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THE PASSENGER PIGEON

Vol. 51 No. 1
Spring 1989

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1939 — 50th ANNIVERSARY — 1989

THE PASSENGER PIGEON

Vol. 51 No. 1

Spring 1989

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Send all manuscripts and correspondence to the Editor; information for "Seasonal Field-notes" should be sent to the Associate Editor or the appropriate Field-note Compiler. Manuscripts that deal with information on birds in the State of Wisconsin, with ornithological topics of interest to WSO members, or with activities of the WSO will be considered for publication. All manuscripts submitted for possible publication should be typewritten, double-spaced, and on only one side of page-numbered typing paper. Illustrations should be submitted as photographs or good-quality drawings. Keep in mind that illustrations must remain legible when reduced to fit on a journal page. All English and scientific names of birds mentioned in manuscripts should follow *The A.O.U. Checklist of North American Birds (6th Edition)*. Use issues after Vol. 50, No. 1, 1988, as a general guide to style.

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Fifty Years of Wisconsin Ornithology

This year we celebrate the fiftieth year of a happy marriage between amateur and professional ornithology in Wisconsin. Not since the Spring 1964 issue of *The Passenger Pigeon*, when we celebrated our 25th anniversary, have we taken the time to look backwards and pat ourselves and others on the back. Twenty-five years is far too long between such exercises in self-congratulation. The brief reviews in this issue do far more than give well-deserved recognition; they also revitalize our purpose for existence and clarify the sometimes forgotten visions of the past. This issue should encourage us to analyze our past, determine our strengths and weaknesses, and plot a course for the future.

Under the guidance of Editor Stan Temple, this issue retraces the activities and history of WSO and Wisconsin ornithology. Stan has commissioned five "anniversary" articles for this special celebration. Stan describes this special issue in his "Editor's Statement."

Even as we celebrate our fiftieth anniversary, it is interesting to reread the 25th anniversary issue of the "Pigeon" to see what was going on in 1964. What were the concerns of conservationists interested in Wisconsin birdlife then versus now? What was important to WSO members at that time and who were the players? You'll see that many of them are still around. Pick up other old issues of the "Pigeon" from that time and see how our journal and the topics in it have changed over the years.

To commemorate our fifty anniversary, the WSO Board of Directors is issuing a fine art print from a special original painting by noted wildlife artist and WSO Board Member, Thomas R. Schultz. A composition of a pair of American Kestrels is planned; the anniversary edition of this print will be limited to 300. It will be offered initially to WSO members only. You will be receiving a special announcement of this offer before our May convention in Madison.

The first part of the "Planning Document" mentioned in the last "President's Statement" is complete, while the second part, a survey of our members, will be complete when each of you returns the survey you will be receiving this spring. To receive the results of this survey or a copy of the outline for our future goals (the "Planning Document"), please send me a stamped, self-addressed envelope. Beyond just talking about the future, we are actually doing things now to promote WSO. We have produced 25 attractive displays for our membership brochure that are to be placed at nature centers, garden stores, or bird-feeding shops—wherever potential members can be found. Even though our membership is at an all time high, we are sure that there are additional birders who would find WSO an important complement to their interest in birds. A recent test of these displays resulted in an encouraging number of new members. If you would like to borrow one of these displays, write to Publicity

Chair Noel Cutright. Remember that a large WSO display is also available for your use at fairs and meetings, again Noel can arrange for its use.

The Board hopes to be able to produce many new educational materials in the next few years. Under the editorship of Daryl Tessen, the 3rd edition of our most popular major publication, *Wisconsin's Favorite Bird Haunts*, may be out in 1990. Meanwhile, the WSO slide show remains one of our most effective tools for educating the public about Wisconsin's birds. For those of you who have donated a set to a local group or school, you know the quality of Steve Lange's production; an improved tape to accompany the basic set is now available. Please write to Steve for information.

As spring approaches, I would like to remind members of procedures for visiting Honey Creek. Groups of up to 20 can visit the area and use the rest facilities near the Nature Center without prior arrangements. For meetings or campouts, please call Lands Committee Chair, Gordon Cox, to make arrangements; the building is normally closed from December through March. Additional information about Honey Creek is available from Vice-President Randy Hoffman.

WSO is rapidly growing into a complex organization that requires skills beyond those of most ornithologists and birders. In the near future we will need to have board members with administrative and managerial skills. Many board positions now require proficiency in the use of personal computers. As we grow, we must also remember our roots: a deep commitment to birding and bird conservation, and we must keep the doors open to any member with the enthusiasm to volunteer. As calls for help are advertised in the coming years, please consider using your talents to help WSO achieve its goals in research, publication, education, and conservation.

A handwritten signature in cursive script, reading "John Idzikowski". The signature is written in dark ink and is positioned above the title "President".

President

Reflections on *The Passenger Pigeon*

With 50 volumes of *The Passenger Pigeon* now behind us, we take great pride in our society's journal. From its humble beginnings, when Trudy Scott (wife of our first editor, Walter Scott) typed stencils for the mimeographed early issues, *The Passenger Pigeon* has grown into one of the best state ornithological journals.

The Passenger Pigeon came into existence in 1939 at a time when there was a major proliferation in state bird publications. In the midwest, the Minnesota Ornithologists' Union also began publishing *The Flicker* (subsequently renamed *The Loon*) in 1939. The Michigan Audubon Society began publishing *The Jack-Pine Warbler* in 1926. The Iowa Ornithologists' Union began publishing *Iowa Birdlife* in 1931. Each of these distinguished midwestern ornithological publications has continued to provide ornithologists in Wisconsin, Minnesota, Michigan, and Iowa with a wealth of information on their state's birdlife.

These journals have persisted and expanded because they serve the valuable role of providing a regional outlet for ornithological articles written by both amateur and professional ornithologists. Whereas other journals—like *The Auk*, *The Condor* and *The Wilson Bulletin*—provide opportunities for professionals to publish their research findings, it is primarily in the various state journals that serious amateurs have an easy route for publishing descriptive life-history studies of birds. In the survey of WSO members in 1987, you reaffirmed that the regional focus and the diversity of articles by both amateurs and professionals were the most important features of *The Passenger Pigeon*. We will strive to carry on this fine tradition.

This is obviously a very special issue of *The Passenger Pigeon*. The 50th anniversary issue contains a number of features that celebrate our society's anniversary in words and pictures. I have commissioned five feature articles that review the history of Wisconsin ornithology. Sam Robbins reviews WSO's accomplishments over the past 50 years. John Emlen recounts the history of ornithology at the University of Wisconsin. James Hale provides details of ornithological work by the Wisconsin Conservation Department and the Wisconsin Department of Natural Resources. Noel Cutright describes the accomplishments of Wisconsin's other bird groups. And finally, John Idzikowski retraces the growth of the Wisconsin state bird list over the past 148 years.

This issue of *The Passenger Pigeon* features only the second piece of colored artwork to ever appear on the cover. The first was an Eastern Bluebird painting on the cover of the 10th anniversary issue in 1949. The Passenger Pigeons on the cover of this issue are the work of Allan Brooks (1869–1946), the famous Canadian artist and ornithologist, who illustrated many bird books in the early half of this century, including *Birds of Minnesota* and *Birds of Canada*. It is a previously unpublished watercolor from the collection of the Cornell Laboratory

The Passenger Pigeon

Monthly Bulletin of the Wisconsin Society of Ornithology

Vol. I.

January 1939

No. 1

PLANS FOR THE WISCONSIN SOCIETY OF ORNITHOLOGY

The Madison Bird Club has in mind a State Bird Club that will unite all the ornithologists of the state, both professional and amateur, to cooperate with State and Federal authorities in bringing about better enforcement of all existing laws, both State and Federal, and to make new laws which protect bird life in Wisconsin. A Club that will promote the study of Birds of Wisconsin, especially in the field, and to bring together and permanently record all accurate and authentic data relative thereto, both past and present, especially on the distribution, relative abundance, seasonal occurrence, breeding, feeding, song and other habitats. A Club that will have a staff of officers composed of the best leaders in Wisconsin, preferably selected from various parts of the state.

Such a society would not interfere with existing societies within the state as it covers a different field. Accordingly it will draw many of its members from their ranks, as is the case in Madison; further, the Society will promote the establishment of local grouse in several sections of the state where none at the present time exist.

As is the rule, only one meeting could be conducted a year; but the club would be held together by a monthly bulletin, that would publish all field notes received from members, which, in the opinion of the Editor and Executive Committee, are worthy of permanent record. In addition to the Field Note Department, the bulletin should contain announcements and news of the Society, and articles of a general character. We hope we will obtain articles for the latter departments from ornithologists in the state who are doing creative or experimental work, so that the bulletin will become a source of information.

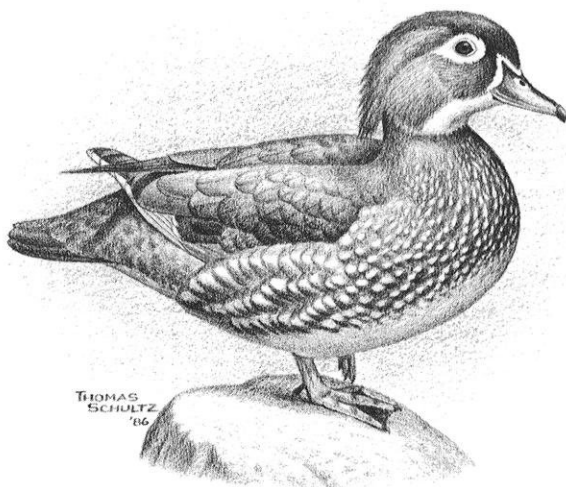
The Madison Bird Club is inviting the Wisconsin Society of Ornithology to Madison this Spring for the first Annual meeting. (Please turn to page 14)

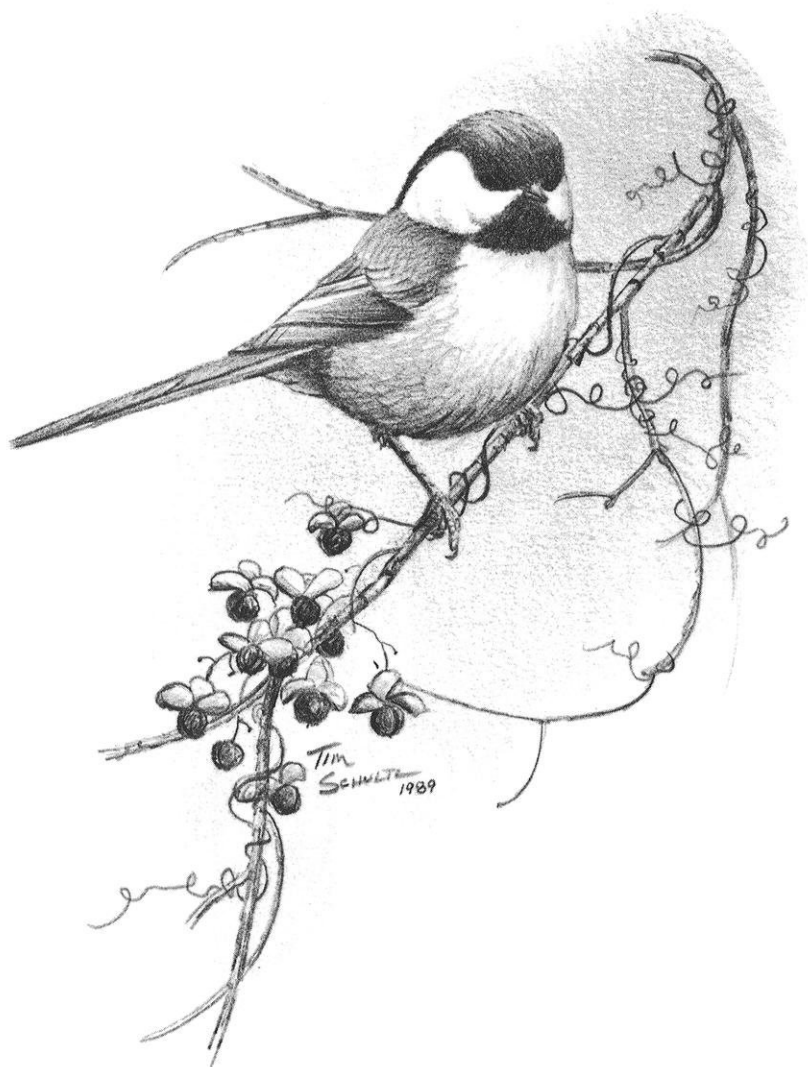
of Ornithology. While attending a Board of Directors meeting at the Cornell Lab last year, I discovered the Brooks painting, which impressed me as one of the best portraits of Passenger Pigeons that I had ever seen. The Cornell Laboratory of Ornithology generously allowed me to reproduce the painting, for the first time, on the cover of our anniversary issue.

During 1989, each of the four issues of *The Passenger Pigeon* will feature brief reviews, "50 Years Ago in *The Passenger Pigeon*," that will refresh our memories of what was happening in Wisconsin ornithology a half-century ago. Noel Cutright has produced these insightful extracts of past issues of *The Passenger Pigeon*.

Finally, scattered throughout this issue I have provided you with a pictorial review of selected covers of *The Passenger Pigeon* over the years since 1944, when the journal first began featuring a proper cover. These covers provide an illustrative history of the changing image of our state ornithological journal. I hope you enjoy these special features of this anniversary issue.

Stanley A. Temple
Editor





Black-capped Chickadee by Tim Schultz

WSO: The First Fifty Years

The Wisconsin Society for Ornithology has experienced tremendous growth since its founding in 1939. A retrospective view of the society's accomplishments in research, publication, education, and conservation suggests that these have been a successful fifty years.

by Samuel D. Robbins

One shelf in one of my bookcases holds a series of journals—234 of them. They are of varying thickness, but each measures 6"×9". I could have had them bound, but have chosen instead to keep them boxed, where I could refer to them again, and again and again. I have referred to them more times than I can count. Each bears the title, *The Passenger Pigeon*.

The first 18 issues are monthly mimeographed pages, dated January 1939 through June 1940. The next 21 are monthly printed pages, July 1940 through March 1942. Another 38 issues are quarterlies, bearing dates from April 1942 through July 1951. The last 1951 issue was labeled "winter" instead of "October." My magazine collection includes another 152 quarterly issues, dated spring 1952 through winter 1988.

I know why the change was made from "October" to "winter." It had long been difficult to maintain a punctual publication schedule. A seasonal title offered more flexibility than did a specific month. Every editor the journal has ever had—

W. E. Scott, N. R. Barger, S. D. Robbins, E. M. Roark, N. P. Dahlstrand, C. A. Kemper, and S. A. Temple—can tell you how hard it is to maintain a publication schedule with an all-volunteer editorial staff. Not one penny has ever been paid an editor, artist, field-note compiler, manuscript contributor, envelope stuffer, or addressor in the production of this magnificent journal. As I contemplate fifty years of accomplishment by WSO members, I think of this as one of its great strengths. Amateurs and professionals—we have worked together—contributing what each of us has to offer, to advance the purposes of WSO.

GATHERING FIELD NOTES

What are these purposes? I turn to Volume 1, Number 5: "The purpose of the Society shall be to stimulate interest in and to promote the study of the birds of Wisconsin, especially in the field, and to bring together and permanently record accurate and authentic data relative thereto."

From the beginning, *The Passenger Pigeon* published the field observations of its readers. These were seen as the raw materials for any and all further investigations that might follow. Editor Scott commented: "The ultimate aim is to accumulate as detailed information as possible on all phases of Wisconsin ornithology. Some day someone will write a state bird book. The bulletin notes help in recording data on breeding, range, abundance, arrival and departure, habitat, nesting habits, etc., for that book." Scott wrote prophetically.

Through a succession of field-note compilers, a system evolved for gathering field notes quarterly, summarizing them in each issue of *The Passenger Pigeon*, and forwarding significant information for continent-wide consumption in *American Birds*. For 15 years I attempted for each season: (1) to send out report forms and reminders, (2) to read every report and check for accuracy of date and identification, (3) to correspond with an observer whenever additional verification seemed warranted, (4) to compile a seasonal summary for *The Passenger Pigeon*, (5) to edit details of rarities for a "By the Wayside" column, (6) to pass on to *American Birds* information about the rarer species, and (7) to copy on file cards for permanent keeping the first and last migration dates for each species in each county.

It was too much! As the number of field-note contributors grew from 20 to 80 or more, the job had to be divided. It is still a large job for an Associate Editor, four seasonal Field-note Compilers (since 1959), a five-person records Committee (since 1979), and a File Keeper who computerizes reports. Since 1972 Daryl Tessen has been keeping us supplied with forms for reporting seasonal observations, Christmas Bird

Counts, May-day counts, and for providing details for the rarities we see.

In 1982 a second avenue for reporting field observations, the Wisconsin Checklist Project, was developed under the guidance of Stanley Temple. The weekly reports submitted by over 400 cooperators have proved especially helpful in determining seasonal and geographical patterns of abundance. In time the project will also detect changes in abundance and range expansions or contractions for species on the fringe of their summer and winter ranges.

WINTER AND SUMMER BIRD COUNTS

Participation in the annual Christmas Bird Count was encouraged from the beginning of WSO's existence. The first issue for 1940 (2:1-11) summarized 12 counts in 1939; 42 birders found 14,074 birds of 92 species. During World War II the number of counts per year dwindled to 7, but the count results were faithfully summarized in *The Passenger Pigeon* as well as in *Bird Lore*, forerunner to *American Birds*. By fits and spurts the number of counts has risen: 28 in 1949, 36 in 1959, 65 in 1969, and 76 in 1979. In 1987 the combined efforts of 1356 observers in 79 areas produced totals of 387,307 individuals of 139 species (*Passenger Pigeon* 50:21-35).

The success in counting birds in winter, when migration is at a minimum, led to a comparable desire to census summer populations during a period when birds are relatively stationary. What about a summer bird count, conducted between 10 and 30 June to take advantage of the summer song period, with observers covering the same territory in succeeding years? The idea seemed plausible, but skeptics noted that people were used to laying binoculars aside when the

spring migration ceased. Can they be persuaded to participate? In 1961 supporters inaugurated 29 counts. In 1965 there were 56 count areas, 22 of which had a four- or five-year history (*Passenger Pigeon* 28:47-62).

The Summer Bird Counts undoubtedly would have expanded in ensuing years, had it not been for the advent of the U.S. Fish and Wildlife Service's newly organized North American Breeding Bird Survey. When I accepted the responsibility as coordinator for Wisconsin's part in this project, I made a random selection of 70 BBS routes (4 per degree-block), and sought volunteers (largely from Summer Bird Count participants) to run each of the 70 routes in 1966 and in succeeding years. The transition from the state-wide project to the continent-wide venture went smoothly. With the exceptions of 1966 and 1968, 60 or more routes have been completed each year; 19 have a full 22-year history, and another 28 have been missed only once or twice. Summaries of the BBS have appeared in *The Passenger Pigeon* at approximately five-year intervals. Data concerning decreasing species have been given to the DNR Bureau of Endangered Resources.

SPECIES AND AREA STUDIES

In the pages of *The Passenger Pigeon* I have read of research concerning species of special interest, in which the findings of one or two writers have been augmented by data supplied by numerous WSO members. Range-and-population studies have focused on the Pine Grosbeak, Bald Eagle, European Starling, Purple Martin, Great Egret, Northern Cardinal, Yellow-headed Blackbird, Dickcissel, Eastern and Western Meadowlarks, Red-tailed Hawk, Evening

Grosbeak, Cliff Swallow, Great Blue Heron, Red-bellied Woodpecker, Osprey, Double-crested Cormorant, Sandhill Crane, Snowy Owl, Common Loon, and Loggerhead Shrike.

Other pages have described the avifauna of different regions. C. H. Richter's commentary on A. J. Schoenebeck's "Birds of Oconto County" emerged in 1939. H. H. T. Jackson's "Summer Birds of Northwestern Wisconsin" appeared first in 1941-1943, then as a separately bound pamphlet. W. E. Southern contributed "The Birds of Hunt Hill Sanctuary" (Washburn County) in 1960. R. F. Bernard described the "Birds of Douglas County" in 1967. C. A. Kemper's "Birds of Chippewa, Eau Claire, and Neighboring Counties" was published in 1973 in the journal, and then as a bound pamphlet. In 1976 we were introduced to "The Birds of Pierce and St. Croix Counties" by C. A. Faanes and S. V. Goddard. In 1981 P. V. Vanderschaegen gave us "The Birds of Forest, Oneida and Vilas Counties."

Wisconsin's Favorite Bird Haunts began serially in *The Passenger Pigeon* in 1953, then expanded into book form in 1961. It was no accident that this volume described only 30 areas, 25 of which were in the southern half of the state. Most WSO members lived south of a LaCrosse-to-Green Bay line, and they had explored but little the birds of the northern half of the state. Great strides in exploring the northern counties came with the 1960s, making possible a much-needed expanded volume compiled by Daryl Tessen in 1976.

OTHER PUBLICATIONS

While *The Passenger Pigeon* was conceived as essential to the purpose of

WSO's existence, and got its start even before the Society's first organizational meeting, additional publications were envisioned in the earliest years. There was an immediate need for a pocket checklist showing all but the rarest Wisconsin birds. Such checklists already existed in Madison, Waukesha, Milwaukee, and Green Bay as products of local bird clubs. The checklist developed for WSO has gone through several revisions, sold many thousands, and is still a best-seller.

There was an immediate need, too, for a more expanded checklist, listing all Wisconsin species—rarities included—and showing graphically the times of year when each species occurs. I recall several of the meetings I had with Walter Scott, Norv Barger, Elton Bussewitz and Earl Loyster in the preparation of *Wisconsin Birds: A Preliminary Check List With Migration Charts*. The literature they consulted was old. The recent field work was sparse. They felt confident they had a correct list of species, but were less confident they had the correct timing of migration. After consulting experts like A. W. Schorger and O. J. Gromme, they published in 1942.

The booklet proved popular, and it was reprinted in 1950 with a selected bibliography of Wisconsin ornithology prepared by Schorger. Not until a third edition was prepared in 1960 by Barger, Robbins, and Roy Lound did we feel safe in dropping "preliminary" from the title. The same threesome prepared the 1975 revision, adding habitat information and replacing "charts" with "graphs" in the title. For the 1988 revision, the late Roy Lound was replaced by Stanley Temple, and the migration graphs were improved by data amassed in the "Wisconsin Checklist Project" and by computer-generated graphics.

Some articles that appeared in *The*

Passenger Pigeon as serials were reprinted as pamphlets (Jackson's "Summer Birds of Northwestern Wisconsin"; Schorger's "Some Wisconsin Naturalists"). In 1947, coincident with the unveiling of the Passenger Pigeon monument in Wyalusing Park, WSO published *Silent Wings*, edited by Walter Scott with articles by Aldo Leopold, H. H. T. Jackson, and A. W. Schorger.

It had been a long time since Kumlien and Hollister published *The Birds of Wisconsin* (1903). It appeared that a new state bird book was still some years away. So the editorial staff of *The Passenger Pigeon* made plans to reprint the Kumlien and Hollister book and asked A. W. Schorger to make comments and additions to include recent sightings. This appeared serially in our magazine between 1948 and 1951, and in book form in 1951.

In 1961, the WSO directors decided to try a monthly newsletter in addition to the quarterly journal. The first four issues came out under the by-line of Harold Liebherr, with a blank masthead where a title should appear. Then Ralph Morse won a naming contest, and the *Badger Birder* appeared in 1962. Since 1964, the by-line has been Mary Donald's. The *Badger Birder* specializes in bringing news of current and future events, sponsored either by WSO or by local bird clubs, describing hot-spots where rare birds are likely to be seen, even mentioning what rarities have been observed. At last count, Mary had edited 351 issues!

Two more recent WSO publications are Mossman and Lange's *Breeding Birds of the Baraboo Hills* (1982) and Temple and Harris' *Birds of the Apostle Islands* (1985). The Society also played an important role in the publication of Tem-

ple and Cary's *Wisconsin Birds: A Seasonal and Geographical Guide* (1987).

THE SUPPLY DEPARTMENT

The idea of stocking and selling bird books seemed like a further means of promoting WSO aims. It was in the minds of leaders like Walter Scott from earliest days, but the World War II period did not seem like an auspicious time to start. Then in April, 1947, the directors approved plans to inaugurate a Supply Department. N. R. Barger became the first manager. He and wife Clara spent untold hours ordering and selling books, keeping records, and setting up displays at each of the Society's annual conventions.

In 1955 Harold Kruse took over the leadership, and moved a substantial book supply to his home near Loganville. Again, it required a team effort, with wife Carla giving great assistance. The team eventually included Ed Prins for the sale of binoculars, and Ed Peartree for the sale of recordings. The Kruse's Hickory Hill Farm was headquarters for the Supply Department until 1978, when the operation was taken over by Chuck Gilmore.

For years the Supply Department chair has disseminated a catalog to the members before Christmas. Through the years, profits from book sales have helped put the Society on a solid financial footing, and have helped keep the annual membership fees low.

CONSERVATION CONCERNS

Can people care about birds and not show concern for the environment on which birds depend? In the early 1950s the issue came to the fore with WSO members. The question was raised in

1952 when Fred and Fran Hamerstrom explained the decline of the Greater Prairie-Chicken. They had developed a plan for saving these birds on the Buena Vista Marsh in central Wisconsin that involved land purchases in a checkerboard pattern. Would WSO show the way by purchasing a 40-acre plot for \$1500? The response was enthusiastic. Jerry Vogelsang, WSO Conservation Chair, wrote several articles. One issue of *The Passenger Pigeon* rang with such slogans as: "Want to save the chickens, mister? Send your gift to treasurer Frister!" The needed funds were oversubscribed. Other conservation groups responded similarly. The decline in Greater Prairie-Chickens has been arrested; but this promises to be a threatened species for the foreseeable future.

An opportunity to preserve scenic forest land within the Baraboo Hills developed in 1958. WSO members had for years harbored the hope that they could purchase an ecologically important plot and erect a nature center. Donations from members made possible the 1960 purchase of 30 acres along Honey Creek north of Leland, plus a 55-acre bog immediately thereafter. When another 40-acre plot south of the bog became available in 1962, WSO members responded generously. A gift from Harry Steenbock made possible a further 85-acre expansion, now marked with a "Steenbock Forest" sign. Continued gifts spurred additional adjacent purchases, enlarging the Honey Creek Natural Area to its present 310-acre size.

Two of the prime supporters of this venture were David and Hazel Cox, who lived close to this property. Soon after Dave's death in 1970, plans for erecting a nature center crystallized. The new building was dedicated two years later. It now bears the name "David and Hazel

Cox Memorial Nature Center." Many WSO supporters helped erect the center. Through annual work bees, members have assisted with property maintenance, and profited from Ed Peartree's banding demonstrations. Since 1985 a May "bird-a-thon" and "band-a-thon" have raised funds to help pay the real estate taxes.

The increased emphasis on conservation showed up in other ways. In 1956 the statement of purpose in the Articles of Incorporation was revised to read: "The purpose of the Society shall be to stimulate interest in and promote the scientific study of birds in Wisconsin toward a better understanding of their biology and the basis of their preservation and conservation."

The winter 1957 issue of *The Passenger Pigeon* was devoted entirely to the use and misuse of pesticides. An additional 200 copies were printed and distributed to legislators, foresters, and chemical sprayers. Additional efforts contributed to the sequence of events that led to the banning of DDT in 1969.

When the DNR first prepared a list of endangered and threatened species in 1972, WSO offered encouragement and advice. With each succeeding revision of this list, WSO has supplied helpful data and recommendations.

The various conservation chairs have approached many other issues by writing letters, making telephone calls, and attending public hearings. Members have passed resolutions at annual meetings. Included among the issues have been: keeping the Mourning Dove on the protected list; placing all hawks and owls on the protected list; protesting goose-hunting on the Horicon National Wildlife Refuge; supporting ORAP; opposing Project Sanguine; opposing pole-trapping of raptors; saving the Sister Is-

lands in Door County; supporting the plan to identify natural areas worthy of preservation, helping to census the bird life in many of these parcels; and supporting the Lower Wisconsin State Riverway plan.

EDUCATION AND PUBLICITY ACTIVITIES

Long before the Board of Directors established an Education Committee, individual members were giving public lectures and talks to school children. When an education-and-publicity committee was established in 1947 it began by initiating field trips and summer campouts, introducing members to new birds and teaching identification skills. The practice continues today, with ten or more trips scheduled each year, in addition to the trips incorporated into the annual meeting programs.

A second thrust was the collection of colored slides for education programs. At first slides were loaned out. Eventually an 80-slide set was produced, together with two scripts—one for adults, one for children. The slide sets have been produced by the hundred, and sold both to schools and to interested individuals. The time needed to promote these ventures adequately led to the establishment of three committees (education, field trips, slide sales), where one position used to suffice.

The serious decline of the Eastern Bluebird led to additional educational work. First the Paul Romigs and then the Vince Bauldrys took the lead within the Green Bay Bird Club. WSO then helped publish a *Bluebird Trails Guide*, giving adults and members of youth groups specific directions for making, erecting, and monitoring nest boxes. In 1962 WSO assumed state leadership for

the nest box program, hoping to establish bluebird trails in every agricultural county. For a while it seemed too little too late, as bluebirds continued to decline. Breeding Bird Survey figures showed the decline continuing through 1979. Hundreds, thousands of nest boxes continued to be erected, and a new statewide group, the Bluebird Restoration Association of Wisconsin was organized. An encouraging increase in the state population finally became evident in 1985.

When Dixie Larkin was Education Chair in the early 1950s, she helped raise funds for the establishment of a new Audubon camp near Sarona. The camp opened in 1955, and for 30 years provided a valuable learning experience for hundreds of school teachers and community youth leaders.

I wonder how many of the state's local bird clubs owe their existence in a large part to WSO influence. No deliberate promotional efforts have been made to spawn new clubs. But, active WSO members were usually at the forefront of each new organization, be it a new chapter of the National Audubon Society or an independent group. At various times WSO conventions have been hosted by the Benjamin F. Goss Bird Club (Waukesha), the Ned Hollister Bird Club (Beaumont), the Hoy Nature Club (Racine), the Oshkosh Bird Club, the Green Bay Bird Club, the Owen J. Gromme Ornithological Society (Fond du Lac), the S. Paul Jones Bird Club (Oconomowoc), the Chippewa Wildlife Society (Chippewa Falls), the Chequamegon Bird Club (Medford), and Audubon chapters at Milwaukee, Madison, LaCrosse, Fond du Lac, and Green Bay. For several years the Society has had a booth at the Milwaukee Sentinel sports show.

RESEARCH ACTIVITIES

In a sense, every Christmas Bird Count, every Breeding Bird Survey, every field-note report, every completed documentation of a rare bird sighting is a research activity. Each contributes toward WSO's stated purpose. Howard Young's 1964 summary (*Passenger Pigeon* 26:22–25) told of the Society's first cooperative range-and-population studies, and the eventual formation of a Research Committee in 1948. For some projects of a historical nature, WSO members made valuable contributions; in other instances, member input was minimal.

Increasingly the encouragement for research has taken the form of identifying research-oriented individuals—college students and others—and helping them select workable projects. Happily funds have become available for this purpose. At the time of WSO's 25th anniversary, Harry Steenbock made a substantial donation, part of which was set aside as a scholarship fund. The first Steenbock Scholarship was awarded in 1966, and it has been followed by numerous others in succeeding years.

The WSO endowment fund, begun in a small way in 1942, rose to \$28,000 in 1986. This made possible additional scholarship funding. Since 1983 the Society has offered a \$200–400 scholarship each year to a potential researcher.

Frances Hamerstrom stressed the need for non-professional researchers when she wrote (*Passenger Pigeon* 45:111–112): "Where are the housewives? the factory workers? the kids down the street? Aren't any of these people engaged in bird projects of their own anymore? . . . I look upon WSO grants in part as a talent search—an opportunity to find newcomers." In a similar

vein, as a result of preparing *Wisconsin Birdlife* for publication, I jotted down a list of 89 topics—big and small—that cry out for further investigation (*Passenger Pigeon* 50:187–191). The “Wisconsin Checklist Project” began in 1982 as a giant research project involving over 400 members; it will hopefully gather more momentum each year.

Significant research possibilities exist in the archives of the State Historical Society of Wisconsin, and the University of Wisconsin-Stevens Point library, thanks in part to the WSO Historians and Record-keepers. These repositories have field notebooks from such ornithologists as O. J. Gromme, S. P. Jones, A. W. Schorger, and W. E. Snyder, containing valuable unpublished information.

IN SUMMARY

How can I best summarize the Wisconsin Society for Ornithology's accomplishments at this 50-year milestone? Shall I point to my bookshelf and its 234 issues of *The Passenger Pigeon*, and to another shelf containing the other WSO publications?

Should I list the new species that have been discovered in Wisconsin in the past 50 years, 47 in all? Here they are with the year each was officially added to the state list: Burrowing Owl (1939), Yellow-crowned Night-Heron (1941), Varied Thrush (1944), Ivory Gull (1947), Great Black-backed Gull (1948), Green-tailed Towhee (1952), Little Gull (1954), Tricolored Heron (1955), Mountain Bluebird (1957), Ruff, Black-throated Sparrow (1959), Cattle Egret, Ross' Goose (1960), Mute Swan (1963), Black-shouldered Kite, Gray Vireo (1964), Laughing Gull, Anhinga (1965), Iceland Gull, Eurasian Tree Sparrow (1966), Black-throated Gray Warbler (1968),

Chuck-Wills-Widow, Lewis' Woodpecker, Black-headed Grosbeak (1969), Black-Turnstone, Curlew Sandpiper, Brown-headed Nuthatch, Curve-billed Thrasher (1971), Mississippi Kite, Painted Bunting (1972), Common Ground Dove (1973), Common Black-headed Gull, Fork-tailed Flycatcher, Kirtland's Warbler, Chestnut-collared Longspur (1978), Sage Thrasher (1979), Lesser Black-backed Gull (1980), Rosy Finch (1981), Hermit Warbler, Baird's Sparrow (1982), House Finch (1983), Sooty Tern, Lazuli Bunting (1984), Royal Tern (1985), Mew Gull, Rufous Hummingbird (1986), White-faced Ibis (1987).

Should I list the people who have given leadership in various capacities to bring about the Society's accomplishments? Walter Scott did this admirably in 1964 for the 1939–1964 period (*Passenger Pigeon* 26:34, 47). The following list covers the 1964–1989 span.

ELECTED OFFICERS

President.—Howard Young (1965), Arol Eppele (1966), Frederick Hamerstrom (1967), George Becker (1968), Harold Mathiak (1969), Donald Hendrick (1970), William Pugh (1971), Rockne Knuth (1972), Robert McCabe (1973), Walter Gilles (1974), Roy Lukes (1975), Frances Hamerstrom (1976), Edward Prins (1977), Daryl Tessen (1978), Daryl Tessen (1979), Mary Donald (1980), Charles Gilmore (1981), Thomas Erdman (1982), Richard Verch (1983), Frederick Leshner (1984), Harold Roberts (1985), Noel Cutright (1986), Noel Cutright (1987), John Idzikowski (1988), John Idzikowski (1989).

Vice-President.—Arol Eppele (1965),

Robert McCabe (1966), George Becker (1967), David Cox (1968), David Cox (1969), William Pugh (1970), Rockne Knuth (1971), Robert McCabe (1972), Walter Gilles (1973), Roy Lukes (1974), Frances Hamerstrom (1975), Edward Prins (1976), Daryl Tessen (1977), Louise Erickson (1978), Mary Donald (1979), Charles Gilmore (1980), Thomas Erdman (1981), Richard Verch (1982), Frederick Leshner (1983), Harold Roberts (1984), Noel Cutright (1985), John Idzikowski (1986), John Idzikowski (1987), Randy Hoffman (1988), Randy Hoffman (1989).

Secretary.—Hazel Cox (1965–1972), Carly Hayssen (1972–1989).

Treasurer.—Phyllis Holz (1965–1977), Linda Safir (1977–1986), Catherine Cleary (1986–1987), Gwyn Tuttle Goy (1987–1989).

Editor.—Nils Dahlstrand (1965–1967), Charles Kemper (1967–1987), Stanley Temple (1988–1989).

COMMITTEE CHAIRS

Supply Department.—Harold Kruse (1965–1979), Charles Gilmore (1979–1989), Edward Peartree (1965–1985), Edward Prins (1972–1979).

Publications and Awards.—Alfred Holz (1965–1976), Ruth Hine (1976–1979), Howard Young (1979–1989).

Memberships.—Mrs. LeRoy Mattern (1965–1968), Norma Schmidt (1968–1976), Catherine Steuer (1976–1978), Alex Kailing (1978–1989).

Field Trips.—Edward Peartree (1965–

1987), Thomas Schultz and Jeffrey Baughman (1987–1989).

Education.—Clara Hussong (1965–1974), Walter Gilles (1974–1975), Roy Lukes (1975–1978), Stephen Lang (1979–1986), William Volkert (1986–1989).

Loan of Slides.—Stephen Lang (1979–1989).

Publicity.—Charles Kemper (1965–1968), Donald Hendrick (1968–1974), Charles Gilmore (1976–1979), Penny Thiessen (1979–1981), Noel Cutright (1981–1989).

Conservation.—George Becker (1965–1966), Frederick Baumgartner (1966–1976), Robert Cook (1976–1977), Raymond Anderson (1977–1988), Samuel Robbins (1988–1989).

Research.—Fred and Fran Hamerstrom (1965–1978), Stanley Temple (1979–1989), Robert Howe (1989).

Scholarships and Grants.—Fred and Fran Hamerstrom (1979–1989).

Endowments.—Carl Hayssen (1965–1972), Ralph Koeller (1973–1974), James Severance (1974–1979).

WSO Lands.—James Severance (1979–1982), Gordon Cox (1982–1989).

Legal Counsel.—Lowell Hall (1965–1970), Robert Lutz (1970–1989).

Custodian-Historian.—Walter Scott (1965–1983), Hazel Cox (1973–1976), Linda Thomas (1979–1988).

Badger Birder.—Mary Donald (1965–1989).

File Keeper.—Lucy Gauerke (1965–1974), Raymond Anderson (1975–1989).

Records Committee.—William Foster, William Hilsenhoff, Joseph Hickey, Daryl Tessen, Samuel Robbins, John Bielefeldt, Frederick Leshner, John Idzikowski, Roger Sundell, Eric Epstein, Janine Polk, Charles Sontag, Richard Verch, Allen Shea.

STAFF OF *The Passenger Pigeon*

Associate Editor.—Samuel Robbins (1965–1970), Norval Barger (1970–1973), Daryl Tessen (1973–1989).

Assistant Editor.—Linda Safir (1980–1987), Thomas Schultz (1988–1989).

Circulation Manager.—Frank King (1965–1973), W. D. Brown (1973–1985).

Field-note Compiler (Spring).—Thomas Soulen (1965–1968), Irma Chipman (1968–1972), Dennis Gustafson (1972–1973), Rockne Knuth (1973–1985), William Volkert (1985–1989).

