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Notes from a Study of the Blue-Winged Teal

by

Grady Mann

The Blue-winged Teal, remaining as one of the most important breeding species of waterfowl in Minnesota, was selected for a recent study primarily to provide information that might lead to improvement in management practices for the species within the state. Its importance to the Minnesota duck hunter is evident when one considers that according to Pittman-Robertson records the Blue-winged Teal during 1944 and 1945 ranked second in the estimated total kill of waterfowl taken by hunters in the state. Because of its wide nesting range this bird lent itself well to extensive field work in south-central Minnesota. This article is a condensation of a more detailed report* on their work.

It was planned to study the spring, summer, and fall phases of the life of the Blue-winged Teal in Minnesota with these specific objectives in mind:

1. To gain as much information as possible on its nesting.

2. To study brood development.

3. To note destructive influences affecting the habitat.

4. To obtain sex and age information during the hunting season.

The areas covered during different phases of the study are shown on the accompanying map of Minnesota Fig. 1.

Nesting season field work was started in the Twin Cities vicinity. During the 1947 summer season collection of field information was sandwiched in with a full time work program while the writer was employed with the Pittman-Robertson project in south-central Minnesota.

* A detailed report of this study was submitted to the Graduate Faculty of the University of Minnesota in partial fulfillment of the writer's requirements for an M.S. degree in Wildlife Management.

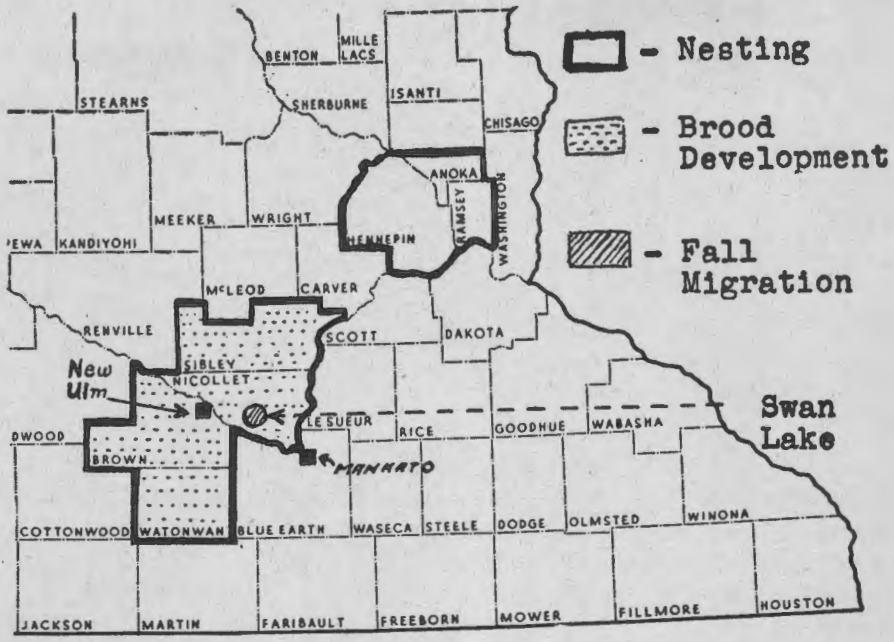

Figure 1. Blue-winged Teal Study Areas

The writer engaged in duck trapping operations on Lake Swan, Sibley County and Swan Lake, Nicollet County, and did lake survey work on ducks throughout Brown and Watonwan counties by canoe. This, as well as extensive driving by car through these counties, afforded him excellent opportunities to observe the development of broods of Blue-wing young.

The greater part of the time in this region was spent on the north side of Swan Lake, Nicollet County, namely Cortland, Sunday, Larson, and Monson Bays. The north side is the shallow part of this lake and is probably one of the heaviest Blue-winged Teal producing areas in this section of the state. Abundant growths of sago pondweed (Potamogeton pectinatus), duck weeds (Lemna sp.), excellent nesting cover, good rearing cover, and proper water depths seemed to fit well the requirements of the Blue-wings and the local breeding population of the birds on this part of the lake was high making it an excellent Blue-winged Teal study area.

Nesting Notes

Brief mention is made of observations on the Blue-winged Teal shortly after their spring arrival. Some time was spent in observation of pairs in their pre-nesting period. It was noted on an intensive study area where the activities were observed on a daily basis that a pronounced increase in the intensity of territorial response was easily discernible shortly before and during the early nesting season. The maximum in intensity of this display was designated as the "peak of territorial display."

That there is a possible connection with the "peak of territorial display" on the part of the Blue-winged Teal and the beginning of nesting of the

species was indicated by an observation on Benson's Marsh on May 16, 1947. Throughout the season there had been an increasing amount of display but on this date the maximum was very forcefully being demonstrated by every pair of Blue-winged Teal under observation.

At this time no intruding male Bluewing came near a mated pair without being attacked immediately by the defending male. The writer witnessed several spirited scuffles, some lasting for as much as thirty seconds, in which there was intense fighting on the water between the defending and intruding drakes.

Of all the nests located on Benson's Marsh during the 1947 season, an estimated date for the laying of the first eggs has been recorded as May 16. It is significant that this coincided with the "peak of territorial display."

In the territory studied nesting cover was found to be extremely scarce. Often an extremely narrow strip of grassy cover near the potholes was the only available haven in which the Blue-wings could nest.

Brood Development

Changing of the habits of broods of waterfowl as the season progresses is perfectly natural and to be expected. However, many casual observers do not consider this when estimating waterfowl production at different seasons. For example, many people in south-central Minnesota prior to the time that birds are beginning to show themselves during full daylight, claim that no ducks are being raised. A week to ten days later, when the broods begin to appear during midday from the marginal cover, the same people completely reverse their duck production estimates.

During the span of the 1947 season 97 accurately observed Blue-winged Teal broods totalling 755 young were recorded. These broods were noted throughout south-central Minnesota on a wide variety of lakes and marshes that differed in water depths, as well as shoreline and emergent cover types. (See figure 1.)

TABLE 1

	Nest Characteristics	Average	No. Nests Considered	Range
1.	Flushing distance of female	11.1 ft.	9	1 to 36 ft.
2.	Number of eggs in completed clutches	11.0	7	8 to 13
3.	Distance of nest from water's edge	66.0 ft.	10	0 to 225 ft.
4.	Distance of nest above water	8.6 ft.	10	5 to 36 ft.
5.	Depth of nest bowl	5.1 in.	9	4 to 6 in.
6.	Estimated date of laying of first egg	May 13, 1947	7	May 8-16, 1947

From field observations it was found that the success of brood counts varied with:

1. Age of brood
2. Time of day
3. Weather

Age of brood: As the broods grow older there is a marked tendency for the young birds to scatter more during their evening and morning feeding periods and to show themselves progressively more during midday. By the time the young have developed just beyond the half-grown stage they could be observed in open water at nearly any time during the day.

Time of day: When the young ducklings were in the down stage they

made their appearance only during the early morning and late evening hours, while the half-grown birds showed themselves on open water even in mid-afternoon. During the morning and evening observations on the lakes, young broods were most often found in the shadows of shoreline cover, emergent vegetation, or islands.

For example, Claire L. Johnson and the writer conducted under ideal conditions a brood count on the north end of Swan Lake the evening of July 29, 1947. At 5:45 p.m. no Blue-winged Teal broods were present on the sunny northwest side of Monson Island. Immediately upon rounding the point to the southeast, shaded side of the island we observed 5 broods totalling 45 birds along an island shoreline distance of 50 yards. There were present no known factors other than the presence of shade that would have made them prefer the southeast side of the island.

Weather: Weather conditions greatly affected the number of Blue-winged Teal broods that could be observed. Cloud cover and wind velocity were very important in this respect. On overcast days there was a tendency for Blue-wing young—even 'downies' —to be more conspicuous in mid-afternoon in open water away from their marginal cover than on sunny days.

When the wind velocity increased to approximately 10-12 miles per hour, particularly over any open water stretch of 70 yards diameter or more, downy young would very seldom be seen. This wind factor in conducting a successful brood count was clearly shown the evening of July 27, 1947, while Clare L. Johnson and the writer were making a brood count on the northeast side of Swan Lake. A distance of approximately two miles was covered by canoe along a shoreline in a good teal producing section. On this particular evening a brisk southwest wind was blowing making the open water extremely rough. During the entire stretch of two miles no Blue-winged Teal were observed on the water.

This obviously did not represent a true picture of the production of that part of the lake. The identical route was traversed under ideal conditions two days later without the wind and approximately 90 young were observed.

These factors should be given due consideration when any census of waterfowl broods is being conducted in an area where a large proportion of the population is Blue-winged Teal. It is felt by the writer that most of the preceding discussion also applies to other common species of river ducks.

Brood Composition

Sixty-two percent of the young Bluewings were fully grown by July 31. On the basis of extensive field work in the early days of August the writer estimated that 90 percent of the Blue-winged Teal produced in south-central Minnesota were nearly fully grown by August 10.

For best results in conducting accurate brood counts in south-central Minnesota, these should be undertaken prior to July 31, and preferably between July 15 and July 31.

Flight of Young

Although there is some movement of flightless young to deeper water sites as shallow areas dry, I believe that in south-central Minnesota the majority of the concentrations of young birds occur after flight has been attained and the young are able to move from one area to another on the wing.

Observations were made of the dates of the flight stages of young

teal in south-central Minnesota. Preliminary flights were first observed during the 1947 season on July 22 and initial flight away from home water site on July 4. Flight formations of 20 birds or more were first observed on August 13. These dates of flight stages were noted as a result of approximately 100 miles of car driving per day through pothole country or approximately 2500 miles of travel by car in Brown, Sibley and Nicollet Counties, and from intensive canoe work on Lake Swan, Sibley County, and Swan Lake, Nicollet County, between July 15 and August 15.

Late Season Shift of Young

By August 15, 1947, the level in the smaller water sites had dropped considerably—many of the more shallow ones having dried completely. With this drop in water level in the first half of August there was a decided shift in the teal population from the potholes areas to deeper water sites. Swan Lake, Nicollet County, was typical of one of these deeper water areas to which the Blue-wings moved.

Early Flight Mortality

In the early flight stages of the young Blue-winged Teal there is a high mortality from accidental deaths due to flight into barbed wire fences or telephone wires which pass through or near pothole margins. No loss was noted after the Blue-wings were flying well. On one pothole area having an estimated production of 70 Blue-winged teal, approximately 4 percent were known to have been killed due to flight into barbed wire. Telephone wires, usually parallel to the highways, cause a definite loss of Blue-wings when the young fly in and out of roadside potholes. In our driving along country roads in this area of Minnestoa many examples of this were noted.

Habitat Destruction

An extremely common sight on the duck lakes and marshes of south-central Minnesota was shorelines that had been partially denuded of vegetation or in some cases practically wholly denuded due to excessive trampling of livestock. Cattle did approximately 95 percent of this trampling. Occasionally when a barn lot was nearby a lake, hogs were permitted free access to the water's edge. Horses and sheep were rarely seen along these lake margins. The extent of the damage depended on the number of cattle, the soil texture, and the slope of the shoreline. Low flat shorelines of mucky soils were particularly susceptible to such damage. Some of the possible effects on a breeding teal population by this excessive trampling are:

1. Rearing and nesting cover for the broods is reduced and in some cases eliminated.
2. Increased turbidity of the water is brought about by even slight wave action over a bare, mucky area. This in turn can affect the aquatic plant growth by reduction of sunlight penetrating the water.
3. Increased erosion over these barren spots speeds up 'silting-in' of the lake, at the same time making insecure rooting areas for aquatic food plants.

In addition to trampling damage to shoreline vegetation, there is an additional riling of the water caused by cattle wading through shallow waters. The majority of the shallow lakes in this part of the state have soft muddy bottoms and continued use by cattle, as is extremely common, easily

raises the turbidity to a point where one cannot see his hand an inch below the surface of the water.

Hunter Bag Check

A small sample (130) of waterfowl found in the hunters' bags on Swan Lake in 1947 was tabulated and the species ranked in their order of numercial importance. The Blue-winged Teal was by far the predominent species in this check, making up 44.4 percent of the total birds tallied. This species was followed in order by the Ruddy, Redhead, and Mallard. One-half or more of the daily bag, i.e. 2 or more Blue-winged Teal, were found in 66 percent of the bags tallied on Swan Lake on the opening day of the season. In the second day's kill this percentage of 2 Blue-wings had dropped to 40 percent. The warm balmy weather during October of that year was a big factor holding the teal in Minnesota until late in the season. Even on the late date of October 19, 66 percent of the daily bags checked still included 2 or more Blue-wings.—**Lower Souris Wildlife Refuge, Upham, North Dakota.**

A Memorial to Dr. Thomas Sadler Roberts was authorized by the Minnesota Ornithologists Union at its annual meeting in May 1947, the expense of this Memorial to be paid by the individual members of the organization. A committee was appointed which decided to make arrangements with the Minneapolis Park Board to have the name of the small park commonly known as the Bridle Path at Lake Harriet, changed to The Thomas Sadler Roberts Bird Sanctuary and to have an inscribed boulder placed at each end of the path. The area was chosen because it was the place in which Dr. Roberts made frequent observations nearly all of his life.

This work has now been completed at a cost of $104.10 which means that each member of the M. O. U. will be required to contribute 25 cents in order to meet the expense. It was decided also that the Treasurer of each bird club would make this collection and mail checks to the Treasurer of the M. O. U. and that members-at-large would send contributions directly to the M. O. U. Treasurer.

Should members desire to contribute a larger amount a special Trust Fund will be set up to pay for another Memorial dedicated to Dr. Roberts.—**Mrs. Mary Lupient, Treasurer, M. O. U.**

North Shore Expedition

by

Bruce Hayward

The Minnesota Bird Club in cooperation with the Duluth Bird Club made an expedition to the North Shore of Lake Superior on the weekend of February 18, 19, and 20. Twenty-two observers participated, 5 from Duluth and 17 from the Twin Cities.

There were very few ice formations on the rocks along the shore because this winter has been very mild. Dr. W. P. Abbott reported that the ice we saw had been formed only a few days previous to our arrival. Twenty-three inches of snow had already fallen in the area this winter. Friday forenoon was clear, but as the day advanced the sky clouded over and remained overcast Saturday. Two to three inches of snow fell Saturday morning. Later that day the sky began to clear and by Sunday morning, the 20th, the clouds had entirely disappeared. The temperatures ranged from a high of 28 degrees F. on Friday to a low of 2 degrees F. on Sunday morning. The wind velocity probably never exceeded 10 miles per hour.

This report covers the area from Duluth to the Pigeon River with emphasis on observations at the Encampment Forest, Palisade Head, Dr. Abbott's point, and the area along the Temperance River. Most of the observing was done from Trunk Highway 61 since deep snow prevented much hiking anywhere but on roads.

Since the observers split into three groups, the author has found it desirable to designate them as groups A, B, and C. Group A included Ruth and Morrie Self, Dorothy Mierow, Dr. W. J. Breckenridge, and Bruce Hayward (Friday and Saturday). This group arrived in Duluth Friday noon and observations that day were made as far north as Schroeder, exploring Palisade Head en route. Saturday they covered the area between Schroeder and Dr. Abbott's cabin 14 miles northeast of Grand Marais, concentrating their efforts on the Temperance River. Sunday they returned to Duluth from Grand Marais. Group B included Paul Steel, Mrs. I. A. Lupient, Lewis Barrett, Amy Chambers, Florence Nelson, Mr. and Mrs. Lyman Newlin, and Bruce Hayward (Sunday). They traveled from Duluth to Dr. Abbott's cabin on Saturday, investigating the area around Beaver Bay more closely. On Sunday this group drove to the Pigeon River and returned to Duluth that afternoon. Group C included Richard Straw, O. A. Finseth, Mr. and Mrs. Harvey Putnam, Theodora Melone, Jeanette Houle, Patricia Rand, Shirley Cotter, Helen Smith, and Miss Cohen. This group left Duluth Saturday morning and reached Dr. Abbott's cabin late that evening. Sunday they returned to Duluth, concentrating their observing in the Encampment Forest.

Despite the fact that the three groups traveled the same area at different times, overlapping of observations was inevitable. Approximations have been necessary, especially in the situations where a large number of birds were involved. American Goldeneyes, Herring Gulls, and Redpolls were seen everywhere along the shore and in most cases exact numbers were not taken. In instances where more than one group reported the same

flock of birds, the first group to see it was credited with the observation.

A Barred Owl four miles west of Forest Lake, approximately 75 Goldfinches one mile north of North Branch, and a Raven at the Nickerson Fire Tower (all seen by Group A) were of interest. All three groups saw Crows en route, but none reported seeing them north of Duluth. Birds seen between Minneapolis and Duluth were not included in this table since this is primarily a report of the birds of the North Shore.

Table 1

Summary Of Birds Seen On The North Shore

Species	A	B	C	Total 1949	1948
American Golden-eye		Common			163
Old-squaw	265	500		764+100	700
American Merganser	14	2		16	0
Red-breasted Merganser	1			1	0
Goshawk		1		1	0
Bald Eagle	1	1	1	3	2
Ruffed Grouse	1			1	1
Ring-necked Pheasant			1	1	0
Herring Gull		Common			659
Glaucous Gull				0	1
Pileated Woodpecker				0	1
Hairy Woodpecker		1	1	2	0
Downy Woodpecker	2	1	10	13	2
Horned Lark		1		1	0
Canada Jay		2	1	3	1
Blue Jay			5	5	3
Raven	4	9	5	20	3
Black-capped Chickadee	7	10	30	47	5
Hudsonian Chickadee		1		1	3
White-breasted Nuthatch		1	1	2	0
Red-breasted Nuthatch	2	7	15	24	0
Northern Shrike	1			1	1
English Sparrow		Common			0
Evening Grosbeak	8	12		20	2
Purple Finch	3			3	0
Pine Grosbeak	16	5		21	4
Redpoll		Common			2
Pine Siskin		15		15	24+
Goldfinch		10		10	18
White-winged Crossbill		2		2	0
Slate-colored Junco			3	3	0
Tree Sparrow		7		7	0
Fox Sparrow	1			1	0
Snow Bunting	30	5	3	38	0
	357+50	594+50	75	1026+100	1595+

\+ Common Species

Saturday morning 15 Old-squaws were seen flying a great distance from the shore at the mouth of the Cross River. Later that day a flock of approximately 250 was sighted offshore from Dr. Abbott's point. They were restless and did not remain in any one spot very long. A third flock of nearly 500 individuals was observed the same afternoon three miles south of Grand Marais in Good Harbor Bay. This flock was more sedentary and allowed closer observation. These three flocks made a total of nearly 750 birds.

Last year a flock of nearly 700 Old-squaws was located 300-400 yards offshore near the north boundary of Gooseberry State Park. They were first seen flying in a compact group close to the water. Mr. William Longley recorded the information in the table below.

Table 2

	Time Under	Time Up	Not Diving
	Sec.	Sec.	
1.	53	89	5+—
2.	54	46	1
3.	46	88	0
4.	54	52	0
5.	55	42	1
6.	57	36	0
7.	55	39	0
8.	54	53	0
9.	50	34	200
10.	50	41	20+—
11.	49	95	20+—
12.	50	70	0
13.	25	10	10
14.	45	34	10
15.	50		0
	(A few in 26 sec.)....		
16.	50	25	20+—
		45	
17.	40	30	0
18.	55	....	
19.	....	....	
20.	35	....	0
21.	30	....	0
22.	50	....	12
23.	35		

After the fifteenth recording, diving became very irregular and was no longer synchronized.

When engaged in diving, the entire flock disappeared at once as if following a leader, and they would come to the surface nearly a minute later still in a close group. It is truly remarkable how they can maintain their close formation under water. Apparently the birds which dove first were also the first to reappear. In nearly half of the instances recorded all of the birds were below the surface of the water at the same time. Other times only a few individuals remained above. The birds called continually when they were on the surface. A 50-60 second period of silence would be broken suddenly by their incessant chattering as they reappeared. It was very apparent why they are called Old-squaws.

When the bird club returned the next day they found a flock of nearly 700 Old-squaws near Two Harbors, which was probably the same group. An East wind had piled a great deal of ice along the shore and open water was at a minimum. The birds were very restless and stayed in one place only a few minutes.

American Golden-eyes were common all along the shore this year and were not courting as they were the previous year. Group B was very pleased to find a female Red-breasted Merganser Sunday afternoon. The bird was close to shore and did not mingle with the American Mergansers which were farther out. A 20 X telescope was used in observing her so there can be no doubt as to the correct identification.

Only one Goshawk was seen on the trip. Mrs. Lupient reported seeing this bird near Beaver Bay. Three Bald Eagles were noted, one near Hovland, one near Beaver Bay, and one at Castle Danger.

A Ruffed Grouse feeding on buds in the tree tops near the Cross River was the only record of this bird for the trip. Similarly our only record last year was a bird feeding on tree buds at dusk near Grand Marais. Although no pheasants were actually seen, members of Group C reported hearing a male crowing.

Although no Glaucous Gulls were seen this year a single bird was observed in a flock of 59 Herring Gulls at the mouth of the Stewart River last year. It was flying with the Herring Gulls but was somewhat removed from the group.

A single Horned Lark was tallied at Grand Marais feeding on weed seeds with a group of Redpolls and Purple Finches. Dr. Breckenridge found a Fox Sparrow near a feeding station at Star-of-the-North resort, a half-mile north of Schroeder.

The area between Grand Marais and the Pigeon River was more productive than any other area of comparable size as far as species were concerned. This area was particularly good for passerine species. Birds seen in this area only included White-winged Crossbills, Tree Sparrows, a Hudsonian Chickadee and a Norther Shrike. Birds seen in this area, but in other localities as well, included Pine Grosbeaks, Evening Grosbeaks, Pine Siskins, Goldfinches, Redpolls, Red-breasted Nuthatches, Ravens, Downy Woodpeckers, Canada Jays, Herring Gulls, Old-squaws, and Golden-eyes. The above observations bear out the fact that the area between the Pigeon River and Grand Marias is an excellent area in which to see birds. Our observations last year similarly point out this area as being good birding territory. Four Pine Grosbeaks were seen near Mineral Center. Three of them were either females or immature birds. The fourth was a male which was singing. Goldfinches, Redpolls, Pine Siskins, Downy Woodpeckers, and Golden-eyes were seen in the area at that time also.

A total of 32 species and well over a thousand individuals were observed in the three days spent there this year. Last year 21 species and over 1,600 individuals were seen in two days. For many. it meant species never seen before; for others, the interesting diving habits of the Old-squaws, the flocking Herring Gulls, and the scenery were interesting new experiences. The North Shore offers the opportunity to see many birds that are not found at any other time or place in Minnesota. To the person who is not afraid of snow and cold it gives an experience that is never forgotten.—**Minneapolis, Minnesota.**

Christmas Census 1948-1949

by

Dorothy Mierow

The Annual Christmas bird census for 1948 took place between December 25 and January 2 all over the country wherever there were bird enthusiasts interested enough to take the extra trouble of recording their data. These results for the country are being compiled by the national office for the Audubon Magazine. Here are some of the results of trips taken by members of the Minnesota Ornithologists' Union. These trips were made around Duluth, St. Cloud, the Twin Cities area and Apple River Canyon, Wisconsin. Winter birds seen by four or more of the six groups include the commoner birds one would expect to see at this time of the year - Ring-necked Pheasant, Hairy and Downy Woodpeckers, Blue Jay, Crow, Black-capped Chickadee, White-breasted Nuthatch, Starling, English Sparrow, Cardinal, Goldfinch and Slate-colored Junco.

As in other years, those groups which did their observing near the larger bodies of open water had the added advantage of seeing some water birds and a few typically spring birds which apparently wintered over were seen by members of the Duluth Bird Club, and the Minneapolis and St. Paul Audubon Societies. These three organizations report the largest number of species and individuals on their trips. In fact from their reports and from observations made by the Minnesota Bird Club on their North Shore trip, it appears that the Duluth area and North Shore are the best areas for observing winter birds.

It would be difficult to draw any conclusions from the information received from the six groups on the weather conditions, time spent in the field and the number of observers in each party, especially since the information given was rather sketchy in some cases.

Duluth Bird Club

Observations were made in the Duluth area including the North Shore to Ilgen City.

Minnesota Bird Club

Observations were made in the Cedar Creek Forest area, 35 miles north of Minneapolis on January 2 from 8:30 a.m. to 4:30 p.m. It was a clear to partly cloudy day with a maximum temperaturs of 30 degrees. The observers were: Meribeth Mitchell, Mrs. I. A. Lupient, Dr. W. J. Breckenridge, Lewis Barrett, Ken Morrison, Mr. and Mrs. Bill Clements, John Rehbein, Sam McIver, Mr. and Mrs. Jerry Paul, Theodora Melone, Elsie Hinchley, Ruth Self, Dorothy Mierow, Byron Harrell, Mrs. A. D. Corniea, Dr. W. R. Hiller, Dr. Dwain Warner, Harvey Gunderson and Bruce Hayward.

Minneapolis Audubon Society

This group went to Theodore Wirth Park, Thomas S. Roberts Bird Sanctuary, Minnesota River Valey, Nine Mile Creek on December 28 from 9:00 a.m. to 4:00 p.m. It was cloudy with a temperature of 33 degrees. The observers were: Lulu May Aler, Mrs. Scott F. Carmean, Mrs. M. W. Evans, Anna J. Johnson, Mrs. J. R. Magney, Florence Masser, Mrs. C. R. Nelson, Mrs. E. D. Swedenborg, Mrs. J. A. Thompson, Mrs. P. D. Tryon, Mr. and Mrs. William Urs, and Mrs. R. H. Wells.

St. Cloud Bird Club

The grounds of the U. S. Veteran's Hospital, the river and the quarries were visited on December 30 from 8:30 a.m. into the afternoon. It was —7 degrees and clear. Those who participated were Mrs. Davis, Mrs. Lehrke, Loretta Rosenberger, Monica Misho and Mrs. Beacom and Mr. H. Goehring in the afternoon.

St. Paul Audubon Society

This group went to McMenemy Bog, Lake Vadnais area and the Sewage Disposal Plant along the Mississippi.

Richard Straw, Norman Russell, Lloyd Spetzman and Horace Haskell made observations on December 30 at Apple River Canyon below Somerset—St. Croix, Wisconsin.

In the following table are summarized the numbers of each species observed by each of the census groups:

Species	Duluth Bird Club	St. Cloud Bird Club	Minnesota Bird Club	Minneapolis Audubon Soc.	Apple River Canyon Group	St. Paul Audubon Soc.	TOTAL
Mallard	1			13		5	19
Black Duck				2		1	3
American Golden-eye	89				7	45	141
American Merganser	1						1
Goshawk						1	1
Sharp-shinned Hawk	1						1
Golden Eagle			1				1
Bald Eagle	1						1
Sparrow Hawk				1			1
Chukar Partridge						7	7
Ruffed Grouse	5		5				10
Ring-necked Pheasant	2	4		66		7	79
Wilson's Snipe				1			1
Herring Gull	1110						1110
Glaucous Gull	4						4
Great Horned Owl	2					1	3
Snowy Owl	1						1
Barred Owl						2	2
Belted Kingfisher				1			1
Flicker	1						1
Pileated Woodpecker	1		1	1			3
Red-bellied Woodpecker				1			1
Red-headed Woodpecker					1		1
Hairy Woodpecker	12	3	3	10		3	31
Downy Woodpecker	66	2	2	22		4	96
Canada Jay	4						4
Blue Jay	20	5	15	51	3	10	104
Raven	17						17

Crow	2		17	3	1	2	25
Black-capped Chickadee	120	3	41	83	33	70	350
White-breasted Nuthatch	2	9	4	36	5	6	62
Red-breasted Nuthatch	45		3			2	50
Brown Creeper	1			4		2	7
Robin	10			1			11
Bluebird	4						4
Golden-crowned Kinglet	8						8
Bohemian Waxwing	25						25
Cedar Waxwing	10						10
Northern Shrike	1					1	2
Starling	285	14		37		90	326
English Sparrow	159	1000+	13	924		95	1000
Meadowlark				1			1
Red-winged Blackbird				15			15
Rusty Blackbird						14	14
Cardinal	3	4		35		8	50
Evening Grosbeak	89	2	4				95
Purple Finch				31			31
Pine Grosbeak	221						221
Redpoll	50	5	13				68
Pine Siskin	191		21				212
Goldfinch	3		35	1	1	3	43
Red Crossbill	6					2	8
White-winged Crossbill	2						2
Vesper Sparrow		2					2
Slate-colored Junco	12	9	4	194	1	60	280
Tree Sparrow			1	174		10	185
White-throated Sparrow		2					2
Snow Bunting	25						25
Totals—Individuals	2642	64+	183	1708	52	451	5100
Species	41	14	17	25	8	25	58

—Minnesota Museum of Natural History, Minneapolis, Minnesota

Editor's Note: The results of the census taken by the members of the Minneapolis Bird Club, which were received too late to be tabulated, are included below. These data were compiled by Mildred Snyder, Secretary, Minneapolis Bird Club—**D. W. W.**

Minneapolis, Minnesota (from Minneapolis, Camden Park, to Anoka, 20 miles, on both sides of the river banks and valleys 75%, open farmland 10%, willow marsh 5%, town suburb 10%).

January 2, 1949; 9:00 a.m. to 5:00 p.m.; Clear; temp. 20 to 25 to 20 degrees; wind WNW, 8-12 m.p.h.; ground covered with 6-8 inches of hard-crusted snow; all fresh water frozen except one mile of water below Coon Creek Dam.

Twenty-three observers in 3 parties. Total hours, 8; total miles 40 (20 miles along Mississippi River, 20 miles by car other side of river, stopping at 20 wooded and brushy spots along

the banks of the Mississippi River.) Golden-eye, 75; American Merganser, 1; Ring-necked pheasants, 48; Belted Kingfisher, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 9; Blue Jay, 18; Black-capped Chickadees, 41; White-breasted Nuthatch, 5; Brown Creeper, 1; Golden-crowned Kinglet, 2 (golden crown distinctly seen by Mrs. Henry Pratt); Cardinal, 6; Purple Finch, 1; Goldfinch, 50; Slate-colored Junco, 9; Tree Sparrow, 87. Total, 16 species; 386 individuals.

Observers: Major C. H. Snyder, Mildred Snyder, Edith Kees, Earl Kees, Mr. Fine, Jimmy Fine, John Pratt, Henry Pratt, Mrs. Henry Pratt, Michael Herz, Mr. Herz, Mrs. M. E. Herz, R. E. Rustand, Mrs. R. E. Rustand, Mrs. Victor Smith, Phillip Layman, Mrs. Phillip Layman, Mr. Bogren, John Futcher, Ruth Hopkins, Boyd Lien, Helen Towle, George Rickert.

A bird census taken Wednesday, December 29, 1948 by Milton Thompson, Dana Struthers, Lola Johnson, Judy Kees and John Futcher in the vicinity of Nine Mile Creek totaled 15 species and 137 individuals: Mallard, 8; Ring-necked Pheasants, 1; Barred Owl, 1; Short-eared Owl, 1; Hairy Woodpecker, 2; Downy Woodpecker, 2; Blue Jay, 8; Black-capped Chickadee, 11; White-breasted Nuthatch, 4; Starling, 1; Rusty Blackbird, 3; Cardinal, 1; Slate-colored Junco, 45; Tree Sparrow, 48; Song Sparrow, 1.

Amy Chambers reported birds seen on route to, and in, California on Christmas vacation, 1948: Cinnamon Teal at the city lake at Denver and many Sparrow Hawks, Mallards, kinglets, Coots, gulls, ducks (scaup), Wilson Snipe, Double-breasted Cormorant, Shovelers, Sandpipers, Western Kingbird, Canyon Wren and woodpeckers. She heard Western Meadowlarks, saw many humming birds, Canada Jay, Pintails, many American Egrets and California Quail.

Evelyn Behrens reported on birds seen in Texas on December 24-26, 1948, between Houston and Victoria, Texas. She saw blackbirds by the thousands; Bobolinks by the dozens; 12 Cardinals; 2 Sparrow Hawks; 6 Bluebirds; 12 shrikes; 1 buzzard; many meadowlarks; Crows by the hundreds, and many Killdeer.

The deadline for the June, 1949, issue of THE FLICKER is May 10, 1949. Book reviews are popular and make good space fillers. The Call Notes section is an excellent place in which various bird clubs and M. O. U. members may become better acquainted with one another's activities. Both are in need of more patronage. The editor would appreciate getting material early. Typewritten manuscripts should be double spaced. Refer to "Preparation of Copy for THE FLICKER", Vol. 19, June, 1947, Page 58

Seasonal Report

by

Mary Lupient

This winter was a very severe one in many parts of the United States. Freezing temperatures were recorded in Southern California and other parts of the South while extremely severe blizzards, cold, and an unusual amount of snow occurred in the Dakotas, Montana, Wyoming, Colorado, Nevada, Kansas and Nebraska. One blizzard followed another and highways were blocked for days creating hardship for live-stock, some of which starved. For several days a fleet of airplanes operated an air-lift carrying hay and food which helped save the lives of thousands of cattle. Bird life in the states mentioned above must have suffered to a considerable degree.

To the contrary, Minnesota enjoyed mild weather during December and the first part of January with very little snow and some rain. Cold weather and snow occurred during late January and the first part of February. Temperatures were below zero much of the time but the weather was about normal to date of this writing, February 21.

The weather was so mild during the late fall and early winter that some of the migrants remained throughout the season and there were late dates for many others. An Oven-bird lived in the yard at the home of Dr. D. E. Minnich, Minneapolis, for about two weeks prior to December 21, the latest date it was seen. A Fox Sparrow came all winter to a feeder at North Star Lodge, on the North Shore about 80 miles beyond Duluth. It was seen February 19 by Dr. W. J. Breckenridge. One was reported at Duluth February 8 by Dr. Olga Lakela. She sent two records of Flickers seen at Duluth also. Two Mourning Doves were reported south of Northfield January 8 by Mrs. Ruth Self, and Mourning Doves and a Bluebird were seen south of Afton February 4 by Albert Brown. The Golden Eagle recorded for the Christmas census at Cedar Creek Bog was still there February 6, according to word received from Mrs. Cora A. Corniea. Several observers reported about 30 Whistling Swans on Medicine Lake November 29. This is one of the few fall records for Whistling Swans in this area. Several Robins and a few Meadowlarks remained through the winter and, as usual, a large flock of Red-winged Blackbirds accompanied by a few Brewers Blackbirds and Rusty Blackbirds lived in the Minnesota River bottomlands near Minneapolis. Pine Grosbeaks in abundance wintered in northern Minnesota. They were reported at Duluth (Dr. Lakela), Woman Lake (Lyman Newlin), Eveleth (D. Beard), and along the North Shore to Pigeon R. by the Minnesota Bird Club. Red-breasted Nuthatches were also more common than usual in northern Minnesota.

Herring Gulls which commonly spend winters on Lake Superior were there in numbers this season. An Ivory Gull in sub-adult plumage was reported in Lake Superior by Dr. Lakela and, although this is a sight record, it is the first for the state. Another gull, as yet unidentified, which is one of two very similar species, was observed November 23, 1948, by Dr. W. J. Breckenridge and February 19, 1948, by the Minnesota Bird Club. This bird

was possibly the Western Gull. There was no possibility of collecting it but pictures were taken by Dr. Breckenridge and an identification may be made from them.

Ornithologists in general agree that in order to make an authentic first record of any bird, the specimen should be collected to make the record certain.

The Cardinal has extended its range much farther north this winter. It was reported at Duluth, Two Harbors, and one has been coming, to date, to a feeder in Grand Marais. Red Crossbills and White-winged Crossbills were recorded in several localities and as "common" in Duluth.

A census of the duck population was taken in and near the Twin Cities for the Regional Fish and Wildlife Service by Dr. W. J. Breckenridge. He was assisted by Mrs. Mary Lupient, A. C. Rosenwinkel, and Warren Nord. The count was made January 13, 1949. There were 391 Golden-eyes in open places in the Mississippi River above the Ford Plant, 273 Golden-eyes near the Sewage Disposal Plant, St. Paul, and 13 Mallards and two Black Ducks at Shakopee. Due to an unforseen circumstance the count at Shakopee had to be made before the ducks returned from feeding so the count there may not be accurate. On February 20 Golden-eyes in numbers were seen along the North Shore as far as Grand Marais. Old-squaws arrived in the harbor at Duluth during the latter part of November and about 750 were observed near Grand Marais February 20. A few American Mergansers and Red-breasted Mergansers remained through the winter on the Mississippi River in the Twin Cities and were reported along the North Shore also.

