

THE FLICKER

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MARCH-JUNE, 1951

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The Nesting Season -- 1950

by

Dwain W. Warner

It has been the custom in the past for the data gathered on nests during the year to be presented in tabular and rather complete form. Such tabulation of data, while of considerable use and interest, is limited in scope and has little comparative value unless the reader is willing to undertake the tedious job of making his own analysis and comparisons. To present the 1950 nesting data in the same manner as in past years is impossible from the standpoint of space alone. But the vast number of nesting records contributed give, for many species at least, a fairly complete picture of what happened to the birds during their breeding period in this region.

By themselves these records mean relatively little, but together and compared with other years several significant facts are apparent. It is not within the scope of this paper to present a complete analysis of the nesting season. The data are still too incomplete for that. However, the rather brief analysis of these nesting data reveals the following interesting points: 1. The overall picture of March, April,

and early May nesting activities, or lack of nesting, supports the meteorological and phenological observations which show the spring of 1950 to have been one of the latest springs on record. 2. The data indicate that almost all early nesting species delayed starting their first nests until warmer weather arrived. 3. Those species which characteristically do not begin to nest until late spring or early summer were not delayed by the cold spring. A brief summary of nest and brood data follows this discussion.

The late spring of 1950 really began in March. A lower temperature for that month had been recorded only five times in sixty years. April, with a mean temperature of 36.9 degrees, was the coldest April on the official record. This delay in the arrival of spring delayed the arrival of many species of birds and caused the deaths of many insect eaters, especially among the swallows. Although May was only slightly cooler and drier than usual, the reduced temperatures of the preceding month were manifest during the early part of the month in the slow

development of plants and marked delay in migration and nesting of birds.

By comparison, 1949 had during the last ten years probably the most normal spring, while 1946 had perhaps the earliest. By comparing the nesting data of these three years, we obtain a striking picture of variations in nesting activity in a year of early spring, one of normal spring, and one of late spring. Unless stated otherwise, all of the following observations are of nests found within a 30 mile radius of Minneapolis.

Let us first examine the records of those species which usually begin to nest during March and April in the vicinity of the Twin Cities. The Horned Lark, a ground nester and first of the small birds to nest here, had young by April 13 in 1949; others were building nests during the first week of that month. In 1946, on the other hand, a nest containing heavily incubated eggs was found on March 27. In 1950 no nesting was reported before April 17, when a nest was found under construction. The three eggs in this nest hatched on May 1, more than a month later than earliest reported dates in other years. The latest nest reported for that year held three eggs on June 15 in Olmstead Co. Robins, which construct elevated nests, were building on April 11 and 16 and had young by May 21, but in 1946 nest construction was noted as early as April 3. Although data on more than 80 nests are available for 1950, there is no indication that any were begun before April 22, when one was found barely started. The peak of nest construction was apparently during the first week in May, with young appearing the last of May. The story for the red wing is quite similar, except that during 1949 high water well into May, may have been the cause of an apparent delay in nesting activities in some

areas. Nevertheless, nest construction was noted as early as April 30 that year on one marsh, but most nests were not built until about, or just after, the middle of the month. In 1946 the first eggs were found on May 13. By May 30 one brood had already left the nest. In 1950 nest building began on May 11, with the first eggs appearing May 16 through 18 (five nests). However, most nests were begun about May 23. The first young appeared on May 31, but many nests held no young until nearly the middle of June.

The cardinal, another of the earliest nesting birds, ordinarily produces its first broods shortly after the middle of May. In 1949 the only observations received were of eggs on May 15 and 20 and young on May 25, so no comparison can safely be made. During the early spring of 1946, however, young cardinals had already left the nest on May 3 and other young were noted May 12. In 1950 a nest contained one egg on May 2, but most nest building was apparently delayed until about the middle of the month. Other nests were reported under construction at the end of May and as late as June 19. No young were reported for May. Thus the cardinal makes its first nests even during inclement spring weather at this latitude but, on the basis of these and other data, is much less successful during years of late springs.

Another of the earliest and more persistent nesters is the phoebe which, during both 1949 and 1950 had eggs by April 29 (2 nests). This figure alone gives a false impression of the two seasons, however. In 1949 the bulk of the first nests, were built before May 10 and contained full clutches by the middle of the month, whereas in 1950 most of the first nests were under construction between May 11 and 25, with the first complete clutches of

three to six eggs appearing late in the month (May 23-27). The data for 1946 are inadequate for comparative purposes.

The early nesting pattern for the blue jay is much like that of the cardinal and pheobe. In 1949 incubation was in progress by the first week in May. Nest building had begun by April 5 in 1946. During 1950 the first nest was observed being built on April 18 and two others on April 22 and 27. Most, however, were built during May and no full clutches were reported before May 20, although one nest contained two eggs on May 6.

Like the cardinal, the mourning dove begins its nesting activities early, readily undertaking the process again and again, even though several attempts may fail to produce fledglings. The earliest date for eggs for the 3 years is for the year 1949, when an egg was laid on April 13. However, a wet, heavy snow fell that night and the nest was deserted. The next eggs were laid on April 30 (2 nests), but the peak of egg laying did not occur that spring until the first week in May. For 1946 the data are scarce, but a dove was found incubating on April 17. In 1950 nesting began by April 24, with a peak of egg laying during the first ten days of May. It is apparent from these observations that the mourning dove was not appreciably delayed in its early nesting during a year of late spring, although there are strong indications that more were unsuccessful during the early nesting period of 1950.

Among those species which do not begin to nest until considerable foliage appears on the shrubs, usually about the middle of May, we have sufficient data for only the yellow warbler, catbird, and brown thrasher. In 1949 the yellow warbler had begun to lay by May 15 and was incubating on

May 20. The earliest nests reported for 1950 were two found nearly completed on May 25. No eggs were found until May 27, when three nests held their first eggs. Most first clutches were not complete until near the end of the first week in June.

The catbird followed much the same pattern for the two years. Nest building had begun by the middle of May in 1949, and the first young were observed May 28. In 1950 the first eggs were laid about May 25, but many pairs were still building their first nests during the last days of the month. Clutches of three and four eggs were not common until June 4. The brown thrasher was already incubating by May 8 in 1949 with full clutches common before the middle of the month. In 1950, however, the first eggs were not laid until May 20, and most nests did not contain full sets of eggs until the last days of May or early June.

Although all of the preceding species do not indicate later first nests in 1950 to the same degree, the discussion shows clearly that the nesting season for those species which ordinarily begin to nest in late March, April, or early May was nearly two weeks later starting in 1950 than in 1949, a more normal year, and in some instances about one month later than the year 1946, which was marked by a very early spring.

What happened, however, to those species in 1950 which do not arrive until May and seldom begin to nest until after the middle of that month? Most of them were far to the south during the severe weather of March and April. One might expect that, since they were not affected by the inclement weather of that period, they would not be delayed in their nesting. The data indicate this to be true.

In both 1949 and 1950 the first nests of the rose-breasted grosbeaks were observed being built on May 18. During the early spring of 1946 the first nest contained one egg and three cowbird eggs on May 20. For the Baltimore oriole the first nests were reported May 16, 15 and 18 for 1946, 1949 and 1950.

It is to be expected that the last bird to begin to nest in this area would not be affected at all by variations in spring weather. The goldfinch, the last bird to begin nesting here, shows no variation. In 1946 the first nest found contained 5 eggs on July 6; the first nests were found on July 4 in 1949, and in 1950 the first nest contained one cowbird egg on June 30.

The condensation of nesting observations on each species which follows supports these data also. In addition they indicate considerable time lapses in nesting between southern and northern points in the state, as much as three weeks in some species. Most locality references are counties only. Unless stated otherwise, each record is of a different nest.

Common Loon—2 eggs June 1, Scenic State Park (Coon Lake); July 1-7, one small young each on Roosevelt Washburn and Buchite Lakes, Cass Co.

Holboell's Grebe—One nest 7 eggs, one nest 6 eggs, two nests 3 eggs, two nests 2 eggs (May 30), Swan Lake, Nicollet.

Pied-billed Grebe—Two eggs and 5 eggs May 30, Swan Lake, Nicollet Co.; 2 downy young July 13, Steele Co.

Double-crested Cormorant — See Flicker 22:128. 1950.

Great-blue Heron—See Flicker 22: 128. 1950.

Green Heron—2 eggs June 2, Ram-

sey Co.

Least Bittern—One nest with 1 egg May 30, Swan Lake, Nicollet Co.

Mallard—Nine eggs (May 4), 14 eggs (May 14), Hennepin Co.; 10 young just hatched June 9, St. Louis County.

Black Duck—One young July 2, Rice Lake Refuge, Aitken Co.

Blue-winged Teal—Twelve eggs May 13, Nicollet Co.; 12 eggs June 3, Hennepin Co.

Gadwall—One downy young July 13, Steele Co.

Pintail—Two broods of 8 to 10 young July 3 and 13, Steele Co.

Wood Duck—Eleven young May 24, Blue Earth Co.; May 30 and July 11, 3 and 5 downy young, Houston and Wabasha Co.; June 4, Hennepin Co., nest on squirrel's nest in grape vine (eggs).

American Golden-eye—Eight young July 10, Caribou Lake, Cook Co.

Cooper's Hawk—Two very small young July 2, Olmstead Co.

Red-tailed Hawk—Two eggs (April 5), 2 eggs (April 30), Olmstead Co.; April 23, 2 eggs, Fillmore Co.; 2 young in nest July 16, St. Louis Co.

Broad-winged Hawk — Incubating June 3, Fillmore Co.

Red-shouldered Hawk—One young out of nest July 9, Fillmore Co.

Bald Eagle—One on nest in late June, Cutfoot Sioux Lake, Cass Co.

Sparrow Hawk—Young out of nest July 20, Olmstead Co.

Spruce Grouse—Three young August 5, St. Louis Co.

Ruffed Grouse—Fourteen eggs May, Winona Co.; 12 eggs June 5, Fillmore Co.; 2, 2, 7 young July 16, St. Louis Co.; brood of 8 August 12, Duluth.

Pheasant—One egg May 18, Hennepin Co.; 8 eggs June 14, Duluth; other broods of 4, 2, 3, 5, 7, 9, 12 young.

King Rail—Four downy young, July 13, Steele Co.

Sora—A report on this species is being prepared by Leo Pospichal.

Virginia Rail—Nine eggs June 2; Ramsey Co.

Florida Gallinule—Three nests (2, 8, 10 eggs) June 2, Swan Lake, Nicollet Co.; 2 downy young August 20, Hennepin Co.

Coot—Three nests (1 egg), single nests with 2, 4, 5, 7 and 9 eggs, May 30, Swan Lake, Nicollet Co.; young still in down during mid-July, Hennepin Co.

Piping Plover—Four eggs June 24, Duluth.

Killdeer—Four eggs (May 5), 4 young (June 3) Ramsey Co.; 4 eggs (May 30), Nicollet Co.; 4, 4, 3, 3, 2, 1 eggs, June 24, Duluth.

Wilson's Snipe— See Flicker 22:44-45 1950.

Spotted Sandpiper—One young June 25, Olmstead Co.; 4, 4, 2 eggs, June 24, 3 one-fourth grown young July 24, 2 young still showing down August 9 (Duluth).

Herring Gull—See Flicker 22:128 1950.

Forster's Tern—Six nests with 2 eggs, one nest with 1 egg, May 30, Swan Lake, Nicollet Co.

Common Tern—Nine nests (3 eggs), 5 nests (2 eggs), 3 nests (1 egg), March-June, 1951

June 24, Duluth.

Black Tern—Three nests (3 eggs), 3 nests (2 eggs), 1 nest (1 egg), May 30, Swan Lake, Nicollet Co.; about 20 nests (1 and 2 eggs), June 2, Wabasha Co.; 1 egg June 13, Beltrami Co.

Mourning Dove—More than 200 nests reported; see brief summary of early nesting above.

Black-billed Cuckoo—Two young and one egg June 25, Olmstead Co.

Screech Owl—Two young out of nest July 7, Dodge Co.

Great Horned Owl—One young about 7 weeks old May 26, Blue Earth Co.; 2 large young May 2, Olmstead Co.

Nighthawk—One young able to fly July 8; Olmstead Co.; 1 young and 1 egg July 19, Beltrami Co.

Chimney Swift—Young July 23, Dodge Co.

Hummingbird—Two eggs July 6, Anoka Co.; 2 nests (2 young each) August 16 and 23, Duluth.

Belted Kingfisher—Excavating May 2, incubating May 14, Hennepin Co.

Flicker—Excavating May 9, incubating May 25, Hennepin Co.

Pileated Woodpecker—A nest containing 3 eggs on May 21 was being excavated on May 6, Olmstead Co.

Red-bellied Woodpecker—Two young just out of nest July 2, Olmstead Co.

Red-headed Woodpecker—Young (3-4) out of nest July 18, Dodge Co.

Hairy Woodpecker—Young June 5, adults carrying food June 25, Olmstead Co.

Downy Woodpecker—Incubating May 21, young in nest July 2, Olmstead Co.

Eastern Kingbird—Four large young July 6, Ramsey Co.; 3 young July 25,

young out of nest July 31, Duluth.

Crested Flycatcher—Five eggs June 25, building June 28, Olmstead Co.; young in nest July 6, Ramsey Co.

Phoebe—Early nests reported above. Late nests: building June 20, Hennepin; 4 small young July 2, Aitkin; 5 young Caribou Lake, Cook Co., July 10.

Alder Flycatcher—Four eggs June 28, Duluth.

Least Flycatcher—Building May 30, Houston; four young left nest July 20, in which there were 4 eggs on June 22, Duluth.

Wood Pewee—Building May 28, Carver.

Horned Lark—Building April 17, Ramsey; 4 eggs May 26, 3 eggs June 15, Olmstead.

Tree Swallow—Building June 4, incubating June 11, young in nest July 9 (same nest) Beltrami; building May 25, Ramsey.

Bank Swallow—Building (50 nests) May 26, Washington; 5 eggs, 1 young and 3 young June 25, Hennepin; 4 nests (2-4 young) July 8, Dakota; 2 nests (3 young each) August 9, Duluth. Ron Anderson is preparing a report on his study of this species at Mankato.

Rough-winged Swallow—Two nests May 31, Olmstead.

Barn Swallow—Five eggs May 27, Mower; 4 eggs June 8, Hennepin; nests with 6, 6, 5, 5, 3 eggs and young already gone (June 29), Ramsey; 3 nests of young July 16, Itasca.

Cliff Swallow—See Flicker 22:127-128 1950; 24 nests (incubation begun) June 24, St. Louis.

Purple Martin—Partly feathered young July 11, Dodge.

Blue Jay—Summarized above. Four eggs May 4, Dodge.

Crow—Building May 6, Olmstead.

Black-capped Chickadee—Excavating April 16 and 18, Hennepin; 3 eggs May 28, 2 young June 11, Carver.

House Wren—Building May 30, Ramsey; incubating May 25, Hennepin; eggs May 31, Olmstead; young in nest June 25 and 30, Hennepin; young in nest August 12, Duluth.

Bewick's Wren—See Flicker 22:108 1950.

Catbird—Early nests summarized above. Later nests are: Building June 9, Beltrami; 3, 4, 4 eggs June 24, Duluth; 3 eggs July 4, Two Harbors.

Brown Thrasher—Early nests summarized above. Later nests are: 3 young June 13 (left nest June 22), 3 eggs June 14 (hatched June 21), 2 eggs June 17, 4 young June 24, Duluth.

Robin—Early nests summarized above. Later nests are: Building July 1, Ramsey; 3 young out of nest (being fed) August 3, St. Louis; young just out of nest September 3, Ramsey.

Wood Thrush—Building (2 nests), incubating (1 nest) May 21; Building (1 nest), 1 cowbird egg May 23; 1 egg, building (2 nests) May 25; incubating (2 nests) May 30; incubating June 20; 2 cowbird eggs July 2; incubating July 8 (all in Hennepin). See Flicker 22: 108-109 1950.

Veery—Two eggs May 26 (empty May 24), Anoka; 1 egg June 18, Duluth.

Bluebird—Two nests (5 eggs each) May 20, Olmstead; 5 eggs June 11, 4

eggs June 12, Winona; 4 young June 11, Nicollet; 4 young June 28, Ramsey.

Cedar Waxwing—Three eggs July 14, Beltrami.

Starling—Young out of nest May 27, Olmstead.

Red-eyed Vireo—Two eggs and 2 cowbird eggs June 20, Winona.

Warbling Vireo—Building May 30, Houston.

Blue-winged Warbler—Four eggs and 1 cowbird egg June 4, 3 eggs and 1 cowbird egg June 4, Fillmore; 2 cowbird young, 1 cowbird egg and 2 warbler eggs June 25, Olmstead.

Yellow Warbler—Early nesting summarized above. Later nests are: Four, 3, 4 eggs June 3, Fillmore; 3 eggs and 1 cowbird egg, 1 egg and 1 young, June 24, Duluth; 2 eggs July 6, Ramsey.

Pine Warbler—Building June 7, Itasca Park.

Ovenbird—Three eggs and 1 cowbird egg June 16, Anoka.

Mourning Warbler—One young out of nest July 12, Duluth.

Yellow-throat—Nest nearly complete May 28, Whitewater State Park; 2 eggs and 5 cowbird eggs (deserted) June 25, Olmstead; 2 eggs and 2 cowbird eggs June 24, 4 eggs June 28, 4 eggs June 29, 4 eggs July 6, 4 eggs July 8, 4 eggs July 15, 4 young July 17, 3 young five days old August 10 (Duluth).

Redstart—Building May 28, Whitewater State Park; 6 building June 4, Fillmore; 1 cowbird egg July 2, Hennepin.

Bobolink—Two eggs and 2 young June 20, Camden State Park; young

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out of nest but unable to fly June 25, Olmstead; 6 young three days old June 29, Ramsey.

Eastern Meadowlark—Four eggs early in May, Olmstead; 6 eggs May 25, Olmstead; 3 young about seven days old June 19, Duluth.

Yellow-headed Blackbird—Eight nests (4 eggs), 2 nests (2 eggs), 3 nests (3 eggs) May 30, Nicollet; 2 nests completed June 2, Wabasha.

Red-wing—Early nesting data summarized above. Later nests are: Three young (3 days old), 2 eggs, 1 egg, 1 egg, 5 cowbird eggs, 3 young just out of nest (June 24) Duluth; young in nest June 13, Beltrami; young in nest July 23, Beltrami.

Baltimore Oriole—Summarized above.

Brewer's Blackbird—May 17, 4 building, two with 1 egg each; May 31, a nest with 4 eggs (Ramsey).

Bronzed Grackle—Two eggs May 10, 5 eggs May 24 (Nicollet); building May 15, Ramsey; young in nest June 4, Dakota; 3 young out of nest August 5, St. Louis.

Cowbird—Parasitized the following species: Phoebe, catbird, brown thrasher, wood thrush, red-eyed vireo, blue-winged warbler, yellow warbler, yellow-throat, redstart, ovenbird, brewer's blackbird, red-wing, cardinal, goldfinch, rose-breasted grosbeak, indigo bunting, chipping sparrow, clay-colored sparrow, song sparrow.

Cardinal—Early nesting summarized above. Later nests are: Building June 19, Hennepin.

Rose-breasted Grosbeak—Early nesting summarized above. Later nests are: Building June 20, Hennepin.

Indigo Bunting—Building June 20,

Hennepin; nest completed June 25, Olmstead.

Goldfinch—More than 50 nests were reported. The earliest contained a cow-bird egg on June 30; the latest held two eggs August 25 (Ramsey).

Savannah Sparrow—Four eggs June 7, a nest with 4 eggs June 10 and another with 5 eggs June 18, Duluth.

Slate-colored Junco—Two young June 16, Chisago.

Chipping Sparrow—Two eggs May 21, 3 eggs May 24, Nicollet; 4 eggs June 11, Ottertail; 2 eggs May 31, Olmstead; 3 eggs June 18, Beltrami; 3 young July 19, Beltrami; 4 eggs July 11, Anoka.

Clay-colored Sparrow—Three eggs and 2 eggs June 13; 1 egg June 22, 3 eggs July 3, 2 eggs July 11, 3 eggs July 12; 4 eggs July 17, 4 eggs July

19, Duluth.

Field Sparrow—Two eggs May 31, Olmstead.

Swamp Sparrow—Five eggs May 28, 3 eggs June 4, 6 eggs June 5, 1 egg June 10, 5 eggs June 20, Hennepin.

Song Sparrow—Three eggs May 26, Washington; 4 eggs June 10, 4 eggs July 16, 3 eggs July 25, Duluth; 4 young six days old July 2, Rice Lake Refuge, Aitkin.

More than one hundred persons contributed nesting records during 1950, giving one of the most complete records for the summer bird life of Minnesota ever obtained in one season. Such a long list of contributors cannot be included, but our thanks and appreciation are extended to all for their excellent cooperation.—Museum of Natural History, University of Minnesota.

The 1950 Christmas Bird Count

by

Dwain W. Warner

One of the most interesting phases of winter studies of birds is the making of spot checks at a number of localities over a large area to sample, so to speak, what birds are with us during the colder months and in what numbers they occur. Such compilation as is here presented leaves out many things but does give census figures which, along with a brief description of climatic conditions at the time, places on record one more series of observations of a season and its bird life.

Between Christmas and the end of 1950 the entire state was blanketed by 12 to 20 inches of snow with temperatures as low as 20° below zero. Despite these conditions 41 species were observed on seven all day census trips over widely scattered parts of the state. Among the species seen were Wilson's snipe, flicker, robin, goldfinch, junco and tree sparrow. Oddly enough, during this winter of heavy snow, many robins remained all winter even in the northern part of the state.

The Minneapolis Bird Club made observation from Minneapolis (Camden Park) to Anoka through a ten mile radius on both sides of the Mississippi River. This region is 40% deciduous woods along river banks and valleys, 30% open farm land, 15% deciduous woods on farm land, and 15% suburban. During the period in the field (9 a.m. to 5 p.m.) the sky was cloudy with a temperature range from 13 to 22 degrees and an east wind blew at four to twelve miles per hour. Thirteen inches of snow covered the

ground and all water was frozen except in the Mississippi River where various places remained open. Nineteen observers spent eight hours in the field covering 225 miles (205 by car, 20 on foot). The observers were: Mrs. M. E. Herz, Betsy Herabek, Colleen Helgeson, Norrie Jones, Billy Nelson, Boyd Lien, Helen Lien, Arle Haberle, Ted Warren, Glen Shirley, Arthur Boe, Mrs. Boe, David Brock, Jeremy Berman, Milton Thompson, Gary Fiberman, Michele Katz, Suzanne Katz.

The Duluth Bird Club on December 31 covered the area from Fond du Lac to Encampment Forest along the St. Louis River and Lake Superior including Minnesota Point where town suburbs made up 20% of the area, deciduous woods of city parks and highways 70%, sand dunes 10%. That day was cloudy with a temperature from 15 to 30 degrees with a northeast wind of 10 to 25 miles per hour. The ground was covered with 15 to 20 inches of heavily crusted snow and all water was frozen except Lake Superior. Fourteen observers in ten parties spent from 8 a.m. to 5 p.m. covering 177 miles (33 on foot, 144 by car). Observers were: Mr. and Mrs. Ralph Boeder, J. K. Bronoel, Margaret Brown, Sam Cox, O. A. Finseth, Henry Gilbert, Stanley Hammer, Pershing Hofslund, M. M. Keith, Miss Olga Lakela, Martin Mattson, Louis Peterson, Marcia Ostrander.

Observations by the St. Cloud Bird Club were made over the three day

period of December 30, 31 and January 1 and covered the area near St. Cloud and Sauk Rapids, and extending north about 20 miles along the Mississippi River. The weather on those days was raw and cold, the wind northerly with a little sunshine but more often clouds and fog covered that region where the temperature hovered around the zero mark. Observers were: Harry Goehring, Mr. and Mrs. Lehrke, Mrs. Rudolph Misho, Mrs. Beacom, Agnes Brohough, Loretta Rosenberger, Adella Glass, Mrs. Davis, Monica Misho.

On December 27 Brother Vincent made observations from 8:30 a.m. until 2 p.m. at Prairie Island near Winona. That area is 90% open field, 9% deciduous, 1% pine. The sun shone and the day was bright but the tempera-

ture ranged from 18 degrees below zero to three above; 12 inches of snow covered the ground.

The St. Paul Audubon Society made counts on December 29 and 31. On the first date the area included Como Parkway, N. Hamline and Lexington Avenues (St. Paul) to County Roads E and F, east to Rice St., McMenemy and Edgerton Avenues, south to the State Fish Hatchery, including McMenemy Slough and Vadnais-Sucker forest area and nearby farm woodlots and fields. The trip on December 31 was made along both sides of the Mississippi River from St. Paul to Newport.

The results of these censuses are tabulated below:

	Mpls. B. C.	Duluth B. C.	St. Cl. B. C.	Bro. Vincent	St. Paul Dec. 29	B. C. Dec. 31
Mallard					5	21
Black Duck				5		
Redhead			6			
Canvasback			2			
American Golden-eye	108	83	2		10	307
Hooded Merganser						2
American Merganser	3		3			4
Goshawk		1			2	
Sparrow Hawk					2	
Ruffed Grouse		2				
Pheasant	69	3	6		30	16
Wilson's Snipe					1	
Herring Gull		506				1
Gr. Horned Owl	1	1	1			
Snowy Owl		4				
Flicker	2			1		
Pileated Woodpecker		2				
Red-bellied Woodpecker				6		
Hairy Woodpecker		8	3	2	7	3
Downy Woodpecker	11	33	4	4	6	1
Blue Jay	83	29	17	5	20	1
Canada Jay		1				
Raven		10				
Crow		2			11	2
Bl.-c. Chickadee	18	19	4		85	1

White-br. Nuthatch	25		18	6	10	3
Red-br. Nuthatch		12	2			
Brown Creeper		1	1	1	2	
Robin		2		1	1	
Gold.-cr. Kinglet		24		5	4	
Starling	8	406	19	2	45	8
House Sparrow	651	435	135	129	200	500
Cardinal	2	1	5	7	4	2
Evening Grosbeak		5				
Purple Finch	1	2				
Pine Grosbeak		2				
Pine Siskin		1				
Goldfinch		15				12
Junco	45	20	8	51	70	2
Tree Sparrow				42	10	5
Snow Bunting		11	24			
Total species	15	29	18	16	20	18
Total individuals	1135	1695	260	272	525	893

—Museum of Natural History, University of Minnesota, Minneapolis.

Seasonal Report

by

Mary Lupient

In mid-November, 1950, snow fell throughout Minnesota and severe cold weather on November 24 froze the Mississippi River, the earliest since 1880. Three tugboats were frozen fast. During the latter part of November the worst storms on record occurred in some of the eastern states, causing the deaths of more than 100 persons and property damage running into hundreds of millions of dollars. In Minnesota more and more snow covered the original fall and at date of this writing, March 1, the temperature has not moderated enough to thaw it to any extent. There were very few days without snowfall and very few days of sunshine. January 29 the thermometer fell to 45 below zero in the northern section and to 30 below zero in the Twin Cities.

