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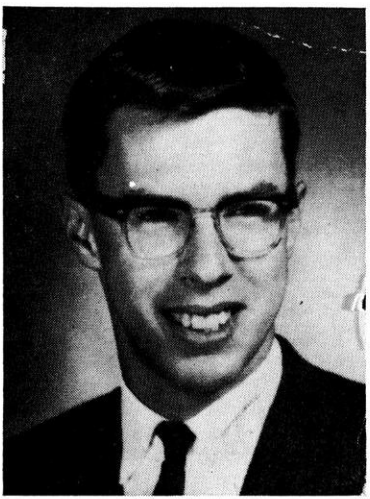
A WINTER POPULATION OF GOLDENEYES

By JAMES O. EVRARD

The Common Goldeneye (**Bucephala clangula**) is the most abundant and most widely distributed wintering duck in Wisconsin (Hilsenhoff, 1967). During the 1956-58 period, approximately 31,000 goldeneyes wintered in Wisconsin with about 25,000 on Lake Michigan and 6,000 on inland waters (Jahn and Hunt, 1964). During the recent Christmas Bird Count of the Audubon Society, WSO members counted as many as 12,000 goldeneyes in Wisconsin (Hilsenhoff, 1970).



However, the population figures for this species are probably underestimated. There is a marked tendency for the goldeneye to scatter over remote areas and extensive bodies of water (Mississippi Flyway Council, 1958). Wintering goldeneyes can be found in almost every county in Wisconsin (Hilsenhoff, 1968).

A concentration of goldeneyes, along with a few Mallards (**Anas platyrhynchos**), Black Ducks (**Anas rubripes**), and and Common Mergansers (**Mergus merganser**) winters on the Oconto River in Oconto County. Approximately five miles of water remains free of ice even during the most severe winter weather. The open water exists in three segments below three power dams and a paper mill (Figure 1). The most northerly segment, below the Chute Pond Dam, is 1.6 miles in length and approximately 50 feet in width. The stream is characterized by alternating rapids and riffles one to three feet deep and pools up to six feet in depth. The second segment, below the power dam and paper mill at Oconto Falls, is 1.9 miles long and approximately 100 feet wide. The river is shallow, two to four feet in depth, but is fairly swift. The third segment, below the Stiles power dam, is 1.1 miles in length and is much the same in physical appearance as the Oconto Falls segment.

Goldeneyes arrive in December and remain until April. I recorded a total of 1366 goldeneye observations on 31 occasions over a period of six years, making most observations during the winter of 1969-70 (Table 1).

There appear to be two distinct populations of goldeneyes on the Oconto River. The goldeneyes below the Chute Pond dam apparently do not intermingle with the birds 21 air miles to the southwest at Oconto Falls and Stiles. I did not observe the birds from the Chute Pond area flying to or from the Oconto Falls or Stiles areas. The peak number of goldeneyes recorded in 1970 at Chute Pond was 65 birds or 41 per linear miles of open river.

The goldeneyes of the lower Oconto River share a common night roost of 0.2 linear miles of habitat located immediately below the Oconto Falls power dam. On several occasions, I observed the birds from the Stiles and the Oconto Falls areas flying at dusk to the roost. Peak number recorded at the roost in 1970 was 150 ducks.

TABLE 1.

COMMON GOLDENEYE OBSERVATIONS, OCONTO FALLS, 1963-1970

Year	Dates	Time	Number of birds	No. of Adult males	Location
1963	February 2	2:00 p.m.	8		Stiles
1966	December 24	4:00 p.m.	18		Oconto Falls roost
	December 28	2:00 p.m.	75		Oconto Falls
1967	March 30	3:00 p.m.	35		Oconto Falls
	March 31	7:00 a.m.	500		Stiles
	April 2	11:00 a.m.	15		Stiles
1968	February 11	11:00 a.m.	31		Oconto Falls roost
	February 25	11:00 a.m.	20		Stiles
	March 31	10:00 a.m.	8	5	Stiles
1969	March 1	3:30 p.m.	9	6	Stiles
	March 16	1:30 p.m.	19	14	Stiles
	April 5	9:00 a.m.	6	5	Stiles
1970	January 12	8:00 a.m.	22		Stiles
		4:45 p.m.	150*		Oconto Falls roost
	January 17	1:00 p.m.	20		Stiles
	January 23	11:30 a.m.	29	15	Chute Pond
		3:30 p.m.	70*	35	Stiles
	January 26	5:00 p.m.	80*		Oconto Falls
	January 30	4.45 p.m.	20		Stiles
	February 3	5:15 p.m.	65*		Chute Pond
	February 12	3:30 p.m.	37		Stiles
		4:00 p.m.	46	23	Oconto Falls roost
	February 18	9:00 a.m.	7	3	Chute Pond
		3:30 p.m.	37		Stiles
		4:00 p.m.	46	23	Oconto Falls roost
	February 19	4:15 p.m.	52		Chute Pond
	February 27	9:00 a.m.	16	7	Chute Pond
	March 13	4:45 p.m.	49		Stiles
		5:00 p.m.	29		Oconto Falls
	March 17	9:15 a.m.	40		Stiles
		3:30 p.m.	35		Oconto Falls
	March 18	4:15 p.m.	33		Stiles
		4:30 p.m.	4		Oconto Falls roost
	March 19	3:15 p.m.	8	6	Stiles
	March 22	1:45 p.m.	34		Stiles
	March 23	8:00 a.m.	37	26	Stiles
	March 25	8:00 a.m.	22		Stiles
		3:30 p.m.	44	28	Stiles
	March 26	8:00 a.m.	12	7	Stiles
	April 2	10:00 a.m.	29	17	Stiles

*Peak count

Kortwright (1953) stated that goldeneyes seek a "secure lodging place" to spend the night. The roost is within the city limits of Oconto Falls where the potential threat of predators is minimal. A small rocky island immediately below the tail-race of the power dam serves as a

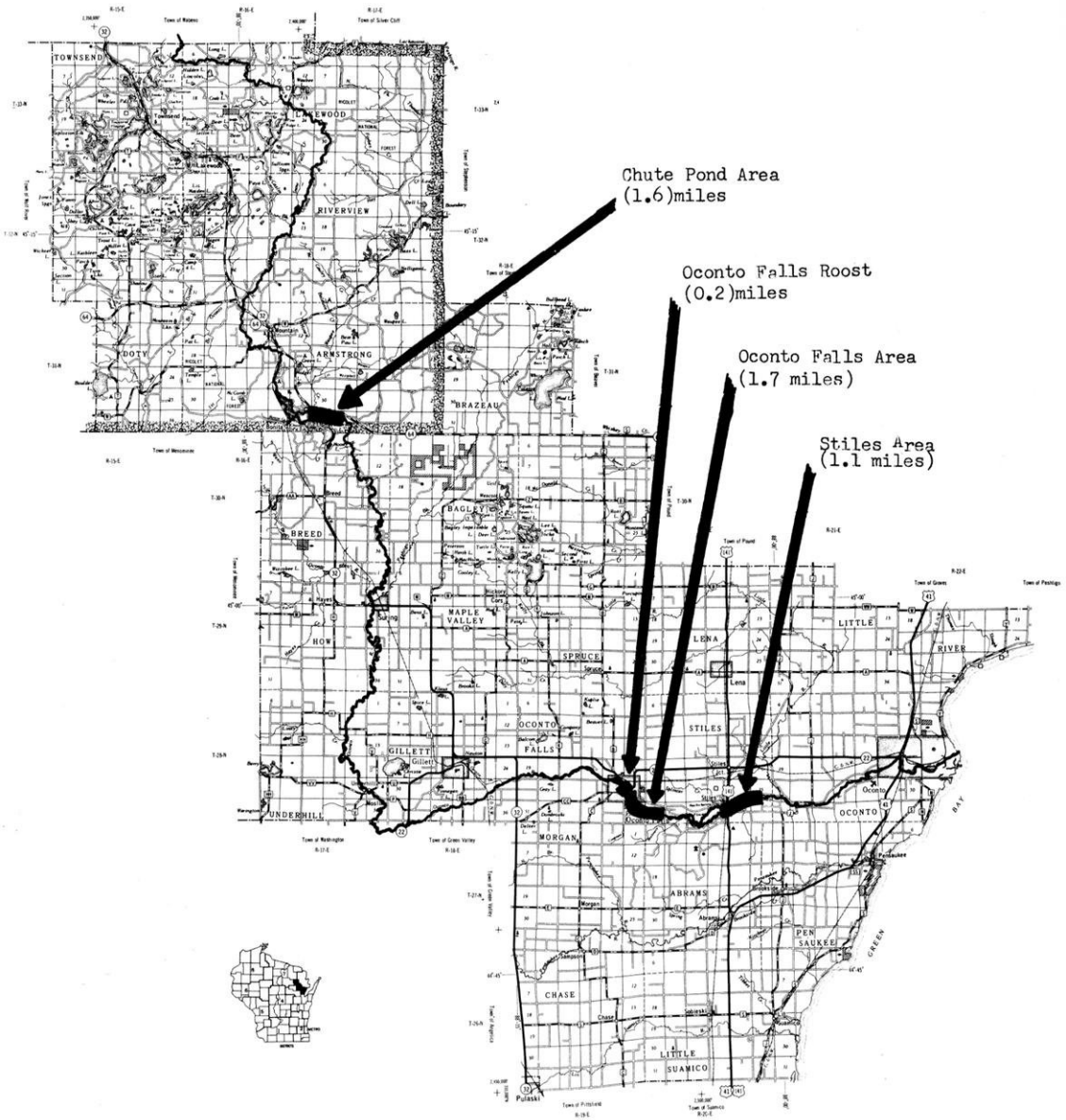


FIGURE 1. Areas inhabited by wintering Goldeneyes.

loafing and roosting site. The birds in the Chute Pond area roost within a highly developed county park in a pool below the power dam.

During the early morning, the bulk of the goldeneyes leave the Oconto Falls roost and fly to the open water below the paper mill and the Stiles power dam. Peak numbers below Oconto Falls in 1970 were 80 birds per linear miles of stream and below the Stiles dam, 70 birds or 64 per linear mile.

When possible, I recorded the number of adult males in the particular group of goldeneyes being observed. The sex ratio is nearly impossible to determine by observation since sub-adult males closely resemble the females and do not achieve full adult male plumage until their second fall or winter (Musgrove, 1943). Thns only adult males can be recognized in the field on the basis of plumage.

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Observations On the Feeding Behavior of the Great Blue Heron

By CLIFFORD J. DENNIS

Wisconsin State University-Whitewater

During the years 1968, 1969 and 1970 observations on the feeding behavior of the Great Blue Heron, **Ardea herodias,** were made on the Mississippi River near Bagley, Wisconsin, between miles 621 and 623 on the Corps of Engineers Navigation Chart.

I. The Study Area

The study area has been previously described (Dennis, in press).

II. Methods

Observations were made from April to November in 1968 and 1969 and from April to June and August to November in 1970. They were made in daylight and darkness, primarily from a boat, but also from concealed places in the vegetation on the mainland and the islands. In addition to the unaided eye, a 7 x 50 binoculars and a 20-power spotting telescope were used. A portable tape recorder was employed for taking notes.

III. Discussion

A. Food

The Great Blue Heron has been reported feeding on a great many different organisms (Bent, 1926; Franks, 1928; Jensen, 1930; Crook, 1938; Chapman, 1939; Sutton, 1946; Ryder, 1950; Peterson, 1953; Rechnitzer, 1956; Longley, 1960; Meyerriecks, 1962; Brackbill, 1966; and Recher and Recher, 1968). I believe it is safe to say that this bird will feed on any living thing it can swallow.

All is not gravy to a feeding heron, however. Bowles (**in** Bent, 1926:117) found a dead Great Blue Heron with a large bulge about midway down its neck caused by a fat bullhead lodged there by its pectoral spines. And Ryder (190) found the head of a Great Blue Heron with the remains of about a 12-inch carp lodged within the mandibles by its erect anterior spine which was stuck in the gullet of the bird. He thought that the bird probably starved or suffocated.

B. Feeding Sentinels

Bretherton (**in** Bent, 1926:110-111) and Zirrer (1951) described sentinel activity when groups of the Great Blue Herons were feeding. No such activity was observed in my study area even though I did find the birds feeding together early in the year. At this time, though, all of them were very wary.

C. Feeding Sites

Bent (1926:108-109) and Chapman (1939:166) indicated both still hunting and stalking as methods of fishing in shallow water. Meyerriecks (1962) described shallow water still hunting (his "stand and wait") and stalking which he expanded into "wade or walk slowly" and "disturb and chase." The Great Blue Heron of my study area employed his three shallow water techniques with intergradations.

When feeding on land they are said to move about "with long stately strides" by Skinner (**in** Bent, 1926:110) and with "dignified ease and grace" (Bent, 1926:110). Hastings (**in** Bent, 1926-109) indicated that when grasshoppers were numerous the herons would stand still waiting for the insects. In my study area I have often seen them walking on the islands and along the shore poking at the ground with their bill or apparently not feeding. I have never seen them feed on recognizable terrestial or aerial organisms while they were on the islands or shoreline. But they often fished from the edges of the islands or shoreline.

Taverner, May, Townsend, Gage and Van Tyne (**in** Bent, 1926:110) noted Great Blue Heron alighting and apparently feeding in deep water. Jensen (1930) described the capture of a bullhead in water over six feet deep. Similar deep water fishing was described by Dickinson (1947). Meyerriecks (1962) stated that in Florida Bay many species (of herons) would hover over deep water or dive into it for food when food was scarce. Longley (1960) reported that when he threw out dead fish for the panhandling Great Blue Heron of Lake Itasca, Minnesota, they would land on the water, take the fish and struggle into flight. I saw no deep water fishing in my study area.