A summary of the Christmas census for the State appears elsewhere in this issue. It may be of interest to readers to compare it with the Christmas census taken by the Tunder Bay Naturalists Club at Port Arthur and Fort William. Fifteen observers traveled 145 miles by car and 17 miles on foot. The following species were listed: American Golden-eye 1, Ruffed Grouse 1, Herring Gull 421, Rock Dove 150, Downy Woodpecker 1, Canada Jay 1, Blue Jay 1, Raven 8, Crow 1, Black-capped Chickadee 48, Hudsonian Chickadee 1, Red breasted Nuthatch 13, Bohemian Waxwing 53, Cedar Waxwing 20, Starling 195, English Sparrow 1010, Evening Grosbeak 17 Purple Finch 16, Pine Grosbeak 538, Common Redpoll 228, Hoary Redpoll 1, Pine Siskin 39, Snow Bunting 5.—**Minneapolis, Minnesota.**

The annual meeting of the Minnesota Ornithologists Union will be held in Duluth on Saturday, May 21, 1949. The Duluth Bird Club, host for this meeting, has completed the following arrangements:

Registration	9:00 A.M.	Recreation Park, Minnesota Point
Field Trips	9:30 A.M.	Minnesota Point, Normanna, or North Shore for nesting Herring Gulls.
Luncheon	1:00 P.M.	Endion Methodist Church, 19th Ave. East and 1st Street
Business Meeting	2:00 P.M.	Endion Methodist Church
Evening Program		Open

NOTES OF INTEREST

MIGRANT DUCKS ON LAKE SUPERIOR—Those few hardy bird observers who visit the North Shore of Lake Superior in late fall, winter or early spring might be interested in my impressions of the general movements of the ducks on the lake at those seasons. I have maintained a cottage along the shore 17 miles northeast of Grand Marais for many years and for the last 8 years I have made this my permanent home.

In the fall the freezing up of inland lakes marks the first big influx of ducks to Superior. Strange to say, the first to arrive in any numbers are the Old-squaws, at least for the last 3 or 4 years, and about the same time come the White-winged Scoters. These usually arrive some time during October. Soon after these arrive, a good cold snap will bring the Mallards, Black Ducks and Scaups but these do not ordinarily stay very long. Still later, the American Golden-eye begin to arrive in small flocks. It is my guess that the earlier ducks come to the big lake when the shallow inland lakes first freeze but that the Golden-eyes go to the deeper inland lakes and stay there until these lakes also are frozen and they are forced out onto Superior. Formerly these Golden-eyes would arrive by the thousands but now by the dozens or at most by the hundreds. They appear or disappear throughout the winter according to the wind and the resulting shifting of the ice. A few Red-breasted Mergansers come in the fall and stay fairly late but very rarely remain through the winter. By late February and March the shore ice is apt to form well out from shore and then few ducks except the Old-squaws are in evidence. These birds, often in large flocks, occur along the edges of the ice fields. As large ice floes break off from the main mass these ducks like to drop into the water between the ice cakes to feed, perhaps attracted there by the quieter water.

In spring the American Mergansers are the first to arrive about the time the thickened shore ice begins to break up, usually in April, but sometimes in March. Close on their heels, the Red-breasted Mergansers show up and about the same time comes an increase in the Golden-eyes. Following these come the Scaups, Ring-necks, Holboell's Grebes and White-winged Scoters. Mallards and Black Ducks may show up any time after the ice is well broken up and drifted out, usually in April. Following them come the rest of the ducks which stay close to shore until the inland lakes open up. When this occurs the American Mergansers move inland to breed while a few Red-breasted Mergansers remain to nest along the rocky shores. A few pairs of White-winged Scoters often stay around even into July but I have no evidence of their nesting.

As to the relative abundance of the species arriving in spring, I would place the Golden-eyes first, then Pintails, Mallards and Black Ducks (about equal). The others in much smaller numbers are Green-winged Teal, Baldpates, Blue-winged Teal, Gadwall, Bufflehead, and Ruddy. Greater Scaups are not common while American and Surf Scoters and Hooded Mergansers are rare. I feel sure I have seen a small flock of Harlequins and also a group of 20 Barrows Golden-eyes. Canvasbacks, Redheads, Shovelers and Wood Ducks I have never encountered along the shore.—**W. P. Abbott, Grand Marais, Minnesota.**

Ed. Note. Minnesota Museum of Natural History collection contains 2 greater scaups, 4 old-squaws, 4 surf scoters, and 2 American scoters taken by Dr. Abbott near his place on the North Shore of Superior. His harlequin record is rendered plausible by the fact that a specimen of this species was taken along the North Shore in 1932. Although no Minnesota specimens of the species exist, several field identifications of Barrows golden-eyes in Minnesota support Dr. Abbott's record of this western duck.—**W. J. B.**

MOUNTAIN BLUEBIRD AT BEMIDJI—I happened to be driving through the grounds of the State Teachers College at Bemidji on Tuesday, March 15, 1949, when suddenly my wife exclaimed over a bluebird which flew up from a buckthorn hedge. The bird flew but a short distance and alighted, then soon returned to the hedge and for perhaps fifteen minutes I had opportunity to study it at close range with 9x35 binoculars. The plain neutral gray head and upper breast attracted my attention immediately and made me suspicious of its identity as an Eastern Bluebird. After examining it carefully and later referring to descriptions and the series of skins at the Minnesota Museum of Natural History, I am convinced that this was a female Mountain Bluebird. There is considerable variation in the amount of rufous on the upper breast in the Eastern Bluebird. Except in badly worn and bleached birds, however, at least a suggestion of this is present to contrast with the bluish gray sides and upper parts of the head. The evenness of the neutral tone both above and below in the head region of this bird together with the clean smooth preserved condition of the plumage led to its identification as the mountain species. No suggestion of spring weather had reached Bemidji at that time and well over a foot of snow remained in the area with the lakes still locked tightly in ice. Consequently the likelihood of an early Eastern Bluebird arriving as far north as this seemed very unlikely.

The fact that no one I contacted at the College had noticed the presence of this bird earlier in the winter discounted the possibility of its having wintered in the area. The nearby College heating plant, however, might have afforded it a sheltered retreat during the cold months. The fact that the majority of our records for the western thrushes, the Varied Thrush, Mountain Bluebird, and Townsend's Solitaire are winter records adds weight to this identification. **— W. J. Breckenridge, Minnesota Museum of Natural History, University of Minnesota.**

RICHARDSON'S OWL AT SEBEKA—Just after dark on February 6, 1949, the children were watching through the front window as some guests were leaving, when suddenly a bird fluttered around in front of the window and settled on a vine just at the side of the window. We flashed an electric lantern on it and discovered it was a small owl. It looked around for a few moments; then flew up under the eaves, hanging momentarily on the stonework; and then dropped back again onto the vine. The next morning I happened to be looking out of another front window when a bird hit the storm window and fell down into a vine with wings outstretched. Presently it came to and flew up onto a trellis about a dozen feet away where I noticed it had a dead mouse in its claws. It seemed very wide awake continually turning its head from side to side. I had never seen such an owl before but my guess is it was a Richardson's Owl. It was about 10 or 12 inches high and very shortlegged, grey with white spots on its head and back, and pale brownish beneath. I did not notice any ear tufts.—**C. O. Bjore, Sebeka, Minnesota**

Editor's Note: Mr. Bjore's description, although not conclusive, suggests strongly that his identification was correct. This owl occurs in winter in northern Minnesota and Sebeka would be well within the area where it might be expected.— **W. J. B.**

NOTES FROM DULUTH—Red-throated Loon. As usual the Duluth records of Red-throated Loons are made in June. In the summer of 1948, two full plumaged birds were observed in Lake Superior on the North Shore within the city limits on June 11 by Mrs. Harvey Putman, Miss Mary Elwell and the writer.

Pigeon Hawk. On June 11 a Pigeon Hawk was observed about the high cliff at East Beaver Bay from a fisherman's boat on the way to Beaver Island by the same group.

Pine Siskins. For a number of years young Pine Siskins have appeared on the terraces of the University of Minnesota campus in Duluth. In late July and early August more than thirty siskins in juvenile plumage were observed feeding on something in the roots of the close-cut grass. From curiosity I sat on the fender of my car to catch a glimpse of their food. The unsuspecting birds were feeding right at my feet, each extracting deftly the seeds from half-decayed samaras of American elms that line the boulevard of the campus.—**Olga Lakela, Duluth, Minnesota.**

FALL AND WINTER BIRD LIFE IN THE DULUTH AREA—The last of the shore birds (Killdeer, Golden and Black-bellied Plovers) were sighted at Minnesota Point at various times during the last two weeks in October. On the 18th of that month a large flock of Bonaparte's Gulls, with Ring-billed and Herring Gulls, were observed on Superior Bay. Along the grassy bay boulevard were feeding large numbers of Rusty Blackbirds back from their nesting grounds. It was the migration climax of Tree Sparrows, Juncos and many White-throats. On October 25 a record flight of Old-squaw ducks was observed. Golden-eyes were also observed among Mallards and Lesser Scaups feeding in the small lagoon on the bay side of the Point. There were scattered bands of Horned Larks, and the first flocks of Snow Buntings and Redpolls along the water front were feeding on fallen seeds in the sand.

American Rough-legged Hawks were observed in migration between November 7 and December 19, especially to the north at Palmer's area. At least one fine bird was saved by this observer by sounding the horn of the car as a passing motorist stopped his car to level a gun at the hawk perching on the roadside telephone wire, unsuspectingly scanning the ground with keen eyes, for mice. Red-tailed Hawks were occasionally sighted during the same period. On December 24 an adult Bald Eagle soared over Woodland Avenue in Hunters Park in Duluth.

Among the song birds, chickadees were fairly common and Pine Siskins numerous, but less common Pine and Evening Grosbeaks. Red and White-winged Crossbills have been sighted frequently in Duluth parks. The last observation of Goldfinches was November 7 at Palmer's, where they were associated with Pine Siskins and Redpolls. Pine Siskins were numerous in Encampment Forest on January 1, as were Red-breasted Nuthatches.

A remarkable pheasant population occurs on Minnesota Point. Their tracks mark the snow in thickets and along the sand ridge among junipers. On December 17, ten female birds crossed Minnesota Avenue at Oatka Beach. A study of the place revealed two more females and two males waiting to cross over to the other side where they all disappeared under a pile of branches. It is remarkable how they escaped the dogs running near the area.

One Crow on the Point was seen pestering the Great-horned Owl as usual on December 17. One Snowy Owl was observed on December 24. About one thousand Herring Gulls are wintering on Lake Superior between Duluth and Ilgen City where they are concentrated about fishermen's docks. Ravens were seen in northern St. Louis county and one was collected at Fish Lake on October 13. The number seen in Encampment Forest January 1 was surprisingly large. A flock of 17 passed over the trees in the region of the upper falls.

Less common were the winter ducks. The January count revealed only 41 American Golden-eyes scattered along the North Shore up to Ilgen City. In Duluth Harbor a flock of 20 was sighted the following day. A single American Merganser was the only other species of wintering ducks sighted.—**Olga Lakela, Duluth, Minnesota.**

EASTERN CARDINALS IN DULUTH—In the early fall Mrs. Harvey Putnam received a specimen of Eastern Cardinal shot at Two Harbors, Lake County, where several had been sighted. In early December Cardinals were first reported in Duluth by Mrs. R. M. Weaver, London Road area where the birds regularly appeared at the feeding station. The winter of 1948 makes the third offical record of the species in Duluth. The two previous records include those sighted in Fond du Lac by G. S. Stevens in 1931-32 where they appeared at the winter feeding station; and the winter months of 1939-40 in Woodland area at Duluth, seen by many observers.

The Cardinal, now a breeding bird and common permanent resident in southeastern Minnesota is extending its range northward, appearing first as a winter resident. It is hoped that it will become established as a breeding bird in northeastern Minnesota.—**Olga Lakela, Duluth, Minnesota.**

I HEAR THEM NOW—Each winter as I work over my botanical collections of the previous summer, copying labels and making exchange sets, the label legends bring back places, scenes and incidents along the highways and byways where the collections were made. It is like reading one's diary of date, numbered pages, but it is an unwritten diary between the lines of label data. It is then I hear them—the birds associated with plant habitats.

In the summer of 1948 my botanical excursions were centered in southwestern St. Louis County, in White Face and St. Louis River valleys, Floodwood, Meadowlands and Toivola areas. The road from Cotton to Toivola passes through long stretches of meadows, swamps and bogs, making necessary many stops for searching for plants. There was no time to follow the birds to their inviting haunts, but that 20th day of June I endeavored to keep a list of bird species in part of the county I had not previously seen. So now, as I copy the label, "No. 7555. **Carex chordorhiza,** from sphagnum-filled drainage ditch on Toivola road," I hear the Hermit Thrush and the White-throat within distant enclosures of clustering spruce in the miles of the Black Spruce bog before me; closer in the willows lining the drainage ditch sing the Veery, the Cedar Waxwing and the elusive Northern Yellow-throat.

While collecting in a meadow aflame with **Castilleja coccinea,** a loud, disturbing commotion burst forth in the woods across the road. It sounded like a violent shaking of a tree, but stopped immediately when I created counter commotion by banging the vasculum with my trowel. It could have been a bear. I hurried into my car; I am afraid of bears. From observations on that meadow I entered into my record Western and Eastern Meadowlarks, Savannah and Clay-colored Sparrows, Goldfinch, Yellow Warbler, Flicker, Killdeer, and along the roadside trees, Chipping Sparrows, Least Flycatchers, Tree Swallows, Robins and Bluebirds. Throughout the day in various collecting localities additional sight records were obtained, totaling fifty-five breeding species. In St. Louis River woods Sparrow Hawks and Broad-winged Hawks were sighted. Ten warblers of different species were seen. There is nothing unusual about the record; the species listed are common summer residents. As incomplete as the list must be, it gives a cross-section of summer bird life in western St. Louis Co. as seen from the highways.—**Olga Lakela, Duluth, Minnesota.**

IVORY GULL IN MINNESOTA—The finding of an Ivory Gull, **Pagophila alba,** in Lake Superior at French River is the first known record of this species in Minnesota. One bird in a flock of Herring Gulls was seen by this observer twice on December 27, 1948, in the morning and at sunset, on and about the fisherman's dock just beyond the French River bridge on Highway 61.

The Ivory Gull is notably smaller than the Herring Gull. The one seen at French River was in immature plumage, nearly white with dusky streaks across the primaries and a dusky area about the base of the bill, with black feet. The mature plumage is pure white, the feet remaining black. It is the only pure white gull with black feet.

The Ivory Gull is a bird of high latitudes of the Arctic Region and open polar seas of the eastern and western hemispheres. According to A. C. Bent's **"Life Histories of North American Gulls and Terns,"** the breeding range of Ivory Gulls includes northern Baffin Land, Melville and Prince Patrick Islands, and Spitzbergen and St. Joseph's Land. Rarely during winter migration the species wanders to lower latitudes. A record as accidental in the interior was made in 1887 at Toronto, Ontario (ibid. P. 35). An Ivory Gull was seen and collected on March 8, 1948, in Oconto Harbor, Wisconsin. (Passenger Pigeon 10 (2) : 73 1948). On the same day a sight record was made at Two Rivers harbor which seems to indicate that at least two birds of this rare arctic species had found their way to Wisconsin. The straggler at French River is here recorded in Minnesota on this sight record.—**Olga Lakela, Duluth, Minnesota.**

RED CROSSBILLS IN DULUTH—On Easter morning, March 28, 1948, I hiked around Minnesota Point. The lake beach was still under a barrier of ice worn into intriguing caverns, still deep pools, and canopied arches fringed with icicles, each terminating in a crystall ball, like man-made ornamental glassware. The dawn breeze, subdued to a murmur as it filtered through the pines, brought the raucous cawing of the Crows pestering the Great-horned Owl, and the song of the Prairie-horned Larks within enclosures of the concealing beach grass. But there was another song in the pines, a chorus of happy warbling not altogether unlike that of Purple Finches. A closer approach of the pines revealed a flock of thirty Red Crossbills, some full plumaged males, feeding in the clusters of cones of white pines. As they were feeding to their own accompani-

ment of delightful music, many seeds spiraled down to the ground into a snow-lined hollow in the sand ridge half encircled by juniper. Standing close to a pine tree I enjoyed the scene. The birds flew from branch to branch and some spying the fallen seeds, settled in the snow to feed. They were so close to me that I could have reached them with my hands. As the Easter sun swung out of the low hanging bank of clouds above the horizon, the full plumaged males caught its full splendor which out-rivaled the color of the rose hips edging the opposite rim of the snow-filled hollow. I quietly withdrew from the unforgettable scene.

On June 12 with the aid of Miss Mary Elwell, I identified a Red Crossbill feeding young in the same pine trees. It was the first nesting record of the species within the experience of this observer.—**Olga Lakela, Duluth, Minnesota.**

WINTER BIRD NOTES—Forrest Lee sends in the following notes on birds seen on his various trips in the region:

American Golden-eye—Forty-four were counted on the Mississippi River near Prescott, Wisconsin on February 4.

American Merganser—Seventeen were counted on the same day and at the same place as the Golden-eyes.

American Rough-legged Hawk—During January several were noted in Wadena County. On February 15 five were seen in Cottonwood County and on March 9 two were observed in Ottertail county near Fergus Falls.

Bald Eagle—An adult was seen on February 15 at the edge of open water of the Mississippi near Prescott, Wisconsin.

Spruce Grouse—Several were seen in the Red Lake Game Refuge near Norris Camp on March 1.

Pinnated Grouse—Prairie Chicken—A flock of at least 150 birds was seen on November 26 in a large slough area near Crow Wing River south of Cottingham Park in Wadena County.

Great-Horned Owl—One was noted in Carlos Avery Refuge on February 4.
Flicker—Two were seen together in the vicinity of a farmyard west of New Ulm on February 18.

Pileated Woodpecker—Two were noted in Ottertail County in hardwoods area known as Leaf Hills on March 9.

Red-headed Woodpecker—On February 15 a Red-headed Woodpecker was seen in a wooded area near Morristown, Minn. Another was seen on February 22 near Aldrich in Wadena County. Both were on roadside telephone poles.

Hairy Woodpecker—Single birds were seen on January 18 and 24 in a mixed hardwood-conifer stand in Wadena.

Downy Woodpecker—One was seen west of Windom in the hardwoods along the outlet of Heron Lake on February 15.

Horned Lark—One-hundred and seventy were tallied on a drive from Farmington to Windom on February 15. They were much more numerous in the southern third of this route. On February 23 a few were observed along roads in Wadena

County. None were seen on February 28 on a drive from Bemidji to Norris Camp in the Red Lake Refuge by way of Baudette. On March 2 only three Horned Larks were seen along the roads between Norris Camp and Grygla by way of Roseau. Wadena County was visited again on March 6 and this time Horned Larks were numerous along the roadsides.

Canada Jay—Canada Jays were seen in the conifers at Norris Camp and in a burn area a few miles from the camp on March 1.

Blue Jay—Blue Jays were noted on several farms in January in Wadena County. They usually stayed in the woodlots near the barnyards and made regular trips to corn cribs and corn stacks.

Raven—Two Ravens were seen on March 1 near Norris Camp at the Red Lake Refuge.

Crow—On February 4 two were noted in Carlos Avery Refuge Area and later six were seen flying over the Mississippi near Prescott, Wisconsin. Forty were tallied in Cottonwood, Brown, and Redwood counties on February 15, 16 and 17. None were seen on the trip from Bemidji to Norris Camp and back to Bemidji by way of Roseau and Grygla from February 28 to March 4.

Black-capped Chickadee—A group of five Chickadees and two White-breasted Nuthatches was observed several times in January in a dense Jack Pine woodlot in Wadena county. Another group of Chickadees seemed to be staying in a balsam-spruce stand in the same locality. On February 15 a single bird was seen in the hardwoods along the outlet of Heron Lake west of Windom. On February 17 two were noted in a woodlot of conifers in Redwood county.

White-breasted Nuthatch—Two were noted in a group of Chickadees as mentioned above.

Red-breasted Nuthatch—Two were seen at Norris Camp.

Starling—On February 15 and 18 one was noted near Faribault and on the later date three were seen in Redwood County and five seen near Faribault.

Meadowlark—One was noted near Madelia on February 15 and on this same day two were seen near a farmyard at Windom. On February 18 two were observed near New Ulm.

Evening Grosbeak—Four were seen in Wadena county on January 20.

Redpolls—Redpolls were numerous in Wadena county during January. Sometimes flocks of at least 500 birds were seen. On February 15 a flock of approximately 500 Redpolls was noted near Faribault and on the same day 15 birds were seen at the Talcott Lake Refuge in Cottonwood county. Large numbers of these birds were seen on a trip from Bemidji to Norris Camp and back to Bemidji by way of Roseau and Grygla from February 28 to March 4. One bird observed at close range at Norris Camp appeared to be a Hoary Redpoll.

Snow Buntings—Numerous in Wadena county during January but not as abundant as the Redpolls. A flock of about 25 was seen near Faribault on February 15. They were frequently seen on the previously mentioned trip to Bemidji and Norris Camp from February 28 to March 4 but they were not nearly as abundant as the Redpolls.—**Forrest Lee, St. Paul, Minnesota**

CALL NOTES

South Dakota Ornithologists' Union was organized at Sioux Falls, South Dakota, on January 15, 1949. As stated in the constitution, "Its aim shall be to encourage the study of birds in South Dakota and to promote the study of ornithology by more closely uniting the students of this branch of natural science."

Herman F. Chapman, Sioux Falls, was elected President and Dr. Gerald B. Spawn, State College, Brookings, is the Vice President of the new Union.

A quarterly publication, **South Dakota Bird Notes**, was provided for and E. R. Lamster, Pierre, was elected editor. The first issue will come off the press about April I.

This new Union should add much to the study of bird ilfe.—**S. C. H.**

* * * *

Dr. Ernst Mayr, Curator of the Whitney-Rothschild Collections in the American Museum of Natural History in New York, is a guest lecturer during the spring quarter in the Department of Zoology at the University of Minnesota. Dr. Mayr, one of the outstanding systematists and evolutionists of today and author of the book. "Systematics and the Origin of Species," is lecturing on speciation and related problems in evolution.

* * * *

Byron E. Harrell is now in the hot, tropical lowlands of southern Tamaulipas, Mexico, where he is making an intensive study of the bird life near the headwaters of the Rio Sabinas.

Miss Meribeth Mitchell is continuing the bird population studies in Cedar Creek Bog which were begun last year by Byron Harrell. This research project, a part of the field program of the Museum of Natural History, is a comparative study of the breeding populations in two distinct forest types in the Cedar Creek area.—**D. W. W.**

* * * *

Owatonna bird enthusiasts have recently been given quite a lift by a splendid gift of a bird collection of several hundred specimens newly installed in the public library. Mr. H. J. Jager, who donated the collection to the city of Owatonna, has had as a hobby for many years the raising of wild geese on his farm on the outskirts of the city. Another closely allied hobby was the mounting of birds and over the years he had gathered a collection representing a fair share of the local birdlife. The collection is now housed in well built flourescent lighted cases in the ground floor of the library building. Mr. Jager has always had a liking for youngsters and certainly has a knack in handling them. With his willingness to talk to groups about his collection it seems that Owatonna is due for an upswing in youngster interest in birds. Mr. Jager has set a fine example. It would be a splendid thing if more such collections hidden away in private hands could be given to public institutions where more could profit from their use.—**W. J. B.**

BOOK REVIEW

BIRDS OVER AMERICA by Roger Tory Peterson. Dodd, Mead and Company, 1948. 342 pages, 78 photographs. $6.00.

Birds Over America is a book which I would recommend not only to both amateur and professional ornithologists but also to the general public. So well does Roger Tory Peterson carry the reader along with him on his varied field expeditions, that even a person with no previous background in bird study will put the book down with reluctance.

Besides being entertained by the countless humorous field anecdotes which the author has included from his varied experiences, the reader has presented to him very clearly the conservation problems which today face the American citizen. In a chapter called "Trailing America's Rarest Bird", he describes the fight which we apparently have already lost to save the Ivory-billed Woodpecker from extinction. In other chapters he tells of the current battle to save the Whooping Crane, the California Condor and others from a similar fate. He does not "preach," however. These facts are brought out incidently in connection with his visits to various refuges.

A chapter certain to amuse the reader is termed, "Deceiving the Experts". Among the anecdotes reported here is one concerning William Vogt's efforts to determine whether or not the male Yellow-throat can recognize visually the female. A male Yellow-throat started courting a none-too-well-stuffed female bird. After several days, Vogt pasted a black mask on the female's face. Returning to resume relations, the male Yellow-throat noticed the black mask on the other bird's face. Seemingly completely mortified, he bounced a full two feet in the air and dashed away never to be seen again. The answer to Vogt's original question was obvious.

By describing his trips to many of the very best (and in some cases little known) refuges in the country, Peterson gives first-hand information as to the best time to arrive, what to expect, and what he himself saw. With a book such as this, one could profitably spend a vacation traveling from one refuge to another.

One finds many excellent thumb-nail sketches of other eminent ornithologists through the author's wide acquaintance with them.

Having done most of his "birding" in the east, the author very aptly describes the "Big Day" during the spring migration in such places as Washington, New York's Central Park and other well-known localities. Also described are the elaborate preparations made for the Christmas census in order not to miss a single bird. A general could not work out his strategy more carefully than did Peterson and his cohorts.

The excellent photographs deserve special mention. They were culled from more than ten-thousand prints taken by the author over a period of twenty years. In a photographic postscript he describes the equipment he uses and adds a few practical hints for the amateur.

Another real help to the reader is the complete index which makes it possible to refer quickly and easily to any of the numerous and varied points brought out in the book.

Many more outstanding features could be noted, but to those already familiar with Peterson's **Field Guide to the Birds**, it should suffice to say that his latest book is in its own way comparable in excellence and in every other respect to his already classic guide. —**Meribeth J. Mitchell, Museum of Natural History, University of Minnesota.**

"AFFILIATED SOCIETIES" (continued)

RANGE NATURALISTS' CLUB

Officers: President, Mrs. Dorothy Beard; Vice President, Jalmer Halunen; Secretary, Vera F. Barrows; Treasurer, Ruth Ambrose.

Meetings are held the third Thursday of each month, October through May at 7:00 p. m. in the Clubrooms of the Virginia Public Library.

DULUTH BIRD CLUB

Officers: President, Mr. O. A. Finseth; Vice President, Ralph Boeder; Secretary, Miss Helen C. Smith; Treasurer, Miss Mira Childs.

Meetings are held the second Thursday of each month at the Duluth Branch, University of Minnesota.

Minnesota Ornithologists' Union
Affiliated Societies

CLOQUET BIRD CLUB

Officers: President, Miss Dorothy Wassen; Vice President, Miss Ruth Johnson; Secretary-treasurer, Miss Edith Sanford.

Meetings are held the first and third Thursday of each month in the Cloquet High School at 7:30 p. m.

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 the first Friday of each month at 2 p. m. at the Walker Branch Library. Field trips during April and May on Tuesdays and Fridays.

MINNEAPOLIS BIRD CLUB

Officers: President, George Rickert; Vice President, Mrs. Preston Haglin; Secretary, Mrs. Mildred Snyder; Treasurer, Mrs. Edith Kees.

Meetings are held the first and third Tuesdays of each month at 7:30 p. m. at the Minneapolis Public Library Museum.

MINNESOTA BIRD CLUB

Officers: President, Harvey Gunderson; Vice President, Miss Theodora Melone; Secretary, Mrs. Mary Lupient; Treasurer, Byron Harrell.

Meetings are held the first Wednesday of each month, except June, July, August, and September, at 8:00 p. m. at the Minnesota 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 the first Wednesday of each month from October through March in the committee room of the public library at 8:00 p. m.

T. S. ROBERTS ORNITHOLOGICAL CLUB

Officers: President, Miss Mavis Scott; Vice President, Robert Fox; Secretary-Treasurer, Miss Dolores Olson; Advisor, G. W. Friedrich.

Meetings are held bi-monthly February through May at the St. Cloud State Teachers College.

ST. PAUL AUDUBON SOCIETY

Officers: President, Leonard C. Lustig; Vice President, Dr. Vernon L. Whipple; Treasurer, Marvin H. Adams; Corresponding Secretary, Miss Dorothy Sundry; Recording Secretary, Mrs, Charles E. Hart; Directors-at-Large Mrs. Arthur H. Savage, J. M. Rice.

MANKATO AUDUBON SOCIETY

Officers: President: T. E. Thomson; Vice President, Mrs. H. B. Elford; Secretary, Miss Libbie Williams; Treasurer, Miss Martha Cunrath; Directors, J. George Lynch and Dr. H. Bradley Troost.

Meetings are held the first Thursday of each month (except July, August, and September) at Mankato State Teachers College.

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THE FLICKER

VOLUME 21 JUNE, 1949 NUMBER 2

Cover Type Use of the Ruffed Grouse In Relation To Forest Management on the Cloquet Forest Experiment Station*

by

Lester T. Magnus

Part I

INTRODUCTION

This report is based on an analysis of past records of the occurrence by cover types on the Cloquet Forest of the Ruffed Grouse (**Bonasa umbellus**). Included in the text of this report are the following: 1. A description of the forest by cover types. 2. A discussion of the relative use of each cover type by the grouse. 3. A discussion of the differences in the relative cover type use between the Cloquet Forest and other parts of the grouse's range.

During the preparation of this report the author became aware of many deficiencies in the ecology both of the Ruffed Grouse and of its habitat in northern Minnesota. Little is known of the immediate and later effects of forest cutting on animal populations; little is known of when a habitat through ecological plant succession first becomes favorable for an animal and later unfavorable; little is known of the effect of the smaller animals in either increasing or decreasing the rate of ecological plant succession on an area; little is known of the kinds amounts, and availability of various foods and their relative importance to wildlife. It will be only when answers to these and other questions are learned that all of the true reasons for cover type use will be known.

I wish to thank the many individuals, known and unknown, who assisted with this report, especially the following: Professors W. H. Marshall, J. H. Allison, R. M. Brown and H. L. Hansen; and my wife, Marion.

Description of the Cover Types

The forest was divided into 16 cover

* This paper is part of a major report submitted to the faculty of the School of Forestry, University of Minnesota, June, 1949, in partial fulfillment of the requirements for the Master of Forestry Degree.

types for the purposes of this report; (1) aspen; (2) aspen-birch; (3) upland brush; (4) upland conifer-hardwood; (5) jack pine; (6) Norway pine; (7) mixed pines; (8) tamarack; (9) lowland brush; (10) lowland conifer-hardwood; (11) lowland conifers; (12) spruce-tamarack; (13) open; (14) muskeg; (15) hardwood slashings; (16) coniferous slashings.

Not all the cover types used would be considered forest cover types in the usual sense, but they do fit the needs of this report. Some are a result of a combination of cover types as given by Allison and Brown (2) such as conifer-hardwoods, a combination of conifer-hardwoods and balsam-hardwods, or the setting up of new types such as coniferous slashings. No attempt has been made to break down the types by age or size classes, as the field data available did not record this adequately. Areas of the types were obtained from Allison and Brown (2) with adjustments to meet the requirements of the study; explanations of the areas and type adjustments will be given in the brief descriptions of the types. All types descriptions given are from Allison and Brown (2). (See Figures 1, 2 and 3 and Table 1).

Aspen—The aspen stands are practically pure even-aged stands less than 50 years or age. The older stands tend to be invaded by conifers and will gradually change to conifer-hardwood type.

The ground cover in the denser stands usually consists of herbaceous plants only. Kittredge (19) lists the following shrub and ground cover species as being the most common in Minnesota and Wisconsin aspen stands:

Shrubs

Mountain Maple
Speckled Alder
Service-berry
Beaked Hazelnut
Bush Honeysuckle
Pin Cherry
Choke Cherry
Roses
Willows
Blueberry

Ground Cover

Wild Sarsaparilla
Aster (**Aster macrophyllus**)
Clintonia
Bunchberry
Strawberry
Wintergreen
Grasses
Club Mosses
Canada Mayflower
Bracken
Star Flower
Violets

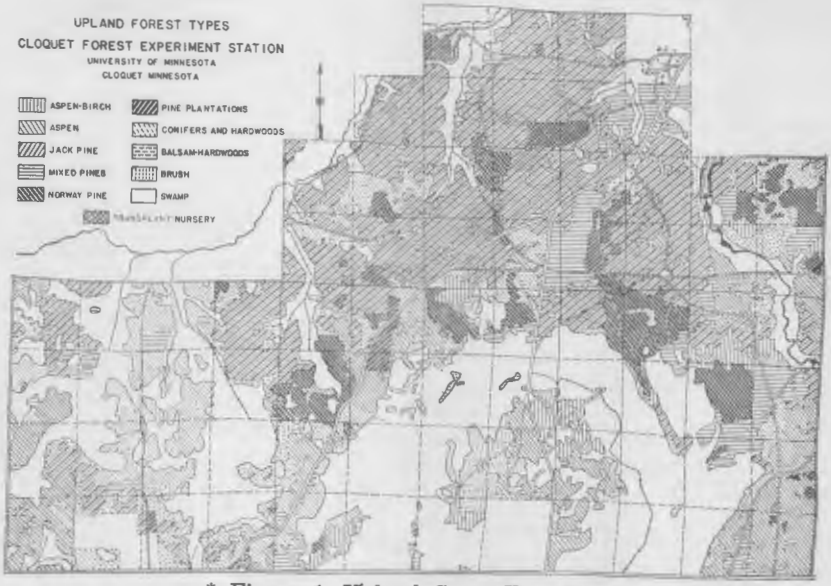
The area of the type for this study was set at 238.6 acres. A total area of 249.3 acres is given from which 10.7 acres have been removed by cutting through 1946.

Aspen-birch—In the 70.8 acres in this type birch makes up about 50 percent of the volume. This type is being more definitely invaded by conifers than is the aspen type, and in time will be converted to conifer-hardwood. Most of the type is less than 50 years of age.

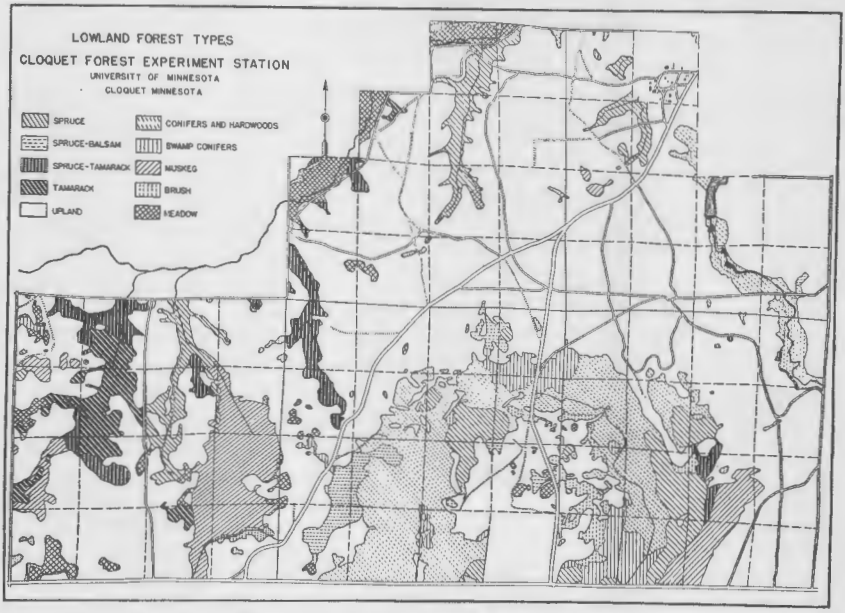
The ground cover in this type is composed of herbaceous plants similar to those in the aspen type. Shrub growth also is similar, though where alder and hazel occur they are much more vigorous.

Upland brush— The upland brush type includes 42.0 acres dominated by hazel.

Conifer-hardwood— This type of 428.6 acres is for the purposes of this report a combination of the conifer-hardwood type of 364.5 acres and the balsam-hardwood type of 64.1 acres.



* Figure 1. Upland Cover Type Map.



* Figure 2. Lowland Cover Type Map.

* Reprinted from Allison and Brown (2) with permission of the publisher.