Reports indicate that fewer species of birds wintered in Minnesota this season and that the population was somewhat reduced. Mrs. Evelyn Putnam wrote that the Duluth Bird Club recorded 28 species for the Christmas Census; last year there were 31 species and the year previous to that there were 41 species. Mr. A. C. Rosenwinkel stated that birds were less abundant than usual in the area around Lake Vadnais near St. Paul. Mr. Ron Anderson, Mankato, found that field trips were less fruitful in that section. A report from Mr. William Longley who made observations in Dodge County,

Rochester, and the area in and around Whitewater Valley listed a fairly good number of species. He said that only 110 Canada geese remained in Rochester this winter; last year there were 500. Twelve mallard ducks and 5 black ducks remained in Whitewater Valley; last year there were 200. A small flock of mallards wintered at Shakopee and small numbers of them were listed by some of the bird clubs for the Christmas Census. There were also a few American and hooded mergansers on the list. Dr. W. J. Breckenridge is of the opinion that on the Mississippi River near the Twin Cities there apparently was little change in the number of American golden-eyes.

A few red-tailed, American rough-legged and Cooper's hawks were reported. The St. Paul Audubon Society listed two goshawks December 29 near St. Paul. The Christmas Census by the Minnesota Bird Club listed a golden eagle at Cedar Creek Forest.

There were a few reports of snowy owls since the last seasonal report. A short-eared owl was seen in Dodge County December 21 by Mrs. William Longley. A nesting record for the great-horned owl was received from Mr. O. A. Rustad. The nest, 35 to 40 feet from the ground in a woods one mile south of the Cannon River near Northfield, contained three eggs on February 24, 1951. An unusually large

number of great grey owls appeared in the northern part of the state. Normally this owl is not often seen. Miss Amy Chambers reported seeing one on a trip along the North Shore February 12 and Mr. M. H. Stenlund reported them as common in north-eastern Minnesota. He stated that 3 great grey owls were preying on the chukar partridges at the mines in Ely. Mr. P. B. Hofslund received reports throughout the winter of these birds appearing in the area around Duluth.

Glaucous gulls lived along the North Shore during January and February and one herring gull was listed by the St. Paul Audubon Society for their Christmas Census. A female Iceland gull was collected near Duluth February 25 by P. B. Hofslund, Harvey Putnam and J. Broenel.

Ring-necked pheasants were more abundant in some areas than they have been for the past few years. Along the Minnesota River from Savage to Shakopee several flocks numbering approximately 200 appeared to be feeding on grain in wind-swept fields where the snow was not deep. Females predominated. A concentration of pheasants in heavy cover near St. Paul was reported by Mr. A. C. Rosenwinkel.

There were two records of Wilson's snipe, one near St. Paul December 29 and one by Brother I. Vincent December 2 near Winona. Brother Vincent observed seven mourning doves on that date.

At Spring Valley James Clements saw a meadow lark December 13 and Mr. R. W. Hanlon wrote that one had lived all winter near a straw stack at Benson. He also saw a cardinal at Benson January 16, which is an unusual record for the western part of

the state. At Shroeder February 12 Miss Amy Chambers saw two cardinals and Mrs. Evelyn Putnam said a few came to feeders in Duluth. Flickers were seen at Duluth this winter.

Occasionally a brown thrasher does not migrate and this winter one came daily to a feeder at the home of Mr. and Mrs. Van Loewe, Minneapolis. Usually this bird is not hardy enough to withstand the rigorous Minnesota winters.

A few prairie horned larks were seen all winter in the fields south of the Twin Cities. The first migration date was sent in by Mr. William Longley. About 80 were seen by him at Kasson February 12. Mr. O. A. Rustad reported them at Northfield February 18 and by February 22 they had arrived in numbers in the Twin City area.

Apparently an extraordinarily large number of robins wintered in all parts of Minnesota. Mr. Ben Gustafson, Manager of the State Fish Hatchery at French River, reported the following: "The lower few miles of the Cascade River do have a few hundred robins in sheltered places and the French River and other streams have similar flocks of robins this winter." A report from Rev. O. L. Bolstad, Red Lake Falls, stated that flocks of robins were seen all winter in that vicinity. Mr. O. A. Stevens, Fargo, wrote that numbers of them were observed along the river from Grand Forks, North Dakota, to Crookston, Minnesota. The following was received from Brother I. Vincent: "On December 26, 62 robins were seen on the north-east side of Lake Winona. While only 62 robins were counted, probably more were present in the vicinity. The temperature was three above zero that day and as was the case in all sur-

rounding localities, the ground was covered with about 10 inches of snow." The News Letter of the Thunder Bay Naturalists Club dated March 1, 1951, stated that numbers of robins had lived near Port Arthur and Fort William, Ontario, all winter.

There were a few reports of cedar waxwings; Mrs. H. D. Klein reported a flock of about 50 in the vicinity of St. Paul February 23. A large flock was seen along the North Shore by Evelyn Putnam and others January 14. A flock of purple finches was seen on the same date by this group of observers.

Very few pine and evening grosbeaks wandered south of northern Minnesota this winter. There were a few records of pine siskins, Lapland longspurs and

snow buntings from various localities. Mr. John Rehbein took a census during the holidays in Itasca County and, in addition to other species, he listed Hudsonian chickadees, brown creepers and white-winged crossbills.

Two interesting banding records were received from Mr. Forrest B. Lee of the Minnesota Department of Conservation. They are as follows: Adult female blue-winged teal banded at Thief Lake Refuge, Marshall County, Minnesota, September 15, 1950; shot November 28, 1950 at Santa Lucia, Pinar del Rio, Cuba. Downy woodpecker, adult, banded at Waukesha, Wisconsin, December 9, 1936; found dead on farm near Sandstone, Pine County, Minnesota, winter of 1946.—**Minneapolis, Minnesota.**

NOTES OF INTEREST

BISON AND BIRD REMAINS FROM ANCIENT PEAT BEDS—On July 6, 1950, Foreman John Tokar of a Minneapolis Sewer Department crew informed the Minnesota Museum of Natural History that a huge skull in an excellent state of preservation had been unearthed by his crew digging a sewer ditch in North Minneapolis. The skull proved to be that of a bison definitely larger than a modern bison such as roamed Minnesota's prairies within the last few hundred years. The excavations were in a low peaty area just west of Morgan and 52nd Avenues North in Minneapolis, adjacent to the present bed of Shingle Creek, which flows from Palmer's Slough east of Brooklyn Center into the Mississippi River at Camden Station, a northern suburb of Minneapolis. The skull came from a depth of between 5 and 6 feet below the surface. The soil to a depth of about 3 feet was heavy blackish peat. At this depth an interrupted line of brown iron oxide, probably due to bacterial action, separated this soil from the lower-lying peat of a slightly browner color, containing considerable marl. At about 6 feet a deposit of white sand was encountered. The bones were taken from the marly peat just above the sand. Bones at this level were much better preserved than those only a couple of feet above this zone.

The engineers agreed not to fill the excavation for several days, and during that period Mr. John Jarosz and Mr. Bruce Hayward of the Museum Staff enlarged the diggings at the point where the skull was found. A large part of the skeleton of the bison, as well as parts of at least four other animals, were found. In addition to the bison bones, several smaller bones of birds and fishes were located. These were sent to Dr. Alexander Wetmore, Secretary of the Smithsonian Institute in Washington, D. C. He identified the bird bones as those of a goose, probably the modern Canada goose, *Branta canadensis*, although they were of maximum size for that bird and could have been from some older Pleistocene species. The fish bones were identified by Dr. Leonard P. Schultz, Curator of Fishes of the Smithsonian Institute, as the modern dogfish, *Amia calva*.

A careful study of the bison material has not been made, but Dr. Samuel Eddy of the University of Minnesota Department of Zoology pointed out that the spread of the horn cores of 806.45 mm. (31.75 inches) was well beyond the maximum recognized for modern bison, *Bison bison*, and stated that in his opinion it was one of the Pleistocene races of bison, probably *Bison antiquus occidentalis*. Several species of bison occurred widely throughout North America several thousands of years ago, and the identification of the forms is still much confused.

Dr. George A. Thiel of the University of Minnesota Department of Geology visited the site where the material was found and examined the deposits at the various levels. He pointed out that the succession of sand, marly peat, and black peat indicated major shifts in the drainage of the area, possibly connected with the receding of the glaciers. The accumulation of peat to a depth of 6 feet indicated the elapse of possibly several thousands of years, but since peat under different conditions accumulates at greatly varying rates, no definite statement could be made as to the time elapsed since the depositing of the bones. Some valuable work has been done recently with dating of such materials by the disintegration of radioactive forms of carbon. It is hoped that this technique may be employed in checking the time of deposition of these specimens.

All the material from the excavation is now preserved in the collections of the Minnesota Museum of Natural History at the University of Minnesota—**W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis.**

APRIL 1950—RECORDS OF THE AVOCET—On that easily remembered day of sleet and snow, last April 29, my two student assistants, Glen Kottke and Bud Teien, and I were driving along a country road between Lake Moore and Sand Lake in Section 15 of Benson township, Swift County. Water from surrounding fields drains into Lake Moore through a culvert, causing a small pond to form beside the road early in the spring. In this pond, through gusts of snow, we saw two avocets wading about in search of food. The uncurved bill protruding abruptly from the buff colored head and the bright blue legs presented a startling sight to new ornithologists. One of the birds was collected for the school museum at Benson and was recently exhibited at the Science Congress held in St. Cloud. The only other inhabitants of this roadside pool at the time were four marbled godwits and a killdeer.—**Bob Hanlon, Benson, Minnesota.**

WINTERING ROBINS IN WINONA—A single robin in the winter in Minnesota is unusual enough, but a large flock is quite rare. On December 5 a single robin was observed in Gilmore Valley on the St. Mary's College campus. This bird was seen during a snowstorm, the ground already being covered with several inches of snow. On December 10 another robin was seen near Garvin Heights having just flown from the other side of Lake Winona. On December 24 a robin was seen in Gilmore Valley in the same location as the December 5 observation. This bird could have been the same one observed there on December 5. However, whether it was the same bird or not, an investigation of the robin situation seemed to be advisable.

The area picked out for investigation was the Lake Winona region. During my walk along Lake Winona several robins were seen flying across the Lake toward Garvin Heights, so I decided to investigate the residential area along Lake Winona where the robins seemed to be coming from. After a short search sixty-two robins were counted in the hackberry trees adjoining Lake Boulevard and Winona Street. This observation was made on December 26, but while only sixty-two birds were counted, there was good reason to believe that a larger flock of possibly about one hundred and fifty birds must have been in the territory.

On December 27, the day selected for the Christmas census, one robin was seen on Prairie Island, which is just about two miles north of the place where the 62 birds were seen on the previous day. Since the immediate Lake Winona area was not covered in the Christmas count, the flock of robins does not appear on the census list. It is certain, however, that the robins were present on that day since they were observed frequently during the entire winter.

Sixty-seven robins were counted in the Lake Winona area on February 3. These birds, the same ones that were observed on December 27, were seen feeding on hackberries. It might be interesting to note here that 47 cedar waxwings were sharing the hackberries with the robins on this same day. That the Winona flock of robins remained throughout the winter was indicated by frequent observations through January, February and March. The birds remained in about the same location during the entire winter. Twelve robins were observed on Prairie Island along a small strip of open water near the shore of one of the sloughs on February 10.

The large flock of robins in Winona seems to have withstood the cold and ice conditions of the past winter. Local observers reported at different times that the robins in the Lake Park area were feeding almost entirely on hackberries. The author also observed the robins feeding on hackberries on many occasions both in the Lake Park area and in Gilmore Valley on the St. Mary's College campus where two robins were observed almost daily. One report told of seeing a "lot" of robins around springs, apparently feeding on the greens and bugs in the spring water.

Other reports refer to robins ranging over the area from the Iowa line up as far as Wabasha. At least flocks were reported at different points in this area during December and January. On March 18 Bill Galewski reported that one hundred robins were in the hackberry trees around his home in the Lake Winona area.

Various observers have estimated the Winona flock of robins of the past winter to number from one hundred and fifty to two hundred. The Winona flock took advantage of the cover provided by the evergreens and the residential area, and also the food provided by the large crop of hackberries.

Along with the reports of the wintering robins in Winona came two other reports. One from La Crosse, Wisconsin, told of one hundred or more robins in the block on Water Street of that town. The other report was from Brownsville, Minnesota, where a "big" flock of robins was observed in the sub-zero weather in a grove of hackberry trees.

Large flocks of wintering robins in Minnesota are rare. Dr. Thomas S. Roberts in his book, *Birds of Minnesota*, says, "There are numerous records from all over southern Minnesota of single birds or rarely small flocks passing the winter, usually in groves of evergreens, near dwellings, or about spring-runs in sheltered valleys." Dr. Roberts mentions large flocks of robins that remained along the shore of Lake Superior from Duluth to Grand Marais in the winters of 1920-1921 and 1922-1923.

In the 1923 flock on the shore of Lake Superior the number of birds was much reduced later in the winter, and it is probable that many of these perished as the food supply failed just when the severe cold and deep snows of February made living conditions worst. Fortunately this was not the case in Winona, as there was no apparent diminution in the size of the flock. While the winter conditions were severe, there was sufficient food at all times and it was available to the birds.

It is difficult to understand why the robins wintered in the Winona area, especially since the winter was unusually severe with the ground covered with snow almost continuously from the first week in November to the last week in March. It seems that the shelter of the evergreens in residential sections and the food provided by the hackberries were the important factors in enabling the robins to survive the winter.—Brother I. Vincent, Saint Mary's College, Winona, Minnesota.

THE LARK BUNTING IN RICE COUNTY—During the course of a field trip from Cannon Lake toward Faribault on Highway 60, a male lark bunting was observed about two miles west of Faribault at 10:20 a.m. on April 22, 1951. In view of the fact that the lark bunting is considered an infrequent straggler in southeastern Minnesota, with no apparent records for Rice County, the following observations are offered.

This area is rather high and rolling, with fields and pastures and with very few trees. The highest point within the immediate area is known as the Calvary Cemetery which is somewhat wooded, but this is entirely surrounded by fields and pastures where the vesper sparrow and the prairie horned larks are commonly found. The lark bunting was seen to fly from the field area, across the road onto a nearby telephone line. The light was excellent, making observations easy. Since this date I have returned to the same area several times, but have seen none.

According to Dr. T. S. Roberts in "The Birds of Minnesota," most records of this bird are from southwestern Minnesota. Dr. Roberts mentions that . . . "the Lark Bunting is an especially interesting bird, and it was a keen disappointment to the bird students of the state that the breaking up of the native prairie caused it to leave after it had become well established for so many years over a wide area and was apparently on the way toward occupying all the prairie region of Minnesota. It is hoped that its partial return in recent years may result in an occasional 'Lark Bunting year' as with the Dickcissel." According to Dr. Roberts, some of the very earliest records of this bird in Minnesota date back to 1879, when a single pair was found in Grant County.

Dr. Johan C. Hvoslef, in his observations at Lanesboro, in Fillmore County, made the following entry in his diary about the lark bunting. "Saw the first of this remarkable bird on North Prairie near Ulvestad June 19, 1883. It was sitting on a field and allowed me within a short distance, but I missed it as my only weapon was a small pistol and the wind besides was blowing a gale. I got within a few yards of it and could distinctly see its peculiar bill. It was a male in its black dress with the long white stripe on the shoulders. The second I saw on the Highland Prairie near Lommen, May 11, 1884. This individual was very wild and took to the wings while quite far off."

Since 1937 to the present I have been able to find only the following single reference to lark bunting in *THE FLICKER*. December 1942: "Lark Bunting, The Prossers and the Swedenborgs found a colony of about 25 birds near Beardslley, Big Stone Co. and one nest with one egg on June 21." This is the last recorded reference that I have been able to find for this bird in Minnesota.

No records have been found for southeastern Minnesota since the records of Dr. Hvoslef in 1883 and 1884.—Orwin A. Rustad, St. Olaf College, Northfield, Minnesota.

HUNGARIAN PARTRIDGE COURTSHIP—In Dodge County on February 22, 1951, at four o'clock in the afternoon, I watched a group of seven Hungarian partridges, almost hidden, feeding along a strip of plowed ground that had been blown free of snow. Some of their time was spent quietly hunched down looking cautiously about, but mostly only their wiggling tails could be seen as they dug and scratched in the dirt. After a few minutes one bird began to call sporadically, and the group began to drift southward. Then I noticed six more Huns only a few yards away. The calling increased as the first group moved closer. Finally the birds ceased feeding, chattered loudly, and, joining in one group, immediately burst into flight.

They soon alighted in a bare, plowed field, and a helter-skelter running and chasing ensued. After a moment this mad scramble slowed down, and it became apparent that, instead of a group fight, there were several separate bouts between two birds. A bout occurred when one bird, assuming a pompous attitude and stretching itself up on its toes, was seen by a bird nearby, which rushed headlong in challenge, but stopped short of actual attack. Standing toe-to-toe both birds stretched and puffed until suddenly one of them launched itself with flashing wings upon the other, which immediately retreated, hotly pursued, for a few yards. The first two or three bouts were attended by spectators who seemed to line up side by side to watch, and even follow, the chase.

It was not long until six pairs had formed as a result of the contests. For many minutes each pair stayed away from the others, one bird of each pair standing, the other crouching. The thirteenth bird, since it crouched close to one of the pairs, seemed to be a male. (With Hungarian Partridge, the female is the aggressive member of the pair.)—William H. Longley, Dodge County Minnesota.

"AFFILIATED SOCIETIES" (continued)

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Minnesota Ornithologists' Union

Affiliated Societies

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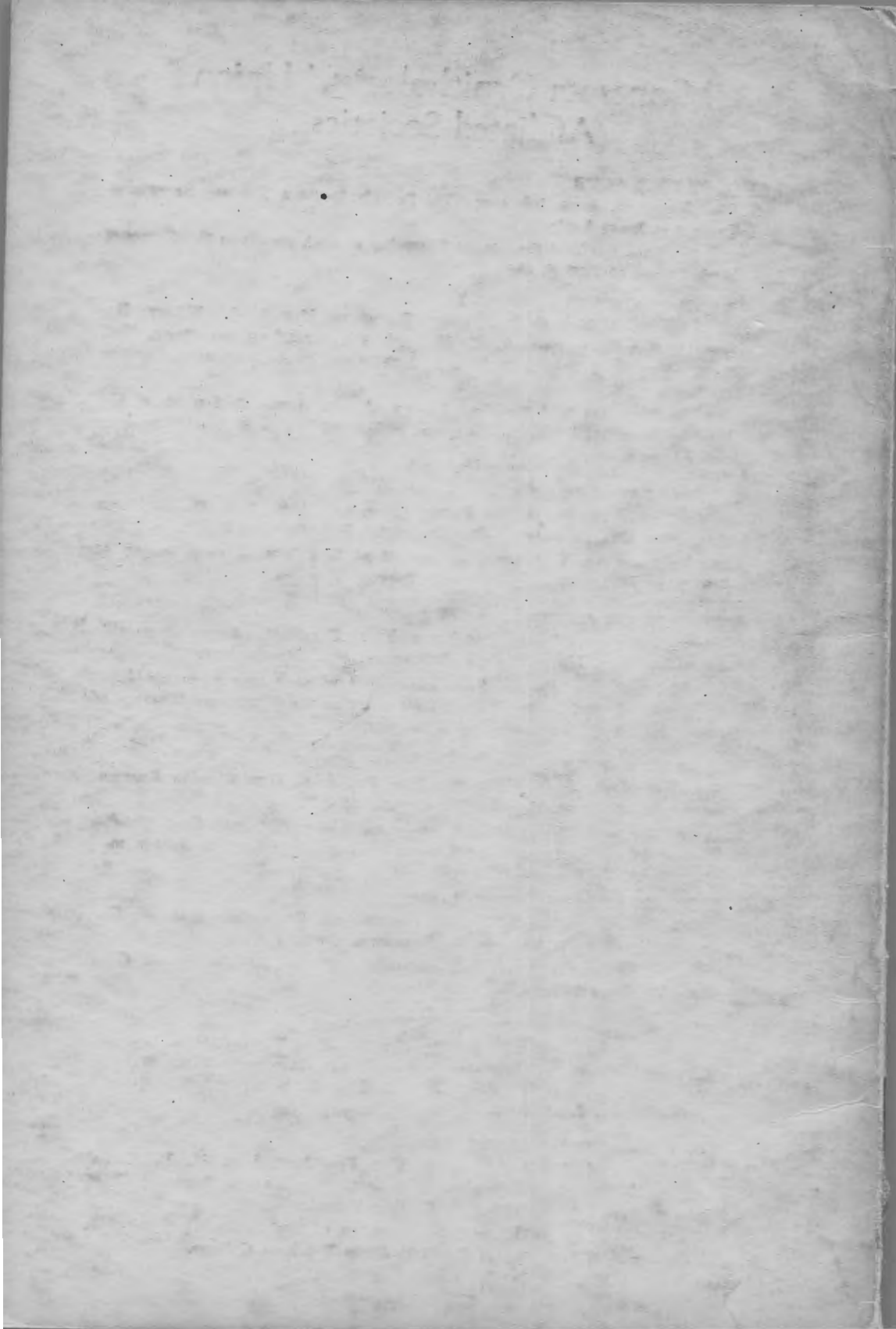
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WOODY, A VICTIM OF IGNORANCE

PHOTO BY HENRY GILBERT, DULUTH



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The Presidents Page

MESSAGE FROM A WOUNDED BIRD

In the fall of 1949 a hunter shot and wounded a pileated woodpecker. The bird was brought into Mrs. Harvey Putnam, and for several weeks it entertained her science class as well as several of the Duluth community clubs. One day "Woody" was found dead, and another chapter of ignorance was finished.

The death of the bird is only part of the tragedy of this story. We feel that the hunter was genuinely sorry that he had mistaken a woodpecker for a woodcock, but the fact remains that he just didn't know what he was shooting at. This is not an editorial against hunting. We hold no more brief with those that condemn all hunting than with those that kill every living creature they can. The ignorance that leads to wanton and mistaken killing, starvation budgets for agencies trying to preserve our natural heritage, fear of some of our most innocuous forms of wildlife — these are the things that we as M.O.U. members should strive to eliminate from the characteristics of our nation.

Hardly a day passes that our newspapers do not carry an article that displays the ignorance of the majority of our populace to the problems of our natural resources. We read in our papers numerous tirades against high taxes, yet how many editorials did you read about the utter futility of the many thousands of dollars spent for bounties? A senator lets loose of his feelings against waste in the Government Printing Office. What publications are most prominent in the lists that he feels are most wasteful of the taxpayer's money? You will find that those dealing with some of the biological principles are most critically viewed. When the time comes to slash the budget, take a look at how the Fish and Wildlife Service, or the state conservation commissions, fared.

Obviously, the answer to ignorance is education. It is our job to become educated ourselves, and then to spread our knowledge to people who are not as well informed as we are. As a program of self-education let us make a checklist of our own activities in the ornithological field. Ask yourself: Did I participate in research projects with my local club? Have I read any of the more erudite pieces of ornithological literature? (How many of you have looked at Mrs. Nice's studies on the life history of the song sparrow?) Do I belong to any other club (the Wilson Club, A.O.U., Cooper Ornithological Club, etc.) dedicated to the advancement of our knowledge about birds? Does my local library carry any of their publications, and for that matter, does my local school library carry the state ornithological publication? That might be a good way to start a little edu-

cation going. Every school library should have a copy of **THE FLICKER**. Are all my thoughts about birds tinged with too much anthropomorphism?

This tribute to "Woody," written by O. A. Finseth, president of the Duluth Bird Club, summarizes in a few beautiful lines the thought of this editorial:

*I was once a roving creature. On steady wings I zoomed
o'er the forest flyways, when a shot from the gun of a care-
less hunter shattered my wingbone, halting my flight.*

*No longer I sally from tree to tree, digging deep with
my chisel, spearing with my arrowlike tongue the hidden
ant and the deadly borer in the heartwood.*

*Unable to fly, I am as if chained to my post with invis-
ible bonds, forged by men I was striving to serve.*

Wise men make laws to protect me.

Fools mock these laws and destroy me.

*Pity me not, but know me better. Teach of my work
and my worth to your youth, that when men, they'll respect
and protect me.*

P. B. Hofslund, Editor

Use your exchange library at the Museum. You will find it interesting to read such articles as "The Songs of Summer Resident Birds" in the April, 1951 *Passenger Pigeon*, "1950 in Review" in the same issue, and "Notes and Observations on the Wilson's Warbler" in the September, 1951 issue of *The Wilson Bulletin*.

Minnesota's Most Important Game Bird

The Pheasant

Facts and figures on pheasant studies 1939 - 1950.¹

by

Arnold B. Erickson, David B. Vesall, C. Edward Carlson and Clair T. Rollings

INTRODUCTION

How often when sportsmen, farmers, and game managers get together the talk drifts to farmer-sportsmen relations! Yet, there would be few relations over much of the state, and little need for them, if it were not for the pheasant. He is the center of the upland game bird picture in Minnesota. Too many times when pheasants are plentiful, sportsmen forget the need for pheasant-farmer-sportsmen relations. When, for one reason or another, pheasant populations fall off and hunting is poor, the sportsmen's interest in "proper relations" is stimulated, and he wants to know what he can do to increase pheasants and what his State Division of Game and Fish is doing.

This report has been prepared to let sportsmen, bird watchers, and farmers know what their State Division of Game and Fish, through the Game Research Unit, has done and is doing to manage the pheasant and maintain populations, to let them know what they can do personally, and to help them organize their relations with the pheasant. They need the pheasant, and pheasants need to have their problems better understood by the farmer, on whose land they are tenants, and by sportsmen who depend on them for

good hunting and savory dinners.

American game biologists have been studying the wild pheasant, its needs, and its environment for over 25 years. These studies have been particularly intense and detailed since 1929. They have helped us know what foods the pheasant eats, where it prefers to live how many young it produces and its rate of survival, how it lives, and what mortality factors it is subject to. We know a great deal about the pheasant, but we need to know more about why pheasant populations decline and what we can do about that, if anything.

Nesting habits of Minnesota pheasants

The servicing of several hens by one rooster is characteristic of pheasant breeding habits. Thus, ample production of young is almost assured if a plentiful supply of hens survive through winter. The average courting party among Minnesota pheasants consists of three hens per cock. Examination of 94 definitely incubated pheasant nests made during a recent study showed an average egg fertility of 98.4 per cent, which indicates that sufficient males were available during the breeding season. It is an established fact that one rooster can service 12 or more hens.

¹ A contribution from Pittman-Robertson Surveys and Investigations Project 11-R, Minnesota Division of Game and Fish.



FIGURE 1—PHEASANT "DUMP" NEST, LYON COUNTY, CONTAINING 27 EGGS ON MAY 16, 1941; 28 ON MAY 21; AND 29 ON MAY 28.

Most pheasants nests are built on the ground and are shallow structures carelessly lined with whatever material is immediately at hand. Many have been found on well drained soil, but one nest was found on a hummock of grass completely surrounded by water, one on a straw pile, one atop a fodder shock, and one in an abandoned crow's nest 21.5 feet from the ground in a black mulberry tree. On June 18, this last nest held 9 eggs; 8 hatched that day, one egg was infertile. The next day, 5 chicks were found dead at the base of the tree. Three chicks were unaccounted for.

In Minnesota, the first pheasant eggs are generally laid during the last two weeks of April, but the majority of hens wait until early May. Early laying is haphazard. Eggs are dropped at dusting places, feeding grounds, or September, 1951

wherever the hen happens to be at the time, with no attempt at concealment. Early in the season several hens may lay in the same nest. These "dump" nests are seldom incubated (Figure 1). Pheasant eggs also have been found in the nests of pintail, blue-winged teal, and Hungarian partridge (Figure 2). A few of these mixed clutches are sometimes successfully incubated, but how the pheasant chicks get along with their foster brothers and parents is not known.