Field-note Compiler (Summer).—Harold and Nancy Roberts (1965–1982), Thomas Soulen (1982–1989).

Field-note Compiler (Autumn).—Charles Kemper (1965–1966), Daryl Tessen (1966–1976), Frederick Leshner (1976–1978), John Idzikowski (1978–1980), Thomas Erdman (1980–1983), Mark Peterson (1983–1989).

Field-note Compiler (Winter).—Harold Bauers (1965–1966), William Hilsenhoff (1966–1989), John Bielefeldt (1976–1981), Kenneth Lange (1981–1989).

The list is long and impressive. It includes college professors, laborers, Department of Natural Resources professionals, and farmers.

RECIPIENTS OF AWARDS

Eight individuals have earned the Golden Passenger Pigeon award (honorary life membership): Wallace Grange, Owen Gromme, Joseph Hickey, John Emlen, Chandler Robbins, Frances Hamerstrom, Frederick Hamerstrom, and Samuel Robbins. This award also went to nine others who have since died: Herbert Stoddard, William Schorger, Leon Cole, Aldo Leopold, Hartley Jackson, George Wagner, Alexander Wetmore, Carl Welty, and Carl Richter.

Finally, there are the faithful volunteer workers who have earned the Silver Passenger Pigeon award, established during the 25th annual convention: (1964) Mary Walker, N. R. Barger, Walter Scott, Samuel Robbins, Harold and Carla Kruse; (1965) J. H. Evans, Carl Frister, Helen Northup, Clara Hussong, Charles Kemper; (1966) Allan Simpson, Harold Liebherr, Harold Bauers, Stanley Polacheck, Frederick and Frances Hamerstrom; (1967) Howard Young, Edward Peartree, David and Hazel Cox, Phyllis and Alfred Holz; (1968) Nils Dahlstrand; (1969) Charles Nelson; (1970) Murl Duesing, Harry Steenbock; (1971) Lucy and Arthur Gauerke; (1972) W. D. Brown; (1974) Mary Donald; (1975) Vincent Bauldry, Donald Kind-schi; (1976) Norma and Earl Schmidt, Elmer Strehlow; (1977) Harold and Nancy Roberts, Charles Gilmore; (1978)

William Hilsenhoff; (1979) Daryl Tes-
sen; (1981) Carl Hayssen, Gordon Cox;
(1984) Roy and Charlotte Lukes; (1987)
Jeannette Peartree.

CONCLUSIONS

The Wisconsin Society for Ornithol-
ogy has, for 50 years, done an outstand-
ing job of achieving its objectives of

research, education, conservation, and
publication. The society's continued
growth and vigor suggests that many fu-
ture accomplishments will be added to
its already impressive list of credits.

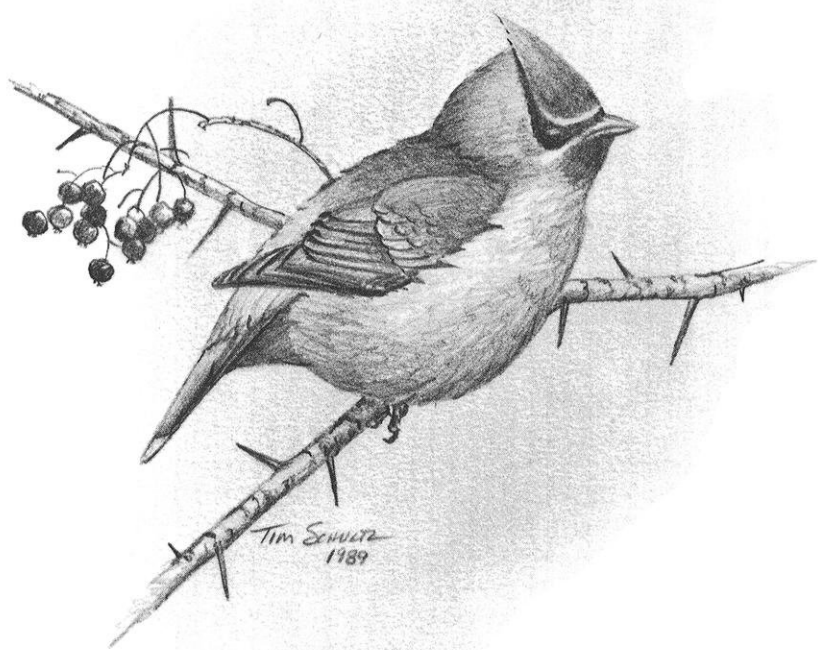
Samuel D. Robbins
14 South Roby Road
Madison, WI 53705

50 Years Ago in *The Passenger Pigeon*

Excerpts from Volume 1 (1939)

Bird records have been published in *The Passenger Pigeon* from its be-
ginning as a monthly bulletin in January 1939. The following items are
excerpts from *The Passenger Pigeon*, Volume 1, Number 2.

From Milwaukee area, "Jung reported a meadowlark on the 1st and
Deusing saw 7 of them later. Mueller found a Pine Grosbeak and a Ruffed
Grouse at the Cedarburg swamp." From Green Bay area, "A total of 29
species were recorded on the January list of the Green Bay Bird Club."
From Racine area, "There were two Mockingbirds seen at the Horlick
Dam and at 'Cedar Bend' several times during the month. Great numbers
of Rough-legged Hawks invaded the county in the second week of January,
40 being counted during a 30 mile trip on January 15." From Madison
area, (from records of Feeney and Sperry for the University Arboretum),
"A census of game birds taken on the 27th, showed about 200 pheasants
and 100 bobwhites. Their notes include the Kingfisher, Northern Shrike,
about 20 Long-eared Owls, several Rusties, the Song Sparrow, Robin, and
Wilson Snipe." From Waukesha area, "Schwartz reported 2 Purple
Finches and three Cardinals. The latter are unusual in Waukesha. Last
summer, Cardinals nested here for the first time to our knowledge." (Com-
piled by Noel J. Cutright.)



Cedar Waxwing by Tim Schultz

It Takes Many: Contributions By Wisconsin's Other Ornithological Organizations

Wisconsin has a variety of private organizations that are devoted to birds and their habitats. Each has its own specific goals and interests, but together they have accomplished much for Wisconsin's birdlife.

by Noel J. Cutright

The Eastern Bluebird, the Greater Prairie-Chicken, the Great Gray Owl, the Wild Turkey: What do these bird species that inhabit the badger state have in common? They and other birds have benefited from the action of Wisconsin-based ornithological organizations devoted to understanding the critical needs of these species. A single organization, whether it is the WSO, Madison Audubon Society, or the International Crane Foundation, cannot accomplish all that is essential for Wisconsin's birds. It takes patience and perseverance, money and manpower, devotion and dedication, and time and togetherness.

Raptor banding, Ruffed Grouse management, wintering Bald Eagle censuses, Sandhill Crane counts: What do these activities have in common? They are the topics of ornithological research and population monitoring that have been spearheaded by organizations interested in discovering facts about birds, determining population trends, and sharing

this information through educational programs.

Baxter's Hollow, Woodland Dunes, Riveredge Nature Center, Buena Vista Marsh, The Ridges Sanctuary: What do such sites have in common? These lands have been identified as significant biological and ecological areas that deserve protection. They and many others have been preserved and then managed through the often difficult and tireless efforts of private organizations. Each of these small parts of Wisconsin's landscape is an ornithological treasure. We must recognize that each species is important, that all of the parts need saving, and that only through preservation of the best remaining natural communities of plants and animals can we expect to have a heritage for the future. Such a heritage will be worth protecting for its diversity, for its beauty, and for its greatness.

What are some of these private organizations and what are some of their

major activities and accomplishments involving Wisconsin's birdlife? The following are brief descriptions of Wisconsin's other ornithological groups; they are intended not only as a note of gratitude from the WSO but also as a source of inspiration and challenge for the future.

BLUEBIRD RESTORATION ASSOCIATION OF WISCONSIN

BRAW was organized in 1986 by a group of individuals wanting to see a rapid return of the Eastern Bluebird in Wisconsin and to bring attention to other cavity-nesting birds. Through a coordinated statewide program of nest box construction and monitoring, bluebird production is being monitored and, we hope, will be increased. Although in its infancy, impressive strides toward a successful program already have been made.

CEDAR GROVE ORNITHOLOGICAL RESEARCH STATION

With the Mississippi River valley along its western border and Lake Michigan to the east, Wisconsin has numerous locations to observe migrating raptors. Sporadically between 1935 and 1949, hawks were trapped and banded near Cedar Grove in southeastern Sheboygan County. Every fall since 1950, sightings of migrating raptors have been tallied, and more than 20,000 birds of prey of 23 species have been live-trapped, banded, measured, and released by dedicated scientists and other volunteers at the Cedar Grove Station. Published research papers have significantly added to our knowledge of birds of prey. In 1983, the Station was incorporated as a private non-profit organization.

THE EAGLE FOUNDATION

Formerly known as Eagle Valley Environmentalists, the Foundation worked to preserve about 1,500 acres in western Grant County. Concentrating on research, population monitoring, and habitat management of the Bald Eagle, the organization has contributed much to our knowledge of our nation's symbol. Although struck recently by financial difficulties, the importance of the Foundation's efforts to draw people's attention to the plight of this magnificent bird of prey has not diminished or can it be overlooked.

INTERNATIONAL CRANE FOUNDATION

Little did I realize when I saw George Archibald working with his captive cranes at Cornell University during our graduate student days that we would both end up in Wisconsin in the 1980s. Undoubtedly, ICF has received more international acclaim than any Wisconsin-based wildlife organization. In pursuing the preservation and study of the world's crane species, no biological or political hurdle has proven too tough to attack, with success usually being the outcome of these endeavors. While Baraboo and circuses have held an intimate relationship for years, the association between Baraboo and cranes is becoming just as close. Because of ICF's annual Sandhill Crane Count, many Wisconsinites have had the thrill of experiencing the awakening of our wetlands on an early spring morning.

MADISON AUDUBON SOCIETY

One of 17 Audubon chapters in Wisconsin, Madison Audubon has a long-standing tradition of involvement with

Wisconsin's birdlife. Whether selling over a quarter of a million pounds of bird seed, lobbying for legislation and regulations to benefit wildlife, conducting exciting birding trips, providing funding for ornithological research, or managing its two properties (Goose Pond and Otsego Marsh), this 40-year-old organization is a model of how hard-working volunteers have achieved a long list of successes.

NATURAL RESOURCES FOUNDATION OF WISCONSIN

The Foundation was created in recent years to help preserve, protect, and enhance Wisconsin's natural heritage. One of the primary projects receiving funds from the Foundation is the Trumpeter Swan reintroduction program.

THE WISCONSIN CHAPTER OF THE NATURE CONSERVANCY

TNC is committed to the preservation of natural diversity. Land comes to TNC through bequests, donations, trades, easements, or direct purchase. Over 24,000 acres at more than 100 Wisconsin sites have been protected through TNC action. Once a property is acquired, it is either retained by TNC or is transferred to another organization for protection. For the 8,000+ acres remaining under Chapter control, stewardship activities that maintain these habitats as homes to many rare and endangered species of wildlife and plants are very important. For example, Baxter's Hollow, a 2,890-acre preserve in Sauk County's Baraboo Hills, provides the best remaining habitat in southern Wisconsin for 10 bird species. Started in 1969 with a purchase of 171 acres,

the Baxter's Hollow property will ultimately encompass 3,800 acres.

THE SOCIETY OF *Tympanuchus cupido* *pinnatus*

Organized in 1961 to protect and preserve Wisconsin's Greater Prairie-Chicken, the story of its work in the Buena Vista Marsh in Portage County is one of unparalleled success. Without this organization's dedication to this single purpose, the prairie chicken would probably have been lost from Wisconsin's landscape. Recently, the group announced plans to sell more than 7,000 acres of chicken habitat to the State for \$1 million. The Society would spend half of the sale price for management of the land. The Society's strategy of setting an agenda and then pursuing it with zeal should be an example for others to emulate.

WISCONSIN FOUNDATION FOR WILDLIFE RESEARCH

Founded by Don Follen in 1986 to assemble and distribute information on wildlife and to promote public education and awareness, this fledgling organization will continue to pursue the goals he so enthusiastically established. With a passion for raptors, especially owls, and especially for the Great Gray Owl, trapping and banding studies were pursued by Don for more than 25 years. One of the most appealing aspects of studying and enjoying birds is the many dedicated individuals that you meet on field trips, at meetings, and through reading literature. This Foundation is an example of what one person with a special sense for discovering and sharing can achieve.

WISCONSIN CHAPTER OF THE WILDLIFE SOCIETY

This is a professional association dedicated to the sound management and preservation of wildlife resources. By promoting wise stewardship of wildlife resources and of the environments upon which wildlife and man depend, university wildlife researchers, agency wildlife managers, and other career wildlifers in Wisconsin have contributed significantly to our understanding of the needs of our Wisconsin birds and to developing strategies to preserve or enhance bird populations.

NATURE CENTERS

These educational facilities, which also function as natural sanctuaries, are dedicated to instilling in people of all ages an understanding of their interrelationships with the earth and its plant and animal life. If people can have a positive experience in the outdoors at a nature center, maybe this experience will come into play in some future decision-making. Many of Wisconsin's nature centers are supported, at least partially, by public sources of funds. Others are totally private. The following are three such facilities located in eastern Wisconsin.

The Ridges Sanctuary.—The Sanctuary, located near Baileys Harbor in Door County, consists of ridges and swales of former Lake Michigan shorelines that were deposited over dolomitic bedrock. Land acquisition at Ridges has been going on for over 50 years, and the property now exceeds 1000 acres. It was Wisconsin's first National Natural Landmark. Although overshadowed by its unique rich flora, activities focusing on

the Sanctuary's birdlife are an integral part of its educational mission.

Riveredge Nature Center.—Riveredge's 350 acres along the Milwaukee River in westcentral Ozaukee County is a refuge to over 180 species of birds and 450 plant species. An established bluebird trail, a Christmas Bird Count and Breeding Bird Survey, bird banding, protection of prime deciduous forestland and other habitats used by several uncommon birds, and ornithological programs and workshops are all part of the ornithological scene at Riveredge.

Woodland Dunes Nature Center.—Located between Manitowoc and Two Rivers, the Center's aggressive property acquisition program has preserved a fantastic natural area and birding spot. For example, 70 acres added in summer 1988 were included in a property master plan started in 1965. A number of rarities have been seen and banded on the property, with several warblers and raptors prominent. In addition to its commitment to nature education, Woodland Dunes is conducting long-term bird population monitoring surveys.

REHABILITATION CENTERS

No one can deny the impact of seeing a Barred Owl, Bald Eagle, Red-tailed Hawk, or other raptor species face to face. Rehabilitation of sick or injured birds often enables close encounters that people do not soon forget. While rehabilitation efforts are often associated with individuals or with nature centers, there are some fine examples of private rehabilitation organizations in Wisconsin. Milwaukee's Wildlife ARC and Minocqua's Northwoods Wildlife Center are two such private groups devoted to re-

habilitating a wide variety of wildlife species. While hundreds of these animals are returned annually to the wild, others become key players in educational programs. The knowledge of birds, especially birds of prey, gained by people of all ages who attend these programs, is certainly a priceless contribution being made to our society.

SPORTSMEN'S GROUPS

Ducks Unlimited.—Like the WSO, DU was founded in the late 1930s. Its single purpose, that of directing its financial resources to the North American waterfowl breeding grounds, is legendary. Starting in 1985, DU initiated the Matching Aid Restoring States Habitat program. Through the end of 1987, nearly \$1 million has been committed to M.A.R.S.H. projects in Wisconsin. Because many of these dollars are going for habitat restoration and wetland preservation, many species of wetland game and non-game birds can be expected to benefit.

Pheasants Forever.—Another new organization on the Wisconsin scene, 12 local chapters of Pheasants Forever have raised \$100,000 since 1985. Habitat improvement, including restoring nesting cover, planting food patches, and providing shrubs for future brushy cover, is the main thrust of the organization. As with most habitat development projects aimed at one species, this work can be expected to benefit a variety of birds.

The Ruffed Grouse Society.—Another seemingly single-species organization, this group has dedicated its efforts to improving habitat not only for the Ruffed Grouse, but also for the American Woodcock and other forest wildlife.

Making private landowners aware of the value of their forest land as wildlife habitat is a cornerstone of the Society's efforts.

Wisconsin Waterfowlers Association.—WWA is another relative new comer to the state's conservation scene. Among projects started in its short four-year history are several local, hands-on efforts such as the "Adopt-a-Marsh" program, allowing chapters to adopt and co-manage a local wetland, a large Wood Duck housing project, and providing funds for habitat management.

Wisconsin Wildlife Federation.—Since the 1940s when the organization was formed as an affiliate of the National Wildlife Federation, WWF members have been active on many fronts that have benefitted Wisconsin birds. Whether working to ban the use of lead shot or to protect wetlands, or raising funds for scholarships and resource education projects, the work of the Federation will continue to be an important part of Wisconsin's conservation scene.

CONCLUSIONS

While the Bald Eagle and Osprey are no longer endangered in Wisconsin, species continue to be added to the official endangered species list. Although the educational programs of bird organizations serve an important function, teaching us to understand how our birdlife fits into the design of Wisconsin and of the earth, only a small percentage of our citizens are touched by them. While many habitats that serve as sanctuaries for a spectacular variety of plants and animals have been identified and preserved, many others are still being threatened by man's assaults, waiting to

be preserved in order to keep all parts of the web of life together. Our work is not finished. However, history has provided some excellent examples of how to get the job done. Only thorough dedication, cooperation, and hard work can we accomplish what is needed. Those organizations just described and many others—by enhancing our knowledge, understanding, and enjoyment of birds—will make Wisconsin an even better place in which to live.

The author apologizes to any organization for any omissions, slights, or

oversights. To those organizations, such as local bird and nature clubs, local Audubon societies, and sportsmen's groups that were not specifically mentioned, your contributions are recognized and appreciated. Each organization provides many valuable services to the citizens and birdlife of Wisconsin. Keep up the good work!

Noel J. Cutright
3352 Knollwood Road
West Bend, WI 53095



VOL. IV MARCH, 1942 No. 3

A Range and Population Study of The Purple Martin
In Wisconsin

BY MURL DEUSING
Milwaukee Public Museum

The following study of the purple martin (*Progne subis subis*) is based upon the reports of 49 observers plus many references in the Wisconsin literature. Our reports cover 53 of the 71 counties in the state. All of our observers except one agree that the purple martin is a common bird in Wisconsin. A few of the observers qualify this a bit by saying, "fairly common" or "quite common." In all the early records for Wisconsin the purple martin has been regarded as a common bird. Dr. Hoy counted the purple martin as common around Racine in 1852, and it appears on Henry Pratt's list of birds found in northern Wisconsin and Minnesota (1852). Kumlien (1862), King (1873), Grundtvig (1881), Willard (1881), and Kumlien and Hollister (1903) all indicate that the purple martin was a familiar bird in their time.

Spring Migration of Martins

In organizing the migration data of the purple martin it was found to be convenient to divide the state into three equal parts: a southern section, a central section, and a northern section. The earliest arrival date recorded for the southern section (which is also the earliest record for the state) is March 13 (Barger). Eight other observers record early dates for March ranging from the 25th to the 30th. The average arrival dates for 16 observers in the southern section range from March 30 to April 17. The general average for the southern section is April 10.

The earliest date recorded for the central section is March 25 (Evans). There are three other early dates for March 26, 27, and 30, as well as two early dates for April 1 and two for April 2. The average arrival dates for 17 observers in the central section range from April 4 to April 24. The general average for the central section is April 13.

The earliest date on record for the northern section is April 7 (Pennington). There are also two early dates for April 9, two for April 10, and one for April 13 and 14. The average arrival dates for 14 observers in the northern section range from April 14 to May 1. The general average for the northern section is April 19.

Only a few of the observers have kept separate records for the arrival of both male and female. In all cases the female arrived after the male. The records of 5 observers show the female arriving anywhere from 2 to 20 days later than the male. The average arrival of the female was 7 days later than the male.

Nesting of Martins

Before the settlement of Wisconsin by the white man all purple

Fifty Years of Ornithology at The University of Wisconsin

The University of Wisconsin has a rich tradition of ornithological research and teaching. Over 500 students have earned graduate degrees in ornithological subjects.

by John T. Emlen

The University of Wisconsin was founded in 1849, only one year after Wisconsin became a state. Apparently biology was a part of the curriculum from the beginning, and the university has always been widely known as a center for biological research, especially for its pioneering work in lake biology. Birds also featured in the early years with courses in animal behavior from 1903 and bionomics (ecology) from 1905. Ornithology appeared as such in 1907 when Professor *George Wagner* started a course and organized a collection of bird specimens collected by such notable ornithological pioneers as *Thure Kumlien*, *Ludwig Kumlien*, and *Charles Cory*. The first formal program in ornithology with opportunities for graduate research was, however, established only after the second world war when *John Emlen* was brought to the Zoology Department from Cornell University.

Over the next 28 years Professor Emlen taught ornithology and guided 22 graduate students to Ph.D. degrees on ornithological topics. Two broadly trained ecologists who joined the de-

partment in the early 1950s, *John Neess* and *Edward Beals*, also have supervised graduate research in ornithology. *Dean Amadon*, from the American Museum of Natural History, took over for Emlen when he was in the field in 1953-54, and *Helmut Mueller*, now ornithology professor at the University of North Carolina, did the same when he was unable to be present in the spring semesters of the late 1960's.

Upon his retirement in 1974 Emlen was replaced by *Timothy Moermond*, whose ornithological training at Illinois and Harvard provided new ecological breadth for Wisconsin's program, and *Jack Hailman*, whose training and experience at Duke, Harvard, and University of Maryland greatly extended the UW's competence in research on bird behavior.

Despite the centralization of ornithological instruction in the Zoology Department, the first great step for ornithology at the University of Wisconsin occurred in 1935 with the establishment of the Department of Game Management (now Wildlife Ecology) in

the College of Agriculture, and the appointment of its distinguished and revered Professor *Aldo Leopold*. Starting from scratch Leopold quickly built up a vigorous teaching and research program in applied aspects of bird and mammal ecology. On Leopold's untimely death in 1948 this program fell into the capable hands of his two stalwart assistants, *Robert McCabe*, a native of Wisconsin with a degree under Leopold, and *Joseph Hickey*, a native of New York and former Leopold student who was at that time completing his doctorate at the University of Michigan. These men guided and developed the program, conducting and supervising graduate research for over three decades until their recent retirements. Three more ecologists with ornithological interests have been added to the wildlife ecology program since 1960: *Lloyd Keith*, from British Columbia, known particularly for his scholarly studies on wildlife cycles; *Donald Rusch*, one of Keith's graduate students and a waterfowl specialist, and *Stanley Temple*, a Cornellian who has made many contributions in avian ecology and the management of endangered species around the world. *Arlie W. Schorger* retired early from a business career in Madison and joined the Wildlife Ecology group in 1951; he contributed substantially to the productivity of that department until his death in 1972.

Ornithology on the Madison campus is not limited to the zoology and wildlife ecology departments. *Thomas Vale*, who was brought to the geography department from the University of California at Berkeley, has supervised research programs on ornithological topics, and *Calvin DeWitt*, an ecologist from the University of Michigan, in the Institute of Environmental Studies has also supervised research on birds.

The University of Wisconsin-Milwaukee initiated a vigorous ornithological program in 1956, when it brought *Charles Weise* from the University of Illinois. This program was expanded in 1967 with the hiring of *Millicent Ficken* and *Robert Ficken* from Cornell University and the University of Maryland and the establishment of an impressive field station and ongoing research program at Saukville, Wisconsin.

In addition to the 13 staff members introduced above and the 74 Ph.D. students listed in Table 1, over 400 students have earned masters degrees in ornithological topics, and over a dozen postdoctoral scholars have undertaken ornithological research projects on the UW's two Ph.D.-granting campuses. Obviously, we can't review the accomplishments of all these ornithologists in this short article. Regrettably, we are also obliged to mention only briefly the fine work being done at the UW's smaller campuses, and in Wisconsin's independent colleges.

NATURAL HISTORY PROJECTS

The first graduate student to complete a Ph.D. in the Zoology Department's ornithology program was *Howard Young*. In a three-year study of the courtship and nesting behavior of the American Robin at Ho-Nee-Um Pond in Madison, Howie discovered that his birds did not conform to the traditional territorial behavior recognized at that time, but confronted contentious neighbors with aggression roughly proportional in intensity to the distance of the encounter from the center of the territory. After completing this study and interludes holding several teaching positions out-of-state, Howie returned to

Table 1. Ornithologists receiving Ph.D. degrees from the University of Wisconsin, 1939-88.

Name and Thesis Title	Year	Department	Major Professor
Andersen, David R. Raptor-human interactions in southern Colorado	1988	Wildlife Ecology	Rongstad
Anderson, Daniel E. Chlorinated hydrocarbons effects on eggshell thickness	1970	Wildlife Ecology	Hickey
Anderson, Raymond K. Prairie Chicken mating and interspecific behavior	1969	Wildlife Ecology	McCabe
Apel, Karen Antipredator behavior in Chickadees	1985	Zoology-Milwaukee	Ficken
Bartonek, James C. Foods and feeding in diving ducks	1968	Wildlife Ecology	Hickey
Bleed, Ann S. Territorial behavior in Redwing Blackbird	1974	Zoology	Emlen
Blohm, Robert J. Gadwall breeding in Manitoba	1979	Wildlife Ecology	McCabe
Bond, Richard R. Ecological distribution of Wisconsin forest birds	1955	Zoology	Emlen
Brittingham, Margaret C. Impacts of winter feeding on bird populations	1987	Wildlife Ecology	Temple
Burger, George V. Licensed shooting preserves in Wisconsin	1959	Wildlife Ecology	McCabe
Burkett, Edward Male and female parental investment in the Flicker	1989	Zoology-Milwaukee	Weise
Burt, Edward H. Wood Warbler coloration	1977	Zoology	Hailman
Buss, Irven O. Population studies in Wisconsin pheasants	1939	Wildlife Ecology	Leopold
Craven, Scott R. Canada Geese of Horicon Marsh	1975	Wildlife Ecology	Rusch
DeJong, Michael J. Energetics of bounding flight in birds	1976	Zoology	Moermond
DeVito, Emil O. Avian habitat selection in New Jersey pine barrens	1988	Zoology	Beals
DeVos, Antoon Vanishing mammals and birds	1952	Wildlife Ecology & Zoology	Leopold & Emlen
Doerr, Phillip D. Ruffed Grouse ecology and fire	1973	Wildlife Ecology	Keith
Ellarson, Robert S. Old Squaw on Lake Michigan	1956	Wildlife Ecology	McCabe
Elowson, A. Margaret Predator-elicited calls of the Florida Scrub Jay	1982	Zoology	Hailman
Evans, Roger M. Ring-billed Gull chick behavior	1966	Zoology	Emlen
Eynon, Alfred E. Japanese Quail behavior	1960	Zoology	Emlen
Faber, Raymond A. Chlorinated hydrocarbons—reproductive impacts	1978	Wildlife Ecology	Hickey
Flack, J. A. Douglas Aspen forest bird communities	1970	Zoology	Beals
Gates, John M. The ecology of a Wisconsin pheasant population	1971	Wildlife Ecology	Hickey
Gramza, Anthony F. Vocal mimicry in Budgerigars	1970	Zoology	Emlen
Greeley, Frederick Stress and endocrine function in pheasants	1953	Wildlife Ecology	Leopold
Grubb, Thomas C. Olfactory navigation in petrels	1971	Zoology	Emlen

continued

Table 1. (*Continued*)

Name and Thesis Title	Year	Department	Major Professor
Gustafson, Dennis Forest fragment size and quality	1985	Zoology	Weise
Halkin, Sylvia Female song in the Cardinal	1988	Zoology	Baylis
Hamerstrom, Frederick N. Prairie Grouse breeding, etc.	1941	Wildlife Ecology	Leopold
Howe, Robert W. Bird distribution in small habitat islands	1977	Zoology	Beals
Hunt, Lawrence B. Insecticide effect on songbirds	1968	Wildlife Ecology	Hickey
Jahn, Lawrence R. Duck and Coot ecology and management in Wisconsin	1958	Wildlife Ecology	Hickey
Kasper, John L. Origin of motor patterns in domestic chicks	1963	Zoology	Emlen
Keith, Lloyd B. Waterfowl ecology on small impoundments	1959	Wildlife Ecology	McCabe
Knight, Richard L. Nest defense in altricial birds	1985	Wildlife Ecology	Temple
Labisky, Ronald F. Pheasant ecology in Illinois	1968	Wildlife Ecology	McCabe
Lanyon, Wesley E. Eastern and Western Meadowlarks—in range overlap areas	1955	Zoology	Emlen
Levey, Douglas Ecology of fruit-eating birds	1986	Zoology	Moermond
Loiselle, Bette Ecology of tropical birds	1987	Zoology	Moermond
March, James R. Mallard populations and harvest	1976	Wildlife Ecology	Rongstad
McCabe, Robert A. A ten-year study of a refuge population of pheasants	1949	Wildlife Ecology	Leopold
McGahan, Jerome Andean Condor behavior and ecology	1972	Zoology	Emlen
Melvin, Scott M. Sandhill Crane migration and winter ecology	1982	Wildlife Ecology	Temple
Millar, John B. White-throated Sparrow migratory behavior	1960	Zoology	Emlen
Miller, Don E. Ontogeny of approach and escape in domestic chicks	1965	Zoology	Emlen
Mossman, Archie S. Fitness and vulnerability to predation	1955	Zoology	Emlen
Mueller, Helmut C. Homing experiments with bats	1963	Zoology	Emlen
Nero, Robert C. Red-winged Blackbird territory and mating	1955	Zoology	Emlen
Parker, Kathleen Desert bird communities	1982	Geography	Vale
Penny, Richard L. Adelie Penguins—territorial and social behavior	1963	Zoology	Emlen
Petersen, Arnold J. Bank Swallow breeding cycle	1953	Zoology	Emlen
Peterson, Steven R. Old Squaw food habits	1976	Wildlife Ecology	Ellarson
Popp, James Aggressive behavior and communication in finches	1987	Zoology-Milwaukee	Ficken
Rabinowitch, Victor E. Early experience and ontogeny of food habits	1965	Zoology	Emlen

continued

Table 1. (Continued)

Name and Thesis Title	Year	Department	Major Professor
Raye, Susan Ontogeny of vocalizations in Bobwhites	1983	Zoology-Milwaukee	Ficken
Reed, Jonathan R. Spectral sensitivity and light attractions in sea birds	1986	Zoology	Hailman
Rusch, Donald H. Ruffed Grouse ecology and predation	1970	Wildlife Ecology	Keith
Rusterholz, Kurt A. Niche relations in pine foliage gleaners	1979	Zoology	Beals
Sargent, Theodore D. Nest-building in Zebra Finches—role of experience	1963	Zoology	Emlen
Skagen, Susan K. Brood reduction in birds	1987	Zoology & Wildlife Ecology	Baylis & Temple
Sowls, Lyle K. Prairie ducks—behavior, ecology and management	1941	Wildlife Ecology	Leopold
Stokes, Allen W. Pheasants in Pelee Island, Lake Ontario	1952	Wildlife Ecology	Leopold
Thompson, David H. Adelie Penguin—chick recognition	1974	Zoology	Emlen
Trost, Robert E. Canada Geese in Mississippi Flyway	1984	Wildlife Ecology	Rusch
Wagner, Frederick H. Weather and pheasant populations	1961	Wildlife Ecology	Hickey
Wallace, Michael P. Andean Condors in Peru	1985	Wildlife Ecology	Temple
Waide, Robert C. Seasonal changes in a tropical wet forest	1973	Zoology	Beals
White, Robin C. Distribution of Neotropical migrants in winter	1987	Geography	Vale
Whitford, Philip Social behavior and communication in Canada Geese	1987	Zoology	Ficken
Wiens, John A. Grassland birds—ecological relationships	1966	Zoology	Emlen
Wing, Leonard Conservation and wildlife cycles	1937	Wildlife Ecology	Leopold
Young, Howard Robin territory	1950	Zoology	Emlen

Wisconsin to develop an ornithology program at U.W.-LaCrosse.

Red-winged Blackbirds were conveniently accessible for research in the Madison area and particularly on the East Wingra Marsh in the University Arboretum. Here *Jim Beer*, a student under Professor Leopold initiated systematic studies with color-banded birds in 1946. A full six-year project on this marsh by *Robert Nero* extended the personal histories of all the residents of the marsh, all color-banded, and revealed many fascinating details of social relationships and

reproductive histories. Bob continued his ornithological activities after graduation at the provincial museums in Regina and Winnipeg. He recently described his experiences with Red-winged Blackbirds in an attractive Smithsonian Press publication.

Also used for class demonstration exercises, the East Wingra redwing colony continued to provide a valuable source of scientific information into the 1970s and 1980s. In 1962–63 *John Wiens*, a masters student in Zoology at the time, took advantage of a small colony of

Common Grackles nesting in the cattails at one edge of the marsh to examine aggressive interactions between the two species. This study was followed by a study of foraging competition between the two species by *John Snelling*. *Ann Bleed* took a hard look at the physical aspects of territories on the marsh and their role in territorial dynamics in 1971–74. *Richard Knight* and *Susan Knight* from the Wildlife Ecology Department examined nest-defense behavior on the marsh in 1984–86.

Eastern Meadowlarks and Western Meadowlarks, represented in roughly equal numbers in southern Wisconsin in the 1950s, provided excellent material for a comparative study and an analysis of interspecies dynamics between two closely related and morphologically similar species for *Wesley Lanyon*. Intensive studies of nesting, territory and song were centered on pastures and hayfields in Fitchburg township just south of Madison, and extensive surveys comparing details of geographic distribution and habitat preferences in the two species were spread in a wide belt across southern Wisconsin from the Mississippi to Lake Michigan. On graduation Lanyon became a curator in the bird department at the American Museum of Natural History in New York, and later chaired that department. He also served a term as president of the American Ornithologist's Union.

The Department of Wildlife Ecology has always had an interest and research program on the ecology of nongame species. Aldo Leopold and Robert McCabe conducted long-term studies on Black-capped Chickadees, Catbirds, Willow Flycatchers, House Wrens, Yellow-headed Blackbirds and the American Woodcock. *Robert Ellarson* also worked many years on a population of Tree

Swallows. The catbird research showed a strong degree of pinpoint homing between and among years. Banding by sex provided a year to year assessment of mate fidelity. All birds captured as pairs were color banded for individual identification. The study ran for 8 years. Spring censuses of male woodcock were conducted at the U.W. Arboretum and at the Leopold property in Sauk County. The Arboretum count has been continuous from 1940 to present. The Willow Flycatcher research placed emphasis on the ecology of the bird through a series of experiments and determined exactly the role of intraspecific nest relocation. Tree Swallows were encouraged to nest on the U.W. Arboretum through a series of nest boxes. The banded birds allowed for an evaluation of the population ecology of those birds.

Chickadees have been top priority subjects for study at UW-Milwaukee's field station where Charles Weise, using audio and video techniques to analyze individual idiosyncrasies, has followed the demography and social behavior of a population of 200–300 color-banded birds for over 20 years. Adding significantly to an understanding of population regulating mechanisms in these birds, Weise found that juveniles in his population characteristically dispersed widely soon after fledging and that a variable—but often heavy—mortality of juveniles in late summer featured importantly in the year-to-year population fluctuations. *Edward Burkitt*, one of Weise's students, has been working on the problem of energetic costs of reproduction, measuring how flickers budget their activities during the breeding season.

Colonial-nesting swallows provided attractive subjects for studies of social interactions under conditions of self-im-

posed crowding. In a study of Cliff Swallows in Wyoming, John Emlen found that adult birds, despite their highly social natures, tolerated no neighbors to perch closer than four inches, the distance a resting bird can reach and peck without moving its feet. This individual tolerance limit determined their spacing in migrating flocks along telephone wires as well as the positioning and arrangement of their nests on cliffs, barns or culvert walls. Emlen was introduced to this species several years earlier by a Leopold student, *Irven Buss*, who, during the early 1940s followed the success of a huge nesting colony on a barn near Deerfield, Wisconsin, where the birds were relentlessly pestered by hoards of House Sparrows. In a later study on this same barn, Emlen found an even more destructive enemy, swarms of bedbugs, lice and ticks overwintering in a dormant condition in the old nests and emerging to plague the nesters when they returned the following spring.

Bank Swallow colonies in Dane County became the subject for a three-year study of colonial breeding by *Arnold Peterson* in 1950. Peterson followed the sexual and social behavior of these birds closely through the breeding cycle and correlated each stage with morphological, physiological and biochemical changes in the bird's primary and secondary sexual characters. On completing the study he went on to direct the ornithology program and to teach related biology courses at St. Olaf's College in Northfield, Minnesota.

Ring-billed Gull and Herring Gull colonies on upper Lake Michigan and Lake Huron shores provided opportunities for ornithology classes to experience the excitement of colonial breeding and for graduate students to study the dynamics of nest spacing, the struggle for survival

among chicks, and the nature of parental care in densely crowded colonies of ground nesters. *Don Miller* studied parent-chick individual recognition and the responses of breeding gulls to artificial advancement and retardation of breeding progress at selected nests by switching eggs or small chicks between nests that had reached various stages in the nesting cycle. *Roger Evans* focussed on parent-chick communication in these same colonies, performing many experiments designed to understand the nature and mechanisms of individual recognition between chicks and their parents in the clamor of the breeding colony. Together, and with Emlen and *Dave Thompson*, these students described the panic and destruction of eggs and chicks that occurred when a marauding raccoon managed to pass an artificial barrier that had blocked the entrance to their colony located on a rocky peninsula in Lake Huron. Don is now teaching animal behavior at Washington State University, Roger at the University of Manitoba.

PROJECTS ON GAMEBIRDS AND WATERFOWL

Waterfowl and upland game birds have been the focus of research by Professors Leopold and McCabe and their students in the Wildlife Ecology Department. *Irven Buss* studied Ring-necked pheasant populations on a state-wide basis. That effort was followed by more local investigations by Robert McCabe, studying the ecology of a refuge population that showed a 70% loss of the annual year class from one fall to the next. *Fred Wagner* explored the role of weather on short-term fluctuations of pheasant numbers, and *John Gates* studied the ecology of the thrifty pheasant popula-

tion in south central Wisconsin. These well-researched efforts formed the basis for the DNR pheasant management program. Later inquiry by *Allan Stokes* focused on population biology in a high-density pheasant population on Pelee Island, Ontario. *Frederick Greeley* researched new endocrine physiology related to stress in pheasants as a clue to survival. *George Burger* investigated the functioning and role of the licensed shooting preserve in Wisconsin. The pheasant is the most important species hunted on shooting preserves. *Ronald Labisky* conducted an extensive and detailed study of pheasants in Illinois, where the bird reaches the southern limits of its range.