The type is a temporary mixture of aspen and birch with jack, Norway and white pines on the lighter soils, and with spruce and balsam on the heavier soils. On the lighter soils the birch tends to be less important than aspen, but assumes a position of equal importance on the heavier soils. These stands tend to be a transition type as they are continually changing. Where the hardwoods are invading an overmature jack pine stand, the hardwoods are increasing; where the mixture is one of hardwoods with spruce and balsam, the conifers are increasing, especially the balsam fir. About 180 acres are classified as uneven-aged, while the remaining 248 acres are even-aged, mostly in the 30-60 year age classes.

In the more open portions of the stands hazel has become established in dense thickets while similar thickets of alder are also found on the lower areas. Where the stand is denser, asters, grasses, honeysuckle and dogwood form the ground cover.

Jack pine—This type makes up the largest single type area on the forest being 596.2 acres after deducting the areas cut through 1946 which totalled 105.9 acres. Pure stands are those in which jack pine makes up 75 per cent or more of the volume. Most of the stands are pure and even-aged with almost all the acreage in the 30-70 year age classes.

Ground cover is non-existent in the dense young stands, but as the stands become older, the density of the canopy decreases by natural thinning to the point where ground cover species such as sweetfern, blueberry, trailing arbutus and wintergreen, and other tree species such as Norway pine and black spruce establish themselves. Hazel, pin cherry and juneberry are present where moisture is sufficient. Hansen (13) noted that the following shrubs and ground cover species were most common in plots taken in the jack pine stands:

Shrubs

Red Maple
Service-Berry
Beaked Hazelnut
Bush Honeysuckle
Pin Cherry
Roses
Blackberry
Prairie Willow
Blueberry

Ground Cover

Anemone
Pussy's Toes
Sedge (Carex pennsylvanica)
Bunchberry
Trailing Arbutus
Strawberry
Wintergreen
Grasses
Twin-flower
Club Mosses
Canada Mayflower
Bracken
Shin Leaf
Star Flower
Violets

Norway pine—This type is now 112.4 acres with about one-fourth in second-growth even-aged stands up to 70 years of age. The remaining three-fourths is virgin timber over 100 years of age. A considerable area of Norway pine advanced growth is coming in under jack pine stands, slowly converting these areas to Norway pine.

In the oldest stands hazel is so dense that natural and artificial regeneration have failed. Hazel, blueberry, and honeysuckle form a brush understory in drier areas and alder in the moist areas. Wintergreen and grasses are among the ground cover species.

Mixed pines—Pine plantations of 41.6 acres which may be considered a

phase of the mixed pine type were included in the 189.5 acres composing the type area. Old growth dominated by Norway pine composes 32 acres; with the remainder in second growth stands three-fourths of which is even-aged and one-fourth of which is all-aged in mixtures of jack, Norway and white pines with a scattering of aspen and birch. One species does not dominate, but everywhere white pine occurs in the smallest numbers. The pine plantations are made up of Norway, Scotch and white pines up to 40 years of age.

The younger stands especially in the plantations are too dense for brush to develop, although hazel has created a serious problem in the older more open stands. The ground cover consists of bracken fern, blueberry, wintergreen and sweetfern in the openings.

Lowland brush—This type of 131.2 acres is a combination of the lowland brush area of 62.4 acres dominated by alder, but containing willows and bog birch; and the meadows which are now mostly covered with willow brush.

Lowland conifer-hardwood—This is the most extensive of the lowland types with an area of 283.0 acres. The uneven-aged type composition varies considerably, with small areas of some stands almost pure black spruce. The stand is composed of balsam fir, black spruce, northern white cedar, white birch, black ash and scattered yellow birch.

Dense thickets of mountain maple, hazel, or red-osier dogwood and blueberry occur in the openings with a scattering of highbush cranberry. Sphagnum is present everywhere.

Lowland conifer—The spruce, spruce-balsam and swamp conifer types have been combined into a lowland conifer type of 259.9 acres for this report. All-aged pure black spruce stands cover 163 acres. The spruce-balsam type of 39 acres is a result of the larch sawfly infestation which eliminated the tamarack. The swamp conifer type of 58 acres is a constantly varying mixture of black spruce, balsam and northern white cedar.

In the denser stands no underbrush is present though sphagnum is everywhere. In the more open stands alder is present in all the component types, often in dense thickets. Red-osier dogwood associates with the alder in the spruce-balsam component, and Labrador tea and leatherleaf with the alder in the spruce.

Spruce-tamarack—This type of 74.4 acres is composed of approximately equal volumes of spruce and tamarack. Uneven-aged stands cover 15 acres or 20 per cent of the type, the remaining 80 per cent being even-aged and up to 100 years of age.

Ground cover is sphagnum everywhere and in the more open stands are alder, leatherleaf and Labrador tea.

Tamarack—This type is composed primarily of pure stands of tamarack although some black spruce is always present. The stands in this type are even-aged up to 80 years of age. Formerly this type occupied a much greater area than its present 77.2 acres, but the larch sawfly epidemic killed much of it.

In the more open stands considerable alder, willows, bog birch, leatherleaf, Labrador tea and sphagnum form the underbrush and ground cover.

Open—This type of 53.5 acres is composed of 44.8 acres of cleared land mostly in cultivated fields, 5.0 acres of beaver pond and 4.0 acres of open upland.

Muskeg—This type including 143.7 acres is either treeless or covered with

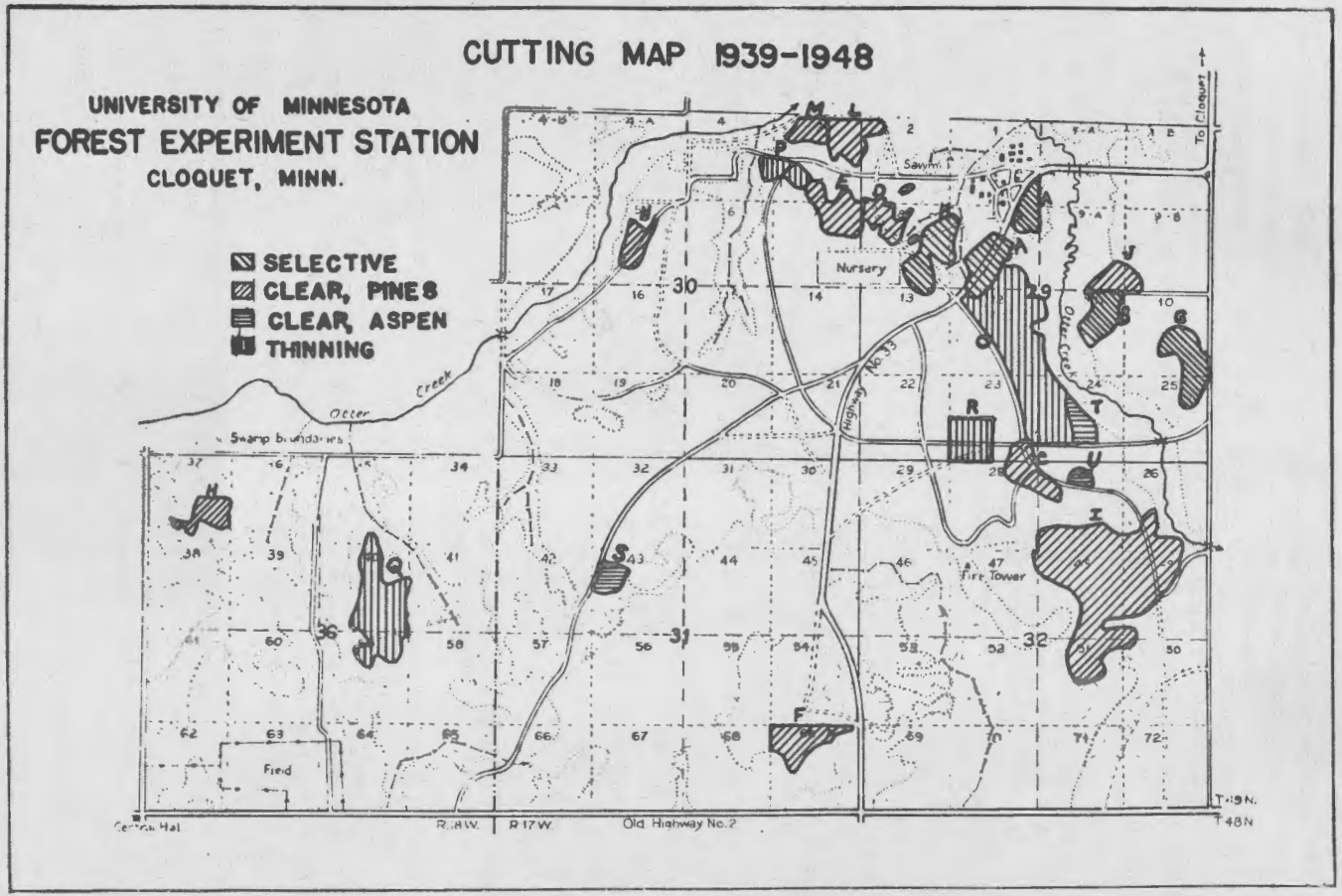


Figure 3. Cutting Map 1938-1948. (Scale: 2 inches equal-1 mile).

Map by J. H. Allison (1949)

small stunted black spruce and tamarack. The proportion of tamarack has increased markedly during the past ten years. Also jack pine has appeared in a very limited way.

Ground cover is leatherleaf, swamp laurel, bog birch, blueberries and cranberries.

Hardwood slashings—This type is a result of three small cuttings in the aspen type from 1941 through 1946. Ten and seven-tenths acres were clear cut and are now regenerating by suckers. Ground cover includes various plants such as asters, strawberries, bunchberries, grasses and sedges.

Coniferous slashings—This type is a result of logging in the older jack pine stands from 1939 to 1946. A total of 105.9 acres was cut during that period mostly in small irregularily shaped blocks. Varying degress of regeneration have taken place naturally and artificially.

Ground cover in the cutting consists of some or all of the following: grasses, sedges, sweetfern, wintergreen, blueberries, raspberries, blackberries, roses, hazel, juneberries, pin cherries, honeysuckle, willows, chockecherries, aspen, birch, jack pine, Norway pine, and white pine as reported by Berklund (3).

TABLE I

Cutting Map Key

Symbol	Year	Area	Species	Cutting Age	Type Cutting
A	1939-1940	9.1 acres	Jack pine	.....	Selective
B	1939-1940	6.5 acres	Jack pine	.....	Selective
C	1939-1940	11.2 acres	Jack pine	80+	Clear
D	1940-1941	6.1 acres	Jack pine	70	Clear
E	1941-1942	11.7 acres	Jack pine	70	Clear
F	1942	9.0 acres	White pine	100+	Clear
G	1942-1943	8.4 acres	Norway pine	120+	Selective
H	1943-1944	6.1 acres	Jack pine	70	Clear
I	1944-1945 1945-1946	35.0 acres	Jack pine	100+	Clear
J	1945-1946	5.0 acres	Jack pine	70+	Clear
K	1941-1942 1946-1947	6.2 acres	Norway pine	140	Selective
L	1946-1947	13.2 acres	Jack pine	70	Clear
M	1947-1948	3.9 acres	Jack pine	70	Clear
N	1947-1948	3.2 acres	Jack pine	70	Clear
O	1935-1936	.....	Jack pine	40	Thinning
P	1942-1943	3.5 acres	Norway pine Jack pine	.....	Thinning
Q	1945-1946 1947		Birch	.....	Thinning
R	1948	10.0 acres	Mixed pine	.....	Thinning
S	1941-1942	5.5 acres	Aspen	.....	Clear
T	1942-1943	2.5 acres	Aspen	.....	Clear
U	1945-1946	2.7 acres	Aspen	.....	Clear

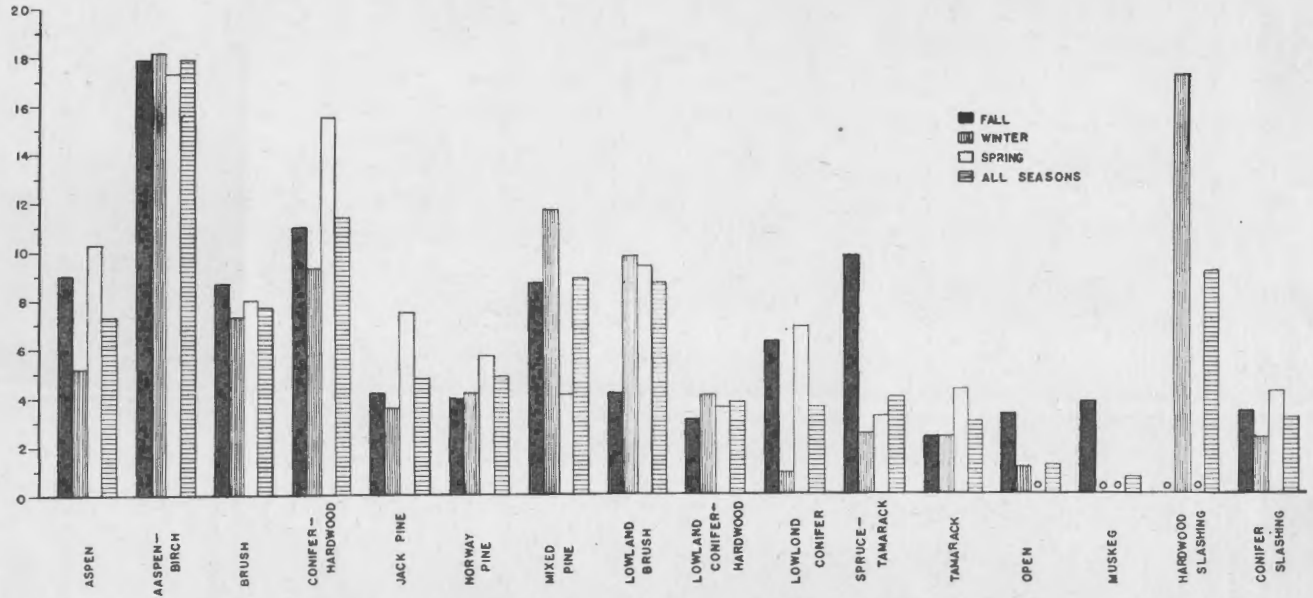


Fig. 4. Relative Cover Type Use by Season on the Cloquet Forest Experiment Station.

Birds Per Unit Area—%

Cover Type Use

The data used were subject to great variations and limitations. Some of the more important were observers, time, and details not recorded. No attempt has been made to analyze the data statistically because of the above-mentioned variations and limitations.

There was considerable variation in the training and experience of the observers which may have induced inconsistencies in reporting the data. Much of the data was obtained from wildlife report slips turned in by the forestry students working on their compartments; some of it was from census studies done by the forestry and wildlife management students using the King census method; and and some of it was obtained from a Master of Science thesis by Hunt (15). These sources of data are all subject to personal judgement differences in reporting the cover type.

The data were gathered during nine years of an eighteen year period with the nine years not evenly distributed over that time. Data were available for 1931 and 1932; 1940 through 1942; and from 1946 to the present. The data used were distributed by season and year as shown in Table 2.

Among the details not recorded at all or lacking in sufficient quantity that place limitations upon the use of the data available were: (1) weather data as to temperature, wind direction and velocity, cloud condition and precipitation; (2) cover type data as to stand age, tree diameters, density, understory-species and densities, ground cover species and densities; (3) food study data as to species, availability, preference and use; and (4) time of day when grouse were flushed. This lack of recorded data severely limits possible discussion of reasons for use or non-use of various cover types.

In order to give a clearer understanding of the importance of the various cover types a rating system was devised that expresses the relative cover type use by Ruffed Grouse This rating system was based on per cent birds per unit area of type which means that if all the types were of equal areas a certain per cent of the grouse would be seen in each type. The number of observations reported for the type is divided by the type area to give a birds per unit area figure. When this is obtained for each type, it is totaled. The total is used to divide the individual type birds per

Table 2

Season and Year in Which the Field Data Were Collected

Year	Number of Observations			
	Fall	Winter	Spring	All Seasons
1931	71			71
1931		141		141
1940			29	29
1941		35		35
1942		49		49
1946	7		36	43
1947			45	45
1948	23		73	96
1949		23		23
Total	101	248	193	542

unit area figures to give per cent birds per unit area. For example in Table 7 for aspen 54 birds were seen on 238.6 acres which gives a birds per unit area figure of .226. The total birds per unit area figure is 3.08. This is used to divide .226 to give the per cent birds per unit area figure of 7.3 per cent.

Four classes were selected to indicate the relative variations in cover type use based on per cent birds per unit area of cover type. **A**—highest use, 9.0 plus per cent; **B**—high use; 6.0-8.9 per cent; **C**—medium use; 3.0-5.9 per cent; **D**—low use, 0.0-2.9 per cent; (all per cents used hereafter are per cent birds per unit area). For example the aspen-birch type with 17.9 per cent birds per unit area is in the A highest use class for ranking of all seasons; the lowland conifer-harwood type has a C medium use rating of all seasons with 3.8 per cent birds per unit area.. An interpretation of the use of each cover type on the relative rating scale will be given. Also an attempt will be made to give possible reasons for usage or non-usage of some types (see Figure 4 and Tables 3, 4, 5, 6, and 7).

Aspen—This type was given an **A** rating for the fall and spring seasons. In the winter the type dropped down to a **C** medium use rating. The rating for all seasons studied was a **B** high use.

Possible reasons for the **A** rating obtained in the fall and spring may be its value as a food producing type. In the fall buds and leaves are consumed, and in the spring buds and catkins are eaten as they are among the earliest of green vegatation to appear. Brown (4) states that in Maine aspen is the most important single year around food being of first importance in the winter and spring. In writing of the principal fall and winter foods of Ruffed Grouse in Michigan and Wisconsin Trippensee (22) states that aspen leads in both states. The **C** rating in the winter that was received in spite of its great value as a source of food may be due to lack of coniferous shelter, as young aspen stands tend to be very pure.

Aspen-birch—This type was given the **A** highest use rating for all seasons and in the three seasons. It received a per cent rating very nearly doubling the required 9.0 per cent needed to reach the **A** rating for all seasons. This type obtained a higher use per cent than any other type for all seasons showing that the Ruffed Grouse have a decided preference for it. This preference was consistent throughout the three seasons studied varying less than 0.9 per cent in 18.0 per cent.

It may be possible to explain the high rating obtained when the species making up the type are considered for their food value. Darrow (8) says aspen is the most important food in all New York except for the Catskills where it is second to birch; and birch is the second most important food in all of the state except the Catskills where it is the most important. Bump et al. (5) in New York lists aspen first and birch second as the results of an 11 year study from 1931 to 1941. This type also tends to have a few scattered conifers occasionally which furnish shelter to make the type more attractive. Another possible explanation is that it occurs in small pockets in other types such as conifer-hardwoods which furnish available shelter.

Brush—This type was given the **B** rating for various seasons and also for the total of all seasons.

Brown (4) in Maine states that hazel furnishes more grouse food than

any other shrub and was placed second to aspen in importance as year around food with 9.9 per cent by volume as compared with 34.7 per cent for aspen. Catkins were utilized mostly and buds were taken freely, but not fruit. It is significant that Brown reported hazel of universal importance as food in all cover type with the amount taken in proportion to its availability. Hazel leads all foods for fall with 14.8 per cent by volume which may explain the slightly increased use during that season.

Conifer-hardwood—An **A** rating for all three seasons and the total of all seasons was indicated by rating table. This type, which is second in type area, is second in the ratings for all three seasons and for the total of all seasons, except for winter, when it is fourth with the mixed pine and the hardwood slashing types in addition to aspen-birch surpassing it. Considerable variation in the use of the type from season to season was shown by the data available. Fall with 11.0 per cent most nearly agreed with the rating for all seasons of 11.4 per cent, while the winter data showed a loss to 9.3 per cent. Spring with 15.5 per cent had the greatest usage being considerably above any other season.

This type with the open type could furnish almost everything an adult Ruffed Grouse needs in the line of food and shelter for year around existence. Aspen birch, hazel, juneberry and cherries furnish food while the various conifers furnish shelter. The decreased use in winter shown by the data is probably due to fact that the coniferous cover is not dense enough to furnish shelter. The type is a transition type where the hardwoods are invading overmature jack pine which does not furnish much in the way of shelter; or where conifers are invading open or old stands of hardwoods so that again there is insufficient winter shelter. The higher spring usage may be due to the following: appearance of early green vegatation in the form of aspen and hazel catkins; need of nesting cover in the less dense portions of the type; and the need of drumming sites. Thus in New Hampshire 72 per cent of the drumming sites were in younger stands of mixed woods containing conifers (22).

Jack pine—This type has a **C** rating for the fall and winter seasons and for the total of all seasons, but rises to a **B** rating for spring.

The jack pine type makes up the largest portion of cover on the Cloquet Forest with its 596.2 acres. Much of this type is in age classes that no longer furnish good cover which may cut down on the use. Also much of this occurs in relatively large unbroken blocks which reduces its use by grouse considerably. In Michigan Fisher (11) has shown by census studies that 77.0 per cent of the grouse flushed within 300 feet of the margin of various cover types. The **B** rating obtained in the spring may possibly be due to the attraction of early spring foods in the form of wintergreen leaves and berries and trailing arbutus leaves and buds as reported by Nelson et al (20) from Virginia and also the northeastern United States. There is also the possibility that the sampling of all the areas has not been strictly at random. There is a tendency in assignment of compartments to students for forestry work to favor this and other upland types thus building up a greater reported use of the type.

Norway pine—A straight **C** rating resulted from data collected for this type which now covers 112 acres. This type showed an increased usage in the spring as did the jack pine, but not to so great an extent

About three-fourths of the type is old growth trees 110 years of age and older with long clean boles that furnish little in the way of shelter for Ruffed Grouse. This probably explains the C rating of the type. The slightly increased spring usage may be explained on the same basis as the increased usage of the jack pine in the spring.

Mixed pine—This type appeared to have had greatest fluctuations in use from season to season. In the fall it rated **B**, in the winter it rated **A**, and in the spring it rated **C**, and for all the seasons it rated **B**.

Its value as shelter was the main cause of the increased winter use of this type. About half of the type is in even-aged stands less than 50 years of age with most of this less than 40 years of age. These younger stands tend to be dense and with branching to the ground form ideal shelter. The stands making up the type are not of great extent, and they tend to be well located in relation to other types furnishing food so as to have a high winter use. Spring shows a 60 per cent decrease in use dropping from 11.7 per cent to 4.1 per cent. The heavy winter shelter which lacks food is no longer needed so the birds utilize the conifer-hardwood type which furnishes both.

Lowland brush—In the fall this type received a **C** rating, but winter and spring both reach the **A** rating. The overall rating was **B** high use. This type was one of three showing a decided increased use in the winter and the only one of the three not to decline greatly in spring use.

This is primarily a food type and is composed of alder mostly with some willows and bog birch. Grange (12) in northwestern Wisconsin included black alder fringes along swamps in a description of an ideal grouse range. Bump et al (5) in New York stated alder as a food was largely ignored by the grouse, though the type was important for broods in the summer. Fisher (11) on the Houghton Lake area in Michigan shows a greater winter use of this type than of any other type with 27 per cent of the grouse as compared with 20 per cent for conifer-hardwoods the next highest type. This high use in winter can only be explained by food, as the type has little value as shelter. Elliot in Bump et al (5) states in an indirect way that alder is a preferred food in referring to the flavor of the meat which becomes bitter in the winter because of the bird having fed on alder buds. Edminster (10) quotes Smyth to the effect that alder is taken during the winter in the Northeast.

Lowland conifer-hardwood—A total of 283 acres is included in this type making it the largest of the lowland types with most of the acreage being in two extensive stands; this may account for its **C** rating for all the seasons studied. King (18) states this type, especially near swamp borders, has an important use as molting cover during late summer for which data were not available. The shelter it furnishes is satisfactory, but is not suitably located for much use especially when there is abundant upland shelter present. Not much food is found in the type which is not more readily available elsewhere.

Lowland conifer—This, the second largest of the lowland types, has a **B** rating for fall and spring, a **D** rating for the winter, and a **C** rating for all seasons.

Fisher (11) in Michigan found that where accessible upland coniferous shelter is present the grouse do not tend so readily to seek the heavier tracts of spruce, cedar, and balsam.

This is shown for the Cloquet Forest by comparing the use made of the upland coniferous types which varies from 17-19 per cent from season to season with the use of the lowland coniferous types which varies from 1-7 per cent from season to season. The decreased use in the winter may be due to lack of data and the kind and location of suitable shelter in relation to the other needs of the grouse.

Spruce-tamarack—This is one type that reaches both extremes of the rating scale from **A** in the fall to **D** in the winter, rising to a **C** in the spring and all seasons. The type area is not extensive and tends to be in areas where other more favorable cover types exist which may be the reason for the lack of use. The result for fall is questionable due to limitation in the data.

Tamarack—This type falls into the lowest use rating **D** in the fall winter, and for the total of all seasons; in the spring, its use rises to a **C** rating. The low use of this type may be due to its lack of food and sufficient shelter at all seasons, and limitations in the data.

Open—This type has a **C** use rating in the fall and a **D** use rating for winter, spring and all seasons. Only 2 grouse out of 542 were seen in the type so the data may have limitations. However, Edminster (10) and Bump et al (5) state that for New York the use of open areas was so low as to be negligible, but that in the use that took place a slight increase was noted in the fall and early winter which agrees with the limited data from Cloquet. Fisher (11) in Michigan noted usage of open land on the Munuscong Area IV, Pigeon River Area I, and Houghton Lake Area III as such:

Area	Sept.	Nov.	Jan.	May
Pigeon River I	1.0%	1.0%	2.0%	.....
Houghton Lake III	1.5%	9.0%	8.0%	11.0%
Munuscong IV	2.0%	0.5%	1.0%	.....

Muskeg—Fall, when it received a **C** use rating, was the only season this type had any use. Total use of all seasons was a low **D** rating. Presence of grouse in muskeg at any time may be termed a fluke. Their presence in muskeg in the fall can possibly be explained by the cranberries growing there. Edminster (10) quotes Hosley as the authority that cranberries are utilized for food.

Hardwood slashings—This type has a rating for one only, a very high **A** rating for winter when it went up to 17.2 per cent. This was sufficient to give an **A** rating for the total of all seasons. This reported high use may, however, only be due to the small area of the type, and because three birds were seen at one time in the small type area of 10.7 acres. Because the data available do not seem to be valid does not mean the type has no value to grouse, as it does furnish summer cover for broods and edges that are so essential.

Coniferous slashings—This type has a **D** rating in the winter and a **C** rating for fall, spring, and all seasons No data were available for the season (summer) when the highest use of this and preceeding type takes place. Bump et al (5) lists slashings as the most frequently used type for the months of June, July, and August, declining in importance until December. An abundance of foods of all kinds, plant and animal, are found in slashings during the summer months which with the shrubby and herbaceous cover present causes their use by broods.

Table 3

Relative Cover Type Use Rating by Seasons*

Cover Type	% Birds/ Unit Area Fall	Rank	% Birds/ Unit Area Winter	Rank	% Birds/ Unit Area Spring	Rank	% Birds/ Unit Area All Seasons	Rank
Aspen	9.0	A	5.2	C	10.3	A	7.3	B
Asp-Bir	17.9	A	18.2	A	17.3	A	17.9	A
Brush	8.7	B	7.3	B	8.0	B	7.7	B
Cond.-Hdwd.	11.0	A	9.3	A	15.5	A	11.4	A
Jack pine	4.2	C	3.6	C	7.5	B	4.8	C
Norway pine	4.5	C	4.4	C	5.7	C	4.9	C
Mixed pine	8.7	B	11.7	A	4.1	C	8.9	B
Low Brush	4.1	C	9.8	A	9.4	A	8.7	B
Low Con.-Hdwd.	3.1	C	4.1	C	3.6	C	3.8	C
Low Conifer	6.3	B	0.9	D	6.9	B	3.6	C
Spruce-tam	9.8	A	2.5	D	3.2	C	4.0	C
Tamarack	2.3	D	2.4	D	4.3	C	3.0	C
Open	3.3	C	1.1	D	....	D	1.2	D
Muskeg	3.8	C	....	D	....	D	0.7	D
Hdwd. slashings	....	D	17.2	A	....	D	9.1	A
Con slashings	3.4	C	2.3	D	4.2	C	3.1	C
**Total	100.1		100.0		100.0		100.1	

* A—rank 9.0%
B—rank 6.0-8.9%
C—rank 3.0-5.9%
D—rank 0.0-2.9%

**Discrepancies due to rounding off to tenths

TABLE 4

Fall Cover Type Use

Cover	# Birds	Area (Acres)	Birds/ Unit	% Birds Per Unit Area
Aspen 1	12	238.6	.050	9.0
Asp-Bir.	7	70.8	.099	17.9
Brush	2	42.0	.048	8.7
Con. Hdwd. 2	26	428.6	.061	11.0
Jack pine 3	14	596.2	.023	4.2
Norway pine	3	112.4	.025	4.5
Mixed pines 4	9	189.5	.048	8.7
Low Brush 5	3	131.2	.023	4.1
Low Con.-Hdwd.	5	283.0	.017	3.1
Low Conifers 6	9	259.9	.035	6.3
Spruce-Tam.	4	74.4	.054	9.8
Tamarack	1	77.2	.013	2.3
Open	1	53.5	.018	3.3

Cover	# Birds	Area (Acres)	Birds/ Unit	% Birds Per Unit Area
Muskeg	3	143.7	.021	3.8
Hdwd. slashings	....	10.7	.....	....
Con. slashing	2	105.9	.019	3.4
*Total	101	2817.6	.554	100.1

* Discrepancy due to rounding off to tenths.

1. Aspen area minus cutting through 1946—10.7 acres.
2. Con.-hdwd. and balsam-hardwood.
3. Jack pine area minus cutting through 1946—105.9 acres.
4. Includes pine plantations.
5. Lowland brush plus meadow now mostly brush covered.
6. Includes lowland conifers spruce, (ced. bal.); spr.; and spr.-bal.

Table 5

Winter Cover Type Use

Cover	# Birds	Area (Acres)	Birds/Unit	% Birds Per Acre
Aspen 1	20	238.6	.084	5.2
Asp-Bir.	21	70.8	.297	18.2
Brush	5	42.0	.119	7.3
Con.-Hdwd. 2	65	428.6	.152	9.3
Jack pine 3	35	596.2	.059	3.6
Norway Pine	8	112.4	.071	4.4
Mixed Pines 4	36	189.5	.190	11.7
Low Brush 5	21	131.2	.160	9.8
Low. Con.-Hdwd.	19	283.0	.067	4.1
Low. Conifers 6	4	259.9	.015	0.9
Spruce-Tam.	3	74.4	.040	2.5
Tamarack	3	77.2	.039	2.4
Open	1	53.5	.018	1.1
Muskeg	.....	143.7	.....	....
Hdwd. Slashings	3	10.7	.280	17.2
Con. Slashing	4	105.9	.038	2.3
Total	248	2817.6	1.629	100.0

Table 6

Spring Cover Type Use

Cover	# Birds	Area (Acres)	Birds/Unit	% Birds Per Acre
Aspen 1	22	238.6	.092	10.3
Asp-Bir.	11	70.8	.155	17.3
Brush	3	42.0	.071	8.0
Con.-Hdwd. 2	59	428.6	.138	15.5
Jack pine 3	40	596.2	.067	7.5
Norway Pine	6	112.4	.051	5.7

Cover Type	# Birds	Area (Acres)	Birds/Unit	Per Acre % Birds
Mixed Pines 4	7	189.5	.037	4.1
Low. Brush 5	11	131.2	.084	9.4
Low. Con.-Hdwd.	9	283.0	.032	3.6
Low. Conifers 6	16	259.9	.062	6.9
Spruce-Tam.	2	74.4	.027	3.2
Tamarack	3	77.2	.039	4.3
Open	....	53.5	.....	....
Muskeg	....	143.7	.....	....
Hdwd. Slashings	....	10.7	.....	....
Con. Slashing	4	105.9	.038	4.2
Total	193	2817.6	.893	100.0

TABLE 7

All Seasons Cover Type Use

Cover Type	# Birds	Area (Acres)	Birds Per Unit Area	% Birds Per Unit Area
Aspen 1	54	238.6	.226	7.3
Asp.-Bir.	39	70.8	.551	17.9
Brush	10	42.0	.289	7.7
Con.-Hdwd. 2	150	438.6	.350	11.4
Jack Pine 3	89	596.2	.149	4.8
Norway Pine	17	112.4	.151	4.9
Mixed Pines 4	52	189.5	.274	8.9
Low. Brush 5	35	131.2	.267	8.7
Low. Con.-Hdwd.	33	283.0	.117	3.8
Low. Conifer 6	29	259.9	.112	3.6
Spruce-Tam.	9	74.4	.122	4.0
Tamarack	7	77.2	.091	3.0
Open	2	53.5	.037	1.2
Muskeg	3	143.7	.021	0.7
Hdwd. Slashing	3	10.7	.280	9.1
Con. Slashing	10	105.9	.094	3.1
*Total	542	2817.6	3.080	100.1

*Discrepancy due to rounding off to tenths.

(Part II will appear in the next issue.)

Spring Migration Patterns Of Twelve Birds At Minneapolis

by

George W. P. Hetfeltinger

During the past year I had the opportunity to meet and talk to Dana Struthers who. with the aid of four fellows students at Principia College, carried on a study of the migration patterns of land birds during the spring of 1948 at Elsah, Illinois. This study suggested to me that a contribution to Minnesota ornithology could be made by applying Mr. Struther's technique to a similar survey in the Minneapolis-St. Paul region. The dynamic aspects of such a study appealed to me so on April 5, 1949, I began taking observations. The primary purpose of the survey was to ascertain by actual count the dates of maximum abundance and migration peaks of as many species of land birds as possible.

I wish here to acknowledge the help given me by the following: Dr. Walter Breckenridge and Dwain Warner of the Minnesota Museum of Natural History in problems connected with the survey; Mr. Dana Struthers for making available to me his paper on spring migration at Elsah, Illinois; Mrs. Mary Lupient for supplying me with a checklist and dates of arrival of birds she saw this spring in the study area; and the Minneapolis chapter of the Izaak Walton League for giving me access to their property during the two months I worked there.

The area chosen for study, known as the Izaak Walton Bass Ponds, borders on the Minnesota River about four miles southwest of its confluence with the Mississippi River. This area has been for many years one of the favorite areas for bird study about the Twin Cities. The bass ponds area itself, an alluvial flat at the base of the bluffs, is leased by the Minneapolis chapter of the Izaak Walton League. There are a series of four ponds on the flat which are used in the summer for rearing various game fishes. The brook that feeds these ponds has its origin back high in the bluffs and leads down to the lower level through a deep, heavily wooded ravine. A series of dams and underground culverts serve to control the water level of the ponds.