Although the first eggs are laid in April, intensive nesting does not begin until May 1, and continues until June 15, with a peak being reached about May 15. About 80 per cent of all nests found have occurred in this period. There is usually a sharp drop in nesting after July 1. One of the latest recorded nests was started on July 23.



FIGURE 2—MALLARD NEST CONTAINING 10 DUCK EGGS, 12 PHEASANT EGGS (8 BROWN, 2 DEEP BLUE, 2 OLIVE). HEN MALLARD INCUBATING, MAY 26, 1941, LYON COUNTY.

Since 1945, because of drainage and intensified agriculture, pheasants have had less and less early spring nesting cover. But during April and early May of a typical nesting season, 1941 for example, most nests were found in old dry grasses and sedges left standing since fall. Many hens laid first eggs at marsh edges in which they spent the winter. Other nests were found

along roadsides, ditches, creeks, and in open woods.

As soon as new plant growth was six to eight inches tall, pheasants began nesting in it. Alfalfa and sweet clover in meadows and nettle, sunflower, and goldenrod along creek banks and ditches proved attractive to nesting hens after May 15. Late in the season, small grain fields were extensively used.

Table 1—Histories of 241 pheasant nests: 69 or 29% successful
172 or 71% unsuccessful

Destructive Agent	Number of Nests Destroyed
Man	
Mower	47
Binder	15
Truck	2
Plow	1
Other machines	1

Disturbance	3
Stock	1
	70 or 41%
Predators	
Small mammals	21
Crows	12
Large mammals	6
Ants	1
	40 or 23%
Pheasants themselves	
Nests abandoned	22
Dump nests	8
	30 or 17%
Inclement weather	
Hail	12
Floods	12
	24 or 14%

In 1941, over 80 per cent of all nests in meadows and grain fields were found in the outer 100 feet. If farmers are aware of this pheasant habit of selecting the periphery of a field for nesting, it may be possible by delayed or controlled cutting to prevent some destruction of eggs and incubating hens by mowers and other farm machinery. The fate of 241 pheasant nests studied during 1941 is shown in Table 1.

Man caused more nest destruction than any other agent. Many nests were crushed and several incubating hens were injured by mowers when the first hay was cut about June 15. A flushing bar, Figure 3, attached to the rig of one mower was found to save many incubating hens from injury, thus enabling them to renest. Studies in 1944 revealed one nest destroyed for every 3.3 acres of alfalfa cut. Thirty per cent of the incubating hens were either killed or injured which prevented their renesting. Few hens are injured by grain binders. The revolving reel apparently acts like a flushing bar. Many hens nesting in grain fields had sufficient time to complete incubation before harvest. Grain fields, in fact, provided the safest nesting place.

Although predators were credited with destroying 23 per cent of the pheasant nests, many of them were "dump" nests or nests abandoned before predation. Nest losses caused by pheasants themselves were "dump" nests and nests abandoned for unknown reasons.

Although only 29 per cent of the 241 nests studied in 1941 were successful, late season observation of broods indicated a much higher proportion of hens finally hatched chicks by second and third nestings. Thus, broods of all ages were seen from mid-June to early fall. Fall broods of varying ages have led many to believe that the pheasant hatches several clutches of eggs per season. This is not true. Once a clutch is hatched, the hen accompanies the chicks until they are nearly grown and does not have time to complete incubation of more than one clutch of eggs.

First clutches of eggs in 1941 hatched about June 1, a typical date for most years. The first brood was seen on June 16; it was then already 10 days old. The results of brood counts, taken throughout the 1941 season, are listed in Table 2.



FIGURE 3—MOWER EQUIPPED WITH A FLUSHING BAR, ON A MINNESOTA FARM.

Table 2 — Results of brood counts — 1941

Date	Age of brood, in weeks	Number of chicks, per brood	Number of broods
6/16-30	2	8.5	20
7/ 1-15	4	7.3	26
7/16-31	5½	6.2	75
8/ 1-10	7½	7.7	37

The important thing to note in Table 2 is the very gradual decrease in the number of chicks per brood from June 16 to August 1. From June 16 to July 31, the average brood lost one chick every two weeks. The increase in number per brood after August 1 was due to intermingling of broods. This apparently happens more often with orphan broods.

That period of a pheasant's life, then, when the eggs are laid and incubated and broods are brought off and nurtured is the most important period to the pheasant and to the hunter,

for on its success depends the production which determines the hunters' harvest and the size of next year's population. The success of the nesting and rearing season is in direct proportion to the number of positive factors working with it, and two of the most important are good nesting cover and warm, mild, dry weather. Weather, unfortunately, cannot be controlled. Nesting cover, on the other hand, can be manipulated. The effects of weather, cover, and other factors, on nesting are more fully discussed in another section of this report.

Table 3 — Average brood sizes for a series of years are compared.
Data collected in late July and August.

Year	Average size	Basis (No. of broods)
1940	6.9	51
1941	6.2	75
1945	5.5	47
1946	6.1	120
1947	*5.5	455
1948	*8.2	755
1949	*7.9	916
1950	*6.7	787

*Data from the August roadside census.

Food Habits of Minnesota Pheasants

The crop contents of 659 adult Minnesota pheasants were examined and reported on by L. A. Fried in 1940. Most of the birds were collected from 1935 to 1938 and in all months of these years. Crop analysis showed that vegetable matter predominated in the diet at all times of the year, forming at least two-thirds of the food taken in every month and representing 96 per cent of the total annual food intake. Animal matter formed only four per cent of the total food.

Cultivated grains made up 81.3 per cent of the total annual food and 49.5 per cent of this was corn, the most important single item in the pheasant's diet. Thus, the pheasant is strictly a farm bird in Minnesota because it depends chiefly on agriculture for its food. The largest quantity of corn was eaten in November (84.2%) and the smallest amount in July (.91%) Only 5.8 per cent of the corn eaten in June could be identified as sprouted. Corn is eaten extensively by pheasants because of its availability and not because the birds are dependent on it.

The most common weed seeds taken were foxtail, common ragweed, and wild buckwheat. Together they formed 78.7 per cent of weed seeds eaten and 6.1 per cent of the total annual food.

Grasshoppers were eaten more often and in greater numbers than any other animal food. Most of these insects were taken in April and July when they were in the egg and nymphal stages, respectively. In destroying large amounts of weed seeds and grasshoppers, the pheasant helps pay, as it were, for some of the corn it eats.

Crops and gizzards from 10 pheasant chicks, ranging from two to seven weeks in age, were examined. Animal matter formed 52.4 per cent of the food of these chicks and vegetable matter 47.6 per cent. Small grasshoppers were preferred to all other foods. Juvenile pheasants probably exist almost entirely on soft-bodied larvae and small insects during the first few weeks of their lives. Utilization of hard seeds, however, may begin at a relatively early age. One four-week old chick had a crop full of corn, but barley was apparently preferred to either corn or oats.

An experiment to test the nutritional value of certain wild foods for pheasants was completed recently by the Division of Game and Fish and the University of Minnesota. Wild foods and mixtures of wild foods and staple foods, corn and other grains, were fed to captive birds over a period of 125 days. From these experiments it was concluded that:



FIGURE 4—PART OF A CONCENTRATION OF 500 TO 600 PHEASANTS AT A ROOST IN A WILLOW SLOUGH IN JACKSON COUNTY, FEBRUARY 17, 1950.

1. Wild fruit, seeds, and berries when constituting the sole diet, do not appear to be adequate for maintaining the weights of pheasants, at least during the breeding season.

2. When supplementing a partial supply of staple foods such as corn and other grains, fruits seeds, and berries appear to have a definite role in maintaining pheasant weights. In fact, such foods may be beneficial by furnishing certain rare minerals or vitamins, if not actually necessary.

3. The liking for, or palatability of, wild foods is no test of their food value. The reverse is likewise true.

4. Woodbine, dogwood, wild cherry, nannyberry, possibly also hackberry, wahoo, black locust, and wild rose were most valuable in carrying pheasants through short emergency periods when staple foods (grains) were absent.

5. Mixtures containing frost grape, woodbine, high-bush cranberry, nannyberry, black locust, dogwood, wahoo, hackberry, and wild cherries were of most value in maintaining weights of pheasants when staple foods were not adequately abundant.

6. Elderberry, high-bush cranberry,

woodbine, wild cherries, possibly also mountain ash, frost grapes, and honeysuckle were the most palatable wild foods tested.

7. Of the plants tested, the following probably would have most value when planted expressively to supplement staple foods, such as corn and grains: woodbine, frost grape, wild cherries, nannyberry, dogwood, high-bush cranberry, wahoo, black locust, hackberry.

Sex and Age ratios of Minn. Pheasants

For intelligent management purposes, it is desirable to make pheasant sex ratio counts annually. It is necessary to know the ratio of hens to cocks so that the possible outcome of the breeding season may be projected. The best time to make these counts is in early February when the birds are concentrated in woodlots, sloughs, and bottomlands along rivers. (Figure 4). Limited studies made in 1941 indicated a ratio of three hens per cock and in 1946 about 2.3 hens per cock. From January 6 to January 11, 1947, in Martin County, 862 pheasants were counted. The ratio was 2.8 hens per cock.

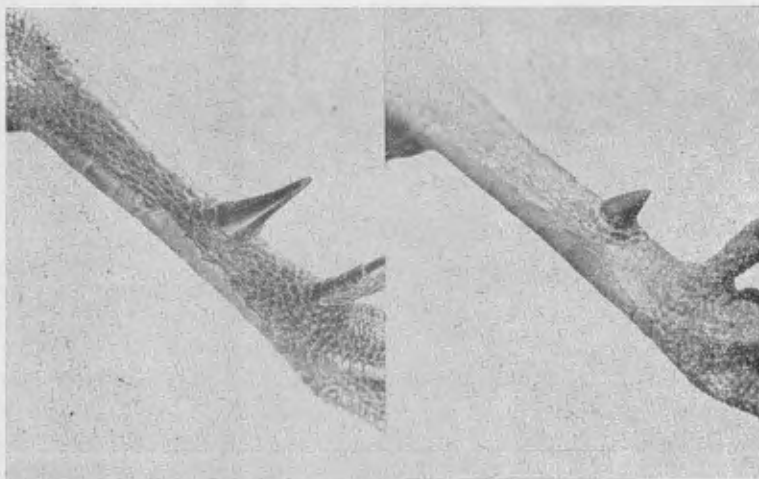


FIGURE 5—(UPPER) SPUR OF ADULT COCK (OVER ONE YEAR OLD) IN THE FALL. NOTE LENGTH, SHAPE, DARKNESS OF COLOR, AND HIGH GLOSS. (LOWER) SPUR OF JUVENILE COCK (BIRD OF THE YEAR). COURTESY OF J. P. LINDUSKA.

It was not until 1948, however, that enough birds were counted over a large enough area to give a fairly reliable sex ratio figure. Of 3,148 birds, 1,779 (57%) were hens and 1,369 (43%) were cocks — a ratio of 1.3 hens per cock. Undoubtedly the closed season of 1947 was important in causing the almost one to one ratio. It would have been desirable to have harvested surplus cocks not needed for reproduction. Then, too, with fewer cocks in the population the existing cover and food could have carried more hens safely through the winter.

In February, 1949, after the open season of October, 1948, the ratio was 1.7 hens per cock in a total of 5,352 pheasants counted in all types of winter concentrations, and in 1950 when 14,003 birds were counted, the ratio was 75 per cent hens and 25 per cent cocks. The more hens, then, that enter the breeding season, the more certain are we to have a shootable population in the fall. The cock pheasant, in a game management sense, can be put

in the same class as drones among bees. Not many need be carried over winter; excess numbers should be removed by hunting.

The age ratio or number of young birds to adults in the fall population is a measure of success of the reproductive season. This ratio can be determined at the time of the roadside census in September, or by a check of hunters' bags in October. If the season has been good, 75 to 85 per cent of the birds counted on roadside censuses or examined in hunters' bags will be young birds. If it has been poor, perhaps only 60 to 65 per cent of the bag will consist of young birds. Pheasants, it must be remembered, and this is important, are **extremely short-lived in the wild**. Studies made in Wisconsin showed a mortality of 84 per cent among young pheasants on an unshot area between hatching and winter. They also indicated that only 21 per cent of the pheasants reached the age of 1½ years; 6 per cent—2½ years, and 1 per cent—3½ years.

Roadside census in Minnesota in 1948 showed the percentage of young pheasants to adults to be 78.4 per cent; in 1949, 79.6 per cent; and in 1950, 78.6 per cent. Limited studies of hunters' bags showed that the age ratio of young to adults in 1943 was 80 per cent young; in 1944, 82 per cent; in 1945, 88 per cent; and in 1949, 81.6 per cent. These figures indicate very good nesting success for the years cited.

Ages of pheasants may be determined in several ways. The simplest and quickest for ascertaining age of cocks is by shape and length of the spur. In adult birds the spur is long (spur and leg bone together over three-fourths inch) and tapers to a sharp point (Figure 5.) In young birds it is short (less than three-fourths inch) and blunt (Figure 5). The Kimball Age Gauge is a useful gadget for determining age by spur length. It is made by boring a 3/4 inch hole in a piece of wood or fiber and then cutting a 1/2 inch opening in one side. The best gauges, however, are made from 3/4 inch bushing washers which are 1/32 inch oversize. Birds with spurs short enough to allow the leg and spur to pass through the hole are young birds. The accuracy of the age gauge is over 97 per cent.

Another way of determining age is to test the strength of the lower bill. Grasp the bill between the thumb and forefinger, and hold the bird out at arm's length. If the bill is insuffi-

ciently hardened to support the weight of the bird, the bird is probably young.

The most infallible way of determining age of pheasants is by the bursa of Fabricius. This organ persists in young birds of both sexes through the first March after their hatching. Gradually it becomes smaller and is entirely lacking in birds over ten months old. The bursa is a short pouch, 20 to 30 mm. deep, lying above the intestine at its lower end and opening externally just above the vent. It may be found either by dissection or probing.

Weights of Minnesota pheasants.

Minnesota pheasants are big, robust birds if taken fairly late in the fall. It is generally desirable to wait until the second or third week in October before opening the season so that late broods will have time to mature. Table 4 summarizes weights of Minnesota pheasants.

Natural factors limiting pheasant production.

Weather

Prolonged periods of inclement weather during the nesting seasons of 1944, 1945, and 1946 were probably a major factor in limiting pheasant production in Minnesota and adjacent states. During the drought years of the middle and late 30's, pheasant populations "boomed" due to a rise of very successful nesting seasons.

Table 4—Weights of pheasants obtained during several hunting seasons.

Year	Adult Male		Juvenile Male	
	Av. Weight	No. of Birds	Av. Weight	No. of Birds
1943	46.2 oz.	22	41.5 oz.	41
1944	47.6 oz.	11	41.0 oz.	99
1945	44.8 oz.	8	40.9 oz.	54
1949	46.8 oz.	19	42.2 oz.	44
1950	46.5 oz.	381	38.6 oz.	228



FIGURE 6—PHEASANT NEST WITH PART OF THE EGGS SMASHED DURING A SEVERE HAIL STORM ON MAY 25, 1941, IN LYON COUNTY.

What can happen to pheasants nests during cold, wet seasons became evident in 1941. From May 20 to June 13, in parts of southwestern Minnesota, 6.37 inches of rain fell. In one forty-hour period, 3.23 inches were recorded. In addition, two severe hail storms covered the ground with hail stones, some as large as goose eggs. Of 90 nests under observation, 12 were flooded, 17 had one or more eggs cracked by hail (Figure 6), and some eggs were completely smashed. It appeared that incubation ceased even though only one egg in an entire clutch was hail-cracked. Nests located along creeks and ditch banks were inundated when water rose 5 to 7 feet. Flooded nests were covered by debris and the eggs were so thoroughly chilled that continued incubation was useless.

The effect of a destructive hail storm
September, 1951

on pheasants and other wildlife was described by J. W. Kimball, a former Minnesota Game Manager. On May 21, 1945, a severe hail storm swept through central Faribault, Freeborn, and Mower Counties, covering an area of 1,100 square miles. About 130 square miles in Freeborn County were hardest hit. Based on observations and a crowing count study that he made in and near the 130 square-mile area both before and after the storm, Kimball concluded that:

1. The hail storm struck the 1,100 square-mile area with sufficient force to destroy partially or completely all pheasants nests and many adult pheasants.

2. Three-fourths of the adult pheasants in the 130 square-mile area were killed by hail.



FIGURE 7—MALE PHEASANT KILLED DURING THE ARMISTICE DAY BLIZZARD, 1940. BIRD WAS ROOSTING IN WINTER WHEAT, FACING INTO THE WIND. NOTE ICE IN MOUTH.

3. Between 5,000 and 10,000 adult pheasants were killed by the Albert Lea hail storm.

Almost every winter blizzard accompanied by wind-blown dirt from fall-plowed fields kill some pheasants in areas where cover is sparse or lacking near feeding areas.

During the severe winter of 1936, 33 of 106 birds found dead had no food in the crop or gizzard. Post-mortem examination showed that 12 of the 33 birds were so emaciated that they probably starved to death. Of the 73 birds in good flesh, many had ice over the eyes, or in the mouth and gullet, and a heavy coating of ice on the rump or under the wings. Although internal examination revealed a good subcutaneous layer of fat, most of these birds had enlarged hearts and hemor-

rhages into the pericardium, or sack around the heart. These findings indicated that they died of exposure and exertion rather than of starvation. They had to travel too far from cover to get food.

Two severe storms struck Minnesota in the winter of 1940-41 — the famous Armistice Day blizzard and the sudden blizzard of March 15-16. The effect of the Armistice Day storm on pheasants was investigated and graphically described by C. Edward Carlson. "Blinded by the sleet and driven by the wind, pheasants had collided with fences, light wires, trees, and other obstacles. If not killed outright, they were rendered helpless and froze to death on the spot. Snow and sleet melted by body heat froze to the feathers and against the skin (Figure 7). Post mor-

tem examinations of storm-killed pheasants revealed many cases of broken wings, legs, necks, and severe body bruises."

On one census area in Martin County, pheasants decreased from 50 per square mile in 1940 to 29 per square mile in 1941 — the year after the Armistice storm. Good winter cover would have saved many birds in southwestern Minnesota during this blizzard.

The March 15-16 blizzard was of short duration. Although little snow fell, the wind reached a velocity of 85 miles per hour in northwestern Minnesota. Snow, dust, and dirt were swirled into a choking blizzard. The high wind was accompanied by a rapid drop in temperature. In portions of the Red River Valley, pheasants were completely wiped out.

Blizzards caused pheasant mortality in 1946 and again in 1947. The effects of the 1947 blizzard as given here were taken from a Game and Fish Division report by David B. Vesall.

1. During February 3-8, 1947, a raging blizzard removed valuable top soil and accounted for a 15 to 20 per cent pheasant mortality in the Windom-Brewster area, and up to a 35 per cent loss near Worthington.

2. Good, permanent winter cover was found seriously lacking in the area studied.

3. Pheasants died principally as a result of choking, freezing, or both, not from starvation.

4. A fair brood stock remains. As an example, 140 pheasants were seen from the road in scattered numbers along the 19 miles between Windom and Talcot Lake.

5. A limited sample showed a sex ratio of one cock per two hens among live birds, and one cock per one hen for storm-killed birds.

The winter of 1950-51, with its record breaking snowfall and series of March blizzards, was very hard on pheasants. An estimated 30 per cent mortality occurred in Martin and Lyon Counties and about 10 per cent for the state as a whole.

Predation

Predation on pheasant nests is probably much more common than predation on young and adult birds. Relatively few predators attack the birds themselves, but everything from ants, small mammals and up in size, relish eggs or young just out of the shell.

Table 1 shows that of 241 nests, 40, or 23.2 per cent failed, due to predation. Small mammals were responsible for 21 per cent of the destruction; crows, 12 per cent; large mammals, 6 per cent; and ants, 1 per cent.

In 1946, weather conditions influenced nest predation. The unusually warm March stimulated pheasant reproduction when there was little safe nesting cover, and the unseasonable cold April and May which followed, prevented the growth of vegetation. Of 20 nests found, 10 had been destroyed by mammals, one by birds, and one by an unidentified predator. Nest predation was probably at an all time high in 1946.

Little substantiated information on predation of adult Minnesota pheasants is available. Remains of pheasants around the dens and nests of predatory species or even in the stomachs of the animals is not unassailable evidence of predation. Some of these remains, in the case of mammals, are due to scavenging.

An analysis of the stomach contents of 29 red foxes and 53 gray foxes collected in Minnesota between November, 1937, and April, 1938, revealed that pheasant remains occurred in only four of the former and seven of the latter. All of the gray foxes were taken in counties south of a line extending east-west 50 miles north of the Twin Cities. The red foxes came from all parts of the state. Of 72 red fox stomachs collected in January and February, 1944, 36 contained food and 36 were empty. Pheasant remains occurred in seven of the stomachs holding food. All 72 of these foxes were taken in the southwestern quarter of the state.

Pheasant parasites and disease

Adult Minnesota pheasants are unusually healthy and hardy birds relatively free from parasites and disease. Three hundred and seven have been autopsied in the Parasitology Laboratory at University Farm by biologists of the Division of Game and Fish and the University. Of these, 278 were specifically examined for animal parasites. Many of the birds were sent in by interested persons who found them dead or injured.

Only seven kinds of parasitic worms were found in the 278 pheasants. The one-fourth inch long roundworm *Heterakis gallinae*, a common parasite of domestic fowl, was the most important. It occurred in the intestines of 167 birds, or 60 per cent, but seemed to do little harm. Other roundworms recovered were *Capillaria contorta* from the crops of seven birds and *Ascaridea* sp. from the intestine of one bird.

Twenty-two of the 278 pheasants, or 8 per cent, were infected by the tapeworm, *Choanotaenea infundibulum*. The immature stage of this tapeworm lives in house flies and dung beetles; pheas-

ants become infected by eating parasitized flies and beetles.

The intestinal flukes, *Echinoparyphium recurvatum* occurred in three birds and *E. contiguum* in one bird. The latter fluke is a normal parasite of the muskrat. Only two birds were found infected by the protozoan, *Eimeria phasianii*, which causes coccidiosis. Ticks were found on one bird, lice on one, and mites on one.

Other pathological conditions noted in the pheasants were: one case of obstructed intestine, one of outpocketing of the crop forming a blind gut, and one of pullorum disease.

In the Veterinary Laboratory at University Farm, 98 pheasants have been examined since 1938. The most frequent causes of death were: brain hemorrhages and mechanical injuries, 13 birds; exposure, 17 birds; starvation, 8 birds; tuberculosis in one bird; and aspergillosis, a mold disease, in three birds. Two birds were suffering from bumblefoot, a disease common in domestic poultry, which causes swelling of the feet.

Fifty-seven pheasants were examined in the University Bacteriology Department from 1933 to 1938. Thirty-two birds showed no disease symptoms. The most common cause of death was mechanical injury—10 birds.

Artificial factors limiting pheasant reproduction

Some artificial factors limiting pheasant production, such as agricultural practices, have already been discussed. Spring burning is another factor that annually cuts down pheasant production by killing birds and depleting the habitat. Burning not only destroys nests and nesting cover, but removes the fertile layer of humus. It also encourages weed growth. By pre-

venting spring burning, farmers can be their own best friends and the pheasants' too.

The autumn of 1949 witnessed the most intensive and extensive uncontrolled burning ever seen in southwestern Minnesota. And all this despite the "No Burning" campaign fostered by the Division of Game and Fish and the Keep Minnesota Green Committee. Roadside ditches were burned; woodlots were burned; swamps and haymeadows were burned; even standing cornfields were burned. Pheasants lost winter cover and nesting cover; farmers lost irreplaceable humus and crops; and the advance of the corn borer was not stayed. Uncontrolled burning to destroy corn borers, in fact, seems to have been the main reason for the fires. The State Entomologist's Office assures us that burning does not control corn borers.

Burning to control the corn borer has never been advocated by the State Entomologist's Office. At best, it is only possible to rake together and burn a portion of the corn stalks in any field. In a year of heavy infestation, like 1949, enough stalks always remain unburned to insure a good crop of borers next spring, if the fall has been mild. Then, too, the corn borer is a tolerant insect. Although it prefers corn, it can get along without corn. In Minnesota it occurs in many coarse-stemmed plants including potatoes, tomatoes, asters, gladioli, dahlias, and many weeds. Immature stages are occasionally found in barley and oats.

Clean plowing is one means of corn borer control if practised on a community-wide basis. And this has the added advantage of returning the corn stalks to the soil. Cornborers winter over in the fifth larval stage in coarse-stalked plants. In this stage they are

practically impervious to cold and need little oxygen. The killing effect of deep plowing begins either in the fall or spring, but usually in the spring, when water soaks up the corn stalks causing them to disintegrate. Water, at the same time, causes the borers to move out of the stalks and up through the soil to the surface. If the plowing has been deep enough, most of the borers die before reaching the surface. Those which make it have to find other stalks on the surface to bore into so that they may continue their life cycle.

The chemicals DDT and Ryania are used to control corn borers. DDT is best used between June 20 and July 7 when eggs of the borers are usually hatching. DDT is dusted or sprayed on at the rate of a pound and a half per acre. There has been no reported loss of young pheasants at this dosage, but the possibility of loss should not be overlooked. The diet of young pheasants, one to three weeks old, consists almost entirely of soft-bodied insects. Although most corn borer larvae are killed between the corn leaf and the stalk where they hatch out and thus do not reach the ground, other insects in the field may be killed by DDT.

Several promising insect parasites for controlling corn borers are being experimented with by the State Entomologist. Weather, however, seems to be the most important factor in influencing fluctuations of corn borer population. Cold driving rains or hot dry winds during the hatching period kill many borers. And sharp frost in early fall before the borers have developed to the resistant fifth larval stage will destroy many of them. The fall of 1949 saw no killing frost until very late; thus, a large population of corn borers was expected in 1950. The extremely cool spring and summer,

however, with many nights of under 65° F. prevented the night-flying female moths from reaching full egg production. On a state-wide basis the average number of borers per 100 plants, as reported by the State Entomologists was 118 in 1947; 70 in 1948; 344 in 1949; and 90 in 1950.

Overgrazing is still another factor that limits pheasant production. Overgrazed pastures, woodlots windbreaks, and shorelines are "sick." In rolling country, especially, overgrazing permits erosion. Soil fertility is lost and with it the full value of the land. Heavily grazed woodlots and windbreaks are threadbare like shoddy cloth and offer little protection to wildlife in winter. By proper grazing farmers can protect their lands and woodlots and at the same time befriend the pheasant.

Anyone who has driven a car through pheasant country has seen dead birds along the roadside — victims of traffic. Many of these collisions could have been prevented by judicious use of the brake. Next time you take a long drive, count the dead pheasants on the highway. You may be surprised.

During a recent survey along 113,000 miles of highway in all parts of the pheasant range, (this excludes northeastern Minnesota), 15 Division of Game biologists, from August 1, 1949 to August 1, 1950, counted 480 dead pheasants or one death every 235 miles. Of the dead birds, 159 were males, 248 females, and 69 sex not determined.