Among the early studies were those on Greater Prairie-Chickens. An important effort of several years ended when *Franklin Schmidt* lost his life and his research data in a tragic fire. *Frederick Hamerstrom* and *Frances Hamerstrom* took up the program on that species and spent most of their professional lives in that endeavor. The resulting management program is a landmark in game bird conservation and a pattern for endangered species management. *Raymond Anderson* experimented with Greater Prairie-Chicken behavior in relation to lek activity.

Donald Rusch and *Philip Doerr* explored the ecology of the Ruffed Grouse in Alberta, Canada. Rusch found that predators accounted for 80% of the fall to spring mortality, and Doerr found it took at least three years to replace Ruffed Grouse densities after a fire reduced the population through reproductive failure and egress.

Waterfowl studies have always been a major undertaking, beginning with the pioneering work of *Albert Hochbaum* that culminated in his classic book *Canvas-*

back on a Prairie Marsh. *Arthur Hawkins*, the U.S. Fish and Wildlife Service representative for the Mississippi Flyway, worked with Wood Ducks and edited a book, *Flyways*, summarizing waterfowl research and management. *Lyle Souls* provided insight into the breeding ecology of surface-feeding ducks in his book, *Prairie Ducks*. R. McCabe reintroduced Wood Ducks as a breeding population in the U.W. Arboretum and Madison area. *Lawrence Jahn* and *Richard Hunt* produced a definitive work entitled, *Duck and Coot Ecology and Management in Wisconsin*. This work was a summary of DNR programs in waterfowl management. *Robert Ellarson* and *Steven Peterson* explored the biology and ecology of the Oldsquaw duck on Lake Michigan. *Lloyd Keith* examined the ecology of waterfowl on small impoundments in southeastern Alberta. These impoundments, important to duck production, were part of an irrigation system. The importance of summer foods was studied in Southern Manitoba by *James Bartonek*. *Robert Blohm* worked on the breeding ecology of the Gadwall in Southern Manitoba including an assessment of body measurements using discriminant analysis for sexing day old ducklings. *James March* investigated the ecology and harvest of the mallard in Wisconsin. He found that up to 50 percent of the mallards shot were locally produced. *Scott Craven* and *Robert Trost* with their mentor, *Donald Rusch*, have, through banding and mathematical analysis, provided insights into Canada Goose management. The data base created by that program form the basis for the federal stance on the Canada Goose harvest.

PROJECTS ON MIGRATION AND NAVIGATION

The progress of spring and fall migration through Wisconsin has been fol-

lowed intermittently and with varying intensity by students on both the Madison and Milwaukee campuses by recording arrival and departure dates, by counting "beeps and peeps" at night, and, in a national cooperative program, by counting bird silhouettes through spotting scopes as they crossed the moon's disc.

Physiological aspects of migration were studied on both the Madison and Milwaukee campuses during the 1950s and 1960s. *Jack Millar* followed the migratory behavior of White-throated Sparrows on Picnic Point for several years closely tracking their arrival and departure dates and relating these to changes in behavioral and physiological indicators of the migratory condition in both free-living migrants and a population of captive birds in an outdoor aviary. Professor Weise performed many experiments on the physiological and environmental factors regulating annual cycles, and migratory behavior in caged White-throated Sparrows and Dark-eyed Juncos in Milwaukee. He was one of the first to show that the migratory condition was presaged in caged birds by a sudden onset of nocturnal restlessness and fat deposition. He also showed that the surgical removal of gonads in young birds blocked the normal development of the migratory condition, if performed before the onset of increasing daylength, but had no such effect if delayed until after that event. In another series of experiments he demonstrated that Juncos kept on short (winter) daylengths developed spring migratory behavior on schedule while White-throats failed to do so. In comparing the physiological and behavioral responses of a number of migratory North American species to naturally increasing spring daylengths he found a gradation in the onset of fat

deposition and migratory restlessness paralleling the lengths of their known migratory flights. His graduate student, *L. Miller*, found that White-throats artificially brought into spring migratory condition in the fall by daylength manipulation oriented northward indicating that an intrinsic (physiological) cue and not a sensory cue (stars) was determining their migratory direction.

In a search for the cues used by birds for homing in daylight *Ted Sargent* captured hundreds of Bank Swallows at their nest burrows in Dane County colonies, marked them with variously colored chicken feathers for quick visual recognition, and transported them in various directions out to distances of 175 miles. All of the birds released within 50 miles were back home within 24 hours, but few made it the same day from greater distances. In another experiment he tested 113 birds for direction selection in a three foot diameter circular cage carried to various points within a 50-mile radius of the home colony and placed on top of his car under the open sky in settings where distant landmarks were visible. Orientation within the cage was good out to 5 miles, variable out to 15 miles if distant landmarks were visible, and essentially nonexistent beyond 15 miles. This he interpreted as evidence that these birds were depending on landmarks rather than celestial or map orientation. Their good performance as free flying birds out to 50 miles was presumably due to the better visibility of distance landmarks possible in flight from the higher viewing altitudes.

Another homing experiment was done a few years later on a non-flying bird, the Adelie Penguin in Antarctica by Professor Emlen and graduate student, *Richard Penny*. Here the observers were

able to keep their subjects under constant surveillance as they, one by one, waddled or tobogganed off from featureless release points on the vast and completely level, snow-covered plateau of the Ross Ice Shelf. Tracked by triangulation from a pair of surveyor's transects mounted atop high poles, these birds, consistently chose a departure course not towards their home but following the local line of longitude that radiates outward from the south pole. A series of releases from other points around the continent showed that the birds were using the sun's position as their guide, consistently adjusting for its smooth and essentially horizontal progress as it moved clockwise around the Antarctic continent's perimeter.

On one of the few occasions when *Helmut Mueller*, now a confirmed and well known Wisconsin ornithologist, diverted his energies from birds to mammals he conducted a series of experiments with homing in bats. Over a series of evenings hundreds of hibernating Little Browns were captured from a roosting cave in Grant County, banded, and transported to a scattering of release points throughout south-western Wisconsin before midnight. Within a half hour they began appearing in the mist-net strung across the mouth of the home cave, and within a few hours they were pouring in from distances up to 60 miles. In a second series of experiments, bats with their eyes temporarily blindfolded with a lampblack covering performed almost as well as those with unobstructed vision. He is now a professor of animal behavior at The University of North Carolina.

To explain how Leach's Storm Petrels find their breeding islands and their home burrows in the dark of night graduate student *Tom Grubb* hypothesized

that olfaction might be involved after noting that the birds consistently approached their nesting island upwind, hovered over areas downwind from the spruce groves under which they nested, and approached their individual burrows on foot upwind in the essentially total darkness of the spruce subcanopy. To test this hypothesis he then constructed a Y maze in which he found that the birds consistently selected the branch that at its end, contained nesting material freshly taken from the bird's home burrow. Tom is now professor of zoology and doing ornithological research at Ohio State University.

PROJECTS ON BIRD COMMUNITIES AND POPULATIONS

Wisconsin ornithologists have contributed substantially to the recent progress of methods and programs for evaluating bird habitats and estimating bird populations. Emlen recently designed and described a transect-count method for estimating bird population densities and, with Hickey and Temple, helped organize an international symposium on census methods in California. With John Wiens, a former Wisconsin student, Temple also participated in and edited the proceedings of a national conference on the extent to which bird populations can be used as indicators of environmental hazards. Many W.S.O. members have contributed to the Wisconsin Checklist Project that Temple organized and that has resulted in the recent publication: *Wisconsin Birds: A Seasonal and Geographical Guide*.

Staff ornithologists on most of the U.W. campuses have organized and supervised one or more student projects involving bird census work. Professor McCabe assisted by many students over

the years, has kept a long term record of the year to year fluctuations of waterfowl populations on University Bay. Professor Weise has assembled a similar record of waterfowl numbers for the Milwaukee Harbor and has followed the local movements of a color-banded wintering population of mallards in the Milwaukee area.

With the pioneering work being done on plant communities by Wisconsin botanists John Curtis and Grant Cottam in the 1950s, an opportunity clearly existed to examine the ecological structure and dynamics of Wisconsin bird communities. *Richard Bond* was keen to undertake such a project and, over a three year period, made systematic counts of all bird species over standardized transect routes through woodlots selected along gradients from dry (xeric) to moist (mesic) as determined by the relative abundance of indicator tree species. After several administrative and teaching positions Dick became Professor of Ecology at Northern Colorado College. His Wisconsin study became a prototype for similar surveys by ornithologists across the continent and around the world. Similar procedures were used by Emlen in Savannah and woodland habitats in central Africa, in an area of mesquite and grassland in southern Texas and in pine woodlands in the Bahamas and Florida. In the late 1950s Professor Beals, applying ordination methods to systematic bird counts surveyed the birds of Wisconsin's Apostle Islands in relation to forest vegetation, and some 20 years later Professor Temple, working with three of his students, *Victor Apanius*, *Mike Wallace*, and *Thomas Smith*, surveyed and published a general account of the island's avifauna as a W.S.O. publication. The Baraboo Hills, birthplace of Alexander Wetmore, one of America's pre-

mier ornithologists, was selected for intensive ornithological research by Temple and students *Mike Mossman*, *Bruce Ambuel*, and *Margaret Brittingham*, and U.W. graduate, *Kenneth Lange*.

Working with a series of master's students Beals has studied bird-vegetation relationships in a variety of habitats and developed several statistical procedures for quantifying and analyzing the data for broader applications. Of his Ph.D. students, *Douglas Flack*, did an extended study of the bird communities of aspen forests in western North America, *Kurt Rusterholz* examined the interaction of pine forest birds in the southwest, and *Robert Howe*, now a professor at UW-Green Bay, examined the effect of forest patch size in the bird communities in northern Minnesota and then Australia. *Robert Waide* worked in Colombia and the Yucatan investigating the interactions of resident and wintering migrants. In a recent study *Emil DeVito* studied habitat selection and analyzed factors influencing the distribution of bird species in mixed pine-oak stands in the New Jersey pine barrens.

Dissertation work in the Geography Department under Professor Vale has also focused on bird-environment relationships. *Kathleen Parker* found that birds discern both physiognomic characteristics and vertical structure in their subdivision of desert vegetation in the American Southwest. *Robin White* determined that migration distance is a primary factor influencing the distribution of North American birds wintering in the Neotropics but that habitat characteristics also are important.

Professor Temple studied how bird communities respond to problems of habitat fragmentation in areas where development has created mosaics of isolated habitat patches where continuous

habitat had previously existed. With students, *Bruce Ambuel*, *Margaret Brittingham* and *Richard Johnson*, he showed that certain groups of bird species are selectively eliminated from fragmented habitats while other species thrive. From Milwaukee *Dennis Gustafson*, one of Charles Weise's students, did a study on the effects of forest fragment size and matrix quality on bird populations.

John Wiens, now a professor of ecology at the Colorado State University and until recently editor of *the Auk*, studied grassland bird communities in the Madison area for his Ph.D. dissertation and then went on to extend these researches to the desert scrub habitats of the great plains. While in Wisconsin Wiens and Emlen initiated a program of annual grassland bird surveys that were continued by Emlen and are now being extended as a long-term project of the Wisconsin Department of Natural Resources by *David Sample*, a graduate student with Beals.

Emlen compared bird populations and community structures in matching habitats on offshore islands and their adjacent mainlands. In the carib pineland forest community of the southern Florida-Bahama region he found that the summed population densities of species and foraging guilds were generally greater and often much greater on the islands, a difference that he tentatively attributed to a depressing influence on reproduction or survival in peripheral populations. Similar differences appeared in a comparison of population densities on islands and mainland areas in the Baja California region. In a between-island comparison of population densities in Hawaii, Emlen found striking differences in the density of species occupying closely-matched coastal mesquite forests on the six major islands of

the archipelago, differences for which he found no satisfactory explanation.

In 1972 Emlen carried his bird community surveys to an urban residential area in Tucson, Arizona. Using the streets and alleys as his transect trails, he found a very high density but low diversity community consisting largely of House Sparrows, House Finches, Inca Doves and Mourning Doves.

In June, 1979, DeJong, Emlen, Jaeger, Moermond, Rusterholz, Thompson and White drove up the Mississippi river road from Cairo, Illinois, at latitude 39° to St. Paul, Minnesota, at latitude 45°, stopping for 2-day sessions of intensive bird counting at each of twelve bottom-land forest stands spaced roughly 60 miles apart at sites pre-selected for similarity in vegetational composition and structure. Their objective was to trace density increases or decreases for each of 42 forest species along this 700-mile geographic transect. According to the literature 23 southern species would disappear and 6 northern species would appear along this stretch. This proved to be correct, and the data appear to support a preliminary hypothesis that the principal factors were not latitudinal changes in vegetation, temperature or rainfall, but decreasing season length northward and decreasing day length southward acting respectively on the seasonal and diurnal foraging times available for provisioning young.

PROJECTS ON BIRD BEHAVIOR

The University of Wisconsin was one of the first American educational institutions to introduce an organized program of teaching and research in ethology, the science of animal behavior developed by Konrad Lorenz and Niko Tinbergen in Europe in the 1930s. At

Wisconsin, birds were the central focus from the start when *Nicholas Collias* came to the Zoology Department on a temporary appointment from the University of Chicago to write up his extensive research on the role of hormones in aggression and sexual behavior in the domestic fowl. While at UW-Madison, Collias also found time to conduct research on imprinting in baby chicks, dominance behavior in pheasants with wildlife ecology student, *Richard Taber*, and the spectrographic analysis of vocalizations of the domestic fowl with Professor *Martin Joos*, a linguist in the German department and a pioneer in the use of newly developed sound analysis equipment.

Laboratory studies of domestic chicks and ducklings dominated ethological studies during the early 1950's. *Jack Kasper* started off with a study of the origin and development of motor patterns in the domestic chick from the first pulsing of the heart in early incubation through hatching and to the development of functional movements at five days post-hatching. Jack is now a professor at U.W.-Oshkosh. *George Schaller* followed with a series of experiments on a variety of species, precocial and altricial, exploring the origin and development of avoidance responses. Among his findings were data showing that a slowly advancing object whether a plain cardboard square or an active live screech owl will induce no more than a simple and slow withdrawal in a domestic chick up to 10 hours post-hatching but may induce strong and complex responses interpretable as "fear" after that age. George went on to a career of field research on large mammals and is now director of Wildlife Conservation International with headquarters in New York. *Don Miller*, now a professor at Washington State Uni-

versity, examined the interaction of approach and withdrawal responses for the first five days of post-hatching life in domestic chicks and recorded the beginnings of a 24-hour (circadian) activity rhythm starting on day 1 and reaching full amplitude on day 2 or 3.

More variety was introduced into our laboratory program when *Al Eynon* established a colony of Japanese Quail in the early 1960s and produced an ethogram of motor patterns for this species with special emphasis on agonistic and sexual behavior. *Victor Rabinowitch* examined the role of early experience on the development and retention of specialized food habits in Zebra Finches and found that nestlings raised by their parents on one food, selected and continued to prefer that food for many months even if it were the least favored item in a three-way food choice by non-experimental birds. Vic took his doctorate jointly with Political Science and is now Executive Director of the Office of International Affairs at the National Academy of Science's in Washington. *Ted Sargent*, also used Zebra Finches to test whether early experience as nestlings or as first-experience nesters might affect the subsequent choice of nesting materials, nest substrates and nesting situations in subsequent breeding activities. In each case the birds were strongly influenced by their earlier experience. Ted is now a professor at the University of Massachusetts.

Upon reading that parrots and mynas, renowned for their vocal mimicry in captivity do not mimic the sounds of nature in their natural habitat, *Tony Gramza*, now teaching at Murdelein College, ran a series of laboratory experiments with Budgerigar parakeets to test the hypothesis that mimicry in these birds is a form of vocal play that enriches the bar-

ren environment of cage life. Supporting this hypothesis his birds mimicked less and were less vocal where their cage environment was visually or aurally enriched with tape recordings, and in choice tests selected complex over simple sounds for their mimicry models. In his master's research Gramza found that nesting Common Nighthawks allowed the closest approach and gave the most extreme distraction displays on the day their eggs hatched. In all tests the birds consistently flushed towards him and settled behind him as he approached, a strategy he suggested should be effective as a distraction display to predators.

Intrigued by reports in the literature that the familiar reaction of humans and other animals to shrink back from a cliff edge is an acquired trait, Emlen took the question to a colony of Herring Gulls nesting on Kent Island in the Bay of Fundy, where some individuals nested on peripheral rocky cliffs while others nested on the inland plateau. Chicks from each of these two nesting situations were experimentally placed on a small translucent platform mounted atop a 6-ft tripod beneath which the observer could stand undetected and watch the bird's silhouette against the sky for responses. Up to one week of age the flightless chicks from the cliff nests would not jump, while those from the plateau nests jumped without hesitation. Apparently nest-life on the brink had instilled a sense of caution in the cliff birds, a sense that they subsequently lost as their wings developed.

Curious about the nature and function of the rapid and difficult-to-follow movements of small birds, Professor Hailman and his student *Edward Burt*, compared and analyzed the movements of various finch species as they scratched or hopped (locomoted) in shallow and

deep ground litter. In another study they compared head scratching movements in a series of birds and found that most song birds reached over the bend of the wing while non-passerines and a few passerines, notably Ovenbirds and Northern Water Thrushes, generally lowered the head and scratched below the wing.

Having noted that play behavior is generally associated with mammals, Professor Ficken surveyed the literature for evidence of play in birds. While play is not always easy to define, she identified the tossing and catching of twigs, commonly seen in hawks, as play and noted that mammal-like social play has been recorded for several species of crows and ravens.

Listening to the confusion of overlapping song often heard especially in forests at the height of the breeding season, and wondering how individual birds could possibly broadcast distinguishable communication signal to their mates under such conditions, the Fickens and Hailman noted that Red-eyed Vireos and Least Flycatchers often adjusted their singing patterns so as to avoid phrase overlap with their neighbors. In another study these workers used playbacks of recorded songs in which the sequence of notes had been variously garbled to demonstrate that Golden-winged Warblers responded best when the sequence of notes in the recording was the natural one, an indication that syntax, the temporal arrangement of notes, was important.

In a study on Picnic Point, *Sylvia Halkin*, a student of Professor Jeff Baylis, found that the song elements of the female Northern Cardinal are indistinguishable from those of the male and are used in many situations, including territorial defense, communicating with mates, and interactions with their young.

When given from the nest, female song apparently signals a stay-away message to the mate.

Having noticed in his earlier pineland community studies that Pine Warblers on Andros Island foraged primarily on pine bark while those on Grand Bahama and in Florida favored pine foliage, Emlen and student *Mike DeJong* found that these behavioral differences persisted in a simple choice of substrate test in flight cages, confirming that the field observations of substrate preference were inherent in the two populations and independent of any undetected differences in the two natural environments.

Professor Hailman, a pioneer in research on avian vision, and his student, *Jonathan Reed*, developed and transported a complex piece of optical equipment to Hawaii where they measured the visual sensitivities of nocturnal shearwaters and petrels that were killing themselves by flying into objects or crashing to the ground when blinded by the glare of shore lights. Their studies resulted in government recommendations for a modification of the lighting system on Kauai and an estimated 40% reduction in the kill. Reed then took the equipment for studies of the optical characteristics of various seabirds on Pacific islands, demonstrating sensitivities well into the ultraviolet wavelengths in many of them. With *Robert Bleiweiss*, a postdoctoral fellow, Hailman recently examined the ultraviolet reflections of various feathers linking their wavelengths with the visibility spectrum of the birds. In other experiments Bleiweiss found that females of a species of tropical hummingbird came in two color phases, one distinctive, the other mimicking the bright plumage of the male.

Hailman's student *Edward Burt* wrote his dissertation on the functional signif-

icance of color in warblers and published a symposium volume on the subject. Among many interesting observations he noted that leg color comes in two shades, dark and light; dark legs characterized species that winter farther north and migrate earlier in spring than light-legged species, suggesting an adaptation for body temperature regulation. In experiments Burt also demonstrated that pigmented feather tips were more resistant to wear than light tips, illustrating another function for plumage pigmentation. Burt is now a biology professor at Ohio Wesleyan University and editor of the *Journal of Field Ornithology*.

One of Hailman's major projects has been the development of an ethogram, a catalogue or inventory of behavior patterns, for the Florida Scrub Jay. On this project *Maree Elowson* has documented and classified the vocal repertoire of the species and, with Hailman, has developed a new methodology for discriminating and characterizing complex calls such as the "hawk alarm." Hailman with his students has also demonstrated that the one- and two-year old offspring of breeding pairs that assist their parents in rearing each year's crop of young, play a major role in juvenile survival by detecting and mobbing predators that invade the nesting area.

In a joint project Hailman and the Fickens have found remarkable richness and variability in the vocal repertoire of the Black-capped Chickadee. They note that the whistled "fee-bee" song differs from most bird songs in being given under a wide variety of situations and throughout the year. The familiar "chick-a-dee" call is remarkable in its potential for information transmission; combined in various ways its three or four notes can generate a huge number of readily

distinguishable communication signals. *Karen Apel*, one of Ficken's students, has found much variability in the alarm calls and has made a special study of the ontogeny of this vocalization. *Janine Clemmons*, a Hailman student has done a similar study on the ontogeny of chickadee vocalizations in Minnesota. Hailman and M. Ficken have recently extended their research on chickadee vocalizations to a comparative study of the vocalizations of the entire family of chickadees and titmice. *Jim Popp*, one of Ficken's students has made a comparative study of threat vocalizations and displays in several species of finches, performing a cost-benefit analysis of the various displays he encountered. With Professor Ficken, he is now recording and comparing the nestling vocalizations of numerous Wisconsin birds and relating their characteristics to age, nest type and taxonomic relationships. Ficken's students, *Philip Whitford*, analyzed the visual and vocal communication system of Canada Geese, and *Stanley Duncan* the vocal repertoire of the Northern Flicker.

Professor Moermond's research interests have focused on foraging behaviors, particularly on those of frugivores and insectivores. Much of his work has been in the tropics where with *Julie Den-slow*, a plant ecologist, he studied the feeding methods and specializations of fruit-eaters from the tiny manakins to trogons and toucans, examining how each species handled the fruits and contributed to the dispersion of the seeds. Similar studies with graduate students, *Bette Loiselle*, *Paul Rasmussen*, and *Cynthia Paskowski*, in Wisconsin and Minnesota concentrated on the acrobatic maneuvers used in searching for and capturing insect prey by warblers, thrushes and flycatchers. Field observations were supplemented with inten-

sive studies of captive birds in aviaries and small cages that included experiments to test and compare the reaching and balancing capabilities and the locomotory limitations of various species. These studies have provided new perspectives for the emerging field of ecomorphology.

Student *Douglas Levy*, now teaching at the University of Florida, studied the spacial distribution and seasonal movements of fruit-eaters in Costa Rican rain forests, correlating them with fruit distributions and fruiting periods. *Bette Loiselle*, with her husband *John Blake* spent several years tracking altitudinal migrations between the Costa Rican lowlands and the surrounding mountains and correlating them with fruiting periods and fruit availability. Moermond has recently extended these studies of fruit-eating birds to central African rain forests.

Professor Moermond has also supervised student projects in bird flight mechanisms and brood reduction. *Michael DeJong*, using high-speed photographic techniques, measured take-off accelerations in birds of various sizes as they flushed from his hand. He then subjected these data to mathematical analyses that revealed the moment-to-moment energetic requirements of the performance. Other studies showed that bounding flight may gain a small bird as much as 10% in flight costs; birds over 100g in weight rarely use bounding flight and would gain little or nothing if they did.

In an ingenious series of experiments *Susan Skagan* switched nest contents in goldfinch nests and in a laboratory colony of Zebra Finch nests to test a controversial hypothesis that in years of food shortage the usual asynchronomous hatching is an adaptation promoting se-

lective survival in the largest young of a brood. Her results appear to support this hypothesis for the goldfinch, but not for the Zebra Finch, a species adopted in nature to the highly variable and unpredictable conditions of the Australian desert.

PROJECTS ON CONSERVATION AND MANAGEMENT

The University of Wisconsin pioneered research in wildlife conservation and management under Aldo Leopold's leadership in the 1930's and continues as a national leader in this important field. Man's impact on songbirds, though generally less direct and more subtle than that on game birds, is attracting increasing attention from the public. Temple's student, *Margaret Brittingham*, recently studied the effect of winter feeding on Black-capped Chickadees and found that while local densities around feeders increased dramatically, survival rates were favorably affected only in the most severe winter weather. She also found that winter feeding could lead to the spread of disease in certain situations. Margaret is now a professor of wildlife biology at Pennsylvania State University. Another Temple student, *John Coleman*, is currently studying the impact of free-ranging house cats on birds around Wisconsin's farmsteads. Several ground-nesting birds seem to be particularly vulnerable to cat predation.

University ornithologists have been actively concerned with stemming the incidental and accidental destruction of wildlife. Lead poisoning, a deadly disease derived from shot pellets ingested as grit from pond or marsh muds, or lodged in the muscle tissues of game birds that "got away" was becoming alarmingly destructive until researches

by game biologists including Professor McCabe and his students identified the problem and helped negotiate government regulations banning the use of lead shot in shotgun cartridges. *Hildegard Reiser*, one of Temple's students, recently identified a threat that secondary lead poisoning poses for birds of prey, including the Bald Eagle, that feed on dead or dying waterfowl.

The massive destruction of insectivorous and carnivorous birds particularly raptors by toxic pesticides, brought to national attention by Rachel Carson's *Silent Spring*, launched a vigorous and effective attack by Joe Hickey and a group of his students in the 1960's. With *Barrie Hunt*, Hickey found that robins in Madison and Milwaukee were dying in proportion to the intensity of spraying with the insecticide DDT and that the insecticide methoxychlor was much less toxic to wildlife than DDT. With *J. A. Keith* he demonstrated that the presence of DDE, a highly toxic breakdown product of DDT accumulating in the bottom muds of Lake Michigan was killing diving ducks and, secondarily, their predators. With student *Dan Anderson*, now chairman of the wildlife department at the University of California at Davis, he found that the alarming reproductive failures of American Peregrine Falcons, Bald Eagles and Ospreys were due to the breaking of eggs in which the shells had been thinned by consuming prey contaminated with DDT. They had demonstrated this relationship between eggshell thickness and DDE content in a study of 40,000 Herring Gull eggs from Lake Michigan gull colonies. Hickey went on to ably defend the case against DDT in legislative hearings in Wisconsin and Washington, D.C., activities for which he received awards from four national wildlife organizations.

University of Wisconsin ornithologists became involved with endangered species and extinction at an early date. *An-ton de Vos'* master's thesis on endangered species was completed in 1946. More recently Professor Temple and his students have been involved in research and conservation projects for some of the world's rarest and most endangered birds. He has even published papers on extinct birds, such as the dodo and its relationship with a now rare endemic tree on the island of Mauritius that needed the dodo's help to germinate its seeds. His research and recommendations for several endangered species on islands of the Indian Ocean has contributed to the recovery of two species that once seemed doomed to extinction, the Mauritius Kestrel and the Mauritius Pink Pigeon. Temple has developed several techniques, such as artificial insemination using birds sexually imprinted on human handlers, that have been used with many endangered species. His pioneering work with captive breeding and reintroduction of Peregrine Falcons reached special significance for Wisconsin when peregrines were released on the UW-Madison campus last summer. Two of his students *Scott Melvin* and *Kurt Johnson*, demonstrated the importance of migration habitat for Whooping Cranes and Sandhill Cranes. Melvin is now director of the nongame wildlife program of the Maine Department of Inland Fisheries and Wildlife. Temple and *Mike Wallace*, working with the Andean Condor in South America, developed the methods now officially adopted for studying and reintroducing the highly endangered California Condor in North America. Wallace is now the Curator of Birds at the Los Angeles Zoo and in charge of their California Condor program. The severely endangered Hawaiian Crow's

future may depend on the results of field work by Temple and his student, *C. David Jenkins*. Many predict that the Hawaiian Crow will be the next American bird to go extinct. Endangered pigeons on Grenada in the Caribbean and Samoa in the Pacific have been studied by Temple and his student *David Blockstein*. Student *Bonnie Brooks* discovered why Loggerhead Shrikes have declined in recent years; they have lost critical habitat on their wintering areas in the gulf coast states. *Becky Abel* is developing techniques for reintroducing the Trumpeter Swan to Wisconsin.

OVERALL CONTRIBUTIONS TO ORNITHOLOGY

Clearly, the University of Wisconsin has trained a large number of students in ornithology. Although exact statistics are unavailable, the University of Wisconsin is unquestionably one of this country's and probably the world's major producers of professional ornithologists.

Measures of the success that UW ornithologists have enjoyed and their overall contributions to the field are the leadership roles they have played in ornithological societies and the awards they have received in recognition of their accomplishments. UW ornithologists have been presidents of the American Ornithologists' Union, Cooper Ornithological Society, Wilson Ornithological Society, The Wildlife Society, Society for Field Ornithology, and Wisconsin Society for Ornithology. They have been editors of *The Auk*, *Journal of Field Ornithology*, *Journal of Wildlife Management*, *Bird Conservation*, and *The Passenger Pigeon*. UW ornithologists have also received the most prestigious awards that are bestowed on professional ornithol-

ogists: The Brewster Medal, The Elliot Coues Award, The Arthur A. Allen Award, The Aldo Leopold Memorial Medal, and The Golden Passenger Pigeon Award.

The University of Wisconsin has a distinguished reputation in ornithology, and all indications are that this strong tra-

dition is being kept alive by the current generation of ornithologists.

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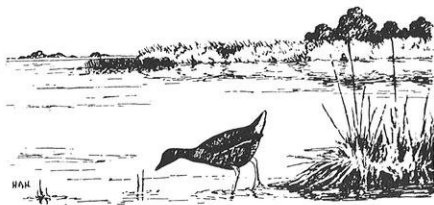
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NOTES ON THE NESTING OF THE FLORIDA GALLINULE

BY MURL DEUSING
Milwaukee Public Museum

This study of the nesting habits of the Florida Gallinule (*Gallinula chloropus cachinnans*) was made by Peter Stieb, Carl Kinzel and the author during the summer of 1938 at Lake Koshkonong, Wisconsin. Twenty-six hours of observations were made on two nests from blinds.

The first Gallinule nests of the season were found on May 30th when three nests were located with 9, 8, and 4 eggs respectively. We continued to find Gallinule nests until July 8th. All of the nests were found over rather deep water (two or three feet deep). They were closer to the open water in the center of the marsh than either the



By J. Arthur Hochbaum, Courtesy Wisconsin Conservation Department

Coot, Virginia Rail, Sora, or American Bittern. Least Bittern nests were often associated with the Gallinule nests but the Least Bittern preferred heavy cover while the Gallinule frequently nested in very sparse vegetation and open situations. The nests were built on stalks of cattails or sedges with the bottom of the nest on the surface of the water and the rim four or five inches above. The nests were thick stout affairs woven with heavy stalks of cattails and sedges. Nests contained six to ten eggs which were a light olive brown color heavily marked with coarse irregular spots. This heavy spotting made the Gallinule's eggs easy to identify from the similar Coot eggs which were marked with finer spotting in a peppered effect. Heavy rains, which raised the level of the marsh 14 inches, did not damage the



Marsh Wren by *William R. Stott Jr.*

Sixty Years of Contributions to Ornithology by Wisconsin State Agencies

The Wisconsin Conservation Department and its successor, the Department of Natural Resources, have for 60 years maintained a vigorous and productive program of ornithological research and avian management.

by James B. Hale

In 1928, the first bird research project under the auspices of a Wisconsin state agency began. Dr. Alfred O. Gross of Bowdoin College, Maine, was employed by the Wisconsin Conservation Department (WCD) to investigate the status of Greater Prairie-Chickens in Wisconsin. The Department had been organized in 1927, and the Gross study was encouraged by Dr. Merritt L. Jones, at that time in charge of the newly formed Research Bureau, by Wallace Grange, the Department's Superintendent of Game, and by Aldo Leopold, who was in the middle of his game survey of north-central states.

Gross' investigation was summarized in a final report in 1930; it provided much new information on the life history of Greater Prairie-Chickens and contained recommendations for habitat management and regulation of hunting. Franklin J. W. Schmidt was an assistant on the Gross study and continued under the Department's supervision through 1933. Schmidt then entered the University of Wisconsin for further grouse

studies in 1934, becoming Aldo Leopold's first graduate student.

No further bird research was undertaken by the Wisconsin Conservation Department until 1940. In that year, the first projects supported by the Federal Aid in Wildlife Restoration Act (commonly called the Pittman-Robertson Act) were established under the direction of Walter E. Scott. Four projects were activated on September 15, 1940: Waterfowl research, led by Fred R. Zimmerman; Ring-necked Pheasant research, led by Irven O. Buss; Greater Prairie-Chicken and Sharp-tailed Grouse research led by Wallace B. Grange; and white-tailed deer research led by William S. Feeney. Except for a hiatus during World War II, an active and successful wildlife research program has been in place ever since. As far as I can determine, no avian research projects have been undertaken by any other non-university state agency. After 1946, studies on Bobwhite Quail, Ruffed Grouse, Mourning Doves, and Gray Partridge were added as part of an expanded re-

search effort. It should also be noted that in 1967 the Wisconsin Conservation Department was reorganized into the present Wisconsin Department of Natural Resources (DNR), fortunately with little effect on the progress of the wildlife research program.

Ornithological research in WCD and DNR is difficult to characterize because of its broad-ranging scope. Projects were and are conducted by the Wildlife Research Section of the Bureau of Research (formerly in the Bureau of Wildlife Management). Most of the recent projects on endangered, threatened and nongame species have been done by the Bureau of Endangered Resources. Both bureaus contract additional research through state universities and colleges (e.g., Wisconsin Cooperative Wildlife Research Unit at University of Wisconsin-Madison), individuals (e.g., Bald Eagle censusing and banding), private and public organizations (e.g., Common Barn-Owl propagation at Milwaukee County Zoo), and through interstate cooperative agreements (e.g., waterfowl studies with the Mississippi Flyway Council).

The DNR research program follows the 1937 legislative mandate to the department to provide protection, preservation, restoration, and orderly utilization of all Wisconsin's natural resources. The program was and is intended primarily as a method of finding facts and making recommendations of use to DNR wildlife managers who are responsible for implementing resource conservation programs on the land. Because of this management orientation, most DNR avian research has been of the applied type (i.e., yielding results of immediate use to management), rather than the basic type (i.e., fact-finding only)

more commonly pursued by academic investigators.

In this process, many DNR research studies directed at other species or habitats have positive effects on birds. Deer habitat improvement techniques may also benefit Ruffed Grouse and some songbirds, development of spawning marshes for warm-water fish provides waterfowl habitat, and new forest management methods provide more bird habitats, as well as trees.

Many activities labeled research by DNR have been more in the character of investigations or surveys rather than the usual hypothesis-testing expected of typical research projects. Examples are inventories of critical habitats for rare birds, statewide status surveys of bird populations, development and publication of management recommendations, and testing new equipment or research techniques.

Because DNR wildlife research serves as an information service for wildlife managers, avian research emphasis from 1940 to about 1970 was on those birds whose hunting for sport is regulated by the state. This group included waterfowl, pheasants, grouse, quail, partridge, Mourning Dove, and woodcock. Another reason for this focus was that the federal government would only help fund projects on hunted species. Pittman-Robertson Act dollars provided about three-fourths of the wildlife research budget in those years.

After 1970, federal-aid rules became more flexible. The federal Endangered Species Act provided funding for non-hunted bird studies, and the Wisconsin income-tax checkoff for endangered resources provided still more money for nongame research. As a result, research projects have expanded to include such diverse bird species as Bald Eagles, Os-

preys, Red-tailed Hawks, Cooper's Hawks, Red-shouldered Hawks, Peregrine Falcons, Common Barn-Owls, Great Horned Owls, Common Terns, Forster's Terns, Double-crested Cormorants, Sandhill Cranes, Piping Plovers, Red-necked Grebes, Trumpeter Swans, Great Egrets and Loggerhead Shrikes. A major current emphasis is on development of methods to promote recovery of species in trouble, such as Forster's Terns and Peregrine Falcons, and on statewide inventories of populations and habitat trends. The bibliography at the end of this report lists 285 titles resulting from WCD and DNR avian research projects. Their scope demonstrates the diversity of research findings concerning Wisconsin birds and the usefulness of these findings to management.

The WCD and DNR wildlife research section has been supervised by five chiefs since it was established in its present form in 1946: Irven O. Buss (1946–1948), Cyril Kabat (1948–1959), James B. Hale (1958–1978), James R. March (1978–1981), and Robert T. Dumke (1981 to date). DNR endangered and nongame species programs have been supervised by James B. Hale (1978–1983) and Ronald Nicotera (1983 to date). Several leaders of avian research projects have gone on to other influential positions, including six to professorial and administrative posts at American and Canadian universities, and seven to major leadership positions in other state and private natural resource agencies.

In the 1930s and 1940s, Aldo Leopold wrote eloquently on the importance of multiple-use management, preservation of endangered species, nongame and wildflower management, more basic knowledge of species and their habitats, wildlife disease investiga-

tions, more inter-agency cooperation, and more technically trained people but less politics in natural-resource administration. The research program he helped to establish has made much progress in these directions, and his philosophies guided us to our successes. But, as in Leopold's day, much remains to be done to save all the cogs and wheels in our natural environment.

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EXCELLENCE IN ORNITHOLOGICAL RESEARCH

Each year The Wildlife Society recognizes outstanding publications in the fields of wildlife ecology and management. This prestigious recognition has been awarded to 6 of the 36 *Wisconsin DNR Technical Bulletins* that have focused on ornithological subjects: "A guide to prairie chicken management," "Relation of weather, parasitic disease and hunting to Wisconsin ruffed grouse populations," "Seasonal movement, winter habitat use, and population distribution of an east-central Wisconsin pheasant population," "Population ecology and management of Wisconsin pheasants," "Wisconsin quail, 1834-1962—population dynamics and habitat management," "Reproduction of an east-central Wisconsin pheasant population."

Over the past 60 years the Wisconsin DNR has established a long tradition of excellence in ornithological research and avian management. That tradition continues today.

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Trends in the List of Wisconsin Birds: A Historical Perspective

Wisconsin's state bird list has grown to 392 species over the past 148 years. During that time there have been 5 eras in which additions occurred at especially rapid paces. It is predicted that as many as 415 species may be on the list by the year 2000.

by John H. Idzikowski

As the Wisconsin Society for Ornithology celebrates its fiftieth anniversary, the recorded history of ornithology in the state is approaching 150 years. Written accounts of the works of four principal early Wisconsin ornithologists—Philo R. Hoy, Thure Kumlien, Aaron L. Kumlien, and Ned Hollister—have been summarized by Schorger in *The Passenger Pigeon* (1944, 1945a, 1945b, 1946a, 1946b). In his 1951 revision of L. Kumlien's and N. Hollister's *The Birds of Wisconsin*. This paper looks at the historical records of new species in the state from the early 1840s (primarily with the work of Hoy and T. Kumlien) through 1988. I conclude with some "crystal ball" predictions about species that may be added in the future.

