



The Redstart

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Editor

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A STUDY OF THE PROTHONOTARY WARBLER IN NORTHERN OHIO

By Merit B. Skaggs

This paper is the report on a three-year study of the prothonotary warbler (Protonotaria citrea) in northern Ohio, and more particularly of a small area of the upper Cuyahoga River valley in Geauga County.

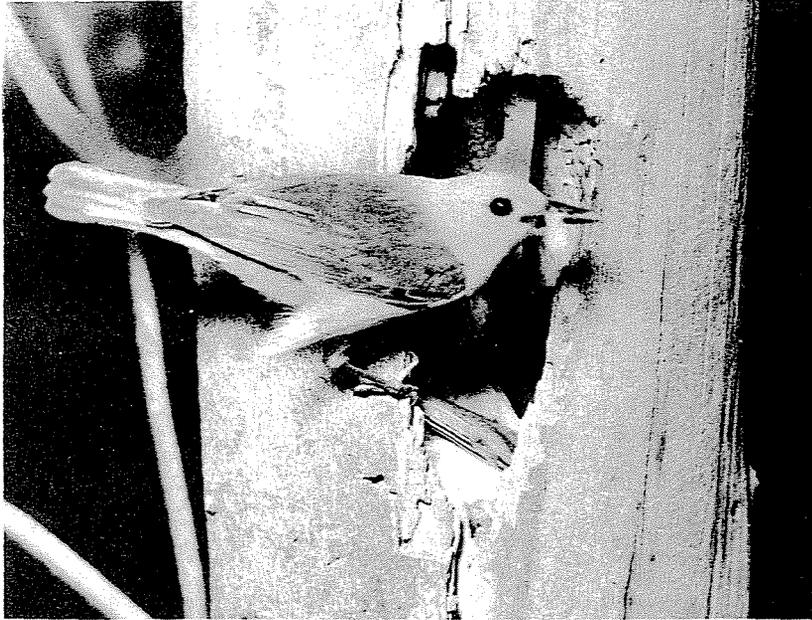
The prothonotary warbler first came to my attention when, as a small boy, I became interested in bird study and became the proud possessor of a copy of Reed's "Bird Guide - Land Birds East of the Rockies" (2). In this book, I saw the pictures of the brightly colored warblers and eagerly awaited the month of May so that I could identify the various species. However, I did not dare hope to see a prothonotary warbler, for the bird was described in this and other books as being found in the swamps or river bottoms of the South. It was, therefore, with some surprise that I, many years later, read in Hicks' "Distribution of the Breeding Birds of Ohio" (2) that the prothonotary warbler had been found nesting in 29 Ohio counties. A visit to Ellis Pond, in Muskingum County, added the prothonotary warbler to my life list.

In 1939, Aldrich (1) found a prothonotary warbler nest at Aurora Pond, Portage County, in a swamp area he was studying at the time. Aurora Pond is located in the Cuyahoga River drainage system. His report on the event was very interesting in that he spied a hole in a dead tree. He struck the tree with a stick, hoping to see a chickadee or perhaps a house wren fly out of the hole. He was quite surprised to see a yellow bird emerge and it was, of course, a female prothonotary warbler!

The next occurrence of this warbler that came to my attention was in 1946 when Margarette E. Morse and Alice Kingman told the writer of seeing two birds at Aurora Lake (formerly Aurora Pond) on May 19. It should be noted that between the time Dr. Aldrich found the nest and 1946 the lake level had been raised several feet, thus flooding many acres of swamp forest and making a habitat more suitable to prothonotary warblers. On June 22, 1946, F. A. Simpson and the writer (4) visited the area and located two well fledged young prothonotaries each being fed by a parent bird. This observation stimulated my interest in the prothonotary warbler, and led to the present study.

