photographer and is always trying to capture nature and wildlife through his lens. He is in several photography clubs and has won numerous awards for his work. In recent years, Jim has focused mostly on birding photography and finds it to be the most challenging. Jim features some his photography work online through his blog, windowtowildlife.com.

David Franzen and his wife, June, have lived in Phelps, Wisconsin since 1969. He worked for 34 years in the woods of northern Wisconsin, retired from the U.S. Forest Service in 2001 and from a private forestry consulting business in 2004. After retirement he took up bird photography with most of his work being shot within 100 yards of his house. His primary interest is in photographing bird behavior. He does not use blinds, but quietly waits in a chair for a bird to strike an interesting pose within close range. During 34 years of forestry work, he captured with the mind, many images that far surpass what he has captured with the camera. The most beautiful nature scene he ever viewed was encountered while trout fishing a small stream surrounded by maple forest that had sparse understory prior to spring leaf emergence. On that misty morning, a huge timber wolf glided over a hill across the stream and came toward him to stream's edge. When a wolf moves slowly, it kind of glides effortlessly, and this big guy was more like a spirit than a real animal. A real magical moment. David does occasional slide programs for local groups.

Jeff Galligan is 48 years old and lives in Middleton, Wisconsin. He is a retention program advisor and the coordinator of a mentoring program for students of color at Madison College and recently completed his doctorate in educational leadership. He enjoys wildlife photog-

raphy (especially birds), reading, cooking, traveling, kayaking, and hiking.

Bill Grossmeyer is a Wisconsin native and has always had a love for nature. He has always enjoyed watching birds in his backyard, but only recently began learning more about them. He enjoys hiking and exploring, especially when it involves learning about birds and the environments they live in. Photography is also a newer hobby, one that stemmed from some difficulty identifying new birds. He is moderately colorblind, and photos made it easier to show people what he saw. He recently moved to the Grafton area and is enjoying the local area to explore with friends and family.

Michael J. Huebschen is the current Art Editor for *The Passenger Pigeon* and has been an amateur wildlife photographer for over 45 years. He is retired from UW-Oshkosh and lives in Oshkosh, Wisconsin with his wife, Cynthia. They enjoy travel, wildlife observations, hiking, canoeing and fishing.

David Lund is an amateur photographer who lives near Eau Claire. Following his retirement as a Mathematics Professor at UW-Eau Claire in 2000, he and his wife, Judy, now include birding and photography as part of all of their travels. Although many of his pictures are taken in Wisconsin, wintering in the southern US has provided many additional opportunities birding photography experiences. He has recently begun making presentations on birds and birding.

Jeremy Meyer has been interested in birds for as long as he can remember. He started taking pictures of birds when he was 11 when his grandpa gave him his old camera. Ever since then bird photography has been a passion. As he got older the more he got into it. His mom and he would walk the Oak Leaf Trails in search of birds. As his passion grew he started to adventure into the parks and forests. He would go out dressed in full camouflage to allow him to get as close as possible without disturbing them and still be able to watch them in their natural habitat. After years of doing that he stumbled across the wisbirdn list while trying to find information about a Snowy Owl in Milwaukee. That was three years ago, and ever since he's been traveling the state taking photographs of birds. He enjoys sharing his pictures with everyone, especially family and friends who are not fortunate enough to see the birds themselves. In the future he hopes to travel the country and continue his passion of bird photography.

Eric Preston is an amateur nature photographer who travels the Midwest, and beyond, to photograph the natural world. He especially likes looking for and photographing birds and butterflies in the native grasslands of southern Wisconsin. His photographs have appeared in numerous books and magazines, including *Birder's World* and *Gulls of the Americas.* He has been interested in birds and nature for most of his life. He currently lives in Madison,

Wisconsin with his wife, Kim, and son, Anders.

Jim Stewart is the son of an upstate New York salt miner and an elementary school teacher. He arrived in Wisconsin 36 years ago and fell in love with the state's natural areas. For all of those many years he has felt, along with Jean Henri Fabre and Wisconsin's Aldo Leopold, that beauty and perception "grow at home as well as abroad." Now, with the luxury (and shortness) of time that comes with age he is able to play, camera in hand, in the natural areas that dot Dane and surrounding counties—jewels that provide sustenance to diverse wildlife. His interest is to use his photography as a means to better see by asking, over and over, two questions posed by Rachel Carson in her remarkable book *The Sense of Wonder* (1956/1998): "For most of us, knowledge of our world comes largely through sight, yet we look about with such unseeing eyes that we are partially blind. One way to open your eyes to the unnoticed beauty is to ask yourself. What if I had never seen this before? What if I knew I would never see it again?"