The route taken in observation may, for convenience in description, be divided into four sections (see Figure 1,). The first section leads from the parking lot through a grove of small conifers to the gravel road ascending the hill. It follows up the hill 150 yards with brush and tall trees to the right and an open meadow to the left. Near the top of the bluff it swings down a steep incline to the ravine. After the foliage has developed, the floor of the ravine is almost completely cut off from sunlight by the heavy leaf canopy of tall oak, basswood, and elm trees. The route follows roughly the course of a winding brook and brings the observer out almost to the point of

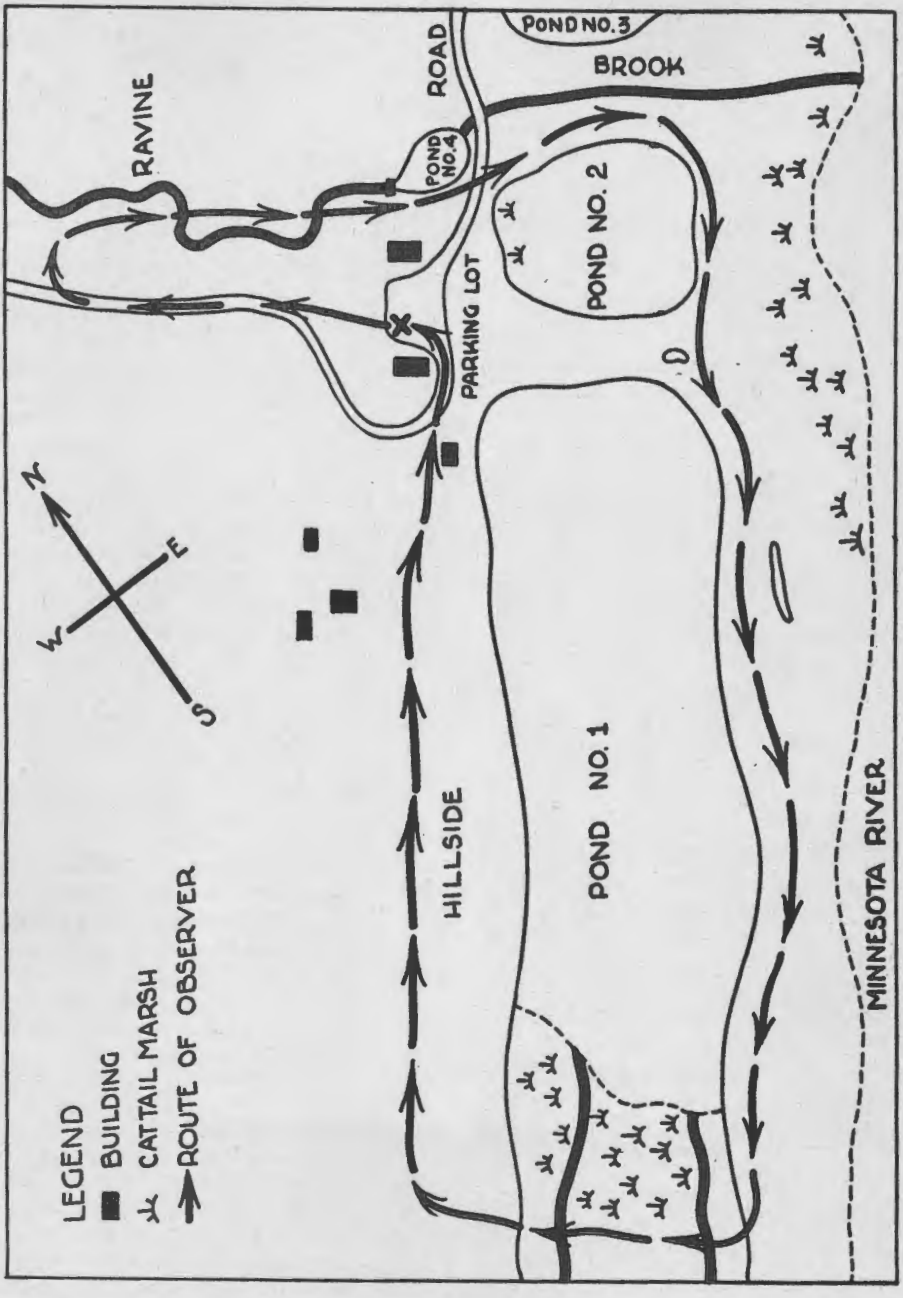


Figure 1. Route of census at Bass Pond Area. (Scale: 1 inch equals 50 yards)

departure near the parking lot. The second section of the route leads between the club house and pond Number 4 and continues across the road and between ponds Number 2 and 3 toward the river. To the left is a substantial growth of willows and to the right a few small conifers growing on the bank of the pond. This section terminates at the north end of pond Number 1. Section three extends in a southwesterly direction along the edge of pond Number 1 and then turns inland across a cattail marsh to the base of the hill. The fourth and final section of the route follows up the heavily wooded hillside for 75 yards and then in a northeasterly dircetion back to the parking lot. The heavy foliage of this section made observation very difficult.

The survey extended from April 5 to May 25 inclusive. No observations were made on April 10, 14, 15, 17, 23, 24, and May 1, 7, 8, 9, 14, 15, 21,and 22. On all other days I made observations starting at 6:45 A.M. along the route described above. Proceeding at a slow walk, I counted only song birds (passerine species) seen to be resting, feeding, or nesting in the area. As supplemetary information, a list was compiled of the birds not seen to exhibit any marked migrational characteristics and their dates of arrival. This list included the following groups: doves, cuckoos, kingfishers, woodpeckers, and song birds not included in the above category.

Most reports on studies of seasonal movements of birds in an area include only the dates of arrival and departure; few include the periods of maximum abundance as determined by actual count. This survey was partially successful in making these determinations. However, of the total 64 species observed and counted during this survey, for only 12 species were sufficient counts made to give adequate pictures of the trends of the migrating populations. Only these 12 are discussed in this paper. In addition to the 64 species which I observed, Mrs. Mary Lupient found 18 other species on the census area at other times during the survey period.

While no attempt has been made to correlate local weather conditions with the spring migration, Table 1 and Figure 6 present the weather picture and in the following discussion certain major features of the weather are mentioned in connection with the arrival, disappearance, and increase and decline in numbers of certain species.

WEATHER DATA

General Summary: The month of April was characterized by relatively pleasant weather. The mean temperature of 47.1 degrees was 0.7 degrees above normal. All measurable precipitation occurred on only six days. The major exception to favorable weather was on April 13 and 14 when 9.3 inches of snow fell. There was a killing freeze on the 16, 17, 19, and 24. The average prevailing wind was from the southwest. The month of May was characterized by relative dryness and fair weather, the total precipitation of only 0.9 inch was 25% of normal. The maximum temperature of 93 degrees on May 3 was not only the highest temperature ever recorded on that date but also the highest recorded so early in the season. No killing freeze occurred. The average prevailing direction of the wind was southeast. (See Figure 6.)

Migrational Manifestations of Weather: April 20 saw a maximum temperature of 70 degrees and a SSW wind at 30 mph. Such favorable conditions may have affected the migrational behavior of the Ruby-crowned

Kinglet which reached a peak of eight individuals the next day. The first Yellow-headed Blackbirds appeared on April 20 and increased sharply during the next several days. The Cowbird reached a high of 19 individuals on April 21 and dropped off again with the less favorable weather of the next three or four days. The increasingly warmer temperature of the last week in April saw the last of the Ruby-crowned Kinglets, the arrival of the Myrtle Warblers in increasing numbers, the beginning of the Palm Warbler migration, the peak of the Cowbird population and a growing White-throated Sparrow population. An unseasonable maximum of 93 degrees temperature on May 3 supplemented by a south wind of 30 mph. may have had an effect on the following species: the first Catbirds were seen on May 5; the Yellow Warbler reached its greatest population number on May 5; the Myrtle and Palm Warblers left the area; the first female Yellow-headed Blackbirds arrived on May 3 and continued to swell the population until May 5; the Rose-breasted Grosbeaks entered the region and the White-throated Sparrows reached a peak on May 5

A systematic list of the birds for which definite peaks of abundance are evident

CATBIRD: The catbird was first seen on May 5 when three appeared on the area. The numbers increased to nine individuals on May 12 and to 12 on May 19. There was a slight decline in numbers seen to ten and eleven after May 20, probably due to the beginning of nesting and the spreading out of migrating flocks. Roberts (1936) states that nesting commences before the end of May. The bulk of the Catbirds on the area were observed in the heavy shrubs and bushes between the north end of pond Number 1 and the river. (See Figure 2).

ROBIN: The observer's survey did not begin until after the onset of the Robin migration. Roberts (1936) reports the average date of first arrival in the Minneapolis-St. Paul region to be March 14. Relatively few individuals were seen during the first few days of the survey, but on April 8, there was a great influx to 19. The number dropped off after that date and steadily decreased to a single pair of nesting birds after May 10. Most of the large migratory flocks were seen on the semi-open ground between the southern end of pond Number 1 and the river. The nesting pair inhabited a low pine tree on the north bank of pond Number 2. (See Figure 2).

HERMIT THRUSH: The first Hermit Thrushes were observed on April 6. A period of over a week elapsed before another was seen. On April 18 the period of maximum abundance was reached when nine of these birds were tallied. The number decreased to four the next day after which they were not seen again. My experience with the Hermit Thrush was brief and the counting of individuals was difficult. These birds were very timid at all times and not once were they heard to utter a sound. They favored the densely wooded areas of the hillside and ravine. (See Figure 2).

RUBY-CROWNED KINGLET: Roberts (1936) reports the average of 52 dates of arrival as being April 8. I observed the first pair this spring on April 13. A peak of abundance was reached on April 21 when nine were seen. Thereafter the number declined. This bird disappeared from the area after April 27. At the time of abundance, this kinglet was cosmopolitan over the area being seen in the sparse sumac growth as well as in the dense woods. (See Figure 2).

YELLOW WARBLER: Consistently the most common of all the warblers

in the area was the Yellow Warbler that appeared suddenly on April 30 in a force of eight individuals. The numbers rose to 16 on May 5 and subsequently leveled off at 12 or 13 which I believed to be a breeding population. This warbler lived in close association with the Catbirds between the northern end of pond Number 1 and the river. The Catbirds inhabited the bushes and low branches while the Yellow Warblers favored the tree tops. (See Figure 2).

MYRTLE WARBLER: I am especially partial to this bird because on the frosty morning of April 8, a day with the remains of an eight inch snowfall still on the ground, I saw the first warbler of the season—a Myrtle. It did not appear again until April 26 when a pair was observed. The number of individuals increased to a peak of 17 on April 30 and subsequently declined. The last was seen on May 6.

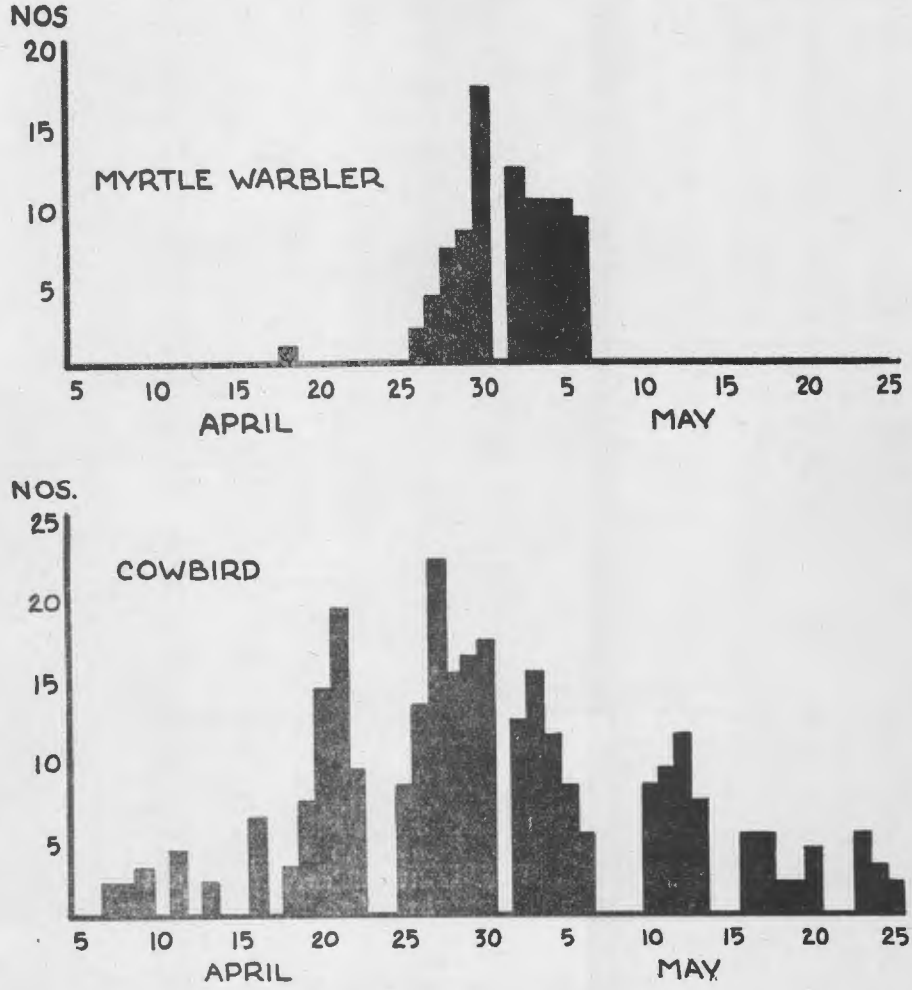


Figure 3. Population Patterns from Bass Pond Census.

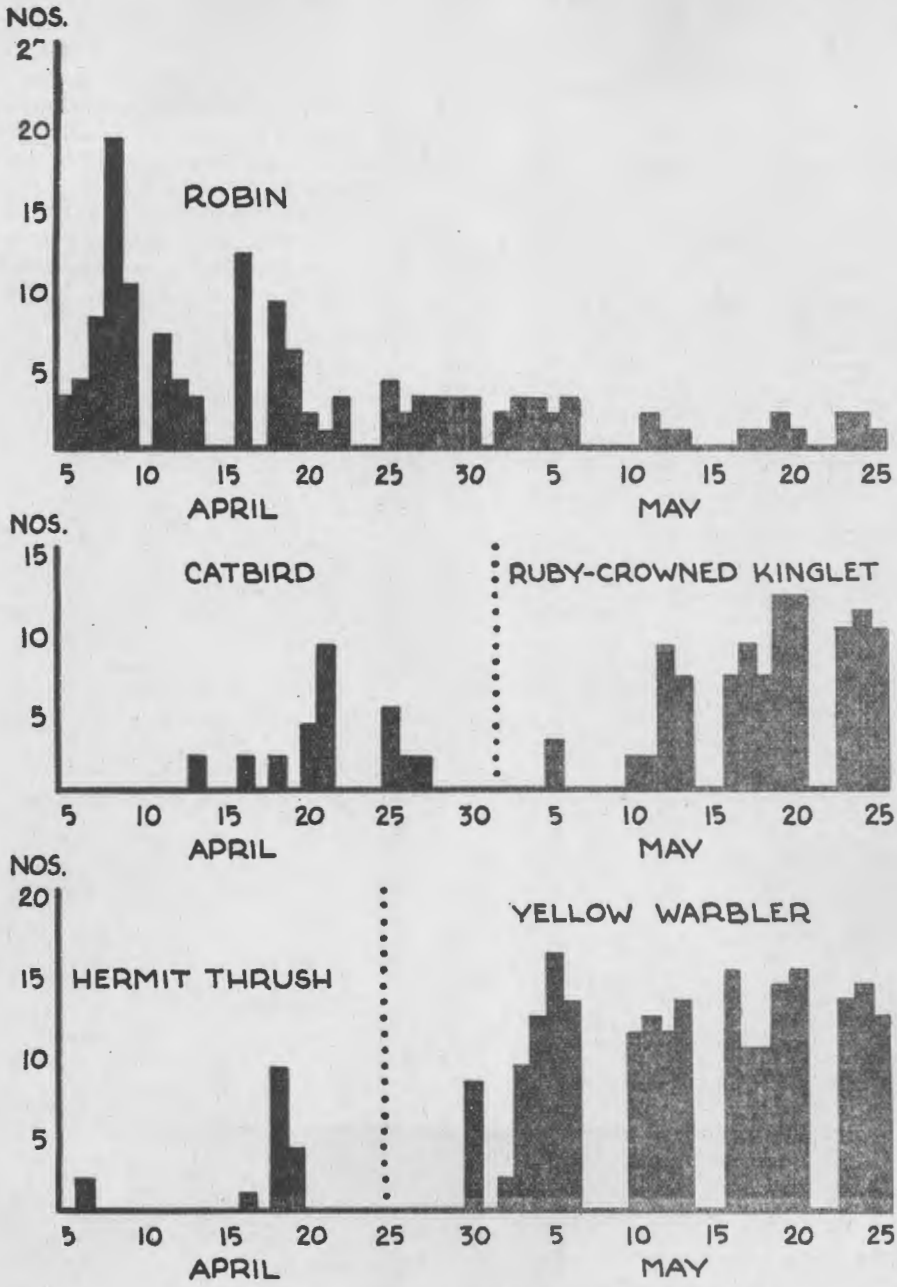


Figure 2. Population patterns from Bass Pond Census.

Although the Myrtle Warbler was seen all over the area, there was an area of concentration on the hillside inland of pond Number 1. I believe that several hundred could have been reported from that hillside had an absolute count been taken. (See Figure 3).

PALM WARBLER: The Palm Warbler was not seen in any great numbers this spring. My data correspond quite favorably with Roberts (1936). He states that the average of 35 arrival dates is April 29. I observed the first Palm Warbler in the area on April 28. The peak of maximum abundance was reached on April 29 and 30 when five individuals were seen on each day. It is interesting to note that the Palm Warbler migration and peak dates coincide roughly with those of the Myrtle Warbler with which it associated. Like the Myrtle, the Palm Warbler was seen more often in the dense woods than elsewhere. (See Figure 5).

YELLOW-HEADED BLACKBIRD: An excellent opportunity to observe the formation of a breeding colony of these birds was given the observer by the development of a community in the cattails at the southern end of pond Number 1. The first males arrived on April 20 and were supplemented by more males in the course of the next two weeks. By May 2 the area supported a noisy population of nine or ten males. On May 3, 4, and 5 an influx of females occurred that doubled the population. The greatest number counted on any one day during the survey was 24 individuals on May 6. Thereafter the number leveled off to what I believe to be a breeding population of nine or ten pairs. (See Figure 4).

RED-WINGED BLACKBIRD: The area chosen for study being topographically situated, such as it was, provided the observer with ample opportunity to watch the Red-winged Blackbird. Not only did I see birds that were nesting on the area, but also individuals from the cattail marshes in the vicinity. A place such as the Minnesota River Valley, supporting as it does so much habitat favored by this bird, has a large Red-wing population. Consequently, for comparative purposes, I restricted my count to birds see in the marshes of ponds Numbers 1 and 2. My work on the area began after the initial arrival of the Red-wings which date is set by Roberts (1936) at about March 16. Very little major trend was observed during the period of study. There was a slight decrease around April 22 followed by an increase probably due to the arrival of the females. (The arrival of females in this region this spring was set by other observers at the week between April 20 and 27). (See Figure 4).

COWBIRD: Friedmann (1929) considers five phases of Cowbird migration. They are: arrival of vagrant males, arrival of migrant males, arrival of resident males, arrival of migrant females and arrival of resident females. The dates he quotes on these phases were collected at Ithaca, New York and hence are not altogether applicable to Minnesota which is generally somewhat later than New York in migrational activity. The above mentioned five phases, however, may be logically applied to the graph of my observations on Cowbird migration. The first indication of this species' arrival came on April 7 when two males were observed and for the next week a few males were seen in the tree tops. There was a sudden influx on April 16 indicating the arrival of migrant males and then a slight drop after April 21 as this phase drew to a close. The resident males and migrant females brought a tremendous increase in activity in the area when they arrived simultaneously on April 26. A decrease in population occurred on

April 28 and indicated the end of this phase and another influx on April 29 indicated the arrival of the resident females. The next ten days saw the period of greatest activity, the tree tops and sky being filled with courting, squabbling males and females. It was not at all uncommon to see five or six males in pursuit of a single female. The subsequent drop in Cowbird population after May 3 may be explained by the beginning of nesting of other species and the breaking up of courting flocks and the dispersal of the females with their accompanying males to separate territories. (See Figure 3).

WHITE-THROATED SPARROW: As is typical of this species, the White-throated Sparrow was seldom seen except in flocks of five or more. Most of the daily records indicate a number seen in one flock and not single birds scattered over the area. This sparrow first appeared on April 22 and increased in number to a total of 30 seen on May 5. On this day there was a large concentration in the dense hedge along the roadside ascending the bluff inland. Had an absolute count been taken, I believe that several score would have been tallied. Another favored spot of this sparrow was a large fallen tree on the hillside inland of pond Number 1. It was also frequently see in the cultivated hedges in the region of the parking lot. This bird was last seen on May 13. (See Figure 5).

FOX-SPARROW: Population records of the Fox Sparrow proved this spring to be rather disappointing. Indications of past years pointed to a heavy migration but relatively few appeared in my area. Roberts (1936) gives March 25 as the average arrival date but I did not see the first one until April 8. The largest number seen on any one day was seven on April 18. Thereafter there was a sharp decline and complete disappearance after April 20. The areas favored by this sparrow were the dense underbrush between pond Number 1 and the river and the above mentioned fallen tree on the hillside inland of that pond. (See Figure 5).

Table 1

Weather Data—Minneapolis

April	Wind Prevailing Direction	Wind Highest Velocity	Relative Humidity	Inches Precipitation
5	WNW	16	91	0
6	WNW	26	91	0
7	WNW	24	73	0
8	ENE	16	69	0
9	E	14	49	0
10	SW	8	63	0
11	SW	14	85	0
12	SW	23	63	0
13	NNE	26	59	.07
14	NNE	29	98	1.24
15	NNE	20	69	0
16	S	19	72	T

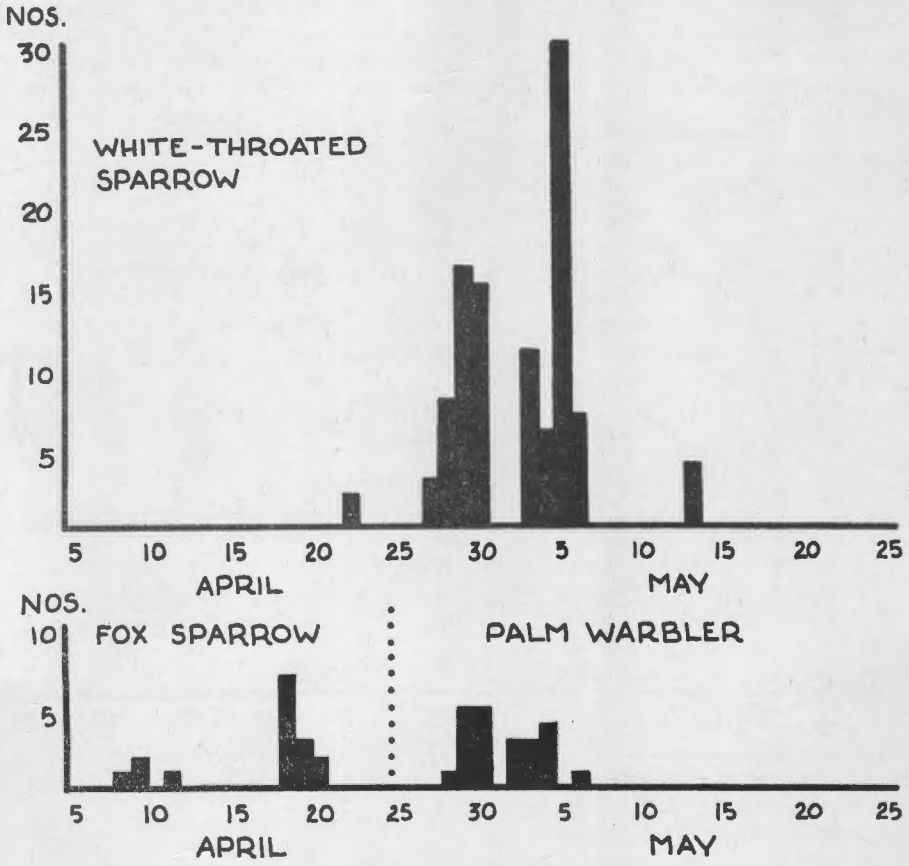


Figure 5, Population Pattern from Bass Pond Census.

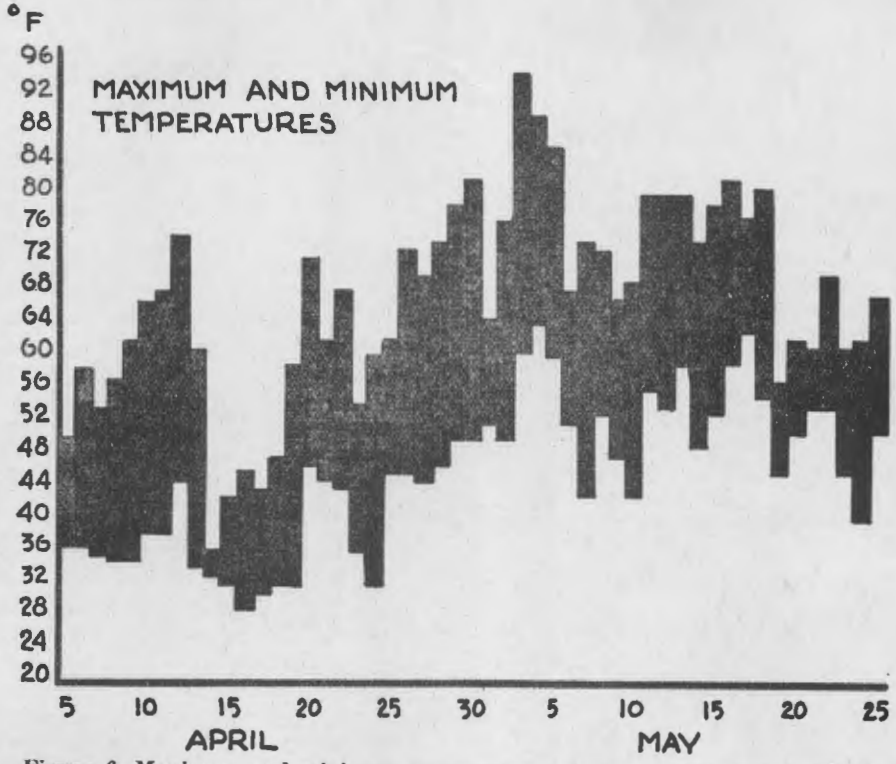
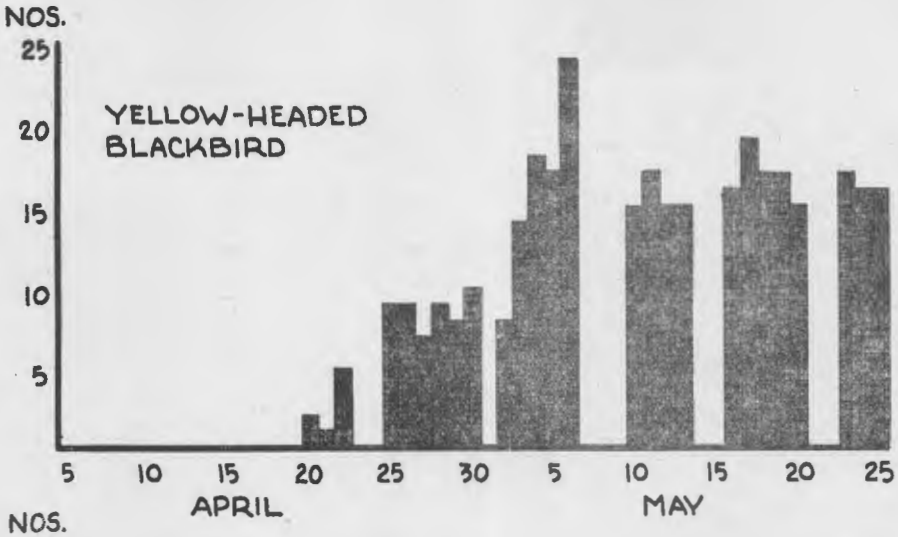
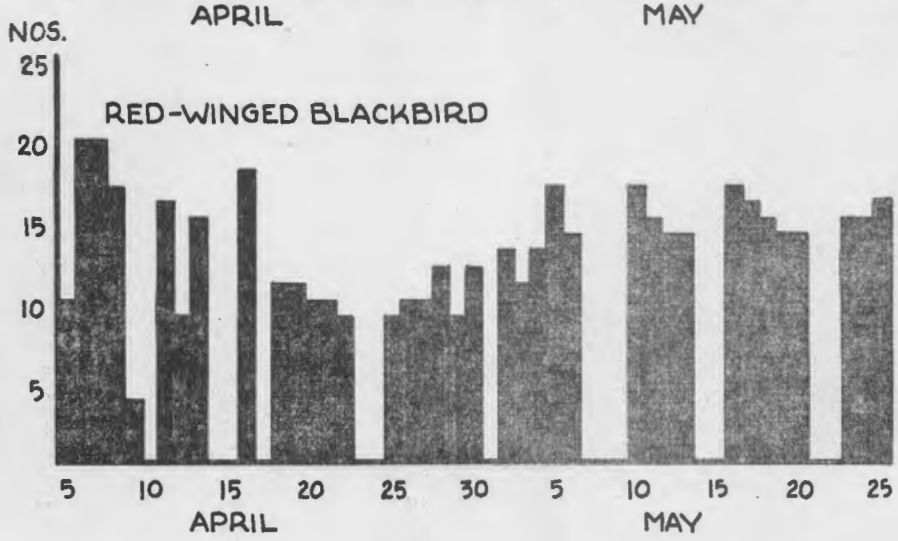


Figure 6. Maximum and minimum temperatures during census period. (U. S. Weather Bureau—Minneapolis).

	Wind Prevailing Direction	Wind Highest Velocity	Relative Humidity	Inches Precipitation
17	NW	29	91	.02
18	NW	18	74	0
19	S	19	86	0
20	SSW	30	67	0
21	S	26	72	.29
22	W	35	83	.01
23	NNW	37	78	0
24	SE	18	69	0
25	SE	26	77	.42
26	NW	20	84	0
27	NNE	14	66	0
28	S	24	61	0
29	SSE	19	55	0
30	SE	28	61	0
May				
1	ESE	26	83	.07
2	W	30	82	.05
3	S	34	70	.04
4	SSE	24	73	T
5	WSW	20	88	.14
6	N	22	82	0
7	SE	8	99	0
8	E	7	75	0
9	NE	24	58	0
10	SE	18	49	0
11	NNW	18	55	T
12	SSW	11	55	0
13	SW	22	66	.01
14	NE	17	68	0
15	ESE	16	68	T
16	SE	22	87	T
17	SSE	29	93	.16
18	SW	26	88	.13
19	NNE	20	80	T
20	SE	17	79	T
21	ESE	16	78	.13
22	NW	18	92	0
23	NW	18	75	T
24	W	22	66	T
25	NNW	20	80	.15





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Seasonal Bird Report

by

Mary Lupient

This spring the variable weather affected the migration in some instances. On March 15 the thermometer dipped to zero and several times during April and even up to the middle of May there was occasional freezing weather. To the contrary the first week in May was unseasonably hot and the temperature rose to above 90 degrees for several days. The temperature on May 3 was 93 degrees, an all time high for Minnesota for that date. Two days later strong south winds brought heavy rain and a great wave of migrating birds appeared in the Twin Cities and surrounding territory.

The migration of warblers was unusual in the respect that the early ones come at the usual time but passed through almost continuously except during a very cold spell about the middle of May. At the date of this writing, May 26 they are still migrating through the southern half of the state. The migration of warblers seems to have telescoped. The late species arrived earlier than usual and the early species not only arrived on time but kept going through at intervals during the whole migratory period. The following persons furnished detailed reports of observations: Dr. D. W. Warner (Hastings, Cannon River, Spring Lake, Frontenac), Dr. W. J. Breckenridge (Minneapolis area), A. C. Rosenwinkel (St. Paul area), Franklin Willis (Stewartville). Their records and verbal reports by others indicate that there were birds in abundance, especially warblers.

The Blue-winged Warbler was reported by Franklin Willis at Stewartville on May 1, and by Dr Warner near Cannon Falls, May 8. This diminutive bird nests in southeastern Minnesota and, due to the fact that it has been seen in migration as far north as Minneapolis, there is the possibility that it nests in other parts of the state. It may have escaped observation because of its shy and elusive habits. It builds its nest on the ground in grass clumps or weeds and has a weak, insect-like song.

A stray far from its western home, an Audubon Warbler, was seen by Mr. and Mrs. W. E. Peterson in the Lake Vadnais region near St. Paul on April 22. It was with a flock of Myrtle Warblers. Another accidental, a Worm-eating Warbler, was reported in the Thomas S. Roberts Sanctuary May 22, by Mrs. F. Davidson, Mr. and Mrs. E. D. Swedenborg and Kathryn Yerksa.

The first few days of March were fair and mild. A small flock of Canada Geese looked for a place to land in the ice-bound lowlands of the Minnesota River near Minneapolis on March 3. Whether or not they migrated from south of the state is a question. They may have been part of the good-sized flock that wintered again near Rochester, Minn. Some of those geese have been reported nesting in that area this year. Miss Kern Bayliss, Cass Lake, reported the lake still frozen April 4, but that on April 4, 1946, hundreds of Snow Geese were resting on the lake.

Flocks of geese were heard migrat-

ing over the Twin Cities throughout the night of April 6. Snow and Blue Geese were reported as late as April 24. B. T. Williams of Orr, Minn., reported on May 2 that eight Blue Geese and two Snow Geese had been frequenting a pasture in St. Louis Co. since April 20. One of them was crippled.

Ducks arrived a few days later than usual in the southern part of the state. This was due possibly to some severe weather in March which delayed opening of the ice. Reports indicate a slight increase in the number of ducks. An unusually large number of Hooded Mergansers spent several days in the Minnesota River lowlands south of Minneapolis. They were not shy and provided a fine opportunity for observation.

Dr. Abbott who lives on the north shore of Lake Superior stated in notes to the Museum of Natural History that ducks began arriving April 24. Among them were Green-winged Teal, Buffleheads, about 50 Baldpates and a few Mallards and Scaup. Members of the M.O.U. saw two Old Squaws off the north shore of Lake Superior at Two Harbors on May 21. A small flock of Red-throated Loons and several White-winged Scoters were observed in the water along Minnesota Point the same day.

The remains of several ducks were found along the shores of Harbor Island and Minnesota Point by members of the M. O. U. May 21. They were mostly Greater and Lesser Scaup. Residents in the vicinity said that dead ducks are often found there. Waste oil is dumped into the harbor from some of the boats and it is possible that the plumage of the ducks become oil soaked making flight impossible.

There were two reports of the European Widgeon. This bird, so far from its usual haunts, was seen at Lake Pepin on April 20 by Dr. Warner. Near the pumping station for Duluth Mr. and Mrs. F. L. Jacques saw one with a flock of Baldpates on May 19.

Mr. Ron Anderson of Mankato contributed the following interesting information on the Double-crested Cormorant: "The Cormorant migration throughout the Mankato area began about a week earlier than in 1948, and lasted about two weeks longer. In all the majority of the birds were present on the surrounding lakes for a period of about five weeks. Sportsmans Clubs in this area came all out for a war on the Cormorants this spring. Over a period of about a month the number of birds killed on the flyway between Duck and Madison Lakes in Blue Earth County would easily number three or four hundred. On Buffalo Lake near Alma City a hunter with a reliable word told me he and his partner killed 97 birds in one day.

The birds that stayed on Madison and Duck Lakes displayed an interesting behavior pattern. At about 4:45 A. M. each morning the flocks of about ten to a hundred could be seen coming from Madison to Duck. In a period of two weeks the time of this flight did not vary more than ten minutes every morning. The birds would land on Duck Lake, feed there for an hour or two, then fly back to Madison in pairs or small flocks where they would spend the day among the drowned-out willows."

There were no reports of large concentrations of shore birds but all of the species that regularly appear throughout the state were observed. Greater Yellowlegs were in the vicinity of the Twin Cities on March 28. Willets, migrants that are becoming more common in Eastern Minnesota, were at the Isaac Walton Bass Pond, May 5.

One of the thrilling high-lights of the M. O. U. convention was the discovery on a field trip, of 14 Hudsonian Curlews. They remained for several hours on Harbor Island and Minnesota Point so that many interested persons were able to see them.

The height of the hawk migration came April 3. The day was fair with a strong south wind and flock after flock of hawks wheeled and circled northward all day. The migration was not nearly so heavy, however. as it was a few years ago. Due to exceedingly good visibility and a bright sun the beauty of the plumage could be clearly seen. The various plumages of the Red-tailed Hawk were particularly beautiful and interesting. There was an unusual number of Red-shouldered Hawks. In one flock there were 37 and there were several smaller flocks. Ospreys were reported by several observers. Dr. Warner saw six at Lake Pepin on April 20.

The arrival of Whistling Swans in the lowlands of the Minnesota River was reported April 5. Miss Kern Bayliss wrote that they were at Cass Lake the second week in April.

The American Egret made an appearance along the Minnesota River just south of Minneapolis this spring. One was seen May 22 by Mr. and Mrs. Clements and May 23 two more were reported by Milton Thompson. At date of this writing they are still there.

The Blue-gray Gnatcatcher was apparently more abundant this year. There were several reports. Dr. Warner saw several pairs at Frontenac, May 14, and Dr. Breckenridge noted three in his yard for several days beginning May 7.

A small flock of Red Crossbills was found in Vadnais Forest on April 30 by A. C. Rosenwinkel. There was only one report of the American Pipit. A single bird was seen on April 27.