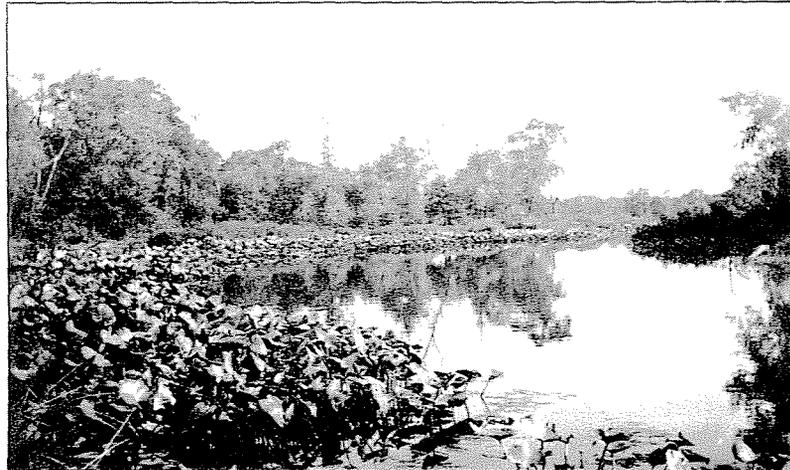
Habitat: All observers agree that the prothonotary warbler is partial to and is seldom found far from swampy places such as the edges of the sluggish streams or shallow ponds. The Aurora Lake area was very largely man-made, as noted above. By means of a boat, on June 22, 1947, Mr. and Mrs. Richard Klein, Mrs. Skaggs and the writer found occupied nests at the south end of the lake. Information on these nests is included in this report.

The next week we found the prothonotary warbler nesting along the Cuyhoga River in Troy township, Geauga County. The circumstances relating to this discovery are perhaps interesting: for a number of years, I had frequently crossed this river and each time I did so, after the prothonotary warbler habitat became known to me, I thought - "There might be prothonotary warblers along that stream." As related in the Jackpine Warbler (5), we visited the area on June 29, 1947, and found nesting prothonotaries.



Photograph by Hal H. Harrison

Prothonotary warblers at nest, June 8, 1949. The male has a large worm which he passed to the female for feeding to the young.



Photograph by the author

Prothonotary warbler habitat - Cuyahoga river valley in Troy township, Geauga county, Ohio.

The principal area under study is along the Cuyahoga River which meanders about in a valley approximately a mile in width. In spring and early summer, the stream overflows its low banks and high top boots are necessary if one is to go along the river. Many low places have a foot or more of water standing in them until the dry days of July or August. The most common tree in this area is the silver maple (Acer saccharinum) with some white ash (Fraxinus sp.) and swamp white oak (Quercus bicolor) along with some willows (Salix nigra). In the damper areas large growths of buttonbush (Cephalanthus occidentalis) predominate and along the river there are rank growths of marsh skullcap (Scutellaria galericulata), pickeral week (Pontederia cordata) as well as arrowhead (Sagittaria sp.) and smartweed (Persicaria sp.). Dead trees are fairly numerous and natural cavities as well as those made by woodpeckers are available to the various cavity-nesting birds. As may be expected, swarms of mosquitoes and other obnoxious insects prevail after mid-May. Here the prothonotary warbler makes his summer home. When viewed in bright sunlight against the dark green foliage, the birds present a striking picture and the southern local name of "golden swamp warbler" is very appropriate.

Arrival Dates: Although not among the first of the warblers to arrive in northern Ohio, prothonotary warblers are usually here before the foliage is well developed. Since this study covers only three spring migrations, the data are not enough to secure a good median date of arrival. On May 10, 1947, we saw a male prothonotary early in the morning near Sandusky, while a heavy frost still covered the ground! The date of arrival is probably not different from that of birds near Battle Creek, Michigan, where Walkinshaw (7) found it to be between April 30 and May 11. During the past three years the birds were first seen on May 10, 8, and 6, respectively.