METHODS

Reviewing the current list of Wisconsin birds, I identified 264 species that

are so common and widespread today that I assumed they would have been known to ornithologists in 1840, even though we have no historical evidence of when they were actually first recorded. This "historically common" list of 264 species comprises 67% of the 1988 list of 392 species. The other 128 species (23% of today's list) are listed in Table 1 according to the year since 1840 in which they were first recorded in the state. These species in Table 1 are rare or unusual enough that they could easily have been missed by early ornithologists; furthermore, there is often a definite date of first occurrence. There are nine other species which were unknown to ornithologists until after 1840 (AOU 1957) but are regular enough today to be included on the "historically common" list. These nine are: Greater White-fronted Goose, Black Duck, White-winged Scoter, Baird's Sandpiper, the Willow/Alder Flycatcher superspecies, Gray-cheeked Thrush and Swainson's

Table 1. Species of birds added to the Wisconsin state bird list since 1840, with the year of discovery.

Species	Year of Discovery
Swallow-tailed Kite	1840 (?)
Cardinal	1840
LeConte's Sparrow	1842
Carolina Parakeet	1844
Buff-breasted Sandpiper	1845
Trumpeter Swan	1845
Roseate Spoonbill	1845
American Avocet	1846
Willow Ptarmigan	1846
Northern Mockingbird	1846
Carolina Wren	1847
Black-necked Stilt	1847
Red Phalarope	1847
Little Blue Heron	1848
Black-billed Magpie	1848
Hoary Redpoll	1848
Yellow-throated Warbler	1848
Say's Phoebe	1850
Boreal Owl	1850
Harlequin Duck	1851
Kentucky Warbler	1851
Purple Gallinule	1851 (?)
Wood Stork	1852
Prairie Warbler	1852
Hooded Warbler	1852 (?)
Golden-crowned Sparrow	1853
Harris' Sparrow	1854 (?)
Summer Tanager	1855 (?)
Pacific Loon	1860
Snowy Egret	1860
Three-toed Woodpecker	1860
Blue Grosbeak	1860
Glossy Ibis	1862
Smith's Longspur	1869
English Sparrow	1869
Masked Duck	1870
Henslow's Sparrow	1870
White-winged Tern	1873
Worm-eating Warbler	1873
Eurasian Wigeon	1874
King Eider	1874
Clark's Nutcracker	1875
Sharp-tailed Sparrow	1877
Western Kingbird	1877
Western Tanager	1877
Western Grebe	1878
Eskimo Curlew	1879
Cinnamon Teal	1879
Pomarine Jaeger	1879
Arctic Tern	1879
Magnificent Frigatebird	1880
Purple Sandpiper	1881
Great Black-backed Gull	1881

Table 1. (Continued)

Species	Year of Discovery
Ancient Murrelet	1882
Brant	1883 (?)
Louisiana Waterthrush	1886
Common Eider	1891
Thayer's Gull	1891
Least Tern	1893 (?)
Ferruginous Hawk	1893
Scissor-tailed Flycatcher	1895
Swainson's Hawk	1896
Western Sandpiper	1896
Sabine's Gull	1900
Brown Pelican	1903
Gyr Falcon	1904
Rock Dove	1905
Dovekie	1908
Gray Partridge	1908
Townsend's Solitaire	1910
Groove-billed Ani	1913
Bell's Vireo	1914
Long-tailed Jaeger	1916
Ring-necked Pheasant	1916
Bewick's Wren	1921
Lark Bunting	1922
Starling	1923
Burrowing Owl	1924
White-cheeked Pintail	1929
Parasitic Jaeger	1933
Snowy Plover	1934
Black-legged Kittiwake	1938
Little Gull	1938
Yellow-crowned Night Heron	1941
Painted Bunting	1942
Varied Thrush	1944
Barrow's Goldeneye	1946
Ivory Gull	1947
Lazuli Bunting	1950
Black Vulture	1951
Green-tailed Towhee	1952
Mountain Bluebird	1954
Tricolored Heron	1955
Mute Swan	1958
Ruff	1959
Ross' Goose	1959
Black-throated Sparrow	1959
Cattle Egret	1960
Gray Vireo	1964
Black-shouldered Kite	1964
Anhinga	1965
Royal Tern	1965
Laughing Gull	1965
Eurasian Tree Sparrow	1966
Common Ground Dove	1966
Curlew Sandpiper	1968
Black-throated Gray Warbler	1968
Chuck-will's Widow	1969

continued

continued

Table 1. (Continued)

Species	Year of Discovery
Lewis' Woodpecker	1969
Black-headed Grosbeak	1969
Mississippi Kite	1970
Black Turnstone	1971
Curve-billed Thrasher	1971
Brown-headed Nuthatch	1971
Sage Thrasher	1972
Rufous Hummingbird	1976
Chestnut-collared Longspur	1976
Fork-tailed Flycatcher	1978
Kirtland's Warbler	1978
Black-headed Gull	1978
Lesser Black-backed Gull	1980
Rosy Finch	1981
Hermit Warbler	1982
Baird's Sparrow	1982
Sooty Tern	1984
Mew Gull	1986
House Finch	1986
White-faced Ibis	1987

Thrush, Philadelphia Vireo, and Western Meadowlark. To eliminate any problems created by past lumpings and splittings, I follow the taxonomic treatment in the 6th edition of the *AOU Checklist of North American Birds* (1983).

Figure 1 plots the cumulative growth

Table 2. Species currently considered hypothetical in Wisconsin and the year in which they were first recorded.

Species	Year
Clark's Grebe	1987
White Ibis	1978
Prairie Falcon	1957
Black Rail	1956
Spotted Redshank	1960
Roseate Tern	1950
Western Wood-pewee	1981
Vermillion Flycatcher	1950
Cassin's Kingbird	1969
Northern Wheatear	1952
Sprague's Pipit	1967
Painted Redstart	1965
Lesser Goldfinch	1984

of the state bird list over the period of 1840–1988. I identified periods of years, in which no new additions occurred (i.e., the slope of the line was horizontal) and eras in which many new additions occurred in a short time (i.e., the slope was more vertical). I designated the “no growth” periods as transitions between possible eras of “ornithological significance.” After examining the graph, I found that there were 5 eras of ornithological significance; these are marked in Figure 1 and summarized in Table 3.

THE 5 ERAS OF ORNITHOLOGICAL SIGNIFICANCE

1840–1855.—The first period of ornithological significance, 1840–1855, can easily be called Wisconsin's “Golden Age of Discovery;” nearly two species per year were added to the state list, mostly by P. Hoy and T. Kumlien (Table 4). Hoy was a naturalist in southeastern Wisconsin by 1840. Kumlien did not reach the Lake Koshkonong area until 1843, but he was soon able to make a living collecting birds and eggs for the ravenous collectors in the East (Schorger 1944, 1946a, 1946b). Of special interest during this period are three species which have never been subsequently recorded in the state: Say's Phoebe, Willow Ptarmigan, and Roseate Spoonbill. The last two species were probably once much more common in Wisconsin than might be expected. Ptarmigan “at least reached northern Wisconsin in the severest winters” (Kumlien and Hollister 1903), and Spoonbills were “found along the Mississippi. . . and occasionally about our small lakes in the interior” (Rev. A. C. Barry in Schorger 1951).

1856–1868.—The period of 1856

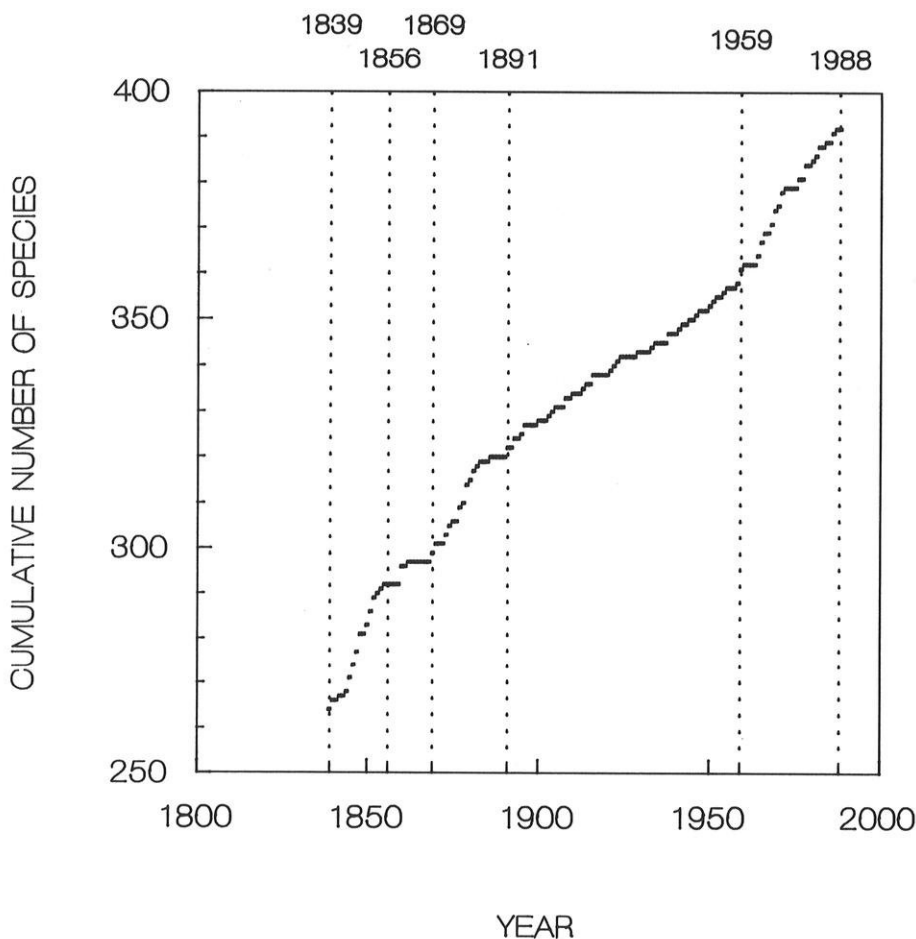


Figure 1. The cumulative growth of the Wisconsin state bird list (1840–1988) with 5 eras of ornithological significance indicated.

through 1868 is rather enigmatic, considering the rapid growth during the eras before and afterwards. It represents a period of very little growth with the addition of new species at a rate of only 0.4 species per year, including a period of 6 years of no growth. There is no mention of the effects that the Civil War had on the efforts of early Wisconsin ornithologists, so we can only speculate that it may have had an influence. Hoy lived until 1892, and the elder Kumlien

until 1888. Hoy, at least, wrote several valuable ornithological papers (Schorger 1945, 1946b). It is possible that the overwhelming demand for “western” bird skins in the East kept Kumlien occupied doing little else besides collecting; he was not known for his travels throughout Wisconsin, as was his son, Aaron Ludwig Kumlien. It is interesting to note that several western species were not discovered during the early years; these include Bell’s Vireo, Bewick’s

Table 3. Eras of ornithological significance in which the state bird list grew at markedly different rates.

Era	Number of Species Discovered During Era	Average Number of Species per Year
1840–1855	28	1.8
1856–1868	5	0.4
1869–1890	23	1.0
1891–1958	38	0.6
1959–1988	34	1.1
1840–1988	128	0.9

Wren, and Lark Bunting. The former two were probably quite regular but local in Wisconsin, but they were missed entirely by the early ornithologists. See Table 1 for other species that were “missed.”

1869–1890.—The period of 1869–1890 represents a revitalization of the growth experienced in the early years, with one species added per year, including two never subsequently recorded (Masked Duck and White-winged Tern). These were years dominated by Aaron Ludwig Kumlien and Ned Hollister, while final contributions were made by P. Hoy and T. Kumlien. During this period the Kumliens and Ned Hollister accounted for 68% of the newly discovered species (Table 3), but other naturalists and ornithologists also began to make contributions during this era, including

such names as Snyder, Zimmerman, Clark, Rev. Gordon, and Rev. Barry. The establishment of the Milwaukee Public Museum also was a major factor influencing ornithology during the era (Kumlien and Hollister 1903 in Schorger 1951). Some of the added species were previously collected specimens tracked down by or given to the Kumliens (e.g., the Pacific Loon attributed to A. L. Kumlien and N. Hollister in Table 3).

1891–1958.—The period of 1891 through 1958 represents a long period of relatively slow growth, about one new species every two years (Figure 1). Rather than consider these 69 years a period of “ornithological malaise,” the era can better be thought of as a period of continuous effort by field ornithologists that had evolved out of the early years and that persisted until recent times when there was an explosive growth in the number of skilled observers. While a rarity would typically be shot, especially in the earlier part of this era, the collector had to get close enough to a bird to shoot it and, of course, identify it as “shot-worthy.”

It was not until later that the tools of field ornithologists improved, allowing new species to be discovered at an increased rate, without the gun. It is surprising that the first edition of the Peterson *Field Guide to Eastern Birds* in

Table 4. Number of first state records attributed to early Wisconsin ornithologists (1840–1900).

Observer	Species Recorded During:			Totals
	1840–1855	1856–1868	1869–1900	
P. Hoy	17 ¹	1	3	21 ¹ (34%)
T. Kumlien	8 ¹	3	4	15 ¹ (26%)
A. L. Kumlien and N. Hollister	0	1	14	15 (22%)
Others	1	0	10	11 (18%)

¹Two species were codiscovered by Hoy and T. Kumlien.

1934 seems to have had no effect on the rate at which new species were found in the state. The prominent names of this era are often associated with Milwaukee and the Milwaukee Public Museum, including Gromme, Stoddard, Deusing, and Jung. It is interesting to note that the periods of slowest growth during this era were in the early thirties and forties.

1959–1988.—Beginning in 1959 we entered the era of modern field ornithology, and the rate of discovery of new species by ornithologists in the field increased. More than one species per year has been added in the period of 1959 through 1988, the period of greatest growth since the “Golden Age.” The possible reasons for this are many; a few are listed below:

- (1) Leadership was provided by such Wisconsin field ornithologists as Sam D. Robbins, Mary Donald, and later by Daryl Tessen who began to investigate new areas of the state.
- (2) Better field guides appeared, including new editions of the Peterson field guides and the popular Golden Guide by Robbins, Bruun, Zim, and Singer. The introduction of inexpensive binoculars and spotting scopes from Japanese manufacturers made bird-

ing equipment available to all who wanted them. All resulted in an increased sophistication and ability of birders.

- (3) Observers accepted the fact that vagrancy is a widespread and regular phenomenon, and they always expected new species.
- (4) The increasing patchiness of a heavily developed environment, especially along well-traveled migration corridors, resulted in predictable ecological traps where migrants and vagrants were concentrated.
- (5) Interest in birds increased along with a general awareness of environmental problems, especially after 1970. This 30-year era of “Modern Field Ornithology” has no end in sight, and only through exhausting of the pool of yet unrecorded species will this period of growth end.

GEOGRAPHICAL ORIGINS

Table 5 separates the 128 species analyzed in this paper into six areas of geographical origin and a category of introduced species. The following comments refer to Table 5.

Western North American Birds.—After the early discovery of 8 now very regular

Table 5. Geographical origins of species added to Wisconsin's bird list.

Region of Origin	Number of Species Recorded per Era:					Totals
	1840–1855	1856–1868	1869–1890	1891–1958	1959–1988	
Western North America	8 (29%)	0	6 (27%)	11 (29%)	16 (47%)	41 (33%)
Eastern U.S. or Canada	1 (3%)	0	5 (18%)	0	1 (3%)	7 (5%)
Southern North America	15 (54%)	3 (60%)	3 (13%)	12 (28%)	9 (26%)	42 (33%)
Eurasia	0	0	2 (9%)	1 (3%)	4 (13%)	7 (5%)
Arctic	4 (14%)	2 (40%)	4 (18%)	8 (22%)	0	18 (13%)
Pelagic	0	0	2 (9%)	1 (3%)	1 (3%)	4 (3%)
Introduced	0	0	1 (5%)	5 (14%)	3 (8%)	9 (7%)
Totals	28	5	23	38	34	128

Table 6. Species predicted to be added to the Wisconsin state bird list by 7 experienced birders¹.

Species	Number of votes
California Gull	7/7
Ross' Gull	5/7
Great-tailed Grackle	5/7
Yellow-billed Loon	4/7
Wilson's Plover	4/7
Rock Wren	4/7
Ash-throated Flycatcher	4/7
Swainson's Warbler	4/7
Tufted Duck	3/7
Sharp-tailed Sandpiper	3/7
Band-tailed Pigeon	3/7
Carolina Chickadee	3/7
Brambling	3/7
McGowan's Longspur	3/7
Garganey	2/7
Violet-green Swallow	2/7
Western Bluebird	2/7
Townsend's Warbler	2/7
McGillivray's Warbler	2/7
Hepatic Tanager	2/7
Cassin's Sparrow	2/7
Black-chinned Hummingbird	1/7
Mountain Plover	1/7
Broad-tailed Hummingbird	1/7
Brewer's Sparrow	1/7
Fulvous Whistling Duck	1/7
Williamson's Sapsucker	1/7
Fish Crow	1/7
Gull-billed Tern	1/7
American Oystercatcher	1/7
Great Skua	1/7
Bachman's Sparrow	1/7
Heerman's Gull	1/7
Black-bellied Whistling Duck	1/7
Common Greenshank	1/7
Black-tailed Godwit	1/7
Bar-tailed Godwit	1/7
Little Stint	1/7
Sandwich Tern	1/7
White-winged Dove	1/7
American Dipper	1/7
White Wagtail	1/7

¹From lists provided by S. D. Robbins, M. Donald, D. Tessen, and members of the WSO Records Committee (J. Polk, C. Sontag, R. Sundell and D. Verch).

species, no western birds were added until the latter part of the 19th Century. Then, western birds were added at an

increasing rate until they became the largest source of new species in the modern era. This pool of potential species is, of course, the largest available.

Eastern U.S. and Canadian Birds.—

This rather limited pool of species was quickly exhausted during the early eras.

Southern North American Birds.—

Overall, the largest percentage of newly recorded species came from this region, but the pool of species remaining to be added seems to be nearly exhausted.

Eurasian Birds.—Nearly unknown to the 19th century ornithologists, vagrant species from this region continue to be added to the state list, with more than half of the new species from this large geographical area being recorded in the last thirty years.

Arctic Birds.—Like the species from the eastern U.S., there are few new species that can be expected to come from this region.

Pelagic Birds.—Oceanic birds are among the rarest of vagrants and the smallest component in Table 5. This is potentially a large pool of new species, but these birds occurred rarely inland, usually in association with unusual weather conditions.

Introduced Birds.—During the 1800's many species of European birds were introduced by "acclimatization societies" to make immigrants feel at home; other birds were introduced for a variety of social and pseudoscientific reasons (Long 1981). Except for the English Sparrow, Starling and Rock Dove, few survived. The House Finch seems destined to be a successful species, whereas

Table 7. Geographical origins of birds already on the list and of those predicted to be added.

Region	Historical Number of Species		Predicted Number of Species	
	1840–1988	Last 12 Years	Hypotheticals	Predicted
Western North America	41 (32%)	7	8 (61%)	29 (53%)
Eastern U.S. and Canada	7 (5%)	1	3 (23%)	3 (6%)
Southern North America	42 (33%)	1	0	9 (16%)
Eurasia	7 (5%)	2	1 (8%)	9 (16%)
Arctic	18 (13%)	0	1 (8%)	4 (7%)
Pelagic	4 (3%)	1	0	1 (2%)
Introduced	9 (7%)	1	0	0
Total	128	13	13	55

other species, including popular game birds, seem to do poorly without continuous restocking efforts.

POSSIBLE FUTURE DISCOVERIES

What of future discoveries in Wisconsin? An extrapolation of the present rate of discovery predicts that 415 species will be on the Wisconsin list by the year 2000. This assumes that current hypothetical species will become "official" and that some additional species will be added. To determine which new species are most likely to show up in the state, I asked the members of the WSO Records Committee and 3 birders who have the largest personal state bird lists to predict the next ten species. These guesses (Table 6) were made mostly on the basis of what had been recently recorded in other midwestern states.

Table 7 identifies the geographic origins of the 128 historical species and the predicted 55 new species from Table 6. Western birds are by far the largest component in the recent past and in the predicted species (53% of all species) whereas southern and European birds are represented by only 9 species each (16%). Of the 55 species listed in Table 7, 16 will probably be discovered on lakes (10 of these probably on the Great

Lakes), 8 will probably be discovered on mudflats and marshes, and 31 will probably be discovered inland in a variety of habitats, often similar to where the bird is found in its normal range.

Wisconsin's current list of 392 species (405, including hypotheticals) is well above the average of 378 for 46 continental states, except Texas and California (ABA 1986). By comparison, since 1945 California's state list has grown by 24% (Jehl 1980) and New York's by 9% (Able 1983); Wisconsin's list has grown by 11% (13% with hypotheticals).

CONCLUSIONS

Perhaps predicting the future is risky, but according to predictions by Wisconsin's most knowledgeable field ornithologists, birders should expect to find new species at migration traps and lakes in western Wisconsin, like the western end of Lake Superior. They should also expect to find new species on "pelagic" trips onto Lakes Michigan and Superior and along breakwaters and concentrating areas during seasons of frequent vagrancy.

This paper has provided a brief historical look at the evolution of Wisconsin's state bird list. I hope it will be referred to in the future to determine

if the predictions have stood the test of time. For now we are overdue for a new species; nothing new has been recorded in Wisconsin since May of 1987!

ACKNOWLEDGEMENTS

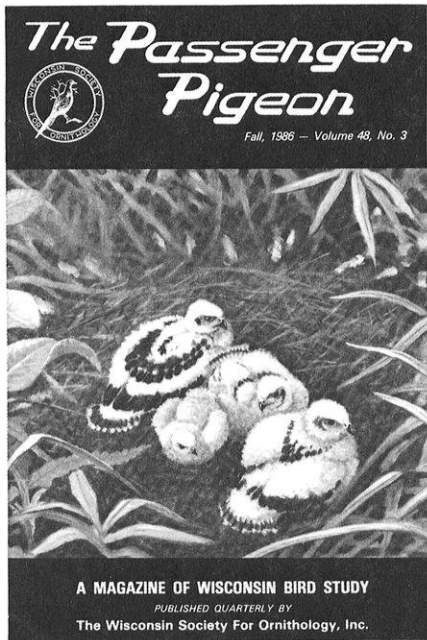
My thanks go to the individuals who took the time to predict Wisconsin's next 10 species and especially Sam Robbins who provided me with information from his forthcoming book, *Wisconsin Birdlife*. Nathan Kraucunas of the Milwaukee Public Museum was very helpful in locating information on early Wisconsin ornithologists in Museum files.

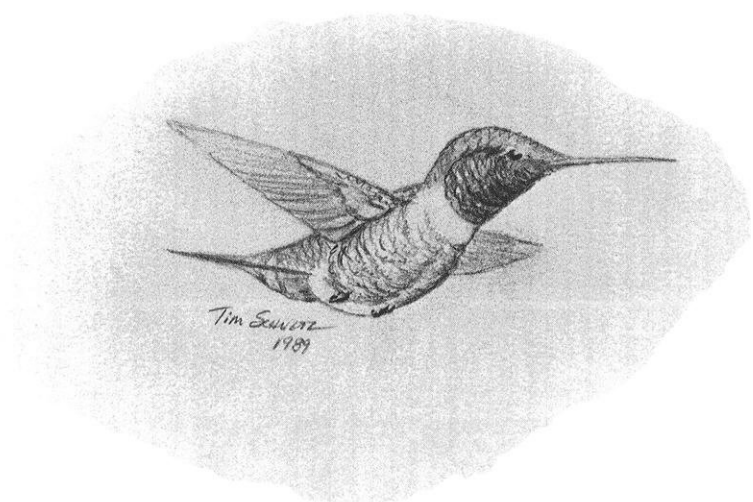
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Schorger, A. W. 1945b. Ned Hollister. *Passenger Pigeon* 7:78-83.
Schorger, A. W. 1946a. Thure Kumlien. *Passenger Pigeon* 8:10-16.
Schorger, A. W. 1946b. Thure Kumlien. *Passenger Pigeon* 8:52-59.

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Ruby-throated Hummingbird by *Tim Schultz*

The 1988 Wisconsin Christmas Bird Counts

Although results were not as good as last year, the 1988 Christmas Bird Counts featured a record effort of over 3,000 party-hours in the field. In all 130 species were recorded on 80 counts.

by William L. Hilsenhoff

After the great Christmas bird count in 1987, the count in 1988 was somewhat disappointing. While there were very good numbers of waterfowl and hawks on most counts, most other species seemed to be difficult to find. There was an extremely poor flight of winter finches, the poorest in several years. Species that normally migrate south from Wisconsin did not seem to linger, in spite of relatively mild weather throughout November and into early December, and there were relatively few species found that are considered rare on Christmas counts. As a result, only 130 species were recorded, which is somewhat below the average for recent counts. Cold weather in mid December, a lack of snow to drive birds to feeders, roadsides, and streams, and windy conditions on many counts probably accounted for the generally low numbers. There were 80 counts this year, and participation was excellent. For the first time more than 3,000 party-hours were recorded statewide. But in spite of the excellent effort, only 9 counts reported 50

or more species. Eighty species were found at Madison, 69 at Newburg, and 68 at Milwaukee. No other count reported 60 species.

LOCATION AND DETAILS OF THE COUNTS

Six counts that were made in 1987 were not repeated in 1988, but there were five returning counts not run in 1987 (Adams, Bowler, Cloverland, Rhinelander, and Wisconsin Rapids) plus a new count in the Minoqua-Saint Germain area and another centered at Columbus. Locations of the counts are shown in Figure 1. The counts are numbered generally from north to south and west to east. An alphabetical listing follows (in bold-faced type) along with the count number (corresponding to Figure 1), the exact location of the count center, and the name, address, and telephone number of the compiler.

Adams (32); 1.25 miles S. of Dellwood on Hwy. Z; Ted May, Rt. 2, Box

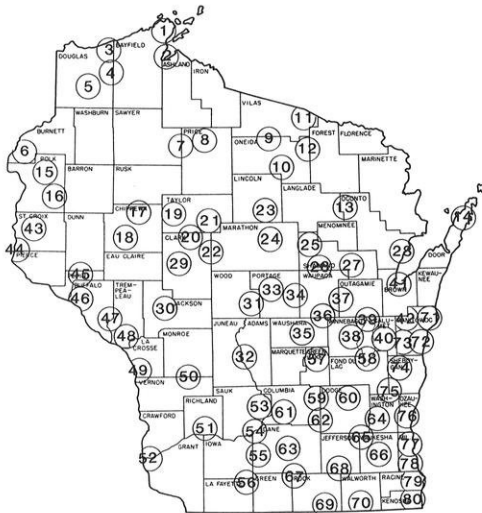


Figure 1. Locations of the 1986 Wisconsin Christmas Bird Counts.

79, Whitehall, WI, 54773. **Amery** (16); Joel; Mrs. Allen Frank, Rt. 1, Clayton, WI 54004; (715) 948-2668. **Amherst** (34); Jct. Hwys. A and B; David Borchardt, 10296 Yellow Brick Rd., Amherst, WI 54406; (715) 824-3971. **Appleton** (39); Jct. Hwys. 10 and 45; John Shillinglaw, 1952 Palisades Dr., Appleton, WI 54915; (414) 731-3237. **Arcadia** (47); Hwy J 1.5 miles S. of Arcadia; Thomas Roskos, Rt. 1, Box 201, Arcadia, WI 54612; (608) 323-7072. **Ashland** (2); Jct. Hwys. 2 and 118; Dick Verch, Biology Department, Northland College, Ashland, WI 54806; (715) 682-4531. **Baraboo** (53); Jct. City View Rd. and Hwy. A; Kenneth Lange, Devil's Lake State Park, Baraboo, WI 53913; (608) 356-8301. **Bayfield** (1); T50N, R5W, Sect. 22; Albert Roy, 906 Water St., Ashland, WI 54806; (715) 682-5334. **Beloit** (69); N. end Big Hill Park; John & Edith Brakefield, Rt. 2, Box 294, Evansville, WI 53536; (608) 876-6242. **Black River Falls** (30); Jct. Norman Rd.

and Hwy. 54; Dorothy Harmer, Rt. 1, Box 70, Black River Falls, WI 54615; (715) 284-4098. **Blanchardville** (56); 2.5 miles SW. of Blanchardville; David Willard, Bird Division, Field Museum of Natural History, Roosevelt Rd. at Lakeshore Dr., Chicago, IL 60605; (312) 922-9410 ext. 269. **Bowler** (25); Jct. Hwys N and D; Linda Slater, Rt. 1, Box 230, Birnamwood, WI; (715) 449-2664. **Bridgeport** (52); 2 miles SE. of Bridgeport; Sam Robbins, 14 S. Roby Rd., Madison, WI 53705; (608) 233-3581. **Brule** (4); Jct. Hwys B and 27; Bernard Klugow, Box 13, Brule, WI 54820; (715) 372-4858. **Caroline** (26); 2 miles W. of Caroline; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Chippewa Falls** (18); Jct. Hwys. 178 and S; C.A. Kemper, Box 818, Chippewa Falls, WI 54729; (715) 723-3815. **Cloverland** (3); Cloverland; Bernard Klugow, Box 13, Brule, WI 54820; (715) 372-4858. **Columbus** (62); Jct. Johnson and Jahnke Sts.; Phyllis Johnson, W12156 Johnson Rd., Columbus, WI 53925; (414) 623-2447. **Cooksville** (67); Cooksville; John Wilde, Rt. 1, Box 429, Evansville, WI 53536; (608) 882-5352. **Durand** (45); Jct. Hwys. 25 and DD 3 miles N. of Durand; C.A. Kemper, Box 818, Chippewa Falls, WI 54729; (715) 723-3815. **Ephraim** (14); Hwy. A, 3 miles S. of Jct. with Hwy 42; Roy & Charlotte Lukes, 3962 Hillside Rd., Egg Harbor, WI 54209. **Fifield** (8); Fifield Post Office; Thomas Nicholls, 2160 Draper Ave., Roseville, MN 55113; (612) 636-2592. **Fond du Lac** (58); Jct. Tower and Cody Roads; Thomas Schultz, Rt. 2, Box 23, Green Lake, WI 54941; (414) 294-3021. **Fort Atkinson** (68); Jct. Main St. and Sherman Ave.; Richard Wanie, W5920 Lee Dr., Fort Atkinson, WI 53538; (414) 563-6274. **Fremont** (36); Jct. Hwys. I and HH, 4 miles S. of Fremont; Daryl Tesen, 2 Pioneer Park Place, Elgin, IL

60123; (312) 695-2464. **Gilman** (19); 1 mile W. of Miller Dam; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Grantsburg** (6); Jct. Hwys. 70 and 48; Dennis Allaman, Rt. 3, Box 39, Grantsburg, WI 54840; (715) 463-2365. **Green Bay** (41); Jct. Alouez and S. Webster Avenues; John Jacobs, Neville Public Museum, 210 Museum Pl., Green Bay, WI 54303; (414) 436-3767. **Green Lake** (57); Jct. Hwy. J and Swamp Rd.; Thomas Schultz, Rt. 2, Box 23, Green Lake, WI 54941; (414) 294-3021. **Hales Corners** (78); Jct. Hwy 41 and Puetz Rd. (Milwaukee Co. only); Harold Bauers, 2846 North 84th St., Milwaukee, WI 53222; (414) 771-2726. **Hartford** (64); Jct. Hwys. 60 and 83; Judy Haseleu, 337 W. State St., Hartford, WI 53027; (414) 673-5865. **Holcombe** (17); Chippewa-Rusk county line 1 mile E. of Hwy. 27; C. A. Kemper, Box 818, Chippewa Falls, WI 54729; (715) 723-3815. **Horicon Marsh** (60); Jct. Main Ditch and Main Dike in Refuge; Bill Volkert, Wis. Dept. Natural Resources, 1210 N. Palmatory, Horicon, WI; (414) 485-3018. **Hudson** (44); Afton, MN; Boyd & Helen Lien, 5148 29th Ave. S., Minneapolis, MN 55417; (612) 729-5982. **Kenosha** (80); Jct. Hwys. 158 and HH (Kenosha Co. only); Ron Hoffmann, Box 886, Kenosha, WI 53141; (414) 654-5854. **Kettle Moraine** (75); Hwy. DD W. of Auburn L.; Bill Volkert, Rt. 3, Campellsport, WI 53010; (414) 533-8939. **Kickapoo Valley** (50); Jct. Hwys. T and 131; Eric Epstein, Rt. 2, Box 100, Norwalk, WI 54648; (608) 823-7837. **LaCrosse** (49); LaCrosse Courthouse; Brian Christoffel, 1816 Madison St., LaCrosse, WI 54601; (608) 782-6268. **Lake Geneva** (70); 42° 15' Lat., 88° 30' Long.; Gaylord Culp, Rt. 3, Box 1, Lake Geneva, WI 53147. **Lakewood** (13); Jct. Hwys. T and FR 2117; John Woodcock, 1718 Cedar

Grove Dr., Apt. 3A, Manitowoc, WI 54220; (414) 684-0447. **Luck** (15); Jct. 180th St. and 180th Ave.; Howard Jorgenson, Rt. 2, Luck, WI; (715) 472-2769. **Madison** (63); State Capitol; Randy Hoffman, 305 Fifth St., Waunakee, WI 53597; (608) 849-4502; Al Shea, 2202 Manor Green Dr., Madison, WI 53711. **Medford** (21); 2.5 miles NE of Whittlesey; Nick Risch, W5172 Allman Ave., Medford, WI 54451; (715) 748-6177. **Merrill** (23); NE. corner of Sect. 31, NW of Merrill; Alan Rusch, 3342 Westview Lane, Madison, WI 53713; (608) 274-1224. **Milwaukee** (77); Jct. Port Washington Rd. and Hampton Ave.; Jim Frank, 4339 W. Laverna Ave., Mequon, WI 53092; (414) 242-2443. **Minoqua** (9); 45° 50'N, 89° 37'W; Douglas Smith, P.O. Box 246, Boulder Junction, WI 54512; (715) 385-3262. **Mount Horeb** (55); Mount Horeb; Warren Gaskill, 10405 Bell Rd., Black Earth, WI 53515; (608) 767-3642. **Nelson** (46); 1 mile S. of Jct. Hwys. I and D; C.A. Kemper, Box 818, Chippewa Falls, WI 54729; (715) 723-3815. **Newburg** (76); Jct. Hwy. 33 and Lakeland School Rd.; Julie Tubbs, Riveredge Nature Center, P.O. Box 26, Newburg, WI 53060; (414) 675-6888. **New Richmond** (43); 2 miles E. of Boardman; Joseph Merchak, Rt 3, Box 137C, River Falls, WI 54022; (715) 386-2082. **Oconomowoc** (65); Hwy 67, 2 miles N. of Oconomowoc; Edward Pear-tree, 36516 Lisbon Rd., Oconomowoc, WI 53066; (414) 567-4086. **Oshkosh** (38); Jct. Hwys. 21 and 41; Thomas Ziebell, 1322 Ceape Ave., Oshkosh, WI 54901; (414) 235-0326. **Owen** (20); Hwy. D, 2.5 miles N. of Hwy. 29; Nick Risch, W5172 Allman Ave, Medford, WI 54451; (715) 748-6177. **Oxbo** (7); Jct. Hwys. EE and 70; Maybelle Hardy, Rt. 1, Box 263, Park Falls, WI 54552; (715) 762-3178. **Pensaukee** (28); Pensaukee;

Thomas Erdman, 4093 Hwy. S, Route 2, Oconto, WI 54153; (414) 834-3416. **Phelps** (11); Jct. FR 2139 and FR 2533, 2 miles S. of Phelps; Bill Reardon, 2547 Hwy 70 E, Eagle River, WI 54521; (715) 479-8055. **Plymouth** (74); Jct. Hwys. 23 and C; Harold Koopman, 415 Caroline St., Plymouth, WI 53073; (414) 892-8101. **Poynette** (61); Jct. Hwys. 51 and CS; Mark & Sue Martin, Goose Pond Sanctuary, W7468 Prairie Lane, Arlington, WI 53911; (608) 635-4160. **Racine** (79); Hwy. H, 0.5 miles S. of Hwy. K (Racine Co. only); Gerald DeBoer, 2406 Kinzie Ave., Racine WI 53405; (414) 637-0393. **Randolph** (59); Hwy P, midway between Cambria and Randolph; Charles Gilmore, 115 Meadowood Dr., Randolph, WI 53956; (414) 326-3221. **Rhineland** (10); Rhineland; Ced Vig, 919 Birch Bend, Rhineland, WI; (715) 363-3047. **Richland Center** (51); Jct. Hwys. O and OO, SE of Richland Center; Robert Hirschy, University of Wisconsin Center-Richland, Richland Center, WI 53581; (608) 647-3042. **Sauk City** (54); 2.5 miles SE. of Witwen; Kenneth Lange, Devil's Lake State Park, S 5975 Park Rd., Baraboo, WI 53913; (608) 356-8301. **Shawano** (27); 2.5 miles N. of Lunds; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Shiocton** (37); Jct. Hwys. M and 54; James Anderson, Mosquito Hill Nature Center, Rt. 1, Rogers Rd., New London, WI 54961; (414) 779-6433. **Solon Springs** (5); Jct. Hwys. M and 53; Bernard Klugow, Box 13, Brule, WI 54820; (715) 372-4858. **Spencer** (22); Jct. Hwys. F and 153; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Stevens Point** (33); Old Main Building, University of Wisconsin-Stevens Point; Nancy Stevenson, 1890 Red Pine Lane, Stevens Point, WI 54481; (715) 341-0084. **Stockbridge** (40); Klo-

ten Swamp, 3 miles SE. of Stockbridge; Carroll Rudy, W3866 Hwy. H, Chilton, WI 53014; (414) 849-9021. **Three Lakes** (12); 6 miles E. of Three Lakes; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479-8055. **Trempealeau** (48); NE corner of Trempealeau; Thomas Hunter, 575 Jay St., Trempealeau, WI 54661; (608) 534-6233. **Waukesha** (66); Jct. Hwy. D and Brookhill Rd. (old Hwy. ZZ); John Bielefeldt, N3066 Hardscrabble Rd., Dousman, WI 53118; (414) 495-8397. **Wausau** (24); Jct. Grand Ave. and Thomas St.; Duane Goetsch, 3005 Heron Ave., Wausau, WI 54401; (715) 845-2651. **Wautoma** (35); Mount Morris; Delbert Greenman, Rt. 1, Box 263, Redgranite, WI 54970; (414) 787-3036. **Willard** (29); 1 mile E. and 1.5 miles S. of Willard; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Wisconsin Rapids** (31); Wisconsin Rapids; LaVonne Middleton, 20 Shorewood Terrace, Wisconsin Rapids, WI 54494; (715) 423-3242. **Woodland Dunes NW** (42), **NE** (71), **SW** (73), and **SE** (72); All in Manitowoc Co. as drawn on a map; Bernard Brouchoud, Woodland Dunes Nature Center, P.O. Box 2108, Manitowoc, WI 54220; (414) 793-4007.