Mrs. P. A. Becker, who lives near Walker during the summer, wrote to say that, in her opinion, the spraying with DDT in that area has caused a decrease in the bird population and that there were fewer birds at her sanctuary last year. A recent issue of Audubon Magazine contains a statement given to the press by John H. Baker, President of the National Audubon Society. In it he warns that wholesale spraying with a heavy concentration of insecticide can be very harmful to birds and all wildlife. In a test in Maryland where insecticide amounting to 4.36 lbs. to the acre was dusted there was a mortality of 65% of birds in six days. The U. S. Fish and Wildlife Service and the Department of Agriculture have warned repeatedly against the heavy use of insecticides. Birds are killed by eating poisoned insects which have not yet died or insects laden with poison. The areas sprayed are devoid of food for birds and, should it be a large area, they cannot find food for their nestlings.

Minneapolis, Minnesota.

NOTES OF INTEREST

BROWN THRASHER KILLED BY GRAY SQUIRREL.—On June 14, 1949, Mrs. O. Hansrud, living in St. Louis Park, a suburb of Minneapolis, reported watching a Gray Squirrel (**Sciurus carolinensis**) capture, kill and eat a fledgling Brown Thrasher. The squirrel had been for some time a pet of the family and the Hansruds as well as several neighbors had been accustomed to feeding it. The thrashers had nested in their shrubbery and the young one taken had only recently left the nest. Rodents, as a rule, are not carnivorous but many observations are on record of numerous species eating flesh on occasion. Among the tree squirrels, the Red Squirrel is usually accused of destroying more birds than the Gray. Actual observations of this type of destruction by rodents are not frequent. With the accumulation of more such records we may eventually have a much better basis for statements regarding the extent of such predation by rodents and the frequency with which the different species prey on birds.—**W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis.**

FALL RECORDS OF THE GOLDEN PLOVER AT THE CANADIAN LAKEHEAD. —Lupient (Flicker. 20:101. 1948) recently referred to the few fall records of the Golden Plover in Minnesota. This is in contrast to its regular occurrence during late September and October at the Canadian Lakehead. During the past decade it has been observed on many occasions in the neighborhood of Fort William and at Whitefish Lake, 50 miles to the south-west and only 12 miles from the northern border of Cook County, Minnesota.

The following records have been taken from my field notes for the years 1941-1948: (Those for 1941-43 were published in The Auk. 62:303. 1945.)

1941—October 10, 25 birds feeding in low pasture fields eight miles west of Fort William.

1942—September 26, one at Whitefish Lake, where an occasional plover was noted throughout October.

1943—September 12, 12 were seen in low hay and grain fields within the city limits; by September 26 an estimated 1,000 birds were feeding on several hundred acres of these fields. They decreased in numbers until October 26 when only 12 were present.

1944—September 26, two; October 3, eight; October 7, one; October 15, many were noted in the same fields.

1945—September 29, one on the beach in the harbor; September 23 and 30, three were present in the above mentioned fields; October 10, five were seen ten miles south-west of the city.

1946—September 26, one; October 20, 18 near Fort William and one flying over Whitefish Lake.

1948—September 24, four; October 29, one. Both records were made in the fields within the city limits which appear to be favoured feeding grounds.

The plovers observed in the field appeared to be immature birds as were the following specimens collected locally and now in the Royal Ontario Museum of Zoology, Toronto, Ontario.

Whitefish Lake, female, October 12, 1939, coll. L. S. Dear.

Fort William, female, October 3, 1943, coll. A. E. Allin.

Fort William, male, September 26, 1946, coll. A. E. Allin.

Fort William, female, October 29, 1948, coll. A. E. Allin.

These observations suggest that the local area is in the path of the fall migration of immature Golden Plovers.

Minnesota observers might expect to find them in suitable areas in their northeastern counties during the same period.—**A. E. Allin, Fort William, Ontario.**

WOOD DUCKS NESTING IN ST. PAUL.—On the morning of May 27, 1949, Miss Eleanor Jilson of St. Paul was walking along Summit Avenue, one of St. Paul's busiest residential streets, when she was surprised to see a female Wood Duck fly up from the boulevard and flutter into the street. This was near the crest of the bluff overlooking downtown St. Paul. After recovering from her surprise she looked about, "and there I saw huddled together on the grass at the foot of a tree three little ones. They must have been just out of the nest; they were so small. The mother flew back to them and with wings outspread drove them toward the sidewalk only three feet in front of me, and then, taking the lead, she walked quacking into some shrubs, the three little ones following her with only a couple of inches of space between them, and cheeping as they hurried along." Other engagements made it impossible for Miss Jilson to make further observations on the family. Their chances for success in reaching the water certainly were not great, since they would have had to descend the bluff to the river level and cross through the heavy traffic of West Seventh St. and the railroad yards to reach the Mississippi River, three-quarters of a mile away.

In a later letter Miss Jilson reported that, "last year about this time, I believe, two men sitting on the terrace of the University Club (within a block of where above observation was made) saw a female Wood Duck fly past, so it may be that they have nested in this neighborhood before."

This incident recalls to mind Miss Mabel Densmore's report of Wood Ducks nesting on the bluffs back of Red Wing, Minnesota, where the families were likewise faced with parading through the town, across a busy arterial highway and the railroad yards to reach the waters of the Mississippi River.—**W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis.**

UNUSUAL WOOD DUCK NESTINGS.—A photograph of seven tiny ducklings and the adult female appeared in one of the Minneapolis papers on June 2, 1949. They were being coralled on a table by a couple of employees of the Max Kohen Jewelry Co., 35 S. Sixth St. in Minneapolis. The news story identified them as 'teal' but they were obviously **Wood Ducks.** The family had been picked up in the alley at the rear of the jewelry store in the very heart of the business district. The game warden, Mr. George Poole, was called to take charge of the birds. On being contacted Mr. Poole reported that in addition to the birds in the photograph two other ducklings had wandered into the Dykman Hotel next door and were scurrying about the lobby before being discovered by one of the porters. The reunited family was taken to the Carlos Avery Game Farm

north of St. Paul where they are being kept for display at the State Fair and later to be released. This seems to have been a remarkable case of this species of duck nesting in the heart of a city loop district where neither a tree nor a blade of grass grew within a good part of a mile.

While discussing the possible nest site of this duck, Mr. Poole further reported that two years ago he got a call from the Minneapolis police department. The occasion was to investigate a report that a family of ducks was wandering about on the roof of the Insurance Exchange Building at Eleventh St. and Nicollet Ave. He found the report correct and managed to capture the entire group of 11 ducklings and also the female which oddly enough appeared quite willing to be taken with the ducklings. The family was taken to a marsh west of the city and liberated. This nesting was within a few blocks of the hotel and jewelry store near which the duck nested this year and since on both occasions the female was willing to be captured with the ducklings, it seems reasonable to suppose that this could have been the same individual Wood Duck.

Mr. Poole further reported two other remarkable Wood Duck nestings. Six or seven years ago a report was received of a duck flying into a hole in the side of a huge chimney in the Minneapolis milling district. This was in the heart of the heavily industrialized district of the city toward the river from the business district but equally far removed from any natural woodlands. He determined that it was a Wood Duck and estimated that the nesting cavity was about 80 feet above the ground. No further information was available on the nest.

The other record came as a result of a report from Northern States Power Co. employees. They were dismantling an abandoned power line near Cedar Lake. One pole to be removed stood near an old wooden bridge over the railroad tracks. It supported a large fuse box from which the fuses had been removed and the door, barely large enough to admit a Wood Duck, had been left open. There in the fuse box they had found a Wood Duck incubating eggs among the power connections where she most certainly would have been electrocuted had the line been in use. Since the pole had to come down, Mr. Poole removed the box and placed it in a tree about 50 feet away and was greatly surprised to have the female remain on the nest all during the transferring operations. Two days later he checked and found her still incubating.

We have become accustomed to the way the Nighthawk has adapted itself to nesting on the gravel-topped business buildings in the hearts of cities and occasionally a Duck Hawk will accept the ledges of city skyscrapers as suitable substitutes for rocky cliffs. The above reports suggest that the Wood Duck is likewise adapting itself to the highly artificial conditions of city life and is coming to accept the brick and stone buildings with their chimneys and parapets as suitable substitutes for their native forests.—**Walter J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis.**

PROTHONOTARY WARBLER NESTING AT ANOKA.—Miss Alberta C. Smith recently reported a nesting of the Prothonotary Warbler at Anoka, Minnesota, which, although not recent, is of sufficient importance to be recorded. In May 1941 Miss Smith and some of her pupils from the Franklin School discovered the nest built inside a metal post several inches down from the top. This post was located about ten feet from the west bank of the Rum River

and adjacent to city park property in the town of Anoka. During the month of May eggs were laid and successfully hatched. The ending of the school year, presumably about the first of June, interrupted the observation and it was not determined whether or not the young survived to leave the nest. This is one of the more northerly records for the nesting of this warbler.—**W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis, Minn.**

MINNESOTA RECORD OF THE GREAT BLACK-BACKED GULL.—On November 23, 1948, the writer was photographing herring fishing operations on Lake Superior for the Conservation Department. While pulling nets from on board a tug ten miles out of Duluth a very black-backed gull appeared among the Herring Gulls following the boat. No gun was available to collect the specimen so the movie camera was brought into action and about 50 feet of colored pictures, some very closeup, were secured.

At first it appeared to be a Great Black-backed Gull but since it appeared exactly the size of the Herring Gull this identification was dimissed. The writer's co-worker, Dr. Dwain Warner, curator of birds at the Minnesota Museum of Natural History, was conferred with and all possible identifications considered but no decision could be reached. The film was finally sent to the University of California for examination by several men experienced in marine bird identification and their opinion was that it was a Great Black-backed Gull. Several other eminent ornithologists who visited the museum were shown the picture and several conflicting opinions secured. In April the film was shown to the members convened at the annual meeting of the Wilson Ornithological Club at Madison, Wisconsin, and still no agreement as to the bird's identification was reached.

Mr. Ludlow Griscom at the Museum of Comparative Zoology at Harvard University and undoubtedly one of the best field observers in America and particularly well acquainted with sea birds was finally appealed to. Below is his decision after examining the pictures:

"I consider the bird definitely a Great Black-backed Gull in full adult plumage. It is true that it appears to be substantially the same size as a Herring Gull, but you will notice that the bulk of the body is definitely larger, even though the linear measurement of the total length does not appear to be substantially greater. I regard this point of no importance, because here on the Atlantic seaboard, where the bird is abundant, seeing individual gulls that do not appear substantially larger than adjacent Herring Gulls is a routine and annual event.

I regard your bird as **Larus marinus** on the following fundamental specific characters: (1) The great depth of the powerful and heavy bill is clearly evident in pictures. (2) The very wide and conspicuous white wing band (formed by the tips of the secondaries) is equally evident in the sitting bird and is unique in North American gulls of that group. (3) The Great **Black-backed** Gull differs from every other possible black-backed species in having far more white in the wing tip. I think I have a perfect mental image of this character, both in the sitting bird and in flight, and your movie makes the pattern of the wing perfectly obvious in both positions. (4) The bill, foot, and eye color are correct for this species and none other in combination."

Apparently, then, this gull can now be added to our list of Minnesota birds although the actual specimen being lacking, it must remain on our hypothetical list.—**W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis.**

A NEST OF THE CHESTNUT—COLLARED LONGSPUR IN CLAY COUNTY.—On July 20, 1949, I discovered a nest of the Chestnut-collared Longspur five miles south of Felton in Section 33, Twp. 141 North—46 West. In the nest were three young which probably left the nest a few days later.—**Martin K. Nelson, State Game Warden, Ada, Minnesota.**

1949 MEETING OF THE MINNESOTA ORNITHOLOGISTS' UNION

One of the best meetings in the history of the Minnesota Ornithologists' Union was held on Saturday, May 21st, when the group convened for its annual meeting in Duluth, Minnesota.

A pre-session field trip on Friday evening to observe the nuptial flight of the woodcock brought many people to Duluth earlier than is usual for arrivals for a one-day meeting. Although the weather was disappointing, the group heard the Wood cock, and a number of them saw it.

Those who rose early enough on Saturday morning to make the 7:00 field trip to Harbor Island were rewarded with a splendid show of shore birds, the most spectacular being a group of fourteen Hudsonian Curlews, which all present had an excellent opportunity to observe. Several nests, including that of the Piping Plover, were also found.

Although reluctant to leave such profitable birding territory, the group returned to Park Point to register and embark on field trips of a different type. Registration showed an attendance of 104, made up as follows: Duluth Bird Club 27, Range Naturalists' Club 4, Minnesota Bird Club 10, Minneapolis Bird Club 12, St. Cloud Bird Club 9, T. S. Roberts Ornithological Club 20, St. Paul Audubon Society 8, Thunder Bay Field Naturalists Club 10, Miscellaneous 4.

Field trips to various nearby areas, including the North Shore, Fond du Lac, Normanna, and Minnesota Point, were very productive. A total of 145 species of birds was seen.

Again, loath to leave such good birding, the group returned to the Endion Methodist Church at 1:00 for lunch and the business session. A ladies' circle of the church served an excellent lunch to the 104 hungry people. Mr. Joel Bronoel, president of the M. O. U., declared the 1949 annual meeting of the Minnesota Ornithologists' Union in session. After the reading of the minutes and the treasurer's report, Mr. George Rickert reported for the Conservation Committee on legistlative activites, and Mr. Lewis Barrett made the final report of the T. S. Roberts Memorial Committee, declaring that the project at **Lake Harriet** Bird Sanctuary (now called T. S. Roberts Bird Sanctuary) in Minneapolis was completed. He explained that the total cost of the project was $104.10, for which an assessment of 25¢ per M. O. U. member was to be made, in accordance with a motion passed at the 1947 meeting, and he urged the club treasurers to be responsible for seeing that this money was sent in to the M. O. U. treasurer.

Miss Amy Chambers, Chairman of the Nominating Committee, submitted the following slate of officers for next year, and they were unanimously elected:

President ..... Mr. Harvey Gunderson, Minneapolis
Vice President ..... Mr.Carlyle Sather, St. Paul
Secretary ..... Miss Vera E. Sparkes, Minneapolis
Treasurer ..... Mrs. Mary Lupient, Minneapolis
Editor of..**The..Flicker** ..... Dr.Dwain Warner,Minneapolis

Following the business session, papers by members were presented on a variety of subjects of interest to bird students. Mr. Kenneth D. Morrison, regional representative of the National Audubon Society, presented a paper on "Summer Program at Itasca State Park," in which he explained what the National Audu-

bon Society is doing there, and what they hope to do in the furture, to interest people in nature. Following this talk the group had the pleasure of hearing Dr. Ernst Mayr of the American Museum of Natural History tell of the "Contributions that Local Amateurs Can Make to American Ornithology." He pointed out a number of very simple observations that amateur bird students can make to help establish data about certain species and about birds in general, which are unknown at the present time. Dr. Dwain W. Warner of the Museum of Natural History of the University of Minnesota presented a paper accompanied by slides, showing "The changes Occurring in the Bird Life of Minnesota." He pointed out that very few records have been kept since publication of Dr. Roberts' book, and that these data are badly needed to help complete the picture of changing bird life. He showed how certain species are moving farther and farther north in Minnesota, others moving east and others west. The last paper was a presentation by Dr. W. J. Breckenridge of the Museum of Natural History at the University of Minnesota of "A Nesting Study of the Wood Duck," accompanying which Dr. Breckenridge showed excellent movies he had taken of Wood Ducks, in which the young birds are seen leaving the nest. In addition to this, he showed a few feet of film of an unidentified gull he observed on the North Shore the previous winter, and he discussed his attempts to classify the bird.

All the papers presented were of unusually high caliber, and everyone agreed that they had given the M. O. U. members something to think about and discuss with their local clubs.

The evening session, which was held at the Duluth Branch of the University of Minnesota, consisted of a short address by Dr. A. E. Allin, Director of the Federation of Ontario Naturalists, on the subject "Field Notes from Canada." He explained the happy relationships between the Canadian and American groups in the Thunder Bay region, and he told of the birds which they see in that area which perhaps are not so common farther south except in migration. Dr. William R. Bagley of Duluth showed several colored films of Minnesota bird life for the entertainment of the group, and with this a long enjoyable day of birding and bird study was completed.

The Duluth Bird Club is to be congratulated on the fine program and field trips which they planned for the state group. They have set a high standard for the Minnesota Bird Club, hosts for the 1950 session, to follow.—**Miss Vera E. Sparkes, Minneapolis Bird Club.**

"AFFILIATED SOCIETIES" (continued)

DULUTH BIRD CLUB

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

Meetings are held the second Thursday of each month at the Duluth Branch, University of Minnesota.

RANGE NATURALISTS' CLUB

Officers: President, Mrs. Dorothy Beard; Vice President, Jalmer Halunen; Secretary, Vera F. Barrows; Treasurer, Ruth Ambrose.

Meetings are held the third Thursday of each month, October through May at 7:00 p. m. in the Clubrooms of the Virginia Public Library.

Minnesota Ornithologists' Union
Affiliated Societies

CLOQUET BIRD CLUB

Officers: President, Miss Dorothy Wassen; Vice President, Miss Ruth Johnson; Secretary-treasurer, Miss Edith Sanford.

Meetings are held the first and third Thursday of each month in the Cloquet High School at 7:30 p. m.

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 the first Friday of each month at 2 p. m. at the Walker Branch Library. Field trips during April and May on Tuesdays and Fridays.

MINNEAPOLIS BIRD CLUB

Officers: President, Marvin H. Rosien; Vice President, Mrs. M. E. Herz; Secretary, Mrs. Mildred Snyder; Treasurer, Mrs. Edith Kees.

Meetings are held the first and third Tuesdays of each month at 7:30 p. m. at the Minneapolis Public Library Museum.

MINNESOTA BIRD CLUB

Officers: President, Jerry Paul; Vice President, Miss Theodora Melone; Secretary, Mrs. Mary Lupient; Treasurer, Miss Jean McIntosh.

Meetings are held the first Wednesday of each month, except June, July, August, and September, at 8:00 p. m. at the Minnesota 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 the first Wednesday of each month from October through March in the committee room of the public library at 8:00 p. m.

T. S. ROBERTS ORNITHOLOGICAL CLUB

Officers: President, John Miller; Vice President, Benjamin Friedrich; Secretary-Treasurer, Joan Fowler; Historian, Dolores Gerard.

Meetings are held bi-monthly February through May at the St. Cloud State Teachers College.

ST. PAUL AUDUBON SOCIETY

Officers: President, Leonard C. Lustig; Vice President, Dr. Vernon L. Whipple; Treasurer, Marvin H. Adams; Corresponding Secretary, Miss Dorothy Sundry: Recording Secretary, Mrs. Charles E. Hart; Directors-at-Large Mrs. Arthur H. Savage, J. M. Rice.

MANKATO AUDUBON SOCIETY

Officers: President: T. E. Thomson; Vice President, Mrs. H. B. E'ford; Secretary, Miss Libbie Williams; Treasurer, Miss Martha Cunrath; Directors, J. George Lynch and Dr. H. Bradley Troost.

Meetings are held the first Thursday of each month (except July, August, and September) at Mankato State Teachers College.

THE FLICKER

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THE FLICKER

VOLUME 21 SEPTEMBER 1949 NUMBER 3

Tentative List of Candidates for State Bird

Prepared by the State Bird Commission, Created by an Act of the 1949 Legislature

A tentative list of 20 candidates for a state bird of Minnesota has been chosen by the State Bird Commission authorized by the 1949 Legislature.

The Commission invites comments on these candidates from organizations or individuals as an aid in the preparation of a final list. This list will be submitted to the school children who will vote for their favorites in a state-wide referendum next spring. Comments should be directed to the Minnesota Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota.

In the preparation of this preliminary list, the Commission has first drawn up the following qualifications which it feels an ideal state bird should have.

1. Since this is to be a distinctive trade mark or insigne for the state, it should be a bird which is not already the state bird of another state.
2. It should be at least fairly well known, although not necessarily abundant. Precious gems are admired and valued in part because they are rare.
3. It should occur throughout the state at least during the nesting season and preferably throughout the year.
4. It should be a strikingly marked bird whose pattern, even in black and white, would lend itself well to use in insignia.
5. It should have some special significance for Minnesota.

The Commission feels that no one bird has all of these qualifications. Different individuals will attach varying degrees of importance to the above requirements. The Commission is unanimous in feeling that any bird already the choice of two or more states should not be considered. On this basis the following have been at least tem-

porarily eliminated: Black-capped Chickadee (2 states), Robin (3 states), Bluebird (2 state), Cardinal (4 states), Meadowlark (5 states), and Goldfinch (3 states). Of the list submitted herewith, the Brown Thrasher, Baltimore Oriole, and Ruffed Grouse are each the state bird of one other state.

The **Loon**, also known as the Great Northern Diver, is a water bird that in the minds of many symbolizes the "Land of 10,000 Lakes," with all its forests and recreational possibilities. It is a summer resident in the northern two thirds of the state and may be seen on all our lakes in spring and fall. Its weird quavering call is a true voice of the wilderness. Its silhouette is striking and is in full color when reproduced in black and white.

The **Great Blue Heron** is a summer resident about water throughout the state. It is a striking bird over three feet tall and lends itself well to artistic design. It nests in large colonies called "rookeries," and feeds on fish and other aquatic life. Locally at such places as fish hatcheries it is considered destructive but this bird is a great traveler and normally its take of fish is so widely spread as to be of little economic importance.

The most colorful waterfowl in America is the **Wood Duck.** Nesting throughout the state it is a common summer resident in all wooded areas near water. Its unusual habit of nesting in tree cavities, often high above the ground, is a surprise to many people. The bird was in danger of extinction in the early '30s but has increased greatly in recent years and now is sufficiently common to be seen and enjoyed by all.

A large bold bird of positive actions, the **Osprey**, has many of the qualities of the Bald Eagle, our national emblem. It typifies Minnesota's 10,000 lakes since it nests along our lake shores and feeds exclusively on fish. Its huge bulky nests in tall trees often are landmarks in the Canoe Country. It is widespread throughout our lake country, but it is never found in numbers great enough to make its take of fish a matter of concern to fishermen. It migrates regularly through the state. It is protected at all times by law.

The trim little falcon, the **Sparrow Hawk** is beautifully marked with chestnut, black, white and blue. This smallest of American hawks is a summer resident throughout the wooded parts of Minnesota where it nests in hollows in dead trees. Its name mistakenly suggests that it lives largely on small birds. Very often it is found hovering in midair watching the ground below for the mice, grasshoppers, and other large insects which make up the main part of its diet. Only occasionally is a small bird taken.

The **Ruffed Grouse** or Partridge, often called the king of game birds, varies greatly in abundance. It is common in Minnesota woods for a few seasons about every nine or ten years. Just now it is near the peak of one of these cycles. This bird's mysterious spring drumming, produced by the beating of its wings in the air, typifies the deep undisturbed forests. Common in the north, it is now nearly gone in southern Minnesota, but can be brought back with good conservation practices.

A member of the plover family, the **Killdeer** is found wherever there are plowed fields, pasture-lands, or golf courses. Its sharp "kill-dee kill-dee" and two black breast bands are well known. It is one of the first spring arrivals in Minnesota and is of great value to agriculture by its destruction of grasshoppers, weevils, cutworms and other injurious insects. Its color pattern would make it an easily recognized emblem.

The brownish-gray **Mourning Dove** is a small edition of the now extinct Passenger Pigeon. It is often seen along country telephone wires though it nests in large cities as well, where its cooing is called mournful by some, restful by others. Its distinctive shape, peaceable disposition and valuable habit of destroying weed seeds commend it as an emblem. Although hunted as a game bird in some more southerly states, it is protected by state law the year around in Minnesota.

About crow-size with long ear tufts, the **Long-eared Owl** is found in tamarack swamps and other low-lying woodlands throughout Minnesota and would typify the appeal of our wilderness areas. No state has yet chosen an owl as its symbol. Its appearance is striking. The Long-eared Owl and most of the other owls are now protected by state law because of their value as rodent destroyers and as interesting members of the wildlife community.

The **Belted Kingfisher** plays a waiting game as he perches on dead branches along lake shores and stream banks in all sections of Minnesota. His prey is small fish, water insects, crawfish, etc. The harsh rattling call, large head, and contrasting blue and white plumage would make the Kingfisher a dashing symbol of our land of lakes. In catching small fish the Kingfisher in many instances is helping to reduce the numbers of stunted fish that never grow large because too many are competing for a limited food supply.

The **Pileated Woodpecker** with its flaming scarlet crest is the largest and showiest of our Minnesota woodpeckers. Though not a common bird, it is well distributed and is a year around resident in woodlands throughout the state. Its beautiful coloration and impressive bearing make it the personification of the appeal of the wild. The Pileated's borings usually are confined to trees that have already been seriously damaged by insects and it is of value in controlling these tree enemies.

The **Kingbird** is so named because of its dash and courage in driving away hawks, crows or other birds much larger than itself from the vicinity of its nest. It has a contrasting pattern of black and white. It is one of the flycatchers all of which feed almost entirely on insects taken on the wing. The entire state lies within the range of this bird. It arrives late in the spring and leaves early in the fall.

The **Barn Swallow** is widely distributed throughout the state and is well known because it so often nests about buildings. It is beautifully but not boldly colored. Its long, pointed wings and scissor-like tail give it a streamlined appearance, and make it one of the most graceful of all our birds in flight. As with all the swallows, it feeds entirely on flying insects. It is a summer resident, leaving Minnesota quite early in the fall.

The **Blue-Jay's** distinctive blue, black and white color pattern and its jaunty crest recommend it highly as an emblem. It is an abundant resident over the whole state and remains throughout the winter even in the Canadian border region. It has a surprising vocabulary and at times does fairly well at imitating certain other birds. Its greedy aggressive manner toward other birds will in the minds of many offset some of these favorable points.

The **Brown Thrasher** is a slim brown bird with a long tail and streaked breast widely distributed throughout the state although more common in the south. It often nests in gardens and hedgerows and so is familiar to many people. It is a close relative of the southern Mockingbird and as a songster it has few, if any, equals among our Minnesota songbirds. It is to a

large extent an insect eater but feeds some on fruits.

The **Cedar Waxwing** is a very trim bird. Its colors are rather soft, highlighted by red on the wing tips and yellow on the tips of the tail feathers. Its crest and the black band through the eyes give it a jaunty appearance. It is widespread through the forested parts of Minnesota and remains throughout the year. It often comes in flocks about cities and towns in winter where it feeds on the colorful berries of the mountain ash and other such fruits.

The tiny warbler, the **Redstart** has a brilliant color combination of red-orange, black and white. It nests throughout the wooded parts of the state and is one of the commonest of the warbler family during migrations. It has an attractive song and its feeding habits are entirely favorable. It is a summer resident. No state has yet chosen one of the warblers as its emblem but this species appears to have most of the requirements except size.

The **Baltimore Oriole** has a contrasting orange and black pattern that commends it highly. It is a song bird of outstanding merit and occurs throughout wooded parts of the state. It feeds extensively on injurious insects. Many know it as the skillful builder of the basket-like nests so conspicuous after the leaves fall in autumn. It is a summer resident in Minnesota. As one might suspect from the name, this bird is the state bird of Maryland.

The **Scarlet Tanager** has a bold black and scarlet pattern as well as an attractive song which can readily be confused with that of a robin. It occurs during the nesting season over a large part of the wooded portions of the state. It is nowhere abundant but is not considered rare. Its food habits are highly favorable since it feeds heavily on destructive caterpillars.

The brilliant black, white and red **Rose-breasted Grosbeak** occurs over the whole state during the summer although on the prairies it is confined to groves. Its rich, mellow robin-like song is one of the finest of any of our birds. Its food includes an extensive list of destructive pests, the potato beetle being one. The grosbeak is familiar to many people since it nests frequently in towns and cities.

STATE BIRD COMMISSION:

Chairman: W. J. Breckenridge
Director, Minnesota Museum of Natural History

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Member: Kenneth D. Morrison
Regional Representative, National Audubon Society

Swallow-tailed Kite in Fillmore County

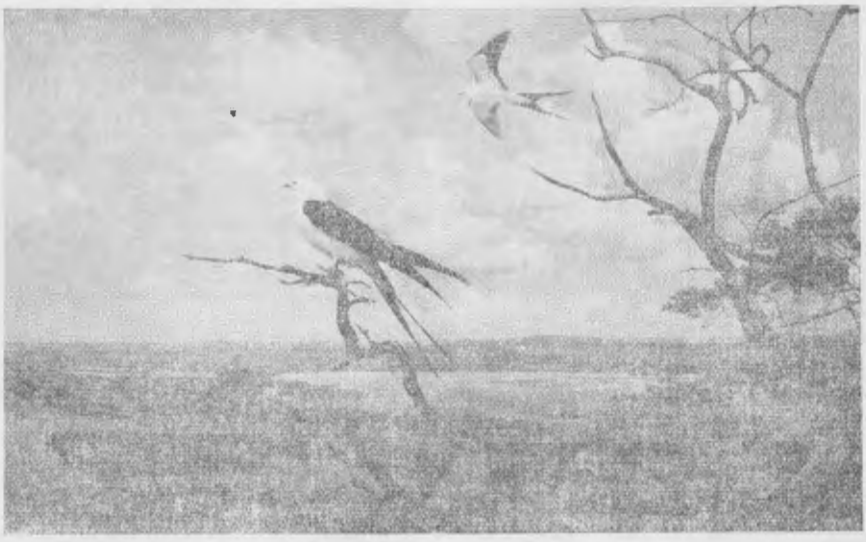
by

Franklin Willis

On August 20, 1949, while I was in Spring Valley, Minnesota, visiting friends, a note in the August 18 issue of the Spring Valley Tribune was brought to the attention of Mrs. C. E. Peterson and myself. It told of a farmer living northeast of town who had shot what he thought at first glance to be a " chicken hawk." When he picked it up, he realized it was not an ordinary hawk so he took it into town where it was identified as a Swallow-tailed Kite (**Elanoides forficatus forficatus**) at the library.

You may rest assured that the reaction of Mrs. Peterson and me was the same as any other amateur ornithologists would have been. We hastily bid our adieus and thanks and proceeded to the newspaper office where we inquired directions to the trigger happy farmer's residence. The place was located in rugged and wooded country with bluffs and deep ravines.

The fellow showed us the bird which he had rather crudely skinned and had nailed to the barn wall. The bird still retained an air of beauty even in death and I could not help imagining the superb grace of the great swallow-like bird when it was free in the air. He explained that he was troubled by hawks taking his poultry so when he saw the bird looking at the yard from a dead tree on the edge of the woods he shot it. Upon examining it he saw that this was no bird he had ever seen before although he'd lived in the woods all his life. He had taken it to the library to be identified and thus the piece in the paper. He consented to let us send the skin to the University Museum but we forgot to ask what had happened to the body. My guess is that it was dog food for the clamoring hound that was tied to a fence. The following measurements were taken of the skin, the bird seeming to be a trifle larger than measurements given in most books: over-all length—27.75 in.; wing span—46 in.; wing length—21.5 in.; tail—14 in.; tarsus—1.5 in.; upper mandible—1.125 in.



(Habitat Group, Minnesota Museum of Natural History)
U. of Minn. Photo Lab.

SWALLOW-TAILED KITES

Whether or not the bird nested in the area is not known. There appears to be suitable habitat along the Root River and tributaries. The woods are dense and the terrain rugged and in many spots sparsely populated, but the farmer who shot it had never seen one before so it is possible that it was just passing through.

At one time the bird was common in all suitable localities but since 1900 there are only eight records of this bird in the state. The latest one was seen by J. Eheim on July 29, 1923 near Hutchinson. There are 26 years between these last two records.. Let us all hope that this will not be the last individual of this magnificent species to be found in the state.—**Stewartville, Minnesota.**

Editor's Note: Since this article was written so much concern over the needless killing of this bird has been expressed to the Conservation Department that their local warden arrested the guilty party. Trial was before a local justice of the peace; the party pleaded guilty; and a fine of $25 and costs was levied against him. This is the first prosecution of anyone under the hawk protective law passed by the 1945 Legislature and sets a precedent for the successful prosecution of other flagrant cases of needless shooting of rare or beneficial hawks in other parts of the state. If interested people will voice their objections to such law violations to wardens or other Conservation Department officials, these officers will feel they have popular support in making such arrests and the law will begin having its desired effect. **W. J. B.**

Cover Type Use of the Ruffed Grouse In Relation To Forest Management on the Cloquet Forest Experiment Station

by

Lester T. Magnus

Part II

(Concluded)

Relative Cover Type Use at Cloquet and in New York

While an exact comparison cannot be made because of the limitations in the data and difference in the composition of the cover types, an attempt will be made to discuss the cover type use on the Cloquet Forest Experiment Station and on the New York study areas (see Figure 5 and Table 8).

Open-land—The use of this type at Cloquet as shown by the data agrees quite well with the results obtained in the New York study, except for fall when Cloquet had a very high use as indicated by the limited amount of data. The relatively high fall use indicated may be due to grouse in muskeg areas seeking cranberries. This type has less use than any other type, but this low use does not detract from its importance in creating edges (5).

Overgrown land—The types vary considerably in composition in the two studies which may possibly explain the higher use of this type in the fall in New York while a higher use is indicated for all other seasons at Cloquet. There is an abundance of the Ruffed Grouse's favored fall food species such as: pin cherry, aspen, thornapple, wild apple, sumac, dogwoods, and viburnums on the overgrown lands in New York—all except aspen place in the top ten fall foods (5). In winter this type has the highest use rating of all the types at Cloquet probably because of the alder upon which the grouse feed heavily. The fall and winter use position of the type nearly reverse in the two studies with Cloquet maintaining an advantage over New York for the spring and all seasons use.

Hardwood—This type is quite different in composition in the two studies being mostly aspen and birch at Cloquet, while in New York aspen, beech, birch, black cherry, maple, and oaks are included. The use of this type at Cloquet is higher than in New York for all seasons with the greatest margin of difference in the fall, when it was nearly three times as great, decreasing until spring when it was only one sixth greater. Trippensee (22)

states that in Michigan aspen and birch are the leading fall and winter foods of the Ruffed Grouse making up 44.7 per cent of the food. In New York (5) birch is third on the list of fall foods with 7.4 per cent, and in the winter aspen is second, and birch third for a total of 30.1 per cent of the food. Assuming that the Michigan food study was done on forest cover types similar to those at Clouquet these figures would indicate that the grouse are much more dependent for food on this type at Cloquet than they are in New York.

Conifer-hardwood—The use of this type in the two studies is in close agreement for all seasons and for the total of the three seasons. The usage is very consistent for the various seasons not varying over 3 per cent in 25 per cent at Cloquet and 4 per cent in 23 per cent in New York.

Conifer—This type at Cloquet has a moderate use at all seasons varying from the low of 14.0 per cent in winter to 16.8 per cent in the spring. In New York however, the type had varying degrees of use from a high of 19.4 per cent in the fall to a very high 37.4 per cent in the winter. This can probably be attributed to the shortage of good coniferous winter shelter in New York so that where it does exist such shelter is very heavily utilized.

Slashing—This type has a consistent low use through all the seasons both at Cloquet and in New York. The type has a slightly higher use in New York for all seasons, except winter as indicated by the data; this is probably due to the limited number of observations at Cloquet and to the greater variety and quantity of plants in New York.

Spot lumbered—No comparable type exists at Cloquet.

The three most used types at Cloquet, overgrown land, hardwoods, and conifer-hardwoods, have a combined usage of 65-74 per cent for the various seasons, while the same types in New York have a combined usage of 51-59 per cent.

The usage figures for winter would seemingly indicate an abundance of good winter shelter types and a shortage of winter food types at Cloquet; and an abundance of winter food types and a shortage of winter shelter types in New York. The usage of the two major food types, overgrown land and hardwoods, at Cloquet during the winter totals 51.6 per cent, while the same two types in New York have a usage of 27.4 per cent, only about half as much as at Cloquet. The two major shelter types, conifer-hardwoods and conifers at Cloquet, have a usage of 35.7 per cent, while the same two types in New York have a usage of 60.2 per cent, one and seven tenths times as great as at Cloquet.