Song: Once heard, the song of the prothonotary warbler is easily distinguishable from that of all other birds of the region. The song is usually phrased as "sweet-sweet" repeated 5 or 6 times on the same pitch, although Walkinshaw (6) records the song as "tweet-tweet," etc. The writer was able to detect some difference between singing males, but there was not as much variation as in the case of song sparrows (Melospiza melodia) or field sparrows (Spizella pusilla). The males start singing immediately upon arrival at the nesting territory and sing at frequent intervals. As would be expected, the song is given more frequently in the early morning, although in May and June the song is repeated at short intervals most of the day. The number of syllables varied from a short song of four to as many as eight. Each male would vary the number of syllables somewhat and I found six to be the usual number. The song is usually delivered from a tree or bush from 6 to 20 feet above the ground and the male tends to use singing perches on all sides of the nesting site. The male bird does not find it a handicap to sing his full song when holding a worm or two in his bill, for this was done in a number of cases.

When an intruder approaches the nest a metallic "chip" is given by both the male and female. This "chip" is distinctive, once heard, although it resembles the alarm note of several other warblers.

Territory: In the study area, as before stated, the Cuyahoga River meanders through a wide valley with swamp land bordering its banks. The prothonotaries established almost exactly the same territories in 1949 as they did in the two previous years. In no case was the nest more than 100 feet from the river. Each territory was vigorously protected by the male, and on

several occasions the resident male would chase another male away in a fierce diving attack. The writer did not observe any case of another species being chased away.

The territories varied in size somewhat and the closest distance between two nests was about 100 feet.

Nesting: Nest building starts within a few days after the arrival of the females and one nest under study was completed and ready for eggs as early as May 11 or 12, 1948.

No evidence of second nestings was discovered in the present study although additional observations will probably show that second nestings do occur, especially if the first nest is not successful.

Prothonotary warbler nests are easily identified because they are made mostly with the use of moss and thus have a peculiar appearance. Nests along the Cuyahoga River contained a few fine rootlets and sometimes a small leaf or two at the bottom of the nest but more than 95% of the material was a moss (Amblystegium riparium var. longifolium¹), of which there was an abundant supply in the area. This moss grows on low ground that is flooded in early spring and some of it is carried away by the river and is left as debris on the buttonbush stems as the water recedes. We observed one female warbler that had found an ample supply of this dried moss only about 30 feet from her nest site. I timed the trips and found that she was averaging a trip every two minutes with the shortest interval being only 30 seconds! Obviously, it would not take long to complete a nest at this rate and her nest was complete in less than two days. While thus occupied, she came within 10 feet of the boat we used to approach the spot.

Some of the birds used moss that was wet enough to soil the edge of the nesting hole as the birds went in.

Nesting Sites: All three nests studied at Aurora Lake in 1947 were located in dead yellow birch stubs. Height above the lake level, and all three nests were over water, was about 10, 5 and 4 feet, respectively. We were not able to examine the nest that was 10 feet above the water, but the adults were feeding young birds.

At the study area in Geauga County, only one of the nests was over the river water and the nests were in a variety of kinds of trees. In most cases it was impossible to identify the tree species, as the stubs were in a bad state of decay. One stub was so frail that a strong wind would cause it to sway.

In 1948, I placed seven bird boxes along the river and was pleased to have prothonotary warblers lay sets of eggs in three boxes. Prothonotary nesting material was placed in six of the boxes but some were never finished and three were taken over by house wrens (Troglodytes aedon). The bird boxes were made to specifications supplied by my friend, Dr. L. H. Walkinshaw, who used them with success near Battle Creek, Michigan. Inside dimensions are about 3-1/2" x 3-1/2" with a depth of about 7". The entrance hole was 1-1/4" in diameter and it did not seem to matter to the birds whether a perch was supplied or not.

1. Identification of moss made by Edward S. Thomas of Ohio State Museum.

In 1949, I placed 12 boxes in the area, and although three boxes contained fully built nests, only one (Nest No. 7B) received eggs and it was not a successful nest. The other three nests found were in natural sites, two in old woodpecker holes and one in a decayed limb. Thus, it was obvious that the density of the prothonotary warblers breeding in the study area was not increased by supplying a number of bird houses, even though the territories of each pair did not always adjoin.