Kelly Vils is 35 years old and lives in Kaukauna, WI. She goes birding as often as she can with her husband, Nate, and their 4 children. She is an occupational therapy assistant who works with children with autism and can also be found passing on the love of birding to her clients.

Chris West is a professional bird tour leader and photographer who started birding in his rural southwestern Wisconsin backyard at age six. He started photography soon after and has since had photos used in over a dozen publications and online articles. He loves photographing birds in their natural environments and particularly enjoys photo-documenting vagrants whenever and wherever they turn up. In 2010, he took his first trip to the tropics and never looked back. His latest trip was three months as a guide at Cristalino Lodge in Amazonian Brazil, and is now planning and leading numerous tours to tropical countries. Even though the tropics call, he always returns to his native rural Wisconsin.

Rita Flores Wiskowski is a birder/photographer from South Milwaukee. Interested in birds and nature from a young age, she became a serious birder in 2008, inspired by a family of Great Horned Owls nesting in her neighborhood. Shortly after, she discovered the wonderful network of birders in Wisconsin who are willing to share knowledge, sightings, and adventures, and she was hooked. These days, when she is not working her day job as a fundraising professional, she can be found birding, with a pair of binoculars in one hand, and her camera attached to a monopod in the other. Besides birding and photography, her passions include environmental advocacy and education. She serves on the boards of Lakeshore State Park, Friends of the Mill Pond & Oak Creek Watercourse, and Wisconsin Metro Audubon Society.

Jim Edlhuber imaged Common Loons together, a parent and juvenile, in Sawyer County in early July.

Guidelines for Authors and Artists

Authors

The Passenger Pigeon, issued quarterly by the Wisconsin Society for Ornithology (WSO), publishes articles on Wisconsin birds, on ornithological topics of interest to WSO members, and on WSO activities and business. Anyone with a serious interest in Wisconsin birdlife—whether a professional ornithologist or an amateur birder – is encouraged to submit articles and observations to this journal. The Editors are happy to discuss ideas for articles with potential authors.

Readers are encouraged to submit articles to be considered for publication in *The Passenger Pigeon*. It should be noted that all research articles will be submitted for peer review. Articles not presenting research will go through the traditional editorial process. The editors will do as much as possible to see that work is published, including offering suggestions for improvement when pertinent.

General articles should be sent via email to PassengerPigeon@WSOBirds.org and research-based articles should be sent directly to the Peer Review Editor, Matt Hayes at research@wsobirds.org. If necessary, articles may be sent by surface mail to: Passenger Pigeon, 5018 Odana Rd, Madison, WI 53711.

Following are specific guidelines for submission:

- The article should have not been previously published in a different journal.
- The text must be in Word format (.doc or .docx), either Word for Windows or Word for Mac.
- The manuscript should be double-spaced throughout (including figure and table captions) and use 12-point Times New Roman or Calibri font style.
- The text must be on pages separate from figures and tables.
- On the title page, provide the article title, name, address, telephone number, and email address of all authors of the article.
- Include the acknowledgments, literature cited, and a brief biographical sketch of each author at the end of the manuscript.
- Research articles should generally follow standard scientific format, with separate sections for abstract, 5–7 key words, introduction, methods, results, discussion, conclusions, and bibliography. Deviations from this format (e.g., combined results and discussion section) will be considered on an individual manuscript basis. Key words should be different from key terms present in the title.
- Please use metric measures (for example: millimeters, kilograms, microliters).
- The spelling of common and scientific bird names should follow the most recent edition of the Checklist of North American Birds (see http://checklist.

aou.org), published by the American Ornithologists' Union (AOU), or the most recent updates to the checklist. Please include Genus and species (*italicized*) following the first time that the common name of a species is introduced in text.

- When appropriate, lists of species in tables or text should follow the most current AOU taxonomic sequence.
- Use capital letters for the full common names of birds (e.g., American Robin, Red-headed Woodpecker). Avoid use of four letter abbreviations often used to shorten the species name. For example, do not use RBWO for Red-bellied Woodpecker.