Relative Cover Type Use at Cloquet and Houghton Lake, Michigan

A study of cover type use was conducted on five areas in Michigan. Of these five areas the Houghton Lake Areas III in the Houghton Lake State Forest most nearly resembled the cover types on the Cloquet Forest Experiment Station. Some differences do exist such as the presence of oak and hemlock at Houghton Lake and more jack pine at Cloquet. Some of the relations between cover type use at Cloquet and Houghton Lake will be discussed (see Figure 6 and Table 9).

Lowland conifer-hardwood—At Cloquet this type shows a decided drop in use from fall to winter with a gain in spring of about half the fall to winter loss. At Houghton Lake a slight drop occurred from fall to winter use with a much greater drop from winter to spring. The greater fall use of this type may be due to the use of its edges

as molting cover early in the fall as stated by King (17) and later the blueberry and high-bush cranberry crops. Both areas have some upland conifers with Cloquet having a much larger proportion; also they both have considerable upland conifer-hardwoods which may explain the decreased winter use as the conifers and/or conifer-hardwoods are more suitably located with reference to food.

Lowland conifers—On both areas this type has a low use for the seasons for which data were available with Cloquet having both the highest and the lowest use in the spring and the winter. The low usage of this type is probably due to the kind and location of the shelter furnished with respect to the location of the variety of other types so essential to the Ruffed Grouse. The greater use of this type during the winter at Houghton Lake in relation to Cloquet is due to the greater amount of upland coniferous shelter at Cloquet.

Lowland brush—This type has a low to moderate use at Cloquet for the three seasons, while at Houghton Lake the use varies from low to extremely high. At Cloquet a decided increase in winter over fall use takes place but this increase is dwarfed by the increased use that took place at Houghton Lake for the same seasons. This rise in use results from the importance of the type as a winter food producing type. The great difference in winter use on the two areas is possibly caused by the greater amount of aspen and birch at Cloquet.

Upland hardwoods—On both areas this type leads for all seasons except the winter at Houghton Lake when it is second to lowland brush. The use is very high varying from a low of 23.0 per cent up to a high of 41.5 per cent. This type is primarily a food producer at all seasons with a possible secondary use as nesting cover in the spring.

Conifer-hardwoods—At Houghton Lake this type has a usage of 50-100 per cent greater than at Cloquet for the various seasons. The apparent explanation for this difference is found in the use of the following type.

Upland conifers—At Cloquet the type has a usage of 100-200 per cent greater than at Houghton Lake for the fall and spring seasons. During the winter Cloquet registers a use of 19.3 per cent, while no use is indicted for Houghton Lake. This would seem to indicate that the conifers at Cloquet furnish more and better shelter than the conifer-hardwoods and that the reverse is true for Houghton Lake.

Open—The use of this type fluctuates considerably with the high extreme questionable. The use at Cloquet is greater for the fall and winter seasons with Houghton Lake assuming the lead in the spring.

The usage of the various types during the fall on the two areas is very similar with two exceptions, conifer-hardwoods and upland conifers, where the differences between the two types compensate for each other. During the winter considerable variation in use exists in all the types. During the spring the usage is quite similar with two main exceptions, conifers and conifer-hardwoods; again the differences tend to compensate each other.

Forest and Wildlife Management

While considerable understanding of the relationships between forestry and wildlife management has been gained in recent years, much more work needs to be done to bring about a better understanding. Curtis and Trippensee (7) have emphasized the need for research on the combined production of timber and wildlife organized so as to give quantitative results. Until research programs are initiated and the resulting data used in educational

work to promote better understanding of the relationships between wildlife and forestry, it will be difficult to break down the idea that forest management and wildlife management are incompatible. Curtis and Trippensee (7) illustrate the view of many foresters. "Foresters tend to term any indications of feeding by animals as "damage," when such feeding may be entirely beneficial to the forester by preventing certain weed species from flourishing." Davenport (9) illustrates the extreme view held by wildlife managers. "As a game man I am very little concerned with 'forest policies' as they relate to the production of essential or other timber supplies and the best methods of insuring permanently generous supplies. By now, I presume it is quite generally understood and taken for granted . . . that stands of timber trees such as are in condition to produce the most high-quality timber per acre per year are automatically low in their game carrying capacity. In general therefore, the practice of intensive forestry on any area is due to eliminate game management as a major consideration on that area."

A few of the forestry practices listed in Bump et al (5) that tend to conflict with even extensive grouse management are: large lumbering operations within individual forest tracts; prohibition of lumbering operations in all forms; complete reforestation with conifers of large contiguous areas; the maintenance of relatively pure stands of any species of tree, shrub or herbaceous growth. These practices all tend to standardize rather than diversify the habitat. In making improvement cuttings the forester tends to remove all "weed" species from his stands regardless of whether or not such species may be of benefit to the wildlife on the tract. The elimination of wolf trees which usually are the heavy fruit and mast producers may also eliminate or drastically reduce the grouse population on an area. Heavy thinning or pruning that create park like conditions on intensively managed forest areas will reduce all wildlife use of the area.

Before any management plans are made, it is desirable to establish the order of importance of the various uses to which a given area is to be put (5). If forest crops are of primary importance and grouse of secondary importance, as they must be on commercial forest lands, radical changes in the methods of managing forest lands are not to be expected purely on the premise that grouse alone are thereby benefited. The best that can be anticipated under such limitations is a forest management plan that recognizes the production of grouse as an allied objective; and its program of forest improvement and regulation of cutting operation encourages such wildlife production by all means compatible with sound forestry practices (22). An example of this as mentioned in Bump et al (5) would be to leave wolf trees that are producing fruit or mast so long as they do not cast shade sufficient to prevent reproduction and maintenance of crop trees and understory shrubs and herbs.

Where grouse and forest production are to be given equal emphasis, as has been done on a few areas in New York, conflicts in management practices may often be avoided if portions of the woodlands particularly suited to the production of a forest crop are set aside for this primary purpose. Established plantations or patches of woodlands of high commerical value are examples of this point. Likewise, throughout the area, an adequate amount of certain cover types may be set aside as of primary importance to grouse production. Among these are

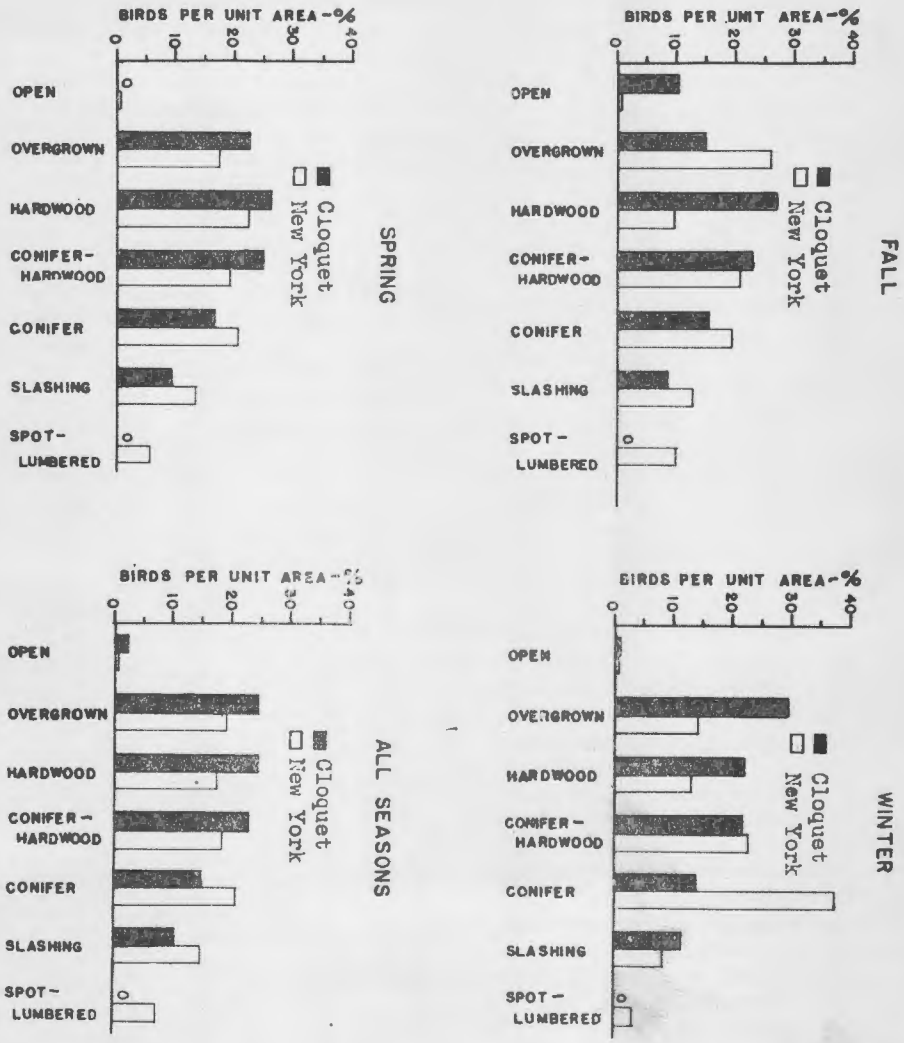


Figure 5. Relative Cover Type Use At Cloquet And In New York

overgrown fields, fencerows, orchards, scattered clumps of conifers, and small slashings or other opening in the forest cover. Having located each of these primary use units, the necessary practices to produce the main crops thereon then may be carried out, together with such other cultural practices as may assist in the production of the secondary crop (5).

Few, if any, areas exist where grouse are of primary importance and timber production of secondary importance. On such areas, cultural practices to stimulate growth and to maintain the composition of desirable species are needed. Desirable species may include trees, shrubs, vines, and herbs beneficial to the grouse as well as those that provide forest products.

As was stated previously, wildlife (Ruffed Grouse) management must necessarily be secondary to the primary objective, forest management. This means that Ruffed Grouse management must for economic reasons be largely of the extensive type. Intensive management for grouse will largely be experimental by s c h o o l s, demonstrational on public lands (as the Connecticut Hill area in New York), or on estates where the value attached to each grouse is high (10). Chapman (6) writes that game management within forest areas looks to the production of the largest possible annual crops of game consistent with the preservation and management of the forest itself. It does not look upon game as the sole or even the primary product of the forest, but as one of several uses, including timber crops, watershed and soil protection. Game crops must find their proper place in this scheme, and it is the business of the forester to see that this resource, as well as others, is brought to its fullest utility.

In these days of large urban populations using forested areas more and more for recreation, and with the means of getting to these forested areas quickly, the multiple use of these areas should not be forgotten. Forested areas can be used for recreation as well as for timber production with one of the best means of developing the recreational facilities of a forest being to aid its wildlife populations. If multiple use practices—including extensive grouse management—were applied to the coniferous forest and the coniferous-deciduous forest ecotone zones which correspond very closely with the Ruffed Grouse's range, increased benefits would accrue to the owners and inhabitants of forest areas. With multiple use practices a good start would be made toward increasing the number of grouse up to the maxium of one grouse per four acres of winter range for Cloquet as found by King (16), or to the less than two acres of winter range per grouse found by Grange (12) on an ideal grouse range in northwestern Wisconsin. In too many areas this scheme of multiple use is ignored, especially with respect to wildlife with resulting losses of economic gains to individuals and to the public.

Ruffed Grouse and the Future

On the Cloquet Forest Experiment Station little management work has been done with the Ruffed Grouse up to the present time. In 1923 the area was created a State Game Refuge with no special provisions being made for game law enforcement. It is not known to what extent poaching is carried on. Also small furbearers were trapped for a number of years by the forest manager's sons. The other management work that is being done consists of taking a grouse census by the King census method each spring quarter by the forestry students, and irregular censusing other quarters by the wildlife students. These censuses show

variations in the Ruffed Grouse populations over the period of time covered by this report (see Figure 7). Most of the observations were made in periods of high densities; it is not known if density had any effect on cover type use.

The present forest management practices on the Cloquet Forest Experiment Station do not take into consideration any possible effects on Ruffed Grouse either positive or negative. Present plans call for conversion to nine types from the present fifteen types: jack pine, Norway pine, white pine, mixed pines, aspen, black spruce, spruce-balsam, spruce-tamarack, and tamarack as stated by Allison and Brown (2). For the forest 50 years hence the more important species will be occupying areas approximately as follows: jack pine, 900 acres; aspen, 500 acres; Norway pine, 300 acres; white pine, 100 acres; and the lowland species, spruce, balsam and tamarack, jointly 800 acres. Ultimately the forest will consist of 1,170 acres of Norway pine; 540 acres of white pine; 150 acres of jack pine; and of 830 acres of lowland species, spruce, balsam, and tamarack as stated by Allison and Brown (2). But the immediate problem is ultilization of the present mature and overmature jack pine stands before they deteriorate too greatly. The problem is complicated by the necessity of converting the forest to small areas of even-aged stands without overcutting at the present, so that a sustained yield may be harvested in the future. To accomplish this a cutting program has been initiated that has clear cut approximately 128 acres of jack pine and 11 acres of aspen in the period 1939 to 1948. This cutting (see Figures 1,2,3 and Table 1) has been in small blocks of irregular shapes ranging up to about 13 acres in size. Natural regeneration is hoped for and is aided in the coniferous cutting by scarification where natural regeneration is not satisfactory and in brushy areas where planting is done. Some stand improvement work such as release cutting, thinnings, and pruning are done in the younger stands.

The present forest management program as a whole tends to be beneficial to the Ruffed Grouse. The cutting in small blocks creates the slashings which are so essential to grouse. In a short time these slashings will be taken over by herbs and low bushes; later the taller brush and sapling tree stages will dominate as a brush type of which the lowland brush is fifth and upland brush sixth on the Ruffed Grouse's use rating. Since natural regeneration is to be attempted in all cases, a mixture of species in varying degrees will result. This mixture of species will tend to create a conifer-hardwood type which is the second most used type on the use rating. Tripensee (22) states from the viewpoint of producing grouse, that the forest that best satisfies their environmental requirements is one containing a mixture of conifers and hardwoods of all ages arranged in numerous well-distributed, even-aged stands, not exceeding in area 600 feet in diameter nor smaller than 100 feet. Hosley (14) writes that mixed stands are obviously more favorable for wildlife than pure stands, because of the greater variety of food, cover, and other environmental conditions to be found there.

Where natural regeneration is a failure, artificial planting will be done. As stated by Hosley (14), the practice of planting conifers is the forestry practice most often criticized from the wildlife standpoint. All agree that a certain amount of conifers is necessary for wildlife, principally as protection from weather and also as concealment from predators. The effect of coniferous plantations on game

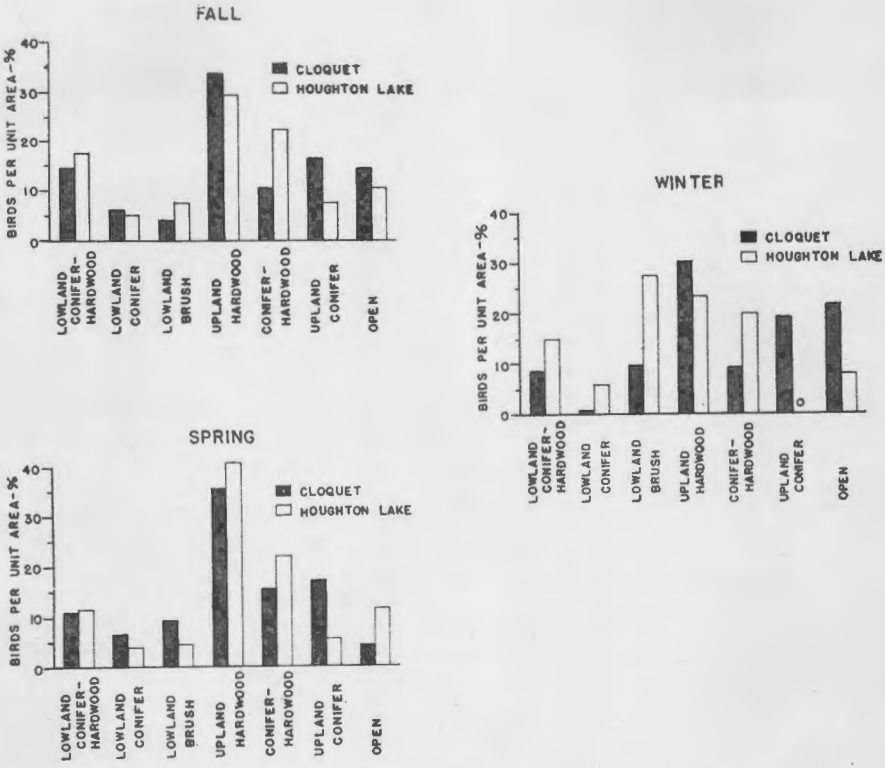


Figure 6. **Relative Cover Type Use At Cloquet And Houghton Lake, Michigan**

seems to be determined by the per cent of land planted, the interspersion of other types, species planted, and later treatments. Bump et al (5) found that in New York grouse were much more widely spread throughout the natural woods than in the coniferous plantations. In the latter twice as many grouse were to be found within 200 feet of an edge as were flushed in the entire interior of the plantation. The reverse was the case in the adjacent natural woodlands. In general where large plantations are established, grouse use of the areas will decrease. The planting that has been done has been in small clear cut areas where natural regenration has failed so the criticism does not apply as rigidly.

Little is done in the line of intermediate cutting, other than the forestry students' thinning and pruning projects. Density of stocking which can be changed by thinnings is a very important factor since it controls timber size and quality as well as development of undergrowth and fruit crops. Hosley (14) writes that from the standpoints of good growth and improved conditions for wildlife, thinnings are the most important cultural operation in any dense stands beyond the sapling stage. Pruning of up to 150 crop trees per acre where conifers are abundant as in plantations will not seriously impair the shelter value of the stand as a whole; but

when carried to the point where the stand becomes open beneath the crown cover, grouse will be notably absent (5). Where intermediate cuttings are carried out, conditions should be improved for grouse resulting in increased usage.

If and when the existing forest is converted to the nine types envisioned 50 years hence, there will tend to be a reduction in the grouse population.

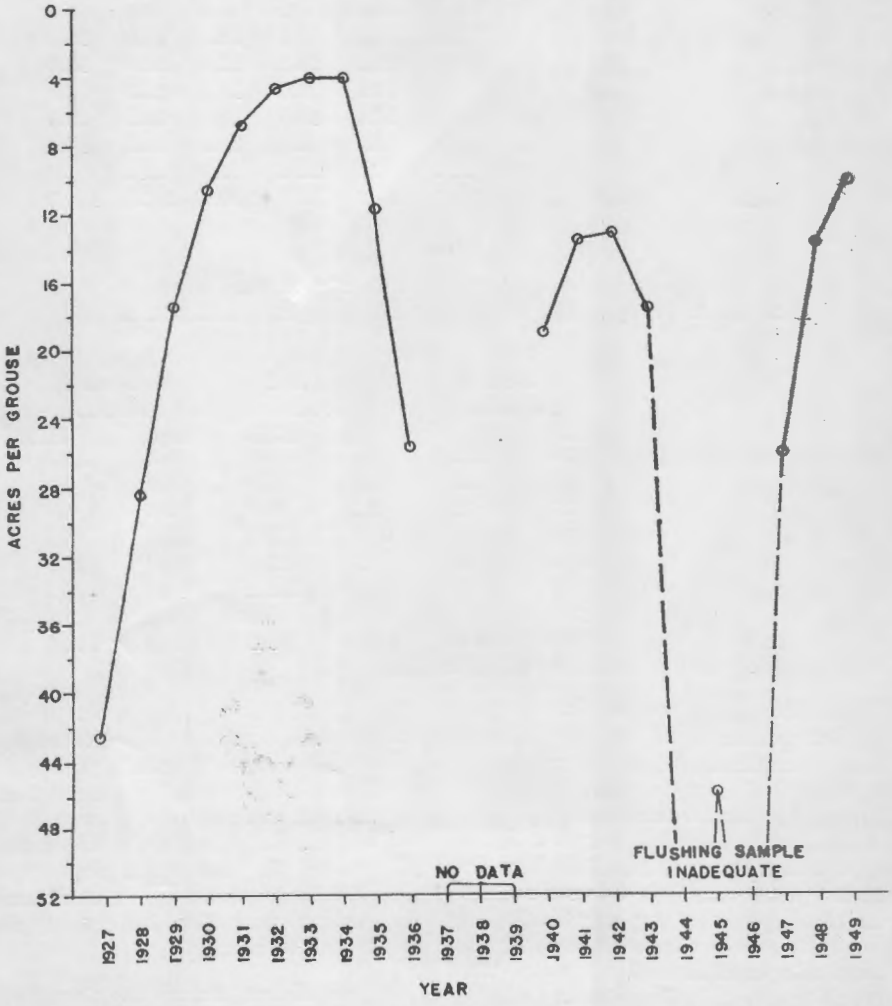


Figure 7. Ruffed Grouse Population Density, Cloquet Forest Experiment Station

TABLE 8

Relative Cover Type Use at Cloquet and in New York

Type	Fall % Birds Per Unit Area		Winter % Birds Per Unit Area		Spring % Birds Per Unit Area		Total % Birds Per Unit Area	
	Cloq.	N.Y.	Cloq	N.Y.	Cloq.	N.Y.	Cloq.	N.Y.
Open land	10.4	0.7	1.0	0.8	.. ..	0.6	2.4	0.6
Overgrown land	15.1	26.1	29.5	14.2	22.7	17.4	24.5	19.2
Hardwood	27.1	9.9	22.1	13.2	26.0	22.4	24.4	17.6
Con.-Hdwd.	22.9	20.9	21.7	22.8	25.0	19.3	23.0	18.6
Conifer	15.6	19.4	14.0	37.4	16.8	20.8	15.2	20.9
Slashing	8.9	12.9	11.7	8.5	9.5	13.6	10.5	14.7
Spot Lumbered	.... ..	10.1	.... ..	3.1	.... ..	5.9	.... ..	7.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9

Relative Cover Type Use at Cloquet
Relative Cover Type Use at Cloquet and Houghton Lake, Michigan

Type	Fall % Birds per Unit Area		Winter % Birds Per Unit Area		Spring % Birds Per Unit Area	
	Cloq.	H.L.	Cloq.	H.L.	Cloq.	H.L.
Lowland Con.-Hdwd.	14.5	17.5	8.8	15.0	11.1	11.5
Lowland Con.	6.0	5.0	0.9	6.0	6.9	4.0
Lowland Brush	4.0	7.5	9.7	27.0	9.4	4.5
Upland Hdwds.	34.0	29.5	30.3	23.0	35.6	41.5
Con.-Hdwd.	10.5	22.5	9.2	20.0	15.5	22.5
Upland Con.	16.5	7.5	19.3	....	17.3	5.5
Open	14.5	10.5	21.8	8.0	4.2	11.5
Total	100.0	100.0	100.0	*99.0	100.0	*101.0

* Discrepancy due to rounding off to tenths.

The jack pine type and Norway pine type with their C use rating will have their areas increased at the expense of the aspen-birch type with an A use rating; the conifer-hardwood type with a B use rating; and the upland brush type with a B use rating. This increase in the pines with their low use ratings at the expense of types with higher use ratings will eliminate some of the favorable conditions for grouse. The aspen type with a B use rating will be increased in area probably from the aspen-birch type and conifer-hardwood type both with A use ratings and upland brush type with a B use rating. This will also result in less favorable conditions for grouse as indicated by the available data. The white pine type envisioned would probably come out of the existing mixed pine type with a B use rating. Assuming about the same use rating for the white pine type would indicate no change in conditions for grouse use. The lowland types would not be changed.

In the distant future the forest as envisioned would consist of three upland types: jack, Norway and white pines. Norway pine would make the largest area gain up to 1,170 acres,

with most of the gain coming from the large jack pine type that is hoped for 50 years hence; this would produce little change in usage as both types have a C use rating; and with a small portion of the gain from the aspen type of 50 years hence, this would result in reduced usage as the aspen type has a B use rating. A small area would remain in jack pine, so no change in usage would take place. The white pine type would gain at the expense of the aspen type of 50 years hence with probably little change in use rating.

All proposed changes in the forest type composition in the future tend to cut down and eventually eliminate the hardwood types upon which the grouse is dependent for food and nesting sites and to increase the amount of coniferous shelter types. As an example, the situation in the preceding paragraph may be used where the white pine is to supplant the aspen. Assuming white pine to have a use rating equal to the mixed pine use rating, it would appear that no change in usage would take place as white pine and aspen both have B use rating however, the white pine is a shelter producing type and the aspen a food producing type; with the elimination of the last food producing type on the area, it is reasonable to assume that the usage of the remaining coniferous shelter types will decrease.

The future situation with regard to the Ruffed Grouse is not as serious as it may seem from the above discussion. The change in forest type composition necessarily has to be accomplished gradually due to the great expense of conversion by artificial regeneration. As stated by Allison and Brown (2), the present plan is to use natural regeneration as far as possible, reducing slowly the number of types with the hope and expectation of ultimately achieving the desired results. Although an artificial conversion may be advisable ultimately, it is not planned to attempt it at present. Some solution will have to be found to the problem of how to subdue the hazel brush before success can be expected with natural regeneration and even with artificial regeneration. Considerable areas will continue to exist that will be dominated by brush, and small open pockets will occur in the stands as well as other unproductive areas that will exist; all of these will be utilized by the grouse. Furthermore the very cuttings contemplated to bring about this change will assure many even-aged stands in small blocks, thus creating some interspersion of conditions.

Summary and Conclusions

The data for this study were collected in nine years of an eighteen year period with the number of observations distributed by seasons as follows: fall, 101; winter, 248; spring, 193; and total of all seasons, 542.

Sixteen cover types were used in working up the data available: aspen, aspen-birch, brush, conifer-hardwood, jack pine, Norway pine, mixed pines, lowland brush, lowland conifer-hardwood, lowland conifer, spruce-tamarack, tamarack, open, muskeg, hardwood slashings and coniferous slashings.

This study shows that Ruffed Grouse on the Cloquet Forest Experiment Station have decided preference for the following seven cover types: (1) aspen-birch, (2) conifer-hardwoods, (3) hardwood slashings, (4) mixed pines, (5) lowland brush, (6) upland brush, (7) aspen. A possible addition to this preference list would be coniferous slashings for which a sufficient amount of data were not available. The same lack of data may account for the high rating of the hardwood slashings.

A comparison of the cover type use relations between Cloquet and New York showed that the three most used types at Cloquet and in New York—overgrown lands, hardwoods and conifer-hardwoods—were the same with the types at Cloquet having a slightly greater use.

A similar comparison of the cover type use relations between Cloquet and Houghton Lake, Michigan indicated a very similar usage during the fall and spring with two exceptions—conifer-hardwood and upland conifers. At Cloquet the upland conifers had a usage of 100-200 per cent greater than at Houghton Lake. At Houghton Lake the conifer-hardwood type had a usage of 50-100 per cent greater than at Cloquet. During the winter considerable variation in the usage of all types existed.

Friction between forest management and wildlife management need not exist if the order of importance of the various uses to which a given area can be put are decided upon. It is probable that only on demonstration, research, or certain private estates is forest management secondary to wildlife management in this country.

The present forest management program of cutting small blocks of mature and over-mature jack pine is tending to have positive effect on the Ruffed Grouse by creating slashings, brushy areas, mixed types, and an uneven aged forest of even-aged stands.

If the brush problem can be solved, the long range program of conversion to pines will eventually tend to reduce the Ruffed Grouse population by reducing and ultimately eliminating the hardwood and conifer-hardwood types.

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—Kinney, Minnesota.

ERRATA

The following errors appeared in the June, 1949, issue: On Figure 4, page 36, the line "Birds Per Unit Area—%" should have been placed beside the vertical column of figures at the left of the graph. Figure 2 on page 50 should have preceded Figure 3 on page 49. The title of Figure 4, page 56, which was omitted, should read "Population Patterns from Bass Pond Census." The portion of Table 1 on page 55 should have occupied page 53; Figure 4 should have occupied page 54; Figure 5, page 55, and Figure 6, page 56. The next to the bottom line on page 56 should read "Struthers, Dana; et al." Unfortunately, too, authors' names did not appear after the titles of articles in the table of contents.

American Ornithologists' Union to Hold 1950 Meeting in Minneapolis

The American Ornithologists' Union has accepted the invitation of the Minnesota Ornithologists' Union and the University of Minnesota to hold its next annual meeting October 9-13, 1950, at the University of Minnesota.

This organization, like the Wilson Ornithological Club, is composed of both professional and amateur ornithologists. The A.O.U. was organized many years ago when there was only a handful of people interested in birds. It has grown until today it consists of more than 3,000 members. The A.O.U. has a variety of functions which can best be shown by listing some of its committees. There is a Committee on Classification and Nomenclature of North American Birds, a Committee on Bird Protection, another on research and still another on education. The Committee on Publication is responsible for the publication of "The Auk," a quarterly journal, where the latest research work in ornithology is published as well as notes of interest and a list of recent articles relating to ornithology which appear in other magazines.

To facilitate the functioning of this large organization, an annual meeting is held to transact business, to present recent research work done by individual members and to become better acquainted with the individuals doing such work.

To act as hosts for this organization for five days will entail considerable work and some money. Committees will have to make arrangements for lodging, for some meals (including a banquet), for field trips and numerous other activities. It is possible that bills totaling several hundred dollars may be incurred for a reception, entertainment at the banquet, rental of buses for field trips, printing a small humorous magazine entitled "The Auklet," printing banquet programs, rental of projectors, payment of projectionists and many other items which it has been the custom for the local committees to provide. Each bird club will be asked to contribute. When the job has been done, may we look back on the 1950 meeting in Minnesota as the most successful meeting ever held by the A.O.U.

—Harvey L. Gunderson, President, Minnesota Ornithologists' Union

Seasonal Report

by

Mary Lupient

Minnesota experienced exceptionally hot weather during the past summer and to date of this writing, September 1, there were one hundred days when the temperature was higher than normal and much of the time it rose above 90 degrees. Bird observation was hampered because of the heat and also because there were hordes of mosquitoes.

American Egrets were reported as early as May 20 at Lake Vadnais. From then on reports came in as follows: Cedar Avenue at Minnesota River May 22, Izaac Walton Bass Pond May 23 and June 10, Albert Lea Lake June 29, Faribault June 30, Cedar Avenue and 58th Street, Minneapolis August 8 and Wacouta August 22. Mrs. Chas. MacKenzie, Jr. stated in a note to the Museum of Natural History dated August 22 that American Egrets definitely nested on Heron Island in General Shields Lake ten miles northwest of Faribault. There was a rookery of several nests. It is possible that they nested at Pelican Lake, Fergus Falls again this season as several were seen in the vicinity. That American Egrets are extending their post-nesting wanderings is borne out by the fact that they were seen August 15 at Sebeka, Cass County by C. O Bjore. This is the northernmost record so far.

From all reports there was an increase in the number of most species of nesting ducks, especially Mallards and Blue-winged Teal. The Wood Duck, which was never very abundant, showed a marked increase. Frank R. Martin, Refuge Manager of Rice Lake National Wildlife Refuge found a Baldpate's nest containing a clutch of ten eggs. The nest was on an island in Rice Lake. Latter, July 24, two broods of young Baldpates were seen swimming about on the lake.

Harvey Gunderson and Bruce Hayward spent some time during July at Albert Lea and Luverne. Two Prairie Falcons were observed near Luverne. Ring-necked Pheasants were abundant everywhere. In Rosedell Township there were several Upland Plovers and the following species were common: Eastern Kingbird, Western Kingbird, Dickcissel, and Grasshopper Sparrow. They reported yellow-legs migrating July 18 in Ash Creek Township. Near the Twin Cities the migration of yellow-legs and other shore birds occurred at the usual time but water was lower than it has been for several summers. Mud flats and shorelines of ponds were covered by a lush growth of swamp vegetation so there were no reports of large concentrations. After the Izaac Walton Bass Ponds were drained the latter part of August, fair sized flocks of Greater and Lesser Yellow-legs, Wilson's Snipe, and the small "peeps" stopped there to feed.

No large waves of migrating warblers were reported but in the Twin Cities' area they began to appear singly and in small flocks August 21.

In Cedar Creek Forest a Black and White Warbler's nest containing three young was found July 29, by Warren

Nord and Harvey Gunderson. At her cabin in the same general area Mrs. A. D. Corniea saw two Red-breasted Nuthatches August 10. This is the earliest fall report on record for that territory. On August 25, there she noted a small flock which had the appearance of being a family group. Although these birds normally nest much farther north, their appearance at such an early date suggests the possibility they may have nested in Cedar Creek Forest or just north of it.

A Raven, a species of bird which is seldom reported in this state except in the northern part in winter, was seen by Dr. Whipple near Hudson, Wisconsin.

The most surprising and interesting record for this season was that of the Swallow-tailed Kite which was shot by a farmer near Rochester, Minn., August 15. A detailed account of this record appears elsewhere in this issue.

During the summer Joel K. Bronoel made observations on Herring Gulls at Knife Island, Lake Superior. He reported a considerable increase in nests and young over previous years.

Major and Mrs. Snyder and four other observers made a trip to Lake Traverse on June 11 and saw 63 species of birds. The birds seen were: several hundred White Pelicans, 50 Western Grebes, 50 Bobolinks, 25 Arkansas Kingbirds, one Western Willet, two Wilson's Phalarope, 30 Sprague's Pipits, and many others in not such great numbers. They did see eight Upland Plover in one area about five miles east of Hancock. Evidently they were near a nest as the birds flew around crying plaintively, trying to lure them away from the spot. There were about 1000 Double-crested Cormorant resting on dead trees in Lake Traverse.

Brother Pius found the first Goldfinch nest on July 4, in his study of 64 nests of this species. One nest still contained three young and one egg on September 8.

So few records were sent in for the summer season that this report is necessarily short. This writer solicits the records of the readers of the Flicker and would be pleased to have them sent to the Museum of Natural History. **Minneapolis, Minnesota.**

NOTES OF INTEREST

SANDHILL CRANES IN WILKIN COUNTY, MINNESOTA. On September 16, 1949, while doing field work for the Minnesota Museum of Natural History on a prairie area five miles west of Rothsay, in Wilkin County, Minnesota, 33 Sandhill Cranes were seen. Early in the morning a flock of sixteen was observed shortly after they had taken off from a stubble field. On the same afternoon, one flock of eight birds and another flock of nine were seen flying overhead. The latter group landed momentarily in a cornfield.

Sandhill Cranes have been seen migrating through this area with some regularity, but very few nests of this bird have been found in Minnesota. Valuable knowledge of the status of this bird in Minnesota would be gained from more frequent and regular reports of observation in the prairie area from Rothsay north to the Canadian border.— **Harvey L. Gunderson and Bruce Hayward.**

COMMON LOONS BREEDING NEAR SAINT PAUL—Since the nesting of Common Loons **(Gavia immer immer)** is now a not-too-frequent occurrence in the central part of the state, the finding of three pairs of these birds with young should be of interest. The records are as follows:

1). Lake Oneka, Washington County, June 17, 1949. Pair with one young.

2). Round Lake, near Anoka County, June 20, 1949. Pair with one downy young.

3). Whaletail Lake, Hennepin County, June 21, 1949. Three or four adults present . One downy young with pair.

Oneka and Round Lakes are small swampy lakes not much disturbed by people. On Whaletail Lake, however, there are 20 boats generally in use on weekends on the north part which is quite swampy in character. This north half of the lake is rimmed by floating cattail mats. **Wm. H. Longley, Saint Paul, Minnesota.**

SWALLOW-TAILED KITE NEAR GARRISON, MINNESOTA— While on a hike Sunday afternoon, October 9, 1949, I had the thrilling experience of seeing a Swallow-tailed Kite. The bird was flying over the trees at Round Lake about seven miles from the town of Garrison in Crow Wing County on the west shore of Mille Lacs.

I was walking along looking for bittersweet and birds when, for some unknown reason, I looked up into the sky and saw this great black and white bird with a long forked tail soaring overhead. It suddenly started down toward me. Then I saw its white face which looked something like an owl's—rather flat—with a black beak. At first glance I thought that it was some kind of gull for its wings were shaped something like the wings of a Herring Gull. When the bird came toward me, I tried to get my glasses on it but lost him in doing so.

This all happened in a matter of minutes. If it were not for the fact that the two men at our cabin, who were out fishing at the time, saw the kite also, I would begin to believe that it were just a dream.