D. Relations with Other Birds While Feeding and Feeding Territories

Meyerriecks (1962) indicated that several species of herons in his study area in Florida Bay have feeding patterns that enable them to occupy different feeding niches on the same shoal. Generally, the larger herons fished in deep water with smaller ones occupying progressively more shallow water ending with the green heron up on the mangrove roots. He mentioned that larger species intimdiated smaller ones and that members of the same species had and defended feeding territories. He stated that individual Great Blue Herons had maintained territories for weeks or even months in Florida Bay.

In my study area few interactions with other birds were noted. In spring I have found the Great Blue Heron fishing singly and in groups of two to five and in close company with Common Egrets, **Lasmerodus albus** (Linnaeus), and an occasional Little Blue Heron, **Florida cacrulaa** (Linnaeus). At the same time many species of ducks and the Pied-billed Grebe, **Podilymbus podiceps** (Linnaeus), often were swimming nearby and were ignored by the Great Blue Heron. In summer and fall, the Great Blue Heron did occupy individual feeding territories in my study area. In early summer the Common Egret and Little Blue Heron had mostly moved on while the Green Heron, **Butorides virescens** (Linnaeus), was arriving. The Green Heron was common all summer and fall and stayed strictly away from the Great Blue Heron. I have seen several occasions when the smaller heron would fly away as a Great Blue Heron approached, even if still as far away as a quarter of a mile. The smaller herons acted as if they really had a weather eye out for the large ones.

E. Mechanics of Feeding

Descriptions of the mechanics of feeding include aspects of still fishing and some sort of stalking (Bent, 1926:108-109, Chapman, 1939:166 and Meyerriecks, 1962).

1) Times of Feeding

Bent (1926:108) mentioned that the Great Blue Heron fishes at night as well as during the day. The herons in my study area did this also.

2) "Stand and Wait" Fishing

Meyerriecks (1962) used the Great Blue Heron in his description of the basic "stand and wait" fishing technique. This species gives a slight vertical tail flick just before it strikes. Often it dips its bill in the water

after swallowing aquatic prey followed by a quick lateral head shake. It performs the bill dip and head shake even if it misses the prey, as though this follow-through were essential to the feeding sequence. The Great Blue Heron in my study area, with both successful and unsuccessful strikes, did the same things with even more frequent and more pronounced tail flickings, bill dipping and head shaking. It should be pointed out that "stand and wait" with my birds did not necessarily mean standing as rigid as a lamp post. There were frequent adjustments of the neck and head, often slight and rapid, and they occosionally moved their feet. The head tilting described by Meyerriecks (1962) in his "wade or walk slowly" category and the wing flicks associated with his "disturb and chase" actions also were practiced by the Great Blue Heron in my study area while standing. Perhaps all of these quick movements were designed to startle prey. The neck movements were certainly remarkable. I got the impression they did nearly anything with their necks but tie them in knots. Some of these flashes of movement of certain body parts might be in response to overt disturbance, but they also were carried out when the birds were evidently not disturbed. While standing, they struck from many positions, ranging from a rigid upright stance down to a very low crouch with a nearly fully horizontally extended neck. The most impressive strikes came when the bird was crouched low with its head back on its shoulders from which position it was explosively shot out. Sometimes they did not really "strike" at all, but simply reached down to pick up prey.

3) **"Wade or Walk Slowly" Fishing**

The "stand and wait" category of Meyerriecks (1962) graded into his "wade or walk slowly" pattern when applied to the Great Blue Heron of my study area. The birds walked slowly, stopped frequently and apparently froze in position when they spotted something. They stalked from a great variety of positions: standing high, crouched somewhat, in deeper crouches and with their heads and necks in many orientations but primarily looking more or less ahead. Orr and Sudia (1960) stated that the fishing Great Blue Heron "will have the head tilted downward; when disturbed the head is moved to a more horizontal position, after which the flight reaction occurs if approach is continued." This is often true but is not always so, and I am sure they did not mean to state that it always occurs. The herons in my study area also used tail flicks, bill dips, head shakes, and wing flicks while stalking.

One striging feature of their stalk was the way they commonly lowered their body to the surface of the water as they moved along. The remarkable aspect of this action is that they accomplished it in as little as two or three inches of water with their feet coming out of the water both fore and aft as they moved. Returning a foot from the rear to the front involved moving it back under water close to the body. It was not swung out laterally over the water. The shallower the water, the more the feet came out, often presenting a rather comical picture. This belly-down action was not necessarily correlated with apparent sighting of prey, though it often was. When I first noticed this I thought that the bird had moved into unexpectedly deeper water, but then the bird stood

up, and I could see what had happened. It looked like the birds were lowering their profile for better concealment from their intended prey.

Meyyeriecks (1962) mentioned the head tilting habit of the Little Blue Heron as it stalks. The Great Blue Heron of my study area did this too. They tipped their heads from side to side while wading and appeared to be looking at the water with each eye singly or in alternation. However, I could not associate this with glare on the water or thick vegetation as he had. My herons stalked at any angle to the sun, including directly into it, and tipped their heads while in any orientation to the sun. Perhaps the swings between monocular and binocular provide it with clues to the location of prey. Hearing could also be involved in the use of head tilting to locate prey. Busnel (1963:738) stated, "Due to the vibratory nature of sound, the bird has three means whereby it may localize the direction of a sonic source. These require a binaural comparison by the two ears between the phase difference, time and intensity. The bird probably uses these three means at the same time, especially when the physical characteristics of the signal may be so adapted. In any case, as experimental work has shown, the direction of the sound may only be recognized by using the two ears." I feel that the herons by swinging their heads can change the character of the acoustic shadow thrown by the head and thusly be aided in determniing direction of sound.

4) **"Disturb and Chase" Fishing**

The "wade or walk slowly" type of feeding behavior of Meyerriecks (1962) intergrades with his "disturb and chase" pattern for the Great Blue Heron in my study area. Here these birds often engaged in wing flilcking, the sudden extension and withdrawal of both wings, the distance varying from barely perceptible to about a foot. Two to five were common flick numbers. They did this while wading or when they had stopped temporarily while wading. They also engaged in rapid tail flicks, bill dips, and head jerks which with wing flicking could possibly disturb prey. There was no wild dash after prey, however, in my study area. My herons "disturbed and chased" slowly.

There was no evidence of "open wing feeding," "underwing feeding," "canopy feeding," "stirring" or "hover stirring" as Meyerriecks (1962) described for other herons and their relatives.

5) **Vocalization During Fishing**

Whatever the pattern of fishing behavior in my study area the Great Blue Herons usually were silent. However, they uttered an occasional soft croak while stalking and sometimes squawked loudly or softly after a strike or swallow. The latter vocalizations occurred when the birds had been standing or stalking and whether the strike was successful or not. I could not associate these sounds with fishing techniques.

6) **Securing and Swallowing Food**

Erichsen (**in** Bent, 1926:113) stated that this bird spears its prey. Audubon (**in** Bent, 1926:109) said that the heron "always strikes its prey

through the body, and as near the head as possible." Bent (1926:108) indicated that the fish usually is seized crosswise between the mandibles. Recher and Recher (1968) stated that herons both seized and speared fish. They found that the birds repeatedly speared larger fish to subdue them and sometimes deflated puffers by spearing. They also indicated that bullheads larger than 10 cm. were killed and thoroughly macerated before being swallowed. I have never seen a Great Blue Heron in my study area spear prey; they caught it between the mandibles. They frequently crushed many kinds of prey, sometimes repeatedly, before swallowing it.

Longley (1960) indicated that these herons washed down fish with a few sips of water. The herons of my study area sometimes did swallow water after both successful and unsuccessful strikes. At least, I assumed that they swallowed the water if I saw swallowing movements of the neck after bill dipping. On the other hand, after catching a fish they sometimes swallowed no extra water at all. Occasionally they came up with vegetation that they crushed a bit before dropping it.

Chapman (1939:166) expressed the opinion that prey "are powerless to escape the lightning thrust of the spearlike bill." Bent (1926:109) stated that the fishing strike is not always successful, and Meyerriecks (1962) intimated the same thing. Recher and Recher (1968) commented that only a few prey escape once being seized by a heron. They also suggested "that a heron must learn how to prevent the escape of prey which have particularly elaborate escape mechanisms." In my study area I have seen many misses as well as hits by the Great Blue Heron, and I have never seen any prey escape after being caught.

Bent (1926:109) indicated that if prey is rather large it is killed by being beaten on the water or carried to shore where it is beaten on the ground to kill it. Jensen (1930) described a Great Blue Heron carrying a bullhead ashore to swallow it. Recher and Recher (1968) reported herons carrying eels away from the water. I have seen Great Blue Heron in my study area carry footlong bullheads and snakes up to about two feet long ashore and other prey being thrashed around in the water after being caught.

F. Defecation

Now that I am about to the end of my story, it seems only fitting that mention also should be made of defecation. Brackbill (1966) indicated that he thought Great Blue Heron leave the water to defecate. The whitewash on and under favorite roosting trees in my study area attests to that habit. However, I occasionally have seen these herons defecate while standing in shallow water, but more commonly while standing on a stump or log surrounded by water, and sometimes when taking flight.

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Relative Abundance of Small Landbirds In Southeastern Wisconsin[1]

By CHARLES M. WEISE

Even after 60 or more years of amateur bird-watching and professional ornithological effort in the state of Wisconsin it is difficult to state reliably the absolute or relative abundance of most species of birds. The problem is of importance, not only in terms of basic biological science, but also in terms of the critical practical questions of preservation, conservation and management. In an age when birds are faced with a plethora of man-induced dangers and hazards — pesticides, drainage, pollution, highway building, "development" of all types, to name just a few — it becomes increasingly urgent to be able to assess accurately and irrefutably the numbers of birds. Anyone who remembers the hullabaloo surrounding Rachel Carson's **Silent Spring,** or who has read Frank Graham's **Since Silent Spring,** or who has followed the pesticide controversy in general, will understand the problems and dangers of basing judgements on what the pesticide proponents call "soft" data.

We need "hard" data. (I enclose these terms in quotation marks because I don't like them and don't ordinarily use them). But, of course, the crux of the whole problem is that "hard" information on this subject is extraordinarily difficult to come by. It involves a synthesis of material from several sources — casual observations by bird-watchers, systematic censuses and population studies, mist-net and trap samples, television tower kill samples, and others. No one of these sources of information by itself is sufficient. Each one has its own advantages and disadvantages, its own biases and selectivities.

Mueller and Berger (1967) approached this subject when they reported on the relative abundance of bird species during the autumn migration period in southeastern Wisconsin, as determined by mist-netting along the Lake Michigan shore. Their results were compared with the status designations given in **Wisconsin Birds. A Check list with Migration Charts** (Barger, **et al,** 1960) and a number of possible revisions were suggested. They also stressed the need for comparative data from other netting operations and from other sources of information such as television tower kills.

Over the past ten years I have collected some information that may serve this purpose. I have conducted mist-netting operations at two localities in southeastern Wisconsin, one along the Root River in Milwaukee County and the other at the UWM Field Station in Ozaukee County; and have also collected birds killed at three Milwaukee television transmitter towers. These data have been compiled and organized to form three samples of small landbirds in autumn, which can be compared with other such samples that have been published in **The Passenger Pigeon,**

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[1]Contribution No. 6 from University of Wisconsin-Milwaukee Field Station.

specifically, the Cedar Grove mist-net sample described by Mueller & Berger (1967), and a sample from a television tower near Eau Claire, compiled from data presented by Kemper (1958) and Kemper, Robbins and Epple (1964). The latter appears to be the only information available from a Wisconsin TV tower so it was used even though it potentially introduces two undesirable sources of variability: geographic differences in the species and populations involved, and distortion of information by consideration of only a few large kills rather than a continuous daily record over several years.

This paper then is an attempt to quantify more precisely the relative abundance of small landbirds in southeastern Wisconsin in autumn (10 August to 16 November, as defined by Mueller and Berger, 1967). It involves the comparison of five samples: A – the Cedar Grove mist-net sample, B – UWM Field Station mist-net sample, C – Root River mist-net sample, D – Milwaukee TV tower sample, E – Eau Claire TV tower sample. These letter designations will be used for convenience throughout this paper.

LOCALITIES AND METHODS

Root River Area. This was a 30-acre study area located on undeveloped Milwaukee County park land in the City of Franklin, Milwaukee County. Netting was done in this area from 1961 through 1966, first as a part of a study of annul physiological rhythms in Swamp Sparrows and later (1966) as part of a study of the prevalence of encephalitus virus in Milwaukee area birds (Barker, 1967).

The area consisted of disturbed flood plain habitat, inundated one or more times each year. The vegetation included small fields of reed canary grass, sedges and other wet meadow and prairie herbs, intermingled with rows and thickets of low trees, mainly willow, cottonwood and black ash.

At this location the floodplain provides an extensive north-south corridor of natural vegetation in an area otherwise dominated by farm fields and suburban residential areas. In autmn most types of small land birds are channeled through the flood plain thickets, with the exception of species that deliberately select at this season open fields, high forest canopies or broad-leaf-covered forest floors.

Mueller and Berger (1967) discussed the advantages and disadvantages of mist-net samples as indices of the abundance of birds. In addition to the shortcomings listed by them most bird netters cannot hope to approach the Cedar Grove operation in terms of day-to-day continuity, standardization of procedures, or total sample size. Some specific differences of technique between my operations and those at Cedar Grove were:

1. Nets were set singly or short lines of two or three. The number of nets varied from 5 to 15 on different dates.
2. Nets were not set permanently in one place but were moved frequently. In the long run, the entire 30 acre study area was covcovered uniformly and repeatedly by the netting operation.

3. Netting was carried out on only one or two days each week, and was confined to daylight hours.

4. All birds caught were identified and counted. However, if we were too busy examining and working with the chief object of our study (Swamp Sparrows), we sometimes released other species without banding. Since netting dates were three days or more apart the chances were small of recapturing unbanded birds that had previously been caught.