Guidelines for submitting figures and tables:

- Each figure and each table must be on a separate page.
- Captions for all figures should be sent as a separate text file, not embedded with the figure.
- Figures and table should be submitted in a way suitable for black-and-white reproduction.
- Tables are encouraged to be submitted as Microsoft Excel spreadsheets. All tables for each manuscript may be included in the same Microsoft Excel Book with separate sheets comprising each table. Alternatively, tables can be created as 'typists' tables' in Microsoft Word. This involves creating a tabular version of your table in Microsoft Word without using the actual "Table" function in that program. Instead, use tabs to separate your columns and a carriage return to separate rows—do not add spaces to make columns line up.

Guidelines for citing literature in text:

Citations should be listed chronologically in parentheses:

- No comma between author(s) and date: (McGhee 1995)
- Use "and" between two authors: (Li and Aschenbrenner 2007)
- If more than two authors, use "et al.:" (Moreau et al. 2015)
- Personal communication or reference to unpublished data: Cite the person's initials and surname, institutional affiliation, followed by "pers. comm." or ."unpub. data." Example: (E. Ramirez, University of Wisconsin-Madison, unpub. data).
- Works by the same author(s) in the same year are arranged alphabetically by article title and differentiated by letter (1998a, 1998b).

Guidelines for formatting references in bibliography section

References at end of document should be listed alphabetically by last name of first author, then in increasing chronological order. Follow the models below for citing books, book chapters, journal articles, etc.

Sample References:

Reller, A.W. 1972. Aspects of behavioral ecology of Red-headed and Red-bellied woodpeckers. American Midland Naturalist 88(2): 270–290.

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Artists

All photos must be submitted as jpeg digital images in e-mail attachments to Michael Huebschen, the Assistant Editor for Art, at mhuebschen4@gmail.com. They will be stored in secure digital files until recommended for a given quarterly issue of *The Passenger Pigeon.*

Although we would prefer to print all images chosen for *The Passenger Pigeon* in color, many will be printed in black & white due to the prohibitive cost of printing everything in color. One image per issue will be selected as a color cover photo. Every effort will be made to use the best photos submitted by as many contributors as possible. Final selections will be made by the Editors.

Following are the criteria for submitted work:

1. Jpeg digital images of photos, drawings, paintings, sculptures, wood carvings, quilts or other artistic works featuring birds seen or photographed in Wisconsin should be sent as email attachments and should be in as large a size as possible, with resolution of at least 300 d.p.i.. (1.2 megabytes for black-and-white and 1.5 megabytes for color). Lower resolution simply does not print well and pixel-dense images make the best candidates for printing since they often need to be cropped. All photos of birds submitted must have been taken in Wisconsin.

2. Please note: since the seasonal reports are for the year previous to the current issue, any photographs for a given issue should also be from the same period. For example, photographs for the Winter, 2015 issue should have been taken on or between December 1, 2014 and February 28, 2015; photographs for Spring, 2016 should have been taken on or between March 1, 2015 and May 31, 2015; and so on.

3. All images submitted must be mate-

rial not previously published in *The Passenger Pigeon*.

4. All images must include the bird species name and name of the artist. Date and location are also necessary in the case of photographs. Images of works other than photographs should have a title if one has been selected.

5. The most useful images are those in "portrait" format, rather than "landscape" format. A cropped photo 4″ horizontal by 5″ vertical is ideal for consideration for a cover photo. The "fill page" images are also best done in portrait format and might run as large as 4.75″ × 7″. The editors may do some additional cropping of images for publication.

6. Since no images will be returned, the submission must be high-resolution copy of the original. In most cases contributors will have cropped the images for the best effect. Cropping the images too tightly should be avoided since the editors may choose to do more cropping. All unused or unusable digital images will be destroyed after a certain time period.

7. It is the policy of Wisconsin Society for Ornithology not to offer monetary compensation to contributing artists for use of their images in *The Passenger Pigeon*. The Society is grateful for those who have contributed limited use of their images for publication in *The Passenger Pigeon* in the past and to those who will do so in the future.

8. When images have been selected and approved for each quarterly issue, a short biography from each contributing artist will be requested. It is tradition to publish those in the "About the Artists" pages of each issue. As a result, the Editors request that contributors include a short biographical statement along with their artwork.

Bill Grossmeyer found this elegant Northern Bobwhite in Jefferson County, in mid-June.