I hope others will see and report this wonderful bird.— **Wynne Lawrence, St. Paul Audubon Society.**

EDITOR'S NOTE— It is reassuring to note that the above observation was made after the Spring Valley bird was shot. We hope sincerely that this field identification was correct and that other kites will drift back to this northern outpost and again establish the species as a nesting Minnesota bird. In the meantime let us do all we can to protect the rare individuals that do return to us.—**W. J. B.**

CALL NOTES

Mr. William Kilgore, who served for many years as assistant director of the Minnesota Museum of Natural History and recently retired, was elected an Honorary Life Associate of the American Ornithologists' Union at its recent annual meeting in Buffalo, New York. This recognition is in honor of his more than 40 years of membership in the A.O.U.

* * *

Mr. Pershing Hofslund has returned to Minnesota from the University of Michigan as instructor in the Department of **Science and Mathematics at** the Duluth Branch of the University of Minnesota. His graduate research which is nearing completion is a life history study of the Northern Yellowthroat.

Mr. Kenneth Morrison has accepted the editorship of Audubon Magazine and has taken up his new duties at the Audubon Society Headquarters in New York. His achievements as organizer of the Audubon program in Minnesota and as the Audubon Representative here are outstanding among the conservation education programs of the country.

* * *

William Longley and Forrest Lee are Game Biologists with the Pittman-Robertson Research Unit of the Minnesota Department of Conservation. Mr. Longley, who now lives in Kasson, is in charge of Area 12 which includes the counties in the southwestern part of the state. Mr. Lee is biologist for Area 8, the Twin Cities area.

"AFFILIATED SOCIETIES" (continued)

DULUTH BIRD CLUB

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

Meetings are held the second Thursday of each month at the Duluth Branch, University of Minnesota.

RANGE NATURALISTS' CLUB

Officers: President, Mrs. Dorothy Beard; Vice President, Hjalmer Halunen: Secretary, Vera F. Barrows; Treasurer, Ruth Ambrose.

Meetings are held the third Thursday of each month, October through May at 7:00 p. m. in the Clubrooms of the Virginia Public Library.

Minnesota Ornithologists' Union
Affiliated Societies

CLOQUET BIRD CLUB

Officers: President, Miss Dorothy Wassen; Vice President, Miss Ruth Johnson; Secretary-treasurer, Miss Edith Sanford.

Meetings are held the first and third Thursday of each month in the Cloquet High School at 7:30 p. m.

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 the first Friday of each month at 2 p. m. at the Walker Branch Library. Field trips during April and May on Tuesdays and Fridays.

MINNEAPOLIS BIRD CLUB

Officers: President, Marvin H. Rosien; Vice President, Mrs. M. E. Herz; Secretary, Mrs. Mildred Snyder; Treasurer, Mrs. Edith Kees.

Meetings are held the first and third Tuesdays of each month at 7:30 p. m. at the Minneapolis Public Library Museum.

MINNESOTA BIRD CLUB

Officers: President, Jerry Paul; Vice President, Miss Theodora Melone; Secretary, Mrs. Mary Lupient; Treasurer, Miss Jean McIntosh.

Meetings are held the first Wednesday of each month, except June, July, August, and September, at 8:00 p. m. at the Minnesota 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 the first Wednesday of each month from October through March in the committee room of the public library at 8:00 p. m.

T. S. ROBERTS ORNITHOLOGICAL CLUB

Officers: President, John Miller; Vice President, Benjamin Friedrich; Secretary-Treasurer, Joan Fowler; Historian, Dolores Gerard.

Meetings are held bi-monthly February through May at the St. Cloud State Teachers College.

ST. PAUL AUDUBON SOCIETY

Officers: President, Mrs. P. M. Jewell; Vice Presiden, Dr. Vernon L. Whipple; Treasurer, Marvin H. Arams; Corresponding Secretary, Miss Winifred Lawrence; Recording Secretary, Mrs. Charles E. Hart; Director-at-Large Leonard Lustig, J. M. Rice.

MANKATO AUDUBON SOCIETY

Officers: President: T. E. Thomson; Vice President, Mrs. H. B. Elford; Sec-
August, and September) at Mankato State Teachers College.
J. George Lynch and Dr. H. Bradley Troost.

Meetings are held the first Thursday of each month (except July,
retary, Miss Libbie Williams; Treasurer, Miss Martha Cunrath; Directors,

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THE FLICKER

VOLUME 21 DECEMBER, 1949 NUMBER 4

The Origin and Distribution of the Birds of the World

by

Dorothy Mierow

In our studies of the past distribution of mammals we are assisted greatly by fossils of ancient forms and of nearly modern forms in places where they are no longer found. So many were preserved in fact that we can say that a certain animal was never found in a geographical area if no fossils are discovered. Birds, however, do not lend themselves to fossilization as well for they have light, hollow bones. The few fossils which we have indicate that a feathered bird with teeth and with claws on it wings first appeared in the Jurassic Period about 125 million years ago. Its structure shows a similarity to the reptiles so we can assume that it developed from a reptile-like ancestor. The Hoatzin from Brazil has claws on its wings as a young bird so we are able to observe a bird today which uses its wings for climbing as the Jurassic bird probably did. In rocks laid down during the Cretaceous Period we have found fossils of a few more highly developed forms—Hesperornis, a gull-like bird, and Ichthyornis, a loon-like bird, both with teeth, the latter so completely adapted to the water that it had lost the wings developed by earlier birds—are the most interesting discoveries.

During the ice age of the Pleistocene Period numerous animals were caught in the tar bubbling from the earth at Carpinteria and Rancho La Brea, California. Among these many birds have been identified as species found in the world today. In general, though, fossils are of little help and we must discover the past distribution by studying the present distribution of bird families and the conditions which determine this.

To get an accurate picture of the distribution of a group of birds the relationships of the species within that group must first be established. This is best done through a study of their internal structure since their external features are often the result of secondary adaptations for life in a particular environment and, therefore, may be misleading.

In studying the distribution of birds

we find that the more specimens we have for study, the more accurate the picture that can be obtained. Not only should we have enough of a species to indicate difference in sex and season but enough of a series from different parts of the bird's range to indicate whether or not there are plumage or size variations developing in populations in various parts of the range of the species. Thus a series of Song Sparrows shows us that as a group those from a desert region are paler in coloration than those found in a moist area. The Jacamars on one side of the Amazon River are of a more coppery color than those on the other and the Motmots on one side of the Andes pluck their central pair of tail feathers into a racquet while those on the other side leave their tail feathers untouched.

So we see there are effective barriers which divide the ranges of birds. A mutation may develop in one locality and eventually a new species may be formed in this area which has been cut off. Subspecies are constantly developing in isolated areas but they may not remain distinct if the barrier is no great enough or if circumstances remove the barrier. These barriers can be classified as physical (including oceans, mountains and rivers), or climatic which would mean deserts for forest-loving birds and forests for birds of the grasslands and lack of winds for birds that depend upon them for soaring. Physiological barriers may keep birds from flying very great distances or limit them to certain foods and nesting sites.

Former barriers as well as present barriers are important in determining the present distributions. During the Tertiary Period, North and South America were almost continually divided by water gaps. As a consequence practically no mammals and very few birds were able to go back and forth at that time. Most of our interchange of animals beween the Americas has been during a comparatively recent time. Thus we can still observe the effects of these barriers on the present day bird life of North, South and Central Amercia. The glaciers of the Pleistocene Period undoubtedly forced species south and they are still moving north to reclaim their old ranges. In Europe species were trapped between the glaciers and the east and west mountain ranges and so many were unable to survive. Here in North America the main mountain ranges go north and south so they may act more as highways for mountain or forest ibrds rather than as islands or barriers to northern or southern birds.

This brings us to the subject of the aids to distribution. Not only may mountain ranges form a sort of a highway, but rivers and lakes make traveling easier for water birds or uninterupted grassland may give the bird of the prairies a chance to spread out rapidly into new areas. Just as people have always been searching for new land and moving out from the more congested areas, competition has forced birds to move out into new areas and often to adapt themselves to different foods or nesting sites. When a species is strong and increasing in numbers it may spread over a favorable area rather rapidly and force out many of the older inhabitants which may not be as aggressive. We can observe this best with animals which man has introduced into a new area such as the English Sparrow and Starling here or the rats and mongoose in many of the Pacific Islands. But even under natural conditions there is constant competition for territories and food and less spectacular changes of populations are taking place. Lumbering

and farming have changed the vegetation cover over large areas of the world and the bird populations have to adjust to these changes or be ex terminated.

During the period of glaciation a great deal of water was in the form of ice and snow. This lowered the water level of the oceans. Areas which are covered with shallow water now were then above the water and formed land bridges to various offshore islands. It used to be the favorite indoor sport among many Zoogeographers to determine ocean depths between various Islands and continents and then build numerous land bridges to account for odd distribution of certain species. Except for the Behring Straits, which accounts for the remarkable similarity between North American and Eurasian species, most of these land bridges have been proved unlikely and unnecessary.

Vegetation is fairly uniformly distributed in the world according to climate. The number of species of land birds in the Pacific varies with the distance of the islands from the mainlands of Asia and Australia. The manner of dispersal rather than land bridges easily accounts for this. Plant seeds can be widely dispersed by wind, water and other agencies. Birds may be blown out of their course to new islands but unless there is a sufficient number of birds brought to the island they soon die out. Thus birds that travel in flocks are more likely to become established on islands than birds of solitary habits. Only six types of land birds are said to have colonized Hawaii and all the other forms developed from mutations of these six.

In determining the place where a species originated and its probable manner of spreading into new areas a few things can be considered. The young of the species usually are most primative in plumage, that is, the spotted or streaked plumage is believed to be the earliest development and the elaborate colors and mating displays are of more recent origin. The area where a bird family originated is probably near where the most species are found. For example, we have only one species of hummingbird in eastern U. S. There are several in the West, but a great many in South America so it seems likely that they originated in South America. The Tanagers are similar in distribution.

Dr. Mayr found that we have more Old World species of birds in northern North Amercia while there are more South American forms found in southern N.A. Our Permanent Residents are mostly Old World in origin while the summer residents which leave in the winter are more often South American in origin. Perhaps the population pressure at breeding time when there are so many extra mouths to feed has forced the South American species to come North during their nesting period. The Old World elements are stronger in the mountains so this bears out the belief that they came over the Behring Strait into Alaska and have continued to move into areas of similar vegetation cover.

Many families of birds have a discontinuous distribution caused probably by their spreading out and then being destroyed in varoius areas by glaciers, disease or unsuccessful competition with other animals. Primitive and too highly specialized forms have managed to survive only in areas where they are isolated. When man has appeared and introduced other forms of life in these isolated areas, the native forms generally suffer greatly and often become extinct. The faunas of Australia and New Zealand are the best known examples of this.

On the contrary, however, we find that if only a limited number of bird species get to a favorable island where the ecological niches are not yet filled there may occur within the species what is known as adaptive radiation. One of the best examples of this is the group called Darwin's Finches found on the Galapagos Islands. They have managed to take the place of the warblers, sparrows and woodpeckers and their bills have become modified for their various diets. One interesting one doesn't have a long enough bill or tongue to get at the grubs available to woodpeckers so it has developed the habit of probing into the holes with a cactis thorn. If it has found an especially handy thorn it has been observed taking this tool from one place to another.

An even more striking adaptation of bills is found in the Hawaiian Honey Creepers, **Drepanididae.** It is believed that their ancestors, finding very little competition for very little food of great variety became adapted to various means of getting their food. Some developed different lengths of sickle-like bill for obtaining nectar from the Lobelias and other long-tubular flowers. Others developed thick beaks for cracking tough seeds and one, which searches for grubs in dead wood has a bill which can be used as a wedge much like the crossbill.

Presumably it was after this divergence had taken place that the early Polynesians arrived and brought the Ohia tree. It spread extensively and the honey-creepers increased with the trees as these trees have a ready supply of nectar. When the plantations were developed, a great many of the forests were destroyed and the birds forced back to the more mountainous wooded section where nectar could be found. Goats and pigs were introduced and their grazing greatly reduced certain native vegetations even in the more isolated areas.

At the same time hundreds of different birds were brought in from all over the world in an effort to make the islands a haven for the birds that were more familiar to the Europeans, Americans and Orientals at home as well as to combat various insects. The Nightingale, Skylark and various less exotic birds were tried but relatively few became established. Those that did adapt themselves like the Mynah, Cardinal, Scaled Dove, Rice birds, and English Sparrow, have become evident everywhere almost to the exclusion of the native birds which were unable to compete. The more extreme cases of spcialization have been the first to become rare or extinct as conditions have changed.

In summary, constant changes are taking place on the earth's surface and in the life which inhabits it. As land forms and climates are modified to form new barriers and bridges or old ones disappear new species develop and competition and other factors may cause established species to disappear. Birds tend to occupy and become adapted to suitable areas which they are able to reach.—**Minneapolis, Minnesota.**

Editor's Note: This interesting article, a condensation of a paper presented by Miss Mierow at the November, 1949, meeting of the Minnesota Bird Club, is printed here by popular request.—**D. W. W.**

Mammals of Cedar Creek Forest, Anoka County, Minnesota

by

Harvey L. Gunderson

Cedar Creek Forest occupies parts of approximately four sections of land, two on each side of the Anoka-Isanti County line, about four miles west of Bethel, Anoka County, Minnesota. Within the area is Cedar Lake, an example of a lake originally formed by an ice-block depression in pitted outwash. The retarded melting of the ice favored the developing of a bog which, at present, contains many northern elements of plant life. Successive peripheral girdles of vegetation surround the lake. At the edge of the lake, and partially over the water is the "sedge mat." A bog differs from a swamp in that the bog is usually bridged over with a mat of vegetation, while a swamp is filled in from the bottom. Surrounding the sedge mat at Cedar Lake is the white cedar area. Surrounding this are various types of deciduous forest, including three maple-basswood "islands," which are found on the highest uplands in the Forest. Some land has been acquired and set aside for research work by cooperative action between the Minnesota Academy of Science and the University of Minnesota. Permission to do research work which would not alter the habitat to any great exent, or to visit the area, should be obtained from the individual or insitution whose land is involved.

The writer worked on small mammals populations at Cedar Creek Forest from November 1947 to November 1948. The list of mammals for the area was compiled from the writer's observations, from observations of people who live or spend a great deal of time in the area, and records and specimens in both private and institutional collections.

Moles. The burrows of the Common Mole are so characteristic that there can not be much doubt as to what species produced them. Although no moles were seen, their burrows were noted on several occasions in the upland. Mrs. Martha Crone believed they were not present on her "island" until. about 1944.

Shrews. All shrews known to occur in Minnesota, with the exception of the Least Shrew, were taken at Cedar Creek Forest. There is only one record of the Least Shrew for the state. The Cinereous Shrew which measures about 3 ¾ inches in total length and and weighs less than five grams is a very small mammal with a pointed nose and long tail. It was the most common Shrew in the area and was found in both the white cedar and the upland. Next in abundance was the Black-backed Shrew. It is sometimes called the Saddle-backed Shrew because of the broad dark dorsal stripe which contrasts with the brownish sides. It is a little large than the

Cinereous Shrew. All these were taken in the white cedar area. The Water Shrew is rarely seen but is very interesting because of the bristles on its hind toes which supposedly allow it to walk on water. It is semi-aquatic and the three individuals taken at Cedar Creek Forest were caught on the sedge mat. The rare Pigmy Shrew was found only once. Although the Short-tailed Shrew is the best known of the shrews, it was observed only three times on the study area.

Bats. During the summer evenings at Dr. and Mrs. Corneia's cabin, bats were often seen flying over the open fields and at the edge of the woods. One was seen which was larger than the others, so there must be more than one species in the area, but those examined were all the Little Brown Bat.

Carnivores. Signs of the presence of Raccoon were often seen. One was known to have used a hollow tree for several years on what is known as Knoll II. They probably hunt along the edge of the lake regularly. Several times the heads of bullheads were found about 70 feet from the edge of the water at seasons when Herons, Bitterns and Kingfishers were absent. It was believed that the Raccoon might have been the predator. The Short-tailed Weasel frequently hunted the area in search of mice and ground nesting birds. Its tracks were often seen and several times individuals were found in the live traps. Of the two foxes present in the area, hunters believed the Red Fox to be the more abundant in the surrounding countryside, but a Gray Fox was seen several times near the Corneia's cabin. It usually appeared just after dusk and was watched a number of times by the light from a five-cell flashlight. When disturbed by movements or by the light, it would give a high-pitched bark similar to that of half grown dog.

Woodchuck. This species appears erratically in Cedar Creek Forest. Sometimes they live under some of the buildings in the area and the Corne's have found them living under the outbuildings near their cabin.

Chipmunks and Squirrels. Of the two different sized Chipmunks found in Minnesota only the larger more southern Gray Chipmunk was present at Cedar Creek Forest. Although it is seen anywhere in the area, it is perhaps most frequently encountered in the white cedar part of the bog. In the deciduous woods both the Gray Squirrel and the larger, redder Fox Squirrel were seen, but the latter was uncommon. Undoubtedly the Red Squirrel was the most common animal of this group. It preferred the white cedar area and seemed to feed on the seeds of both the white cedar and the white pine. During the early part of August many "middens" or little piles of white pine scales began to appear on top of old stumps and on logs. Frequently a Red Squirrel was seen adding to these piles as he worked over a white pine cone. The nocturnal Flying Squirrels are not very often seen, but several individuals of the Little Flying Squirrel have been taken at Cedar Creek Forest. These are small, grayish animals with a fold of skin connecting the hind and front foot on either side which allows them to glide through the air. The flattened tail helps guide them in their air travel. Their large black eyes also help identify them.

Beaver. Although the area might be suitable for Beaver, much of the surrounding lowland is used for hay and it is doubtful if they would be allowed to remain. Several Beaver did try to establish themselves nearby in 1941 or 1942 but these were removed to another

place by live trapping.

Pocket Gopher. The mounds of the Mississippi Valley Pocket Gopher were common in the open areas and fields. During the fall an abundance of new mounds appeared, an occasional one even in the heavier woods. Could this be the dispersal of the young after they leave their parents?

Mice. House Mice are found almost everywhere there are buildings, but sometimes they are caught away from human habitation. Two were caught, marked and released in the white cedar part of the study area, but neither was recaptured, suggesting that they were transients. The Northern White-footed Mouse or Deer Mouse has white feet and belly and a grayish brown back, and large eyes. Its tail is nearly as long as its body. At Cedar Creek Forest it occurred in the deciduous forest uplands. It is very skillfull at climbing and often makes its home in abandoned nests of birds or other mammals well above the ground. A nest of this type was found about 15 feet up in a tree, and one even used a trap box which was hung on the limb of an oak tree in such a manner that the door remained open! Two of the short-tailed mice, called voles, were common on the area. The Red-backed Mouse (its name is very descriptive) was found in the white cedar area, and on the sedge mat the closely related Pennsylvania Meadow Mouse was found. The Meadow Mouse is quite a large vole, dark grayish brown above, with slightly paler sides and silver-tipped hairs on the belly. The ears are nearly concealed in the thick fur and the eyes are small, dark beads. The enlarged edition of the Meadow Mouse, or Muskrat, was not seen by the writer, but they were known to occur regularly at Cedar Lake. The Jumping Mouse is a small long-tailed mouse with long hind feet. Sometimes it is called the Kangaroo Mouse, a corruption of Kangaroo Rat, which is a western United States group. Although the term might be descriptive when applied to the Jumping Mouse, it can also be confusing. This mouse prefers low meadows and at Cedar Creek Forest it was found during the summer on the sedge mat and on the extensions of the sedge mat into the white cedar. During the winter the Jumping Mouse hibernates and must perhaps go to the upland to find suitable places, since the water table is very near the surface in the habitat where it is found during the summer months.

Rabbits. Snowshoe Rabbits were recorded at Cedar Creek Forest during their years of abundance. During 1947-48 no individuals were seen, but several times the large tracks of this rabbit were noted. Well marked trails of the Cottontail led through the white cedar areas and uplands, but none were seen.

Deer. White-tailed Deer were frequently seen at the Forest. They were numerous enough to wear trails throughout the Forest, but the large amount of surrounding agricultural land precludes their browsing on white cedar to a great extent.

The following list comprises a total of 28 species, representing 14 families of mammals, recorded at Cedar Creek Forest:

Family Talpidae

Common Mole **(Scalopus aquaticus)**

Family Soricidae

Cinereous Shrew **(Sorex cinereous)**
Black-backed Shrew **(Sorex arcticus)**
Water Shrew **(Sorex palustris)**
Pigmy Shrew **(Microsorex hoyi)**
Short-tailed Shrew **(Blarina brevicauda)**

Family Vespertilionidae

Little Brown Bat **(Myotis lucifugus)**

Family Procyonidae

Raccoon **(Procyon lotor)**

Family Mustelidae

Short-tailed Weasel **(Mustela erminea)**

Family Canidae

Red Fox **(Vulpes fulva)**
Gray Fox **(Urocyon cinereoargenteus)**

Family Sciuridae

Woodchuck **(Marmota monax)**
Gray Chipmunk **(Tamias striatus)**
Gray Squirrel **(Sciurus carolinensis)**
Fox Squirrel **(Sciurus niger)**
Red Squirrel **(Tamiasciurus hudsonicus)**
Little Flying Squirrel **(Glaucomys volans)**

Family Castoridae

Beaver **(Castor canadensis)**

Family Cricetidae

Mississippi Valley Pocket Gopher **(Geomys bursarius)**

Family Muridae

House Mouse **(Mus musculus)**

Family Gricetidae

Northern White-footed Mouse **(Peromyscus leucopus)**
Red-backed Mouse **(Clethrionomys gapperi)**
Pennsylvania Meadow Mouse **Microtus pennsylvanicus)**
Muskrat **(Ondatra zibethica)**

Family Zapodidae

Jumping Mouse **(Zapus hudsonius)**

Family Leporidae

Snowshoe Rabbit **(Lepus americanus)**
Cottontail **(Sylvilagus floridanus)**

Family Cervidae

White-tailed Deer **(Odocoileus virginianus)**

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—Minnesota Museum of Natural History, Minneapolis, Minnesota.

Snowy Owl Records

Another major movement of Snowy Owl into southern Canada and the northern United States is taking place this winter. In order to determine the magnitude and extent in time of these movements and reasons for them observers in both countries are urged to record observations of this species and send them to several centers for compilation. These records will then be forwarded to a central committee which will publish the final report on this year's invasion. Observers in this region should send their reports to Dr. W. J. Breckenridge, Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota.

Minnesota Nesting Records, 1949

by

Dorothy Mierow

The nesting records for 1949 represent the work of fewer observers than last year. Some of the members in the best positions to make observations slipped up and failed to record and send in the information on the nests they found. The majority of the records were sent in on cards by Franklin Willis, Olga Lakela, and Lewis Barrett. Miller and Risser went with Willis while Olga Lakela was accompanied by Anna Kipela, Mary Elwell, Allen B. Brown, Lois Heikkila, Shirley Lakela, Raymond Darland, Indianola Willcuts, and her class. Mrs. E. Joul, Ron Andersen, Russell Hofstead, Mildred Snyder, Mrs. W. S. Quom, Mrs. A. C. Rosenwinkel and the Duluth Bird Club represented by Mrs. Boeder, Mr. Finseth, Mr. and Mrs. J. K. Bronoel, and Mr. and Mrs. Harvey Putman sent in lists of their findings, indicating a busy season. The University of Minnesota Ornithology Class studying under Dr. Dwain Warner made special studies of areas, most'y around St. Paul Campus and their findings were a good source of material for this list. Several students worked on each area so, far the sake of brevity, I have used the name of only one observer for each nesting record. The names used from the class include Mulch, Fashingbauer, Steel, Self, Houle, Lee, Revsbeck, Straw, Jarosz, Lundholm, Vukelick, Rutske, Hibbard, Wilkins, Nelson, Soulen, Wiley, and Coleman. Bird species which have seldom been recorded nesting in the State were sent in by Mrs. Charles Mackenzie, Frank R. Martin, Martin Nelson and Mr. C. R. Alexander. Brother Pius contributed data on 64 Goldfinch nests in addition to information on other species.

I believe the list can be interpreted without too much explaination. Lack of space made it necessary to indicate a Cowbird egg in the nest with **1cb,** and two Cowbird eggs then are indicated by **2cb.**

Although this yearly listing of bird nests observed in Minnesota may make rather dull reading and occupy a lot of space in The Flicker, it could indicate some very interesting facts if we receive enough varied records from different parts of the state. See the Mourning Dove records for instance and notice how birds have been found incubating eggs May 12, June 1, and Aug. 10. Perhaps this is an indication that the same birds breed more than once in a summer or then again it may it may show that a pair that has been unsuccessful the first time may nest again quite late. Or look at the Yellow Warbler records and observe how much later they seem to be nesting further north than around the Twin Cities. Of course we can't jump to conclusions from the few records sent in on a bird in one season, but if we save these records and add to them year after year we may make some very worth while discoveries. It

is just such records that formed the basis for the state bird books of which Robert's **Birds of Minnesota** is among the best. The thing that makes bird books valuable to the research student is the amount of accurate observations which they contain. An author must rely a lot on the observations of others so it is up to us to send in as complete and accurate information as possible on the nests we have observed.

Some of the records sent in this year had to be left out because the observer forgot to record the date, or failed to mention whether the nest contained eggs or nestlings and how many. It might be good for the record to state the location of the nest (whether it is in the grass or how high in what kind of a tree it is situated) and locate it closer than the county. This information often must be left out in this list but it is recorded in the Species File in the Museum of Natural History. The task of compiling the nesting records is much easier if those who send in records put them on 3x5 cards, one species to a card.

Some birds have nests which are easy to locate and so our records for them are getting rather full. This spring it might be interesting if you would make a special effort to find nests of species which have seldom been recorded nesting in Minnesota. Here is a list of birds to be on the lookout for on your "birding" trips:

White Pelican
Baldpate
White-winged Scoter
Hooded Merganser
Pigeon Hawk
Canada Spruce Grouse
Wilson's Snipe
Solitary Sandpiper
Barn Owl
Hawk Owl
Great Gray Owl
Richardson's Owl
Saw-whet Owl
Arctic 3-toed Woodpecker
Am. 3-toed Woodpecker
Yellow-bellied Sapsucker
Raven
Hudsonian Chickadee
Tufted Titmouse
Brown Creeper
Blue-gray Gnatcatcher
Golden-crowned Kinglet
Ruby-crowned Kinglet
Sprague's Pipit
Bohemian Waxwing
Migrant Shrike
Philadelphia Vireo
Most of the Warblers
Evening Grosbeak
Pine Siskin
Red Crossbill
White-winged Crossbill
Lark Bunting
Grasshopper Sparrow
Baird's Sparrow
Leconte's Sparrow
Henslow's Sparrow
Nelson's Sparrow
Chestnut-collared Longspur
Magpie

Common Loon

2 young	June 23	Clearwater Co.	Barrett

Holboell's Grebe			
5 eggs	June 2	Swan Lake, Nicollet Co.	Anderson
4 eggs	June 2	Swan Lake, Nicollet Co.	Anderson
4 eggs	June 2	Swan Lake, Nicollet Co.	Anderson
4 nests	June 24	Mud Lake Refuge, Marshal Co.	Alexander
Pied-billed Grebe			
1 egg	May 15	Swan Lake, Nicollet Co.	Anderson
2 eggs	May 15	Swan Lake, Nicollet Co.	Anderson
9 nests (2-8 eggs)	June 2	Swan Lake, Nicollet Co.	Anderson
2 young	June 18	Mother Lake, Hennepin Co.	Joul
5 nests (3-7 eggs)	June 24	Mud Lake Refuge, Marshall Co.	Alexander
American Egret			
nesting	Aug. 22	Gen. Shield's Lake, Rice Co.	Mackenzie
Green Heron			
2 young	June 15	Vadnais Forest, Ramsey Co.	Rosenwinkel
American Bittern			
4 eggs	June 24	Mud Lake Refuge, Marshall Co.	Alexander
building	May 30	Swan Lake, Nicollet Co.	Warner
Least Bittern			
blg.-laying	May 30	Swan Lake, Nicollet Co.	Warner
Mallard			
11 eggs	Apr. 25	St. Paul U. Campus, Ramsey Co.	Univ. Class
5 eggs	Apr. 23	Palmer's Slough, Hennepin Co.	Mulch
7 eggs	May 3	St. Paul U. Campus, Ramsey Co.	Fashingbauer
8 eggs	May 10	"Benson's Pond," Ramsey Co.	Univ. Class
11 eggs	May 11	St. Paul U. Campus, Ramsey Co.	Fashingbauer
10 eggs	May 14	Basswood Lake, Lake Co.	Lakela
8 eggs	May 15	Swan Lake, Nicollet Co.	Anderson
9 eggs	June 11	Harbor Is., St. Louis Co.	Bronoel
6 young	Aug. 20	Fillmore Co.	Willis
Baldpate			
10 eggs	June 2	Rice Lake, Aitkin Co.	Martin
5 young	July 24	Rice Lake, Aitkin Co.	Martin
American Pintail			
8 young	Aug. 17	Kandiyohi Co.	Barrett
9 young	Aug. 17	Kandiyohi Co.	Barrett
Blue-winged Teal			
5 eggs	May 13	St. Paul U. Campus Ramsey Co	Univ. Class
10 eggs	May 21	Duluth, St. Louis Co.	Barrett
5 eggs	May 21	Duluth, St. Louis Co.	Barrett

12 eggs	May 23	St. Paul U. Campus, Ramsey Co.	Univ. Class
3 eggs	May 23	St. Paul U. Campus, Ramsey Co.	Steele
12 eggs	May 26	St. Paul U. Campus, Ramsey Co.	Univ. Class
7 young	Aug. 15	Duluth, St. Louis Co.	Lakela
10 young	Aug. 15	Duluth, St. Louis Co.	Lakela
Shoveler			
2 broods	June 11	Mother Lake, Hennepin Co.	Rosenwinkel
Wood Duck			
17 eggs	May 23	Birchwood, Washington Co.	Self
8 young	Aug. 19	Wright Co.	Barrett
1 young	Aug. 20	Fillmore Co.	Willis
Redhead			
8 young	Aug. 18	Lac Qui Parle Co.	Barrett
Ring-necked Duck			
9 young	June 25	Hubbard Co.	Barrett
7 broods (6-10 young)	June 30	Palo, St. Louis Co.	Lakela
Ruddy Duck			
6 nests (3-11 eggs)	June 24	Mud Lake Refuge, Marshall Co.	Alexander
American Merganser			
15 young	June 26	Bear Is. Lake, St. Louis Co.	Lakela
Red-tailed Hawk			
building	Mar. 6	Pine tree in Olmstead Co.	Risser
incubating	Apr. 14	Dead tree in Olmstead Co.	Willis
building	Apr. 17	Basswood in Olmstead Co.	Risser
Red-shouldered Hawk			
young	Apr. 7	Willow River, Pine Co.	Rosenwinkel
Broad-winged Hawk			
2 eggs	May 9	Birchwood, Washington Co.	Self
Marsh Hawk			
3 eggs	May 7	Olmstead Co.	Willis
6 eggs	May 10	Olmstead Co.	Willis
Osprey			
2 young	June 21	Becker Co.	Barrett
Sparrow Hawk			
3 young	July 2	Olmstead Co.	Willis
5 young	July 3	Olmstead Co.	Willis
3 young	Aug. 18	Lac Qui Parle Co.	Barrett

Ruffed Grouse

14 young	June 25	Cass Co.	Barrett
2 young	July 10	Basswood Lake, Lake Co.	Lakela
14 young	Aug. 6	Fillmore Co.	Willis

Hungarian Partridge

11 young	Aug. 19	Renville Co.	Barrett

Pheasant

11 eggs	May 13	St. Paul U. Campus, Ramsey Co.	Steele
5 eggs	May 15	St. Paul U. Campus, Ramsey Co.	Steele
2 eggs	May 20	St. Paul U. Campus, Ramsey Co.	Steele
1 egg	May 20	St. Paul U. Campus, Ramsey Co.	Steele
3 eggs	May 22	Ramsey Co.	Univ. Class
20 eggs	May 25	Ramsey Co.	Wilkins
8 young	Aug. 9	Olmstead Co.	Willis

Sora Rail

3 eggs	May 10	Ramsey Co.	Univ. Class

Florida Gallinule

2 eggs	June 2	Swan Lake, Nicollet Co.	Anderson
8 eggs	June 2	Swan Lake, Nicollet Co.	Anderson
10 eggs	June 2	Swan Lake, Nicollet Co.	Anderson

Coot

6 nests (1-4 eggs)	May 15	Swan Lake, Nicollet Co.	Andersen
19 nests (1-11 eggs; 2 nests with hatching young)	June 2	Swan Lake, Nicollet Co.	Andersen
3 young	June 30	Palo, St. Louis Co.	Lakela
3 young	Aug. 18	Lac Qui Parle Co.	Barrett
4 young	Aug. 18	Lac Qui Parle Co.	Barrett

Piping Plover

3 eggs	May 21	Duluth, St. Louis Co.	Barrett
4 eggs	May 21	Duluth, St. Louis Co.	Barrett
3 eggs	May 21	St. Louis Co.	Boeder
2 eggs	June 11	Harbor Is., St. Louis Co.	Finseth
1 egg	June 11	Harbor Is., St. Louis Co.	Finseth

Killdeer

3 young 1 egg	May 17	Birchwood, Washington Co.	Self
4 hatched	May 18	St. Paul U. Campus, Ramsey Co.	Steele
4 hatched	May 22	St. Paul U. Campus, Ramsey Co.	Steele
4 pipped	May 19	St. Paul U. Campus, Ramsey Co.	Fashingbauer
1 egg	May 22	Duluth, St. Louis Co.	Barrett
pipped	May 24	St. Paul U. Campus, Ramsey Co.	Houle
4 eggs	May 26	St. Paul U. Campus, Ramsey Co.	Univ. Class
1 egg	May 30	Olmsted Co.	Willis

6 nests (1-4 eggs)	June 11	Harbor Is., St. Louis Co.	Bronoel
4 hatched	June 29	3 mi. W. Hopkins, Henn. Co.	Snyder
4 eggs	June 20	Olmsted Co.	Willis
Spotted Sandpiper			
4 nests (2-4 eggs)	June 11	Harbor Is., St. Louis Co.	Boeder
4 eggs	June 29	Birch Lake, St. Louis Co.	Kilpela
2 young	July 4	McLeod Co.	Andersen
Herring Gull			
405 young (228 nest: 188 empty; 20-1 egg; 12-2 eggs; 8-3 eggs)	June 18	Knife Island, Lake Co.	Broncel
15 juv.	July 11	Is. in Basswood Lake, Lake Co.	Lakela
Common Tern			
16 nests (1-4 eggs)	June 11	Harbor Is., St. Louis Co.	Boeder
Black Tern			
16 nests (1-3 eggs)	June 2	Swan Lake, Nicollet Co.	Andersen
1 egg	May 30	Cedar Ave. Slough, Henn. Co.	Rosenwinkel
9 nests (Average 3 eggs)	June 24	Mud Lake Refuge, Marshall Co.	Alexander
Mourning Dove			
2 eggs	May 12	Blue Earth Co.	Andersen
2 eggs	May 12	Blue Earth Co.	Andersen
2 young	May 12	Blue Earth Co.	Andersen
2 eggs	May 15	Juniper in Olmsted Co.	Willis
building	May 15	Frontenac, Goodhue Co.	Barrett
2 young	May 17	St. Paul U. Campus, Ramsey Co.	Lee
2 young	May 17	St. Paul U. Campus, Ramsey Co.	Lee
2 eggs	May 24	St. Paul U. Campus, Ramsey Co.	Lee
1 yng. 1 egg	May 24	St. Paul U. Campus, Ramsey Co.	Lee
2 young	June 1	St. Paul U. Campus, Ramsey Co.	Lee
2 eggs	June 1	St. Paul U. Campus, Ramsey Co.	Lee
2 eggs	June 1	St. Paul U. Campus, Ramsey Co.	Lee
incubating	Aug. 10	Ramsey Co.	Hofstead
Yellow-billed Cuckoo			
3 young	June 23	Olmsted Co.	Willis
Black-billed Cuckoo			
2 eggs	May 24	St. Paul U. Campus, Ramsey Co.	Revsbeck
6 eggs	June 2	Olmsted Co.	Willis
3 young	June 16	Olmsted Co.	Willis
Great Horned Owl			
1 young	May 7	Blue Earth Co.	Andersen