Eggs: Walkinshaw (6) found sets of prothonotary warbler eggs to vary from three to seven with early nests containing the larger number of eggs. The present study includes only ten nests and the number of eggs laid was as follows:

<u>Nest No.</u>	<u>Date Set Completed</u>	<u>No. Eggs</u>	<u>Young Produced</u>	<u>Remarks</u>
1A	June 2, 1947	4	3	1 egg infertile
2A	June 6, 1947	3	3	2 cowbirds
3	June 9, 1947	5	4	1 egg infertile
4B	May 18, 1948	6	6	young banded
5B	June 6, 1948	5	4	" "
6B	June 12, 1948	4	0	eggs destroyed
7B	May 18, 1949	6	0	young destroyed
8	May 31, 1949	5	?	nest empty June 24
9	May 26, 1949	4	3	1 egg infertile - young banded
10	June 3, 1949	<u>5</u>	<u>5</u>	young banded
		47	28	

Key: A. Aurora Lake nests
B. Nest was in bird box

The percentage of young, successfully fledged from eggs in the ten nests in the above table, is 59.6% and compares closely with Walkinshaw's (7) findings of 61.3% in Tennessee, but is much higher than the Michigan figures of 25.6%. Additional study may show the Ohio figures to be somewhat more nearly approaching the Michigan figure. However, floods which caused some loss in Walkinshaw's study do not seem to be a factor in this Ohio study area.

Three nests contained one infertile egg each and this lowers the reproduction rate somewhat. In such cases, the young leave the nest without breaking the egg, although it must inconvenience them somewhat.

Incubation period on several nests checked was 13 days. The female evidently does all the brooding but the males, in some cases, come to the nest entrance and feed the female.

On the first two days after the eggs hatch, the females brood the young considerably even though the temperature, during the day, seems warm to us. My observations indicate that the young leave the nest in about 10 days, but they will leave a day or two earlier than that if they are disturbed.

Nest No. 9 was found by Hal Harrison, to whom I am indebted for the use of the picture illustrating this article, and was especially interesting to me

because the female wore a band. Unfortunately, we were not able to capture her to read the band, but I feel that she was one of the young banded a year previously scarcely 100 feet away from her nest location of this year.

The family groups scatter in July and become increasingly hard to find in succeeding weeks.

Enemies and Factors Controlling Nesting Success: In Ohio, one of the factors in the nesting success of the prothonotary warbler is the house wren. Although we usually think of the wren as a bird found most often about human habitations, the house wren is surprisingly abundant in prothonotary warbler habitat. The wrens almost invariably arrive before the warblers do and start to fill all sorts of cavities with sticks, this being a well-known industry of the wren. On more than one occasion, I found wrens had placed their sticks on top of moss placed there by a prothonotary and in such cases the prothonotaries would give up the nest site. No evidence of wrens molesting the warbler eggs was noted.

Snakes are numerous in prothonotary warbler habitats and they are undoubtedly destructive to bird life when the young are in the nest. The female birds would have little chance to escape once a snake came through the nest cavity hole. I suspect a snake was the cause of the destruction of the eggs or newly hatched young at box-nest No. 6.

Young birds were being fed in nest No. 8 on June 16, but on June 24, the nest was empty and I am not certain that the young survived although a young bird was being fed by an adult at a point across the river from the nest site. This is the reason for the question mark as to the number of young produced.

Raccoons and opossums must also be considered as enemies and I believe that the young in nest 7B were destroyed by one of these animals. The destroyer was too large to enter the nest box, but destroyed the nest by reaching inside and removing five of the six young when they were about a week old. The sixth bird was found dead when I opened the box.

All birds that nest in natural cavities or in bird boxes face the hazard of an enemy catching the female while she is brooding by blocking the nest hole whereas a bird on an open nest has a fair chance to escape. The prothonotary warbler is unique in that it is the only warbler that habitually nests in cavities. The females are close sitters and can frequently be caught on the nest. On one occasion Mrs. Skaggs and I caught one in my handkerchief! Since prothonotary warblers are close sitters, it seems that enemies catching the female on the nest is one of the factors controlling the abundance of this species.