The loss of pheasants to motor car traffic was large only in Game Management Areas X and XI in southwestern Minnesota. Unfortunately the loss was greatest when the population was at its lowest ebb during the breed-

ing and nesting season. This fact could mean that highway mortality is more serious to pheasants than to other species. In Area XI the kill of males increased sharply in April and May while the kill of females rose slowly. For the entire year the ratio was 1.56 females killed per male. For the critical period, December through June, the ratio was 1.43 females per male. When it is known that the sex ratio of Minnesota pheasants in February, 1950, was three hens per cock, it is evident that cocks are killed on the highway more frequently than hens. If the sexes are equally vulnerable to highway traffic, three hens could have been killed for each cock.

Some valuable observations on highway mortality are given here for the benefit of motorists and sportsmen.

Most highway game casualties occur on straight paved highways where traffic is heavy and fast. Where there is cover on one side of the road and food on the other, many game birds and animals are killed, especially if cover extends too close to the pavement. Where cover extends beyond the fence lines on both sides of the road, the number of casualties is smaller even where animals must pass from cover on one side to food on the other. Along some highways there are low spots which extend across the ditch to the shoulder of the highway. Mowers are forced to detour around such spots leaving tall grass from fence line to the highway shoulder. In one such spot between June and October, 1949, 18 pheasants were found dead and probably many were killed that went unnoticed. It seems obvious that dense cover should not extend close to much-traveled highways.

Heaviest mortality occurs on Mondays and days following holidays.

Sometimes grain trucks spring leaks, spewing grain on the pavement for miles. Pheasants are attracted and many are killed, just as they are killed when well-meaning but unthinking persons scatter food along roadsides in severe winter weather. Pheasants must never be fed along roadsides.

Birds of all kinds are killed in great numbers on windy days. They take off into the wind which means that often they try to fly across the road and are unable to move fast enough to avoid high speed vehicles. Drivers should be especially alert on windy days.

not show the number of birds that are lost due to crippling. Some studies indicate that crippling may be as high as 25 per cent of the total kill. This could mean that in Minnesota during some hunting seasons, 400,000 birds may have been lost due to crippling. One thing sportsmen can and should do to reduce this wanton loss is to use well trained dogs.

Treated seed grain and its possible effect on pheasants.

The information given below is taken from a report by Norman J. Ordal.

The rapid decline in pheasant popu-

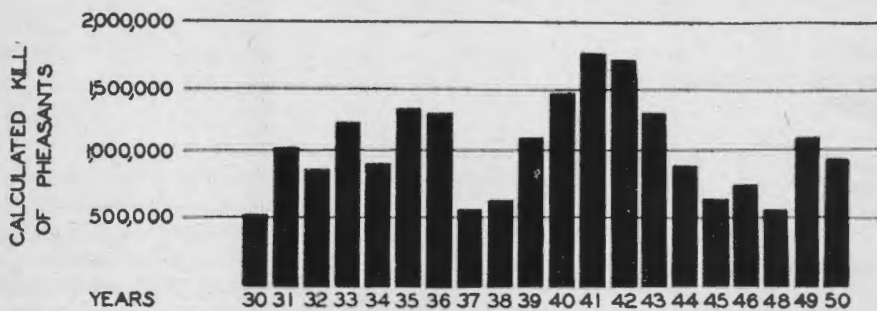


FIGURE 8—CALCULATED PHEASANT KILL IN MINNESOTA FOR THE PERIOD 1930 TO 1950. THERE WAS NO SEASON IN 1947.

Hunting is another artificial factor limiting pheasant production. Unlike most other limiting factors, it can be controlled rather easily by hunting regulations and restrictions. When the fall population of pheasants is large, generally the kill is large and vice versa. In Figure 8 the kill, as determined by hunters' report cards, is shown for the years 1930-1950. In Table 5 the trend of the fall population, as determined by roadside census, and the kill are compared for the period 1939-1950.

Hunters' report cards, however, do
September, 1951

lations in the north central states in 1945 caused much concern among hunters. Because the decline had not been adequately explained by various theories and investigations, a study was made of another possible source of mortality—the almost universal practice of planting seed grain treated with mercurial disinfectants. The seed disinfectants used in the experimental work were Semisan Jr. and New Improved Ceresan.

The amount of seed disinfectant necessary to kill a pheasant was determined by force feeding measured

Table 5—Twelve years' results of August roadside censuses, showing birds-per-mile and calculated kill.

Year	Date of Census	Miles of Census Route	Birds per Mile	Calculated Kill
1939	Aug. 9-20	7,094	1.66	1,133,625
1940	Aug. 15-24	6,514	2.43	1,489,000
1941	Aug. 1-13	6,765	2.17	1,790,000
1942	Aug. 1-12	3,922	2.73	1,749,000
1943	Aug. 15-30	1,574	2.00	1,377,500
1944	Aug. 14-25	1,277	1.64	910,285
1945	Aug. 21-30	368	2.59	738,882
1946	July 15-25	865	1.51	805,906
	(No Aug. census)			
1947	Aug. 25 to Sept. 6	4,097	1.02	Season closed
1948	Aug. 30 to Sept. 8	4,620	1.71	668,331
1949	Aug. 22-31	4,120	2.30	1,127,752
1950	Aug. 21-31	3,540	2.08	890,838
	TOTALS	44,756		12,681,119

amounts of the compounds in gelatin capsules. A dosage of Semisan Jr. or Ceresan containing ten milligrams of mercury per kilogram body weight of pheasant was found to be lethal. However, it would be impossible for a bird to obtain dosage of mercury this large from eating treated grain because the amount of seed disinfectant used in it would treat about 15 times as much grain as a pheasant could be expected to eat in one day.

Daily dosages of seed disinfectant smaller than the lethal dosage but larger than the amount birds would pick up in the field were force-fed a group of pheasants to obtain information on the effect of repeated sublethal doses. Results indicate that pheasants can tolerate more than twice as much seed disinfectant when it is given in equal dosages over a 13-day period than when it is given in a single dosage. Two hen pheasants were fed an exclusive diet of yellow corn treated at 1 1/3 times the rate of application of disinfectant recommended by the manufacturer, for a period of 49 days. Both birds gained weight during the

period of treatment, but showed a lesser rate of gain than birds fed untreated corn.

Factors that are operative on treated grain in the field, such as exposure to the elements and loss of the applied seed disinfectant due to handling and planting, would tend to reduce the toxicity of treated grain available to wild birds. It seems, therefore, extremely unlikely that seed disinfectants are ever a direct cause of death for pheasants.

Management methods for protecting and increasing pheasants.

It must be recognized that only a part of Minnesota is good pheasant habitat and that some portions of the state can, under present cover, food, weather and/or other conditions, produce only medium or small populations.

The distribution and abundance of pheasants in Minnesota are shown in Figure 9. This map is based on data accumulated during 11 years of roadside census and extensive field observations with emphasis placed on the

FIGURE 9
 DISTRIBUTION AND
 ABUNDANCE OF PHEASANTS
 IN MINNESOTA

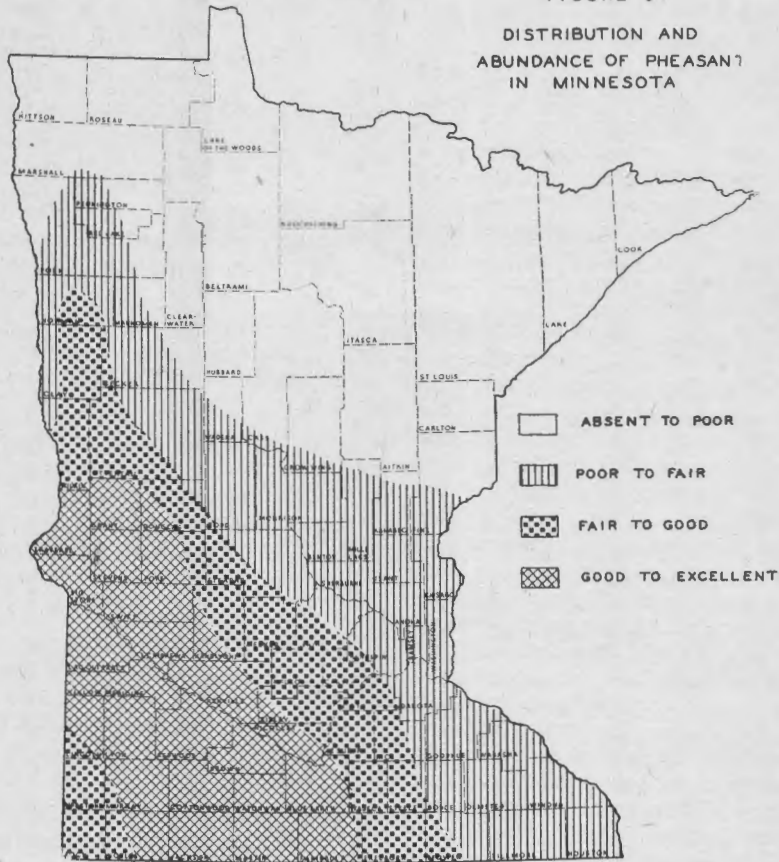


FIGURE 9—Distribution and Abundance of Pheasants in Minnesota.

last four years. Population increases shown in different zones of the map are gradual and the boundaries do not represent abrupt changes in density. The unlined portion of the map represents an area in which pheasants are very scarce. In the vertically lined area distribution and abundance vary considerably, but in no place are pheasants common enough to satisfy local hunting demands. Populations in this area run from zero to one or two birds per mile as determined by roadside census. Hunting is unprofitable because pheasants are few and cover is dense except

in the southeast. The dotted areas represent buffer strips between poor and good pheasant range. They contain populations ranging from two to four birds per mile of road. Cover is less extensive and hunting is more remunerative. Pheasants are abundant enough, in general, to satisfy local hunting demand. The cross-hatched region represents the best pheasant range. Here the population ranges from three to eight or more birds per mile. Only a small part of the land is in permanent cover, and the abundance of birds provides ideal shooting. This

region produces the bulk of the annual kill.

We do not, by any means, have all the answers telling us why pheasants are abundant in one region or few in another and why populations fluctuate. But recent information indicates that those areas "less suitable" for pheasants probably will never have large populations unless they can be improved by various game management practices such as cover planting and extensive production of corn. And even with such practices it may not be possible to have large populations because of conditions beyond our control such as weather and inadequate mineral content of the soil. When times of low pheasant populations occur, the "less suitable areas" will usually be the first to show decreased populations. The best pheasant areas, on the other hand, should have and did, maintain the larger populations during the pheasant low 1945-47. Populations have bounced back to a high level in the better areas with favorable weather conditions during the last three nesting seasons. Improvement of habitat and a continued ban on shooting hens has helped. Every sportsman must keep in mind that the illegal or accidental killing of one hen during hunting season represents a potential loss of 6 to 8 birds the following fall.

A few reasons may be assigned to account for pheasant distribution and numbers in the several regions of the state.

Northern Minnesota: Pheasants absent to poor because not enough agriculture producing corn and grain; winters too long and cold; soil in general poorly drained; and much untilled land.

Southeastern Minnesota: Pheasants poor because winter cover largely confined to hillsides and is heavily pas-

tured; excessive run-off and inundation; sloughs and swamps with winter cover are absent; about half of the corn is cut for fodder and entirely removed from the fields and remaining corn is heavily pastured reducing both its food and cover value; small farms crowded into valleys increase chances of pheasants contracting poultry diseases; and possible lack of sufficient soil minerals such as calcium.

Northwestern Minnesota: Pheasants absent to fair because not enough agriculture producing corn and grains; not enough cover for the long cold winters.

Southwestern Minnesota: Pheasants good to excellent because heavy production of corn and grain; good winter cover in some areas such as Redwood County, sparse in others; soil in general well drained; livestock generally more closely confined.

Improvement of the environment is one of the surest ways to increase pheasant populations. Over much of the state good cover is the crying need; food is secondary except in a few localities.

Farmers should start to look critically at their windbreaks and woodlots. In a recent flight over much of the southwestern part of the state, game biologists observed windbreaks and woodlots from the air and were dismayed. Planted years ago with quick-growing short-lived trees most windbreaks are in advanced stages of deterioration. Wintry wind whistles through them, and because of the absence of ground cover due to overgrazing there is shelter for neither bird nor beast. Threadbare windbreaks are frequently pheasant deathtraps during blizzards. Well-kept windbreaks containing evergreens are harbors where pheasants can outride the stiffest gales.

Existing cover may be improved by preventing overgrazing and burning. But much new cover, especially evergreens, must be planted in southwestern Minnesota. At the present time the Division of Game and Fish is carrying on a cover planting project which aims to establish plantings in the pheasant range that will help supply winter cover in the future. The plantings are of several kinds: newly established woodlots and windbreaks, and repair plantings of deteriorating woodlots and windbreaks. An essential part of the establishment and repair of plantings is protection from grazing by fencing.

The planting project has been underway five years. In 1947, 20,110 pieces of stock were planted; in 1948, 89,000 pieces; in 1949, 121,384 pieces; and in 1950, 476,395. During the spring of 1951, an anticipated 1,225,000 trees and shrubs will be planted. By the end of the 1951 planting season, an estimated 1,700 farms and homesteads in 65 counties will have been planted.

Hundreds of farmers are cooperating in this planting project by giving the state easements for a period of 25 years. The farmer, on his part, promises to plant and care for the stock; the state furnishes the stock and supervises the plantings. Sportsmen's clubs, Boy Scouts, 4-H Clubs, and other civic organizations assist in the planting.

Another Division of Game and Fish Project, Duck and Muskrat Lake Surveys, will also contribute to the improvement of cover for pheasants, although the primary aim is to improve cover and food of ducks and muskrats. Shores of certain lakes on which surveys have been completed will be fenced to prevent grazing. Easements will be obtained from farmers and fencing materials will be sup-

plied by the Division of Game and Fish. Once the grazed-out shorelines recover, and vegetation reestablishes itself, some new winter, as well as nesting, cover will be available to pheasants.

Lack of good nesting cover in the early spring is always a critical problem; it is probably one of the most important factors limiting pheasant production in Minnesota. Farmers can help by preventing spring burning and leaving fence rows grown up in grasses, vines and weeds. Weed patches and bushy fence rows are generally safer for pheasant nesting than alfalfa and grain fields. Pheasants are very partial to alfalfa and grain fields, and the majority of birds will nest in these coverts. Farmers should do whatever they can to prevent destruction of nests—use flushing bars, cut the outermost 100 feet of the field last; and whenever possible, delay cutting until the third week in June. By June 15, if the season has been good, most eggs will have hatched.

A food and cover patch program pheasants sponsored by the Division of Game and Fish was initiated in the spring of 1950. Contracts were made for a two-year period with farmers in 25 western and southwestern counties for the use of 3,943 acres of land in three to ten-acre plots. The land was planted to sweet clover by the farmers. It is expected that the sweet clover will furnish some nesting cover the first year, good auxiliary cover the first winter, good nesting cover the second spring, and good winter cover the second winter. Studies are being made on these areas to determine the extent of winter use by pheasants and the extent and success of nesting. A similar sweet clover food and cover patch program is being carried on this spring (1951).

In order to evaluate the place of artificial feeding in the winter survival of pheasants, the Division of Game and Fish undertook an extensive feeding program in January and February, 1950. Six hundred shelters and 1,087 feeders were established in pheasant concentration areas such as woodlots and slough bottoms in 48 western and southwestern counties. Wardens, farmers, and sportsmen's clubs kept the shelters and feeders supplied with corn during the winter. Biologists and wardens made frequent inspection trips to the feeder and shelter sites to determine the amount of pheasant use during the winter, and whether or not the type of shelter put up actually furnished shelter during blizzards and times of drifting snow.

A questionnaire form was used by biologists and wardens on which to record use and effectiveness of the shelters and feeders. Inspection trips were made on February 10 and 24 and on March 1 and 14. Some definite points that the feeding program cleared up are summarized as follows:

1. The most successful method of feeding was ground dumps of cob corn. Pheasants are not afraid of this type of feeding station as they are of artificial structures.

2. The artificial lean-to shelter did not prove entirely satisfactory in all areas. Even when well-placed and protected by natural vegetation, many shelters were buried under snow, or partially covered and filled with snow.

3. Wardens and area game biologists estimated that between 40 and 45 per cent of the shelters, and 40 to 75 per cent of the feeders were used by pheasants during the winter.

4. The feeding program gave each warden a better picture of the pheasant population, location of winter con-

centrations, and amount of available winter habitat in his district.

5. Checks made during the latter half of the feeding program showed that 14,267 pheasants were flushed in the vicinity of the artificial feeders, and that 16,885 pheasants were flushed from areas of natural habitat.

6. Large pheasant concentrations were not subjected to an excessive amount of predation.

Banding and recovery records of adult pheasants.

After the egg production season is over on the game farms, there frequently remains an excess number of old breeding birds that are banded and liberated, usually early in July. Records of these adult pheasant releases go back to 1941. In that year, 133 cocks and 34 hens were banded and released. None of these birds was recovered the first fall. The second fall after their release, however, three hens and one cock showed up in hunters' bags, and the bands were sent in for identification. The third season after the release, only one hen was killed during the hunting season. One hen was allowed in the bag both in 1942 and 1943. For the 1941 release, then, the total known recovery of banded birds was six out of 167, or three per cent.

In 1944, 78 banded cocks and 39 hens were released in April. The only recovery from this group was a cock released in Section 23, Anoka County. It was found dead on July 25, in Section 25, Anoka County.

The release made in 1945 is of special interest. Four hundred ninety banded adult pheasants (number of males and females not determined) were planted on July 2-3, in Faribault, Freeborn, and Martin Counties in the

area, where several thousand pheasants had been killed by the severe hail storm of May 21, 1945. The following October, thirteen cocks from this release were shot by hunters who submitted the bands for identification. The second hunting season after the release, one additional cock was killed by a hunter. Thus, 14, or 2.8 per cent of the birds were killed by hunters.

In addition, four other birds, two hens and two cocks were found dead before the 1945 hunting season, probably victims of the highway traffic, and another hen was found dead during the second hunting season after being liberated. Altogether, 19 pheasants (3.87 per cent) from this release of 490 birds were shot or found dead and the bands sent in by interested persons. These records of release and recovery showed that most of the birds were killed within a mile or two of the point of liberation. One, however, had wandered about twelve miles.

Pheasant hunting was prohibited in 1947. As a result, only three bands removed from two cocks and a hen found dead, were received for identification. A total of 1,582 birds, 433 cocks and 1,149 hens, were banded and released.

Seventeen banded cocks were killed and reported by hunters during the 1948 season. They were a part of a group of 389 cocks and 1,130 hens released in July preceding the season. Six other birds from this release, three cocks and three hens, were found dead. Hunting, then, resulted in the recovery of 4.37 per cent of the banded cocks.

July, 1949, saw the release of the largest number of banded adult pheasants yet—2,055. Nine, or 1.94 per cent, of the 458 cocks liberated were killed by hunters in October. Nine other birds, four cocks and four hens, were

found dead. Two of these were killed by flying into wires and one was hit by a car.

From April through July, 1950, 369 banded adults were released. Eleven cocks, or 12 per cent, of the 92 cocks liberated were killed by hunters during the 1950 season. Three other birds, two hens and one cock, were found dead shortly after their release.

Determining Minnesota's annual increase of pheasants

The Federal Government counts heads once every ten years. With short-lived pheasants, annual censuses are necessary, for on the size of the fall population depends the length of the hunting season and the size of the daily and seasonal bag. Since 1939, fall populations have been determined by Game and Fish biologists, with the assistance of the warden force, on the roadside census.

The techniques of this census are relatively simple after census routes traversing representative cover and crop types in various counties have been selected. The census method takes advantage of the pheasants' habit of coming to roadsides in early morning to dry themselves and to avoid dew in the coverts. The census taker, then, with one assistant, begins his counts one-half hour before sunrise, driving his car at a speed of 20 miles per hour over the 25 miles long census route on low-traffic gravel roads. All pheasants seen are counted, sex ratios are noted, and also the size of the broods. The census should be taken only on clear mornings with no wind and after a night of heavy dew or light rain.

The average number of pheasants seen per mile on the census routes in one county or the pheasant range as a whole is a measure of the total population of the county and the pheas-

ant range. It has been determined that one bird seen per mile of census route in any one county indicates a small population; five or more birds per mile indicates a large population. The average for all census routes in 1941 was 2.17 birds per mile; and 1,790,000 pheasants were harvested that year. In 1945, only 0.62 birds were seen per mile, and 738,832 birds were taken by hunters. In 1949, 3.30 pheasants were seen per mile of travel over 4,120 miles of census route and 1,127,752 birds were harvested. State-wide populations of two or more birds per mile of census route, then, indicate that the harvest probably will be large. Population of less than a bird per mile probably will result in a comparatively small total bag. Roadside censuses and pheasant harvests for the period 1939-1950 are compared in Table 5.

The census drive is a method for determining population on limited areas. The census takers on foot walk abreast about 25 feet apart in a straight line from one end of a section of land to the other, counting birds as they flush. This method was first used by the Division of Game and Fish and the University of Minnesota in 1939, with the cooperation of the National Youth Administration. The findings of these census drives are summarized in Table 6. No census drives have been made since 1939 because of the large number of men required.

The "crowing count" is still another method used to census pheasants. This is how it works. The census taker drives his car over a predetermined route beginning one hour before sunrise on clear calm mornings. Every mile he stops, gets out of the car, and records the number of individual pheasant "crowings" that he hears in a two-minute period.

Crowing counts made in Minnesota and South Dakota indicate that crowing can be heard at distances up to three-fourths mile, that individual cocks crow at intervals of slightly less than three minutes, and that over 70 crows per two-minute period denotes an excellent density of cocks; 30-70, a good density; 10-30, a fair density; and 0-10, a poor density. From May 3 to June 15, 1949, five area game managers made crowing counts in the principal pheasant range. Stops were made at one-mile intervals, and the number of cock pheasant calls heard per two-minute period was recorded. This procedure was continued until ten stops had been completed. Counts were made in 17 counties on 34 mornings; 327 listening stops were made and 3,099 cock call were recorded. The average number of calls per two-minute period for the 17 counties was ten. Counties in which the largest numbers of calls per two-minute period were heard were Cottonwood, 22; Watonwan, 20; and Martin, 19. In Scott and Dakota Counties very few calls were recorded.

Table 6—Number of pheasants seen per square mile on census drives in southern Minnesota areas from February to March, 1939.

Locality	Square Miles Average No. per		No. Males	No. Females
	Censused	Square Mile		
Fairmont	24	29	178	164
Bello Plaine	8	28	42	147
Mankato	21	107	98	104
Mountain Lake	18	25	140	186
Redwood Falls	9	20	(Censused in May)	

Valuable as the pheasant crowing count census is for determining the density and distribution of the spring population of cocks, an index of the total breeding population can only be obtained when crowing count information is combined with accurate sex ratio data. Furthermore, to obtain an index of the fall pheasant population, it is necessary to determine the reproductive success by roadside census or other means. Because the length of the hunting season and the size of the daily and seasonal bag are determined by the fall pheasant population, the roadside census is considered the best single method for estimating Minnesota's annual pheasant crop.

The airplane is a comparative newcomer to the game census field. To date, it has been used largely for waterfowl and big game work. Minnesota game biologists first had the opportunity in February, 1947, to try it out on pheasants while counting deer in southwestern Minnesota. The plane was used again in 1951. We believe that it is a useful tool for studying pheasant concentrations in winter and particularly after severe blizzards.

Summary

Farmer-sportsmen relations are desirable, but pheasant-farmer-sportsmen relations are necessary if the pheasant is going to have his problems understood by the farmer, on whose land he is a tenant, and by the sportsman who depends on him for recreation and savory dinners.

Pheasant studies and investigations in Minnesota have established the following facts:

1. Polygamy is a characteristic pheasant breeding habit. The average size harem among Minnesota pheasants is three hens per cock. One rooster can service 12 or more hens.

2. The first eggs are laid during the last two weeks of April but most hens wait until May. About 80 per cent of all nests found have occurred between May 1 and June 15. Early in the season several hens may lay in the same nest. These "dump nests" are seldom incubated.

3. Of 241 nests studied, 29 per cent were successful and 71 per cent were unsuccessful. Of the unsuccessful nests, 41 per cent were destroyed by farming activities of man; 23 per cent by predators, mostly small mammals and crows; 17 per cent by pheasants themselves, through nest abandoning; 14 per cent by inclement weather; and 5 per cent unknown.

4. Although only 69 of 241 nests were successful, late season observations of broods indicated that a much higher proportion of hens hatched chicks by second and third nesting attempts. Hens hatch only one clutch per season, but will renest if the first clutch is destroyed.

5. A study of 158 broods of chicks from June 16 to July 31, 1941, showed that the average brood lost only one chick every two weeks. The average brood size in late July varies from year to year. In 1940, it was seven chicks per brood; in 1946, six chicks; and in 1949, eight chicks.

6. The crop contents of 659 adult pheasants collected in all months of the year were analyzed. Vegetable matter comprised 96 per cent of the total annual food, and animal matter, largely grasshoppers, only 4 per cent. Cultivated grains made up 81 per cent of the vegetable matter, and of this, 49.5 per cent was corn. Of weed seeds, foxtail, ragweed, and wild buckwheat comprised 6 per cent of the plant food.

7. The crops and gizzards of 10 pheasants, 2 to 7 weeks old, contained

52 per cent animal matter, largely grasshoppers, and 48 per cent plant material.

8. Knowledge of pheasant sex ratio is valuable in projecting the possible outcome of the breeding season and hence the hunting season. Sex ratio counts are best made in January and February. The 1941 counts showed 3 hens per cock; 1946, 2.3 hens per cock; 1947, 2.8 hens per cock; 1948, 1.3 hens per cock; 1949, 1.7 hens per cock; and 1950, 3 hens per cock.

9. The ratio, or number of young birds to adults, in the fall is a measure of success of the reproductive season. If the breeding season has been good, 80 to 85 per cent of the hunters' bag will consist of young birds. If it has been poor, only 60 to 65 per cent of the birds will be young.

10. The quickest way for determining age of cocks is by shape and length of the spur. In adults it is long (spur and leg bone together over 3/4 inch) and tapers to a sharp point. In young birds it is short (less than 3/4 inch) and blunt.

11. The average weight of 22 adult males collected in 1943 was 46.2 ounces and of 41 juvenile males, 41.5 ounces. Three hundred eighty-one adults collected in 1950 averaged 46.5 ounces, and 228 juveniles averaged 38.6 ounces.

12. Prolonged periods of inclement weather during recent nesting seasons probably have been limiting pheasant production. A severe hail storm in 1945, for example, that struck 1,100 square miles in 3 counties, is believed to have destroyed all pheasant nests in the area and over 5,000 adult birds.

13. Almost every winter blizzards kill some pheasants in areas where cover is sparse or lacking near feeding areas.

14. Predation of pheasant nests is

probably much more common than predation of young and adult birds. Relatively few predators attack the birds themselves, but everything from ants, small mammals and up in size, relish eggs or young just out of the shell.

15. Seven kinds of parasitic worms have been found in the digestive tracts of 278 Minnesota pheasants. Of these the cecal worm was most important, occurring in 167 birds.

16. Spring burning cuts down pheasant production by killing birds and destroying nesting cover. Fall burning is especially destructive of winter cover and it does not control corn borers.

17. Highway mortality is an important factor in pheasant losses. During a recent survey (August 1, 1949, to August 1, 1950) along 113,000 miles of highway in all parts of the pheasant range, game biologists counted 480 dead pheasants, or one death every 235 miles.

18. Studies made of grain and corn seed treated with mercurial disinfectants have shown that treated seed is not toxic for pheasants.