Chimney Swift			
2 eggs	June 19	Blue Earth Co.	Andersen
Hummingbird			
2 young	July 21	East Duluth, St. Louis Co.	Lakela
2 young	Aug. 31	Lake Kabetogoma, St. Louis Co.	Elwell
Belted Kingfisher			
7 eggs	May 6	Birchwood, Washington Co.	Self
6 eggs	May 8	Olmsted Co.	Willis
incubating	May 30	Washington Co.	Hofstead
Flicker			
7 eggs	May 26	St. Paul U. Campus, Ramsey Co.	Straw
Pileated Woodpecker			
incubating	May 30	Olmsted Co.	Willis
1 young	June 17	Seen feed-Birchwood, Wash. Co.	Self
Red-bellied Woodpecker			
young	June 15	Olmsted Co.	Willis
Red-headed Woodpecker			
excavating	May 15	dead elm in Olmsted Co.	Willis
3 young	Aug. 7	Le Seuer Co.	Andersen
Yellow-bellied Sapsucker			
young	June 2	Olmsted Co.	Willis
incubating	June 2	Burr oak in Olmsted Co.	Willis
3 young	June 22	Becker Co.	Barrett
Hairy Woodpecker			
young	May 1	Olmsted Co.	Willis
young	May 29	Washington Co.	Willis
young	June 15	Olmsted Co.	Willis
Downy Woodpecker			
excavating	Apr. 28	St. Paul U. Campus, Ramsey Co.	Univ. Class
young	June 2	Olmsted Co.	Willis
young	June 2	Olmsted Co.	Willis
Crested Flycatcher			
building	June 5	Olmsted Co.	Willis
2 young	July 22	Le Seuer Co.	Andersen
Phoebe			
5 eggs	Apr. 29	Palmer's Slough, Henn. Co.	Jarosz
building	May 12	Blue Earth Co.	Andersen
5 eggs-2cb	May 13	Blue Earth Co.	Andersen
5 eggs	May 14	Basswood Lake, Lake Co.	Brown
4 eggs	May 15	Frontenac, Goodhue Co.	Barrett
4 yng. 1 egg	May 29	Blue Earth Co.	Andersen

5 eggs	June 19	Clearwater Co.	Barrett
4 eggs	June 22	Becker Co.	Barrett
3 eggs	June 24	Clearwater Co.	Barrett
4 young	June 25	Palo, St. Louis Co.	Lakela
4 young	July 17	Lake Minnetonka, Henn. Co.	Barrett
Least Flycatcher			
3 eggs	June 22	Becker Co.	Barrett
3 young	July 10	Basswood Lake, Lake Co.	Lakela
1 young	July 26	Duluth U. Campus, St. L. Co.	Lakela
Wood Pewee			
incubating	June 22	Basswood-30' up, Olmsted Co.	Willis
Horned Lark			
3 eggs	May 8	Plowed field, Olmsted Co.	Willis
4 eggs	July 5	Cornfield, Olmsted Co.	Willis
Tree Swallow			
building	Apr. 29	Ramsey Co.	Hofstead
7 young	June 29	On wires at Palo, St. L. Co.	Lakela
Bank Swallow			
excavating	Apr. 29	Birchwood, Washington Co.	Self
excavating	May 15	Small colony in Olmsted Co.	Willis
colony (4 nests-2 eggs each, 3 others)	June 16	Blue Earth Co.	Andersen
colony (5 nests: 1-1 young, 1-2 young; 3 with 2 eggs each)	June 29	Blue Earth Co.	Andersen
colony (7 nests: 1-1 egg; 2-2 eggs; 3-2 young; 2-1 young)	Aug. 8	Blue Earth Co.	Andersen
colony	Aug. 28	S. of Chatfield, Fillmore Co.	Willis
Rough-winged Swallow			
1 adult	June 2	Flying from crevice, Olmsted Co.	Willis
Barn Swallow			
building (also 2 nests with 4 eggs each)	May 28	Pig's Eye, St. Paul, Ramsey Co.	Rosenwinkel
3 young	June 21	Palo, St. Louis Co.	Lakela
"eggs"	June 23	4 nests in Clearwater Co.	Barrett
5 young	July 10	Basswood Lake, Lake Co.	Lakela

Cliff Swallows			
10 nests	May 21	St. Louis Co.	Barrett
64 nests	June 24	Palo, St. Louis Co.	Heikkila
24 nests	June 25	Palo, St. Louis Co.	Lakela
Purple Martin			
young	June 19	5 nests in Ramsey Co.	Hofstead
5 eggs	June 24	Clearwater Co.	Barrett
young	June 30	Out of nest, Ramsey Co.	Hofstead
2 young	July 2	Left nest, Mpls., Henn. Co.	Joul
Blue Jay			
5 eggs	May 4	Blue Earth Co.	Andersen
5 eggs	May 7	Pine tree in Olmsted Co.	Willis
building	May 12	Blue Earth Co.	Andersen
3 eggs	May 24	St. Paul U. Campus, Ramsey Co.	Hibbard
4 young	May 24	St. Paul U. Campus, Ramsey Co.	Lee
4 young	June 1	St. Paul U. Campus, Ramsey Co.	Lee
Crow			
3 young	Apr. 28	St. Paul U. Campus, Ramsey Co.	Fashingbauer
incubating	Apr. 30	Elm in Olmsted Co.	Willis
incubating	May 2	Boxelder in Olmsted Co.	Willis
brooding	May 7	Olmsted Co.	Willis
Black-capped Chickadee			
2 young	May 30	Carver Co.	Quom
White-breasted Nuthatch			
11 eggs	May 1	Knot hole in Olmsted Co.	Willis
young	June 16	Olmsted Co.	Willis
House Wren			
incubating	June 2	Crevice in bluff, Olmsted Co.	Willis
4 young	June 23	Clearwater Co.	Barrett
6 young	July 28	Lester Park, Duluth, St. L. Co.	Lakela
4 young	Aug. 17	East Duluth, St. Louis Co.	Lakela
Short-billed Marsh Wren			
building	June 19	Hayfield in Olmsted Co.	Willis
Catbird			
building	May 16	Dakota Co.	Hofstead
1 egg 1cb	May 19	St. Paul U. Campus, Ramsey Co.	Vukelick
3 eggs	May 24	Palmer's Slough, Henn. Co.	Hayward
1 egg	May 28	Palmer's Slough, Henn. Co.	Hayward
3 young	May 28	Pig's Eyes, St. Paul, Ramsey Co.	Rosenwinkel
1 egg	May 30	Carver Co.	Quom
2 nests	June 21	1 egg each, Goodhue Co.	Willis
2 eggs	June 23	Olmsted Co.	Willis

Brown Thrasher			
4 eggs	May 8	River Road, Henn. Co.	Lundholm
2 eggs	May 12	Blue Earth Co.	Andersen
4 eggs	May 12	St. Paul U. Campus, Ramsey Co.	Fashingbauer
4 eggs 1cb	May 17	St. Paul U. Campus, Ramsey Co.	Rutske
4 eggs	May 19	St. Paul U. Campus, Ramsey Co.	Univ. Class
4 young	May 23	Blue Earth Co.	Anderson
2 young 1cb	June 11	Harbor Is., St. Louis Co.	Boeder
3 eggs 1cb	June 11	Harbor Is., St. Louis Co.	Boeder
3 eggs	June 15	Juniper in Olmsted Co.	Willis
3 eggs	June 28	Minneapolis, Henn. Co.	Barrett
Robin			
building	Apr. 11	Ramsey Co.	Hofstead
building	Apr. 16	Olmsted Co.	Willis
1 egg	May 3	Palmer's Slough, Henn. Co.	Jarosz
4 eggs	May 5	Minneapolis, Henn. Co.	Barrett
4 eggs	May 14	St. Paul U. Campus Ramsey Co.	Hibbard
4 young	May 21	St. Paul U. Campus Ramsey Co.	Lee
4 young	May 22	Duluth, St. Louis Co.	Barrett
4 young	May 29	Carver Co.	Quom
building	June 8	Ramsey Co.	Hofstead
3 young	June 24	Palo, St. Louis Co.	Lakela
3 young	July 26	Minneapolis, Henn. Co.	Barrett
Wood Thrush			
2 eggs	May 28	Nest 8' up, Washington Co.	Willis
Bluebird			
incubating	Apr. 30	Boxelder stub in Fillmore Co.	Willis
building	May 5	Ramsey Co.	Hofstead
5 eggs	May 10	St. Paul U. Campus, Ramsey Co.	Wilkins
4 eggs	May 16	Dakota Co.	Hofstead
incubating	May 30	Washington Co.	Hofstead
5 eggs	June 4	Hopkins, Henn. Co.	Snyder
4 young	June 4	Olmsted Co.	Willis
incubating	June 12	Henn. Co.	Hofstead
3 eggs	June 23	Clearwater Co.	Barrett
2 young	July 27	Left nest, Minneapolis, Henn. Co.	Joul
Blue-gray Gnatcatcher			
building	May 14	Frontenac, Goodhue Co.	Warner
young	July 6	Out of nest, Olmsted Co.	Willis
Cedar Waxwing			
building	June 19	Clearwater Co.	Barrett
young	July 28	Lester Park, Duluth, St. L. Co.	Lakela
Starling			
3 young 1 egg	May 5	St. Paul U. Campus, Ramsey Co.	Nelson
6 eggs	May 5	St. Paul U. Campus, Ramsey Co.	Nelson

6 young	May 12	St. Paul U. Campus, Ramsey Co.	Steele
4 eggs	May 15	St. Paul U. Campus, Ramsey Co.	Soulen
5 young	May 17	St. Paul U. Campus, Ramsey Co.	Nelson
5 young	May 24	Palmer's Slough, Henn. Co.	Mulch
3 young	June 13	Out of nest, Mpls.. Henn. Co.	Joul
Red-eyed Vireo			
building	May 29	Washington Co.	Hofstead
building	June 2	Olmsted Co.	Willis
Warbling Vireo			
young	June 21	Elm in Goodhue Co.	Willis
Prothonotary Warbler			
pair	June 28	Hole, St. Croix, Wash. Co.	Risser
Blue-winged Warbler			
young	June 23	Out of nest, Olmsted Co.	Willis
Yellow Warbler			
1 egg	May 17	St. Paul U. Campus, Ramsey Co.	Wilkins
5 eggs	May 19	Palmer's Slough, Henn. Co.	Mulch
3 eggs 1cb	May 20	St. Paul U. Campus, Ramsey Co.	Wiley
3 cb eggs	May 21	St. Paul U. Campus, Ramsey Co.	Wilkins
2 eggs 1cb	May 24	Palmer's Slough, Henn. Co.	Jarosz
5 eggs	May 24	Palmer's Slough, Henn. Co.	Hayward
4 eggs 2cb	May 26	St. Paul U. Campus Ramsey Co.	Wilkins
5 eggs 1cb	June 11	Harbor Is., St. Louis Co.	Finseth
1 egg	June 11	Harbor Is., St. Louis Co.	Bronoel
3 eggs	June 11	Harbor Is., St. Louis Co.	Boeder
1 egg	June 21	Palo, St. Louis Co.	Lakela
3 young	July 10	Basswood Lake, Lake Co.	Lakela
Ovenbird			
1 young	July 17	Out of nest, Olmsted Co.	Willis
Northern Yellow-throat			
3 egg 1cb	May 31	Palmer's Slough, Henn. Co.	Hayward
3 eggs	June 11	Prairie Lake, St. Louis Co.	Darland
Canada Warbler			
1 young	July 25	Lester Park, Duluth St. L. Co.	Lakela
Redstart			
building	May 15	Frontenac, Goodhue Co.	Barrett
English Sparrow			
young	May 26	Minneapolis, Henn. Co.	Joul
Bobolink			
adult	June 15	Carrying food, Olmsted Co.	Willis

Eastern Meadowlark

4 eggs	June 5	Pasture in Olmsted Co.	Willis

Western Meadowlark

2 eggs 1cb	May 5	Nicollet Co.	Andersen

Yellow-headed Blackbird

8 nests (3 empty; 2 with 1 egg; 3 with 3 eggs)	May 15	Swan Lake, Nicollet Co.	Andersen
18 nests (8 with 4 eggs; 5 with 3 eggs; 1 with 2 eggs; 2 with 3 young; 1 with 3 eggs, 1 young; 1 with 4 eggs, 1 young)	June 2	Swan Lake, Nicollet Co.	Andersen

Red-winged Blackbird

Dr. Warner has on file a study done by Robert Schumacher.

7 nests (1 to 3 eggs; 4 with cowbird eggs)	May 24	St. Paul U. Campus, Ramsey Co.	Wilkins
5 nests (1-empty; 2 with 2 eggs; 2 with 4 eggs)	May 26	Palmer's Slough, Henn. Co.	Jarosz
13 nests (6 new; 1 with 1 egg; 2 with 2 eggs; 4 with 4 eggs)	May 31	Birchwood, Washington Co.	Self
8 nests (0-4 eggs; 1-4 young; 3 with Cowbird eggs)	June 11	Harbor Is., St. Louis Co.	Bronoel
1 young	Aug. 8	Being fed, Minn. Point Duluth	Lakela

Orchard Oriole

2 young	June 22	S. of Hopkins, Henn. Co.	Snyder
2 young	July 5	Grape arbor in Henn. Co.	Quom

Baltimore Oriole

building	May 15	Frontenac, Goodhue Co.	Barrett
building	May 16	Washington Co.	Hofstead

Brewer's Blackbird

3 nests (1 with 5 eggs; 1 with 4 eggs; 1 with 4 eggs and 1 cb egg)	May 14	Ramsey Co.	Hofstead
3 eggs	May 31	Palmer's Slough, Henn. Co.	Hayward

Bronzed Grackle

building	Apr. 9	Ramsey Co.	Hofstead
building	May 1	Ramsey Co.	Hofstead
1 young	July 10	Basswood Lake, Lake Co.	Lakela

Cowbird

Eggs found in nests of: Phoebe, Indigo Bunting, Song Sparrow, E. Meadowlark, Warbling Vireo, & Red-eyed Towhee by Willis. Young reported fed by Chipping Sparrow & Song Sparrow—Lakela See also: Phoebe, Catbird, Brown Thrasher, Yellow Warbler, Northern Yellow-throat, W. Meadowlark, Red-winged Blackbird, Brewer's Blackbird, Cardinal, Indigo Bunting, Red-eyed Towhee, Chipping Sparrow, and Song Sparrow.

Scarlet Tanager

1 young	June 15	Being fed, Olmsted Co.	Willis

Cardinal

2 egge 1cb	May 15	Blue Earth Co.	Andersen
2 eggs	May 20	Dwarf juniper in Olmsted Co.	Willis
2 young	May 25	Blue Earth Co.	Andersen

Rose-breasted Grosbeak

1 egg	May 15	Frontenac, Goodhue Co.	Barrett
5 eggs	May 30	Birchwood, Washington Co.	Self

Indigo Bunting

1 egg 1 cb	June 23	Olmsted Co.	Willis

Goldfinch

64 nests	July 4 Sept. 8	44 in thistle, Ramsey Co.	Pius
4 eggs	July 17	Olmsted Co.	Miller
3 young	Aug. 15	Minn. Point, Duluth, St. L. Co.	Lakela

Red-eyed Towhee

1 egg 1cb	late June	Amos' woods, Olmsted Co.	Risser

Savannah Sparrow

4 eggs	May 21	Duluth, St. Louis Co.	Barrett

Grasshopper Sparrow

4 eggs	July 7	Pasture in Olmsted Co.	Willis

Vesper Sparrow

4 eggs	July 5	Under corn, Olmsted Co.	Willis
3 eggs	July 7	Under corn, Olmsted Co.	Willis
2 young	July 7	Able to fly, Olmsted Co.	Willis

Slate-colored Junco

3 young	July 10	Basswood Lake, Lake Co.	Lakela

Chipping Sparrow			
building	May 11	Oak tree, Hopkins, Henn. Co	Snyder
1 cb egg	May 16	Dakota Co.	Hofstead
3 young	July 10	Basswood Lake, Lake Co.	Lakela
3 young	July 20	Prairie Lake, St. Louis Co.	Lakela
Song Sparrow			
5 eggs	May 8	St. Paul U. Campus, Ramsey Co.	Coleman
6 eggs	May 12	Palmer's Slough, Henn. Co.	Hayward
5 eggs 2cb	May 15	St. Paul U. Campus, Ramsey Co.	Coleman
4 yng. 1 egg	May 19	Palmer's Slough, Henn. Co.	Jarosz
3 eggs	May 21	Duluth, St. Louis Co.	Barrett
3 young	June 11	Harbor Is., St. Louis Co.	Finseth
Chestnut-collared Longspur			
3 young	July 20	5 mi. S. Felton, Clay Co.	Nelson

——**Minnesota Bird Club, Minneapolis, Minnesota**

1950 Annual Meeting Of The Minnesota Ornithologists' Union

The next meeting of the M.O.U. will be held on Saturday, May 13, at the Museum of Natural History at the University of Minnesota. The Minnesota Bird Club will be host to this meeting. Final schedule of events will appear in the March issue. Plan to attend.

Seasonal Report

by

Mary Lupient

Minnesota enjoyed fine weather from September 1 to December 1, the period covered by this report. There was one exception, however. A severe windstorm of tornado proportions occurred October 10. For fifteen hours the wind velocity was from ninety to one hundred miles per hour. It blew down thousands of trees, crippled telephone and telegraph service, grounded planes and caused considerable property damage. Corn was flattened and about one-third of the crop was reported lost. An appeal was broadcast to pheasant hunters to help pick corn before the hunting season opened. There were an estimated two hundred thousand pheasant hunters this fall and according to reports, the number of pheasants had increased very little over last year.

The duck hunting season opened October 7 and the shooting in most parts of the state was reported good. All species of ducks had increased slightly in numbers. Mallards and Blue-winged Teal were the most abundant. This season more Gadwalls and Wood Ducks were taken than in the past few years. Large flights of migrating ducks were reported from various points in the state. Paul C. Murphy reported that at Rondo Lake, near St. Paul, an estimated twenty thousand ducks had concentrated September 8 to feed on the wild rice that grew so abundantly there. Later observations showed that a goodly number of these ducks were Wood Ducks. Thousands of ducks, mostly Mallards flew over the Minnesota River Valley near Minneapolis November 6. The flight was first observed about 4:00 P.M. and was still proceeding when darkness fell. Several flocks could be seen at one time passing so near that the hissing of the air through their wing feathers could be distinctly heard. Robley W. Hunt, Refuge Manager of Mud Lake National Refuge in northwestern Minnesota, reported on the duck migration as follows, "In general the 1949 fall migration was considerably larger in numbers of the more common species of ducks. Mallards, Gadwalls, Baldpates and Coots went through in large numbers; Shovelers were down as were Pintails; Black Ducks were here in larger numbers, but still accounted for in hundreds only." The unusual appearance of an Old Squaw Duck was reported at Wheaton November 12, by E. A. Kobs. The bird was collected. American Golden-eyes apparently arrived very late in all sections of the state. Joel Bronoel, Duluth, reported the fall migration of Golden-eyes to be late for that region. Only four were in the harbor on November 18. Dr. Abbott who lives near Grand Marais stated that up to December 1, only a few ducks, mostly Golden-eyes, had appeared on Lake Superior in front of his home and they stayed just a short time. About one hundred Old Squaws arrived and they also left after a brief stay. Dr. Abbott said that last year

Old Squaws by the thousands came to this same area. He saw only two White-winged Scoters. However, the unusual records of Surf and American Scoters were received. A Surf Scoter was shot October 29 in Hennepin County by E. A. Kobs and an American Scoter was killed in Lake County by Lloyd Campbell October 26. The ducks were still lingering on lakes in Minneapolis, December 1. Among them were Blue-winged Teal and Coots.

The fall flight of geese was spectacular in Eastern Minnesota, especially over the Twin Cities. Such large flights have rarely been seen in this section of the state. Since the usual flight occurred in western Minnesota and the Dakotas, an increase in the number of geese is suggested. At Mud Lake National Refuge a huge flight of thousands began October 21. Canada, Richardson's, Snow and Blue Geese were reported. Mr. Hunt stated that native residents could recall nothing like the large numbers using the area this fall. Four Richardson's Geese were shot at Swan Lake Meeker Co., and vicinity October 20. This report was sent in by J. P. Jensen. Near Lake Henry a White-fronted Goose was brought down with a broken wing by hunters. This species and the Richardson's Goose are rarely found in the eastern part of Minnesota.

American Magpies were observed at Mud Lake Refuge throughout the summer and were still being seen there November 22.

Ravens may be extending their range. Several members of the Academy of Science saw one south of Cloquet September 10. One was reported September 25 near the Minnesota end of the Hudson Bridge. This bird was seen at close range by Dr. Vernon Whipple of St. Paul.

At Duluth, seventeen White Pelicans were observed September 17 by Julius Wolff, Jr.

The hawk migration was about normal. Over the Twin Cities the heaviest migration occurred between October 24 and November 5. In Duluth Joel Bronoel reported that a large migration of Rough-legged Hawks took place during the latter part of October and the first part of November.

Franklin's Gulls migrated through eastern Minnesota again this fall. A large flock flew over the Isaac Walton Bass Pond September 25 and A. C. Rosenwinkel reported about twenty-five near Como Lake, St. Paul, October 5.

Late dates were reported for some of the perching birds. The Yellow-throated Vireo and the Blue-headed Vireo were observed October 9 by A. C. Rosenwinkel, St. Paul. A Catbird, a Brown Thrasher and several Bluebirds tarried in Minneapolis, as late as November 5.

American Egrets lived around lakes in the vicinity of the Twin Cities and in the marshlands of the Minnesota and Mississippi Rivers until driven away by the opening of hunting season. It was another good year for them. The report to the Audubon Field Notes by Harvey Gunderson is as follows: "A good summary of the fall distribution of American Egrets in Minnesota was furnished by biologists from the Conservation Department who flew twenty-five hundred miles in an aerial survey of waterfowl in mid-August. Out of a total of two hundred ninety American Egrets, two hundred thirty-one were tallied along the Mississippi River between Hastings and Winona. (Lee, Longley, Zorichak)."

Birds from the North arrived at the usual time. Tree Sparrows appeared

in the area around the Twin Cities October 9. A report from Duluth by Joel Bronoel dated November 19 stated that Snow Buntings and Lapland Longspurs were numerous and that Northern Shrikes, Evening and Pine Grosbeaks and Bohemian Waxwings had arrived. Pine Siskins appeared near St. Paul October 15. On a field trip in Lake Vadnais Pine Forest November 5, the St. Paul Bird Club listed an Arctic Three-toed Woodpeckers, a Goshawk and a flock of Red Grossbills.

A pronounced invasion of the Snowy Owl occurred in Minnnesota this fall. From various parts of the state fourteen reports have been sent to the Museum of Natural History. Two Snowy Owls came to the University of Minnesota Campus November 17 and are still living on the roofs of the buildings.— **Minneapolis, Minnesota.**

NOTES OF INTEREST

PARASITIC JAEGERS AT MINNESOTA POINT, DULUTH—On May 21, 1949, a very successful annual meeting of the M. O. U. was held at Duluth, Minnesota. M.O.U. members reported a total of 145 species of birds observed during the course of the day. It was my good fortune during the morning to share with other bird enthusiasts an opportunity to observe such species as the following: Red-throated Loon, Glaucous Gull, Hudsonian Curlew, White-winged Scoter, Greater Scaup, Goshawk, Piping Plovers including 2 nests with eggs, and 18 species of warblers including 10 Bay-breasted Warblers. Surely all of these ornithological treats sandwiched into a list that totaled 93 species for the day should have been quite adequate for one day's "birding." However, after the afternoon meeting had adjourned I could not resist the temptation to return once more to the fascinating "birding" area on Minnesota Point. My companions were somewhat weary, so I found myself returning alone to the sandy stretch of beach on the north side of Minnesota Point.

After watching the warblers in the wooded area near the bath house, a flock of Golden-eyes feeding in the bay, and small flocks of shore birds, I walked further down the beach and sat down on the sand with a log serving as a backrest. My attention was turned to the Herring Gulls and Common Terns flying over Lake Superior. Among the Terns and Gulls were two birds which appeared to be quite dark and hawk-like. One reason my attention was attracted to these two particular birds was because of their behavior in flight. They were pursuing Common Terns and apparently taking food from them. These two birds had a white patch in the wing which appeared as a white flash as the birds circled in close to the shore. At times they appeared within 75 yards of the beach. The central tail feathers were pointed and through an 8x30 mm. binocular appeared to be a few inches longer than the rest of the tail. After checking the field marks of these two birds on three different occasions when they swung in close to the sandy beach and comparing the figures and descriptions in Peterson's "A Field Guide to The Birds" and studying the interesting behavior of these two hawk-like creatures, I concluded that I was observing Parasitic Jaegers which are rare visitors to this state.

Parastic Jaegers have been reported on about four other occasions in Minnesota. Dr. Thomas S. Roberts in "Birds of Minnesota" gives the one following record for the state: an immature Parasitic Jaeger was collected by Mr. W. W. Peters at Heron Lake, Jackson County, on September 8, 1916. Mr. Alfred Peterson found a dead bird of this species in 1936 in southwestern Minnesota. Mrs. Judson Wicks reported observing a Parasitic Jaeger in the Minnesota River bottoms near Minneapolis on April 9, 1939. Mr. John Dobie and Dr. Lloyd Smith, Jr., observed a bird of this species on Lake of the Woods on September 6, 1944. Two of these are fall records, and two are spring records (including the two birds seen on Lake Superior). Two other Jaegers, the Long-tailed and Pomarine have also been collected and observed in Minnesota but the records are fewer than for the Parasitic Jaeger.—**Lewis L. Barrett, Minneapolis, Minnesota.**

DUCKS AT MINNEAPOLIS IN DECEMBER—With the advent of December in Minnesota we usually expect to find such species of ducks as Golden-eyes, American Mergansers, Mallards and Black Ducks wintering in the open waters of the Twin Cities area. The presence of Lesser Scaups, Redheads and Canvasbacks may be of interest, but the occurrence of Blue-winged Teal at Minneapolis in December is decidely out of the ordinary as we usually think of this teal as a warm weather duck.

At Minneapolis on December 4 the ponds and marshes were frozen while the larger city lakes were almost free of ice. The ground was almost bare except for occasional snow patches. That afternoon the sky was clear, the temperature stood at 40 degrees, and there was a brisk northwest wind. At the Cedar Avenue Bridge in the Minnesota River bottoms a small flock of 10 Mallards and 5 Black Ducks floated in small open patches of water in the ice bound marshes.

Near the West shore of Lake Calhoun mixed flocks of ducks included 36 Lesser Scaup, 7 Redheads, 6 Canvasbacks and 10 Coots. Far out in the lake about 70 Golden-eyes and 2 American Mergansers were swimming with Herring Gulls. A flock of 11 Mallards was feeding on the south shore. On the southwest shore a Snowy Owl perched on a sign which read "Danger Deep Water Drop Off." A single Blue-winged Teal stood in the shallow water not over 30 feet from the perched Snowy Owl. The Blue-wing intermittently swam out in to the lake and then returned to the lakeshore.

A short time later that afternoon at Lake Harriet I had an opportunity to observe 42 Blue-winged Teal. These birds flew onto the lake in two separate flocks. One flock of 15 teal settled farther out in the lake, while the larger flock of 27 Blue-wing alighted near the west side of Lake Harriet within a half mile of the Thomas S. Roberts Bird Sanctuary. As they swam inshore at times they were feeding within forty yards of land. As these ducks fed they held the bill in such a manner as to skim the surface of the water. Consequently, some passersby commented about the ducks that looked as if they didn't have heads. I was unable to determine what the teal were eating. Possibly some of their food consisted of algae that apparently had been lossened by wind and wave action. There was considerable algae in the shallow water near the west shore of the lake.

Previous records of Blue-winged Teal in winter in Minnesota are not numerous. E. D. Swedenborg's Ten Year Lists of Winter Birds published in The Flicker contain only three winter reports of Blue-wings in the twenty year period from 1927 to 1947. Mr. Swedenborg's lists have been complied from records in **The Flicker, The Auk, Wilson Bulletin,** and **Audubon Magazine.** The previous winter records of Blue-winged Teal in Minnesota are as follows: 2 birds at Lamoille, Winona County, December 29, 1931, observed by John C. Jones; 1 bird near Minneapolis, February 2, 1940, reported by E. D. Swedenborg; and 15 teal seen near Morris by Warden Bolsted during the winter of 1941-42. No further winter records of Blue-winged Teal were discovered in the files of bird records of the Natural History Museum at the University of Minnesota, Dr. Thomas S. Roberts' "Birds of Minnesota," and Dr. Roberts' "Log Book of Minnesota Bird Life."

Possibly the comparatively mild fall of 1949 may have temporarily delayed the southward migration flight of the 43 Blue-winged Teal found at Minneapolis on December 4. One week later at Lake Harriet there was no sign of Blue-wings and the lake was ice bound. While at Lake Calhoun, on the same afternoon, 2 Redheads and 14 Mallards rested on the ice, and 3 Lesser Scaup, 13 Goldeneyes and numerous Herring Gulls were swimming in the lone patch of open water that remained.—**Lewis L. Barrett, Minneapolis, Minnesota.**

EGRET DISTRIBUTION IN AUGUST, 1949—A good indication of the distribution of American Egrets **(Casmerodius albus egretta)** in Minnesota was obtained during an aerial survey of waterfowl in mid-August by Forrest B. Lee, John L. Zorichak, and the writer, of the State Pittman-Robertson Unit, Division of Game and Fish. The survey consisted of a flight line that sampled the entire state and was approximately 2,500 miles in length. Although called a "random flight line," it actually was designed to cover waterfowl concentration areas. Thus, a great deal of the territory in the state suitable for egrets was visited. No difficulty was experienced in identifying egrets from the 100-foot altitude at which most of the flying was done.

Flight Route

August 16 — Followed Mississippi River from Saint Paul to the Iowa line, west to Adams, Austin, Albert Lea, north to Mankato, along Minnesota River to Minneapolis. North to Forrest Lake, west to Buffalo, south to Gaylord, north to Saint Cloud and McGregor.

August 17 — McGregor to Grand Rapids to Leech Lake to Brainerd. North to Bemidji, to Thief River Falls. South to Fergus Falls, west to Red River. Following Red River to Lake Traverse, Big Stone Lake, and Minnesota River to Montivideo, then south to Marshall.

August 18 — Marshall to Willmar to Saint Paul.

August 22 — Saint Paul to Willmar to Marshall, Slayton, Worthington, to Heron Lake. East to Saint James, north to Redwood Falls, Glenwood, Ada, Crookston, and Thief River Falls.

August 23 — Thief River Falls to Mud and Thief Lakes, to Roseau Bog, to Roseau. Southeast to Hibbing, east to Brimson, south to Duluth.

August 24 — Duluth to St. Croix River, along St. Croix to Taylors Falls, west to Chisago City, south to Saint Paul.

Location of Egrets

On Mississippi River

Saint Paul to Hastings	3
Hastings to Red Wing	119
Red Wing to Wabasha	9
Wabasha to Winona	112
Winona to Iowa Line	11

Inland		
	Harmony to Adams	1
	Albert Lea	26
On Minnesota River		
	Le Sueur to Shakopee	6
	Lake Lac Qui Parle	2
	Lake Traverse	1
Total		290

—William H. Longley, Minnesota Division of Game and Fish, St. Paul, Minnesota.

RICHARDSON'S GEESE SHOT NEAR DASSEL—On the foggy morning of October 20, 1949, Arnold Anderson and his son, Gael, hunting on Big Swan Lake, Meeker County, shot four very small geese. These geese, weighing four pounds each were brought to me for identification. Their very small size, short stubby bills and short necks were at once striking. Upon closer examination they proved to be Richardson's Geese **(Branta canadensis hutchinsi)** the smallest representative of the Canada Goose group.

Ten Lesser Canada Geese **(Branta Canadensis leucopareia)** averaging six pounds in weigh, were shot here on October 12, 1927, but these were the first Richardson's Geese that have been brought to me for identification in more than thirty years.—**J. P. Jensen, Dassel, Minnesota.**

INDIGO BUNTING NEST WITH FIVE COWBIRD EGGS—During a search for Goldfinch nests on July 6, 1949, Brother Theodore and I found an Indigo Bunting nest in a thistle in Highland Park, St. Paul. At first we were quite puzzled as to the builder of this rather tall nest for it was nearly twice as thick from top to bottom as a normal bunting nest. One Indigo Bunting egg, one normal Cowbird egg and one very small Cowbird egg, which resembled very closely the egg of the Song Sparrow, were visible in the nest. We removed the larger Cowbird egg and noticed that there were two more normal Cowbird eggs almost completely buried in the nest.

On July 11 we saw the female bunting at the nest, making identification certain. On this date we found another very small Cowbird egg on the ground beside the nest. Apparently this egg had been thrown from the nest. When Dr. Dwain Warner visited the nest with us on July 19, the nest contained two young—a bunting and a Cowbird. The next day the Cowbird was twice as large as the bunting.

As we approached the nest on July 23, the young Indigo left the nest. The female flew immediately toward the fledgling and settled near it. Two days later when we visited the nest no buntings were present and the Cowbird was dead in the nest.—**Brother Pius, Cretin High School, St. Paul, Minnesota.**

Note: Brother Pius brought to me for further examination one each of the large and small Cowbird eggs from this nest. The larger egg measures 24x18 mm. and is very light, the markings being small and widely scattered except at the larger end. The small egg, measuring 20x14.5 mm., though not as dark as many eggs of this species is heavily marked with large brown blotches. The other Cowbird eggs in this nest resembled these closely, the two larger eggs being light and the small egg darker with large blotches. The differences in size and coloration of these two groups of eggs suggests strongly that two Cowbirds parasitized the nest of this pair of Indigo Buntings.—**Dwain Warner, Editor.**

"AFFILIATED SOCIETIES" (continued)

DULUTH BIRD CLUB

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

Meetings are held the second Thursday of each month at the Duluth Branch, University of Minnesota.

RANGE NATURALISTS' CLUB

Officers: President, Mrs. Dorothy Beard; Vice President, Hjalmer Halunen: Secretary, Vera F. Barrows; Treasurer, Ruth Ambrose.

Meetings are held the third Thursday of each month, October through May at 7:00 p. m. in the Clubrooms of the Virginia Public Library.

Minnesota Ornithologists' Union
Affiliated Societies

CLOUQUET BIRD CLUB

Officers: President, Ruth Johnson; Vice President, Olive Esping; Secretary-Treasurer, Irene Lorie.

Meetings are held the second Thursday of each month in the Clouquet High School at 7:30 P. M.

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 the first Friday of each month at 2 p. m. at the Walker Branch Library. Field trips during April and May on Tuesdays and Fridays.

MINNEAPOLIS BIRD CLUB

Officers: President, Marvin H. Rosien; Vice President, Mrs. M. E. Herz; Secretary, Mrs. Mildred Snyder; Treasurer, Mrs. Dorothy Smith.

Meetings are held the first and third Tuesdays of each month at 7:30 p. m. at the Minneapolis Public Library Museum.

MINNESOTA BIRD CLUB

Officers: President, Jerry Paul; Vice President, Miss Theodora Melone; Secretary, Mrs. Mary Lupient; Treasurer, Miss Jean McIntosh.

Meetings are held the first Wednesday of each month, except June, July, August, and September, at 8:00 p. m. at the Minnesota 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 the first Wednesday of each month from October through March in the committee room of the public library at 8:00 p. m.

T. S. ROBERTS ORNITHOLOGICAL CLUB

Officers: President, John Miller; Vice President, Benjamin Friedrich; Secretary-Treasurer, Joan Fowler; Historian, Dolores Gerard.

Meetings are held bi-monthly February through May at the St. Cloud State Teachers College.

ST. PAUL AUDUBON SOCIETY

Officers: President, Mrs. P. M. Jewell; Vice Presiden, Dr. Vernon L. Whipple; Treasurer, Marvin H. Arams; Corresponding Secretary, Miss Winifred Lawrence; Recording Secretary, Mrs. Charles E. Hart; Director-at-Large Leonard Lustig, J. M. Rice.

MANKATO AUDUBON SOCIETY

Officers: President, T. E. Thomson; Vice President, Mrs. H. B. Elford; Secretary, Miss Libbie Williams; Treasurer, Miss Martha Cunrath; Directors, J. George Lynch and Dr. H. Bradley Troost.

Meetings are held the first Thursday of each month (except July, August and September) at Mankato State Teachers College.