Information on weather and participation in each count is summarized in Table 1.

RESULTS OF THE COUNTS

Results are reported in Tables 2-8. The more common species are reported in Table 2 to 7, with counts in 6 regions of the state grouped together in each table. In Table 7 the number of each species is compared with the average for the previous ten years, corrected for participation (total party hours). Rarer species are listed in Table 8. Highlights

Table 1. Details of the Counts.

Name of count	Date	Sky	Snow (in)	Wind Dir.	Wind Vel. (mph)	High Temp. (°F)	Low Temp. (°F)	Observers at Feeders	Observers in the Field	Parties	Party hours	Owl hours
Adams	12/17	Fair-MCI	2	NW	10	17	9	10	8	4	28	0
Amery	12/17	Partly Cloudy	3	W-SW	4-6	24	8	12	6	4	25	3
Amherst	12/17	Partly Cloudy	2	WNW	10	10	5	2	9	4	16.5	0
Appleton	12/17	Fair-PCI	2	NW	10-15	15	8	2	11	8	35	0
Arcadia	12/26	Cloudy	3	SW-NW	5-7	21	-4	0	4	2	15	1
Ashland	12/17	Partly Cloudy	9	W	8-12	12	7	0	6	3	16	0
Baraboo	12/28	Fair-Cloudy	9	NW	10-15	20	9	2	7	3	24.5	0.5
Bayfield	12/22	Cloudy	4	SE	7-10	30	24	0	5	4	23	0
Beloit	12/17	Fair	0		8	26	20	2	20	11	91	0
Black River Falls	12/28	Fair-Cloudy	2		10-15	7	2	22	9	5	14	3
Blanchardville	12/16	Cloudy-Snow	tr.		15-20	15	0	0	6	3	21	2
Bowler	12/18	Snow-Fair	3			24	8	12	2	2	8.5	0
Bridgeport	12/19	Partly Cloudy	0	S	6-18	51	18	0	9	5	32	6
Bruce	12/18	Partly Cloudy	12	SE	4-7	26	8	13	4	4	20	3
Caroline	12/31	Fair-PCI	5	NW	5-10	25	2	13	4	3	10	0.5
Chippewa Falls	12/26	Cloudy-Snow	2	E	10-30	22	11	0	9	5	22.5	1
Cloverland	1/2	Cloudy-Pcl	11	W	10-12	8	-12	4	2	2	19	2
Columbus	12/17	Fair	0		5-10	17	0	2	2	1	10	1
Cooksville	1/1	Fog-PCI	3	SSW	5-20	28	21	2	4	2	24	4
Durand	12/17	PCI-Cloudy	1	W	0-15	16	12	0	5	3	22	0
Ephraim	12/17	PCI-Fair	2	NW	15-20	24	17	30	24	13	47.5	(0)
Fifield	12/26	Cloudy-Snow	7	ESE	0-15	13	-4	16	3	3	13	0
Fond du Lac	12/18	Snow-Cloudy	2	SW	0-15	26	12	3	16	4	23.7	0.7
Fort Atkinson	12/31	Fair	0	Var.	0-5	30	10	0	10	(5)	26.5	0
Fremont	12/26	PCI-Snow	tr.	SE-NE	0-17	21	8	0	2	1	9	0.5
Gilman	12/18	Cloudy-PCI	3	S	5-15	28	16	6	8	5	32.7	4.7
Grantsburg	12/17	Fair	4		11-15	20	3	0	18	10	69.2	0
Green Bay	12/17	Snow-PCI	2	WNW	10-20	20	5	16	32	15	84	7
Green Lake	1/1	PCI-Cloudy	2	SSW	5-15	28	24	0	16	4	26.2	0.7
Hales Corners	12/18	Cloudy	0	SW	7-20	20	14	3	13	11	61.2	1.5
Hartford	12/28	Cloudy-Fair	2	NW-N	5-20	18	8	3	11	3	26	6.2
Holcombe	12/28	Fair	3	Var.	0-5	12	0	0	7	4	26.5	0
Horicon Marsh	12/18	Fair-PCI	1	NW	10-20	18	12	0	10	3	18.5	0
Hudson	1/1	Cloudy	1	NW	10-15	25	10	0	4	2	14.2	0
Kenosha	12/19	Fair-PCI	1	SSW	3-20	55	29	2	1	1	10	0
Kettle Moraine	12/31	Fair-MCI	2	SE	0-10	30	14	0	8	3	18.5	0.5
Kickapoo Valley	12/18	PCI-Fair	3	SW	10-15	30	10	0	4	3	18	0
LaCrosse	12/17	Mostly Cloudy	1	NW	10-15	21	16	0	25	14	82	0.2
Lake Geneva	12/18	Fair	tr.	SW	10-20	31	20	2	5	3	18	1.5
Lakewood	12/25	Fair	3	W	10-15	19	3	0	1	1	8.7	0
Luck	12/17	Partly Cloudy	4	NW	10-15	20	10	21	10	6	22	4
Madison	12/17	PCI-Fair	1	NW	8-18	21	11	6	64	30	243	26
Medford	12/26	PCI-Snow	3	SE	2-16	20	12	11	10	4	32.2	7.2
Merrill	12/27	Cloudy-PCI	3	S-W	15-35	24	12	0	7	4	21.7	0
Milwaukee	12/17	Partly Cloudy	0	NW	10-15	22	10	10	28	12	78.7	3
Minocqua	12/18	Cloudy	4	SW	10-20	21	16	2	7	(3)	46	0
Mount Horeb	12/18	Fair-PCI	tr.	S	15-20	28	15	5	39	22	122	1.5
Nelson	1/2	Fair	1	W	0-5	8	-1	0	5	3	25.5	0
New Richmond	12/17	Partly Cloudy	1	NW	10-15	20	10	26	76	25	210.7	19.1
Oconomowoc	12/17	Snow-Cloudy	1	W	15	20	14	2	9	3	23.5	0
Oshkosh	12/18	Cloudy-PCI	tr.	SW	5-30	32	15	4	14	5	29	1.5
Owen	12/17	Fair-PCI	1	NW-W	12-18	19	12	2	19	11	68.5	0
Oxbo	12/17	Partly Cloudy	4	NW	5-10	18	10	5	18	5	42.7	6.5
Pensaukee	12/17	Cloudy	6	NW	0-3	18	10	8	4	2	9	1
Pensaukee	1/1	MCI-Snow	3	S-SW	3-10	32	22	1	2	1	10	2
Phelps	12/17	Light Snow	8	NW	10-15	12	10	3	3	3	22	0
Plymouth	12/17	Partly Cloudy	0	NW	10-20	20	10	5	11	6	22.5	0
Poynette	12/31	Fair	2	Calm	28	8	9	30	12	80.7	5	5
Racine	12/17	Fair	0	NW		19	9	0	22	7	54	3.5
Randolph	12/17	PCI-MCI	1		12-20	15	8	0	2	1	9.5	0
Rhinclander	12/17	Partly Cloudy	4	NW	10	10	10	4	3	1	10	0
Richland Center	12/18	Partly Cloudy	1	SW	10-20	32	17	1	47	23	117	2
Sauk City	12/26	Snow	2	E	5-10	30	18	3	34	12	85.5	7.1
Shawano	12/17	Partly Cloudy	3	W	10-20	25	12	12	11	7	24	1
Shiocton	12/23	Cloudy-PCI	0	SW-W	9-25	36	35	4	18	5	30.5	0
Solon Springs	12/23	Cloudy-PCI	6	W	12-14	29	25	10	6	4	32.5	2
Spencer	12/26	Cloudy-Snow	2	SE	5-30	26	10	5	11	5	40	4.5
Stevens Point	12/17	Fair-PCI	4	NW	15-20	14	6	7	24	9	50.5	0
Stockbridge	12/19	Fair	3	W	5-12	19	7	4	12	7	33.2	1
Three Lakes	1/1	Cloudy-Snow	8	S-SW	8	30	20	1	4	3	16.5	0
Trempealeau	12/17	PCI-Cloudy	2	NW	15-20	20	16	5	14	7	47.2	0
Waukesha	12/17	Fair-PCI	1	NW	10-20	18	12	6	22	10	70	10
Wausau	12/17	Cloudy-PCI	4	NW	5-10	17	6	0	9	6	38	0
Wautoma	12/29	Fair	2	N-NW	0-5	9	-10	34	12	9	27.5	0.5
Willard	12/31	Partly Cloudy	2	S	0-5	22	5	3	11	5	39.7	0.5
Wisconsin Rapids	12/17	Fair	3	NW	10-25	18	4	6	21	6	19	0
Woodland Dunes NW	12/31	Fair	1		Calm	24	10	0	12	3	19.5	1
Woodland Dunes NE	1/2	Fair	1	W	10-15	21	8	4	9	4	23.5	1
Woodland Dunes SW	12/17	Cloudy	1	W	10-25	18	10	1	3	3	16.7	1.5
Woodland Dunes SE	12/18	Cloudy-Pcl	1	S-SW	0-8	28	10	4	10	6	29	1
TOTAL								413	1023	448	3054.2	165.2

Table 2. Number of each species found on 12 or more counts in northern Wisconsin.

Species	Bayfield (1)	Ashland (2)	Cloverland (3)	Brule (4)	Solon Spring (5)	Grantsburg (6)	Oxbo (7)	Fifield (8)	Minoqua (9)	Rhineland (10)	Pelphs (11)	Three Lakes (12)	Lakewood (13)	Ephraim (14)
Canada Goose	0	3	0	0	49	3906	0	0	0	0	0	0	0	425
American Black Duck	0	51	0	1	0	0	0	0	0	0	0	0	0	218
Mallard	0	61	0	3	1	85	0	0	0	300	0	0	0	5
Common Goldeneye	34	1	0	7	7	0	0	0	0	0	0	0	0	216
Bufflehead	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Common Merganser	12	0	0	2	1	0	0	0	0	0	0	0	0	59
Bald Eagle	0	1	3	4	5	12	2	1	1	5	*	*	0	4
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Sharp-shinned Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cooper's Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-tailed Hawk	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Rough-legged Hawk	0	4	0	1	0	33	10	2	0	0	1	1	1	8
American Kestrel	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ring-necked Pheasant	*	0	0	0	0	1	0	0	0	0	0	0	0	1
Ruffed Grouse	3	2	2	6	2	10	11	16	0	1	6	1	4	3
Wild Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	0	3	0	0	0	0	0	0	0	0	0	0	0	*
Herring Gull	189	150	0	0	0	0	0	0	0	0	0	0	0	1785
Rock Dove	10	145	0	16	0	453	0	40	0	8	0	0	0	209
Mourning Dove	0	15	0	12	0	11	0	2	0	51	1	1	0	196
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0	1	0	1	0	0	1	0	0	0	0	1
Barred Owl	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Belted Kingfisher	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Red-headed Woodpecker	0	0	0	0	0	0	0	0	1	0	0	0	0	*
Red-bellied Woodpecker	0	0	0	2	0	6	0	2	0	0	1	0	0	12
Downy Woodpecker	3	6	2	6	5	38	28	36	5	13	17	21	2	71
Hairy Woodpecker	*	3	3	5	5	17	26	47	12	12	15	9	0	65
Northern Flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Pileated Woodpecker	0	0	3	4	2	8	1	5	1	1	2	0	0	7
Horned Lark	0	0	0	0	0	0	0	0	0	0	0	0	0	40
Blue Jay	79	44	38	68	48	168	26	55	28	31	30	41	20	162
American Crow	6	31	7	6	51	124	56	121	5	7	8	1	30	237
Common Raven	54	28	8	238	22	21	32	28	19	8	73	13	6	22
Black-capped Chickadee	77	108	222	213	192	334	272	474	139	250	312	201	83	569
Tufted Titmouse	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Nuthatch	5	1	4	3	18	1	2	32	4	14	33	45	6	50
White-breasted Nuthatch	3	3	6	13	24	101	16	39	10	39	11	11	5	48
Brown Creeper	0	0	0	3	0	0	0	3	0	1	0	0	0	7
Golden-crowned Kinglet	0	0	0	2	0	0	0	0	0	0	1	0	0	*
American Robin	0	5	0	0	0	0	0	0	0	1	0	0	0	*
Cedar Waxwing	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Northern Shrike	1	4	0	1	0	6	1	0	0	0	1	1	0	*
European Starling	175	248	0	26	0	186	0	63	0	4	7	0	3	412
Northern Cardinal	*	0	0	2	0	14	0	7	0	3	0	1	0	49
American Tree Sparrow	0	0	0	1	2	9	0	1	0	0	0	0	0	21
Song Sparrow	0	1	0	0	0	0	0	0	0	0	0	0	0	0
White-throated Sparrow	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Dark-eyed Junco	0	0	0	3	2	0	2	2	0	6	0	0	0	68
Snow Bunting	0	0	2	26	0	30	0	12	7	0	0	0	200	50
Red-winged Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Common Grackle	0	0	0	0	0	0	0	0	1	0	0	0	0	10
Purple Finch	0	0	0	4	5	2	0	0	0	108	39	45	0	15
House Finch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pine Siskin	0	3	0	0	0	0	1	0	0	2	0	140	0	14
American Goldfinch	0	0	0	8	2	277	36	87	33	216	181	97	9	389
Evening Grosbeak	17	8	0	6	12	1	21	101	0	145	158	66	0	10
House Sparrow	243	52	2	0	3	1046	0	194	0	6	8	14	2	141
Total Species	21	28	16	37	26	33	19	25	15	30	23	26	15	44

*Found within 3 days of the count day but not on the day of the count.

Table 3. Number of each species found on 12 or more counts in north-central Wisconsin.

Species	Luck (15)	Amery (16)	Holcombe (17)	Chippewa Falls (18)	Gilman (19)	Owen (20)	Medford (21)	Spencer (22)	Merrill (23)	Wausau (24)	Bowler (25)	Caroline (26)	Shawano (27)	Pensaukee (28)
Canada Goose	190	0	0	8	0	0	0	0	0	0	0	0	0	2
American Black Duck	0	1	0	20	0	0	0	0	3	0	0	5	5	*
Mallard	11	95	0	367	0	0	0	0	260	138	0	305	3	*
Common Goldeneye	*	2	0	74	0	0	0	0	0	5	0	0	1	*
Bufflehead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Bald Eagle	0	2	2	2	4	1	0	0	*	4	0	*	1	*
Northern Harrier	0	0	0	0	0	0	0	0	3	0	0	0	0	1
Sharp-shinned Hawk	0	0	1	0	0	1	1	0	0	2	1	1	1	*
Cooper's Hawk	0	0	0	0	1	0	0	1	0	0	0	0	2	0
Red-tailed Hawk	0	1	5	3	1	5	0	1	0	1	0	2	11	3
Rough-legged Hawk	0	2	1	0	12	14	5	1	3	2	6	3	6	8
American Kestrel	0	1	3	*	0	2	3	1	0	1	6	2	5	3
Ring-necked Pheasant	1	7	0	1	0	1	0	2	2	0	0	0	*	*
Ruffed Grouse	4	7	2	0	18	17	34	18	15	4	2	*	18	2
Wild Turkey	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Common Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull	0	0	0	0	0	0	0	0	0	0	2	0	0	3
Rock Dove	27	198	192	97	107	370	70	623	18	130	3	100	285	16
Mourning Dove	18	2	26	48	0	149	151	54	76	184	51	125	265	263
Eastern Screech-Owl	0	0	0	0	0	1	0	0	0	0	0	0	0	*
Great Horned Owl	0	2	0	0	0	1	3	7	0	1	0	0	2	2
Barred Owl	*	1	0	0	0	0	1	1	0	0	0	0	*	3
Belted Kingfisher	0	1	1	0	0	0	0	0	0	*	0	3	2	0
Red-headed Woodpecker	0	1	0	0	0	0	0	1	0	0	0	0	1	0
Red-bellied Woodpecker	21	4	7	4	2	19	4	7	1	4	8	10	10	2
Downy Woodpecker	53	24	25	25	26	50	41	28	15	12	32	21	40	9
Hairy Woodpecker	43	11	14	7	28	30	46	14	12	9	26	14	25	6
Northern Flicker	2	0	0	0	0	0	0	0	0	0	0	0	1	0
Pileated Woodpecker	10	3	0	0	1	4	2	0	0	2	0	3	1	3
Horned Lark	0	0	6	23	0	31	2	27	0	0	0	11	39	0
Blue Jay	125	76	124	77	110	207	128	137	48	36	81	142	135	16
American Crow	40	64	162	250	200	693	494	99	165	133	28	60	474	5
Common Raven	*	2	3	0	42	6	14	0	7	0	0	2	1	0
Black-capped Chickadee	242	95	416	192	529	71	1169	358	266	163	130	260	263	22
Tufted Titmouse	0	0	0	10	0	0	1	0	0	0	0	0	0	0
Red-breasted Nuthatch	2	1	1	0	7	1	12	2	8	6	6	11	16	0
White-breasted Nuthatch	108	36	54	40	54	69	49	42	21	22	26	51	62	5
Brown Creeper	0	2	0	0	0	1	0	0	1	*	1	0	4	1
Golden-crowned Kinglet	*	0	0	0	0	0	1	2	0	0	0	0	0	0
American Robin	0	0	0	0	0	2	1	0	1	1	0	*	0	0
Cedar Waxwing	1	0	0	0	0	0	0	0	0	0	0	4	0	0
Northern Shrike	*	1	4	8	7	4	10	3	5	2	1	0	2	6
European Starling	30	52	97	259	137	297	320	114	69	205	105	125	561	54
Northern Cardinal	73	32	18	37	2	70	27	24	21	12	31	59	51	3
American Tree Sparrow	3	11	66	18	12	342	49	93	0	0	51	26	8	135
Song Sparrow	13	0	0	0	0	0	0	0	0	0	0	0	0	0
White-throated Sparrow	0	0	0	0	0	0	0	0	0	1	5	2	0	0
Dark-eyed Junco	40	4	1	86	0	8	25	18	1	14	39	185	125	3
Snow Bunting	42	56	100	0	100	76	1370	200	280	0	0	*	20	*
Red-winged Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Grackle	12	0	0	0	0	1	0	0	1	0	0	0	0	4
Purple Finch	2	4	0	2	0	2	21	0	0	0	89	61	32	3
House Finch	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pine Siskin	29	0	0	125	6	0	65	0	20	0	4	57	0	0
American Goldfinch	91	136	157	158	222	188	234	96	107	126	502	267	344	160
Evening Grosbeak	*	0	6	0	75	6	66	0	36	0	0	*	0	0
House Sparrow	398	274	974	817	95	242	118	1600	213	435	50	244	472	52
Total Species	29	35	29	29	26	36	35	31	33	28	27	35	41	31

*Found within 3 days of the count day but not on the day of the count.

Table 4. Number of each species found on 12 or more counts in central Wisconsin.

Species	Willard (29)	Black River Falls (30)	Wisconsin Rapids (31)	Adams (32)	Stevens Point (33)	Amherst (34)	Wautoma (35)	Fremont (36)	Shiocton (37)	Oshkosh (38)	Appleton (39)	Stockbridge (40)	Green Bay (41)	Woodland Dunes NW (42)
Canada Goose	0	0	0	1250	0	0	58	0	0	342	83		2718	0
American Black Duck	0	0	9	4	14	0	1	10	0	49	26	0	412	0
Mallard	0	0	72	65	759	*	190	161	1	88	1700		1981	0
Common Goldeneye	0	0	2	1	38	0	0	2	0	81	170	0	3	0
Bufflehead	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Common Merganser	0	0	0	2	0	0	0	0	0	26	136		1800	0
Bald Eagle	1	3	1	2	2	0	*	1	0	0	7	0	0	0
Northern Harrier	0	0	0	2	1	1	0	0	0	1	0	0	0	0
Sharp-shinned Hawk	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Cooper's Hawk	0	1	0	0	0	0	0	0	1	1	0	0	1	0
Red-tailed Hawk	10	1	3	3	3	15	7	12	18	23	21	8	34	2
Rough-legged Hawk	5	1	1	1	7	5	14	24	1	5	0	2	21	0
American Kestrel	1	0	0	1	1	2	1	4	32	21	11	5	27	2
Ring-necked Pheasant	0	0	0	0	0	1	9	0	2	11	4	0	6	2
Kuffed Grouse	8	17	4	2	1	1	2	1	0	0	0	*	0	13
Wild Turkey	0	29	0	0	0	0	0	0	0	0	0	0	0	0
Common Snipe	0	0	0	4	0	0	2	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	6	89	12	7	1
Herring Gull	0	0	0	0	0	0	0	0	0	29	195	*	595	0
Rock Dove	390	139	34	40	329	136	100	161	650	590	315	61	1169	119
Mourning Dove	45	6	50	1	146	42	145	261	45	741	125	189	623	33
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Great Horned Owl	1	5	0	0	0	0	0	6	0	3	4	*	7	16
Barred Owl	2	2	2	0	1	*	2	0	0	2	1	0	2	0
Belted Kingfisher	0	0	1	0	2	0	0	1	0	0	0	0	0	0
Red-headed Woodpecker	4	0	0	1	0	0	0	1	0	3	3	0	8	0
Red-bellied Woodpecker	10	24	6	20	5	6	17	7	6	9	14	8	8	4
Downy Woodpecker	43	42	12	42	33	26	51	19	19	77	7	23	54	15
Hairy Woodpecker	30	37	7	33	12	16	24	12	10	12	4	10	15	7
Northern Flicker	0	0	0	4	0	0	0	0	0	0	0	0	1	1
Pileated Woodpecker	4	8	1	2	1	1	4	0	0	0	0	*	1	0
Horned Lark	36	0	2	0	21	4	0	0	0	9	0	139	46	0
Blue Jay	355	167	48	318	163	64	299	57	25	127	41	54	97	64
American Crow	200	85	37	45	255	153	164	194	155	99	101	46	177	53
Common Raven	10	1	0	0	0	1	0	0	0	0	0	0	0	0
Black-capped Chickadee	646	171	117	448	480	131	289	80	113	189	52	125	269	137
Tufted Titmouse	0	5	0	2	0	0	0	0	0	0	0	0	0	0
Red-breasted Nuthatch	1	13	7	7	8	3	11	1	3	2	3	0	15	13
White-breasted Nuthatch	101	77	29	109	75	39	104	30	31	112	22	20	80	27
Brown Creeper	0	0	0	0	0	0	0	2	1	3	1	1	1	0
Golden-crowned Kinglet	0	0	3	0	0	0	0	0	0	1	1	0	0	0
American Robin	0	0	*	0	2	0	0	*	0	0	3	0	*	0
Cedar Waxwing	0	0	7	3	15	0	2	0	54	18	15	0	23	0
Northern Shrike	6	*	1	0	1	0	1	1	1	1	0	1	2	3
European Starling	502	21	10	7	21	48	128	343	58	1502	113	776	666	203
Northern Cardinal	75	85	19	32	58	24	102	21	24	63	22	30	67	31
American Tree Sparrow	315	37	34	4	49	5	189	158	4	413	56	63	115	14
Song Sparrow	0	0	0	0	0	0	0	0	0	1	2	0	1	1
White-throated Sparrow	0	0	0	0	1	0	0	0	0	0	6	0	1	0
Dark-eyed Junco	84	390	71	131	172	10	1184	185	80	276	141	38	191	110
Snow Bunting	0	0	0	0	206	1	35	0	3	40	2	835	158	150
Red-winged Blackbird	0	0	0	0	*	0	0	1	0	1	3	0	4	0
Common Grackle	0	0	1	0	0	0	0	5	1	4	1	0	1	0
Purple Finch	0	43	8	2	0	3	4	17	0	0	3	2	*	0
House Finch	0	0	0	0	0	0	5	0	0	0	0	0	*	0
Pine Siskin	0	0	5	48	4	0	18	1	0	1	0	0	1	25
American Goldfinch	897	707	104	351	684	167	894	453	135	91	92	35	155	50
Evening Grosbeak	8	0	0	20	13	0	0	0	0	0	0	0	0	0
House Sparrow	3401	103	295	63	434	217	232	54	110	2790	56	250	1989	551
Total Species	32	30	32	38	45	27	34	33	28	49	48	26	53	29

*Found within 3 days of the count day but not on the day of the count.

Table 5. Number of each species found on 12 or more counts in west and southwest Wisconsin.

Species	New Richmond (43)	Hudson (44)	Durand (45)	Nelson (46)	Arcadia (47)	Trempealeau (48)	LaCrosse (49)	Kickapoo Valley (50)	Richland Center (51)	Bridgeport (52)	Baraboo (53)	Sauk City (54)	Mount Horeb (55)	Blancardville (56)
Canada Goose	240	1764	0	1	0	0	1	0	0	70	2600	0	0	40
American Black Duck	1	3	0	0	0	1	6	0	0	2	0	7	0	0
Mallard	131	725	4	1	0	52	750	1	14	522	4	647	0	0
Common Goldeneye	0	32	3	0	0	0	21	0	0	1	14	175	0	0
Bufflehead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Merganser	0	98	0	36	0	0	0	0	0	0	11	72	0	0
Bald Eagle	0	5	14	43	1	5	6	1	36	49	13	46	0	0
Northern Harrier	0	0	1	0	0	0	0	0	12	1	1	8	0	0
Sharp-shinned Hawk	0	0	0	0	0	0	2	1	0	0	1	1	5	0
Cooper's Hawk	0	0	0	0	0	0	0	1	0	0	0	4	0	0
Red-tailed Hawk	4	5	8	29	15	8	37	25	79	30	24	39	37	10
Rough-legged Hawk	1	1	2	3	5	3	10	2	21	3	13	28	7	0
American Kestrel	2	2	0	2	7	5	11	2	28	15	5	17	16	8
Ring-necked Pheasant	1	0	0	1	0	0	0	0	1	0	0	3	0	1
Ruffed Grouse	2	0	4	35	2	*	24	10	27	2	5	12	9	8
Wild Turkey	0	0	0	38	15	24	77	21	191	32	0	91	235	0
Common Snipe	0	0	0	0	0	0	0	0	3	5	1	0	1	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	74	0	0
Herring Gull	0	0	0	0	0	0	0	0	0	0	0	2500	0	0
Rock Dove	361	175	219	647	246	269	409	124	577	290	191	696	327	280
Mourning Dove	28	15	2	35	1	18	62	10	33	5	69	232	44	1
Eastern Screech-Owl	0	0	0	0	0	0	1	0	0	4	1	4	0	6
Great Horned Owl	0	0	0	0	0	3	3	2	7	15	0	14	4	4
Barred Owl	0	0	0	0	3	5	11	1	1	2	0	1	3	4
Belted Kingfisher	1	0	0	1	0	8	5	2	2	2	0	2	0	1
Red-headed Woodpecker	0	0	1	0	0	3	4	0	2	0	0	1	8	0
Red-bellied Woodpecker	8	2	7	21	12	26	22	20	48	23	9	65	33	15
Downy Woodpecker	46	22	11	27	21	49	76	12	56	40	28	87	56	44
Hairy Woodpecker	14	10	3	17	9	23	45	9	24	18	7	35	32	18
Northern Flicker	0	0	0	1	0	2	0	0	2	0	0	4	1	0
Pileated Woodpecker	1	3	1	1	1	3	10	3	19	8	1	12	2	1
Horned Lark	21	0	0	0	0	1	1	8	17	99	25	96	6	40
Blue Jay	112	71	42	145	64	147	125	69	356	91	109	315	198	60
American Crow	248	163	180	331	268	535	172	199	921	119	296	936	392	87
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	233	84	46	175	111	140	320	83	482	189	157	367	217	150
Tufted Titmouse	1	0	2	0	0	0	4	0	12	19	1	7	8	1
Red-breasted Nuthatch	0	0	0	0	0	2	1	2	2	2	0	2	0	0
White-breasted Nuthatch	54	46	13	46	18	43	90	36	146	104	34	107	78	51
Brown Creeper	0	0	0	4	1	2	13	3	2	4	1	9	1	1
Golden-crowned Kinglet	0	0	0	0	0	0	0	0	2	2	0	9	97	4
American Robin	0	0	0	0	0	*	4	0	0	0	1	1	1	0
Cedar Waxwing	0	0	0	0	0	0	89	0	0	18	0	68	0	0
Northern Shrike	7	0	1	1	9	0	0	3	2	1	4	5	5	2
European Starling	125	158	573	172	688	159	251	126	622	866	120	387	512	675
Northern Cardinal	41	13	13	130	274	125	148	94	339	118	75	408	213	154
American Tree Sparrow	92	0	87	194	146	277	152	72	834	257	39	1497	359	286
Song Sparrow	0	0	0	0	0	0	14	0	2	1	0	9	4	6
White-throated Sparrow	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Dark-eyed Junco	27	23	240	319	197	315	250	96	760	136	37	1535	607	152
Snow Bunting	239	0	0	14	40	0	0	20	0	0	10	0	0	0
Red-winged Blackbird	0	0	0	3	3	5	0	0	0	28	0	2	0	3
Common Grackle	1	0	0	2	0	4	5	0	3	28	0	1	0	0
Purple Finch	3	9	2	6	1	23	2	3	43	0	7	86	11	1
House Finch	0	0	0	0	0	0	0	0	0	0	*	0	1	0
Pine Siskin	3	49	0	10	15	0	12	0	0	1	5	27	0	0
American Goldfinch	141	57	108	24	32	140	136	262	697	104	169	360	480	109
Evening Grosbeak	0	0	0	0	0	0	0	0	0	0	0	0	0	0
House Sparrow	1161	233	79	1465	515	352	526	33	271	1926	38	141	111	1940
Total Species	33	29	28	35	29	40	47	36	46	50	37	58	39	36

*Found within 3 days of the count day but not on the day of the count.

Table 6. Number of each species found on 12 or more counts in southeast Wisconsin.

Species	Green Lake (57)	Fond du Lac (58)	Randolph (59)	Horicon Marsh (60)	Poynette (61)	Columbus (62)	Madison (63)	Hartford (64)	Oconomowoc (65)	Waukesha (66)	Cooksville (67)	Fort Atkinson (68)	Beloit (69)	Lake Geneva (70)
Canada Goose	70000	73	3037	21400	2945	4030	1481	2140	965	3469	1	1500	966	3804
American Black Duck	12	32	0	0	9	9	135	0	36	2	*	13	69	0
Mallard	187	318	0	2	363	36	6574	0	805	158	69	375	1331	421
Common Goldeneye	160	0	0	0	201	0	528	0	6	2	0	0	208	432
Bufflehead	4	0	0	0	0	0	2	0	0	0	0	0	0	121
Common Merganser	590	0	0	0	186	0	768	2	8	0	0	0	2	30
Bald Eagle	2	0	0	0	12	0	1	0	2	0	0	0	1	0
Northern Harrier	2	0	0	14	3	0	4	0	0	0	0	1	1	1
Sharp-shinned Hawk	0	1	0	0	1	0	3	0	1	3	0	0	1	1
Cooper's Hawk	1	0	0	0	2	0	6	1	2	0	*	*	2	0
Red-tailed Hawk	10	13	8	32	55	1	49	13	9	23	1	12	17	3
Rough-legged Hawk	11	17	0	18	17	0	5	0	1	1	1	1	1	0
American Kestrel	8	11	6	6	31	4	18	4	10	8	5	7	14	7
Ring-necked Pheasant	5	2	0	5	5	5	5	1	3	1	4	1	1	0
Ruffed Grouse	0	0	0	0	9	0	0	0	0	0	0	0	0	0
Wild Turkey	0	0	0	0	8	0	0	0	0	0	0	0	0	0
Common Snipe	0	1	0	0	3	0	8	0	0	2	1	0	1	0
Ring-billed Gull	1	14	0	0	0	1	321	0	1	4	0	0	0	0
Herring Gull	45	0	0	*	2	0	2911	0	0	2	0	*	2	220
Rock Dove	345	149	223	231	494	95	641	244	155	309	59	108	173	173
Mourning Dove	72	207	291	23	586	29	1417	178	46	195	160	100	149	85
Eastern Screech-Owl	0	1	0	0	6	0	81	3	0	10	4	0	2	0
Great Horned Owl	3	10	0	5	20	0	18	1	2	10	0	0	5	1
Barred Owl	0	1	0	1	0	0	1	0	3	1	*	0	0	0
Belted Kingfisher	1	0	0	0	3	0	9	0	1	4	1	1	1	0
Red-headed Woodpecker	0	0	0	0	3	0	1	0	0	0	1	0	1	3
Red-bellied Woodpecker	6	1	0	1	40	1	60	9	7	14	3	1	8	4
Downy Woodpecker	33	37	5	12	100	10	238	43	21	56	50	25	52	21
Hairy Woodpecker	16	8	0	1	33	1	72	12	7	20	11	2	23	7
Northern Flicker	0	0	0	0	4	0	9	1	1	2	2	0	1	0
Pileated Woodpecker	1	0	0	0	6	0	0	0	0	*	0	0	0	0
Horned Lark	19	121	30	25	73	70	48	46	0	0	301	25	242	106
Blue Jay	101	155	21	20	394	19	287	52	37	127	60	19	73	23
American Crow	169	97	15	*	732	20	1119	99	205	438	46	156	176	139
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	92	127	22	54	527	12	943	170	162	328	68	75	122	99
Tufted Titmouse	0	0	0	0	11	0	3	0	4	0	0	0	*	0
Red-breasted Nuthatch	4	2	0	0	8	0	10	2	4	13	0	1	1	0
White-breasted Nuthatch	56	18	2	20	114	6	210	38	29	57	24	8	115	30
Brown Creeper	1	2	0	2	6	0	101	1	0	2	2	0	12	0
Golden-crowned Kinglet	0	0	0	1	14	0	36	0	0	4	0	0	0	0
American Robin	13	3	0	0	0	0	46	0	0	17	0	0	*	1
Cedar Waxwing	10	0	0	0	169	0	61	0	1	98	0	*	0	1
Northern Shrike	0	3	1	1	2	2	9	*	0	0	0	0	0	0
European Starling	156	171	73	73	1697	267	4555	228	452	663	606	347	639	168
Northern Cardinal	65	37	13	6	250	9	449	71	68	127	79	71	237	56
American Tree Sparrow	441	135	127	110	1147	195	1454	215	847	246	684	210	724	815
Song Sparrow	0	1	0	0	6	2	32	0	2	15	1	8	27	6
White-throated Sparrow	0	0	0	0	0	0	6	0	0	1	0	0	1	0
Dark-eyed Junco	599	113	132	19	939	28	1196	164	183	506	213	224	565	568
Snow Bunting	155	395	0	0	354	0	0	0	0	0	60	0	22	3
Red-winged Blackbird	0	0	0	6	18	0	605	0	0	0	10	0	1	0
Common Grackle	*	0	0	10	16	1	8	0	2	2	0	1	0	0
Purple Finch	12	0	0	0	56	0	16	0	7	4	*	0	0	0
House Finch	0	13	0	0	0	0	20	5	0	2	2	0	0	0
Pine Siskin	0	2	0	0	24	0	23	0	0	1	0	0	0	0
American Goldfinch	343	87	24	22	634	23	678	41	113	89	92	36	69	83
Evening Grosbeak	0	0	0	0	60	0	0	0	0	0	0	0	0	0
House Sparrow	149	1451	338	406	3359	210	4561	962	530	848	845	425	1216	590
Total Species	46	39	18	31	59	26	80	31	47	54	34	30	48	37

*Found within 3 days of the count day but not on the day of the count.

Table 7. Number of each species found on 12 or more counts in southern Lake Michigan counties.

Species	Woodland Dunes NE (71)	Woodland Dunes SE (72)	Woodland Dunes SW (73)	Plymouth (74)	Kettle Moraine (75)	Newburg (76)	Milwaukee (77)	Hales Corners (78)	Racine (79)	Kenosha (80)	Number of Counts	Total Birds	Percent Change
Canada Goose	0	43	1292	125	0	2258	2112	1186	1343	120	41	140,862	+139
American Black Duck	0	53	7	18	0	15	393	1	22	4	38	1,670	+13
Mallard	0	300	75	63	0	313	7284	204	1226	558	53	30,958	+26
Common Goldeneye	4	58	0	0	0	14	255	217	103	9	36	3,087	-16
Bufflehead	2	0	0	0	0	2	107	15	69	3	12	329	+31
Common Merganser	5	12	0	0	0	48	14	3	2	1	26	3926	+37
Bald Eagle	0	0	0	0	0	0	0	0	0	0	40	308	+29
Northern Harrier	2	0	0	1	0	2	2	0	4	0	23	69	+44
Sharp-shinned Hawk	0	0	0	1	0	1	0	0	3	0	24	36	+2
Cooper's Hawk	0	1	0	2	0	4	0	1	1	0	20	36	+61
Red-tailed Hawk	1	2	4	10	6	42	18	11	15	3	64	905	+1
Rough-legged Hawk	2	4	3	0	4	6	5	2	1	1	65	411	+41
American Kestrel	4	5	3	5	1	25	8	14	30	23	60	512	+15
Ring-necked Pheasant	7	3	0	0	0	6	5	9	8	12	39	146	-72
Ruffed Grouse	2	4	4	0	0	9	0	0	0	0	51	425	+1
Wild Turkey	0	0	0	0	2	0	0	0	0	0	13	764	+804
Common Snipe	0	0	0	0	0	0	0	0	0	0	12	32	+8
Ring-billed Gull	0	6	0	5	0	38	788	361	213	178	19	2,123	-21
Herring Gull	3005	132	0	210	0	36	755	47	435	744	23	14,294	+61
Rock Dove	204	161	249	232	128	562	749	446	238	896	73	19,982	-12
Mourning Dove	96	211	19	51	31	805	933	365	766	144	73	11,699	+54
Eastern Screech-Owl	0	0	0	1	0	6	1	3	2	0	21	140	+24
Great Horned Owl	2	5	2	1	*	13	5	9	2	1	45	231	-13
Barred Owl	0	2	0	0	0	4	0	0	0	1	30	66	-17
Belted Kingfisher	0	2	0	0	0	6	2	0	1	0	29	68	+10
Red-headed Woodpecker	0	1	0	0	0	3	0	0	7	0	24	63	-74
Red-bellied Woodpecker	0	1	1	9	5	43	7	4	7	1	69	814	+18
Downy Woodpecker	22	12	9	38	6	214	33	38	34	6	80	2,807	+7
Hairy Woodpecker	7	5	2	20	10	61	22	8	8	1	77	1,354	-1
Northern Flicker	0	0	0	0	2	11	1	0	3	11	22	67	-46
Pileated Woodpecker	2	0	0	0	0	1	0	0	0	0	45	161	+10
Horned Lark	8	2	3	2	9	49	0	0	28	18	45	1,975	+102
Blue Jay	68	39	24	56	70	335	27	26	28	13	80	8,137	-11
American Crow	53	117	5	115	88	372	425	603	166	219	79	15,742	-46
Common Raven	0	0	0	0	0	0	0	0	0	0	25	661	+13
Black-capped Chickadee	177	81	46	80	97	917	309	157	126	117	80	19,179	+23
Tufted Titmouse	0	0	0	0	0	0	0	0	0	0	16	91	+25
Red-breasted Nuthatch	6	8	0	2	2	28	25	9	13	2	63	529	-10
White-breasted Nuthatch	11	28	8	11	14	186	43	37	17	6	80	3,778	+12
Brown Creeper	2	1	0	0	4	7	2	1	0	1	43	221	-2
Golden-crowned Kinglet	0	3	0	0	2	2	3	3	2	5	23	200	-15
American Robin	0	0	2	0	0	0	67	30	22	16	22	240	-35
Cedar Waxwing	44	4	0	0	0	65	17	93	25	32	27	939	-36
Northern Shrike	0	2	2	0	*	6	2	3	1	0	52	160	+9
European Starling	50	241	537	334	484	1399	5895	1786	900	852	75	36,485	-80
Northern Cardinal	37	20	11	32	20	325	114	49	73	7	72	5,528	-27
American Tree Sparrow	16	3	7	12	151	592	53	379	288	538	68	16,345	+22
Song Sparrow	1	2	1	0	2	5	1	9	6	4	31	186	+2
White-throated Sparrow	0	1	2	0	0	0	3	0	1	0	17	35	-44
Dark-eyed Junco	73	76	8	89	74	1102	368	228	332	831	71	17,442	-8
Snow Bunting	0	0	0	0	0	0	0	17	229	9	39	6,253	+43
Red-winged Blackbird	1	0	0	0	0	0	0	8	38	11	20	752	-81
Common Grackle	0	0	0	2	1	0	3	1	1	14	32	148	-56
Purple Finch	0	9	0	9	7	4	0	0	1	1	48	839	-40
House Finch	1	0	0	*	0	*	45	2	10	0	13	108	+2092
Pine Siskin	4	8	0	9	*	15	15	0	0	7	38	799	-76
American Goldfinch	119	59	12	85	3	303	239	86	63	366	77	15,427	+69
Evening Grosbeak	0	0	0	1	*	0	0	0	0	0	21	836	-89
House Sparrow	201	110	405	291	312	3429	1608	638	724	488	77	65,567	+9
Total Species	40	44	28	35	27	69	68	47	56	58			

*Found within 3 days of the count day but not on the day of the count.