Federal Duck Stamps = Big Win for Conservation

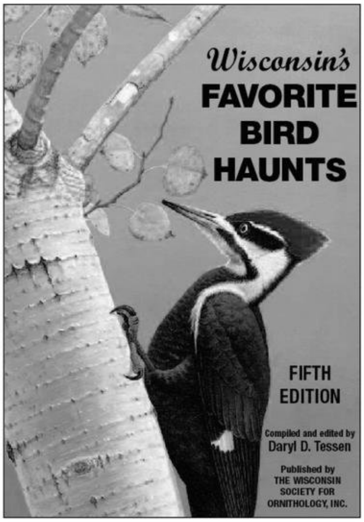
Trumpeter Swans – image from the 2016-2017 federal Duck Stamp

Officially the Migratory Bird Hunting and Conservation Stamp, the federal Duck Stamp provides revenue to help acquire and protect wetlands within the National Wildlife Refuge System. Sales have raised more than $800 million since the program began in 1934, and they have helped acquire and protect more than six million acres of irreplaceable bird-friendly habitat.

Wisconsin refuges funded in part by sales of Duck Stamps include:

- Horicon National Wildlife Refuge
- Necedah National Wildlife Refuge
- Trempealeau National Wildlife Refuge
- Wisconsin Waterfowl Production Areas

For a form that includes price and ordering information, visit the Conservation section of the WSO website, www.wsobirds.org.



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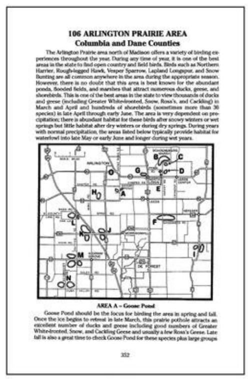


145 articles cover some 1,100 areas and include detailed maps.

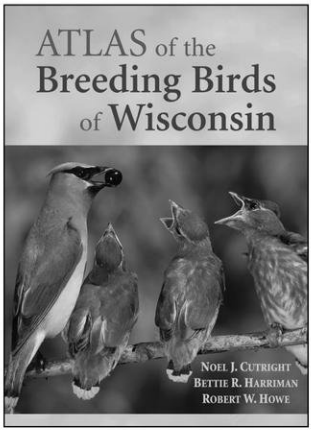
This edition marks the fourth time this comprehensive bird-finding guide to Wisconsin has been compiled and edited by Daryl Tessen.

- New in this edition: An **annotated checklist** of 443 species and a **birding highlights** quick reference.
- Nearly 40 bird illustrations (many in color) by Wisconsin artists Thomas Schultz, David Kuecherer, Jeannie Perry, Tom Uttech, and Robbye Johnson.
- Contributions from birders throughout the state.

Designed for durability and functionality, this book is printed on heavy coated paper and has a spiral binding so it lies flat when open. 6" by 9", 556 pages. ISBN: 978-0-9774986-3-5.

Published by The Wisconsin Society for Ornithology, Inc., with proceeds used for projects supported by the organization.

Visit the WSO website, www.wsobirds.org, for an order form that includes price and ordering information, or contact the Bookstore Manager (see contact information on Inside Back Cover).



Atlas of the Breeding Birds of Wisconsin

- Features almost 1,400 photographs, distribution maps, and figures – **all in color**!
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- Edited by Noel J. Cutright, Bettie R. Harriman, and Robert W. Howe.

The largest natural history survey ever conducted in Wisconsin has resulted in this comprehensive guide to birds that breed in the state.

Hardcover, large format (9" x 11.25"), 624 pages. Copyright 2006. ISBN-10: 0-9774986-0-3; ISBN-13: 978-0-9774986-0-4.

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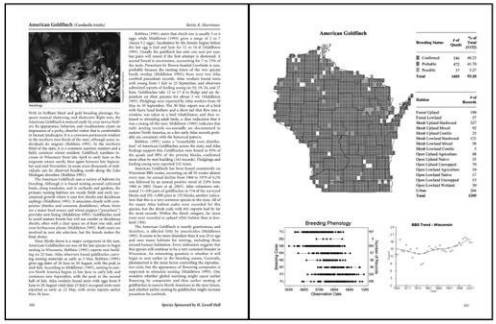

The two-page species accounts – 214 of them in all – provide a host of information on the state's breeding species, including their range, habitat preference, breeding biology, conservation concerns, and population trends. An additional 23 less-common species also are covered. Also included are chapters on Atlas methodology, results, history, habitats, and conservation.

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Michael Huebschen captured this early July image of a Forster's Tern with its distinctive tail spread in Horicon Marsh, Dodge County.

THE WISCONSIN SOCIETY FOR ORNITHOLOGY

The Wisconsin Society for Ornithology is an educational and scientific non-profit organization founded in 1939 "to encourage the study of Wisconsin birds." The Society achieves this goal through programs in research, education, conservation and publication.

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