5. As in the Cedar Grove sample only first captures of a bird were counted; repeats, returns and recoveries are not included in the data reported here. Therefore the majority of birds in the sample were migrants or transients.

Let me emphasize that although the netting was aimed at one species the catch of birds in the autumn was essentially a random sample of all the species present in the study area. If there is any bias at all it stems from the fact that the area was originally selected because it had a large nesting population of Swamp Sparrows, and not from the netting procedures as such.

UWM Field Station. The University of Wisconsin-Milwaukee Field Station is in the Town of Saukville, Ozaukee County, on the west side of Cedarburg Bog. Netting has been done in several habitat types, but all the data reported here were collected in a general bird-banding operation conducted each fall from 1965 through 1970 in one particular habitat, the "Forest-edge". The Forest-edge area of the Field Station is fairly similar to the habitat at Cedar Grove. It consists of a transitional zone or ecotone between swamp hardwood forest and abandoned farm fields. The vegetation is mainly shrubby and includes willow, red-osier dogwood, raspberry, and many other shrubs as well as small trees of aspen, elm, ash, tamarack, white cedar, white birch, yellow birch, etc. As at Cedar Grove there are scattered taller trees which provide a canopy stratum not well sampled by mist-nets.

The netting procedures were basically the same as at Root River except that there was less opportunity for moving nets. Certain net positions were used consistently on nearly every trapping date. Also, on a few occasions nets were left up overnight.

Milwaukee TV Transmitter Towers. Throughout September and October in each of the years from 1965 through 1970, I checked the three TV towers on Milwaukee's northeast side, for dead birds. I visited the towers every two or three days, or daily if weather conditions seemed conducive for a kill. I examined, identified and counted all the birds I could find in the open areas around the towers, but did not have time to search the woods or other heavy vegetation. Therefore the figures given are underestimates of the total kills, but this does not affect the results reported in this paper since these are based on relative rather than absolute abundance.

The Milwaukee towers are all in the neighborhood of 1000 feet high but they differ in their bird-killing propensities. One, WITI, is self-

supporting (no guy wires) and is brightly illuminated by rows of white lights during the early part of the night. This tower has killed very few birds. The WTMJ tower just a few hundred yards farther west is of the more typical design, with an extensive guy wire system and only red aircraft warning lights. Moderate kills have occurred there. The third tower, WISN, is about two miles northwest of the other two and is similar in design and lighting to the WTMJ tower. For unknown reasons this is the worst bird-killer of the three, with frequent small kills and occasional fairly large kills (300-500 birds). Nevertheless it will be clear that these towers are not notorious bird-killer like the Eau Claire towers or others around the country, and therefore the sample of birds I have collected from them is relatively small.

RESULTS AND DISCUSSIONS

The data collected in my three samples together with those from the Cedar Grove and Eau Clair samples, are shown in Table 1. We have for comparison three mist-net samples (A, B and C) all from the same part of the state but differing from each other in respect to habitat type, proximity to the Lake Michigan shore, netting procedures, and years sampled; and two TV tower samples which differ in respect to geological area and years sampled. We must assume that, in general, year-to-year fluctuations in bird populations will cancel out so that any sample collected over a period of several years will be comparable to any other sample collected over a period of years. Let us assume that the differences in netting procedures have only minor effects in the long run (for this type of analysis of relative abundance), and that the species composition of the migrant swarm passing over western Wisconsin is about the same as that passing over the eastern part of the state. The remaining factors which might then cause differences in the results are: (a) variations in habitat among the mist-net samples, with A and B known to be fairly similar and C quite different; (b) differences in the proximity of the mist-netting stations to Lake Michigan with B and C similar and A different; and (c) differences in the type of sample with A, B and C representing mist-net samples of birds stopping over on the ground between migration flights, and D and E representing birds in the process of migration flight.

In examining Table 1 it is the percentage columns which must be compared. Looking at these figures for each species it is immediately apparent that there are conspicuous differences from sample to sample in the majority of species. To appreciate the magnitude and the direction of the differences look particularly at the species of flycatchers, the Catbird, the thrushes, some of the more common warblers and vireos, and the more common species of sparrows.

It is possible to evaluate these differences and similarities quantitatively by calculating a coefficient of similarity for each pair of samples. This is a technique widely used in ecology for comparing the species composition of different community types. It has also been used by ornithologists such as Bond (1957) and Beals (1960) and the methods are fully described in their papers. An extension of this technique known as ordination (Cox, 1967) permits the results to be shown graphically.

Coefficients of similarity for each of the pairs of samples are shown in Table 2. These are based on the percentage columns of Table 1. In interpreting these values bear in mind the following: if two samples were completely different, i.e. had no species in common, the coefficient of similarity would be 0. If they were exactly alike, with the same species and the same numbers of individuals for each species, the value would be 1.00. Actually in samples such as these involving many species and individuals it is unrealistic to expect complete similarity. Ecologists have a working rule that a value of 0.85 is about the maximum one might obtain in such samples.

In Table 2 the highest similarity value, 0.57, is between A and B, the Cedar Grove and UWM Field Station mist-net samples, where habitat was fairly similar. The two TV tower samples, D and E, are also quite similar despite the geographic differences involved and the small size of the Milwaukee sample (small sample size tends to cause underestimation of the similarities.) The least similarities occur between the Root River mist-net sample, C, and the two TV tower samples.

These relationships can be seen more clearly by ordinating the values in Table 2 and showing them graphically (Figure 1A). In this graph the X axis probably represents mainly differences ascribable to habitat while the Y axis reflects other differences including the type of sample (mist-net versus TV tower). The mist-net samples form a cluster far separated from the TV tower samples. The average direct line between mist-net and TV points is .71 graph units. Among the mist-net samples note that all three lie close together on the Y axis while C, the Root River sample, lies some distance from the other two on the X or habitat axis.

We can conclude that the two mist-net samples collected from similar habitats provide a reasonably consistent picture of the abundance of autumn birds. On the other hand the sample from a somewhat different type of habitat (C, the Root River area) is quite different, even though the local situation was such that a concentration of small land migrants have been expected. Probably the habitat factors of key importance were: (1) the scarcity of taller trees — vireos and many species of warblers may have avoided the area for this reason; (2) the presence of a leaf-litter, even in the thickets, composed predominantly of grass leaves and stems rather than tree leaves — this may have discouraged such birds as thrushes and white-throated Sparrows, while favoring marsh birds and Song Sparrows; (3) the scarcity of fruit bearing shrubs and a lack of diversity in the seed-bearing herbs.

Conversely the TV tower samples give a picture of relative abundance which is sharply different from all the mist-net samples. Extermination of Table 1 reveals that nearly 95% of the birds in each of the TV tower samples were warblers and vireos. These Wisconsin TV tower killsthus have given a highly selective and biased sample of the birds passing over the area in night migration. Without going into the reasons for this at this point we can ask the question: if the mist-net and TV tower samples were compared only in terms of warblers and vireos, would the results be more compatible?

Accordingly the data for warblers and vireos were extracted from Table 1, the figures for each species were re-calculated as percentages of the totals for these two families alone, and new coefficients of similarity were worked out. The results are shown in Table 3 and Figure 1B.

It can be seen that the similarity between D and E, the two TV tower samples, has changed only slightly (compared with Table 2), and would be expected since they were initially composed almost entirely of warblers and vireos. The similarities in all other cases have increased considerably over those shown in Table 2 indicating that when confined to these two families, mist-net sampling and TV tower sampling give results that are much more nearly comparable. In Figure 1B, the mist-net points and TV tower points overlap greatly on the Y axis and the average distance between mist-net points and TV tower points has been reduced to 0.34. However there remains a separation on the X axis suggesting that substantial differences still exist, possibly related in some way to the habitat preferences of the birds.

This point is examined further in Table 4. Here the results from the three mist-net samples (equally weighted) are averaged, as are those from the two TV tower samples. The rank order for each type of sample is also shown and the species are listed according to the rank order of the mist-net samples. The percentage values have been rounded to one decimal place; however, in determining the rank orders, ties have been avoided by using the original un-rounded percentages. Now, the coefficient of similarity between mist-net samples and TV tower samples, calculated on the basis of the percentage columns, is 0.57, in other words fairly high. It is also possible to compare the rank order columns, using the Spearman rank correlation coefficient (Segal, 1956), which is 0.74, again a significantly high value. These figures merely confirm what has already been stated — that the two types of samples are fairly compatible as far as warblers and vireos are concerned, but with some important differences still to be explained.

These differences can be seen best in the column representing deviations in rank. Plus signs indicate that the species has turned up more frequently in mist-net samples than in TV tower samples, minus signs indicate the converse. Values of 0 or not far from it indicate that the discrepancies are not very great, i.e. the species is about equally represented in the two types of samples.

Several species have conspicuously large plus values: Myrtle Warbler, Orange-crowned Warbler, Yellowthroat, Northern Waterthrush, and American Redstart. Since these are all shrub-inhabiting birds it can reasonably be inferred that mist-net samples overestimate their abundance. In addition, the Myrtle Warbler and Yellowthroat turn up so rarely in TV tower kills that we must suspect a bias in the other direction as well. That is, the TV tower samples tend to **under**estimate their abundance. Why this should be so is difficult to understand, especially since both species have been recorded in large numbers in TV tower kills in the southern states (**e.g.** Stoddard and Norris, 1967).

Species with large minus values indicating better representation in the TV tower kills are: Blackburnian, Bay-breasted, Chestnut-sided and Blackpoll Warblers and Solitary and Yellowthroated Vireos. Here again I suspect bias in both directions. These species are not only less susceptible than others to mist-net capture, but seem to be more susceptible to TV tower accidents.

Finally, there are two species that are commonly taken in mist-nets but are even more common in TV tower samples: Tennessee Warbler and Ovenbird. Both species seem to be about twice as susceptible to TV tower accident as to mist-net capture.

It is easy enough to understand the species selectivity of mist-netting (Mueller and Berger, 1967), but not that of TV tower kills. Here we are dealing with warblers and vireos only, a fairly homogenous group of birds in respect to size, strength, speed of flight, timing of migration and other characteristics of migratory flight. Why should they not be killed in direct proportion to their abundance in the air?

The insusceptibility of a few species like the Yellow and Blus-winged Warblres can be explained by their very early southward flight, which makes them less subject to the type of weather system that ordinarily causes accidents. But for the rest, only a few very tentative hypotheses can be advanced: (1) some species regularly fly at a lower altitude than others making them more likely to hit TV towers, or at a higher altitude, making them less so; (2) some species are either more or less apt than others to initiate or to continue migratory flight under the weather conditions conducive of kills; (3) if kills are due mainly to visual disorientation (Herbert, 1970), then physiological differences might be involved, perhaps in regard to the light-adaptedness of the eye. Ovenbirds for example with large eyes adapted in several ways to the dim light of forests might be more easily disrupted by a TV tower light than some other species.

CONCLUSIONS

As I stated at the outset the abundance of a species of bird must be derived from several sources of information. Mist-netting and TV tower kills, as we have seen, provide generally consistent assessments of the relative abundance of warblers and vireos (but not of other birds), although with a number of contradictions regarding certain species. Taking into consideration these discrepancies and the relative selectivities and biases of the two sources of data, I have tried to reconcile the results with my own bird-watching experience, and with that of others as expressed in **Wisconsin Birds: A Checklist with Migration Charts** (Barger, **et al,** 1960). In Table 4 the two right-hand columns list the status designations as given currently in **Wisconsin Birds,** and as suggested by the results of this study.

Before explaining som eof the suggested changes, several commonly acknowledged points need to be reiterated:

1. Status designations such as these are very crude. At best they represent an attempt to place the species in a rough rank order of abundance, with many ties at each rank.

2. Conspicuousness should not be confused with abundance. Warblers and vireos are much easier to locate and identify in the spring, giving an erroneous impression of greater abundance at that season. Mist-net and TV tower samples have a major advantage over unsystematic bird watching in this respect.

3. In general a given species must be more abundant in fall migration than in spring migration because of the annual patterns of reproduction and survival of birds. However, the **relative** abundance should not be different in spring and fall. Genuine exceptions to this rule can be attributed to three factors: differences in spring and fall migration routes; very early fall migration; a southern species "overshooting" its normal range during spring migration. The first two of these apply to only a small number of Wisconsin warblers and vireos, although the third involves several species.

Generally the status designations suggested in the last column of Table 4 are in accord with the mist-net rank order, but with a number of exceptions, which are here explained. Although the Myrtle Warbler appears to be far more abundant than other species this was the case in only one of the three mist-net samples. Since the relative abundance of this species is probably over-estimated by mist-netting anyhow, I suggest that it is little if any more numerous than the next several species on the list. The Redstart and Northern Waterthrush although high on the list are probably also overestimated and are designated C and FC respectively.

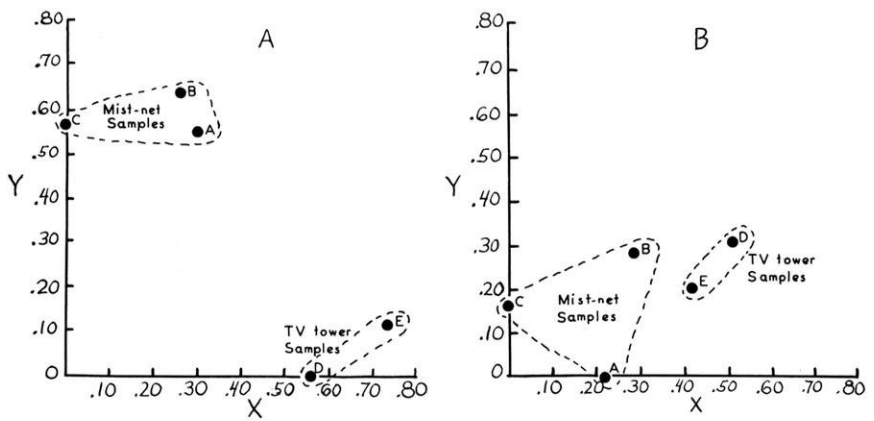
Several inconspicuous species like the Philadelphia Vireo and Connecticut Warbler are probably more abundant than the **Wisconsin Birds** designations show, and have been upgraded slightly. An exception is the Orange-crowned Warbler which has been downgraded to U; it is not only inconspicuous but also in all likelihood overestimated by mist-netting.