19. In abundance and production of pheasants the following Minnesota areas rank in order: southwest and south central, north central and northwest, southeast, north and northeast.

20. If farmers are aware of the fact that over 80 per cent of all nests in meadows and grain fields occur in the outer 100 feet, it may be possible by delayed or controlled cutting to prevent some destruction of eggs and hens by mowers. Whenever possible, mowing should be delayed until after June 15, when most eggs hatch.

21. A flushing bar attached to one mower saved many incubating hens from injury, thus enabling them to renest. Studies in 1944 showed one

nest was destroyed by mowing for every 3.3 acres of alfalfa, and 30 per cent of the hens were killed or injured.

22. Overgrazing limits pheasant production by reduction of nesting and winter cover. It also encourages soil erosion and hence reduces land values.

23. Some studies indicate that crippling losses due to hunting may run as high as 25 per cent of the total kill. This means that in Minnesota during some hunting seasons, 400,000 birds may have been lost to crippling. Sportsmen can reduce this wanton loss by using well-trained dogs.

24. Improvement of the environment is one of the surest ways of increasing pheasant populations. Over much of the state, good cover is the crying need; food is secondary, except in a few localities.

25. In a recent flight over south-

western Minnesota, biologists observed windbreaks and woodlots from the air and were dismayed. Planted years ago with quick-growing, short-lived trees, most windbreaks are in an advanced state of deterioration.

26. The Game and Fish cover planting project has been underway five years. In 1947, 20,110 pieces of stock were planted; in 1948, 89,000 pieces; in 1949, 121,384 pieces; in 1950, 476,395 pieces; and in 1951, 1,225,000 pieces.

27. After the egg production season, excess adult breeding birds from the game farms are banded and released annually, usually in early July. In 1941, 167 such birds were stocked; in 1944, 117; in 1945, 490; in 1947, 1,582; in 1948, 1,519; in 1949, 2,055; and in 1950, 369. Percentages of recovery by hunters of banded cocks are given in the main portion of the paper.

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Dr's. George M. Sutton and Andy Berger should be congratulated on the excellent job they have done with the current volume of *The Wilson Bulletin*. Those M.O.U. members who are not acquainted with the bulletin should get ahold of a copy. Membership in one of the finest organizations of its kind is only \$3.00. Remember, too, that a membership would give you a good excuse to visit the Smoky Mountains in April, when the Society holds its annual meeting at Gatlinburg, Tennessee.

Seasonal Report

by

Mary Lupient

The heaviest snowfall on record in Minnesota occurred during the winter of 1950-1951. Although the fall was not exceptionally heavy in some of the northern sections, more than 90 in. fell in some areas. As late as April 11 a severe storm struck southwestern Minnesota, and a 40 mph wind piled snow into drifts eight feet high. Ice left the rivers the first week of April, and a few days later spring floods spread disaster, made highways impassable, drove hundreds of families from their homes, and caused property damage that ran into millions. The Mississippi River rose to its highest mark since 1881, and in St. Paul, below its confluence with the Minnesota River, the crest was the highest in history.

Cold and inclement weather continued through March to April 28, but May to date of this writing, May 25, has been mild with fair skies except for occasional rains that promised good growing weather.

The movement of early migrants, except for a few individuals, was delayed from one to two weeks. Observation of waterfowl was hampered this spring because of the large expanse of water caused by floods.

Detailed reports from Paul Murphy and A. C. Rosenwinkel, St. Paul; William Longley, Kasson; and O. A. Rustad, Northfield indicate that the arrival of ducks in goodly numbers occurred during the week of April 14-15. Mergansers and pintail ducks were

seen earlier. At Lake Traverse and vicinity, April 14-15, A. C. Rosenwinkel saw species of all ducks except black duck, blue-winged teal, ruddy duck and shoveler. Lesser, snow, blue, and Canada geese were present in flocks numbering hundreds. According to Dr. W. J. Breckenridge, wood ducks that annually nest in his yard began incubating a few days later than normally. He investigated the nest April 30 and found seven eggs, two days later there were nine. At Gull Lake, May 13, H. C. Whittier found two duck nests containing eggs.

A concentration of 200 common loons on Lake Gervais near St. Paul was observed by Alberta Smith, April 24. Dr. Breckenridge saw a juvenile common loon on Lake Nokomis, May 6 which he states is an interesting record because the juvenile of this species lives on oceans. About 30 white pelicans were observed by William Longley in the Fairmont area, April 29.

With one exception, reports from various localities on whistling swans were dated April 13-14. The earliest date was April 3 at Red Wing by John Novak. Alberta Smith reported about 500 whistling swans at Prairie Island, April 13. Additional reports on swans came from Heron Lake, Lake Traverse, Wells Lake, Minnesota River bottoms and at Palmer's Slough where one wounded swan in a flock of 68 was seen by Game Warden George Poole.

The migration of pied-billed and horned grebes was about one week late. The eared grebe is not often found as far east as the Twin Cities. Four of these birds were seen by Mr. and Mrs. Morris Self at Lake Vadnais, April 26.

The arrival of herring and ring-billed gulls was about two weeks late. A. C. Rosenwinkel saw 17 Bonaparte's gulls over the Minnesota River bottoms, May 5. An Iceland gull was collected by Pershing Hofslund and Harvey Putnam near Duluth, February 25.

The common tern was observed over Twin City Lakes, April 25, and the Forster's tern over Woman Lake, Minneapolis, May 6. This tern had nested in the area around Woman Lake in the past so there is the possibility that it may nest there again this year. William Longley reported nine Forster's terns in Dodge County, May 12. The Caspian was seen over Mille Lacs, May 17.

Reports on the hawk migration indicate that movement was heaviest the first two weeks of April, and that the red-tailed hawk was the most abundant throughout eastern and southern Minnesota. Ross Olson stated that about 10,000 hawks, mostly red-tailed hawks, migrated near Stillwater, April 5. He trapped one Krider's hawk. There were several records of the Krider's hawk, one seen at the Bass Ponds April 13, one near Peterson April 9, and at Whitewater State Park April 10. The last two records are by William Longley. A golden eagle was observed near Shakopee March 17, and one was trapped near Red Lake in January.

Ring-necked pheasants were hard hit during the severe spring storms and heavy snows. From 20 to 30 percent of them were killed. Mortality would have been higher except for the fact that food for them was placed along

the highways and in sheltered spots by the State Conservation Department.

Few observers sent reports on shore birds. Water was still high at their normal migration dates, and they were not to be found in many of their usual stopping places. Dr. Breckenridge saw a number of small flocks of golden plovers, about 30 or 40 birds in all, lighting on plowed fields near Heron Lake, May 13. About six miles west of Redwood Falls he saw 13 Hudsonian godwits. In Dodge County, April 23, the upland plover was found to be quite common by William Longley, who reported that the peak of the migration of the Wilsons' snipe was April 30.

From various parts of the state came reports of cedar and Bohemian waxwings in separate and mixed flocks. These reports were dated from late February to early May.

Although the peak of the warbler migration was May 13 to 20, a few of the early warblers arrived sooner. Warblers that commonly migrate early in May were seen with species that usually appear about the middle of May. At Frontenac, members of Bird Clubs from the Twin Cities observed as many as 17 species. Blue-winged warblers were found in the Cannon River valley near Red Wing, May 20, by Dr. D. W. Warner and his class. They saw 4 yellow-breasted chats in the same area. What he believed to be a Kirtland's warbler was found in Como Park, St. Paul by A. C. Rosenwinkel. The bird was singing which Mr. Rosenwinkel says helped him to identify it. There are few records of the appearance of this bird in Minnesota.

Red-winged blackbirds arrived in force the first week in April. The earliest date reported for the rusty blackbird was March 17 when a flock

was seen near Shakopee. O. A. Rustad reported a lark bunting in the area east of Cannon Lake, April 22, an unusual record.

In the Twin City area migrating sparrows arrived a few days late and hurried through. A. C. Rosenwinkel sent the following interesting observation, "On March 17 I found a junco with pinkish sides and brownish back and wings and a black head, certainly very near an Oregon junco. Seen again March 24." O. A. Rustad observed a similar junco at Northfield which, after consultation with the staff of the Museum of Natural History, he considered to be the western junco subspecies.

After a very rainy night that brought the birds to earth, a heavy migration occurred May 25. Warblers, vireos and flycatchers were the most abundant.

The blue-grey gnatcatcher was reported as early as April 28 at White Bear Lake by A. C. Rosenwinkel. Gnatcatchers were seen at Frontenac by several observers during the week May 13 to 20, four reported at the Isaak Walton Bass Ponds May 5, and Dr. Breckenridge reported that one came to his yard.

Two tufted titmice lived in Robert's Sanctuary during April, and to date they are still there. A titmouse came to a feeder at the home of Mrs. Harold Searles, St. Anthony Park, St. Paul.

Reports on red crossbills show that they still lingered in the southern half of the state as late as May 8. Sheridan S. Flaherty at Morris reported that two red crossbills appeared in his yard Good Friday, and to date nine of them are coming to his pool. He believes that a pair nested in the vicinity because they came daily to his feeder all spring.

Bewick's wrens started nesting at 617 Westwood Ave., Minneapolis, but unfortunately after two weeks they were driven away by house wrens.

Swallow-tailed kites have been reported again. Rev. and Mrs. W. Vance were driving near Newport, March 18, and were surprised to see one fly across the highway at close range, and sail away over trees nearby. Because no other bird resembles the kite, they are certain of the identification. Again on April 15 they were driving along the highway near Mendota, and as they stopped for traffic at a crossing, a swallow-tailed kite sailed near them.

Rev. and Mrs. Vance reported an American egret at the Isaak Walton Bass Ponds, May 14. In the spring of 1950 two of these birds were seen in the same vicinity during the latter part of May and early June.

This is a dickcissel year. They arrived in force about May 20 and are abundant everywhere in the southern half of the state.

The following interesting observations were made by Forest Lee, Gerald Bue, and John Zorichak on the 1951 aerial breeding bird census. May 24, One American egret, or white great blue heron, was seen on Hattie Lake in Cass County. This bird was observed from about 50 feet, dark legs were noted.

May 24, One snow goose and one blue goose were seen at Roseau Lake, Roseau County.

May 24, One sandhill crane was seen in the bog area of northeastern Roseau County.

May 24, Four snow geese were seen at North Twin Lake in Kittson County.

May 24, One swan in marsh, western Marshall County .

May 23, Two swans in Mud Lake Federal Refuge, Marshall County.

May 23, Two Canada geese in Mud Lake Federal Refuge, Marshall County.

May 22, One pair snow geese near Battle Lake, Otter Tail County.

May 22, Eight snow and ten blue geese, Mud Lake, Traverse County.

May 18, Colony of what appeared to be Franklin's gulls nesting on Long Lake, Kandiyohi County. — Minneapolis, Minnesota.

The Massachusetts Audubon Society offer many types of traps for bird banders, and the new aluminum color bands. For further information, write Massachusetts Audubon Society, 155 Newbury Street, Boston 16, Massachusetts.

Ken Morrison and Josephine Herz continue to receive plaudits for their *Where to Find Birds in Minnesota*. Joseph Hickey has suggested to the Wisconsin society that they should get busy on a similar booklet for their state.

The September, 1951 issue of the *Jack Pine Warbler* brings word of the tragic death of Frederick A. Woodard, one of the active members of the Michigan Audubon Society.

Notes of Interest

NOTES OF THE WHISTLING SWAN—The following sight observations of whistling swans were reported by area game biologists, refuge personnel, and game wardens of the Minnesota Division of Game and Fish, during the 1950 spring months.

Whistling Swan Observation Records—1950

Date	Area	County	Number	Observer
April 1	Rush Lake	Otter Tail	6	Paul Krueger
-- 8	Little Pine Lake	Otter Tail	7	Paul Krueger
-- 8	---	Renville	20	Merle Shields
-- 8	---	Redwood	7	Gerald Bue
-- 8	Otter Tail Lake	Otter Tail	17	Paul Krueger
-- 9	Marsh Lake	Lac qui Parle	150	W. L. Severson
-- 10	Prairie Lake	Otter Tail	7	F. H. McArdle
-- 10	---	Scott	9	Ernest Boyd
-- 10	Goose Lake	Waseca	5	George Huber
-- 10	Otter Tail Lake	Otter Tail	19	Paul Krueger
-- 11	Otter Tail Lake	Otter Tail	6	Paul Krueger
-- 12	Little Pine Lake	Otter Tail	3	Paul Krueger
-- 12	---	Lac qui Parle	1	Robert Benson
-- 12	Lake Lizzie	Otter Tail	6	F. H. McArdle
-- 12	Prairie Lake	Otter Tail	7	F. H. McArdle
-- 12	---	Big Stone	1	John Gilbertson
-- 13	Waconia Lake	Carver	9	A. B. Colburn
-- 13	Rush Lake	Otter Tail	19	Paul Krueger
-- 13	Otter Tail Lake	Otter Tail	20	Paul Krueger
-- 13	---	Chippewa	6	Robert Benson
-- 13	---	Chippewa	19	Robert Benson
-- 14	---	Swift	4	Art Degen
-- 15	Mud Lake	Otter Tail	4	Paul Krueger
-- 15	Waconia Lake	Carver	4	A. B. Colburn
-- 16	---	Renville	18	Merle Shields
-- 16	Waconia Lake	Big Stone	9	John Gilbertson
-- 16	Little Pine Lake	Otter Tail	3	Paul Krueger
-- 16	Otter Tail River	Otter Tail	11	Paul Krueger
-- 16	Otter Tail Lake	Otter Tail	18	Paul Krueger
-- 17	Otter Tail Lake	Kandiyohi	12	L. M. Halvorson
-- 18	Moose Lake	Carlton	18	John Buck
-- 18	---	Kittson	1,500	Paul Blide
-- 18	---	Wilkin	138	A. M. Tomlinson
-- 18	Averill	Clay	22	Wm. Borchert
-- 19	---	Renville	44	Merle Shields

September, 1951

--	19	---	Big Stone	6	Robert Benson
--	19	---	Lac qui Parle	10	Robert Benson
--	19	West Newton	Wabasha	70	Willis Kruger
--	19	Mud Lake	Otter Tail	5	Paul Krueger
--	19	---	Traverse	27	A. G. Klawon
--	20	---	Polk	1	F. A. Fischer
--	21	Little Pine Lake	Otter Tail	2	Paul Krueger
--	22	Prairie Lake	Otter Tail	17	F. H. McArdle
--	22	Lake Lizzie	Otter Tail	7	F. H. McArdle
--	22	---	Otter Tail	18	F. H. McArdle
--	22	---	Otter Tail	75	F. H. McArdle
--	22	---	Isanti	2	A. C. Hiljus
--	22	---	Kanabec	52	H. B. Kuluvar
--	22	---	Polk	1	F. A. Fischer
--	22	---	Otter Tail	101	N. J. Ordal
--	23	Mud Lake Area	Traverse	18	A. G. Klawon
--	27	Lake Min'ew'ka	Pope	3	Robert Benson
--	28	Mud Lake Area	Traverse	34	A. G. Klawon
--	28	Tanner Lake	Washington	17	Joe Brickner
--	28	Shakopee	Scott	21	Clare Johnson
--	29	Robinson Lake	Wabasha	17	Willis Kruger
--	30	---	Big Stone	9	John Gilbertson
May	1	Mud Lake Area	Traverse	17	A. G. Klawon
--	1	---	Crow Wing	19	W. G. Alexander
--	2	---	Clay	1	F. H. McArdle
--	2	---	Mahnomen	18	Milt Hockel
--	3	---	Washington	12	Joe Brickner
--	5	---	Swift	22	Art Degen
--	7	---	Waseca	11	George Huber
--	18	---	Marshall	18	Felix Klet

—Forrest B. Lee, Pittman-Robertson Unit, Minnesota Division of Game and Fish, St. Paul, Minnesota.

NOTES OF THE WHITE PELICAN—Area game biologists, game wardens, and refuge personnel of the Minnesota Division of Game and Fish tallied waterfowl observations during the 1950 spring months. The following sight records for the white pelican were reported along with the waterfowl data.

WHITE PELICAN OBSERVATION RECORDS—1950

Date	Place	County	Number	Observer
April 7	Mud Lake	Redwood	16	Merle Shields
-- 8	---	Traverse	72	A. G. Klawon
-- 13	Lake Ochida	Nobles	12	Bert Getty
-- 13	Talcot Lake	Cottonwood	200	Gordon Jadwin
-- 14	Graham Lakes	Nobles	50	Bert Getty
-- 19	Mud Lake	Traverse	500	A. G. Klawon
-- 19	Lake Traverse	Traverse	1,000	Robert Benson
-- 19	Marsh Lake	Lac qui Parle	300	Robert Benson
-- 23	Mud Lake	Traverse	200	A. G. Klawon

--	28	---	Traverse	2,000	A. G. Klawon
May	1	---	Traverse	500	A. G. Klawon
--	1	---	Lincoln	66	Gerald Bue
--	5	Spellman Lake	Yellow Medicine	500	Wenzel Anderson
--	5	---	Lyon	900	Gerald Bue
--	6	Albert Lea	Freeborn	5	Al Rye
--	9	Lake Marshall	Yellow Medicine	75	Gerald Bue
--	9	---	Swift	72	Art Degen
--	9	Balatan	Lyon	28	Gerald Bue
--	9	Rock Lake	Lyon	78	Gerald Bue
--	10	---	Nobles	1,000	Bert Getty
--	10	Lake Marshall	Yellow Medicine	60	Gerald Bue
--	11	Island Lake	Lyon	27	Gerald Bue
--	13	---	Nobles	500	Bert Getty
--	13	Rat Root Lake	Koochiching	10	Lester Magnus
--	19	---	Nobles	250	Bert Getty
--	21	Milaca	Mille Lacs	6	Forrest Lee
--	30	Heron Lake	Jackson	20	Forrest Lee
--	30	Lac qui Parle	Lac qui Parle	5	Forrest Lee
--	30	Marsh Lake	Lac qui Parle	47	Forrest Lee

The writer and Gerald Bue noted an unusually large concentration of these birds at Heron Lake, Jackson County, on September 20, 1950. Numbers that passed a given point in a five-minute period were counted as they streamed from end of the lake to the other. By checking the time it took for the flights to pass by an estimate of total numbers was made. It seems that well over 15,000 white pelicans were at Heron Lake at this time. Later on in the fall, on October 3, the writer and Robert Farnes noted forty-five pelicans at Thief Lake in Marshall County.—Forrest B. Lee, Pittman-Robertson Unit, Minnesota Division of Game and Fish, St. Paul, Minnesota.

YOUNG RAVEN IN NORTHEASTERN ST. LOUIS COUNTY—On July 7, 1951, on highway 21 south of Ely in Section 6 Township 61 N., Range 12 W, I saw a young raven in company with an adult. The young although able to fly was still being fed. It's voice and actions marked it as a young bird but it was about the same size as the adult. When first seen the young bird was sitting on the highway with wings fluttering in the usual attitude of a young bird begging for food. As I approached with the car, both birds flew to a nearby tree. I stopped and they flew a short distance farther and although I could not see them I could hear the young one begging again and then a gurgling, squawking sound as though it were swallowing food. Because I am familiar with both ravens and crows, and I saw these two birds at close range, I am quite certain of their identification.

Both this spring and in the spring of 1950 I observed adult ravens in this same area long after most of the wintering ravens had returned north. This led me to suspect that they nested here but no nest has so far been found. This observation however indicates that they must have nested nearby this year.—Burton W. Ellig, Game Warden, Winton, Minnesota.

WATERFOWL WINTERING IN SOUTHEASTERN MINNESOTA—Canadian honkers, mallards and black ducks were our chief quarry when my wife Miriam and I took a 300-mile jaunt into southeastern Minnesota on February 24, 1951.

Our first stop was Silver Lake at Rochester where more than 400 Canada geese, about 350 mallards, and a lone black duck were wintering. Silver Lake, which has an area of about 58 acres, was formed by a dam across the Zumbro River. This artificial lake does not freeze, because warm water enters it from the Rochester power plant. The wintering waterfowl are fed corn to supplement the food they garner from farmers' fields. The mallards will take bread or other food from one's hand. The Canada geese are more wary—although at times we were within 15 yards of them—and will not eat from one's hand. A car parked along the lake shore provides an excellent blind from which to study the Canadian honkers.

Maywood Lake, about four miles southwest of Rochester, was our next stop. The mixed deciduous and coniferous plantings near this lake offer a variety of food and cover to birds. Here we found a flock of cedar waxwings, juncos, cardinals, black-capped chickadees, white-breasted nuthatches, blue jays, crows and hairy and downy woodpeckers.

Along the highway from Rochester to Albert Lea, horned larks flew up intermittently from the gravel shoulders, flocks of starlings were common, and a single flock of redpolls flew overhead.

Albert Lea was our last stop. Surface-feeding ducks winter on Albert Lea Lake in a channel kept open by water emptied into the lake from the Wilson and Co. packing plant. There were approximately 850 mallards and 125 black ducks on the lake. What a spectacle lay before us—mallards and black ducks paddling in the channel, or resting on the ice, or joining squadrons of the web-footed clan which were going out to feed, or returning from nearby cornfields.—Lewis L. Barrett, Minneapolis, Minnesota.

CENSUS REVIEW, HARBOR ISLAND, DULUTH, MINNESOTA—For the fifth consecutive year the Duluth Bird Club took a census of nesting birds on Harbor Island in St. Louis Bay at Duluth. This year's census on June 17th, was taken by Mr. O. A. Finseth, Mr. and Mrs. J. K. Bronoel, Mr. P. B. Hofslund, Mr. and Mrs. Harvey Putnam, Mrs. Ralph Boeder, John Boeder and James Felton.

	1947	1948	1949	1950	1951
	June 29	June 18	June 11	June 24	June 17
Mallard			1		1
Piping plover	1	10	2	1	0
Spotted sandpiper			6	6	3
Killdeer			6	6	8
Common tern	9	20	16	17	49
Catbird		1		2	
Brown thrasher		1	2	1	2
Yellow warbler			3	2	1
Red-wing blackbird		7	8	2	10
Song sparrow	1		1		1
Blue-wing teal					1

No piping plover nests were observed although one bird was heard. A great increase in the number of common tern nests was noted. Catbirds were observed, as well as northern yellowthroats, but no nests were found.

Changes in cover are occurring each year and the sand dunes are becoming smaller. Possibly the increased number of tern nests with the smaller nesting area has driven the piping plovers elsewhere. The island still remains the only tern nesting area in the vicinity. It was noted that 30 tern nests contained three eggs; 16 contained two eggs and three nests only one egg.—Joel K. Bronoel, Duluth Bird Club.

HERRING GULL CENSUS ON KNIFE ISLAND—The annual Duluth Bird Club census of herring gulls nesting on Knife Island in Lake Superior was taken on June 16, 1951 by Mr. O. A. Finseth, Mr. and Mrs. J. K. Bronoel, Mr. P. B. Hofslund, Dr. Ray Darland, James Felton, Mr. and Mrs. Harvey Putnam, Miss Evelyn Palmer and Miss Catherine Lieske.

	1948 June 19	1949 June 18	1950 June 17	1951 June 16
Nests	187	228	312	250
Eggs	62	40	151	55
Living young	267	405	338	359
Dead young	5	8	3	11
Banded young			23	300

Many young gulls that escaped to the lake waters were attacked by adult birds. Some were injured and others drowned. Of the gulls banded in 1950 recoveries were made on two birds, one from Burlington, Ontario and one from the North Shore out of Duluth.—Joel K. Bronoel, Duluth Bird Club.

CORMORANT-GREAT BLUE HERON ROOKERY—The Duluth Bird Club visited Rice Lake Refuge, Aitken County on June 24, 1951 to observe and count the numbers of cormorant and great blue heron nesting on Tom's Island in Rice Lake.

The nests were approximately the same as in 1950 with 20 great blue heron and 20 cormorant nests observed. Of the cormorant nests checked, two had one young, 12 had three young and two had four young. Two great blue heron nests examined had three young each.

Ten cormorant young were banded, others that could be reached were too small for bands.

One baldpate with three young and one with 10 young were observed. Many bob-o-link and short-billed marsh wrens were seen in the area as well as a western kingbird and an indigo bunting. Wilson's snipe were found to be numerous around McGregor. An osprey's nest was observed at Big Sandy Lake, although the young had apparently left the nest.

Observers: Mr. and Mrs. O. A. Finseth, Mr. P. B. Hofslund, Mr. and Mrs. Ralph Boeder, Mr. and Mrs. Joel K. Bronoel, Mr. and Mrs. Harvey Putnam, John Boeder, Miss Catherine Lieske, Miss Evelyn Palmer.

The refuge manager, Mr. L. H. Dundas was very co-operative and provided a good boat to visit the island.—Joel K. Bronoel, Duluth Bird Club.

MARBLED GODWITS IN McLEOD COUNTY—On June 13, 1951, while I was driving past a small natural meadow, 10 miles west of Glencoe and 8 miles south of Hutchinson in McLeod County, Minnesota, my attention was attracted to two medium-sized birds which flew over the car. They made a considerable noise, acting as if they were nesting in the meadow or had young. When I stopped and left my car, they hovered over me about 20 feet in the air, and then flew back to the meadow. A look at Peterson's "Field Guide to the Birds," always handy, told me they were marbled godwits. To me their cry was more like the "keret" mentioned in Peterson than the accepted "go-wit" from which they derive their name. Roberts' "Birds of Minnesota" report on the behavior of marbled godwits when nesting confirms my suspicions that they were nesting. Not having time then to look for a nest, I returned three days later, but found neither birds nor nest.—L. B. Gilbert, 2358 McKinley St., Minneapolis, Minnesota.

A Guide to Bird Finding East of the Mississippi by Olin Sewall Pettingill, Jr. Oxford University Press, 114 Fifth Avenue, New York 11, N. Y. 1951. pp. XXI plus 659, 72 illustrations. \$5.00.

I am not planning a trip east in the near future, but if I were, I would make sure I had a copy of Pettingill's "Guide" with me. There has been a need for a guide to the best birding spots, and this book seems to fill that need very well. It is surprisingly complete when you think of the vast amount of information that one would expect to find in a book of this nature. A description of the area and the birds in the area are things that one would expect to find. Authorities to contact, reference material to the birds of the area, things that one would like to have access to, but which are so often missing, are treated very well in this book. I had forgotten that zoos might provide me with a different type of birding, and that when I was traveling I might want to check with a reference skin collection for the area. Every chapter has this material available for the user of the guide. Furthermore, I found that the book was well written. I have enjoyed reading it, and that often is not true of this type of book. The illustrations are done by Sutton. It seems superfluous to add that they are delightful.

In general, the book is divided into 24 chapters covering 26 states (Delaware and New Jersey, Connecticut and Rhode Island, are combined), with introductory chapters on the plan of the book and hints to bird finders. There is also a section on suggested reference material and quite an adequate index. Each chapter includes a general description of the state, relating the ornithology to the physiographic features, special ornithological features of the state, general migration tables, and then the outstanding birding places of the state are discussed with highway routes, landmarks, mileages and other helps in locating some of the places where the birds may be best observed.

It is only natural that not all of an individual's favorite birding spots will be listed in the book. I found no reference to the Blue Hole of Castalia, Ohio, where I saw my first European widgeon. I was somewhat disappointed, when I wanted a quick reference to Hawk Mountain and Pymatuning to find they were not listed in the index. These are minor criticisms, however, and I unhesitatingly recommend this book to anyone interested in birding. P.B. Hofslund.