Prothonotary warbler nests Nos. 2 and 10 were in the ends of stubs about 20° from vertical and it is evident that the birds can and do use a variety of nest locations. In the area under study there were plenty of natural cavities and old woodpecker holes that were not used even though outside the territories of any pair of prothonotaries. This indicates that only a small number of birds came into the area in search of territories. Perhaps in a location further south a greater population of prothonotaries would have nested.

One nest at Aurora Lake contained two cowbirds and probably would not have produced any prothonotary young capable of leaving the nest as the young cowbirds were at the nest opening and the young warblers were in an undernourished

condition. It seems very likely that the cowbird removed one or more prothonotary eggs when she laid her eggs.

Summary: The prothonotary warbler nests regularly, though sparingly, in suitable habitat located in the Lake Erie drainage system of northern Ohio.

More than twelve nests have been under observation during the past few years, either at Aurora Lake (formerly Aurora Pond) in Portage County or along the Cuyahoga River in Geauga County. At Aurora Lake, the nesting colony was attracted when the lake level was raised, thus flooding the adjacent bog-forest, although Dr. Aldrich had a single nesting record previously. Nesting prothonotaries were first located along the Cuyahoga River in Geauga County in 1947 although they have probably nested there for many years.

The birds arrive during the first two weeks in May and the females start construction of the nests in a few days. Prothonotary warbler nests are distinctive because they are constructed almost entirely of moss. The usual number of eggs, laid in late May or early June, is five or six and the incubation period is 13 days. The writer's records for ten nests indicate that 47 eggs produced 28 young able to leave the nest. The young birds leave the nest at the approximate age of 10 days. No second broods were noted in this study. Three, or 6%, of the 47 eggs found were infertile.

Cowbirds sometimes deposit eggs in prothonotary warbler nests.

Principal enemies, in common with other hole-nesting birds, are snakes, raccoons, and opossums. These animals were frequently noted in the area.

House wrens give prothonotary warblers considerable competition for nesting sites, in some cases causing the warblers to abandon nests.

Placing bird houses in a study area did not increase the population density, although prothonotary warblers readily accept bird houses as nesting sites.

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Eagle and Dodd Roads
Willoughby, Ohio

A COMPARISON OF TWO FORAYS OF THE BROOKS BIRD CLUB

By John W. Handlan

Certain statistical data from the ornithological report of the Brooks Bird Club Foray for 1945 (1) were compared in the report for the 1948 Foray (2).

It occurs to the author, however, that similarity of the two from the standpoint of geographical location and the fact that only 10 persons, excluding two children, were present at both Forays under consideration make it worth while to prepare this comparison, which looks at the two field expeditions from other than a purely statistical viewpoint.

The two Forays operated in much the same territory at about the same time of year. Each was on the Randolph-Pocahontas County line so far as explorations for bird study was concerned. That of 1945 was based at Cheat Lodge, Randolph County, June 10-17 and that of 1948 was based at Camp Thornwood, Pocahontas County, June 12-20. Cheat Lodge is at an elevation of about 3,600 feet above sea level and Camp Thornwood at about 3,000 feet.

Participants of both did field work on Gaudineer Knob, Blister Pine Swamp, the White Top-Barton Knob area, Shaver's Mountain, and along Shaver's Fork of Cheat. During both Forays small parties remained at the Gaudineer fire tower overnight.

Those who attended both Forays were Mesdames Mary Kay Conrad and Elizabeth Etz; Misses Dorothy and Carolyn Conrad and Maxine Thacker; and Messers. George Breiding, W. R. DeGarmo, Lawrence Hicks, William Strunk and the author. The two youngsters who attended both Forays were Joan Kay Conrad (just seven months old during the 1945 event!) and Harold Etz II who was eight years old at that time.

Similarities between the two expeditions end there. There were great disparities in number of participants and in mobility of the two camp groups.