In the middle part of the list in Table 4 several species have been downgraded somewhat in accordance with their rankings. Yellow Warblers and Warbling Vireos are decidedly uncommon in the fall and in fact I believe their abundance in spring is generally overestimated. How many individual Yellow Warblers do you actually record in a day of birding in May, compared with the numbers of Ovenbirds, Yellowthroats, Chestnut-sided Warblers and other conspicuous species? I would rank the Yellow Warbler as noticeably less numerous than the Yellowthroat which occurs in the same kind of habitat. The Warbling Vireo is certainly conspicuous (by its song) in spring in certain habitats which are also hightly frequented by humans (e.g. lake shore cottage or camping areas) but overall I would rank it as no more than FC, or perhaps even U. The Blackburnian Warbler is another species the abundance of which seems to be overestimated because of its conspicuousness and perhaps bird-watchers deliberately search for it.

Finally at the bottom of the list are a number of species that are rare or very rare in S.E. Wisconsin and have not been found thus far in

these mist-net or TV tower samples. Some of these, Worm-eating Warbler, Kentuck Warbler, etc., are species that "overshoot" during spring migration. Another, the Pine Warbler, deserves special mention. Although listed as FC in **Wisconsin Birds,** it was never captured at Cedar Grove, I have never found it either spring or fall in my mist-net or TV tower samples, and my bird-watching records reveal only four sight observations since I came to Milwaukee in 1956, three of them in spring and one in fall. A cursory check of The Season reports in the Passenger Pigeon indicates that this species is more abundant inland than along the Lake Michigan shore. Since this is an easy epecies to mis-identify I suggest that bird-watchers in S.E. Wisconsin double check their sight records and document them fully in reports to the seasonal editors of the Passenger Pigeon. I believe that this is a decidedly rare bird in the Lake Michigan shore counties.

In regard to species other than warblers and vireos I concur in general with the comments made by Mueller and Berger (1967). I believe their results tend to exaggerate the importance of the Swainsons Thrush, which nevertheless is clearly a very abundant bird. Their statement that the capture of 900 Black-capped Chickadees "obviously includes many transients", is open to question. At the UWM Field Station, I and several colleagues have been studying this species intensively since 1965. Although we have observed some large annual fluctuations in fall and winter populations we feel that these can be explained by differences from year to year in the survival rates of locally-reared young birds. Since 1965 we have had absolutely no evidence of influxes of migrants from outside the immediate area. I suspect that migrating Chickadees seldom reach southern Wisconsin, but if they do I will agree that they would be most likely to move along the Lake Michigan shore.



Courtesy Migratory Bird Populations Center

FIGURE 1. Ordination showing degree of similarity of samples. See Table 1 for identification of the five samples. Graph A: based on all species; Graph B: based on warblers and vireos only.

TABLE 1. MIST-NETTING AND TV TOWER SAMPLES OF BIRDS IN AUTUMN (10 AUG.-16 NOV.) IN WISCONSIN

Species[1]	A Cedar Grove[2] 1958-1963 No.	%	B UWM Field Station 1965-1970 No.	%	C Root River 1961-1966 No.	%	D Milwaukee TV Towers 1965-1970 No.	%	E Eau Claire TV Towers[3] 1957 and 1963 No.	%
Green Heron	3	.008	0	—	0	—	0	—	0	—
Least Bittern	1	.003	0	—	0	—	0	—	0	—
American Bittern	1	.003	0	—	0	—	0	—	0	—
Sharp-shinned Hawk	30	.084	0	—	0	—	0	—	0	—
Cooper's Hawk	1	.003	0	—	0	—	0	—	0	—
Sora	6	.017	0	—	1	.059	0	—	4	.035
American Coot	0	—	0	—	0	—	1	.134	0	—
American Woodcock	27	.076	0	—	0	—	0	—	0	—
Common Snipe	1	.003	0	—	0	—	0	—	0	—
Spotted Sandpiper	2	.006	0	—	0	—	0	—	0	—
Mourning Dove	5	.014	0	—	0	—	0	—	3	.026
Yellow-billed Cuckoo	18	.050	0	—	4	.234	0	—	0	—
Black-billed Cuckoo	80	.224	7	.205	11	.647	0	—	4	.035
Screech Owl	3	.008	1	.029	2	.118	0	—	0	—
Long-eared Owl	2	.006	0	—	0	—	0	—	0	—
Saw-whet Owl	89	.249	1	.029	0	—	0	—	0	—
Whip-poor-will	19	.053	0	—	0	—	0	—	0	—
Common Nighthawk	2	.006	0	—	0	—	0	—	0	—
Ruby-throated Hummingbird	75	.210	3	.088	0	—	0	—	0	—
Belted Kingfisher	7	.020	0	—	0	—	0	—	0	—
Yellow-shafted Flicker	127	.356	6	.176	1	.059	0	—	0	—
Red-bellied Woodpecker	1	. 003	0	—	0	—	0	—	0	—
Red-headed Woodpecker	2	.006	0	—	0	—	0	—	0	—
Yellow-bellied Sapsucker	191	. 535	1	.029	0	—	0	—	0	—
Hairy Woodpecker	13	. 036	4	.117	0	—	0	—	0	—
Downy Woodpecker	91	.255	24	.704	10	.589	0	—	0	—
Eastern Kingbird	12	. 034	3	.088	0	—	0	—	0	—
Great Crested Flycatcher	60	. 168	3	.088	2	.118	0	—	0	—
Eastern Phoebe	42	. 118	1	.029	0	—	0	—	0	—
Yellow-bellied Flycatcher	499	1.397	19	.588	0	—	0	—	4	.035

TABLE 1 — continued

Species[1]	A Cedar Grove[2] 1958-1963 No.	%	B UWM Field Station 1965-1970 No.	%	C Root River 1961-1966 No.	%	D Milwaukee TV Towers 1965-1970 No.	%	E Eau Claire TV Towers[3] 1957 and 1963 No.	%
Traills Flycatcher	931	2.607	9	.264	75	4.425	0	—	3	.026
Least Flycatcher	557	1.560	34	.997	30	1.764	0	—	2	.017
Eastern Wood Pewee	73	.204	8	.235	0	—	0	—	0	—
Olive-sided Flycatcher	4	.011	0	—	0	—	0	—	0	—
Barn Swallow	1	.003	2	.059	1	.059	0	—	0	—
Blue Jay	41	.115	14	.411	1	.059	0	—	0	—
Black-capped Chickadee	898	2.514	205	6.017	9	.530	0	—	0	—
Boreal Chickadee	1	.003	0	—	0	—	0	—	0	—
Tufted Titmouse	2	.006	0	—	1	.059	0	—	0	—
White-breasted Nuthatch	12	.034	3	.088	0	—	0	—	0	—
Rose-breasted Nuthatch	63	.176	3	.088	2	.118	2	.268	6	.052
Brown Creeper	630	1.764	32	.939	0	—	1	.134	0	—
House Wren	29	.081	33	.969	0	—	0	—	0	—
Winter Wren	17	.048	7	.205	0	—	0	—	0	—
Long-billed Marsh Wren	1	.003	0	—	1	.059	0	—	0	—
Short-billed Marsh Wren	0	—	0	—	3	.117	0	—	3	.026
Catbird	1544	4.323	96	2.818	23	1.354	1	.134	25	.217
Brown Thrasher	97	.272	4	.117	0	—	0	—	0	—
Robin	228	.638	31	.910	2	.118	0	—	0	—
Wood Thrush	42	.118	10	.294	0	—	0	—	1	.009
Hermit Thrush	1701	4.763	108	3.170	4	.235	0	—	0	—
Swainson's Thrush	7678	21.498	201	5.900	8	.471	9	1.208	272	2.366
Grey-cheeked Thrush	1553	4.348	65	1.908	6	.353	16	2.148	75	.652
Veery	432	1.210	3	.088	0	—	1	.134	11	.096
Golden-crowned Kinglet	911	2.551	332	9.745	6	.353	6	.805	0	—
Ruby-crowned Kinglet	1088	3.046	224	6.575	25	1.472	4	.537	1	.009
Bohemian Waxwing	2	.006	0	—	0	—	0	—	0	—
Cedar Waxwing	494	1.383	6	.176	26	1.530	0	—	5	.043
Starling	7	.020	0	—	0	—	0	—	0	—
White-eyed Vireo	2	.006	0	—	0	—	0	—	0	—

TABLE 1 — continued

Species[1]	A Cedar Grove[2] 1958-1963 No.	%	B UWM Field Station 1965-1970 No.	%	C Root River 1961-1966 No.	%	D Milwaukee TV Towers 1965-1970 No.	%	E Eau Claire TV Towers[3] 1957 and 1963 No.	%
Yellow-throated Vireo	11	.031	1	.029	0	—	0	—	53	.461
Solitary Vireo	72	.202	5	.147	2	.118	0	—	143	1.244
Red-eyed Vireo	1416	3.965	65	1.908	9	.530	21	2.819	1302	11.324
Philadelphia Vireo	407	1.140	28	.822	5	.294	18	2.416	721	6.271
Warbling Vireo	5	.014	0	—	3	.177	0	—	0	—
Black and White Warbler	210	.588	14	.411	8	.471	10	1.342	350	3.044
Golden-winged Warbler	15	.042	16	.470	1	.059	0	—	23	.200
Blue-winged Warbler	2	.006	0	—	0	—	0	—	0	—
Tennessee Warbler	441	1.235	97	2.847	43	2.531	182	24.430	1082	9.410
Orange-crowned Warbler	102	.286	14	.411	0	—	0	—	1	.009
Nashville Warbler	110	.308	48	1.409	3	.177	6	.805	120	1.004
Parula Warbler	2	.006	3	.088	0	—	1	.134	10	.087
Yellow Warbler	12	.034	0	—	3	.177	0	—	12	.104
Magnolia Warbler	683	1.912	115	3.375	17	1.001	41	5.503	1458	12.680
Cape May Warbler	61	.171	2	.059	4	.235	12	1.611	147	1.278
Black-throated Blue Warbler	16	.045	10	.294	0	—	3	.403	3	.026
Myrtle Warbler	809	2.265	91	2.671	181	10.653	4	.537	20	.174
Black-throated Green Warbler	31	.087	19	.558	0	—	2	.268	71	.617
Blackburnian Warbler	2	.006	1	.029	0	—	4	.537	49	.426
Chestnut-sided Warbler	77	.216	25	.734	1	.059	7	.939	995	8.654
Bay-breasted Warbler	47	.132	7	.205	5	.294	30	4.027	1208	10.506
Blackpoll Warbler	290	.812	33	.969	19	1.118	124	16.644	518	4.505
Palm Warbler	123	.344	6	.176	18	1.059	17	2.282	340	2.957
Ovenbird	635	1.778	127	3.728	3	.177	168	22.550	1259	10.950
Northern Waterthrush	679	1.901	5	.147	36	2.119	9	1.208	149	1.296
Connecticut Warbler	125	.350	14	.411	0	—	14	1.879	144	1.252
Mourning Warbler	97	.272	3	.088	5	.294	4	.537	5	.043
Yellowthroat	99	.277	70	2.055	52	3.061	3	.403	72	.626
Yellow-breasted Chat	14	.039	0	—	0	—	0	—	0	—
Wilsons Warbler	85	.238	3	.088	4	.235	0	—	7	.061

TABLE 1 — continued

Species[1]	A Cedar Grove[2] 1958-1963 No.	%	B UWM Field Station 1965-1970 No.	%	C Root River 1961-1966 No.	%	D Milwaukee TV Towers 1965-1970 No.	%	E Eau Claire TV Towers[3] 1957 and 1963 No.	%
Canada Warbler	82	.230	7	.205	3	.177	0	—	2	.017
American Redstart	1462	4.094	57	1.673	6	.353	20	2.685	636	5.531
House Sparrow	3	.008	0	—	0	—	0	—	0	—
Bobolink	0	—	0	—	1	.059	0	—	0	—
Red-winged Blackbird	3	.008	0	—	28	1.648	0	—	0	—
Baltimore Oriole	10	.028	0	—	0	—	0	—	2	.017
Rusty Blackbird	1	.003	0	—	1	.059	0	—	0	—
Common Grackle	5	.014	2	.059	0	—	0	—	0	—
Brown-headed Cowbird	12	.034	0	—	8	.471	0	—	0	—
Scarlet Tanager	45	.126	8	.235	0	—	0	—	63	.548
Cardinal	84	.235	3	.088	4	.235	0	—	0	—
Rose-breasted Grosbeak	331	.927	31	.910	13	.765	1	.134	93	.809
Indigo Bunting	43	.120	16	.470	12	.706	1	.134	3	.026
Evening Grosbeak	24	.067	0	—	0	—	0	—	0	—
Purple Finch	367	1.028	5	.147	3	.177	0	—	3	.026
Common Redpoll	2	.006	7	.205	0	—	0	—	0	—
Pine Siskin	115	.322	19	.558	0	—	0	—	0	—
American Goldfinch	155	.434	148	4.344	76	4.473	0	—	0	—
White-winged Crossbill	1	.003	0	—	0	—	0	—	0	—
Rufous-sided Towhee	70	.196	0	—	0	—	0	—	0	—
Savannah Sparrow	0	—	2	.059	50	2.943	0	—	2	.017
Sharp-tailed Sparrow	0	—	0	—	0	—	0	—	1	.009
Vesper Sparrow	0	—	0	—	3	.177	0	—	1	.009
Slate-colored Junco	1275	3.570	285	8.365	53	3.120	0	—	0	—
Tree Sparrow	461	1.291	86	2.524	71	4.179	0	—	0	—
Field Sparrow	44	.123	3	.088	0	—	0	—	0	—
Harris Sparrow	3	.008	0	—	0	—	0	—	0	—
White-crowned Sparrow	104	.291	3	.088	12	.706	0	—	1	.009
White-throated Sparrow	2243	6.280	100	2.935	26	1.530	0	—	4	.035
Fox Sparrow	716	2.005	60	1.761	97	5.709	0	—	0	—

TABLE 1 — continued

Species[1]	A Cedar Grove[2] 1958-1963 No.	%	B UWM Field Station 1965-1970 No.	%	C Root River 1961-1966 No.	%	D Milwaukee TV Towers 1965-1970 No.	%	E Eau Claire TV Towers[3] 1957 and 1963 No.	%
Lincoln's Sparrow	115	.322	27	.792	34	2.001	1	.134	3	.026
Swamp Sparrow	380	1.064	35	1.027	186	10.948	1	.134	3	.026
Song Sparrow	423	1.184	178	5.225	336	19.776	0	—	0	—
Total Birds	35584		3407		1699		745		11498	
No. of Species	117		82		66		35		55	

[1]Species names are taken from AOU Checklist of North American Birds, 1957

[2]From Mueller and Berger, 1967

[3]From Kemper, 1958 and Kemper, Robbins and Epple, 1964

TABLE 2. COEFFICIENTS OF SIMILARITY FOR EACH PAIR OF SAMPLES, BASED ON RELATIVE ABUNDANCE OF ALL SPECIES.