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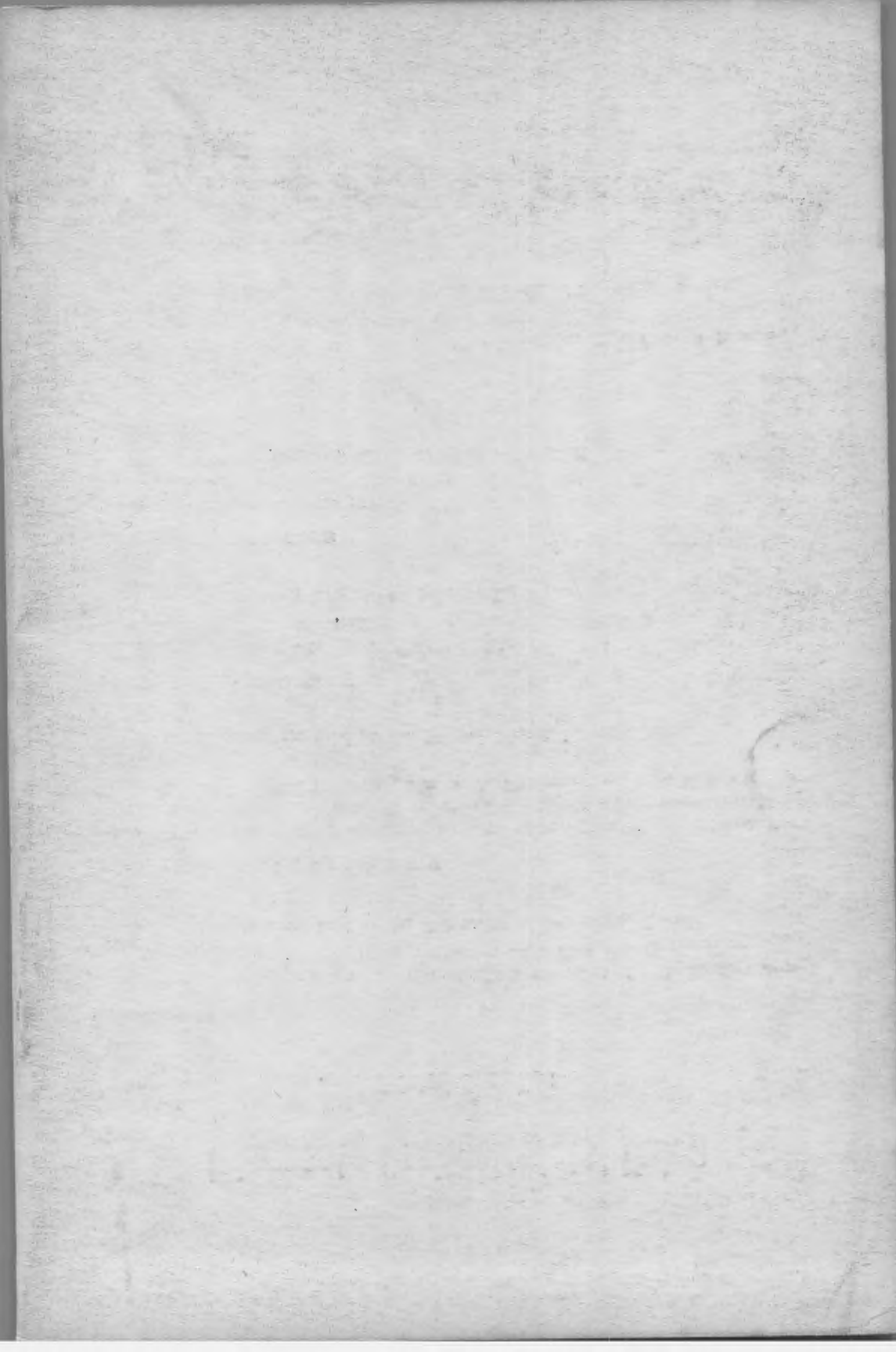
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The President's Page

To often the results of our bird watching remain a part of our own inner knowledge, and are not shared with others. Although we desire to know more, and we sometimes avidly read what others have found out, so many times we fail to add our own bit of knowledge to the general pattern. Do not think that your discoveries are not important enough. Things that happen in the normal course of events are usually of more importance to the study of ornithology than the rare finds. It is only after the study of many nests (the more the better) that the true happenings are learned. Record faithfully and accurately even things that seem commonplace to you, and then relay your information to someone who can judge their importance.

We hope that *The Flicker* will serve as an outlet for your information, and also as a guide to your hobby. We hope that with the inclusion of regular features in our publication that you will find some spot where you can become a regular contributor.

If you feel like editorializing, the President's Page, despite its title, is meant for you. A regular feature is the yearly summary of the nesting records, and it is hoped that as a regular feature there will be a migration report similar to the nesting records. With the inclusion of the Student's Page we now have an outlet for some of our younger bird enthusiasts.

In the March issue we will have a guide to a state-wide study of some bird common to most parts of the state. Your contribution, no matter how minor, will be appreciated. The Book Page will no longer contain just reviews of the new publications, but will serve as a guide to real enjoyment of ornithological literature, both new and old.

It is only with your help that the Minnesota Ornithologists' Union can become a functional society. We will appreciate having your literary contributions and constructive criticism. —P. B. Hofslund, Editor

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Some Observations of the Birds of Basswood Lake²

by

James R. Beer and Fred Priewert

During the course of a survey of small mammal population on the islands in Basswood Lake, Lake County, Minnesota, a number of observations were made on the resident birds. The field work included 21 islands in Back Bay, Hoist Bay, and Basswood Lake proper (see Figure 1) with limited data from the mainland. None of these islands, which varied in size from a fraction of an acre to about 200 acres, were inhabited by humans other than to be selected occasionally as camp sites by canoeists. Two of the typical islands, No. 7 and No. 3 are shown in Figures 2 and 3. The observations on the 47 species of birds identified were made between July third and nineteenth, 1950. This list is not complete but probably includes most of the species found on the smaller islands.

Common loon — The loons are undoubtedly the most characteristic birds of this wilderness area. Each spring

they leave their winter feeding grounds at sea or in the south for the lonely lakes of the north country where they raise their young. A pair were observed on nearly every small lake and bay of the larger lakes. During our field work the results of two nesting attempts were discovered. The first was a nest on the east end of Island No. 17. This nest, if it may be called such, was merely a slight depression in some drift materials at the waters' edge. The single egg that was found in it had been destroyed by some predator. The side of the egg had been broken in such a fashion that we came to the conclusion that probably one of the herring gulls frequenting the area had eaten its contents.

The result of the other nesting attempt was observed on the morning of July 17 when we located a pair of loons with two newly hatched young. We watched them for half an hour

1. Misc. Jour. Series No. 753 of the Minnesota Agricultural Experiment Station.

2. This study was made possible through the use of the facilities and support of the Quetico-Superior Wilderness Research Center.



Figure 1. A map of the Basswood Lake study area showing the islands that were studied. These islands are blocked in and numbered. The camp area was on Hoist Bay at the mouth of the outlet from Pine Lake.

during which times they traveled about a quarter of a mile. The adults swam side by side with the two chicks trailing very closely. Every few seconds one of the adults would immerse its bill to about the level of the eyes as though it were looking for danger from below. We ran the boat up to them and captured one of the chicks.

They dived as we approached but the young were unable to stay under water for more than a few seconds at a time. When we captured one chick, the adult with it displayed by racing back and forth, beating the water with its wings and calling wildly. The other adult led the second chick away as rapidly as possible.

The young loons were not more than two or three days old as the egg tooth was still on the bill. The body, with the exception of the belly, was covered with a dense, dull, black down. The belly was white.

After photographing the chick (see Figure 4) we came as close to the adult loons as possible to release it, but it did not locate its parents and swam in the opposite direction. We then moved away to await for the adults to come for it, but as we did so, five herring gulls came in from nowhere and started circling down toward the lone chick. As they did, we headed for the chick in an attempt to save it from becoming a meal for the gulls. At the same time the lone adult started to the aid of the chick traveling by short rapid dives. As soon as it approached the chick the gulls stopped circling and drifted off to hunt for another source of a meal. Two days later we saw the same two chicks riding on the back of an adult.

Besides the usual scattered pairs, a flock of nine loons were seen in the area near the Canadian Customs station. We were told that this group had been here off and on since about the last of June. It is interesting to speculate as to the position of such flocks in the population picture. Are they non-breeding birds, birds loafing away from their territory, birds on a communal fishing ground or some other classification?

Great blue heron — Single great blues were seen occasionally as they fed in the shallow areas along shore, or as they flew to or from the rookery farther to the north.

Waterfowl — The rocky, glacial lakes of the north country have little of the type of cover needed by most waterfowl to raise their young. During our work in the area we observed four

species of ducks. Two species were known to be breeding there.

American mergansers were seen regularly in our travels about the lake. Besides several single birds, we saw three broods containing four, four, and eight young respectively. All of the adult birds seen were females. The black duck, the other species observed to be breeding, was seen only three times. One of our observations included a brood of four, one-third grown young.

The other two species, the ring-necked duck and the American golden-eye, were not observed nesting or with broods. The ringnecks were seen occasionally in Back Bay where three pair worked over one of the wild-rice beds. This group was usually seen as a compact unit until flushed when they broke up into three pair. A single female was flushed twice from the marsh along the outlet from Pine Lake. Her actions indicated that she might have a brood of young. The only golden eyes observed were two females out on the open water of Basswood Lake.

The hawks — Our observations on this group included the turkey vulture, goshawk, broad-winged hawk, bald eagle, osprey and pigeon hawk.

It was not unusual to see a majestic bald eagle soaring high in the sky or sitting in some tall pine on a headland. On July third, as we were working in Back Bay, we saw one of the rare instances of a bald eagle doing its own fishing. An immature eagle was observed circling at a relatively low altitude while off to one side a herring gull was floating on the open water without seeming to pay any attention to the circling eagle. Suddenly the eagle dropped into a long low glide in the general direction of the gull which took off hurriedly for parts unknown. The eagle con-



Figure 2. Island Number 7 is typical of the smaller islands of the region.

tinued to glide until it was scarcely clearing the water when it reached down with its talons and grabbed a fish. Then it flew to a tree to eat its prize, a flopping fish about a foot long.

The osprey, the real fisherman, was seen working the waters of our area at irregular intervals, and was seen making its spectacular feet-first dive into the water coming up amidst a cloud of spray with a fish.

The hawks that seemed to use the islands as nesting places were the broad-winged and pigeon hawks. The pigeon hawks were seen every time we visited Island No. 20, and the broad-wings were seen regularly on Islands 13 and 21.

The turkey vultures were seen wheeling overhead taking advantage of the air currents in their easy flight. As many as five or six were seen at a time. The goshawk was seen but once.

Upland game birds — While there were numerous winter droppings of the ruffed grouse on several of the islands visited, we were unable to find a single bird or even fresh sign. They were quite common on the mainland, and several were heard drumming. We also heard several reports of spruce grouse in the area.

Rails — A glimpse of a bird, tentatively identified as a sora rail, was seen in a marsh along the lower end of the outlet from Pine Lake.

Shorebirds — While four species of shore birds were seen, none was abundant. The herring gulls were seen most often, but usually only two or three individuals at a time. The spotted sandpiper was found occasionally on both the mainland and the islands. A nest with four eggs was found on No. 7 (see Figure 2), a tiny and nearly barren island. While we were unable to find a nest on Island No. 1 the bird indicated by its actions that a nest was nearby.

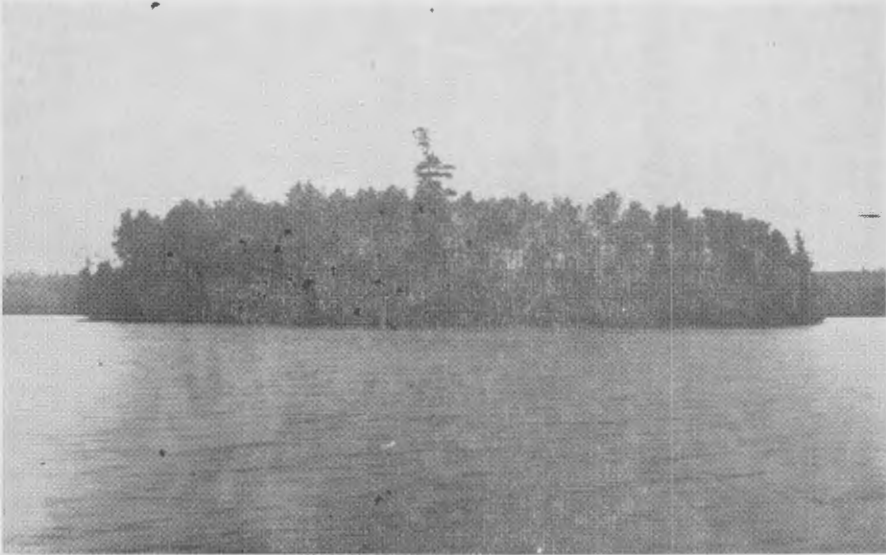


Figure 3. Island Number 3 is typical of the islands of from three to ten acres. The larger islands are usually identical to the mainland areas from the standpoint of vegetative cover.

Owls — These nocturnal hunters were seen but twice. A great-horned owl was observed flying across Pine Lake, and the other, a short-eared owl, was seen out in a marsh where it was being "mobbed" by red-wings and grackles.

Goatsuckers — Occasionally night hawks were to be seen feeding over the lakes. They did not appear to be very common.

Kingfisher — The kingfisher is not a common bird, although it was seen occasionally along the edges of the lake.

A single lesser yellow-legs and a group of eight unidentified "peeps" were seen near the camp site. The lack of mud flats, beaches and open areas probably accounts for the low population of this group.

Cuckoos — The black-billed cuckoos heard occasionally from the heavily wooded areas, on the mainland. A single bird was seen to fly from Island

No. 4 to Island No. 6. Both of these islands are heavily wooded. Suitable nesting places are not abundant.

Woodpeckers — The only two species of this group observed were the flicker and the pileated woodpecker. Neither species was especially common. Flickers were seen occasionally, and a nest was found on Island No. 1. This nest with at least four young was located in the top of a dead birch stub. The parents were seen to fly to the mainland to forage for food.

The workings of the pileated woodpecker were seen in various places on the islands and mainland. Individuals were seen two or three times as they flew from one area to another.

Flycatchers — Two species of flycatcher were observed in the Basswood Lake area. The eastern kingbird was seen occasionally on the mainland, but not on the islands.

The phoebe, which was more common, nested regularly under the eaves of the buildings at the Paul Bunyon Trading Post. They probably nest both in the cliffs that are found along certain parts of the lake shore, and around the buildings of the various resorts.

Swallows — A pair of tree swallows were seen regularly about the camp site. They centered their activity about a snag a short distance away where they probably nested in an old woodpecker hole. At irregular intervals lone barn swallows were observed feeding low over the water.



Fig. 4 One of the two young loons seen on Basswood Lake.

Crows and jays — More crows were seen than any other species of bird. They were not only common nesting birds on the larger islands (those with five or more acres), but were also seen in large flocks. One of these aggregations numbered about 300 individuals.

The blue jay is another fairly common bird on the larger islands. Evidence that they nest on the islands as well as the mainland was found when we observed a pair feeding a brood of newly fledged young. They seemed to prefer the areas with large pine

timber.

Thrushes — Robins are not common in this type of habitat. A pair with three fledgling young were seen on Island No. 12. One fledgling was seen in the heavy aspen on the mainland.

The olive-backed thrush was seen in the heavy cover of Islands No. 4 and 20, and was heard several places on the mainland.

Cedar waxwing — Pairs of this waxwing were seen on four of the islands and occasionally on the mainland. They seemed to be restless, and gave no indication of having started to nest.

Vireos — The red-eyed vireo is one of the most common of the smaller birds in the area. Eleven of the islands had at least one pair. It seemed that any island with a half dozen birch trees was large enough for a pair. In contrast, due to the territorial behavior of this species, an island had to be at least four or five acres in extent before it was large enough for more than one pair. One nest with four small young, as well as several old nests, were found. The occupied nest was about five feet above the ground and was out at the end of a Norway pine branch. The adults were very bold in their attempts to defend the nest.

Warblers — This family is well represented, seven species being noted. The yellow warbler was observed on six of the islands worked. Here the singing males were very conspicuous, and it was relatively easy to estimate the number of territories involved. Any wooded area having less than one and one-half acres would not have more than one singing male. A larger area might have two or more territories. No nests were found although one female was seen carrying food.

The myrtle warbler was nearly as abundant as the yellow warbler, but

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they were apt to be found in the areas having coniferous vegetation. Newly fledged young were seen on two, and adults carrying food on one other, of the seven islands on which this species was observed.

The blackburian warbler was found on four of the islands, where it preferred the older mixed woods. They are common breeding birds on the islands of the north country. A female carrying food was seen on Island No. 20.

Single males of the chestnut-sided and bay breasted warblers and a pair of Canada warblers were observed in the brushy area of Island No. 12. The cover here was mainly hazel and small aspen.

A pair of nothern water-thrushes were seen several times about an old deserted beaver house found on the shore of Island No. 2. They seemed to prefer the heavily shaded areas of the undergrowth.

Blackbirds and orioles — Redwings and bronze grackles were common throughout the area. The former were common breeding birds wherever there was emergent aquatic vegetation. The grackles had pretty well finished nesting by the time we arrived in the area, and small flocks were to be seen occasionally throughout the area. One abandoned nest was found on Island No. 5. They appeared to be feeding on the forest tent caterpillar which had denuded large areas of the hardwoods.

A single male Baltimore oriole, whose behavior indicated that it was a transient individual, was seen once near the camp area.

Sparrows — Only three species from this large group were observed during our stay on Basswood.

The chipping sparrow was observed on six of the islands. It seems to be more mobile than some of the other small birds as it was seen to fly between two of the islands.

The swamp sparrow was observed twice in the floating marsh along the mainland.

The song sparrow is one of the most abundant as well as most interesting of the birds observed. All but two of the study islands had at least one pair of them. The size of the island seemed to have little to do with the suitability of an area for song sparrows. Island No. 7, which is a tiny rocky island, had a pair which had fledged one nest of young and were incubating a second nest with four eggs, when we visited the island. The presence of small brushy species such as willow and a sharp edge effect seem to be the main habitat requirements.

The territorial behavior and minimum home range sizes exhibited on these islands were the most interesting aspects of our "birding" in the canoe country. The average territory, or defended area, where space is not a limiting factor, is many times larger than the minimum sized area which they will use when it is bounded by physical barriers. Some of the larger islands had several pair.

On July fourth we visited Island No. 7 (see Figure 2) and found it to be without bird life although the next day a pair of song sparrows were present. We did not disturb them more than we had to, but one of the pair immediately took off for the mainland about 350 yards away. It was seen to tire, starting a fluttery flight when a little more than half way across. It finally dropped into the water 75 feet from shore, and proceeded to swim to shore by using its wings as though it were flying. These swimming efforts would carry it up to 15 feet at a time

after which it would rest quietly on the water. It finally arrived on shore exhausted and soaked.

It was interesting to note that we saw an average of two species of birds per island for those of less than an acre in extent, and as we went to the larger islands we saw more breeding species until we reached an average of over six species of terrestrial birds on islands of over ten acres. This brings up the question of why this should be so. At the present, we can only speculate, but among the possibilities are the lack of suitable variety of habitat for more species, a limited food supply, interspecies competition, and possibly space requirements for

some species. We feel that the last two are probably the nearest to being correct.

The answer to these questions are open to anyone with time, patience, and the ability to observe. The beautiful undisturbed islands of the canoe country are ideal in many respects, but we must not forget that water is not the only thing that forms islands for birds. A small woodlot surrounded by cultivated fields is also an island to the birds living there. — **Division of Entomology and Economic Zoology, University of Minnesota, St. Paul, Minnesota.**

Wilderness Besieged

by

Dorothy Beard

The wilderness canoe country, on the "ridgepole of our continent," is a wild and beautiful region, with a labyrinth of interlacing lakes and streams that combine in natural canoe trails that have an no equal anywhere. Part of the Superior National Forest, this land rich in wildlife and trees and beautiful waters, was set aside many years ago by our government to be forever free of exploitation. The law reckoned, however, without the "empire builders," whose persistant efforts to gain access to the area for personal gain have so far been blocked each time by those who love the wilderness and would like to keep it intact for posterity—as a living museum of natural history, a living historical record, and a living monument to the veterans of the United States and Canada who lost their lives in two world wars.

In 1927 the Canadian legion suggested that the two nations combine their wilderness areas in a great International Peace Memorial Forest, to be jointly administered and dedicated to the service men of both countries. The American Legion immediately agreed to the plan, and in 1944 the two Legions suggested dedication to the veterans, men and women, of both wars.

The only time the unparalleled Wilderness Area (which comprises but a small part of the entire forest) wasn't in danger of extinction at the grasp-

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ing hands of the white men was before the white man got there—at least in appreciable numbers. For the half-century before 1660 the Chipewewa Indians were in undisputed control of the region. They fished and hunted without doing any lasting damage to the region. They had come in from the east along the shore of Lake Superior and driven the Sioux out, thenceforth living there undisturbed until the arrival of Radisson and Groseillers in 1660. The two explorers were followed by the trader Du Lhut, and then by La Verendrye and his sons, who established a canoe trail along what is now the International Boundary and founded a fur trading post at Grand Portage. This post remained actively engaged in fur trading for over a hundred years, leaving as its only marks on the area the tree blazes of portages, some of which are still visible.

With the opening of the Iron Ranges of Northern Minnesota the presence of white men began for the first time to seriously affect the region. "Lumber barons" added their bit to the damage done by the "men of steel" and wiped out thousands of acres of trees. The first railroad from the Mesabi Range to Duluth was finished in 1884, and the shipping of ore brought with it the first large-scale lumbering. Saw-mills and lumberjacks added their colorful personalities to the early history of the state. It seemed then as though there would

never be an end to the available timber, and no one took pains to see that a few trees were left to reseed themselves, or that seedlings were planted in cut-over areas. Fires caused by lumbermen kept far ahead of cutting in forest destruction, and caused three times as much damage. The sixty-five mile drive north from Duluth to Eveleth on the Miller Trunk highway displays the wholesale havoc wrought by fire and over-cutting at its worst. Tourists in Eveleth, for example, often complain that if what they had seen thus far on the trip was a fair sample of the glorious north they might just as well turn back and go home. Fortunately, not all the forest area was so easily reached in the earlier days, and a great number of trees were left untouched.

Our greatest conservation president, Theodore Roosevelt, was one of the first to take seriously the damage being done to the wilderness area. When Canada informed him that she would like to make a national forest out of her Quetico region, but was afraid to spend the money to attain title because of depredations on the United States side of the line, Roosevelt, on February 13, 1909, established the nucleus of what is now Superior National Forest. Canada immediately followed his lead and created Quetico National Forest on her side of the border. The nucleus established by President Roosevelt contained 909,734 acres, and it since has been enlarged to 3,728,932 acres in gross area. It lies entirely within the Arrowhead country and extends from the northeast corner of the state to International Falls, and from near Bemidji to Lake Mille Lacs.

John G. Handberg, who built the first forest lookout in the Superior National Forest in 1909, was trans-

ferred from Kawishiwi Ranger District east of Ely to headquarters at Spring Lake in 1913. From 1915, when he saw the first damage from dams in Superior National Forest, until the present time, Mr. Handberg has waged unceasing war on every company that built a dam there. He had little cooperation from the Forest Service, but in 1920 he found an ally in Dr. Henry Williams, then University of Minnesota football coach, who helped him find other men interested in preserving the border lakes. This group, which included among others Sig Olson and Ernest C. Oberholtzer, remained a coherent group for many years and later formed the nucleus of the present President's Quetico-Superior Committee. Their long list of triumphs over "empire builders" bound on destruction of the wilderness began in 1920—when they succeeded in preventing the powerful Minnesota Ontario Power Company from finishing an eighty-foot dam at the outlet of little Vermillion Lake—and is not yet finished.

In 1922 a plan was introduced to cut broad roads into the vicinity of every major lake in Superior National Forest. The just-organized Izaak Walton League joined forces with the Handberg - Williams - Olson - Oberholtzer group and a scrappy little club that has long since died, The Superior National Forest Recreation Association. Many conservation-minded and influential citizens, including Arthur H. Carhart, of the Forest Service, and Paul B. Riis, of the American Institute of Park Executives, aided the already vociferous conservationists in reaching the all-important ear at Washington. In spite of the fact that the manager of the Superior was adamant in his support of the road-builders, and in spite of the fact that as usual the would-be destroyers were wealthy and tremendously influential,

the group sent the "empire builders" into ignominious defeat. In 1924 Minnesota's Donald Hough wrote a triumphant article for *Outdoor American*, the official magazine of the Izaak Walton League, entitled *Superior National Forest Saved*. Hardly had a quick breath of relief been drawn, however, when another industrialist enemy of the border lakes came along.

He was E. W. Backus, of Minneapolis, who proposed to build a series of dams along the entire length of the International Boundary from Rainy Lake down to Lake Superior. The waters piled up behind these dams would be directed into Mr. Backus' paper mill holdings at International Falls. It wouldn't matter, said the gentleman, that millions of trees would be drowned out through the raising of the border water level, sometimes to a height of eight feet, because Mr. Backus himself would be glad to remove the lumber. Notwithstanding the fact that Ontario's largest river emptying into the area would be drained totally dry, and not withstanding the fact that the land Mr. Backus proposed to use was a national forest, he actually had the gall to ask that the total cost of the venture be borne by the United States and Canada. And the peculiar thing about it is that Mr. Backus came very close to winning out, as close, in fact, as did the airplane interests many years later.

Maybe it's because we were so recently wilderness fighters—all of us—or maybe it's a certain lethargy in Americans, but at any rate we don't seem to care much, one way or the other, about schemes like Mr. Backus'—as long as they don't encroach on our own property. Adding this strange fact to the power and influence of the "empire builder" it seems perhaps

not so strange as at first thought that it took over ten years of hard and vigorous fighting to defeat Mr. Backus.

The men who undertook battle against him were mostly young and not too well off financially. The few who did have a little money were no better off than their less-fortunate cohorts by the time Mr. Backus got through with them. Some of them who had jobs with Minneapolis corporations found themselves suddenly out of work. Banks foreclosed notes unexpectedly, landlords got unprecedently tough about rent, up-to-then easy-going creditors brought suit, and threats of physical violence were common.

The young fighters retaliated by forming an organization that they called the Quetico-Superior Council—composed again of essentially the same fighters that had banded together before—and soon learned to fight fire with fire. They barnstormed up and down Minnesota, they helped farmers whose land had been ruined bring suit against Mr. Backus, they looked into the tax records of his companies.—Finally things began to swing the way of the conservationists, as the people of the state begin to realize what was happening to the border lake area. As it became more and more obvious that Mr. Backus was going down in unprecedented defeat the politicians of Minnesota ran rough-shod over each other in their hurry to get on the other side of the fence, and Mr. Backus, in spite of his teary-eyed pleas (to the International Commission hearing the case) to be allowed just one more empire to build before he died, was unanimously turned down. The young conservationists embarked on quite a celebration, which had its jubilant climax when they took, in the middle of

the night, a mess of repulsive fish—shovel-nosed sturgeon, eels, and gar—to Mr. Backus' garden and threw them, wriggling, into his swimming pool.