Table 8. Species found on fewer than 12 counts.

Species	Number of Counts	Number of Birds	Count and Number
Pied-billed Grebe	1	1	Woodland Dunes SE 1
Great Blue Heron	11	12	Three Lakes 1, Green Bay 1, Hudson 1, Trempealeau 1, Richland Center 1, Oconomowoc 1, Waukesha 1, Woodland Dunes NE 1, Woodland Dunes SE 1, Newburg 2, Milwaukee 1, (Hales Corners)
Tundra Swan	5	31	Bayfield 15, Adams 1, (Stockbridge), Trempealeau 4, LaCrosse 2, Madison 9
Mute Swan	7	24	Solon Springs 9, Shawano 3, Stevens Point 4, Madison 2, Oconomowoc 1, Waukesha 3, Lake Geneva 2
Snow Goose	4	4	Stevens Point 1, Green Lake 1, Horicon Marsh 1, Milwaukee 1
Wood Duck	11	31	Chippewa Falls 5, Merrill 4, Caroline 2, Stevens Point 1, Trempealeau 2, LaCrosse 3, Madison 3, Oconomowoc 2, Cooksville 1, Beloit 1, (Racine), Kenosha 7
Green-winged Teal	3	3	Trempealeau 1, Bridgeport 1, Milwaukee 1
Northern Pintail	3	4	(Stevens Point), Appleton 1, Milwaukee 1, Kenosha 1
Northern Shoveler	2	53	Madison 52, Beloit 1
Gadwall	6	392	New Richmond 1, Green Lake 3, Madison 361, Waukesha 16, Plymouth 3, Milwaukee 8
American Wigeon	6	40	Caroline 1, Bridgeport 2, Madison 27, Waukesha 1, Newburg 2, Milwaukee 7
Canvasback	5	12	LaCrosse 3, Green Lake 2, Newburg 2, Racine 3, Kenosha 2
Redhead	6	7	Green Bay 1, Green Lake 1, Madison 2, Oconomowoc 1, Milwaukee 1, (Racine), Kenosha 1
Ring-necked Duck	5	14	Caroline 1, Appleton 1, Madison 7, Milwaukee 3, Kenosha 2
Greater Scaup	6	1506	Woodland Dunes NE 2, Newburg 26, Milwaukee 1451, Hales Corners 13, Racine 11, Kenosha 3
Lesser Scaup	8	61	Brule 1, Oshkosh 2, Green Lake 7, Madison 26, Milwaukee 13, Hales Corners 1, Racine 1, Kenosha 1
Oldsquaw	7	695	(Rhinelander), Ephraim 525, Madison 1, Woodland Dunes NE 15, Newburg 5, Milwaukee 85, Hales Corners 33, Kenosha 31
Surf Scoter	1	1	Racine 1
White-winged Scoter	3	6	Ephraim 2, Newburg 1, Milwaukee 3
Hooded Merganser	9	25	Bayfield 2, (Stevens Point), Hudson 2, LaCrosse 1, Green Lake 2, Madison 7, Beloit 1, Plymouth 1, Newburg 7, Milwaukee 2
Red-breasted Merganser	8	221	Madison 4, Oconomowoc 1, Woodland Dunes NE 2, Newburg 7, Milwaukee 84, Hales Corners 27, Racine 93, Kenosha 3
Ruddy Duck	3	8	Madison 2, Lake Geneva 3, Milwaukee 3
Turkey Vulture	1	1	Willard 1
Northern Goshawk	11	12	Holcombe 1, Medford 1, Merrill 1, (Caroline), (Pensaukee), Willard 2, Appleton 1, Hudson 1, Trempealeau 1, Poynette 1, Madison 1, Milwaukee 1, Racine 1
Red-shouldered Hawk	3	4	Bridgeport 2, Poynette 1, Waukesha 1
Golden Eagle	2	2	Bridgeport 1, Lake Geneva 1
Merlin	3	4	Bridgeport 1, Fond du Lac 1, Madison 2
Gray Partridge	5	35	Mount Horeb 12, Poynette 14, Madison 2, Hartford 1, Newburg 6
Greater Prairie-Chicken	2	30	Spencer 29, Stevens Point 1
Sharp-tailed Grouse	3	48	Brule 6, Grantsburg 8, Gilman 34
Northern Bobwhite	7	58	Black River Falls 10, Kickapoo Valley 4, Richland Center 26, Bridgeport 2, Sauk City 1, Newburg 2, Kenosha 13
American Coot	10	222	Oshkosh 1, Green Bay 1, Madison 184, Hartford 2, Oconomowoc 6, Waukesha 1, Lake Geneva 22, Newburg 1, Milwaukee 3, Kenosha 1
Killdeer	4	8	Wautoma 1, Richland Center 3, Bridgeport 1, Kenosha 3
Bonaparte's Gull	1	112	Kenosha 112
Thayer's Gull	1	1	Milwaukee 1
Glaucous Gull	4	4	Bayfield 1, Appleton 1, Green Bay 1, Sauk City 1
Great Black-backed Gull	1	1	Milwaukee 1
Snowy Owl	4	4	(Ephraim), Caroline 1, Oshkosh 1, Poynette 1, Hartford 1, (Milwaukee)
Long-eared Owl	6	8	Oshkosh 1, Appleton 1, Richland Center 1, Blanchardville 3, Poynette 1, Madison 1
Short-eared Owl	2	6	Waukesha 5, Newburg 1
Northern Saw-whet Owl	1	1	(Pensaukee), (Black River Falls), Madison 1
Yellow-bellied Sapsucker	7	9	Caroline 1, Black River Falls 1, Appleton 1, Richland Center 1, Madison 2, Newburg 1, Milwaukee 2
Three-toed Woodpecker	1	1	Brule 1
Black-backed Woodpecker	1	1	Three Lakes 1
Eastern Phoebe	1	1	Fort Atkinson 1
Gray Jay	8	58	Cloverland 1, Brule 5, Solon Springs 3, Grantsburg 1, Oxbow 14, Fifield 20, Rhinelander 1, Three Lakes 13
Boreal Chickadee	2	5	Fifield 1, Three Lakes 4
Carolina Wren	2	3	Madison 2, (Beloit), (Lake Geneva), (Newburg), Milwaukee 1
Winter Wren	6	7	Woodland Dunes NW 1, Madison 1, Fort Atkinson 1, Woodland Dunes NE 1, Newburg 2, Milwaukee 1
Townsend's Solitaire	1	1	Green Bay 1
Hermit Thrush	4	6	Stevens Point 1, Appleton 1, Waukesha 1, Milwaukee 1
Varied Thrush	2	2	(Owen), Willard 1, Sauk City 1

continued

Table 8. (Continued)

Species	Number of Counts	Number of Birds	Count and Number
Gray Catbird	2	2	Beloit 1, Milwaukee 1
Brown Thrasher	4	4	Merrill 1, Bowler 1, Mount Horeb 1, Newburg 1
Bohemian Waxwing	5	204	Ashland 52, Rhineland 75, Medford 10, Merrill 65, (Wisconsin Rapids), Stevens Point 2
Yellow-rumped Warbler	3	5	Sauk City 3, Waukesha 1, Milwaukee 1
Rufous-sided Towhee	2	3	Adams 2, Newburg 1
Field Sparrow	2	3	Trempealeau 1, Waukesha 1
Fox Sparrow	3	6	Shawano 1, Madison 3, Newburg 2
Lincoln's Sparrow	1	2	Newburg 2
Swamp Sparrow	9	26	Sauk City 2, Blanchardville 2, Poynette 1, Madison 8, Oconomowoc 1, Woodland Dunes NE 1, Hales Corners 2, Racine 6, Kenosha 3
White-crowned Sparrow	1	3	Racine 3
Harris' Sparrow	1	2	Solon Springs 2
Lapland Longspur	9	431	Brule 2, Owen 34, Pensaukee 1, Stockbridge 2, Green Bay 50, Madison 1, Cooksville 5, Beloit 266, Kenosha 70
Rusty Blackbird	9	12	Oshkosh 1, Appleton 1, Sauk City 2, Fond du Lac 1, Poynette 1, Madison 1, (Cooksville), Lake Geneva 3, Newburg 1, Hales Corners 1
Brewer's Blackbird	2	2	Stevens Point 1, Oconomowoc 1
Brown-headed Cowbird	11	217	Oshkosh 2, Green Bay 5, Woodland Dunes NW 1, Richland Center 35, Sauk City 1, Blanchardville 1, Horicon Marsh 158, Madison 9, Waukesha 2, Newburg 1, Kenosha 2
Pine Grosbeak	8	110	Bayfield 11, Ashland 3, Cloverland 1, Brule 8, Solon Springs 2, Grantsburg 70, Three Lakes 10, Oconomowoc 5
Red Crossbill	5	45	Rhineland 8, Phelps 15, Three Lakes 1, Spencer 15, Beloit 6
White-winged Crossbill	4	129	Phelps 27, Three Lakes 94, Lakewood 6, Green Bay 2
Common Redpoll	11	234	Solon Springs 9, Grantsburg 21, Rhineland 1, Phelps 51, Three Lakes 75, Lakewood 2, Ephraim 2, Luck 2, Chippewa Falls 40, Hudson 25, Newburg 6
Accipiter species	2	3	Durand 1, Madison 2
Gull species	3	115	Poynette 2, Milwaukee 87, Hales Corners 26

of the counts were several rarities, but not as many as usually appear. An Eastern Phoebe at Fort Atkinson and a Tayer's Gull at Milwaukee are only the third Wisconsin Christmas bird count records for these species. A Turkey Vulture at Willard represents only the fourth Christmas Count record for that species. The only other rare birds were a Surf Scoter at Racine, a Great Black-backed Gull at Milwaukee, a Three-toed Woodpecker at Brule in Douglas County, a Townsend's Solitaire at Green Bay, and a Lincoln's Sparrow at Newburg. All appeared for the fifth time on Wisconsin Christmas bird counts. Other notable sightings include a Pied-billed Grebe at Woodland Dunes SE, White-winged Scoters at Ephraim, Newburg, and Milwaukee, Golden Eagles at Bridgeport and Lake Geneva, Merlins at Bridgeport, Fond du Lac, and Madison, a Northern Saw-whet Owl at Madison, a Black-backed Woodpecker at Three Lakes, Ca-

rolina Wrens at Madison and Milwaukee, Varied Thrushes at Willard and Sauk City, Rufous-sided Towhees at Adams and Newburg, White-crowned Sparrows at Racine, and Harris' Sparrows at Solon Springs. Another Three-toed Woodpecker and a Barrow's Goldeneye were reported but not included because the documentation was not conclusive. Documentation for the Barrow's Goldeneye, Turkey Vulture, and Three-toed Woodpeckers, and the Lincoln's Sparrows have been reviewed by the WSO Records Committee. Three Golden Eagles and a Black Scoter were not included because there was no documentation. A summary of the general abundance of various species follows.

SPECIES ACCOUNTS

Waterfowl.—The substantial amount of open water led to above normal num-

bers of most species of waterfowl. The number of Canada Geese was the second highest ever recorded on Wisconsin Christmas Counts. Most species of ducks and mergansers were more plentiful than usual, but there were two exceptions. Numbers of Common Goldeneyes were down slightly and the number of Oldsquaws was the lowest in at least 20 years. Swans were present in about normal numbers.

Hawks and Eagles.—Numbers of all hawks and eagles were at or above normal, probably reflecting the general lack of snow cover, which increased availability of food. Numbers of Bald Eagles, Northern Harriers, Cooper's Hawks, and Rough-legged Hawks were especially impressive. The four Merlins is the highest total ever found on Wisconsin Christmas bird counts.

Grouse, Pheasants, Quail, etc.—The explosion of the Wild Turkey population was a highlight of many counts in western and southwestern Wisconsin. Turkeys were first found in 1978, but in the last five years numbers have increased dramatically as follows: 1984 (40), 1985 (95), 1986 (146), 1987 (373), and 1988 (764). On the negative side, Ring-necked Pheasant numbers remain near their all-time low, and the number of Gray Partridges was the lowest in at least 20 years. Numbers of Ruffed Grouse and Northern Bobwhite remained about normal.

Gulls and Other Waterbirds.—Herring Gulls were present in record numbers, but Ring-billed Gull numbers were down, suggesting that many had migrated south. The number of Great Blue Herons was the third highest ever recorded, but no other herons were found nor were there any rails or other rare wa-

terbirds seen. Numbers of Common Snipe, Belted Kingfishers, and Killdeers were about normal.

Owls.—Numbers of the common owls were about normal, but counts of Short-eared, Long-eared, and Snowy Owls were distinctly below normal.

Woodpeckers.—The range of the Red-bellied Woodpecker appears to be still expanding and its numbers increasing. Numbers of Red-headed Woodpeckers were extremely low, in spite of an apparently excellent crop of acorns. Northern Flickers were also much less abundant than usual. All resident woodpeckers were present in about normal numbers.

Jays, Crows, Chickadees, Nuthatches, etc.—Numbers of American Crows remained down, perhaps because large roosts are not being counted. Black-capped Chickadees occurred in record numbers, and were especially abundant on northern counts. Populations of Tufted Titmice continue to improve, especially in the southwestern part of the state, but numbers are still well below those found in the 1960's. Common Ravens, Blue Jays, Red-breasted and White-breasted Nuthatches, Brown Creepers, and Golden-crowned Kinglets were all present in about normal numbers.

Thrushes, Shrikes, and Waxwings.—Numbers of American Robins, Cedar Waxwings, and Bohemian Waxwings were well below normal. It was a reasonably good year for Northern Shrikes, and the 6 Hermit Thrushes is close to the record number of 7 in 1983.

Sparrows.—It was a rather poor year

for sparrows, especially in comparison to last year. Only American Tree Sparrows occurred in somewhat above normal numbers. Numbers of Swamp Sparrows and White-throated Sparrows were exceptionally low. Other species appeared in about normal or somewhat below normal numbers.

Open Country Birds.—In spite of a lack of snow to force them to roadsides and manure spreads. Horned Larks, Snow Buntings, and Lapland Longspurs were unusually abundant. No meadowlarks were seen for the first time since 1955.

Blackbirds.—Numbers of all species of blackbirds were extremely low.

Finches.—It was the poorest count for winter finches that I can remember.

Common Redpolls, Pine Siskins, Pine Grosbeaks, Evening Grosbeaks, Purple Finches, and both species of crossbills were extremely scarce in most areas of the state. Only the American Goldfinch was abundant; it appeared in record numbers. The spread of the House Finch into Wisconsin has been remarkable. It was first found on Christmas bird counts in 1986, when 8 were reported. Last year 36 were found on 10 counts, and this year 108 were recorded on 13 counts. This exponential explosion suggests that it may soon become one of our common Christmas bird count species.

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WR STOTT JR 88

Sedge Wren by William R. Stott Jr.

The Rise of the Amateur Ornithologist (Alias "Bird Watcher")

by *Scott R. Craven*

As a kid I never really grasped the idea that someday I could reflect on such things as the 5-cent candy bar or 19.9 cents/gallon gasoline. However, someday seems to be now. One of the changes worth reflecting on is the emergence of the amateur ornithologist—bird watcher if you will—from the "little old lady in tennis shoes" stereotype to a participant in a well-recognized, tremendously popular hobby. Birders are close to becoming the rule rather than the exception.

How popular is birding? A few figures tell the story very well. A 1980 U.S. Fish and Wildlife Service nationwide survey identified 2 million "highly committed" birders, 7 million who were "fairly interested," and 60 million "casual" birders, but birders nevertheless. There are probably other levels of participation ranging from the "disinterested" to the "fanatical," but they were not tabulated. The total numbers are undoubtedly higher today in 1989, as all available indices point to continued growth in birding. For example, in 1985 Americans spent about \$1 billion on bird seed, about twice the 1980 total. Over the same time period, annual

expenditures on binoculars almost tripled to \$373 million, and \$239 million was spent on bird houses, feeders, and baths; up from just over \$75 million. Stan Temple's recent survey of WSO members, indicated that they collectively spend well over a million dollars each year on their various birding-related activities. WSO membership, reasonably static for 10–20 years, has recently seen a growth spurt of 10–15 percent.

Over 600 thousand bird guides are sold each year in the United States. Sales of Roger Tory Peterson's classic, *A Field Guide to the Birds*, have topped 3.5 million copies. There is even a simplified youth version of the guide, as well as video versions, audio tapes, records, slide sets, etc. Many other excellent field guides and books on birding have joined the original "field guide" since it was first published in 1934.

Beyond field guides, there are specialty magazines of all kinds: *Birder's World*, *Birding*, and *Wildbird*, to name a few. One magazine advertises a "center-fold portrait," a particularly high quality photograph of a bird or birds.

I wonder where that idea originated?? Regular features include "birding hot-spots," "rare bird alert," and other topics. *Audubon Magazine* is in a class by itself as a fine environmental publication, in addition to its appeal for birders. Publications are filled with advertisements for books, equipment, field clothes, and birding tours to every corner of the globe. There is even a chain of "Wild Birds Unlimited" stores with their own informative newsletter. If the shop in Madison is any indication, they are all stocked floor-to-ceiling and wall-to-wall with every conceivable bit of paraphernalia of interest to birders. Catalogue sales companies, such as Duncraft and Audubon Workshop, provide the convenience of mail-order shopping for similar merchandise.

The May 25, 1987 issue of *Time Magazine* had an excellent article on modern birding. In it the author speculated on the appeal of birding and then characterized the "serious" birder. Birding requires minimal equipment, limited physical dexterity, and a little financial investment (maybe!). Birding is intellectual, yet basically simple, and, if conducted properly, there is no harm to either the quarry or the environment. It's relaxing and can be done just about anywhere from the kitchen window to the wilds of a tropical forest. That's an impressive list of attributes for any hobby!

As Joseph J. Hickey stated in the preface to his 1943 book, *A Guide to Bird Watching*: "Bird watching embraces individual enterprise on the one hand, collective effort on the other. Above all else, it is marked by a ready exchange of experience, by a high regard for truth, and by a conviction that wild birds express the most spectacular

development of nature." It seems obvious then, why it would be easy to get "hooked" on birding once first exposed by a friend, scout leader, teacher, book, or by accident. What then causes some individuals to progress from casual to serious birder?

The author of the *Time Magazine* article speculates that it is the competitive aspects of birding and a basic "collector" mentality that has resulted in lists and contests. Such competition is no small matter. As birders progress from backyard watching to making lengthy expensive trips to see single birds, the competition can become pretty serious, both competition with oneself or with other birders. The result has been a tremendous growth in the American Birding Association, the acknowledged referee of bird listing. The ABA has about 8000 members, and its checklist committee rules on events like "Big Days" and other competitive birding. They even maintain statistics on leading birders, much like batting averages and other statistics are kept for baseball players! Other services have arisen to accommodate the needs of the serious birder. The North American Rare Bird Alert is a "for-profit" telephone system to alert birders to rarities throughout North America. Local groups, such as WSO and Madison Audubon offer hotline services to report rare species. Such aids must help. In 1972 only 75 birders had recorded over 600 North American species; in 1987 there were over 500!

All birders should guard against activities that could downgrade the image of birding. As J. J. Hickey went on to point out in his 1943 book: "The art of bird watching. . .at its best is a sport, testing the eye, the ear, and one's legs. At its worst, it is a mad rush to

the next oasis, with birds ticked off on the run, and a great reliance placed on both gasoline and brakes." Almost 50 years ago, Hickey saw both ends of the spectrum.

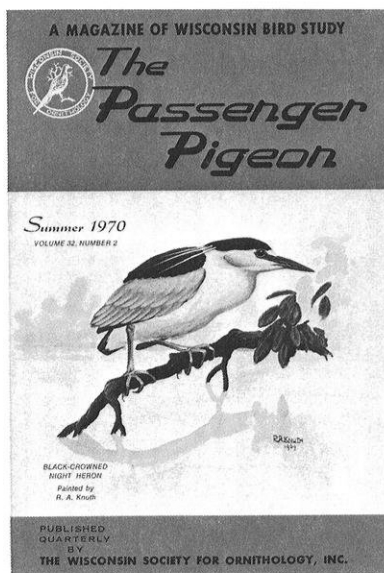
There can be no denial of the popularity of birding, but what of its importance beyond individual pleasure and recreation? In fact, what was once a rather unusual hobby is now a necessity for modern ornithology. There are many opportunities for amateur birders to make an important contribution to ornithology: the Christmas Bird Count; Stan Temple's Wisconsin Checklist Project; Project Feeder Watch; the Breeding Bird Survey; the Nest Record Program; observations of banded or marked birds; inventories, such as the Sandhill Crane count or, the mid-winter Bald Eagle count, and contributions to various research projects are some important opportunities. Much of what we know about birds

came from amateur birders or amateurs who went on to careers as professional ornithologists. Consider the contributions of Margaret Nice, or the backgrounds of J. J. Hickey or Roger Tory Peterson as youthful birders in New York City. If you would like to trace the birding history of such an individual, I suggest you read "Joseph J. Hickey: Birder" in *Defenders Magazine*, February, 1982.

The popularity of birding will continue to grow. Important contributions are still possible, and perhaps the biggest one of all might be to be sure each and every one of you introduce a child to the life-long hobby of birding.

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Angelia Kumlien Main (*photograph courtesy of Hoard Historical Museum, Fort Atkinson*)

Angie Main's Bird Companions

by Michael J. Mossman

When we think of the early days of ornithology in Wisconsin, the Kumlien family comes foremost to mind. Thure Kumlien emigrated to the Lake Koshkonong area from Sweden in 1843 and collected a wealth of information on that area's birdlife over the ensuing decades (Schorger 1946). His eldest son, Ludwig, from an early age carried on this work (Schorger 1945), which culminated in *The Birds of Wisconsin* (Kumlien and Hollister 1903). The third generation of Kumliens also included an ornithologist not so well known as Thure and Ludwig.

This was Angelia Kumlien Main (1883–1952), daughter of Thure's second son, Theodore. She grew up on a farm near her grandfather's home at Lake Koshkonong, graduated from Whitewater Normal, and taught school near Albion and in Fort Atkinson and Lake Mills. In 1908 she married John Main, and for over 40 years they farmed near Fort Atkinson. Angie maintained an active interest in history, genealogy, and nature, writing for periodicals and local newspapers, and speaking to schools and organizations in southern Wisconsin. She served as

a curator and vice-president of the State Historical Society of Wisconsin almost until her death in 1952, when she was remembered by the Society as "a lover of birds and flowers and an accomplished genealogist . . . gentle, soft-spoken and firm . . . she will always be associated in our thought with Fort Atkinson and the beautiful region round about it" (Sellery 1952). More information on Main is given by Gerling (1925), State Historical Society of Wisconsin (1960), and the Jefferson County Union (14 August 1925, 2 September 1952).

Main's most significant ornithological writings (Main 1927, 1939, 1943–44, 1945) chronicled the life and work of Thure Kumlien, who documented his observations with specimens, personal notes, and letters to ornithologists, such as Thomas Brewer, but published almost nothing himself. Main conveyed many of Kumlien's notes, journals, and correspondence to the State Historical Society archives.

Main (1920, 1921, 1922, 1927, 1944) also published descriptions of her own experiences in the Koshkonong area. She was especially fasci-

nated by local wetlands with their conifer or hardwood timber, extensive beds of emergent vegetation, and abundant bird life. A visit to the same sites today shows the sort of decline that is probably typical of many southern Wisconsin wetlands and their surroundings over the past 70 years.

During her lifetime Angie Main was best known for her book, *Bird Companions: With Description and Biography of One-Hundred and Fifty Songbirds Found East of the Mississippi. Paying Especial Attention to These Birds in Wisconsin* (1925). This popular account was designed not to provide new information as much as to spark interest in bird life and its conservation. As she said in the preface,

"In writing this book, I have tried not 'to preach,' but to let the birds speak for themselves, and so teach my readers to love them for their own sakes, not for their utility alone, but for their bright songs, their beauty of form and plumage, their grace, their powers of flight, their helplessness, their skill in nest building and for the loving care and protection of their young.

"If, after reading this volume, when you are attracted by a new bird or hear a new song, you will pause to look and listen and spend some time in 'Birdland' and then keep on until you have several bird companions and know the ways of 'Birdland,' my object in writing this book will have been accomplished."

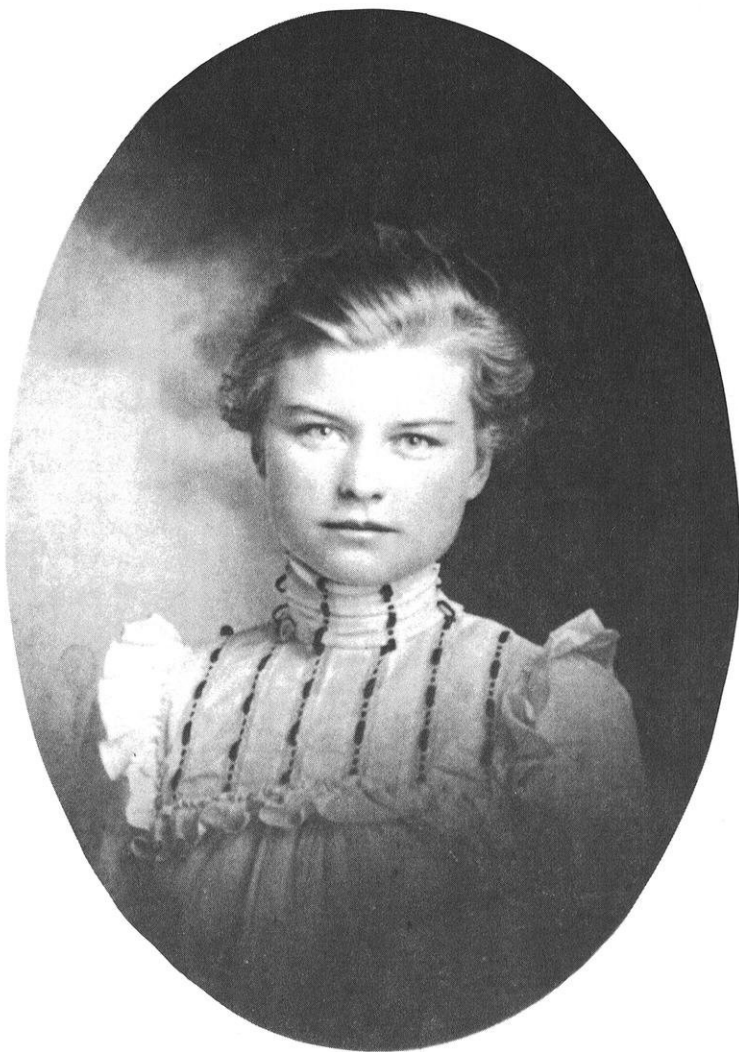
The book contains accounts of 150 songbird species and subspecies, with several black-and-white photographs, some of which she apparently took herself, and a few color illustrations, most by Bruno Ertz. There are frequent lines of verse by Main, John Burroughs, Frank Bolles, Edith Thomas, and others. An appendix contains a general-

ized "key for identification by conspicuous markings" organized by dominant plumage color. The prominent ornithologist Robert Ridgway wrote a brief introduction and interjected a few comments within the text. *Bird Companions* can be found in many libraries and can be purchased through used book shops for well under 10 dollars.

When *Bird Companions* appeared in 1925, it had been more than 20 years since a major work had been published on Wisconsin birds, and there were few outlets for publication, even though significant field work was being done by Gromme, Jackson, Stoddard, and others. So it is not surprising that this book gave Main a place as Wisconsin's foremost authority on birds (Gerling 1925), a reputation fostered by her Kumlien heritage and by Ridgway's endorsement.

Bird Companions was written in the tradition of popular authors, such as Florence Merriam (1889) and Neltje Blanchan (1897), who humanized birds and, thus, endeared them to children and general readers. This apparently served the book's purpose well. The Jefferson County Union (14 August 1925) headlined its review of the book "Birds, Hobby of Farm Woman, Have Strange Traits, Some Almost Human, Book Reveals." Gerling (1925) said "Mrs. Main does not present her material in a dry, catalog-style, but in an intensely interesting and readable manner. Appropriate verse and pleasantly intimate observations made in the swamps and wildwoods of old Koshkonong liven the pages." Here is a sample:

"The yellow-breasted chat is the imp of all birdland, possessing such a marked individuality that he is a bird of more



Angelia Kumlien Main in her youth (*photograph courtesy of Hoard Historical Museum, Fort Atkinson*)

than usual interest. How well I recall my first introduction to this bird clown, beginning an acquaintance which has lasted twenty years. It was a hot day in July, in an opening in the thick woods, where grew hazel bushes and blackberries, the latter of which I had been sent to pick. After working for some time, all the while enjoying my surroundings, I felt that I was being laughed at and barked at by a boy and his dog. . . . After some searching and much listening, I found the actor in this strange vocal performance to be his clownship, the yellow-breasted chat."

The species accounts are written mostly in terms of human traits. The Hairy Woodpecker is a "plain, industrious, useful bird citizen. . . . He works at getting his bread and butter, building his home, and raising his family." Sapsuckers are "bright, handsome, clever birds", Pileated Woodpeckers are "noble-looking", Red-headed Woodpeckers are "jolly, interesting, and handsome", and the Northern Flicker "very gay and beautiful . . . a gallant lover."

Only a few birds are judged critically. House Sparrows, are "quarrelsome nuisances . . . foreign rogues . . . vulgar, noisy hoodlums," though "quick-witted and with untiring domestic habits" worthy of emulation. And of the Brown-headed Cowbird she states: "No poet has deigned to write about these shirks, these shiftless, shameless interlopers of our bird world. We do not connect these birds with sentiment or with any tender feelings whatever; nor do they deserve any, for they are lazy, indifferent nest parasites." Moreover, they are "polygamists!"

What may have been "intensely interesting" to a general readership in 1925 may seem overly sentimental and tiresome to many of us today, as it cer-

tainly was to some ornithologists and naturalists of the 1920's. And yet this writing shows closeness between the author and her subjects, constrained as it may be by anthropomorphism. In his Introduction, Ridgway states that "It is very evident that the author has not only been a lover of birds from early childhood but was literally "brought up" in intimate companionship with them and therefore has enjoyed unusual opportunities for learning of their ways."

This companionship flourished under the influence of her family, especially grandfather Thure, who had a profound effect on her although he died when she was but five years old. She developed an abiding affection for him and for the birdlife with which he acquainted her, and she dedicated *Bird Companions* to his memory.

In *Koshkonong Naturalist* (1943-44), she recalled some of these early days:

"I recollect his taking me into his parlor down at the old farm, his raising the shades and saying, 'Aunt Sophia likes it dark in here so the sun won't fade the carpet, but I like it light.' Then he would show me the best of his collection of mounted birds and animals which he kept in this room. He once entertained me by teaching me to draw a pig. . . .

After her grandfather died,

"I called upon or visited Great-aunt Sophia Wallberg, Grandmother Kummlien's sister, at Grandfather's home several times a week. The walk down through the woods to the house was an especially beautiful one to me. After we left our yard we followed a road which ran beside a long row of Indian mounds. . . . Beautiful Lake Koshkonong was in plain sight all the way except where a small piece of woods, which we called 'the breaking,' hid our view. This piece of unpastured

woodland, with a rail fence along the side of the road, was left in its natural state to save the beautiful ferns and flowers—maidenhair ferns and yellow lady-slippers grew there in great abundance.

"When I went after the cows at night, I used to wish they would be way down by the old spring so I could stop in to see this great-aunt of mine. She used to let my older brother and me take the discarded mounted birds out of the old log house [Thure's former home] to play with, if we would put them back again. Our favorites were a pelican, a blue heron, a sand-hill crane, and a pink flamingo. They were tall and mounted in an upright position on boards that we could drag around and play horse with. The driver had to hold the lines with one hand and keep the bird right side up.

"It was always of great interest to explore the old log house. . . . The live squirrels and the chipmunks used to run around in there among the mounted ones and at our approach would sit upright, so that it was hard to tell which were alive.

"A pair of house wrens raised a family between two logs where the plaster had fallen out. The barn swallows plastered their mud homes against the walls and flew in and out of the broken windows unmindful that this was once the home of a great naturalist. . . .

"I loved to go into the big room, or loft, upstairs, where on the floor was a huge pile of letters. . . . After I was older, it was a great pleasure for me to read those letters, many of which were intensely interesting and which I took home with me. The letters I found from Edward Lee Greene, who later became a well-known botanist, were my favorites [See, Main 1929]. As I sat there on that stack of letters with the bees and hornets flying around, I was lost to the present and was following this soldier lad through the Civil War, then later over the plains and mountains of Colorado and California in his search for flowers and new plants."

Eventually Angie attended White-water State Teachers College, where some of Thure's many bird mounts were used: "At first when I became too homesick, I visited the Zoological Department and there had it out with Grandfather's birds. His name on the labels was a great comfort, and that wonderful collection seemed to belong to me."

Some of the most notable passages from *Bird Companions* are those from Main's childhood:

"One of the pleasantest memory pictures of my childhood is one seen from the west dining room window out at our old farm house. I need but to close my eyes to bring it back; an open window full of happy, wondering children, a bed of gayly-colored phlox, the air laden with their rich perfume, and humming birds, which seemed to hang in mid-air before these flowers, as they rifled them of their nectar. To this day the sight of a humming bird brings back the odor of the phlox. And then also comes to mind the sly chase we gave those birds around the petunia bed, in the hopes that we might catch one and hold it in our hands for a moment to see if it were really a bird. . . . Fortunate indeed are the children who have brothers and sisters, birds and flowers for their playmates.

"As long as I can remember a case of mounted birds with one of these beautiful [cerulean] warblers in the front sat on our parlor table. As a child, I used to look at this bird and plan that when I grew to be a big lady, I would have a fine silk party dress just the color of this plumage and trimmed with black velvet.

"When I was a child, the phoebes returned year after year and nested above my bedroom window, which was in the second story above the porch roof. Here the birds felt secure from cats and other enemies, but they were not out of reach of small girls, who repeatedly crawled out

of the window onto the slanting porch roof to count the four to six white eggs or to see if the first little birds had left the nest and if the second brood was yet hatched. This the old birds did not mind, as we never harmed, but only admired them. The day the phoebes came back to us and began to repair the old nest or to build a new one was always a red-letter day.

"Years ago while visiting an Indian camp one winter in the heavy woods along Koshkonong Creek in company with the Indian children, we found great pleasure in watching one of these [red-bellied] woodpeckers play around a large tree trunk. He went around the trunk so fast that he looked like a ball of red and gray."

Main's observations came from a time when Wisconsin was less populous and less urban, with fewer human distractions, and where agricultural practices were friendlier toward wildlife; when many people were closer to nature on a daily basis and were more likely to learn about it in their own gardens, farms, and neighborhoods than from the various media on which we rely so much today. It's instructive to a more "sophisticated" generation of bird watchers and ornithologists to be reminded of the pleasure and intimate knowledge that a patient observer can gain by watching, listening, and living among even the common sorts of birds:

"At evening when the farm work is all done, the chickens gone to roost, the cows to their night pasture, and everything about the farm is settled and quiet, the vesper sparrow's song is a vocal expression of peace.

"One beautiful morning during the height of the May migration when nature was in her most joyous mood, the birds in the nearby woodland were having a full chorus practice. Not content to be

a back seat listener, I sauntered to the middle of the grove where I occupied a box seat in the shape of a large granite stone. In the treetops above my head and all around could be heard the joyous notes of the different birds. The silver notes of the wood thrush, the oriole's happy song, the robin's cheery lay, and the animated strain of the vireos fell upon my ears. From the meadow across the road could be heard the bobolink's tinkling fireworks and the fife-like whistle of the meadow lark, and joining in from the bushes and lower branches of trees . . . the black-throated blue warblers sang their drowsy, languid "zee, zee, zee". Heard alone, the song is not remarkable, but it is charming in the general chorus. It possesses soothing qualities which put one at his ease and in perfect harmony with the things about him."

In the '20's it was also acceptable to keep wild pets. "A gentle little lady who lives in Lake Mills . . . and who is a great friend of the birds, has a pet blue jay. When she sits out on the porch with her sewing, he alights on her lap and pulls the thread out of her needle, then he alights on her head and pulls the hairpins out of her hair."

Those too were the days before common names of birds were standardized. As with so many things, our concern with efficiency has sacrificed some of the richness of older ways. Not that we should return to that confusion, which argued the necessity of scientific bird names, but these colloquial names often convey more of the character and haunts of a bird species than the "lowest common denominators" that have since become standard. The alternate names mentioned in *Bird Companions* include "bull-bat," "summer yellow bird," "log-cock," "bee martin," "snowflake," "Harry wicker," "titlark," and my favorite (for the Hermit Thrush) "swamp angel."