		Sample A	B	C	D	E
Sample	A	—	.57	.35	.23	.24
	B		—	.42	.25	.25
	C			—	.13	.13
	D				—	.55
	E					—

TABLE 3. COEFFICIENTS OF SIMILARITY FOR EACH PAIR OF SAMPLES, BASED ON WARBLERS AND VIREOS ONLY.

		Sample A	B	C	D	E
Sample	A	—	.64	.47	.42	.61
	B		—	.48	.53	.66
	C			—	.33	.35
	D				—	.56
	E					—

TABLE 4. SUMMARY OF MIST-NET SAMPLING vs. TV TOWER SAMPLING OF WARBLERS AND VIREOS WITH CURRENT AND RECOMMENDED STATUS DESIGNATIONS FOR S.E. WISCONSIN.

Species	Mist-net Samples A, B, C Ave. %	TV tower Samples D, E Ave. %	Mist-net Samples Rank	TV tower Samples Rank	Deviation in rank	Current Status (Barger et al 1960)	Suggested Status (this study)[1]
Myrtle Warbler	20.8	0.4	1	20	+19	A	A
Tennessee Warbler	8.8	17.9	2	1	− 1	C	A
Red-eyed Vireo	8.6	7.4	3	6	+ 3	C	A
American Redstart	8.5	4.3	4	9	+ 5	C	C
Magnolia Warbler	8.4	9.5	5	4	− 1	FC	A
Ovenbird	7.6	17.7	6	2	− 4	C	A
Yellow Throat	7.1	.5	7	18	+11	C	C
Northern Waterthrush	5.7	1.3	8	14	+ 6	FC	FC
Blackpoll Warbler	3.9	11.2	9	3	− 6	FC	C
Philadelphia Vireo	3.1	4.5	10	8	− 2	U	C
Nashville Warbler	2.5	1.0	11	15	+ 4	FC	C
Palm Warbler	2.1	2.7	12	10	− 2	C	C
Black and White Warbler	2.0	2.3	13	11	− 2	C	C
Chestnut-sided Warbler	1.3	5.0	14	7	− 7	C	C
Connecticut Warbler	1.0	2.3	15	12	− 3	U	FC
Orange-crowned Warbler	.9	0	16	29	+13	FC	U
Mourning Warbler	.9	.4	17	21	+ 4	FC	FC
Black-throated Green Warbler	.8	.5	18	19	+ 1	C	FC
Bay-breasted Warbler	.8	7.6	19	5	− 14	FC	FC
Canada Warbler	.8	.1	20	24	+ 4	FC	U (FC)
Wilsons Warbler	.8	.1	21	25	+ 4	FC	U (FC)
Golden-winged Warbler	.7	.1	22	26	+ 4	FC	U (FC)
Cape May Warbler	.6	1.5	23	13	− 10	FC	FC
Solitary Vireo	.6	.7	24	17	− 7	FC	FC
Black-throated Blue Warbler	.5	.3	25	22	− 3	U	U
Yellow Warbler	.3	.1	26	27	+ 1	C	U (FC)
Warbling Vireo	.3	0	27	30	+ 3	C	U (FC?)
Parula Warbler	.1	.1	27	28	0	FC	U
Yellow-throated Vireo	.1	.2	29	23	− 6	FC	U
Yellow-breasted Chat	.1	0	30	31	+ 1	R	R
Blackburnian Warbler	.1	1.0	31	16	− 15	C	FC
Blue-winged Warbler	.1	0	32	32	0	U	U
White-eyed Vireo	.1	0	33	33	0	VR	R
Bell's Vireo	....	....	....	....	....	....	....
Prothonotary Warbler	....	....	....	....	....	R	VR (R)
Worm-eating Warbler	....	....	....	....	....	VR	VR (R)
Yellow-throated Warbler	....	....	....	....	....	VR	VR
Pine Warbler	....	....	....	....	....	FC	VR (R)
Prairie Warbler	....	....	....	....	....	R	VR
Louisiana Waterthrush	....	....	....	....	....	U	VR (R)
Kentucky Warbler	....	....	....	....	....	....	VR (R)
Hooded Warbler	....	....	....	....	....	R	VR (R)

[1]Designations in parentheses are for spring season, in those cases where a genuine difference may exist between spring and fall.

SUMMARY

Three mist-net samples from S.E. Wisconsin are compared with each other and with two Wisconsin TV tower kill samples. The mist-net samples give a fairly consistent picture of relative abundance of small land birds in S.E. Wisconsin in the fall. What differences exist are mostly ascribable to differences in habitat in the mist-netting areas. The Wisconsin TV tower samples consisted almost entirely of warblers and vireos. When the comparison was confined to these two groups, the mist-net samples and TV tower samples were in general concordance, but with conspicuous disagreement in certain species. Apparently mist-netting selects for and overestimates the abundance of: Myrtle Warbler, Orange-crowned Warbler, Yellowthroat, Northern Waterthrush, Redstart and perhaps others. It underestimates the abundance of tree-canopy species like the Blackburnian Warbler. TV tower accidents also select for some species like Ovenbird and Blackburnian, Tennessee, Cape May, Bay-breasted and Blackpoll Warblers, while selecting against others like Myrtle Warbler and Yellowthroat. The reasons for this selectivity are not known, but some hypotheses are presented.

The results of TV tower and mist-net sampling are compared with general bird-watching experience and suggestion are made for revising the abundance status designations of warblers and vireos in S.E. Wisconsin.

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FIELD NOTES

The 1970-1971 Winter Season—by William Hilsenhoff

The snow that blanketed the state in December remained through February, and along with cold temperatures forced many species that were still present at Christmas-time to leave the state. Species that were not seen again after the Christmas Counts were the Common Loon, Red-throated Loon, Pied-billed Grebe, Whistling Swan, American Widgeon, Common Scoter, Turkey, Winter Wren, Catbird, Hermit Thrush, Ruby-crowned Kinglet, Vesper Sparrow, and Swamp Sparrow. The results of the Christmas Counts and the status of the Wisconsin bird population through December 1970 has already been reported (**Passenger Pigeon,** Vol. 33, No. 1).

Subsequent to the Christmas Counts several rarities were observed, the most noteworthy being a Ferruginous Hawk at the Bong Recreation Area in Kenosha County, a Spruce Grouse in Iron County, a Savannah Sparrow in Waukesha County, a Harris' Sparrow in Rock County, and a Lincoln's Sparrow in Sheboygan County. All of these observations are detailed in "By the Wayside". Additional rarities included a Mute Swan, Barrow's Goldeneye, Iceland Gull, Ringed Turtle Dove, two Mockingbirds, two Varied Thrushes, a Loggerhead Shrike, and a Hoary Redpoll. Prior to the Christmas Counts a Dunlin was observed in Milwaukee County on December 19, a new late departure record for this species. The last two days of February were very warm, and there was evidence of migrating Canada Geese, Marsh Hawks, Killdeers, and Red-winged Blackbirds.

Observations made during the 1970-1971 Winter Season are summarized below, with emphasis on observations made after the Christmas Count Period.

The Season Summary

Common Loon: 2 Christmas Counts (Milwaukee and Lake Geneva).

Red-throated Loon: 1 Count (Milwaukee).

Pied-billed Grebe: 4 Counts (Green Bay, Oshkosh, Milton, and Lake Geneva).

Great Blue Heron: 2 Counts — One at Petenwell (Juneau-Adams Cos.) on Feb. 7 (Daryl Tessen).

Black-crowned Night Heron: 2 Counts — One remained in Waupaca Co. until Jan. 8 (Mrs. Clarence Radtke).

Mute Swan: 1 Count — One appeared in Milwaukee Co. Feb. 20 and remained at least one week (Dennis Gustafson).

Whistling Swan: 1 Count (LaCrosse).

Canada Goose: 8 Counts — Wintered in several areas north to Brown Co. where 250 wintered (Bro. Columban and Ed Cleary). Migrants were reported in Dodge Co. Feb. 25 (J. March).

Snow Goose: 1 Count — One remained in Winnebago Co. most of the winter (Tessen).

Blue Goose: 1 Count — One wintered in Brown Co. (Columban and Cleary).

Mallard: 37 Counts — Wintered in about normal numbers.

Black Duck: 26 Counts — Wintered in about normal numbers.

Gadwall: 3 Counts — At least 24 wintered in Dane Co. (William Hilsenhoff). Reported from Ozaukee Co. Jan. 16 (Don Hanbury) and Rock Co. Feb. 21 (Martin Stabb) and Feb. 26 (Thomas Ellis).

American Pintail: 2 Counts — Two wintered in Winnebago Co. (Tessen). Remained in Waukesha Co. through January (W. Sievert) and seen Feb. 26 in Milwaukee Co. (Hanbury).

Green-winged Teal: 1 Count — Two wintered in Milwaukee Co. (several observers), and one appeared in Rock Co. Feb. 21 (Stabb).

Blue-winged Teal: 2 Counts — One wintered in Winnebago Co. (Tessen).

American Widgeon: 2 Counts (Stevens Point and Hales Corners).

Shoveler: 1 Count — Two wintered in Dane Co. (Hilsenhoff).

Wood Duck: 4 Counts — Two wintered in Winnebago Co. (Tessen).

Redhead: 6 Counts — Several wintered in Winnebago Co. (Tessen). Also wintered in Ozaukee and Milwaukee Counties (several observers).

Ring-necked Duck: 2 Counts — Wintered in Ozaukee Co. (Thomas Bintz family) and seen in Winnebago Co. until mid-January (Tessen).

Canvasback: 6 Counts — Wintered in Winnebago (Tessen), Ozaukee (Bintz and Hanbury), and Milwaukee Counties (many observers).

Greater Scaup Duck: 7 Counts — Wintering individuals and flocks reported only from Lake Michigan.

Lesser Scaup Duck: 6 Counts — Wintered in Winnebago (Tessen) and Ozaukee Counties (Bintz). Seen Feb. 27-8 in Waukesha Co. (Mary & Charles Nelson).

Common Goldeneye: 34 Counts — Reported wintering throughout the state in normal numbers.

Barrow's Goldeneye: One spent the winter in the Port Washington Harbor, Ozaukee Co. and was seen by several persons (Bintz).

Bufflehead: 7 Counts — Wintering birds observed in Milwaukee and Ozaukee Counties by several people.

Oldsquaw: 7 Counts — In addition to flocks wintering in Lake Michigan, two were seen Dec. 26-Jan. 10 on the Wisconsin R. in Sauk Co. (Philip Ashman).

White-winged Scoter: 3 Counts — Two wintered in Milwaukee Co. (Mary Donald), and one was found Dec. 11 in LaCrosse Co. (Jerome Rosso).

Common Scoter: 1 Count (Hales Corners).

Ruddy Duck: 3 Counts — Wintered in Ozaukee and Milwaukee Counties (many observers). Seen Feb. 25 in Rock Co. (Melva Maxson).

Hooded Merganser: 6 Counts — The three observed in Price Co. on Feb. 18 (Alice Vincent) represent a very unusual observation for the far north. One was also seen in Milwaukee on Feb. 27 (Gustafson).

Common Merganser: 14 Counts — Wintering birds reported north to Portage, Outagamie, and Brown Counties.

Red-breasted Merganser: 9 Counts — Wintered only in Manitowoc Co. (Ray Casper) and Milwaukee Co. (Donald).

Goshawk: 3 Counts — After the Christmas Counts there were 5 reports as follows: Waushara Co. Jan. 14 (Sievert), Taylor Co. Jan. 24 (John & Lois Fadness), Washburn Co. Feb. 6 (Beatrice Bailey), Dane Co. Feb. 16-20 (P. Ashman), and Portage Co. where one was captured Feb. 1 and released Feb. 7 (Vincent Heig).

Sharp-shinned Hawk: 7 Counts — Wintered in Waushara Co. (Irma Chipman) and Manitowoc Co. (Bernard Brochoud). Seen in Dane Co. Feb. 17 (Nancy Ashman) and in Waukesha Co. Feb. 26 (Sievert).

Cooper's Hawk: 6 Counts — Reported wintering only in Winnebago Co. (Tessen), with late winter sightings also in Ozaukee, Dane, Waukesha, and Rock Counties.