Unlike the Superior National Forest Recreation Association, the Quetico-Superior Council did not die out when the fight seemed to be over. They remained a well-organized group and took the lead in 1930 in getting passed the Shipstead-Nolan Act, which "reserves the timber along the shores of streams and lakes, prohibits the sale of federally-owned land within the watershed, and prohibits the changing of natural water levels except in minor respects when required for logging." Three years later Minnesota's legislature set up the same restrictions on state-owned lands in the same area.

During the 1920's bush pilots began flying into the wilderness, but the gentlemen of the Council didn't become particularly alarmed about the situation until the 1930's. Under formal approval of the secretary of Agriculture and the Forest Service Chief, three separate roadless areas totaling 1,079,430 acres has been created. These areas extend for 108 miles along the border and cover approximately 51 wilderness townships. The roadless areas were created to preserve this unique canoe country in a perpetually primitive state. Not all the lands within it were under government ownership, but since they were inaccessible except by canoe it was not thought necessary to spend government funds in buying up the land. Since there were no roads, all building materials had to be brought into the area by canoe or back pack, and this in itself was believed to be sufficient barrier against further development of civilization, and consequent despoliation of the wilderness.

By 1934 wilderness flying was causing some concern, and President Roosevelt by Executive Order created, from what was left of the old Quetico-Superior Council, the Quetico-Superior Committee, and set as its duty the coordinating of activities of state and federal agencies and invoking their aid in early perpetuation of the International Peace Memorial Forest. The Committee is composed of five members: three appointed by the president, one representing the Department of Agriculture, and one representing the Department of Interior. The committee worked with representatives of both governments, the Department of Conservation in Minnesota, and private organizations and individuals for the years before the second world war. Roosevelt had, at the time war was declared, given his unqualified approval to their suggestions, but the war interfered and nothing further was accomplished until September 6, 1947, when President Truman renewed and amended the Executive Order. Since that time the efforts of the Committee have been directed almost entirely toward getting airplane flying banned in the wilderness area.

It is unfortunate that neither owners of private land within the wilderness area nor airplane pilots of recent years have felt any compunction to obey the spirit of the law. There can be little disagreement as to the original intent of the roadless area law, but in recent years the ferrying in of fishing parties and resort tenants has become big business. Ely, on the southern border of the canoe country, by 1947 had become the largest inland seaplane base in the nation, with the twenty-six planes based there flying daily schedules like those of commuter's trains, and countless other planes from all over the nation using the airport facilities. Advertise-

ments, in papers as far away as Florida, lauded the praises of Minnesota's "wilderness" fishing and suggested that record fish for one's mantle could be obtained simply by signing up for the "commuters' special" every Friday—Florida to Crooked Lake. To make the inroads on the canoe area more complete, specially - outfitted planes flew fishermen into the heart of the wilderness to isolated lakes, where they fished from canoes carried in on the pontoons of the plane.

Cargo planes did a thriving business flying in supplies to resorts built on privately-owned land. The old laws designed to protect the wilderness turned out to be gold mines for the resort owners, because competition was automatically limited by government ownership of most of the property. For example, there were from the beginning only two small bits of privately-owned land on Crooked Lake, one at Curtain Falls and the other at Friday Bay. The Forest Service tried to buy these two bits of property but the owners tripled the price when approached, and the Forest Service funds did not encompass purchase of inflated real estate. The Forest Service also tried to induce the owners to exchange their property for equivalent land outside the wilderness area, but the landholders still held out. It didn't take long to find out why. Two large resorts were built there, one on each piece of privately-owned property; veritable islands of business, guaranteed immunity from other competition by the fact that all surrounding land was owned by the government. Portages became roads, shallow waters passable only to canoes were "improved," motorboats roared up and down the lake, and the usual large catches of fish were taken from the lake every day and flown to all parts

of the nation. It didn't take long to ruin Crooked Lake and now no one goes to Crooked any more — except to see the Painted Rocks.

Through a smoke screen thrown up by airplane and resort owners, conservationists fought doggedly on and on for abolition of the airplane in the wilderness. Congressman Blatnik introduced H. R. 2642 in the House of Representatives, and Senator Thye introduced a companion bill, S. 1090, in the Senate. Both bills were pigeonholed, and alarmed conservationists flooded Washington with pleas and arguments. So did the airplane people, and the resort owners, but their very occupation perhaps counted against the validity of their arguments, because Senate 1090 was passed in both Houses and President Truman signed it on June 22, 1948. It is now Public Law No. 733. Then to add to the laurels of the old Council, he invoked, at the request of the Quetico-Superior Committee, an Airspace Reservation over the area, as the President of the United States is entitled to do under an Aeronautics Statute of 1926.

The airplane-resort "empire builders" have evidently not given up the fight. Only recently I received a letter telling me that the organization for fighting the ban has been revived. John Smrekar of Ely is president, the same John Smrekar who sent this letter to George L. Peterson of *The Minneapolis Star*: "This propoganda for an airplane ban has been circulated to take away your privilege as an American citizen to choose your mode of travel into the wilderness area. IT'S UNAMERICAN. IT'S UNDEMOCRATIC. IT'S A CHALLENGE TO FREE ENTERPRISE." Evidently Mr. Smrekar hopes that, all other arguments having failed, a good old red herring can never do any harm to his

side of the question.

The chief argument used by Mr. Smrekar and his friends has been that banning airplanes limits wilderness fishing to a chosen few, and that those few must be young and strong to be able to withstand the "rigors" of the wilderness. Anyone who has been on a canoe trip—if he's honest, and doesn't yield to the temptation to make himself out a big strong rugged outdoorsman who conquered the wilderness all by himself—will tell you that making a canoe trip is as easy and relaxing as you care to make it. I've seen elderly couples up there, and small children.

The fight for the wilderness goes on and on—as I suppose it always will, as long as we have "empire builders" in our midst—and we still cannot draw that deep breath we thought we were getting back in 1922, when the Superior National Forest was "saved." There are still eight unaffected resorts in the area—every one of them opened in defiance of the spirit of the law.

There are still too few planes at the disposal of the Conservation Department to police the forest adequately. There are many hundreds of dollars still to be appropriated by Congress before the sum is large enough to buy up all the needed land. And there is still the International Peace Memorial Forest to fight for . . . But as long as men of the Quetico-Superior Council stamp live, as long as organizations like the Izaak Walton League stay in the fight, as long as there lives a single person with the fire of the wilderness in his veins—the International Peace Memorial Forest has a chance of becoming a reality. The fight will be one of intangibles against tangibles, beauty against commercialism, men of vision against empire-builders—but with the cause of the conservationists the perpetuation of a living museum of the past, a living garden of wilderness, a living land of refuge and delight for future generations to enjoy—I don't think we can lose, in the long run.—University of Minnesota, Minneapolis.

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Seasonal Report

by
Mary Lupient

SUMMER

Except for a hot spell of about two week in July the weather in Minnesota was cool and marked by heavy rains. On August 12, the U.S. Weather Bureau in Minneapolis reported that the greatest precipitation in fifty-eight years for a summer season had occurred this year, and at date of this writing, September 1, showers or heavy rains are still continuing to fall nearly every day. On July 20 a tornado in Minneapolis caused five deaths and six million dollars in property damage. Several business buildings were blown away and thousands of trees were felled. It must have caused considerable destruction of birds. Three days after the storm approximately 400 dead birds were found by John Jarosz in a pasture near Hamel, Hennepin Co. The dead birds were predominantly English sparrows.

Although the spring migration was late for some species, due to the cold late spring, nesting was generally successful. In spite of floods and high water which affected the early nesting of waterfowl, the population did not diminish to any marked extent. No census reports have been received as yet, but from general observation it is believed that the nesting of waterfowl in the western sections was successful to the point where numbers were not lessened. Of interest is the nesting of Canada geese at Mud Lake

National Refuge reported by Manager Robley W. Hunt, who wrote as follows, "One nest, later destroyed by crows, is the first known Canada goose nest in many years in this area. Regular observation of four additional paired geese outside the goose pen would indicate a good possibility of several more nests. Some of these geese are birds that were originally released on the area as goslings back in 1949-1950, and in some cases these banded birds have mated with foreign flyers."

A southerly record for the nesting of the common loon was made by A.C. Rosenwinkel who saw an adult with downy young at Lake Vadnais, Ramsey Co., June 16.

This season the American egret appeared in noticeably small numbers. The following records were received: W. J. Breckenridge, two, Wacouta, August 18; Robert Hanlon, one, Pope Co., May 20; William Longley, one, near Kellogg, August 20, and four were seen by this writer August 29 near Shakopee. Reports from surrounding states indicate that they appeared there also in smaller numbers. Exceptionally high water in marshes and sloughs was possibly the reason that so few appeared, though this a matter of conjecture.

The following record sent by Game Warden, Leo Manthei, is of interest, because few nests of the turkey vul-

ture have been found in Minnesota. He found two young still unable to fly, August 20, in an old roofless barn near Black Duck. The nest apparently had been in a manger, but the young birds were walking about under it. One bird was exhibited in the wild animal display of the Conservation Department at the Minnesota State Fair.

The peak of the migration of returning shore birds occurred during the second week of August. Observation was hampered by tall vegetation and high water, and no large concentrations were reported. Individuals and small flocks were seen the last of July and throughout August. W. J. Breckenridge saw six long-billed dowitchers near Osseo, July 13. A marbled godwit was observed near Glencoe, June 10 by L. B. Gilbert.

A very large colony of Franklin's gulls that nested in Mud Lake Refuge, was reported by Robley W. Hunt. He stated that a smaller colony of common terns was present also. Another colony of about 60 was found by A. C. Rosenwinkel at Whitefish Lake, July 19, on a small gravelly island. A number of eggs, apparently abandoned, were found on the ground. Three Caspian terns and one Bonaparte's gull were seen flying in the same area with a flock of ring-billed gulls, July 19, by Mr. Rosenwinkel.

Again this season the western kingbird appeared in eastern Minnesota. W. J. Breckenridge, John Jarosz and Ruth Self saw one July 12, six miles south of Afton. Dr. Breckenridge saw one three times in the same place one mile north of Anoka.

From all reports, swallows have made up the numbers lost during the late freezes of recent springs. Robley W. Hunt wrote that they had definite-

ly increased at Mud Lake Refuge, especially cliff and tree swallows. There were many barn swallows, too, and a few martins. A. C. Rosenwinkel has seen the cliff swallow colony at White-water State Park for the past four years. He visited this colony, July 9, and found more than 300 birds, some feeding young, which is the largest number he has seen there.

To date, no large warbler waves were reported. Small waves occurred August 22 and 23 according to A. C. Rosenwinkel and W. J. Breckenridge. Several prothonotary and cerulean warblers were seen during season by Sally Davidson and Paul Murphy. The birds were in an area near Afton where nesting was probable. Two pairs of prothonotary warblers nested in bird boxes at the Johnson home on the banks of the Mississippi River about 8 miles north of Minneapolis. The only report of the nesting of the blue-winged warbler was received from William Longley who found an adult with one young in Whitewater Valley, August 8.

On a small study area in Hennepin County, John Jarosz found 19 red-start nests, 13 of which were subsequently destroyed. It took each female three days to complete her nest, the clutches were from three to four eggs, they were incubated 14 to 15 days and the birds left the nest at nine days of age. Mr. Jarosz found 14 nests of the ruby-throated hummingbird from June 7 to July 24. One of the nests had elm seeds replacing lichens on the outside.

These seasonal reports appearing in the Flicker are meant to record the trends in migration of birds, their nesting and changes in range as well as interesting and unusual records. This writer sincerely thanks those whose names have appeared in all of the

reports and solicits records of anyone else who may have information along these lines. Please send them to Mrs. Mary Lupient, Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota.

FALL

Autumn brought sunny mild weather throughout the state until the last week of October when a blizzard blew in from the west bringing severe cold and from 3 to 14 inches of snow to western and northern Minnesota. The storm diminished somewhat by the time it reached all sections, but the cold weather did not abate. The thermometer dipped to five above zero in Minneapolis, November 1, which broke the record there for that date. It was 10 below at Whitefish Lake and 14 inches of snow fell. Cold weather and snow have continued to the date of this writing, November 6, and an unusually early winter appears to have come to stay.

Shallow ponds and marshes froze during the last few days of October, and in some areas in northern Minnesota due to bad weather part of the migration of ducks and geese passed over without stopping. William Longley reported from the southeastern sections and he was of the opinion, "that the northern flight of ducks either passed over or did not materialize." He sent a detailed lengthy report which is too long to be included in its entirety in this paper, but will be filed at the Museum of Natural History. Peak records of ducks and geese in his report follow, in part: **October 5** Mallard—7,500, black duck—1,000, baldpate—5,000, American pintail—7,500, wood duck—40. **October 25** Lesser scaup—3,100. **September 27** Blue-winged teal—432. **October 5** Canada Goose — 300. **October 11** Blue goose and snow goose (totald togeth-

er.—500. His report contained a series of dates which indicated that the number of individuals in some species progressively dwindled. However, November 1, the following were listed: mallard—1,100; baldpate—810; American pintail—1,600; lesser scaup—1,200.

In general duck shooting was considered good, and most hunters got the daily bag limit, particularly in the early part of the hunting season.

The goose migration occurred throughout October, the peak being around the middle of the month. However, about 40 snow geese flew over Minneapolis as early as September 20.

An immature old squaw duck was shot at Thief Lake, October 18 by Bob Farmes, game biologist, who sent the skin to the Museum of Natural History. Four white-winged scoters were shot by W. A. Huntley in Grant County, October 21, and a bird believed to be a surf scoter was observed by Whitney H. Eastman and party on September 23 near Two Harbors. William Longley reported six horned grebes on October 10, and a concentration of 20,000 coots, October 11, in southeastern Minnesota.

Whistling swans fly high and seldom stop in this state during the fall migration so there are not many observations of their return flight. This season there were a few reports. Dr. and Mrs. Sylvester Koontz saw two adults and three immature whistling swans, October 28, near Shakopee. The State Conservation Department confiscated one adult that had been shot near Silver Lake, October 27. George T. Ryan saw about 200 at Whitefish Lake, October 14. They stayed two days in spite of fishing boats that passed close by. Mr. Glen Wyer reporting from Whitemouth Lake, Canada, a few miles north of Roseau, Minnesota,

stated that he saw several flocks of whistling swans which he estimated totaled about 1000. A local farmer said that he had not seen that many in the past 27 years. From southeastern Minnesota, two were reported October 31, and nine on November 1. Mrs. Josephine Herz and party spent a few days in September making observations near Ada. They saw about 200 sandhill cranes in that area, September 22.

Fall records of the appearance of the American egret that were sent to the Museum of Natural History were as follows: Whitney H. Eastman, two, Crook Lake near Wilmar, October 5; Russ Sether, 23, Bear Lake, Freeborn Co. and a few at Geneva Lake the second week in September, 12 at Etter, September 2. A flock was reported by Roy E. Johnson, September 10, in a slough between Blue Earth and Albert Lea. William Longley reported several October dates, the largest number he saw was eight, October 11. His report listed two white pelicans on September 13.

An interesting report by Harvey Gunderson on the hawk census taken in the state appears elsewhere in this issue. The largest numbers were counted in Duluth where hawks annually take advantage of air currents along the high bluff back of the city. Mr. and Mrs. Whitney Eastman, Dr. W. J. Breckenridge and other members of the policy committee of the M. O. U., including this writer, met in Duluth the weekend of September 21. We were led by Mrs. Evelyn Putnam to the spot on this bluff where so much shooting of hawks took place in recent years. Due to the efforts of Mrs. Putnam and other members of the Duluth Bird Club this practice has been eliminated almost entirely. In the Twin City area the peak of the

migration was in mid-October. Only a few were counted for the census in September. William Longley stated that red-tailed hawks were numerous in southeastern Minnesota. He noted one bald eagle, November 4.

Hunters reported that ruffed grouse were plentiful, but that the hunting of ring-necked pheasants was only moderately successful. Many starved last spring during the late heavy snows which probably accounts for their scarcity this fall.

The bulk of the migration of shore birds occurred in August and early September. The water levels were so high that in many cases they had to find new stopping places so that observation was hampered. William Longley reported a large evening flight of solitary sandpipers at Itasca Park, September 2. At dusk on September 29, during drizzling rain, J. Jarosz, C. Jarosz and H. Gunderson in 10 minutes, counted about 30 woodcocks flying across a road near Page, Minnesota. Many of these birds were giving aerial performances, but none were heard "peenting." On the two following Saturdays, woodcocks were seen at dusk at this or nearby places. Scattered individuals were seen during the day.

William Longley's report on the Frankin's gull in Dodge and Rice Counties contained several dates, the earliest being 24 individuals on September 18, the latest October 27, 54 individuals. On September 19 he saw an estimated 2,460 Franklin's gulls. A flock of 11 flew over the Isaak Walton Bass Ponds, September 16. Two small flocks were seen October 1 by Dr. Breckenridge at Highway 100 and the Mississippi River, and at his home north of Minneapolis, he observed a few more October 3.

Flycatchers, swallows and sparrows

left on normal dates. The warbler migration progressed as it usually does in the fall, mostly small bands hurrying through during September and early October.

Huge flocks of crows numbering hundreds were concentrated in an area north of Duluth, September 23. In one flock there were several ravens. William Longley reported about 1,000 crows headed south, November 4.

Near Prior Lake, October 14, thousands of red-winged blackbirds flocked. It was a very spectacular sight when they rose in great clouds to wheel about and return to the grassy fields where they apparently were feeding. Flocks were seen along the highway south of Duluth on September 23, and William Longley reported huge flocks of rusty blackbirds, red-winged blackbirds and bronzed grackles in the Mississippi River marshes through October. Many left November 1.

A good sized flock of Lapland longspurs and several American pipits were observed on Minnesota Point, September 22 by members of the Duluth Bird Club and the M. O. U. Policy Committee.

A mixed flock of horned larks and snow buntings was seen by Sally Davidson and party near Afton; November 4.

More than the usual number of purple finches in fair sized flocks came from several sections of the state. The migration occurred about the middle of October.

An interesting report from William Longley was that of the observation of two tufted titmice in southeastern Minnesota, November 1.

A belated whippoorwill was observed resting on a tree branch, October 14, at Purgatory Springs south of Minneapolis.—Minneapolis, Minnesota.

Each affiliated club should see that notes for the March issue reach Mrs. Lupient early enough so that she can include them in her regular feature *Seasonal Report*. The deadline for the March issue will be February 1.

THE CANADIAN LAKEHEAD

Edited by

A. E. Allin

This has been a very disagreeable fall—September was wet and hundreds of acres of grain were never cut. October was partly clear and fine, but partly cold, and recently, of course, in common with the rest of the country we have had sub-zero weather and almost a foot of snow in the bush.

Shore birds were exceptionally uncommon, although we saw lesser yellow legs and solitary sandpipers returning on August 19. Very few shore birds were seen subsequently, except another solitary sandpiper on October 7. No pectoral sandpipers at all were noted, although they are usually fairly common here in the fall, and only a few golden plovers were seen about September 17 and 21. A whistling swan spent the summer, 60 miles south-west of here at Shebandowan.

On August 31 and September 1, 1950 several great blue herons were brought into this laboratory in a weakened condition. They were unable to fly and appeared to be anaemic. At least one showed the presence of a Leucocytozoon infection, and this year on September 13 another one was brought in which was unable to fly. It was very weak and anaemic. Its haemoglobin was less than 25%, but I could not find any evidence of parasitic infection, although it is possible that it had been present.

Black-capped chickadees appear to be very abundant in the bush this year, but only occasionally has the Hudsonian been seen. On the other hand, December, 1951

there is apparently a heavy migration of these birds into southern Ontario, particularly about the Toronto area.

Ruffed grouse appear to be particularly abundant this year, although they are declining in eastern Ontario. Possibly we are at a peak, and undoubtedly they were as abundant as they had been at any time for the past ten years, although I can find plenty of people who will dispute that fact. We had no trouble in finding them, however, in suitable locations. Following the snow storm on October 26, when the ground became covered with snow, they commenced to bud. It was very interesting to note their absence along the roads during the day, but at approximately five-thirty in the evening they could be seen budding in the birches, poplars and alders, and those which we procured showed crops which were bulging with the buds. It was interesting that we obtained several specimens of ruffed grouse with the copper ruff. Previously I had obtained specimens of this color from one flock only. I gather that spruce grouse are less abundant than they were a year ago. They occur only locally. At least two prairie sharp-tailed grouse were obtained. The Hungarian partridge was introduced locally many years ago, and a number of coveys still exist. For some reason the Department saw fit to open the season on them this year, but the local Game and Fish Association advertised widely over the radio and through the press asking their members to leave them alone and pro-

tect them. This was an outstanding example of sportsmanship we thought, and the Association was supported by the Thunder Bay Field Naturalists Club. As a result, I believe very few Hungarian partridge were shot. Not that it would have mattered eventually from the sportsman angle, but it seemed unfortunate to eliminate this species from our local fauna.

In 1950 we had a terrific crop of rowan berries which hung on the trees throughout the winter and provided food for the wintering flocks of robins. They persisted until midsummer, but finally fell. The trees which bore these last year are practically void of berries this year, and there are rowans only on a few trees which did not have berries in 1950. I wonder what our wintering birds will find to feed on this year? In this regard, there is a very heavy crop of seeds on the Manitoba maples, but to date we have not noted any evening grosbeaks. They have, however, occurred already as far south as Toronto, but these birds may have been actually southern ones, as several years ago I saw an evening grosbeak within a few miles of Lake Ontario in mid-August. Quite a contrast to their accepted status of thirty-odd years ago!

Ducks and geese—large flocks of migrating geese were noted on September 27, but the species could not be identified, except three which were Canadas. There was another heavy flight on October 11 and 12. Many of these were blues. I think that ducks were more abundant this year than usual, but this was due to the fact of a very heavy migration of scaup. They were present as early as September 17, and persisted in large numbers until the freeze-up on October 30. The majority were lesser, but on October 20 I saw one greater which was in full

plumage. Although ring-necks were fairly common in mid-September and there was another flight near the end of that month, they were unusually rare throughout the month of October. Ordinarily they form a large proportion of our duck population. A number of red-heads were noticed but probably not more than average. There was a very great decline, however, in the number of dabbling ducks. I saw very few mallards and blacks, although an occasional black is still hanging around the local waterfront. I did not see a baldpate, not a pintail, nor a green-winged teal, and only a few blue-winged teal were present after the early part of September. On the other hand, white-winged scoters were more common than usual—a flock of 30 being noticed on September 29 on Whitefish Lake. They persisted from that time on. A western grebe, noted at Whitefish Lake on October 19, by Col. Dear, is probably the most unusual record for the fall. It is a new species for the local area.

There appeared to be a heavy migration about October 7 which included crows, robins and juncos. The first tree sparrows were noted on September 28, and a northern shrike was seen on October 13, another on October 27, and still another on October 28. Snow buntings have been abundant since October 20. A few pine grosbeaks were noted as early as October 21. Claude Garton saw fox sparrows and broad-winged hawks on October 27, both unusually late records, and another broad-winged hawk was seen by Col. Dear on November 4. We saw our first American rough-legged hawk on October 29, and another on November 4. These were fewer than usual, and occurred at a later date than is normal. The one and only snowy owl was seen in Port Arthur by Mr. J. Parkin on November 3. —Fort William, Ontario.

The Students Page

MY PET HERRING GULL

by

Sharon Hill

Last summer my Dad and I went fishing up North to a lake over a hundred miles from Duluth. We had to portage through wilderness a mile up to a stream that connected with the lake. When we reached the lake we made camp on its shore, ate and went to bed. The next day after we had fished quite a while, my Dad and I decided to go around the lake. We were about a quarter of a mile across the lake, when we found a baby herring gull. It was so frightened when I picked him up that he burped up a three inch minnow! I named the gull "Baby."

Baby was covered with down, soft as fur. It was a light grey with brownish black spots, and its body was the size of a lemon. The gull made a soft whistling sound. He didn't like the motor of our canoe, nor did he like to ride in the canoe.

A storm was coming up so we packed and went home. I fed my gull pieces of fish and bread when we were in the car. At first he didn't want to eat, but after a while he ate a piece of fish three inches long. He had a big mouth.

The kids around my house thought it was a duck, but they soon found out that it wasn't. I kept Baby in the garage with my two kittens and my tame English sparrow "Chirp." The kittens were afraid of the gull. One day one of the kittens started to cuff Baby with its paws. The gull didn't like that. It spread out its wings and started to chase the kitten. The kitten ran and hid in the garage.

Baby grew up and made friends with the kittens and even ate with them. My little sparrow thought that Baby was its mother. It would fly up on the gull's back and ride him like a horse. Baby didn't like it when the sparrow rode on its back. It would cry and cry until someone took Chirp off. Other times the sparrow would cuddle up under the gull's wings and go to sleep.

Then, one day we gave Baby to the Zoo. I thought he would be better off there. I went to visit him every week. One day I couldn't find him. I guess he had flown away. I hope he is still alive some place with the rest of the gulls.—
Grade 7, West Junior Bird Club, Duluth

BIRDS AT CAMP—I attended Camp Lawrie about fifty miles west of Duluth from August 5 to 12. We had a chance to see many birds. I saw flickers, cliff swallows, a black and white warbler, a bobolink, cedar wax-wings, goldfinches, barn swallows, mallards, black terns, robins, and ducks.

Near the end of August, I drove to Winnipeg with my parents. We saw
December, 1951

kingbirds, mourning doves, and about 20 red-tailed hawks along the way.—Robert Cohen, Grade 7—Washington Jr. High, Duluth.

GEESE MIGRATING—October 6, 1951 I was at the Brule River in Wisconsin. I saw snow geese and blue geese in a mixed flock. This seemed a rather early migration.—Ronald Shoberg, Central High School, Duluth.

WREN AND STICKS I brought my old bird house with a wren's nest in it to school. It was $9\frac{1}{2}$ inches high, $7\frac{1}{2}$ inches long, and 6 inches wide. The hole was $1\frac{1}{4}$ inches wide. We opened it and counted the sticks. We found 2,215 sticks (mostly from a spruce) three match sticks, five pieces of string, one bug, three pieces of wire, two pieces of cotton, 30 feathers, one broken egg, one tiny dried up bird, and a lot of dirt. We keep the house in an apple tree in our back yard.—Ronald Orrey, Grade 7—Washington Jr. High, Duluth.

WRONG IDEAS One morning in October while I was outside playing I saw a little boy screaming and running home. So I began to look around to see what he was running from. Then I saw a hawk swooping around.

Suddenly the mother came out with the boy still crying and hanging on to her apron. When she saw me she told me that her son came in saying that an eagle was trying to kill him. He needed some better teaching.—Frank Tomars, Grade 7, Washington Jr. High, Duluth.

HAWK IN CHESTER PARK In the region of Chester Park some buddies and I, were skiing. All of a sudden a hawk landed by a tree next to our jump. In a hurry I took off my skis. We went up to get a closer look, and I saw that his legs were covered with feathers. We studied hawks at school so I thought he must be a rough-legged hawk. One big boy came up to shoot at it so my pal threw a ski toward it. This frightened the hawk away so the boy couldn't kill it. Jim McMann, Grade 7—Washington Junior High, Duluth.

Notes of Interest

FLYCATCHER PULLS THE SNAKE SKIN STUNT—A pair of great-crested flycatchers nested at my place this past season, and as usual they took the snake skin I always provide for them. An English sparrow was bothering them, as you might expect. The female flycatcher, however, either accidentally or intentionally pulled part of the snake skin out of the door so the breeze whipped it around. The English sparrow didn't bother them any more.—Sheridan S. Flaherty, Morris, Minnesota.