True to the standard of her day, Main preached the usefulness of birds (even the despicable cowbird), particularly their consumption of harmful insects and weed seeds. The advance of clean farming, with its reliance on potent pesticides and herbicides seems to have rendered these arguments for bird conservation less pertinent, while at the same time magnifying the threat to bird populations. Conservation's more recent rallying cry of "biological diversity" still argues for usefulness, but like Main we are largely driven by a subjective desire to protect the richness of the natural world and our "companions" in it.

Unfortunately, *Bird Companions* presents little historical information about the distribution, abundance, and habits of Wisconsin birds, other than what was drawn (with no citation whatsoever) from Kumlien and Hollister (1903). As with the latter publication, *Bird Companions* gives rather scant treatment to northern Wisconsin birds, and it repeats several of that work's oversights (e.g., that Mourning Warblers do not breed in Wisconsin) and dubious statements (e.g., that White-crowned Sparrows and Orange-crowned Warblers breed here). In some cases it's impossible to know whether Main's descriptions of nesting habits, for example, refer to her own Wisconsin experience or are simply paraphrased from other texts. More convincing is her description of several Blue Grosbeak sightings in Jefferson County.

Nevertheless, a comparison of Main's observations with Kumlien and Hollister (1903), other historical sources, and current knowledge does help us recognize trends in a few species. For example, neither Kumlien and Hollister

(1903) nor King (1883) found Wood Thrushes nesting in towns, although this had been noted in eastern states (King 1883, Baird et al. 1874). Main says that "Years ago the wood thrush was considered to be an inhabitant only of the deep, shadowy woods, but of late years he has changed his haunts somewhat, and has gained enough confidence in people so that he is seen along shaded village streets and on lawns which contain trees and shrubbery." It seems since to have abandoned villages and farmsteads as breeding habitat.

Main's information on Yellow-headed Blackbirds is also original (see also, Main 1927) and proves that their decline on Lake Koshkonong (where only a few breed today) has occurred since the 1920's:

"These birds are friendly and will walk about in dooryards if there happen to be any near their chosen habitat. After rainstorms, great flocks of them have been seen feeding on bugs and insects off the lawn around the club house on Black Hawk Island in Lake Koshkonong. They breed in great numbers around this lake."

The Northern Cardinal, common throughout southern Wisconsin today, was just beginning to spread into our state during Main's time:

"Of late years they have been frequently seen as far north as Wisconsin in the winter time and very often in the spring and summer where they are now permanent residents. It is hoped that in time they will become as common here as they are in the East."

The Red-winged Blackbird today is widespread during the nesting season in upland hayfields and oldfields; but during the 1920's it had yet to expand

from its original wetland breeding habitats:

"With a sailor's fondness for water, the red-winged, or swamp blackbirds will surely be found near it. Their chosen haunts are low meadows, marshes, and reedy margins of ponds and lakes and running water. . . . Owing to their partiality for low, wet ground for breeding places, they are somewhat local in their distribution."

Today, we would be hard pressed to duplicate Main's experience with Bank Swallows, which have certainly declined since then:

"The sociable little bank swallows are seen in immense flocks after the young are raised. Near Rock River in southern Wisconsin, a flock containing between two and three thousand were counted this July (1924). Hundreds of them would fly from the fences and telegraph wires, where they were resting, and sail off into the air to feed, and then again light and rest for a time. . . . It was an impressive sight and sound, . . . thousands of these graceful birds sailing, skimming, hovering above, around, and about us like a dense cloud, until they seemed to darken the landscape. . . .

"In the aforesaid neighborhood there were high sand banks where these happy birds nested in colonies. Some of the banks rose from the river, while others were high hills with roads cut through, thus forming steep banks which served admirably as homes for the swallows. On one side of the road I counted one hundred and fifty holes that had been excavated by them."

Although Kumlien and Hollister (1903) found Lark Sparrows decreasing in southern Wisconsin after the breaking of the prairie sod, Main apparently saw them still in "wooded pastures, roadsides, [and] hay fields", and

recalled from childhood a nest in a Jefferson County hayfield. This species has since become quite uncommon except in the western counties. Orchard Orioles, too, were apparently more widespread then: "Here in southern Wisconsin they are fairly common, even nesting in orchards on the edges of towns."

It was not only orioles that frequented orchards in the early 1900's, for of all the habitats to which Main refers, it is orchards that seem most surprisingly rich in birdlife. Among their breeding birds she includes Yellow-billed Cuckoo, Downy Woodpecker, Eastern Kingbird, Great Crested Flycatcher, Least Flycatcher, Cedar Waxwing, and others, along with a host of migrants. The breeding avifauna of this habitat has become rather meager since then, probably because of the loss of "home" orchards and the increased efficiency of commercial operations (Graber and Graber 1963, Mossman and Lange 1982).

Angie Main wrote at a time when native bird species were more accessible in everyday life, when natural habitats were less fragmented, and when agricultural and urban habitats were richer in birdlife. She found her bird companions close by, without the benefit of today's sophisticated field guides, checklists, optics, and audio tapes. Today, these aids and our greater mobility compensate somewhat for more depauperate landscapes, yet these factors tend to preoccupy us and sometimes encourage us to rush along and "miss the forest for the trees." Simple, firsthand encounters with birds, no matter how common the species, can yield satisfying associations among birds, places, and feelings, and an intimate awareness of the character

of birds. It is the quality rather than the sheer quantity of encounters that matters, for such an awareness does not result from a long checklist any more than a long list of people we "know" can substitute for any set of true friends.

Angie Main understood this, and we would do well to accept her challenge to "put on your rubber boots and get into this old scow with me and we will paddle around to that clump of tall rushes", and to "come with me, in memory, please, to the orchard out back of the old farm home."

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Birds of Wisconsin Northern Mesic Forests

by Randy M. Hoffman

Northern mesic forest is the largest natural community in Wisconsin. The total acreage in presettlement times was estimated to be 11.7 million acres or approximately one-third of the states' total land area (Curtis, 1959). These forests are found predominately north of the tension zone; however, some relict stands occur further south. The mesic forest is usually located on deep loam soils and gently rolling terrain.

Northern Wisconsin mesic forest, about the time of the Civil War, consisted of sugar maple (*Acer saccharum*), hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), beech (*Fagus grandifolia*), white pine (*Pinus strobus*), basswood (*Tilia americana*), elms (*Ulmus* sp.), and several other species which occurred sparingly. Not all species occur at every site. Several species reach their western range limit in Wisconsin and are not found naturally further west. American beech is restricted in Wisconsin from Shawano, eastern Langlade County and central Marinette County to the south and east. Eastern hemlock reaches its range limit in eastern Washburn and Bayfield

Counties, Yellow Birch becomes very scarce near the St. Croix River. The net effect is that the tree species become less diverse as one travels west.

As with tree composition, the understory of the northern mesic forest changes across its range. These changes in composition and structure are dependent upon local relief, soil properties, moisture and canopy structure. Dense stands of mature hemlock have intermediate wood-fern (*Dryopteris intermedia*), clubmoss (*Lycopodium* sp.), and wood sorrel (*Oxalis montana*) as the predominant groundlayer species. Hardwood stands have a different composition and can vary over short distances. Species commonly found occurring in mature northern mesic forest stands include Canada mayflower (*Maianthemum canadense*), twisted stalk (*Streptopus roseus*), Solomon's seal (*Polygonatum pubescens*), naked miterwort (*Mitellanuda*), white baneberry (*Actaea alba*), large-leaved aster (*Aster macrophyllus*), bluebead lily (*Clintonia borealis*), partridgeberry (*Mitchella repens*), starflower (*Trientalis borealis*), large-flowered trillium (*Trillium grandiflorum*) large bellwort (*Uvularia grandi-*

flora), and downy yellow violet (*Viola pubescens*) (Curtis 1959).

Shrub composition also is greatly dependent upon topography, soils, moisture and especially, the percentage of canopy closure (openings). In addition to sapling trees which make up a great proportion of the shrub layer, important species include beaked hazelnut (*Cornus cornuta*), red-berried elder (*Sambucus pubens*), fly honeysuckle (*Lonicera canadensis*), leatherwood (*Dirca palustris*), swamp currant (*Ribes lacustre*), maple-leaved viburnum (*Viburnum acerifolium*) and formerly yew (*Taxus canadensis*) (Curtis 1959).

What did northern Wisconsin look like at the time of first exploration? It is not totally known although there are many accounts of impressions and perceptions by early explorers. These descriptions gave us a general picture of the landscape, but nothing quantifiable came forth until the area was surveyed. Most of Northern Wisconsin was surveyed between 1850 and 1875. The General Land Survey conducted a complete section-by-section survey. The surveyors would blaze and record four witness trees at each section corner and two at each quarter section corner. Data recorded included the species, diameter at breast height, and distance from the corner of each witness tree. In addition, surveyors were to make comments on the condition of the land, quality of the timber, and suitability for agriculture. The land survey records are invaluable in characterizing the vegetation of the mid-nineteenth century and quantifying changes that have occurred since then (Stearns 1949) (Ward 1956).

This forest described by the land surveyors is almost non-existent today. Virtually the entire forest was logged

prior to 1930. Those few areas not logged were either young stands that started development just before the logging era or non-merchantable trees. Today following regrowth and various protective measures, roughly 6.1 million acres now occupy the area identified as northern mesic forest. Of this, 3.2 million acres fall into the classically described northern mesic forest, while the rest is composed mostly of early successional species such as aspen and paper birch (Smith 1986).

The average age of the forest is also changing. The young early successional forest of the early 1930's, has gradually aged. The average age of this second growth forest is increasing even with continued commercial harvest and intensified silviculture practices. Although increasing in age, the median age of mesic hardwood forests is only about 50 years old. By not including aspen, where the median age is younger due to short-rotation regenerative clear-cut practices, the median age is still just over 60 years. While long-lived using the age of a human life reference, it is quite young for a forest where many stands may live 200–300 years and some individual trees may live 500 years (Smith 1986.)

Remnants of the presettlement type forest persist today only in small, scattered, often isolated stands. Within the interval 1969–1983 the Wisconsin Department of Natural Resources conducted a county-by-county search for significant natural areas. This survey revealed that only around 20,000 acres of northern hardwood-hemlock remain in a condition approximating that of the presettlement forest. The rest has been significantly altered, directly or indirectly, by human-related disturbances such as logging, fire and ov-

erbrowsing (R. Epstein, unpublished notes).

Our present northern mesic forest is much different than presettlement northern mesic forest. Foremost is the fact that nearly 100% of the forest has been cut at least once. In addition, large acreages were plowed for farming; while some failed, many farms still exist within the presettlement northern mesic forest boundaries.

The composition of the remaining forest has also changed. The most dramatic change is the tremendous increase in aspen, (predominantly quaking (*Populus tremuloides*) and big tooth (*Populus grandidentata*). Going from a very small component of the presettlement forest to about 2.9 million acres today. Other increasing species are sugar maple and basswood, while those decreasing in abundance are hemlock, white pine, and yellow birch.

The processes working on the present day forest are much different. Natural forces of wind, disease, insects, and fire (although now greatly controlled) still affect the forest dynamics. However, human impacts are by far a greater shaping force. The major process today is logging. Other human related forces that shape forests include transportation, urban sprawl, grazing, vacation homes, and environmental degradation.

The current forest wildlife is also much different than in presettlement times. Although there was very little quantitative ornithology at the time of settlement, we can surmise that there was a somewhat different avifauna then, one that was more reflective of an older, more structural diverse forest. Northern mesic forest birds have been shown (Temple et al. 1979) to support

species both from the south (hardwood lovers) and from the north (conifer lovers). Together they mix in the northern mesic forest to produce a species diversity higher than that found in the physiographic regions to the north or south. Species whose range centers in this forest are few, including Nashville Warbler, Black-throated Blue Warbler, Blackburnian Warbler, Chestnut-sided Warbler and Canada Warbler (Temple et al. 1979).

Table 1 shows the diverse avifauna associated with northern mesic forest. Any particular stand will contain significantly fewer bird species, depending on local physiography and past history. Because the northern mesic forest is so large and diverse it is necessary to understand that different stands will have different species and stands in different stages of succession will have different species.

By understanding current processes working on the forest, the reader should develop an understanding of what species occur within certain tracts. Let's begin at the beginning and start a forest on its long process of succession. We also have to remember the northern mesic forest has species whose main ranges are centered either north (in coniferous forests) or south (in deciduous forests). Therefore, we will follow two different types through the process. A mixed forest of both hardwoods and conifer could harbor anywhere from some to most (but usually not all) of the species in both categories.

A forest is leveled (Figure 1). Whether it be a fire, windstorm or clearcut, the regenerative process begins. The first year the avifauna is largely open-ground species and cavity nesters that use and depend on the

Table 1. Birds which nest in northern mesic forests and their relative abundance.

Species	Abundance
Wood Duck	Common
Osprey (near water)	Uncommon
Bald Eagle (near water)	Uncommon
Sharp-shinned Hawk	Common
Cooper's Hawk	Uncommon
Northern Goshawk	Rare
Red-shouldered Hawk	Uncommon
Broad-winged Hawk	Common
Ruffed Grouse	Common
Mourning Dove	Uncommon
Black-billed Cuckoo	Rare
Yellow-billed Cuckoo	Common
Great-Horned Owl	Common
Barred Owl	Common
Long-eared Owl	Rare
Saw-whet owl	Rare
Common Nighthawk	Rare
Whip-poor-will	Common
Ruby-throated Hummingbird	Common
Red-headed Woodpecker	Rare
Red-bellied Woodpecker(south)	Rare
Yellow-bellied Sapsucker	Uncommon
Downy Woodpecker	Common
Hairy Woodpecker	Common
Northern Flicker	Uncommon
Pileated Woodpecker	Uncommon
Eastern Wood Pewee	Common
Yellow-bellied Flycatcher	Rare
Least Flycatcher	Common
Eastern Phoebe	Rare
Great Crested Flycatcher	Uncommon
Blue Jay	Common
American Crow	Common
Common Raven	Uncommon
Black-capped Chickadee	Common
Red-breasted Nuthatch	Uncommon
White-breasted Nuthatch	Common
Brown Creeper	Uncommon
House Wren	Rare
Winter Wren	Rare
Golden-crowned Kinglet	Uncommon
Ruby-crowned Kinglet	Rare
Eastern Bluebird	Uncommon
Veery	Common
Swainson's Thrush	Rare
Hermit Thrush	Rare
Wood Thrush	Uncommon
American Robin	Uncommon
Cedar Waxwing	Rare
Solitary Vireo	Uncommon
Yellow-throated Vireo	Uncommon
Warbling Vireo	Uncommon
Red-eyed Vireo	Common
Golden-winged Warbler	Uncommon

Table 1. (Continued)

Species	Abundance
Nashville Warbler	Uncommon
Northern Parula	Rare
Yellow Warbler	Common
Chestnut-sided warbler	Common
Magnolia Warbler	Rare
Cape May Warbler	Rare
Black-throated Blue Warbler	Uncommon
Yellow-rumped Warbler	Uncommon
Black-throated Green Warbler	Uncommon
Blackburnian Warbler	Uncommon
Pine Warbler	Rare
Black-and-white Warbler	Uncommon
American Redstart	Uncommon
Ovenbird	Common
Mourning Warbler	Uncommon
Common Yellowthroat	Common
Canada Warbler	Uncommon
Scarlet Tanager	Common
Rose-Breasted Grosbeak	Common
Indigo Bunting	Common
Rufous-sided Towhee	Common
Chipping Sparrow	Common
Song Sparrow	Common
White-throated Sparrow	Common
Dark-eyed Junco	Rare
Common Grackle	Uncommon
Brown-headed Cowbird	Common
Northern Oriole	Common
Purple Finch	Uncommon
Pine Siskin	Rare
American Goldfinch	Rare
Evening Grosbeak	Rare

concentration of snags. Sometimes regrowth is rapid and dense, in the case of aspen after cutting or fire or sugar maple after cutting or windfall. At any one time between 5 and 7% of the forest may be in this stage of development. The birds associated with these young, sometimes dense forests occasionally interspersed with snags are American Kestrel, Ruffed Grouse, American Woodcock, Northern Flicker, Downy Woodpecker, Eastern Kingbird, Least Flycatcher, Tree Swallow, Gray Catbird, Brown Thrasher, Chestnut-sided Warbler, Golden-winged Warbler, Mourning Warbler,

continued



Figure 1. Clearcut on the Nicolet National Forest (Photo by Cliff Germain).

Brown-headed Cowbird, American Goldfinch, Veery, American Robin, Nashville Warbler, Black and White Warbler, Common Yellowthroat, Rose-breasted Grosbeak, Indigo Bunting, and Song Sparrow.

Then, the forest increases in height and density, especially aspen or dense sugar maple forest. Coniferous forest typically have some openings, but may form very dense stands, especially hemlock. The structure of these forest stages is quite simple. There is virtually no shrub understory and a correspondingly sparse ground layer. A majority of present stands of this age are hardwoods, although occasional dense mesic coniferous stands or mixed stand are found. Approximately 20–25% of the present northern mesic forest is in the sapling stage (Figure 2). Birds commonly found in sapling deciduous for-

est include Ruffed Grouse, American Woodcock, Downy Woodpecker, Black-billed Cuckoo, Least Flycatcher, Blue Jay, Black-capped Chickadee, Hermit Thrush, Veery, Red-eyed Vireo, Black-and-White Warbler, Golden-winged Warbler, Chestnut-sided Warbler, Ovenbird, Mourning Warbler, Canada Warbler, American Redstart, Rose-breasted Grosbeak, Rufous-sided Towhee, White-throated Sparrow, Song Sparrow. Those in coniferous saplings include Black-capped Chickadee, Hermit Thrush, Solitary Vireo, Nashville Warbler, Magnolia Warbler, Yellow-rumped Warbler, Ovenbird, Brown-headed Cowbird, Evening Grosbeak, Dark-eyed Junco, Chipping Sparrow, and White-throated Sparrow.

The forest continues to grow older and taller, trees become pole-sized (5–9 inches in diameter). There is a con-



Figure 2. Sapling stage of Northern Mesic Forest with dense trees; notice the stumps in the left center (*Natural Areas File Photo*).

stant thinning process going on as trees compete for light, water and nutrients. More spacing occurs between individuals. The canopy is nearly complete with very few breaks. The light reaching the ground is much reduced; however, the thinning process has allowed the beginnings of a shrub layer to develop. Pole-sized stands occupy approximately 45–50% of all northern mesic forest stands today (Figure 3). Pole-sized deciduous stand birds include Ruffed Grouse, Northern Flicker, Yellow-bellied Sapsucker, Hairy Woodpecker, Downy Woodpecker, Eastern Wood Pewee, Least Flycatcher, Blue Jay, Crow, Black-capped Chickadee, White-breasted Nuthatch, Wood Thrush, Veery, Cedar Waxwing, Red-eyed Vireo, Black and White Warbler, Black-throated Green Warbler, Ovenbird, Canada Warbler, American

Redstart, Brown-headed Cowbird, Scarlet Tanager, Rose-breasted Grosbeak, and Indigo Bunting.

The birds in pole-sized coniferous or mixed forest include Yellow-bellied Sapsucker, Hairy Woodpecker, Downy Woodpecker, Yellow-bellied Flycatcher, Eastern Wood Pewee, Least Flycatcher, Black-capped Chickadee, Crow, Common Raven, Red-breasted Nuthatch, Hermit Thrush, Black-and-White Warbler, Nashville Warbler, Northern Parula, Yellow-rumped Warbler, Ovenbird, Canada Warbler, Purple Finch, Evening Grosbeak, Dark-eyed Junco, Chipping Sparrow, and White-throated Sparrow.

The next stage is sometimes called the saw-timber stage. The trees are still larger (greater than 9 inches in diameter) and more widely spaced (Figure 4). Although the canopy is mostly



Figure 3. Pole-sized paper birch showing lower density; notice the young conifers and large old stumps (Photo by Robert Read).

closed, a shrub layer and understory of sapling trees is developing. These older "mesic" forests are less easily classified as deciduous or coniferous. They often contain both groups in the canopy and understory. About 25–30% of the northern mesic forest is currently classified as saw timber. Typical species in these "mature" forests include Sharp-shinned Hawk, Broad-winged Hawk, Red-shouldered Hawk, Great-horned Owl, Barred Owl, Pileated Woodpecker, Yellow-bellied Flycatcher, Red-eyed Vireo, Veery, Canada Warbler, Ovenbird, Magnolia Warbler, Black-and-White Warbler, Black-capped Chickadee, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Hermit Thrush, White-breasted Nuthatch, Scarlet Tanager,

Ruffed Grouse, Wood Thrush, and Solitary Vireo.

If no large-scale catastrophic disturbance occurs, the forest begins to show signs of old-growth (Figure 5). The thinning process continues. Old trees die or topple in the wind. As they fall, gaps are created in the canopy allowing additional light to reach the forest floor. This promotes rapid growth and in little time these gaps are filled with saplings all competing for available light. Other trees may have their heartwood rot out, becoming shells around habitable space for many creatures. Old trunks remain on the forest floor, providing a nursery for many young trees and a foraging ground for animals. The older the few remaining trees become the more layered the forest structure becomes, until a nearly perpetual steady state of death and growth pre-



Figure 4. Mature beech and maple forest showing more spacing between trees (Photo by Robert Read).

vails. This state may last for centuries or it can be wiped clean by a natural or human caused disturbance. The dynamics of an old-growth forest, if looked at on a large enough scale, could provide habitat for nearly all of those species previously listed. Due to past logging, fire and other disturbance history, there is virtually no true old-growth in Wisconsin. The approximately 20,000 acres that have been identified as having qualities closely approximating presettlement conditions represent only about 0.17% of the presettlement forest and about 0.32% of today's northern mesic forest acreage. Most of these old growth acres have a natural disturbance origin.

The succession stages and vertical structure are very important in determining species composition. Equally important is the horizontal structure.

The distance from any edge will determine species composition. Some birds are extremely sensitive to habitat edges (Temple 1988). Other factors which help determine species composition are the patchiness of a tract, shape of a tract, degree of connectiveness with other tracts, and topography.

Changes in horizontal structure caused by man has been great. Exceedingly few areas in Wisconsin are far from the influence of man. One half of Wisconsin's forest is within $\frac{1}{4}$ mile of a maintained road, and 97% is within 1 mile (Smith 1986). The remaining 3% is nearly all swamp, bog, or muskeg land. It is virtually impossible today, in a northern mesic forest, to be more than 1 mile away from marks of civilization.

The forest we have today is much different than the presettlement for-



Figure 5. Old-growth forest showing large diameter trees and downed logs; notice the sapling trees filling a gap in the top center (Photo by M. Jaunzems).

est. Today's northern mesic forest is heavily managed with nearly all of it proposed for some type of silviculture practice in the next fifty years. The effects of this management will be to produce plenty of nesting habitat for those species that optimally use early to mid-aged stands. Those species that do best in mature forest will find little of their preferred habitat, and they will have to utilize younger forests as best they can.

SITES

The four sites described here should give you a good sample of northern mesic forest habitats. Featured will be Plum Lake Hemlocks Natural Area in Vilas County, a site containing old-growth hemlock-hardwoods; Giant White Pine Grove in Forest County,

containing a super canopy of large white pines; Marinette County Beech Forest, a hardwood forest containing the beech component of the canopy; and Flambeau River Hemlocks-Hardwoods, the site of a catastrophic blow-down.

Because the northern mesic forest is our state's largest plant community, any few selected sites would not cover all of the facets of this community. The changing compositional structure of this community is so varied that a large number of sites would have to be visited to get a feel for its complexity. To help you gain a better understanding of the forests, an additional 11 publicly owned areas are described briefly at the end.

PLUM LAKE HEMLOCK FOREST

Size.—The designated State Natural Area covers 228 acres. In conjunction, an adjacent 333 acres of public-use natural area bringing the total acreage to 561 acres.

Location.—Vilas County.

Access.—From east; go 0.75 mile south on County Hwy. N from Star Lake, then west on Hook Road 0.7 mile to Star Creek and into the area. From Sayner; go west 1.75 miles on County Hwy. N, then north 4.4 miles on Razorback Road, then take Rearing Pond Road east to the site.

Site Description.—Plum Lake Hemlock Forest is a large, old-growth hemlock-hardwood stand on rolling topography. Tree reproduction is sparse, and the ground layer depauperate. There is a history of high deer populations and winter yarding. The stand originated about 1810 following fire and has gone from aspen to pine to hemlock. The presence of many white birch in the larger size classes suggests fire origin. A selective cutting for pine occurred in the 1880's. White pine stumps are present but not dense. Importance values of tree species in decreasing order are hemlock, sugar maple, yellow birch, and basswood. Soils are Vilas, Omega, and Hiawatha sands.

Birds.—Foremost in any analysis of Plum Lake Hemlock Forest is its size and configuration. At 561 acres it is one of the largest blocks of older growth anywhere in Wisconsin. Secondly, perched on an isthmus, the forest has linear configuration, but these

long sides are water edges. This affords the interior preference birds a relatively secure place to nest. See Table 2 for regularly nesting species.

GIANT WHITE PINE GROVE

Size.—Although only 25 acres, it lies with the Shelp Lake Wilderness Area. The site is located within the Nicolet National Forest.

Location.—Forest County.

Access.—From the intersection of Forest Roads 2183 and 2414 east of Scott Lake and 9.5 miles east of Three Lakes, go north on 2414, 1.7 miles to an old borrow pit on the north side of the road. Walk northeast on Giant White Pine Trail, 0.5 mile to the site.

Site Description.—Giant White Pine Grove is one of the best examples of mature hemlock-hardwoods with a white pine supercanopy. The canopy species are dominated by hemlock, sugar maple, yellow birch, and basswood with taller white pines (to 3 feet in diameter at breast height) adding a supercanopy stratum. Saplings are nearly all sugar maple; shrubs are mountain maple, beaked hazelnut, red-berried elder, and fly honeysuckle. Groundlayer species are bunchberry, bluebead lily, starflower, wild sarsaparilla, large-leaved aster, shining clubmoss, and oak fern.

Birds.—Although much smaller than Plum Lake Hemlock, this site contains many of the same species plus a few associated with the super canopy white pines. The primary reason is the fact that the site is surrounded by unbrow-

Table 2. Breeding birds of four stands of northern mesic forests.

Species	Plum Lake	Giant White Pine	Marinette Beech Forest	Flambeau
Goshawk	Uncommon	Uncommon		
Broad-winged Hawk		Uncommon	Uncommon	
Black-billed Cuckoo				Uncommon
Ruby-throated Hummingbird	Uncommon	Uncommon		
Yellow-bellied Sapsucker	Uncommon	Uncommon	Uncommon	
Downy Woodpecker		Uncommon	Uncommon	Uncommon
Hairy Woodpecker	Uncommon	Uncommon		Uncommon
Northern Flicker				Uncommon
Pileated Woodpecker	Uncommon	Uncommon		
Eastern Wood-Pewee	Uncommon	Uncommon	Uncommon	
Least Flycatcher	Uncommon	Uncommon	Common	
Great Crested Flycatcher	Uncommon	Uncommon		Uncommon
Blue Jay	Uncommon			Uncommon
American Crow	Uncommon			
Common Raven	Uncommon			
Black-capped Chickadee	Uncommon		Common	
Red-breasted Nuthatch	Uncommon	Uncommon		
White-breasted Nuthatch			Uncommon	
Brown Creeper	Uncommon	Uncommon		
Winter Wren	Common		Uncommon	
Golden-crowned Kinglet	Uncommon	Uncommon		
Veery	Uncommon	Uncommon	Uncommon	Uncommon
Swainson's Thrush	Uncommon			
Hermit Thrush	Uncommon	Uncommon	Uncommon	
American Robin			Uncommon	Common
Cedar Waxwing		Uncommon		Uncommon
Solitary Vireo	Uncommon	Uncommon		
Red-eyed Vireo	Common	Common	Common	
Northern Parula	Uncommon	Uncommon		
Chestnut-sided Warbler				Common
Black-throated Blue Warbler	Uncommon		Uncommon	
Yellow-rumped Warbler	Uncommon			
Black-throated Green Warbler	Common	Common	Common	
Blackburnian Warbler	Common	Common		
Pine Warbler	Uncommon	Uncommon		
Black-and-White Warbler	Uncommon	Uncommon		Uncommon
American Redstart		Uncommon		Common
Ovenbird	Common	Common	Common	
Mourning Warbler				Common
Common Yellowthroat				Uncommon
Canada Warbler	Uncommon			
Scarlet Tanager	Uncommon	Uncommon	Uncommon	
Rose-breasted Grosbeak			Common	Uncommon
Rufous-sided Towhee				Uncommon
Song Sparrow				Common
White-throated Sparrow		Uncommon		Uncommon
Brown-headed Cowbird				Uncommon
Purple Finch			Uncommon	
American Goldfinch				Common
Evening Grosbeak		Uncommon		

ken (although young) forest. See Table 2 for regularly occurring nesters.

MARINETTE COUNTY BEECH FOREST

Size.—40 acres located within county forest land.

Location.—Marinette County.

Access.—From Wausaukee, go west on County Highway C 19 miles, then north on Goodman Parkway Road nearly 5 miles. The road bisects the natural area.

Site Description.—Marinette County Beech Forest State Natural Area is a beech dominated forest within a surrounding landscape of hemlock-hardwood forest. The area has granite and greenstone bedrock overlain by glacial till from the Athelstane lobe of the Cary stage of Wisconsin glaciation. The soils are mildly podolized sandy loams on rough to undulating topography. Forest dominants are beech, sugar maple, yellow birch, and hemlock. Ground layer species include starflower, sweet cicely, pyrolas, large-leaved aster, Canada mayflower, white baneberry, and large-flowered trillium.

Birds.—This site has birds indicative of forest dominated by hardwoods and containing American beech. The forest, although surrounded by other forest land, has marked influences of man acting on it. Primarily is the road which forms a corridor diagonally right through the heart of the site. See Table 2 for regularly occurring nesters.

FLAMBEAU RIVER HEMLOCK-HARDWOOD FOREST

Size.—320 acres lying within Flambeau River State Forest.

Location.—Sawyer County.

Access.—From the intersection of County Hwys. W and M, west of Phillips, go south on County M, 5.0 miles, then west on Hines Grade Road, 1.8 miles, then north on Carlson Road, 1.1 miles, to the southern boundary of the natural area. Caution: Carlson Road is dirt-surfaced, unimproved and not maintained.

Site Description.—Prior to 1977 this old-growth forest was dominated by hemlock, yellow birch, and sugar maple with some white ash, elm, basswood, and very large white pine. A wind storm (downburst) on July 4, 1977, felled the entire stand except for a few large trees, providing a unique opportunity to study the role of natural disasters within natural ecosystems. The forest is now composed of sugar maple, yellow birch, and basswood; the hemlocks are disappearing. Small deer and hare exclosures were constructed in both salvaged and unsalvaged portions of the natural area in 1982.

Birds.—The birds are those typical of a large-scale natural disturbance. This site was chosen to give an excellent comparison between natural disturbance regimes and man-produced disturbance. See Table 2 for regularly occurring nesters.

ADDITIONAL SITES

Birchwood Lakes.—A designated Washburn County Primitive Area. The

site features a large 800-acre block of second growth hardwoods. Of significance is the large intact acreage and the west Wisconsin range. Location: Township 38N Range 10, Section 13 (the E 3/4) and Section 24 (E 3/4 of N 1/2).

Totagatic Highlands Hemlocks State Natural Area.—The site features an old-growth hemlock-hardwood stand within a large block of Washburn County Forest Land. Of significance is hemlock here at its western most range limit. Location: Township 42N Range 10W Section 23 (the SE 1/4 SW 1/4) and Section 26 (the W 1/2 NE 1/4 and SE 1/4 NW 1/4). Access is over 2.5 miles of rutted County forest road.

Platte Woods State Natural Areas.—The site features an old-growth forest on the flanks of Flambeau Ridge in northern Chippewa County. Of significance is the mixture of northern and southern species at this forest located at its southwest limit in Wisconsin. Location: Township 32 N Range 7W Section 11 (the N 1/2 NE 1/4).

Outer Island Hemlocks.—This site features an old-growth hemlock-yellow birch forest within the Apostles Islands National Lakeshore. Of significance is the lush understory and its associated birds, that develop with the absence of deer. Location: Township 53N Range 12E on the northwest shore of the island.

Memorial Grove Hemlocks.—The site features an old-growth hemlock forest. This site is a candidate research natural area within the Chequamegon National Forest. Location: Township 39N Range 3E Section 1 (the SE 1/4 SW

1/4 and SW 1/4 SE 1/4). This site is easily accessible through a wayside on the north side of Hwy. 70, 1/4 mile east of the Oneida County line.

Patterson Hemlocks State Natural Area.—This site features an old growth hemlock-hardwood stand. Of significance is the fairly dense shrub-sapling layer and its associated bird life. This is due to the low, stable deer populations. Location: Township 39N Range 4E Section 3 within the N 1/2.

Eau Pleine Park Hardwoods.—This site features an old growth hardwood forest within Eau Pleine Park in the Marathon County Park System. Of significance is its location at the south central limit of the northern mesic forest. Location: Township 26N Range 6E Section 18 (within the NW 1/4).

Scott Lake-Shelp Lake Natural Area.—This site features an old-growth hemlock stand on the northwest shore of Scott Lake within Nicolet National Forest. An excellent trail allows easy access of Forest Road 2183. Location: Township 38N Range 12E Section 17 (the NE 1/4 SW 1/4).

Jung Hemlock-Beech Forest State Natural Area.—The site features an old-growth hemlock-beech-maple forest in Shawano County. Of significance is the beech component, here near its western limit. The site, unfortunately, is entirely isolated and now contains many edge species, but it is still valuable for comparative studies. Location: Township 27N Range NE Section 23 (the E 1/2 NW 1/4).

Peninsula Park Beech Forest.—This park features an expansive area of in-

tact forest. This is of great importance to interior forest birds in this highly developed part of the state. The entire forest lies within Peninsula State Park.

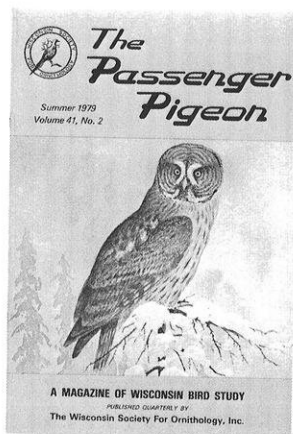
Rock Island State Park.—This site features a second growth forest. Of significance is the large size near 800 acres and the small amount of edge (only on the southwest corner and around the old lighthouse). The park is reached by ferry (no cars) from Washington Island.

ACKNOWLEDGEMENTS

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The Summer Season: 1988

by Thomas K. Soulen

The summer of 1988 was hot and dry enough that it evoked some debate about whether we might actually be experiencing the beginning of the "greenhouse effect." It may be some time before that question is settled, but there is no doubt about the extreme, relentless heat and dry conditions that we experienced. Some crops fared very poorly, with soil moisture down severely and little rain. There were brief breaks of somewhat cooler temperatures, especially early in the summer, but it almost reached or exceeded 100°F in many sections of the state in nearly every week. Rain was mostly spotty through the season. A few times, mostly in July, there were some soaking rains of up to 1–2 inches, and some localized areas received up to 3–6 inches, but the overall season still added up to one of the hottest and driest in a long time.

A number of observers said they thought the drought had a significant impact on some bird species, especially those characteristic of wetlands. Nesting success of many of these was reported to be poor. As many of us saw graphically, a large number of ponds

and marshy areas simply dried up. To the delight of shorebird enthusiasts, on the other hand, a lot of excellent habitat appeared in places that normally are covered with water. Some observers wondered whether the severe drought to the south of us might have had something to do with this year's explosion of Dickcissels in Wisconsin. Finally, one might speculate whether drought conditions could have affected the breeding success of species that summer in or north of our northern counties, or at least somehow affected the time at which they began their fall migration. There was considerably more evidence of early movement than in most years. No less than 9 shorebird species were on the move by or before the last week in June, and several additional species not normally observed until August were noted in July. Most years there are reports of a few warblers near the end of July. This year Tennessee Warblers had appeared in 2 Wisconsin locations before the middle of July, and within the following week observers in southern Wisconsin and Minnesota had found at least a half dozen northern species in

transit. There were even reports from southern Wisconsin counties of both Winter Wren and Golden-crowned Kinglet, presumably migrating, before the end of July.

Despite the summer's drought and heat, Wisconsin observers located an amazing 269 species during the season, significantly more than the average of approximately 260 found in recent years. Of these, 86 were common and widespread enough to be reported from more than 25 counties; they are not included in the listings below. The following additional 42 species were noted in 10–25 counties; the figure indicated for each species is the number of counties in which it was observed: Double-crested Cormorant (20), American Bittern (19) and Least Bittern (10), Great Egret (14), Black-crowned Night-Heron (18), Green-winged Teal (17), American Black Duck (12), Hooded Merganser (11), Osprey (24), Bald Eagle (15), Cooper's Hawk (20), Ring-necked Pheasant (22), Virginia Rail (12), Sora (18), American Coot (22), Upland Sandpiper (18), Common Snipe (25), American Woodcock (14), Herring Gull (19), Forster's Tern (14), Barred Owl (24), Whip-poor-will (21), Alder (21) and Willow (23) Flycatchers, Brown Creeper (18), Blue-gray Gnatcatcher (21), Hermit Thrush (19), Blue-winged Warbler (12), Golden-winged Warbler (18), Nashville Warbler (19), Northern Parula (11), Chestnut-sided Warbler (25), Black-throated Green Warbler (13), Blackburnian Warbler (11), Pine Warbler (19), Black-and-White Warbler (23) and Mourning Warbler (24), Grasshopper Sparrow (20), Henslow's Sparrow (10), Lincoln's Sparrow (10) and White-throated Sparrow (17), and Evening Grosbeak (14). The remaining 141

species are dealt with in the summary below.

Observers found a good sprinkling of rarities, including Wisconsin's first summer records of a Lesser Black-backed Gull in Ashland and a Fork-tailed Flycatcher in Douglas Co. Manitowoc Co. again produced a Laughing Gull and, for the second year in a row, an Arctic Tern. An intensive search for Kirtland's Warblers, orchestrated by the DNR, turned up at least 8 singing males in western and northwestern Wisconsin. There was no evidence of breeding. Other rarities, some of interest because they are not normally found in summer, included Red-throated Loon, American White Pelican, Yellow-crowned Night-Heron, Harlequin Duck, Oldsquaw, Rough-legged Hawk, Piping Plover, American Avocet, Buff-breasted Sandpiper, Chuck-will's-widow, Northern Mockingbird, White-eyed Vireo, Yellow-throated Warbler and Prairie Warblers.