Red-tailed Hawk: 39 Counts — Wintered in about normal numbers north of Barron (Alta Goff) and Marinette Counties (Harold Lindberg).

Red-shouldered Hawk: 8 Counts — Wintering birds observed only in Brown Co. (Columban, Cleary) and Ozaukee Co. (several observers).

Rough-legged Hawk: 45 Counts — Wintering birds reported as far north as Burnett and Marinette Counties, with a large concentration near Lake Michigan from Ozaukee Co. south.

Ferruginous Hawk: 1 Count — After being observed on the Lake Geneva Christmas Count, another was sighted at Bong Air Base in Kenosha Co. on Jan. 9 (Gustafson) and Jan. 10 (Donald). See "By the Wayside".

Bald Eagle: 15 Counts — Wintered throughout the state in the vicinity of open rivers.

Marsh Hawk: 8 Counts — Only two January reports: Brown Co. Jan. 21 (Paul Kane) and Dane Co. (N. Ashman). In February there were reports from Rock Co. Feb. 14 (Mrs. Joseph Mahlum) and Kenosha Co. Feb. 21 (Hilsenhoff). Several additional observations on Feb. 27-8 suggest the beginning of the spring migration.

Osprey: A late Osprey was sighted in St. Croix Co. on Dec. 31.

Sparrow Hawk: 32 Counts — Wintered throughout the southern two-thirds of the state.

Spruce Grouse: A sighting of this rare species on Dec. 11 in Iron Co. was reported by Jim Evrard. See "By the Wayside".

Ruffed Grouse: 30 Counts — Reported from all but the extreme southeastern counties.

Prairie Chicken: The only report was from Portage Co. on Feb. 6 (Bernice Athorp).

Sharp-tailed Grouse: 1 Count — Wintered in Burnett (N. R. Stone) and Langlade Counties (Schimmels).

Bobwhite: 8 Counts — Wintered south of Waushara and LaCrosse Counties.

Ring-necked Pheasant: 35 Counts — Common in the agricultural areas.

Gray Partridge: 20 Counts — The Christmas Counts clearly define the distribution of this species in the southeastern third of the state.

Turkey: 1 Count (Necedah).

American Coot: 9 Counts — Single birds wintered north to LaCrosse (Rosso), Outagamie, and Winnebago Counties (Tessen), and at least 200 spent the winter on Lake Monona in Dane Co. (Hilsenhoff).

Killdeer: 1 Count — In addition to the bird on the Cornelia Christmas Count, one was seen Dec. 22 in Dane Co. (N. R. Barger). Apparent early migrants were seen Feb. 27 in Milwaukee Co. (Gustafson) and Feb. 28 in Waukesha Co. (Nelson).

Common Snipe: 10 Counts — Reported wintering only in Waukesha Co. (Nelson).

Dunlin: The sighting in Milwaukee Co. on Dec. 19 (Gustafson) is one week later than the previous late departure record for Wisconsin. See "By the Wayside".

Glaucous Gull: 1 Count — Six were present in Bayfield Co. Jan. 1-3 (David Bratley). Three were sighted in Douglas Co. Dec. 8-9 (Thomas Staupe) and one was found in Brown Co. Dec. 19 (Cleary).

Iceland Gull: 1 Count — The one on the Bayfield Christmas Count was photographed on Jan. 3 (Bratley).

Herring Gull: 19 Counts — Wintered along Lakes Superior, Michigan, and Winnebago.

Ring-billed Gull: 6 Counts — Reported wintering only in Ozaukee (Bintz) and Milwaukee Counties (Donald).

Bonaparte's Gull: 2 Counts (Milwaukee and Racine).

Mourning Dove: 47 Counts — Wintered north to Marinette, Lincoln, and St. Croix Counties.

Ringed Turtle Dove: One was observed along with Mourning Doves in Milwaukee Co. (E. Sheridan).

Barn Owl: One was heard in Sauk Co. on Jan. 6 (Kenneth Lange).

Screech Owl: 14 Counts — Most were reported from the southern two-thirds of the state.

Great Horned Owl: 22 Counts — Common throughout the state.

Snowy Owl: 4 Counts — Found in 16 counties.

Barred Owl: 15 Counts — Found throughout the state.

Long-eared Owl: 9 Counts — Found north to Taylor Co. (Fadness Jan. 16).

Short-eared Owl: 7 Counts — Wintered north to Brown Co. (Columban, Cleary, Kane).

Saw-whet Owl: Seen in Brown Co. Dec. 19 and Jan. 2 (Kane), Langlade Co. Jan. 12 (Schimmels), Oconto Co. Jan. 14 (C. H. Richter), and Iowa Co. Feb. 16 (Robert Hanson). One that fell down the Biemborn's chimney in Milwaukee Co. on Feb. 2 was held captive a while and seen by many observers.

Belted Kingfisher: 22 Counts — Although reported wintering only in LaCrosse (Rosso) and Dane Counties (Tom Ashman), February reports from Washington Co. (Norma Schmidt) and Waupaca Co. (Radtke) suggest wintering birds.

Yellow-shafted Flicker: 13 Counts — Wintered in Ozaukee Co. (Jeanne Jarboe, Bintz) and Rock Co. (Chet Skelly). Birds that probably wintered were sighted Feb. 16 in Columbia Co. (Margarita Cuff) and Feb. 28 in Lafayette Co. (Barger).

Pileated Woodpecker: 17 Counts — Found in all but the extreme northeastern counties.

Red-bellied Woodpecker: 37 Counts — Appeared in normal numbers throughout the southwestern two-thirds of the state. A bird in Vilas Co. (Lolita Gravelle) represents an unusual record.

Red-headed Woodpecker: 30 Counts — Although reported wintering north to Burnett, Barron, St. Croix and Outagamie Counties, this species was difficult to find this winter.

Yellow-bellied Sapsucker: 1 Count — Remained in Milwaukee Co. until Jan. 22 (Gustafson).

Hairy Woodpecker: 58 Counts — Numbers normal.

Downy Woodpecker: 61 Counts — Numbers normal.

Black-backed Three-toed Woodpecker: The only report was Dec. 29 in Marquette Co. (Bernard Kasierski).

Horned Lark: 25 Counts — Wintered in the southern half of the state. Observations in Burnett Co. Feb. 9 (Stone) and Langlade Co. Feb. 10 (Richter) suggest the beginning of their northward migration.

Gray Jay: 3 Counts — Reported only from Sawyer, Vilas, Price, Taylor, Langlade and Shawano Counties.

Blue Jay: 60 Counts — Wintered in about normal numbers.

Common Raven: 11 Counts — Wintered throughout the northern third of the state.

Common Crow: 57 Counts — More abundant than usual in the northern counties.

Black-capped Chickadee: 61 Counts — Most observers felt this species was more abundant than usual.

Boreal Chickadee: 2 Counts — Reported only from Price, Langlade, and Marathon Counties.

Tufted Titmouse: 23 Counts — Found as far north as Lincoln Co. (Theodore Lokemoen) and Langlade Co. (Schimmels).

White-breasted Nuthatch: 59 Counts — Several observers felt numbers were down in the southern half of the state.

Red-breasted Nuthatch: 36 Counts — Wintering birds were found throughout the state, but they were uncommon.

Brown Creeper: 31 Counts — Wintered throughout the state.

Winter Wren: 2 Counts (Madison, Hales Corners).

Mockingbird: One remained in Vernon Co. until Jan. 5 (Viratine Weber). Present in Ozaukee Co. Dec. 22 (Gustafson) and Milwaukee Co. Dec. 29-Jan. 4 (Donald).

Catbird: 3 Counts (Madison, Hales Corners, Lake Geneva).

Brown Thrasher: 9 Counts — Wintered in Waushara Co. (Chipman) and Milwaukee Co. (Donald).

Robin: 23 Counts — Wintered north to Waupaca, Outagamie, and Brown Counties.

Varied Thrush: 1 Count — One wintered in Milwaukee Co. (many observers), and another was present at least until Jan. 10 in Columbia Co. (Werner, T. Ashman).

Hermit Thrush: 1 Count (Madison).

Eastern Bluebird: One remained through the Christmas Count Period in Vernon Co. (Weber).

Golden-crowned Kinglet: 18 Counts — After the Christmas Counts, the only reports were from Rock Co. on Jan. 25 (Stabb) and Milwaukee Co. (Elmer Strehlow) where some remained through Jan. 13.

Ruby-crowned Kinglet: 2 Counts (Sauk City, Milwaukee).

Cedar Waxwing: 9 Counts — Rather uncommon this winter, with wintering flocks seen only in Outagamie and Winnebago Counties (Tessen), Milwaukee Co. (Donald), and Rock Co. (several observers).

Northern Shrike: 33 Counts — Numerous reports from throughout the state indicated that this species was much more common than usual.

Loggerhead Shrike: One observed several times at the same site in Dane Co. from November through Jan. 13 (N. Ashman) is a highly unusual record. This is only the second winter record for this species.

Meadowlarks: 18 Counts — Wintering Meadowlarks were observed as far north as Outagamie (Tessen) and Brown Counties (Columban, Cleary).

Red-winged Blackbird: 22 Counts — Remained in St. Croix Co. until Jan. 15 (Martin Granica). Wintered north to Outagamie Co. (Tessen). Migrants were seen in Green Co. Feb. 28 (Wayne Rohde).

Rusty Blackbird: 2 Counts — Remained in LaCrosse Co. until Jan. 10 (Fred Lesher). Observed in Dodge Co. Feb. 27 (Harold Mathiak).

Brewer's Blackbird: 1 Count — Found in Rock Co. Dec. 19-28 (Mrs. John Brakefield).

Common Grackle: 25 Counts — Wintered as far north as Vilas Co. (Thomas).

Brown-headed Cowbird: 14 Counts — Wintered infrequently north to Dodge Co. (Mathiak). One remained in Brown Co. until Jan. 8 (Peggy Wolfe).

Cardinal: 53 Counts — Numbers normal.

Evening Grosbeak: 41 Counts — Wintered commonly in the northern two-thirds of the state, with scattered reports from the southern counties.

Purple Finch: 29 Counts — The concensus of most observers was that numbers were well below normal.

Pine Grosbeak: 2 Counts — Wintered in Sawyer Co. (Sam Ruegger). Other reports were from Price Co. Feb. 14 (Vincent), Brown Co. Jan. 9 (Cleary, Columban), and Milwaukee Co. Jan. 24 (L. Decker).

Hoary Redpoll: One was observed in Brown Co. on Feb. 14 (Columban, Cleary).

Common Redpoll: 13 Counts — Most reports came from the central counties, but even there this species was uncommon this winter.

Pine Siskin: 11 Counts — Although reported as fairly common in Burnett Co. (Stone), other observers remarked about their general absence. The only other late winter reports were from Price, Shawano, Manitowoc, and Waukesha Counties.

American Goldfinch: 50 Counts — Most observers felt that numbers of wintering birds were above normal.

Red Crossbill: 1 Count — Besides those reported on the Hudson Christmas Count, the only others were seen Dec. 13 in Dane Co. (T. Ashman).

White-winged Crossbill: The only report was from Burnett Co. where they were "fairly common" (Stone).

Rufous-sided Towhee: 2 Counts — Wintered in Shawano Co. (Mrs. Karl Hafemann), Winnebago Co. (Mrs. Edward Natzke), Ozaukee Co. (Donald), and Milwaukee Co. (Donald, Hanbury).

Savannah Sparrow: One remained in Waukesha Co. until Feb. 21 (Gustafson). This is the first February record for this species. See "By the Wayside".

Vesper Sparrow: 1 Count (Lake Geneva).

Slate-colored Junco: 51 Counts — Numbers of wintering birds in the southern half of the state were considered by most observers to be a little below normal.

Oregon Junco: 18 Counts — Wintered north to Wood and Portage Counties.

Tree Sparrow: 49 Counts — Wintered in slightly below normal numbers in the southern half of the state. Remained as far north as Burnett and Langlade Counties.

Harris' Sparrow: 1 Count — One observed Jan. 24 in Rock Co. (Ellis). See "By the Wayside".

White-crowned Sparrow: 2 Counts — Remained throughout February in Manitowoc Co. (Casper).

White-throated Sparrow: 11 Counts — Wintered north to Langlade (Schimmels) and Wood Counties (Athorp).

Fox Sparrow: 1 Count — Wintered in Vilas (Thomas) and Manitowoc Counties (Irene Luethge).

Lincoln's Sparrow: One found in Sheboygan Co. on Feb. 27 is the first February record for this species. See "By the Wayside".

Swamp Sparrow: 8 Counts — None seen after the Christmas Counts.

Song Sparrow: 25 Counts — Wintered north to Outagamie and Brown Counties.

Lapland Longspur: 8 Counts — Seen Jan. 10 and Feb. 3 in Brown Co. (Cleary, Columban), and Feb. 28 in Waushara Co. (Delbert Greenman). The only other late winter records were from Dodge, Ozaukee, Waukesha, and Kenosha Counties.

Snow Bunting: 31 Counts — Although most common in the north, this species was found throughout the state. N. R. Barger reported seeing "several hundred" in Green Co. on Feb. 28.

By the Wayside . . .

Ferruginous Hawk at Bong Recreation Area – "First mentioned to me by Larry Balch of Chicago who had seen it in December with other Illinois birders. Seen two times on 1-9-71 for a total of 8-10 minutes, both perched at only 50 ft. from our car and in flight. Undersides showed all whitish tail, whitish primaries and secondaries, inner wing linings dark with rusty shading and dark body. From above the back, head, and wings were all uniformly dark with the exception of a light area just beyond the wrist area on each wing and the tail also lighter than the back. It perched in trees, usually near the top. In flight the wings were slightly above the horizontal. When apparently hunting, it was never observed to hover as a Rough-legged Hawk characteristically does. My last communication with the group indicated that someone found two specimens in the Smithsonian collection that match this hawk (both Ferruginous dark phase) but one immature Rough-leg is also a close match for it." –Dennis K. Gustafson.