A CHIMNEY-NEST OF THE AMERICAN MERGANSER—To the various nesting sites recorded for the American Merganser, herewith is added a cabin chimney. On arrival at the Burley Resort, White Iron Lake, south of Ely, St. Louis Co., Miss Elwell and I were informed of a "wood duck" nesting in the chimney of one of the unoccupied cabins. The nest of ten eggs had been discovered by Mr. Frank Pelnard, the resort worker, on May 26, 1951. Then ensued days and weeks of concern and speculation for the cabin was rented for the summer. What should be done with the eggs, if the renters should arrive during the incubation period. Mr. Pelnard watched and waited. On June 20, the eggs were still unhatched.

On June 24, as Mr. Pelnard was leading us to the cabin, the duck on the chimney top was identified as the American Merganser. To view the nest, we went into the cabin. Mr. Pelnard removed the stove pipe from its hole in the wall of the brick chimney. From an elevated position one could look into the nest built at the bottom, a thick layer of beautiful gray-white down, rounding the corners of the square spacious chimney-interior. A glance into the nest revealed one young and one egg. Whereabouts of the remaining possible young seemed a mystery. Were they carried out of the chimney by the mother as the eggs hatched?

Momentarily sounds of activity came from the stove. Search ensued. The stove pipe with an elbow turn was empty. As the top with lids of the wood-burning cooking stove was lifted five live young and one dead, were rescued from various passages. The two remaining ones could be heard but not reached in blind pockets between the oven and the back of the stove. A group of spectators gathered to the scene of rescue. One felt the rising enthusiasm and eagerness on the part of rescuers for the trapped young. Willing hands helped Mr. Pelnard carry out the stove. Once outside by skillful maneuvering it was possible to shake out one, and finally the last hapless young. Gathered into a paper carton, the ash-powdered young seemed none the worse for their imprisonment, the dead specimen was mailed to r. P. Hofslund, University of Minnesota at Duluth. Hoping that the mother bird would solve her own problem of getting the young into the lake, Mr. Pelnard closed the stove pipe and returned the young into the nest. The mother bird returned to the nest, presumably to brood the young and sit on the one remaining egg.

A check of the nest, the following morning, revealed one chirping young, the egg, and the seven rescued young, either dead or at sleep. The mother bird was not in the nest, but was seen in the vicinity.

The nest was not inspected again until the next morning, June 26, when Miss Elwell went to take the final record. All the young were dead, the egg unhatched. The mother bird obviously had abandoned the nest. The young with the egg were collected by Miss Elwell and shipped to Dr. Breckenridge, Museum of Natural History at Minneapolis, for preservation.—*Olga Lakela, Duluth, Minnesota.*

BIRD OBSERVATIONS IN NORTHERN ST. LOUIS COUNTY During botanical forays of the last two years in the wilderness area of northern St. Louis County, Minnesota, along the international boundary, observations of bird life were made.

The following list of early and late summer birds of species compiled from notes, is herewith placed on record.

Loon	Black-capped Chickadee
Double-crested Cormorant	Hudsonian Chickadee
Great Blue Heron	Red-breasted Nuthatch
American Bittern	House Wren
Mallard	White-throated Sparrow
American Merganser	Hermit Thrush
Turkey Vulture	Willow Thrush (Veery)
Osprey	Cedar Waxwing
Ruffed Grouse	Red-eyed Vireo
Spotted Sandpiper	Black & White Warbler
Herring Gull	Yellow Warbler
Nighthawk	Myrtle Warbler
Ruby-th'd Hummingbird	Black-th'd Green Warbler
Belted Kingfisher	Chestnut-sided Warbler
Flicker	Oven-Bird
Hairy Woodpecker	Mourning Warbler
Downy Woodpecker	Northern Yellow-throat
Phoebe	Red-winged Blackbird
Least Flycatcher	Redstart
Tree Swallow	Chipping Sparrow
Crow	Robin
	Song Sparrow

—*Olga Lakela and Mary I. Elwell, U.M.D., Duluth*

A CALLER IN THE WILDERNESS. It happened at Finger Bay, Rainy Lake, where a creek flows out from Bald Rock Lake. On July 13, 1951, I was absorbed in collecting Hayden's sedges, (*Carex Haydenii*), when Miss Mary Elwell cautiously warned, "Look, look!" It seemed that I was looking in all directions but the right one, and Mr. Williams, our guide was looking too, when at last we spotted a hummingbird poised on the back of Miss Elwell's hand. A creature so transient as a hummingbird, in intimate human association rendered us speechless. We watched it spellbound, expecting it to vanish instantly into the wilderness it had come from. But instead, the wholly fearless and unsuspecting bird stayed long enough to search the colorful plaids of Miss Elwell's shirt, and as it

did so from the cuff at the wrist and along the arm to the elbow, its delicate tongue-tip brushed the fabric with flickering motion simulating feeding. Freed from our fear of its imminent departure we chatted and speculated at its age. Our assumption that it was a young, just out of the nest, finding its way in the environment really had no proof. There was nothing to indicate juvenal plumage. It could have been an adult female. In another moment it darted on the back of my shirt, then on to the red gasoline can in the boat and back to Miss Elwell. Finally, the lure of the artifacts was surpassed by nature's bright gems. It hovered among the blossoms of jewel-weed (*Impatiens capensis*) and loosestrife (*Lysimachia ciliata*), replete with life-sustaining nectar. Then, obviously gratified, it rose on invisible wings within its own halo and disappeared into the glorious wilderness, leaving us a memory gem of the unexpected in nature. Olga Lakela, Duluth, Minnesota.

A REPORT OF THE FALL HAWK MIGRATION—A cooperative hawk migration project has been carried on in the eastern United States for several years. This year, through the efforts of the United States Fish and Wildlife Service and the National Audubon Society this project was extended to include the entire fall migration range of the Broad-winged Hawk. Information concerning the project was received too late to give it much publicity among the bird clubs, but next year more thorough plans can be made. If this project receives wide support in the coming years it should furnish both interesting and surprising information. Plans are to publish the information in one of the national ornithological magazines.

A summary of the data gathered this year showed that the bulk of the migration had not reached the Twin Cities at the time the Count was made (Sept. 15 and 16, and Sept. 22 and 23). Most activity centered about Duluth, where the most observers made the most observations. In the Duluth vicinity 8966 hawks were counted by 16 people. Broad-winged Hawks were most frequently seen, 3251 individuals recorded, and next in number were 697 Sharp-shinned Hawks. Of the rarer hawks, there were 7 Bald Eagles, 6 Golden Eagles and 7 Goshawks seen. Project leaders at Duluth were J. K. Bronoel and P. B. Hofslund. They had the assistance of Mr. and Mrs. Ralph Boeder, John Boeder, Mrs. J. K. Bronoel, Mrs. Miriam Carlstedt, Sam Cox, Mrs. Flora Evans, James Felton, O. A. Finseth, George Flaim, Henry Gilbert, Lloyd Hackl, M. M. Keith and Mr. and Mrs. Harvey Putnam. In the Twin Cities area 82 hawks were seen by eight observers. The Red-tailed Hawk was most frequently seen. Observers in the Twin Cities area were Amy Chambers, John Fuchter, Burton Guttman, Arthur Harris, Mary Lupient, Jean McIntosh, Theodora Melone, and Bill Pieper.—Harvey L. Gunderson, Minnesota Museum of Natural History.

LARK BUNTING AT VIRGINIA—Mr. Walter W. Nelson, Superintendent of Olcott Park, reported seeing, on November 9, "two black birds with square white patches on their wings." In company with his son-in-law Mr. Nelson observed these birds in some tall shrubs bordering Silver Lake across from Lakeview Hotel in Virginia. When shown a picture of the lark bunting both men said, "That the bird."

It seems incredible but I've no reason to doubt their observation as Mr. Nelson,
December, 1951

son has considerable interest and some experience in bird watching. Vera Barrows, Virginia, Minnesota.

BIRDING IN NORTH DAKOTA—On Friday, May 26, 1950, eleven members of the Minneapolis Bird Club left Minneapolis for Lidgerwood, on the first leg of a 900 mile tour of North Dakota and the Sand Lake region of South Dakota. We were in three cars, and all arrived in Lidgerwood after dark.

The next morning, on a slough just on the outskirts of Lidgerwood, we found many species of ducks as well as the following more unusual birds: western kingbird, western sandpiper, northern phalarope, (flock of about 200), and orchard oriole.

After leaving Lidgerwood we proceeded to Oakes for breakfast. We arrived there at 9:00 a.m. after having added to our list the horned grebe, burrowing owl, upland plover, and western willet. One carload of our party reported 10 white pelicans south of Oakes.

At the Oakes Golf Club, which is located three miles north of town, we saw more willets and located a nest of the chestnut-collared longspur. From Oakes to Wishek, we traveled more or less non-stop. However, we did manage to add the marbled godwit to our list. At Wishek we entered the territory of the avocet, the alkali sloughs. However, up to lunch-time only one carload of us (Whitney Eastman's group) had seen an avocet. Mr. Eastman's group also spotted several Sprague's pipits. Everyone was amazed at the numbers of ducks and how easy they were to view. Mr. Eastman and I were not surprised, because we had had our surprise the previous year.

As we reached the area of the avocets, I could not help but notice how much higher the water was than it had been in 1949. In many places, especially near Napoleon, roads were under water, and we had to make frequent detours. Between Wishek and Napoleon we spotted several lark buntings, which really surprised me. I had traveled the eastern half of North Dakota all the summer of 1949 and had seen only two of these birds in the region. We also saw Baird's, Gambel's and grasshopper sparrows in the same area. At Napoleon we saw the eared grebe, as I had expected. Between Napoleon and Dawson, we added the western grebe and several sandpipers, mostly "peeps." However, the bulk of our party had not yet seen an avocet, which was what most of us were anxious to see.

The trip from Dawson east to Crystal Springs was uneventful except for one Swainson's hawk which we saw soaring over the highway. At Crystal Springs we finally found a flock of about 30 avocets which, of course, delighted everyone.

At this point I would like to insert a word about the water conditions in North Dakota at the time we were out there. The 30 avocets were feeding in a slough directly across the highway from a slough on which Mr. Eastman and I found an estimated 5,000 shorebirds the previous fall. The water at that time probably never exceeded three or four inches in depth at any point. Now I noticed that there were grebes diving in the same slough. I would judge the depth to have been between six and 10 feet. This was one of the prime factors contributing to the fact that shorebirds were comparatively scarce in the spring of 1950.

We added the Wilson's phalarope to our list on our way into Jamestown, North Dakota, where we had supper and spent the night.

Sunday morning we drove to Ellendale for breakfast. This stretch yielded little other than a Swainson's hawk's nest. After breakfast we proceeded to Sand Lake, South Dakota. The road across the lake was all but under water. As a matter of fact, the road had been under water and was still blocked off at each end. We removed the barriers and drove across, with frequent stops to watch Baird's sandpipers and ruddy turnstones which were feeding on the road. We also saw prairie chickens and Hungarian partridges in the Sand Lake area. We saw the only white pelicans other than those found the day before near Oakes.

At a spot about 10 miles east of Sand Lake we saw two small groups of geese. There was one white-fronted goose, the rest were blues and snows. While in this area we spotted an osprey, which is considered uncommon in South Dakota.

We saw one more Swainson's hawk in South Dakota just after lunch. At Sisseton, South Dakota, we disbanded and headed for Minneapolis. The group in my car birded in as far as Willmar, Minn. We added the Holboell's grebe at both Graceville, Minn., and at Green Lake near Willmar. We also saw marbled godwits and white-rumped sandpipers near Murdock, Minnesota.

The total list for the trip was 103. I know a lot of life-time lists got a good boost during the two days of birding in North Dakota.—William R. Pieper, Minneapolis Bird Club.

REPORT OF HIGHWAY DOVE COUNT—The first mourning dove this year was a lone bird picking up gravel near the road, April 26, 1950. The fields were covered with snow which had fallen the day before.

The last doves observed were on October 7, 1950. A flock of six birds were sunning themselves on the ground near a granite grout pile.

The largest number of doves counted in one morning was 162. That was on September 5, 1950, a warm day with misty rain in the air. The next highest count was July 20 with a count of 103, a warm pleasant day. Fewer birds were seen on the same route in afternoons of the same day. On September 5, 70 doves, on July 20, 60 doves.

. My regular daily drive to Montevideo and back began at 6:00 a.m. and usually ended about 3:00 p.m. A record was made of 35 days. I made a separate morning and afternoon count, and I saw many more during the morning hours than I did in the afternoons. From the week end of May 14 on, my wife and I usually drove to Lake Alexander, 52 miles north of St. Cloud. We left Friday or Saturday after 5:00 and returned to St. Cloud Sunday afternoon or evening. The number of doves counted on that route was small probably in part due to the hours we observed them.

The country from St. Cloud to Montevideo is rolling, partly wooded, with some fields and pastures. More doves were seen on the outskirts of towns and villages than in the open country. No place on the route is much more than a mile from trees, street planting, farm shelter belts, or native wood.—George Lehrke, St. Cloud, Minnesota.

TURKEY VULTURE NESTING RECORD—State Game Warden Leo Manthei of Blackduck, Minnesota advises me that the turkey vulture which was a part of the Bureau of Game state fair exhibit, was one of two which he discovered in an old roofless barn at an abandoned cutting camp located in Section 28, Township 148 N., Range 29 W. The feed box in the manger apparently served as the nest. The two birds were under the manger at the time Mr. Manthei discovered them and he stated that there was evidence to indicate that they had sat on an old pine near the barn. He further stated that when first found, both birds threw-up a brown evil smelling substance that could turn the stomach of a skunk! He further states that there were adult vultures in his district, but he had no further information concerning their nesting.—Taylor W. Huston, Supervisor of Game, St Paul, Minnesota.

MAGPIES IN MINNESOTA — State Game Warden Leo Manthei of Blackduck, Minnesota observed magpies this last spring and summer in Section 7, Township 153 N., Range 30W. The adult birds, where he first observed them were feeding on carrion. Later, about the first of August, he noticed seven in the area, five of which appeared to be young birds. Mr. Manthei further states that he did not locate the magpie nest, but feels it would be possible to do so after there has been a sufficient killing frost, to cause leaves to fall.—Taylor W. Huston, Supervisor of Game, St. Paul, Minnesota.

CHRISTMAS BIRD COUNT

All clubs or individuals who cooperate in taking the Christmas Bird Count should mail their notes to the editor as soon after the count as possible so the data can be compiled for publication in the March issue of *The Flicker*. The regulations for this count may be found in the November-December 1945, *Audubon Magazine* or the July 1947 issue of *Audubon Field Notes*.

Call Notes

Edited by
Evelyn J. Putnam

Dr. Dwain Warner of the Minnesota Museum of Natural History at the University in Minneapolis, and until recently Editor of *The Flicker*, and Dr. and Mrs. O. S. Pettingill of Carleton College at Northfield were Minnesota's only representative at the American Ornithological Union Annual Meeting, October 8-13 at Montreal, Canada. Dr. Pettingill completed his fifth year of very efficiently shouldering the arduous tasks of Secretary of the Union and handed in his resignation. Dr. Albert Wolfson of Northwestern University is the newly elected Secretary. Dr. Warner's active participation in research, as well as in the affairs of the Union, were recognized by election from the status of Associate to that of Member of the Union.

★ ★

Mr. Milton Thompson, past president of the M.O.U. and an active participant in M.O.U. affairs for a number of years, has left his post as Curator of the Minneapolis Public Library Museum to accept the position of Assistant Director of the Illinois State Museum at Springfield, Illinois. The good wishes of the M.O.U. go with Milton and Mrs. Thompson to their new duties, together with our sincere appreciation of the work Milton has done in aiding the development of the M.O.U.

★ ★

Dr. W. J. Breckenridge, Director of the Minnesota Museum of Natural History, University of Minnesota, has recently returned from a two weeks' tour of midwestern cities as a speaker representing the National Audubon Society on an Audubon Screen Tour circuit.

★ ★

Byron E. Harrell, a student of the University of Minnesota and a member of the M.O.U., was one of the recipients of the Chapman research grants for promotion of ornithological investigations of bird life in southern Tamaulipas, Mexico.

★ ★

Mr. Charles E. Broley, the *Eagle Man*, spoke to audiences at Minneapolis and Duluth on November 14 and 15.

★ ★

Whitney H. Eastman, president of the M.O.U., and Karen Anderson of Minneapolis were married on July 21 at Norwood, Iowa. Mr. Eastman's daughter and son-in-law, Mr. and Mrs. John Peyton, were the attendants. A three weeks trip to the Canadian Rockies provided not only a wedding trip, but a chance for Mr. Eastman to add 68 new birds to his life list.

★ ★

Ross Olson, a student at the University of Minnesota, was in Duluth, September 29,30 and October 1, banding migrating hawks for the Fish and Wildlife Service.

★ ★

The First M.O.U. Policy Committee meeting was held at Duluth on the weekend of September 29, 1951. Mr. and Mrs. Eastman, Dr. W. J. Breckenridge, Mrs. Mary Lupient, Miss Vera Sparkes, Miss Amy Chambers, Mr. O. A. Finseth and Mr. P. B. Hofslund were the members present. They joined the Duluth Bird Club on their fall field trip on Minnesota Point followed by a picnic lunch at noon. In the afternoon the meeting was held at the University of Minnesota, Duluth's Science Building. Plans for **The Flicker** and

projects for the M.O.U. were discussed.

★ ★

Lloyd Hackle, a taxidermist at Storey's in Duluth, kept a record of the stomach contents of 50 great horned owls that he mounted in the past year. All contained rats and mice, some contained shrews and rabbits, and only two contained game birds.

★ ★

Mrs. Ralph Boeder recently underwent a major operation at the Mayo Hospital. The hopes and prayers of the M.O.U. go for her speedy recovery.

★ ★

Dr. George Friedrich has retired from active teaching and is now wintering in Florida. His address is: Box 475, Safety Harbor, Florida.

The illustrations committee, headed by O. A. Finseth, will be pleased to receive prints of any nature photographs that you might have. It is our intent to have a file of such photographs that we may use from time to time for illustrating **The Flicker**.

The Book Page

Although there are many excellent books on nature unless we are kept in contact with them we are at loss to find just what we want when we want it. It is the plan of this section of **The Flicker** to remind you of some of the classics that you may have forgotten, and to bring to your attention some of the newer publications. In addition, we hope that you will use this particular section of the magazine as an aid in finding literature about a subject that interests you particularly.

In past issues of **The Flicker** your attention has been called to the opportunity you have to use the exchange

magazines that the M.O.U. gets each month. The library of **The Wilson Club** is another service provided by an ornithological organization for those who want access to the literature of the field. Still another source of nature literature is available to the readers of **The Flicker**. In November, 1950 the Duluth Bird Club, wishing to acknowledge the many contributions of Dr. Olga Lakela, established in her honor a collection of nature books now housed in the library of the University of Minnesota, Duluth. The loan of one of these books may be had by writing to the library. A partial list (up to July 1, 1951) of the titles is appended.—P. B. H.

LAKELA COLLECTION

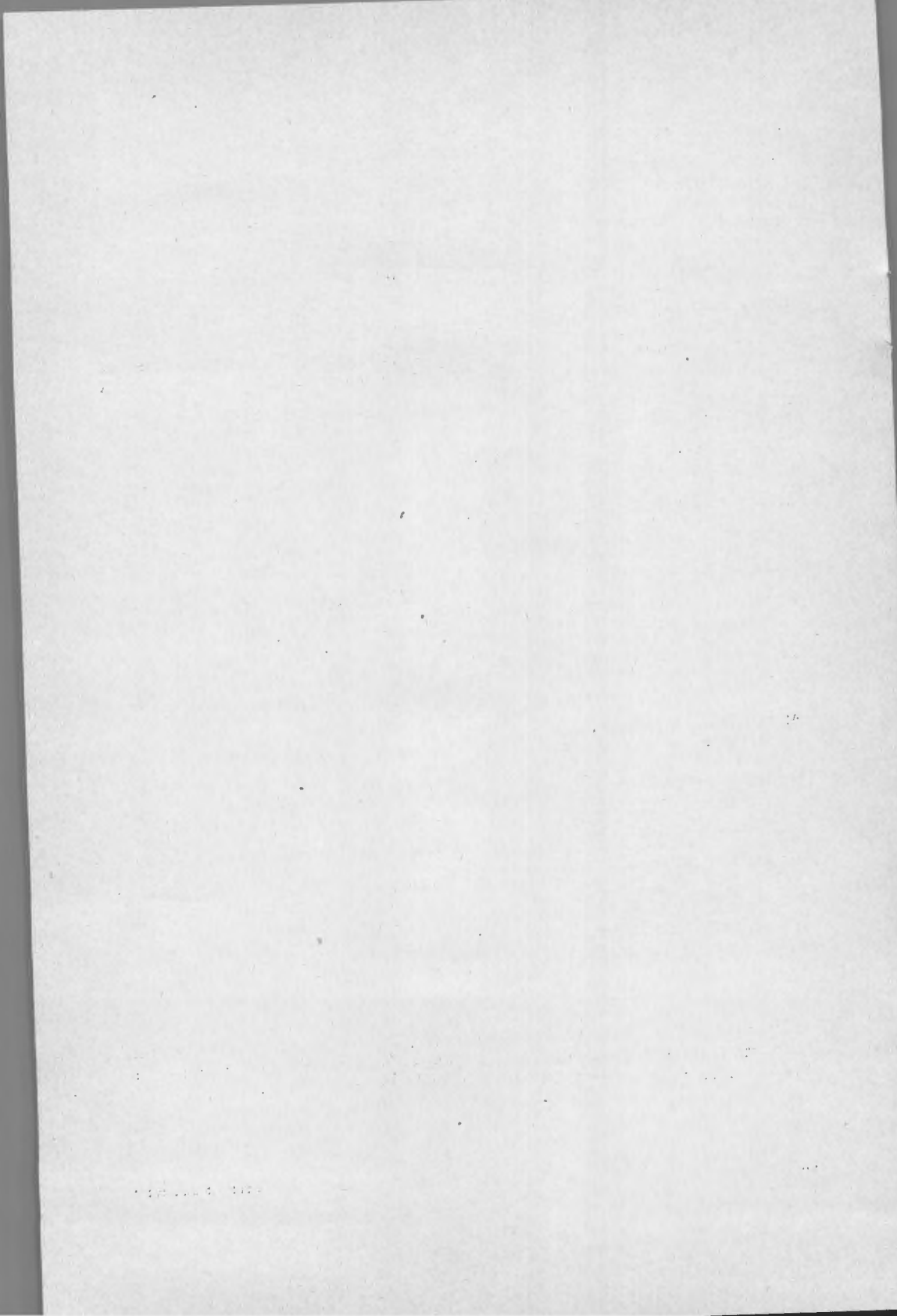
- | | |
|--|---|
| Audubon: Birds of America | Chapman: Camps and cruises of an ornithologist |
| The Auk, 1930-1936, and one copy 1914 | Commons: The log of Tanager Hill |
| Barbour: Naturalist at large | Coulter: The story of the plant kingdom |
| Barth: Make Skrik | Coulter: New manual of Rocky Mountain botany |
| Beard: Fading trails | Dixon: The human side of birds |
| Beebe: Pheasants — their lives and homes | Dear: Breeding birds of the region of Thunder Bay, Lake Superior, Ontario |
| Bent: Life histories of North American flycatchers, larks, swallows and their allies | Dice: The biotic provinces of North America |
| Bent: Life histories of North American gallinaceous birds | Dickerson: The frog book |
| Bent: Life histories of North American shore birds, Part 2 | Dubkin: The murmur of wings |
| Breckenridge: Reptiles and amphibians of Minnesota | Eames: Morphology of vascular plants —lower groups |

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- Fairchild: The world is my garden
- Ferril and Folsom: Indoor bird watcher's manual
- Gaeumann: Principles of plant infection
- Goldman: Rice rats of North America
- Gunderson: A study of some small mammal populations at Cedar Creek Forest
- Heilner: Our American game birds
- Hickey: A guide to bird watching
- Howell: Revision of the American pikas
- Hylander and Stanley: College botany
- Jacques: How to know the insects
- Keller: Bird notes afield
- Kortright: Ducks, geese and swans of North America
- Leopold: A Sand County almanac
- Lincoln: Migration of American birds
- Maheshwari: Introduction to the embryology of angiosperms
- Mathews: Field book of wild birds and their music
- Menaboni: Menaboni's birds
- Miller: Butterfly and moth book
- Murie: Moose of Isle Royale
- Nice: Studies in the life histories of the song sparrow, Part II
- Peattie: Green laurels
- Peterson: Birds over America
- Peterson: Field guide to the birds
- Peterson: Field guide to western birds
- Pough: Audubon bird guide—eastern land birds
- Rickett: Green earth
- Ridgeway and Friedmann: Birds of North and Middle America, Part X
- Robbins and Rickett: Botany
- Rourke: Audubon
- Sanderson: Animal treasures
- Shelford: Animal communities in temperate America
- Storer: Flight of birds
- Swain: Insect guide
- Tanner: Ivory-billed woodpecker
- Tilden: Minnesota algae, Volume I
- Troughton: Furred animals of Australia
- Ware: Wing to wing
- West: Algae, Volume I
- Wood: Animate creation, Volume II
- Wood: Illustrated natural history
- Wyman and Burnell: Field book of birds of the southwestern United States



The deadline for the March issue is February 10. The March issue will contain the nesting records for the 1951 season. Please send your records to Mr. J. K. Bronoel, 1703 E. 3rd. Street, Duluth, Minnesota before February 1.



Minnesota Ornithologists' Union

Affiliated Societies

DULUTH BIRD CLUB

Officers: President, Mr. O. A. Finseth; Vice President, Ralph Boeder; Secretary, Mrs. Harvey Putnam; Treasurer, Miss Mira Childs.

Meetings are held at the University of Minnesota, Duluth.

MINNEAPOLIS AUDUBON SOCIETY

Officers: President, Mrs. G. R. Magney; Treasurer, Mrs. W. W. Wilcox; Recording Secretary, Mrs. A. M. McLeod; Corresponding Secretary, Mrs. S. A. Gile; Field Secretary, Mrs. J. A. Thompson; Auditor, Mrs. Gaylord Davidson.

Meetings are held at the Walker Branch Library.

MINNEAPOLIS BIRD CLUB

Officers: President, Mr. Rene Hurtubise; Vice President, Mr. Boyd M. Lien, Secretary, Mrs. Boyd M. Lien; Treasurer, Mrs. Victor Smith.

Meetings are held at the Minneapolis Public Library Museum.

MINNESOTA BIRD CLUB

Officers: President, Dana Struthers; Vice President, Forrest Lee; Secretary, Jesse Richardson; Treasurer, Lucille Hunter.

Meetings are held at the Museum of Natural History, University of Minnesota.

ST. CLOUD BIRD CLUB

Officers: President, H. H. Goehring; Vice President, Mrs. Charles Beacom; Secretary-treasurer, Miss Loretta Rosenberger.

Meetings are held in the committee room of the public library.

ST. PAUL AUDUBON SOCIETY

Officers: President, Mrs. Charles E. Hart; Vice President, Mr. Phillip J. Hummel; Treasurer, Mr. M. H. Adams; Recording Secretary, Miss Helen E. Schulte; Corresponding Secretary, Mrs. Nanele K. Wells; Directors-at-large, Mr. John Haag and Mr. Joseph H. Reisinger.