A welcome number of reports included comments on the relative abundance of a variety of species. The list of those thought by at least 3 observers to be present in lower than normal numbers was more lengthy than usual: American Bittern, Green-backed Heron, Blue-winged Teal, Ruddy Duck, Northern Harrier, Broad-winged Hawk, Red-tailed Hawk, Ruffed Grouse, Killdeer, Common Tern, Common Nighthawk, Ruby-throated Hummingbird, Belted Kingfisher, Red-headed Woodpecker, Tree Swallow, Red-eyed Vireo, Yellow Warbler, American Redstart, Common Yellowthroat, Chipping Sparrow, Swamp Sparrow, and Northern Oriole. As usual, there were many less species in the "greater than normal numbers"

category. Heading the list was the Dickcissel, which was widely distributed throughout the state. Eastern Bluebirds appeared to maintain their recently increased numbers, and at least 3 observers also thought that Solitary Sandpipers, Black Terns and Black-billed Cuckoos were present in above normal numbers.

Despite the large total number of species and of rarities reported, coverage of the state was not as good as it has been in some recent years. Seven counties were totally unrepresented by the reports submitted, and a good many more were included only because one or a few people passed through them on the way to their destinations. The 65 contributors this year number more than last year's group, but we're still down from the highs of about 70 of some recent years. On the other hand, a heartening 16 were new contributors for the summer season, and some of those individuals provided information from their home counties, which otherwise would have been represented little if at all. If some of our irregular contributors would be more consistent, and if we could also induce yet more individuals to begin to submit reports from their home counties, we could gradually build up a more balanced and comprehensive picture of our state's summer avifauna. We're doing reasonably well in lots of areas, but we could do better.

REPORTS (JUNE 1-JULY 31, 1988)

Red-throated Loon.—A bird in Douglas Co. through June 9 provided Wisconsin's first summer record in some years (Johnson).

Common Loon.—Nested in Adams Co.

(Humphrey). Seven were noted in Dane Co. July 22 (Robbins). Present also in 15 more northern counties.

Red-necked Grebe.—Noted throughout the period in Winnebago Co. (Ziebell); considerably fewer were reported from this area than in recent years.

American White Pelican.—The only report was of a bird in Winnebago Co. June 18 (Ziebell).

Cattle Egret.—Two were observed in Brown Co. July 25 (Tessen).

Yellow-crowned Night-Heron.—Noted July 8 in Horicon Marsh, Dodge Co. (Soulen).

Tundra Swan.—Observed in Brown Co. June 4 (Norris) and Door Co. June 11 (the Lukes).

Mute Swan.—Reports came from Ashland/Bayfield, Burnett, Dane, Door, Douglas, Sheboygan and Winnebago Counties.

Snow Goose.—A July 10 report from St. Croix Co. (Smith) was very unusual.

Northern Pintail.—Noted throughout the period in Dunn Co. and in June in Burnett, Columbia, Marathon and Winnebago Counties. Birds were observed July 21 and later in Brown, Dodge and Manitowoc Counties.

Northern Shoveler.—Reported in June from Brown, Chippewa, Columbia, Dodge, Green Lake, La Crosse, Manitowoc, Oconto and Winnebago Counties.

Gadwall.—Noted in Brown, Dodge, La Crosse, Manitowoc, Milwaukee, Oconto and Winnebago Counties.

American Wigeon.—Present in these counties: Ashland/Bayfield, Burnett, Columbia, Dane, Dodge, Price, Vilas, and Winnebago.

Canvasback.—Reported from Dunn Co. after July 8 (Polk), Kewaunee Co. July 30 (Peterson) and La Crosse Co. June 1 (Leshner).

Redhead.—Recorded in Brown, Columbia,

Dodge, Manitowoc, Milwaukee and Winnebago Counties.

Ring-necked Duck.—Observed in these counties: Barron, Burnett, Forest, Marathon, Oneida, Vilas and Wood.

Greater Scaup.—Noted July 4–30 in Douglas Co. (Johnson).

Lesser Scaup.—Recorded in these counties: Ashland/Bayfield, Chippewa, Dunn, La Crosse and Manitowoc.

Harlequin Duck.—A pair photographed in Sheboygan Co. June 3–4 (the Brassers) provided Wisconsin's first summer record in many years.

Oldsquaw.—A male in Manitowoc Co. July 18 (Tessen) was similarly highly unusual.

Common Goldeneye.—The only report came from Oneida Co. via the Nicolet National Forest Bird Survey (NNFBS) June 12.

Bufflehead.—Stayed in Dane Co. until June 1 (Robbins).

Common Merganser.—Recorded in Ashland Co. June 18 (Zanoni), Forest Co. June 11 (Reardon) and Price Co. through July 20 (Hardy).

Red-breasted Merganser.—Noted in Ashland (Verch), Bayfield (Swengel), Door (the Lukes) and Manitowoc (many observers) Counties.

Ruddy Duck.—These counties provided reports: Brown, Burnett, Chippewa, Columbia, Dunn, St. Croix and Winnebago.

Osprey.—Observations came from these somewhat southern counties: Columbia June 25 (Ashman), Trempealeau through June 2 (Hunter) and Waukesha July 3 (Sundy), as well as 21 more northern ones.

Sharp-shinned Hawk.—Reported from Milwaukee Co. July 28 (Zehner), Rock Co. July 30 (Tessen), and from 17 more northern counties.

Northern Goshawk.—Observed only in Door (the Lukes) and Douglas (Leshner, Semo) Counties.

Red-shouldered Hawk.—The most northerly reports came from Forest Co. July 20 (Reardon) and Sawyer Co. July 10 (Merkel). Noted also in 14 more southern counties.

Rough-legged Hawk.—Very rarely seen in Wisconsin in summer, this species was present this year in Burnett Co. June 26 (Hoffman fide Tessen) and in Oneida Co. June 1 (Swengel).

Merlin.—A bird in Columbia Co. July 4 was unusually far south (Sunby). Observed also in Bayfield Co. June 8 (Leshner), Florence Co. June 10 (Robbins) and 12 (NNFBS), and St. Croix Co. June 6 (Smith).

Peregrine Falcon.—One reported July 17 in Milwaukee Co., the site of a reintroduction project.

Gray Partridge.—Observed only in Brown, Columbia, Dane, Grant and St. Croix Counties.

Spruce Grouse.—This elusive species was reported from 3 counties this year, more than usual: Florence (NNFBS), Forest (the La Valleys) and Sawyer (Hoffman fide Tessen; female and 6 young).

Greater Prairie-Chicken.—Reported only from Marathon (Belter, Semo) and Portage (Semo) Counties.

Sharp-tailed Grouse.—Observed in Burnett Co. June 25 (Schultz, Smith) and Taylor Co. July 3 (Offord, Risch).

Wild Turkey.—This summer's reports came from these 4 counties: Crawford, Grant, Monroe and Waukesha.

Northern Bobwhite.—A July 19 report from Price Co. comes from somewhat further north than this species is normally observed. The other 14 reporting counties were more southern.

Yellow Rail.—The only observation this summer was in Barron Co. (Hoffman fide Tes-

sen, June 25), a previously unreported location for this species.

King Rail.—Tessen found this species in Winnebago June 17.

Common Moorhen.—Noted in these counties: Brown, Columbia, Dane, Dodge, Fond du Lac, Manitowoc, Shawano, Walworth and Winnebago.

Sandhill Crane.—This species has become much more widely reported than was the case even a decade ago. Noted this summer in no less than 34 counties.

Black-bellied Plover.—Noted in the Ashland/Bayfield Co. area June 7 (Verch) and Burnett Co. June 1 (Cathers). One still present in Dane Co. June 9 (Ashman).

Lesser Golden-Plover.—Lingered in Ashland and Bayfield Counties until June 7 (Verch) and in Trempealeau Co. until June 14 (Hunter).

Semipalmated Plover.—Birds were seen continuously in the Ashland/Bayfield Co. area, making it difficult to determine whether birds were spring or fall migrants (Verch). Elsewhere the latest spring birds were noted in Columbia Co. June 9 (Ashman) and Manitowoc Co. June 11 (Sontag). Returning birds were seen in Columbia Co. July 4 (Sunby), Dodge Co. July 8 (Soulen) and Manitowoc Co. July 12 (Tessen).

Piping Plover.—The only report came from Milwaukee, where a bird was seen July 9 (Soulen).

American Avocet.—A single bird appeared in the Ashland/Bayfield Co. area July 8 (Verch, Rick Simek, Erica Peterson).

Greater Yellowlegs.—The earliest fall migrants were observed in Columbia Co. June 21 (Hansen), Outagamie Co. June 22 (Anderson, Brittnacher) and Burnett Co. June 26 (Hoffman fide Tessen). Most areas reported none until the second or third week in July.

Lesser Yellowlegs.—One lingered in Dane Co. until June 1 (Ashman). Noted June 21 in Columbia Co. (Hansen) and in 4 additional counties before the end of June.

Solitary Sandpiper.—Observed in Jackson Co. June 20 (Polk), Ashland Co. June 21 (Zanoni), Burnett Co. June 26 (Hoffman fide Tessen) and Chippewa Co. June 27 (Polk). Observers in a number of areas first reported birds July 6–9.

Willet.—Noted in Manitowoc Co. July 8–12 (Sontag, Tessen) and Columbia Co. July 11 (Hoffman fide Tessen).

Whimbrel.—A single bird was in Manitowoc June 16 (Sontag).

Hudsonian Godwit.—Lingered through June 5 in Columbia Co. (Ashman) and June 12 in Brown Co. (Mead). Noted also in Manitowoc Co. July 21 (Sontag).

Marbled Godwit.—Observed in Columbia Co. through June 5; a bird there June 25 most likely was a returning migrant (Ashman).

Ruddy Turnstone.—Present in early June in Dunn (Polk) and Sheboygan (the Brassers) Counties and until June 21 in Manitowoc Co. (Sontag). The only July observation was in Columbia Co. July 30 (Tessen).

Red Knot.—The only report came from Brown Co. July 25 (Tessen).

Sanderling.—Spring migrants were in Sheboygan Co. June 4 (the Brassers) and Manitowoc Co. June 5 (Sontag). The first fall migrants were noted July 16 in Douglas (Johnson) and Dunn (Polk) Counties.

Semipalmated Sandpiper.—Spring and fall migrants overlapped in Manitowoc Co. (Sontag). The latest departure dates elsewhere were June 10–12. Hoffman (fide Tessen) observed this species in Burnett Co. June 26, but no other returning birds were reported until around July 16.

Western Sandpiper.—Recorded in Manitowoc Co. July 16–19 (Sontag) and Dane Co. July 22 (Hansen) and 24 (Hoffman fide Tessen).

Least Sandpiper.—The first returning migrants were seen in Burnett Co. June 25 (Schultz, Smith), with reports coming from several other areas within the next few days.

White-rumped Sandpiper.—Lingered into the first week in June in several counties, until June 16 in Manitowoc (Sontag) and Milwaukee (Sunby) Counties. The only July report was of 2 birds in Dodge Co. July 28 (Tessen).

Baird's Sandpiper.—Seen off and on through the season in Ashland and Bayfield Counties (Verch). Other records were from La Crosse Co. June 3 (Leshner), Sheboygan Co. June 11 (the Brassers), Manitowoc Co. July 12 and Dodge Co. July 28 (Tessen), and Douglas Co. July 30 (Johnson).

Pectoral Sandpiper.—Still present in Dunn Co. June 4 (Polk). Birds appeared again in Burnett Co. by June 26 (Hoffman fide Tessen) and in Dane Co. by June 29 (Ashman). Most fall migrants were first noted July 6–13.

Dunlin.—Observed in 6 counties into June, latest in Milwaukee Co. June 16 (Sunby). Noted in St. Croix Co. July 24 (Smith).

Stilt Sandpiper.—Present in Burnett Co. June 26 (Hoffman fide Tessen). Appeared in 9 additional counties during July, arriving mostly July 10–19.

Buff-breasted Sandpiper.—The only report was of 2 birds in Columbia Co. July 30 (Lison).

Dowitchers.—Only 2 of 19 dowitcher reports were accompanied by a description of the basis for identification, although 16 of them were specified as to species. Among the Short-billed reports, the earliest was from Burnett Co. June 26 (Hoffman fide Tessen), with others from Dane Co. June 29 and Columbia Co. July 3 (Ashman). Long-bills were reported from St. Croix Co. July 26 (Smith) and Dodge Co. July 28 (Tessen).

Wilson's Phalarope.—Sorting out which reports are of migrating rather than resident birds is difficult. A family was observed in Marathon Co. June 13 (Brian Maedke). Early to mid-June reports came from 6 other counties and July reports from an additional 5.

Red-necked Phalarope.—Noted June 1 in the Ashland/Bayfield Co. area (Verch).

Laughing Gull.—The season's only report came from Manitowoc Co. June 21–30 (Sontag).

Accepted by the Records Committee. See "By the Wayside".

Franklin's Gull.—Observed in Manitowoc Co. from June 24 through July 11 (Sontag), Milwaukee Co. June 16 (Sunby), and Ashland and Bayfield Counties from June 18 on (Verch).

Little Gull.—Not as regular in the Manitowoc area as it once was, this species was seen there through July 21 (several observers). A number of observers reported it also in Milwaukee Co. between June 16 and July 28.

Bonaparte's Gull.—Noted in Dunn (Polk) and La Crosse (Leshner) Counties June 3; the other 8 reporting counties were on Lakes Michigan and Superior.

Lesser Black-backed Gull.—A gradually increasing number of reports in the Midwest suggest that this species is one we should be alert for. Wisconsin's first summer record came from the Ashland/Bayfield Co. area June 4 (Verch). Accepted by the Records Committee. See "By the Wayside".

Glaucous Gull.—One bird was in Manitowoc Co. June 22 (Sontag).

Caspian Tern.—Noted in La Crosse Co. June 3 (Leshner) and in 11 additional counties along Lake Michigan or Superior.

Common Tern.—Reported from only 9 counties this season, somewhat less than usual.

Arctic Tern.—Another species to watch out for; we have very few well documented sightings. Two reports came from Manitowoc Co. this summer: June 11 (Sontag) and July 16 (Mueller), both accepted by the Records Committee. See "By the Wayside".

Yellow-billed Cuckoo.—Among the 27 counties from which this species was reported were these far northern ones: Bayfield, Douglas, Florence, Forest and Vilas.

Eastern Screech-Owl.—Noted only in Barron, Florence, Jefferson, Milwaukee and Washington Counties.

Snowy Owl.—A bird photographed in

Chippewa Co. June 10 by Leshner later turned up with a leg band, injured, and subsequently died. It had been released after rehabilitation last winter by Charles Kemper.

Great Gray Owl.—Although no birds were seen or heard during the season, Semo found pellets, whitewash and molted feathers of this species in a large bog in Douglas Co.

Long-eared Owl.—Reported June 12 on the Nicolet National Forest Bird Survey.

Short-eared Owl.—Seen June 12 in Powell Marsh, Vilas Co. (Norris) and through much of June at Crex Meadows, Burnett Co. (several observers), last on June 25 (Smith).

Northern Saw-whet Owl.—Noted June 11 (6 birds) through 18 in Sawyer Co. (Merkel), June 25 (Smith) and July 16 (Johnson, Semo) in Douglas Co., and in Lincoln and Oneida Counties (Semo).

Chuck-will's-widow.—A bird present during the spring in Polk Co. was heard through June 28 (Hudick).

Red-bellied Woodpecker.—Among the 25 counties from which this species was reported, the most northern were Barron (Goff), Bayfield (Swengel) and Shawano (Peterson).

Black-backed Woodpecker.—Observed in these 5 counties: Douglas (Johnson), Langlade (Soulen), Price (Hardy), Rusk (Hoffman fide Tessen) and Sawyer (Merkel).

Olive-sided Flycatcher.—Birds reported from Wood Co. June 5 (Merkel), Milwaukee Co. June 10 (Woodmansee), Waupaca Co. June 11 (Tessen) and Fond du Lac Co. July 26 (Swengel) were undoubtedly migrants. Noted otherwise only in Douglas, Forest and Vilas Counties.

Yellow-bellied Flycatcher.—Migrants were still present in Milwaukee Co. June 4 (Woodmansee) and Waupaca Co. June 11 (Tessen). Other observations came from Douglas, Florence, Forest, Langlade, Oneida, Sawyer and Vilas Counties.

Acadian Flycatcher.—A bird in Waupaca Co. June 11 was somewhat further north than

this species is normally observed (Tessen). Recorded also in Dane, Grant, Juneau, Rock, Sauk and Walworth Counties.

Fork-tailed Flycatcher.—Johnson and Penning got a short but good look at one in Douglas Co. June 24, providing one of very few Wisconsin records. Accepted by the Records Committee. See "By the Wayside".

Gray Jay.—Observers found this species in Douglas, Florence, Forest, Oneida, Price, Sawyer and Vilas Counties.

Common Raven.—Jackson Co. again provided the southernmost record (Polk, up to 6 birds) among this year's total of 19 counties.

Boreal Chickadee.—Observations again were restricted to far northeastern counties: Florence (NNFBS), Oneida (Soulen, Tessen) and Vilas (Baughman, Spahn).

Tufted Titmouse.—Reports came from these 7 counties: Chippewa, Crawford, Dane, Dunn, Eau Claire, Grant and Rock.

Red-breasted Nuthatch.—Observers found these in Dane (Ashman, Hansen), Milwaukee and Ozaukee (Woodmansee) and 20 more northern counties.

Carolina Wren.—This season's 2 reports are the most in summer in a number of years: Dane Co. July 17 (Hansen) and Grant Co. June 29 (Swengel).

Winter Wren.—Reports from Grant Co. June 2 (Leshner) and Juneau Co. June 11 (Swengel) remind us that Sauk Co. is not the only southern county that can provide suitable habitat for this species. A bird in Walworth Co. July 21 (possible migrant?) was unusual (Tessen). Noted in 18 counties overall.

Golden-crowned Kinglet.—A very early migrant had reached Walworth Co. by July 31 (Parsons). Observed also in 10 northern counties.

Ruby-crowned Kinglet.—Reported only from Douglas (Johnson), Forest (the La Valleys, Reardon), Oneida (the Engbergs) and Vilas (Baughman) Counties.

Swainson's Thrush.—Lingered until June 2 in Sheboygan Co. (the Brassers). Reports during the next week from Florence (Peterson) and Bayfield (Leshner) Counties could have been of later migrants or summer residents. Three had returned to Milwaukee Co. by July 25 (Woodmansee). Likely residents were noted from near mid- to late June in Ashland (Zanoni), Forest (Reardon, Robbins), Sawyer (Merkel) and Vilas (Karow) Counties.

Northern Mockingbird.—Observed in Door Co. July 3 (the Lukes), Iowa Co. June 1 (Robbins, Bill Foster) and Sauk Co. from June 18 through July 1 (Swengel).

Loggerhead Shrike.—The only report was of a single bird in Sheboygan Co. July 5 (the Kuhn family). This was the lowest number of summer reports in a number of years.

White-eyed Vireo.—Noted only in Waukesha (Soulen, July 9) and Winnebago (Tessen, June 17) Counties.

Bell's Vireo.—Observers found this species in Crawford Co. June 12 (the Sheas), Grant Co. June 5 (Smith) and 30 (Swengel), Fond du Lac Co. July 27 (Swengel) and Iowa Co. July 10 (Soulen).

Solitary Vireo.—A bird in Milwaukee Co. June 6 was unusual (Woodmansee). Other reports came from 11 northern counties.

Tennessee Warbler.—Observed from July 10 on in Douglas Co. (Johnson) and in Brown Co. (Mead) on July 15, suggesting an extremely early migration.

Orange-crowned Warbler.—A July 27 observation in the Ashland/Bayfield Co. area (Verch) also suggests a very early migration.

Magnolia Warbler.—A bird in Adams Co. June 10 was somewhat south of the usual range of this species (Robbins). The remaining reports came from 8 northern counties.

Cape May Warbler.—Observed in Ashland (Cathers), Bayfield (Swengel), Douglas (Smith), Florence (Swengel, NNFBS) and Vilas (Baughman) Counties. Migrants had reached Manitowoc (Sontag) and Ozaukee (Frank) Counties by July 22–23.

Black-throated Blue Warbler.—Reported from Florence (Swengel, NNFBS), Forest (several observers), Shawano (Peterson) and Vilas (Baughman) Counties.

Yellow-rumped Warbler.—Noted again in Jackson Co. (Polk). Other reports came from 16 more northern counties, except for a migrant in Manitowoc Co. July 21 (Sontag).

Yellow-throated Warbler.—The only report came from Rock Co. (Robbins, Bill Foster; July 25), currently the most likely Wisconsin summer location for this species.

Kirtland's Warbler.—No less than 8 males were discovered in June during this season's intensive search of potentially suitable habitat, in 3 western and northwestern counties: Douglas, Jackson and Washburn. There was no evidence of breeding. Accepted by the Records Committee. See "By the Wayside" for accounts by Johnson and Polk.

Prairie Warbler.—This species was noted in Adams Co. June 10 (Robbins) and 17 (Tessen) and in 2 different areas in Jackson Co. June 5 and 16 (Polk).

Palm Warbler.—Reported in more counties than usual: Ashland and Iron (Swengel), Douglas (Johnson, Soulen), Forest and Oneida (Soulen), and Vilas (Baughman).

Bay-breasted Warbler.—Two in Bayfield Co. June 14 suggest that the suspicion some have had that this species may summer rarely in this part of the state could be correct (Swengel). Other reports July 22–30 came from Douglas, Manitowoc and Sauk Counties.

Blackpoll Warbler.—Lingered until June 2 in Manitowoc Co. (Sontag).

Cerulean Warbler.—There have been sporadic reports of this species from far northern counties over the years, but most have been suspect because the birds have not been seen and because of the possibility of confusing the song with that of unusual sounding Black-throated Blue Warblers. One was watched for a long time by Robbins and 5 others while it sang in Forest Co. June 12. Noted in only 3 other counties, all southern.

Prothonotary Warbler.—Reports came from Grant, Iowa, La Crosse, Polk, Rock and Sheboygan Counties.

Worm-eating Warbler.—This season's only report came from Baxter's Hollow, Sauk Co. on June 9 (Robbins, several others).

Northern Waterthrush.—Still present in Milwaukee Co. June 6 (Woodmansee). The other 14 reporting counties were more northern.

Louisiana Waterthrush.—Nesting was reported from Polk and Rusk Counties (Hoffman, fide Tessen). Also noted in Grant (Leshner), Juneau (Robbins, Swengel) and Sauk (Hansen, Robbins) Counties.

Kentucky Warbler.—Observed in Dane Co. June 4–15 (Ashman, Hansen), Grant Co. through June (several observers), and Sauk Co. June 10 (Hansen).

Connecticut Warbler.—Located in these 6 counties: Ashland, Bayfield, Douglas, Forest, Jackson and Vilas.

Hooded Warbler.—A bird in Dane Co. June 4 provided the season's only report (Ashman).

Canada Warbler.—Observers found this species in Bayfield, Douglas, Florence, Forest, Kewaunee, Manitowoc, Shawano, Waupaca and Vilas Counties.

Yellow-breasted Chat.—Several were present in Dane Co. during June (Hansen). Also noted in Grant (Smith, Soulen), Milwaukee (Woodmansee) and Rock (Hansen) Counties.

Northern Cardinal.—The most northernmost of the 45 reporting counties this year were Barron (Goff), Douglas (Smith) and Price (Hardy) in the west and Door (the Lukes), Langlade (Soulen), and Oconto (Norris) in the east.

Dickcissel.—The best populations in years reached no less than 43 counties, extending as far north as Ashland/Bayfield (Verch; although this was only the second time he has observed them there, he found 50 pairs), Door (the Lukes), Douglas (Johnson), Langlade (Soulen), and Mar-

inette and Oconto (Norris) Counties. Hudick found them in 52 locations in Polk Co.

Field Sparrow.—Northernmost of the 43 reporting counties were Barron (Goff), Bayfield (Swengel), Douglas (Johnson), Florence and Forest (NNFBS), and Vilas (Reardon).

Lark Sparrow.—Noted in Dunn and Eau Claire (Polk), Grant (Leshner, Soulen), Sauk (several observers; Hoffman found 23 pairs near Spring Green), Trempealeau (Hunter), Walworth (Parsons) and Waushara (Tessen) Counties.

LeConte's Sparrow.—Hoffman (fide Tessen) found 27 in Barron Co. June 25. Also present in Ashland (Swengel, Verch), Bayfield (Verch), Burnett (several observers), Douglas (Johnson, Polk), Oneida (Swengel) and Vilas (Norris) Counties.

Dark-eyed Junco.—Present in Bayfield, Douglas, Florence, Forest and Vilas Counties in June. A July 20 bird in Door Co. likely was a migrant (the Lukes).

Orchard Oriole.—A bird was present in Shawano Co. through June 10 (Peterson). Other reports came from Dane, Iowa, La Crosse, Monroe, Ozaukee, Sauk and Walworth Counties.

Purple Finch.—In addition to observations in 18 more northern counties in June, a migrant was noted in Walworth Co. July 29 (Parsons).

House Finch.—Numbers continue to increase. Wisconsin's first summer records were in 1986. This year birds were noted in Dane, Manitowoc, Milwaukee, Outagamie, Sauk, Sheboygan, Washington and Winnebago Counties.

Red Crossbill.—Observers found these in the Ashland/Sawyer Co. area June 2 (Cathers), Douglas Co. July 9 (Johnson), and Vilas Co. from June 26 through July 23 (Baughman).

White-winged Crossbill.—The only reports came from Douglas Co. June 3–4 (Johnson), Oneida Co. June 18 (the Engbergs), and Sawyer Co. June 24 (Hoffman fide Tessen).

Pine Siskin.—A few observers noted large

"By The Wayside"

Laughing Gull, Lesser Black-backed Gull, Arctic Tern, Fork-tailed Flycatcher, Kirtland's Warbler, and Blue Grosbeak were the highlights of the 1988 summer season.

LAUGHING GULL (*Larus atricilla*)

21-30 June 1988, Manitowoc County.—A single adult in breeding plumage was seen standing on the shoreline of the containment vessel in the company of Bonaparte's Gulls (immediate area) and Ring-billed Gulls (general area). The larger size and darker mantle quickly attracted my attention. Since Franklin's Gulls also frequent the containment, the following critical field marks were noted. The large size (about halfway between the size of the Bonaparte's Gull and Ring-billed Gull) and large reddish "gull like" bill with drooped appearance was easily observed from a distance of 150 feet. The bill length was easily the width of the head. The bird was flushed with other gulls and terns and revealed the black primaries (numbered 1 to 5 or 6) both above and below. The remainder of the primaries were dark, and like the secondaries were bordered with white on the trailing edge. At no time did this white enter the first 5 to 6 primaries. The rump and tail were white; the tail was unmarked. The distinct orbital ring was broken in the area opposite the lores, and incomplete in the area of the lore. The tarsi and feet were dark. The bird

did not vocalize during the observation period.

I assumed that this bird and the one observed on 29 and 30 June were one and the same.—*Charles Sontag, 801 North 4th St., Manitowoc, WI 54220.*

LESSER BLACK-BACKED GULL (*Larus fuscus*)

4 June 1988, Ashland County.—As I moved on to the sandbar to try to photograph several immature Bonaparte's Gulls, I noticed a gull with a dark gray mantle and wings. Its color caused it to stand out from the ring-billed gulls around it. I knew by its size that it couldn't be a Greater Black-backed Gull so I suspected it was a Lesser Black-backed Gull. I made the following observations: Size: Larger than the Ring-billed Gulls nearby, but not quite as large as the Herring Gulls. Head: White; bill, like a Herring Gull. Mantle: Dark gray—uniform. Wings: Dark gray, with tips of primaries black and extending beyond the tail. Ventral portions: White. Legs: Yellow! This was one of the first characteristics I saw when I started looking at this bird.

As I moved closer to the bird it flew and the dark gray uniform back and

wings were visible. There was a slight trailing edge of white on the secondaries, and both the rump and tail were white.

Several other birders and I were unable to locate the bird later on.—*Dick Verch, Biology Department, Northland College, Ashland, WI 54806.*

ARCTIC TERN (*Sterna paradisaea*)

16 July 1988, Manitowoc County.—This adult Arctic Tern was found perched near both of the following: an adult Common Tern, and an adult Forster's Tern. These two latter individuals were within 8–10 feet of the Arctic Tern, remained perched during the time of the observation, as did the Arctic Tern, and were easily compared with each other and the Arctic Tern.

The Arctic Tern was approximately the same size as each of the other two birds with which it was compared: 14–16 inches in length. The Arctic Tern had a gray back and wings, and a slightly lighter gray breast and belly, throat and face. The only white area on the face was a narrow area below the black cap; this area was approximately $\frac{1}{2}$ inch wide, extending from the bill to where it met the black nape of the neck. The bird was noticeably shorter-necked than either the Common Tern or the Forster's Tern. The bill was all-red, dark red, with no trace of a black tip. The legs were obviously and considerably much shorter than those of either of the other two birds. The Common Tern had a typical red bill with a black tip, while the Forster's Tern had a lighter orange-colored bill with a black tip. The combination of the gray breast, narrow area of white on the face, short red legs and feet, and all-red bill, in addition to the easy comparison with the other two birds, made this

a very straight-forward identification. I heard no calls from any of these birds during the time of observation, and none of them flew during this time.—*William Mueller, 1244 S. 45 St., Milwaukee, WI 53214.*

6–11 June 1988, Manitowoc County.

While scanning the containment shoreline, a group of Common Terns was found that contained one individual that had an all red bill which was shorter and "finer." The head of the bird was more dome shaped which seemed to emphasize the no neck appearance. The black cap was complete and contrasted with the white below the eye-line. This individual was quite gray in the throat, breast and belly making it quite easy to locate the individual a second time on the far side of the containment shore when I returned from the end of the breakwater. It was this characteristic, along with the short tarsi, that convinced me that I was really observing an Arctic Tern and not just a summer Common Tern with a red bill. The tarsi, as I mentioned earlier, were shorter by $\frac{1}{4}$ to $\frac{1}{3}$ than that of the Common Tern's used for the comparison. This gave the bird a rather squat appearance. The Common Tern is a better species for comparison for this field mark as the Forster's Tern stands taller than the Common Tern. The tail and wings were about the same length. The bird was not heard during the period of observation. A Common Tern postured to the Arctic Tern, but its gesture was rebuffed.—*Charles Sontag, 801 North 4th St., Manitowoc, WI 54420.*

FORK-TAILED FLYCATCHER (*Tyrannus savana*)

24 June 1988, Douglas County.—Bill Penning and I were scouting for the up-

coming ABA convention field trips when we heard a Grasshopper Sparrow singing in a small bushy field. Since this species is so rare here, we stopped to try to see the bird. As we were getting out of the car, Bill spotted a bird that looked like a dark Scissor-tailed Flycatcher. The bird flew a few feet, landed on a small shrub, then flew towards us and landed on a barb wire fence about 150 feet from us where it stayed about 2 minutes, giving us a front/side view with the sun at our backs. Realizing that this was not a Scissor-tailed Flycatcher, I shot two photographs then observed the following field marks.

Size and shape of a Scissor-tailed Flycatcher, including a tail at least 9 inches long, black and deeply forked, and same size and shape of bill. Entire top half of head black, very much like an Eastern Kingbird, gray back, light gray nape, darker gray or blackish wings. Underparts entirely white with no hint of pink. When it turned its head directly towards us, I noticed a large brown patch on the forehead. When the bird flew, it angled towards us about 20 feet off the ground. Flight and shape were just like a Scissor-tailed Flycatcher but wing linings, including axillaries, were whitish or very light gray with no sign of pink. Total viewing time was about 3 minutes, and although we searched for another hour we were unable to relocate the bird.—*Robbye Johnson, 2602 North 28th Street, Superior, WI 54880.*

24 June 1988, Douglas County.—First impression of coloration is of a shrike. First impression of body is Scissor-tailed Flycatcher. Black cap, wings, and long black tail. Grayish upper throat and side of neck contrasting with black cap. White lower throat, belly, undertail and underwings including wing linings; no pink

anywhere. Bird first seen in flight in "Clay-colored Sparrow type" habitat, landed on small bush then flew to barbed wire fence; I took photos. It then flew bee-line west out of sight. Total time 3–5 minutes or less. Viewing distance as close as 75 feet, 10× binoculars.—*Bill Penning, 1957 Wilson, Apt. 202, St. Paul, MN 55119.*

KIRTLAND'S WARBLER (*Dendroica kirtlandii*)

20 June 1988, Douglas County.—Bill Penning and I checked on a possible Kirtland's Warbler on the morning of June 20. When we had walked on a trail about $\frac{3}{10}$ mile, we heard what sounded like two notes of a distant Connecticut Warbler song. We continued about another tenth mile and heard the song again, only this time it was a full, unmistakable Kirtland's Warbler song—four ascending rapid notes followed by 4 louder, slower, higher notes with the accent on the last two, and with the same loud, clear, throaty voice quality as a Connecticut Warbler. We followed the song until we spotted the bird singing on top of a dead tree about 150 feet away, 15 feet off the ground. It was early morning and light was low and to our left, but I could still see the bird clearly through Bill's scope. A large warbler with gray head, back, wings and tail, yellow throat, breast, belly and sides. Black at base of bill ran down into heavy spotty streaking all the way down sides. The area from the base of the bill to the eye was black. I could see a white eye-ring, but not clearly enough to tell if it was broken. Head looked lighter gray than back and wings. We left after about 15 minutes. The bird continued singing.—*Robbye Johnson, 2602 North 28th Street, Superior, WI 54880.*

9–18 June 1988, Jackson County.—

Around noon on 9 June, 1988, I discovered the first of several singing male Kirtland's Warblers in Jackson County, while helping with the DNR's survey for this species. I walked into some appropriate-looking habitat (short jack pine at the site of an old burn) and almost immediately heard the bird singing 100 or so feet away. I approached it slowly (eventually coming as close as about 20 feet) and watched for about half an hour as it sang, flew from perch to perch, and occasionally dropped down to feed near the ground. The vigorous, loud, rather low-pitched song was well-defined and "typical" in construction for this species (as heard on the bird song recordings) and was often delivered from scattered tall pine snags. I mentally transcribed the song as having three parts: two or three low, somewhat burry introductory notes on one pitch or rising slightly, followed by two notes on a higher pitch, and ending with two notes on an intermediate pitch. . . . The song was repeated many times, and the bird was still singing at about one o'clock when I left to inform the wildlife manager of my sighting.

The bird was large for a warbler, with blue-gray upperparts, black streaks on the back, darker wings and tail, and indistinct white wing bars. The underparts were bright yellow with a few black spots and thin black streaks on the sides of the breast, and heavier black streaks along the flanks. There was a wide, diffuse blackish area through the lores and a white eye-ring broken in front and back, giving the bird a somewhat masked appearance. The (unbanded) legs and bill were black. The bird was rather slow and deliberate [in] its movements (for a warbler) and frequently wagged its tail. This description applies, in general, to the

other birds as well, with a few differences as noted below. The next day, June 10, I returned early in the morning but could not find the warbler, to my great disappointment. After searching the area for a while I discovered another bird (or possibly the same one) about a mile west. This bird, which I will call #2, looked to my human eyes similar or identical to the first bird and sounded very much like it also. This bird proved to be the most reliable of all and was present on territory through June 18, when it was banded. . . . I watched this bird on several days from many distances (closest about 6 feet) and got at least one photograph.

On June 15, bird #1 was not there, bird #2 was present at his usual spot, and a third bird turned up about $\frac{3}{4}$ of a mile to the northwest. I did not get as close a look at this bird, but its song was quite different from that of birds #1 and #2. It was recognizable as a Kirtland's Warbler song by its pattern and vocal quality, but it was more run together (the notes were less distinctly separated) and there didn't seem to be as much variation in pitch. According to Bent, Kirtland's Warblers rarely change their songs after the beginning of the season, so individuals can be readily identified by song style.

On June 16, bird #2 was still on territory, but there were no birds where #1 and #3 had been. Instead, bird #2 had a territorial dispute with an apparently different bird at the presumed edge of #2's area. The warblers would alternate chasing each other around with sitting near each other (often within feet) and singing (often simultaneously). The new bird's song was similar to #2's but a little faster, and unlike #3's. The two birds came within 12 feet of me at times and I could see that neither was banded. Bird

#4 was paler yellow below than #2 and had thin dark streaks across the front of the breast (indicating a first year bird). Eventually bird #2 chased #4 north about 1/4 mile and returned to the center of his territory.

On the morning of June 17, bird #2 was on territory, a bird that looked and sounded like bird #4 was near where #4 had been chased to the previous day, and another bird that looked and sounded much like bird #1 was back where #1 had been originally. The next day, only #2 could be found. He was banded on that day, and no birds were found thereafter. So, I can say with certainty that at least three, probably four, and maybe even five Kirtland's Warblers were present in this area. There was absolutely no evidence of breeding or even of the presence of females. The peripatetic nature of most of these males underscored that fact.—*Janine Polk, 1407 Frederic, Eau Claire, WI 54701.*

BLUE GROSBEAK (*Guiraca caerulea*)

2 June 1987, Iowa County.—I heard an unusual song that I couldn't place. Not an Orchard Oriole, not a Purple Finch. It was a "short, mellow, trilly warble." Phrases in quotation marks come from notes made immediately after the sighting. A bird flew to a perch about 7 feet high at a distance of perhaps 75 feet or so. I observed it under overcast but bright skies for 10 to 15 seconds. The

view was primarily a side view. It was turned slightly away, but the head was in profile. The upperparts were plain "brown with the richest color on the head." The tail and primaries were blackish. I immediately noticed a "prominent light chestnut upper wing-bar. The lower wing bar was not nearly as conspicuous." I then carefully examined the bill and found it to be a large, pale gray, grosbeak type of bill, not the smaller proportioned Bunting type. At the time I suspected this was a Blue Grosbeak so took my time examining the bill. As I watched, the bird sang its short, pretty warble again. Quite different from Indigo Bunting in both voice and pattern.

Then it flew into denser vegetation. I glimpsed it a few more times but at a greater distance in poorer light. It jerked its tail a few times, but it may have been annoyed! I've seen Indigo Buntings do that too. It sang again but only faintly. Altogether less than 5 minutes. I then wrote down my observations and then found the bird in National Geographic Field Guide. It looked like fall male Blue Grosbeak. It was not pale like the rendering of the female. However, Peterson's rendering of the female is dark enough to fit this bird. I had a tape player with me, and I listened to the Blue Grosbeak recording of the new Peterson edition and also the Federation of Ontario Naturalists. The song I heard was of the same type.—*Karl Legler, 429 Franklin Street, Sauk City, WI 53583.*

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Samuel D. Robbins is one of Wisconsin's most active ornithologists. He has served WSO in many capacities, in-

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Thomas R. Schultz is one of Wisconsin's top wildlife artists. He is well known to WSO members as co-chairman of the Field Trip Committee and Assistant Editor for Art. Tom's work has appeared in many premier art shows, including the prestigious "Birds in Art" exhibition in Wausau.


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