Spruce Grouse in Iron County – "One Spruce Grouse was seen at 3:30 p. m. on December 11, 1970 on the Chippewa Lane, Iron County (Section 11, T 43 N, R 1 E). The bird flushed from a dense stand of young balsam fir on a road cut, flew 10 yards down the road and turned off in the direction of a conifer swamp. There was 8-10 inches of snow on the ground. The bird appeared to be smaller and much dark-grayer than a Ruffed Grouse. The tan-colored band on the tail was visible. I have previously seen Spruce Grouse in Ontario and Wisconsin. Area Game Manager Cliff Wiita also observed the bird." – Jim Evrard.

Savannah Sparrow Wintering in Waukesha – "One at feeder of the Klug's at Waukesha for some time; seen on 2-21. Fine stripes on breast and sides. Striped head with yellow-buff under coloring especially at whisker area. Size smaller than Tree Sparrow with medium length forked tail with pale but not white outer tail feathers. Bill sparrow-like, perhaps slightly more pointed than usual and pinkish towards base, blackish at tip. Matches Peterson, except eyeline not as yellowish." – Dennis K. Gustafson.

Harris' Sparrow on January 24 – "Seen at north end of Big Hill Park by myself and Lee Johnson and Bill Shephard of Rockford, Ill. The loud alarm note was heard several times. When disturbed it flew up into a tree where it was easily observed. Bill reddish, face and throat black, head blackish, sides streaked with black, two distinct white wing-bars. A large sparrow – slightly larger than Fox Sparrow." – Thomas R. Ellis.

Lincoln's Sparrow at Sheboygan – "On Feb. 27th (yesterday) on the ground beneath our feeder and about twenty feet from our kitchen window I found a sparrow amongst the ten or more English Sparrows. It looked quite dark through the window. I looked at it with my 7 X 35 B. & L. close to the window. I noticed the fine streaking with the buffy color mainly on the breast; the thin white eye ring and the gray face – it was a Lincoln's Sparrow (only one). I was flabbergasted." – H. Koopmann.

Minutes of the Annual Business Meeting

WISCONSIN SOCIETY FOR ORNITHOLOGY, INC.

Milwaukee, Wisconsin **May 23, 1971**

The meeting was called to order at 2:30 p. m. by President William Pugh with at least 95 persons present.

MINUTES of the 1970 Business Meeting were read by the Secretary; there being no additions o rcorrections the Minutes were approved as read.

Ed Prins then took the floor and asked what had been done in regard to the committee for the purpose of seeking affiliation with local groups within the state as authorized by last year's Annual Meeting and who had been put on that committee. President Pugh explained the difficulties of such a program, citing the experience of the Minnesota Ornithological Society. Since it was evident from the ensuing discussion that no action had been taken, Harold Liebherr moved the re-affirmation of such authorization with the appointment of the committee to be the responsibility of the Board of Directors; this was seconded but was superseded by a motion that immediate action be taken and that Harold Liebherr and Ed Prins be appointed to this committee. This motion was carried.

The Re-stated Articles of Incorporation, having been made available to all mem-mers through the **Badger Birder,** were now offered for adoption by President Pugh. Inquiry about the need for such a re-statement was answered by Lowell Hall who ex-plained the technical changes in regard to property matters necessary to comply with present state laws. Motion for adoption by Judge Simpson was approved.

Evelyn Werner, Naturalist at Goose Pond, told of the breeding bird study being conducted there and proposed that such studies be extended to other suitable State Scientific Areas. This should be a long-range program of considerable value. Thirty-five of the ninety such areas will be censused this coming June and she asked for volunteers to help achieve the desired coverage. Scieitific Areas, it was explained, were set aside by the State because of their unique geological, botanical or ornithological features.

She also spoke of the proposed drawdown and poisoning program at Horicon this coming November. A newly formed organization, Southern Wisconsin Wetlands Asso-ciation, desires that a study be made before that time in order that comparisons may be drawn and other effects on the environment evaluated. Since much of the Horicon Marsh area is a well-known Federal Refuge, there will, no doubt, be widespread in-terest shown in what will happen in regard to the large heron rookery, the huge mi-grant flocks and the many resident species. WSO members are urged to be alert and watch the situation carefully.

WRITTEN REPORTS OF BOARD MEMBERS

TREASURER —

Income:		**Expenses:**	
Memberships	$4,182.00	Addressograph	$ 138.67
Advertising	200.00	Badger Birder	310.60
		Circulation Manager	75.00
		Fire Insurance	27.00
		Liability Insurance	34.00
		Honey Creek	254.13
		Membership Chairman	39.64
		Mimeograph	36.15
		Stationery and Printing	71.00
		Treasurer	12.00
		Passenger Pigeon	824.05
		Miscellaneous	1.90
			$1,724.14
		Net Gain to Date	2,657.86
Total	$4,382.00	Total	$4,382.00

BALANCE SHEET

(Assets)		(Credits)	
Cash on Hand	$ 2,867.56	Endowment Fund	$ 2,000.00
Steenbock Savings (Total)	2,294.54	WSO Net Worth	31,591.65
General Savings	4,120.67	Net Gain to Date	2,657.86
Astro Savings	2,004.53		
Books Inventory	5,100.00		
Equipment (Listed)	825.26		
Land Values	14,288.39		
U.S. Treasury Note	4,960.26		
Total	$36,249.51	Total	$36,249.51

Astro Savings Account was established April 14, 1971. It earns 5½% interest and should remain intact for one year without loss of interest. The amount of $2,000.00 was made of $1,760.00 which was refunded by the Wisconsin Academy of Arts, Letters and Science — the unused portion of WSO's grant for the Wild Rivers Project. $240.00 was taken from the checking account to make up the difference.

Scholarships (Steenbock): On April 30, 1971, two $100.00 scholarships were sent to the candidates selected by the Committee headed by Clara Hussong.

Out-of-State Contributions: On the suggestion of the Hamerstroms of the Research Committee, the Board voted to contribute $100.00 to the Michigan Dept. of Natural Resources for the purpose of acquiring land for the preservation of Prairie Chickens. The fiscal year for WSO is from January 1 through December 31; therefore this report reflects the financial activity of WSO for only a half year.

Respectfully submitted, Phyllis Holz, Treasurer

MEMBERSHIP: Paid Memberships — Life 20; Honorary 9; Patron 5; Sustaining 65; Family 215; Single 576; Library 61 & 61; Total 1105. New memberships in 1970 — Single 67; Family 26. I have answered all the questions as well as I could in letters and phone calls. I have shown my slides at many places and tried to work for Conservation of our environment. Biggest problem: out-dated brochures that have the old amount for memberships. Everyone has been co-operating in sending address changes which I appreciate. I with to thank everyone for their help during the past year.

Norma Schmidt, Chairman (Addressograph)

PUBLICATIONS AND AWARDS: All routine publications for the Society were kept in good supply and Board members were furnished with their necessary and/or special stationery, envelopes and forms. A one-page special brochure announcing the publication of Fran Hamerstrom's excellent book "An Eagle in the Sky" was designed and published for distribution to the membership of WSO. New for the Society this year was the self-mailer type of annual dues statement. This new form has proved to be very successful, both in additional revenue and in the ease of handling and prompt return to the membership chairman.

As Chairman of the Awards Committee, a Life Membership Award plaque was made for and presented to Chandler Robbins in 1970. There was no Silver Pigeon Award in 1970. Your Chairman attended all but the mid-January meeting of the Board of Directors.

Respectfully submitted, Alfred O. Holz, Chairman

RESEARCH: Erdman's Shrike survey has been completed and a manuscript submitted to the **Passenger Pigeon;** it should appear shortly. A brief article has been published in the Wisconsin Conservation Bulletin: Sindelar, Charles R. "Are We Losing the Osprey?" Wis. Cons. Bull. 36(2)1971:20-22. Erdman's continuing study of Egrets and Herons is well launched. He particularly needs the help of the membership of WSO in reporting rookeries, whether still active or defunct. There is a tear-out questionnaire in the **Passenger Pigeon** 32(4)1970:185-186 (Winter Issue, 1970). If you prefer, write a letter to Tom Erdman, P.O. Box 631, Green Bay, Wisconsin 54305. Don't fail to send your information.

Frederick and Frances Hamerstrom, Co-Chairmen

CONSERVATION: The major activities of the Committee during the year were directed towards environmental problems. The Board has supported the Wisconsin Department of Natural Resources' efforts to raise the water quality standards and their enforcement on the major rivers of the state where pollution from industries and sewage threatens the welfare of aquatic birds and other forms of wildlife.

The rapid increase in the number of snowmobiles has resulted in serious damage to the vegetation and harrassment of wildlife. WSO has supported the efforts of the DNR and some local governments in restricting the use of snowmobiles on public lands such as local and state parks, wildlife management areas, and scientific areas.

Robert Lutz, our legal council, conducted a thorough investigation of the pole trapping operations permitted by the DNR on private game farms and rabbit hunting club grounds. The Department agreed to tighten up on the supervision of such activities. Hopefully the Department will outlaw pole trapping in the near future.

F. M. Baumgartner, Chairman, Conservation Committee

SUPPLY DEPARTMENT: Report for 1970

Total Income		$4,975.37	Bookstore Profit	$ 892.00
Merchandise	$3,798.17		Turned over to WSO Treas.	1,000.00
Operating Expense	262.78		Number of mail orders filled	4200
Refunds	21.14			
Total	$4,082.09	$4,082.09		

Total income, 1970, was below previous years, mainly due to lower Conservation income, also a drop in the size of book orders.

Harold G. Kruse, Manager

EDUCATION: Answering letters about a variety of nature subjects, telling where to order bird books and records (WSO Supply Dept.), where to get free pamphlets for scouts and other groups and recommending good birding spots in various areas has been my main work this year. The WSO slides were used six times and there are two bookings for upcoming months. Whenever it appeared that letter writers were not WSO members, I sent them a brochure and enclosed a membership blank.

Clara Hussong, Chairman

STEENBOCK SCHOLARSHIP AWARDS: Two $100.00 scholarships were given this year at the recommendation of the WSO Board. Winners were Michael Jaeger of Madison who will make a study of breeding birds at Goose Pond (Columbia County), and Orren Bendickson, Thief River Falls, Minn., who is completing his Master of Science degree at LaCrosse University. He will use this money to help defray his expenses while attending the summer session at Pigon Lake Field Station in Bayfield County.

Clara Hussong, Drs. Fred and Fran Hamerstrom

(As reported by President Pugh)

EDITOR, BADGER BIRDER: Mary Donald reports that 11 issues were put out since the last annual meeting. She wishes to thank all who sent in information. She again requests that the information keep on its way to her.

LEGAL COUNSEL: Robert Lutz started court action to compel the pole-trap law be enforced. New By-Laws.

— END OF SUBMITTED REPORTS —

EDITOR, PASSENGER PIGEON: Dr. Kemper stressed the need for more information to be given to Tom Erdman in regard to the Heron and Egret study; he emphasized the great importance of such research material in the Pigeon, both for present and for future studies. The interest and enthusiasm being shown by young people is extremely encouraging and must be augmented in every way possible.

FIELD TRIPS: Edward Peartree reported — Spring Campout, Point Beach; Fall Campout, Rock County home of John Brakefield; Petenwell Area Field Trip, February; Milwaukee Area Field Trip, March; Fond du Lac Area Swan Trip, April. Mounting interest is being shown in these events, providing friendly, informative get-togethers for members and friends from all parts of the state.

Judge Simpson, noting many WSO Past-Presidents present, asked them to stand — a surprising number of distinguished looking persons rose and received a hearty tribute for their part in making WSO the honored and effective organization it has grown to be.

Although WSO definitely went on record at the 1968 Annual Meeting as being opposed to removing the Mourning Dove from the songbird list, there still seems to be wide-spread misunderstanding. To put an end to this, Judge Simpson moved a Resolution to re-affirm the previous Resolution to keep the Mourning Dove on the song bird list. Seconded by Owen Gromme and unanimously endorsed.

The following slate of officers for 1971-72 was placed in nomination by Chairmen E. Peartree, Walter Scott and Carl Hayssen: President, Rockne Knuth, Sarena; Pres.-Elect, Robert McCabe, Madison; Treasurer, Mrs. A. O. Holz, Green Bay; Secretary, Mrs. D. J. Cox, Beloit; Editor, Charles Kemper, M.D., Chippewa Falls. No other nominations being offered, the Secretary was instructed to cast a unanimous ballot for the above slate, which was done; a standing ovation was given the officers, the gavel was handed over to President Knuth. The Secretary read a few of the letters received from school children. President Knuth, seemingly awed by the imposing array of Past-Presidents he had just witnessed and finding no further business to come before the meeting called for adjournment at 3:15 p. m.

Respectfully submitted, Hazel Cox. Secretary

THE PUGNOSE SHINER — A DODO?

By GEORGE BECKER

Dept. of Biology, Wis. State Univ.

Stevens Point, Wis.

The pugnose shiner (**Notropis anogenus** Forbes) is unquestionably one of the rarest fishes in North America. Scattered collections of this minnow have been made from eastern North Dakota to the western part of New York state, from the northern parts of the states of Ohio, Inliana, Illinois and Iowa, with the center of its distribution the states of Minnesota, Wisconsin and Michigan.

Although it appears to have a wide range, nowhere has it been collected in large numbers. So rare has it become that one expert has sought out and verified all known records and plotted some 70 localities throughout its entire range (Bailey 1959). Many of these records go back into the last century. It has disappeared from Indiana and Ohio and is no longer found in many areas of those few states where it is still thought to be present.

The pugnosed shiner is a compressed species seldom more than 1¾ inches in length. Perhaps its most distinctive feature is the small mouth, opening upward with the jaws almost vertical in position. It has a broad lateral stripe. The lining of the abdominal cavity is dark. In Michigan this shiner is reported as rare in weedy shoals of lakes (Hubbs & Cooper 1936). When Willard Greene (1935) sampled the waters of the state of Wiscnosin in the late 1920's he was able to locate it at only 14 stations. Recent sampling of these same areas failed to locate this species, indicating perhaps extirpation at those sites.

The following are known recent records from Wisconsin waters:

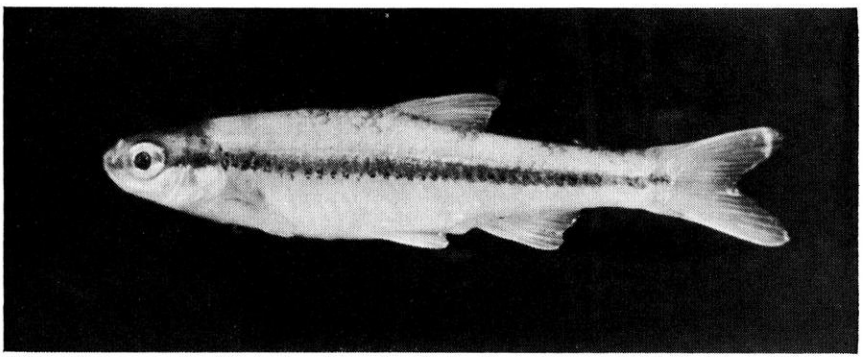
2 specimens. Pawaukee Lake (Washara Co.), Aug. 3, 1960. Coll. by G. Becker.

2 specimens. Lake Poygan (Winnebago Co.), Aug. 8, 1961. A second collection at the same locale consisted of 41 specimens, July, 1963). Coll. by G. Becker.

1 specimen. White Clay Lake (Shawano Co.), May 25, 1968. Coll. by Marlin Johnson.

The above is a poor showing considering the intensive collecting that has been done in the state during the past decade. It is probably a worse showing considering that Wisconsin is perhaps the pugnose shiner's best remaining stronghold.

The history of our animal species relates a story of habitat deterioration and eventual destruction. Without question heavy siltation of our waters has destructive affect on this species with its tiny mouth and fragile body. Its life history is an enigma and will probably continue until it is completely eliminated from the scene (Becker 1961).



PUGNOSE SHINER

Some agencies have given thought to the establishment of a sanctuary dedicated to the preservation of a threatened fish species in its native habitat. This has been done for rare plants, birds and mammals in Wisconsin. Before such a sanctuary could be established for the pugnose shiner, we would have to know its water, bottom, vegetation and other ecological requirements. We would certainly want to preserve a population which is healthy and has some probability of surviving under the limited protection that we are able to accord an aquatic environment today.

Even if a sanctuary were established, a single careless use of agricultural pesticide could instantly rub out what took thousands of years to evolve. Cattle and hogs still rile up stream and lake bottoms and in addition to the silt add copious quantities of manure directly into the water. We treat our lakes, rivers and trout streams like open cesspools. Although the direct affect on the pugnose shiner is not known, we have enough evidence that such treatment destroys or at least disrupts the ecological balance of many aquatic environments.

Indiscriminate treatment of waters with fish toxins for eradicating carp and unwanted fish species may have removed isolated populations of the pugnose shiner from some of our waters in the past. This is still going on. Careful determination of the minnows present in a body of water scheduled for such treatment is not always known. Even if it were known, I am confident that most agencies would make little effort toward saving the remnant population. After all, who except for a fish taxonomist or a nature lover can get excited about a pugnose shiner?

Thus it appears that **Notropic anogenus,** alias pugnose shiner, will soon follow the way of the dodo. It seems to be a plight destined for a number of Wisconsin fish species, bits of life which are as unique as the cormorant, prairie chicken, bald eagle and peregrine falcon.
Feb. 8, 1971.

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SONG-SPREAD PERCHES OF MALE RED-WINGED BLACKBIRDS

By MICHAEL JAEGER

In the study of breeding behavior in birds the first thing generally noted is song. Singing in birds serves many functions (i.e. territorial maintenance, sexual attraction, etc.). Singing is usually accompanied by visual displays. Armstrong (1947) concludes "that vocalizations, posturings and other kinds of behaviour are not merely closely connected one with another but are integrated into display-patterns, which are a combination of visual and vocal elements." To be most effective these display-patterns should be received as both visual and vocal elements.

The structure of the plant community in which the display-pattern is given presents some problems. In many plant communities there are layers of dense vegetation. Marshes may have only one such layer while a forest may have three or more of these layers. These layers "not only obstruct vision, but it absorbs sound." (Welty, 1962). If a display-pattern is given from within one of these layers of vegetation its effectiveness would cover only a small area nearby. The vegetation would hide the visual aspect, and it would absorb much of the sound. A bird must get into a position that puts it out of the dense vegetation.

The Red-winged Blackbird, **Agelaius phoeniceus** (Linnaeus), usually chooses and open area for nesting. Its first preference is the marsh, though they do well in prairie and fields. These areas have one thick layer of plants near to the ground.

Nero (1956) describes two song-displays of the male Red-winged Blackbird. One of these called "song-spread" is dealt with here.

The song-spread consists of the call 'ong-ka-lee'. The head is thrust forward, the tail and wing feathers are spread and lowered, and the red shoulder patches (epaulets) are raised. With the climax 'lee' the tail and wing feathers are carried to an extreme. The closure of the song usually brings about the normal resting position.

In the spring of 1970 I made a series of observations dealing with the location of male Red-winged Blackbirds when they performed song-spreads. The Curtis Prairie of the University of Wisconsin Arboretum in Madison, Wisconsin served as the location of these observations.

The song-spread was given as soon as the males arrived on their breeding grounds, about the second week in March. The year's growth of vegetation is not yet started, for prairies usually don't green up until late spring. The only plants available to the Red-winged Blackbirds are those from previous years. It is not until early summer that the new growth of plants exceeds that of the previous year's.

Forty-two males performing song-spreads were observed (table one). Over 95% were performing above the general layer of vegetation. 45.2% were perched on dead stalks of various prairie plants that had grown in the previous year. These birds were all above the layer of vegetation and were visible for quite a distance around. Only 4.8% performed on the ground. These birds were hidden by the vegetation layer. These birds performed only one song-spread apiece from this position before moving.

TABLE 1. Perches for song-spreads

LOCATION	# OF MALES	% OF TOTAL
Trees	21	50
Dead Stalks	19	45.2
Ground	2	4.8
Total	42	100

CONCLUSION

The song-spread display of the Red-winged Blackbird is a combination of visual and vocal elements. It is probably most effective when both heard and seen. It chooses plants that project above the general layer of dense vegetation as perches for its song-spreads so that they can easily be seen and heard.

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Heavy Mortality of Migrating Birds at Madison's TV Towers

By BRIAN SHARP

Dept. of Wildlife Ecology, University of Wisconsin

Madison, Wisconsin[1]

On the inauspicious morning of September 24, 1968, Margaret B. Hickey and I picked up 493 dead birds from the ground beneath Madison's four TV towers – channels 27 (WKOW), 15 (WMTV), 3 (WISC), and University of Wisconsin (WHA). Drs. John T. Emlen and Joseph J. Hickey helped in identifying these birds. Thirty-three species were represented in the kill (Table 1). Of these, five species – the Olive-backed Thrush, the Ovenbird, and the Tennessee, Bay-brsated and Blackpoll Warblers – accounted for two-thirds of the casualties. As is usual in occurrences of this kind, the thrushes, warblers and vireos together made up the greater portion (98%) of the total. A smaller percentage of Olive-backed Thrushes (29%) was found at towers 27 and 15, where the grass was mowed, than at the other two towers (44%), where the thrushes were more conspicuous than the small warblers, many of which escaped detection in the unmowed grass and alfalfa.

Some of the dead birds were wet, some dry. There were puddles of water in the TV stations' parking lots that morning, and workmen reported an early downpour. During the night the weather had acted somewhat peculiar. From sunset until midnight the wind was southwest to west, 5-8 mph; from midnight until daybreak again it varied from 4 to 10 mph, but between 2 a.m. and 3 a.m. its direction had been from the northwest. Minimum temperature (i.e., during the early hours of the morning) on September 24 were substantially lower (48°) than the previous night (62°). The cloud ceiling was lowest (600 feet at the Madison airport) from 11 p.m. until 2 a.m., after which it was variable, up to 6500 feet. Rain occurred locally between 1 a.m. and 5 a. m.(with the airport recording 0.08 inches). The shift in wind direction and the change in temperature may have contributed to the heavy migration flight that night, and the coincidental rainfall in the vicinity of the towers was apparently responsible for much of the mortality.

Visibility was evidently extremely limited much of the time. Whether the change in wind direction aggravated the birds' confusion or not is unknown. And, of course, it should not be forgotten that the presence of the television towers themselves, even under less unfavorable circumstances, is a constant hazard.

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[1]Present address: Bird Banding Laboratory
Migratory Bird Populations Station
Laurel, Maryland 20810

TABLE 1. NUMBERS AND SPECIES OF BIRDS KILLED AT FOUR MADISON TV TOWERS, NIGHT OF SEPT. 23-24, 1968.

Species	Tower 27	15	8	Univ.	Total
Passerines other than vireos and warblers					
Olive-backed Thrush	84	43	16	7	150
Gray-cheeked Thrush	1	3	1		5
Veery	3				3
Rose-breasted Grosbeak	3		1		4
Scarlet Tanager	1	1			2
Yellow-bellied Flycatcher		1			1
Ruby-crowned Kinglet	1				1
Swamp Sparrow	1				1
Vireos and Warblers					
Ovenbird	46	12	7	4	69
Tennessee Warbler	34	7	1	1	43
Bay-breasted Warbler	24	8	1	2	35
Blackpoll Warbler	22	7	1		30
Red-eyed Vireo	18	6			24
Redstart	10	9	3		22
Magnolia Warbler	12	2		1	15
Chestnut-sided Warbler	10	4			14
Palm Warbler	7	4			11
Black and White Warbler	10	1			11
Philadelphia Vireo	7	2	1		10
Connecticut Warbler	4	3	1		8
Northern Waterthrush	3	2			5
Cape May Warbler	3	2			5
Yellowthroat	3			1	4
Blue-headed Vireo	3	1			4
Black-throated Green Warbler	2		1		3
Nashville Warbler	1	1	1		3
Blackburnian Warbler		1	1		2
Myrtle Warbler		2			2
Yellow-throated Vireo	1	1			2
Golden-winged Warbler	1				1
Orange-crowned Warbler	1				1
Yellow-bellied Sapsucker	1				1
Yellow-billed Cuckoo		1			1
Totals	317	124	36	16	493

Revisions and Additions to Extreme Arrival and Departure Dates

Vol. XXXII, No. 3, the fall issue of the *Passenger Pigeon,* there appeared Extreme Arrival and Departure Dates for Wisconsin Birds. It has been the editorial policy to update this from time to time. The value of this edition to each reader will lie in his keeping his own revisions and additions.

The newest revisions are as follows:

1. p. 94—below Black Vulture, insert Mississippi Kite. Under Fall Arrival column put *Sep. 10, 1970, Dan D. Berger. Sep. 11, 1971, Mr. and Mrs. Paul Engberg.* Under Exceptional Dates column add *hypothetical.* This means the record was not documented by specimen or photograph.

2. p. 108—below Caspian Tern, insert Royal Tern. Under Fall Arrival put *Sep. 5, 1965, Daryl Tessen.* Under Fall Departure column put *Sep. 27, 1970, David Bratley and Harold Mathiak.* Under Exceptional Dates column, put *hypothetical.*

3. p. 109—Opposite Black-legged Kittiwake, under Fall Arrival column, add *Nov. 6, 1970, Dennis Gustafson* in place of Nov. 26, 1967, Roland Wienke .

4. p. 109—Opposite Yellow-billed Cuckoo, under Fall Departure replace current record with *Nov. 19, 1970, Mary Donald.*

5. p. 111—Opposite Chuck-will's Widow, under the Fall Arrival column, insert *mid-August, 1970, Roy Flaherty.* Under the Exceptional Dates column, remove "only record."

6. p. 129—Opposite Hooded Warbler, under Exceptional Dates put *Sep. 20, 1970, Edith Sheridan, Oscar Lemke.*

Notes from the Editor

It perhaps will come as a shock to WSO members to see an article about a fish in their bird magazine. As a matter of fact I am sure the feelings of some of our purists will be ruffled. How does a magazine for bird study have the right to print an article about a fish?

Well, that is a point of view that may be nearly invulnerable. However, we have felt that we should extend our bird sightings a little bit, especially since the author is a former past president of WSO, an active birder, and a friend of many of our readers. Secondly, most "birders" are not that parochial. They usually are naturalists with great interest in all facets of wildlife and our environment. A report on a rare fish by a rare birder seems to this editor quite appropriate.

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There is a storage problem for Circulation Manager Frank King. Back numbers may be secured on request from Mr. King for $1 each. The editor gets requests for back issues from individuals over the whole world. He forwards these to Frank King, 646 Knickerbocker St., Madison, Wisconsin 53711.

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Clara Hussong, 332 Beaupre Ave., Green Bay, is custodian of WSO's collection of bird slides. These are available for loan to interested groups on request. She is particularly in need of slides of Black-backed Woodpeckers. Hope someone can fill this need.

— o —

The WSO has presented to the Sentry Insurance Company an Owen Gromme Bobwhite painting in appreciation for their allowing us meeting facilities over the past ten or more years. Four times a year directors of the WSO come from all corners and parts of Wisconsin to tend to the business of this organization. Such a meeting generally lasts from 10 a. m. to 4 p. m. with time out for lunch.

—NOTES—

W. S. O. OFFICERS & COMMITTEES — 1971-1972

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