There were 29 "full-time" participants in the 1945 event and of this number three were present for a three-day period, only. Of this group perhaps 16 might have been termed ornithologists of varying degrees of competence in field work. Five others who assisted in establishing nesting records were without previous experience. There were 43 "full-time" participants in the 1948 Foray,

of whom eight were children. In the group were at least 26 who might be termed ornithologists, as above.

The Cheat Lodge Foray was a war-time venture which was kept largely afoot because of gasoline rationing. One general trip was made to Gaudineer Knob (this was cut short by rain and about half the party walked the 10-mile round trip to the Knob and return.) Three other small groups visited the Knob, including the overnight expedition. One trip for provisions was made to Mill Creek by a small group which had no time to stop along the way. The White Top-Barton Knob area was visited afoot, as was Blister Pine Swamp and its environs.

Campers at Thornwood, on the contrary, ranged comparatively far from camp on numerous occasions via automobile. It is safe to estimate that an average of five groups daily were on Gaudineer and that two groups daily visited Shaver's Mountain and Burner Mountain. Blister Pine Swamp was explored on at least five occasions. Trips from camp to such points as Spruce Knob, Bartow, Durbin, Arbovale, Greenbank and Cass took various groups through farmland, grazing areas and towns of the rich Greenbrier valley watershed.

In other words, the 1945 Foray participants confined most of their ornithological work to the base camp vicinity, both because circumstances forbade much work farther afield and because the camp itself was in a rich ornithological field. The 1948 group, to the contrary, ranged frequently from 5 to 20 miles from the base camp.

Reference to the ornithological reports of the two camps reflects something of the effect of superior numbers and greater mobility of the 1948 group. The Cheat Lodge camp listed four species not reported by the 1948 camp. The Camp Thornwood group, however, recorded 32 species not observed during the 1945 camp.

Account of actual breeding records is not nearly so disparate. The 1945 camp reported 127 breeding records representing 37 species. The 1948 camp listed 115 breeding records representing 46 species. Only one of the 1945 breeding records was based on observations of young birds out of the nest and no "colony" nestings were found. During the 1948 camp five breeding records were based on young out of the nest and of the 15 nests of the barn swallow reported by three observers working independently, five were in two colonies and four in another.

During the 1945 camp, DeGarmo and Strunk established the state's first actual breeding records for the purple finch by locating three nests. An unoccupied nest of the brown creeper was found by Handlan, Legg, Carolyn Conrad and Doenges, and Handlan and Hicks each located a nest of the yellow-bellied sapsucker for which the author has not seen a previously published record.

In 1948, Foray members (DeGarmo, Etz, Breiding, Swank and Sauer) established the first actual breeding record for the brown creeper and Lyle and J. J. Murray substantiated the 1945 purple finch record by locating another nest.

For purposes of further contrasting the records of the two Forays there follows a numerical comparison of breeding records from the two papers cited in the first paragraph of this one. Vernacular names only are employed here and numbers under the respective headings indicate total nests found. The word "young" indicates a breeding record based on young birds out of the nest, but obviously hatched nearby.

<u>Species</u>	<u>1945</u>	<u>1948</u>
1. Ruffed grouse	2	Young
2. Woodcock	Young	0
3. Black-billed cuckoo	1	1
4. Chimney swift	0	1
5. Barred owl	1	0
6. Flicker	2	0
7. Yellow-bellied sapsucker	2	0
8. Hairy woodpecker	1	2
9. Downy woodpecker	3	0
10. Kingbird	0	1
11. Phoebe	1	3
12. Least flycatcher	3	2
13. Wood pewee	0	1
14. Barn swallow	0	15
15. Blue Jay	1	0
16. Chickadee	0	3
17. White-breasted nuthatch	0	1
18. Brown creeper	0 (see above)	1
19. House wren	6	3
20. Catbird	14	8
21. Brown thrasher	0	1
22. Robin	14	10
23. Wood thrush	5	1
24. Olive-backed thrush	1	1
25. Veery	9	0
26. Bluebird	0	1
27. Golden-crowned kinglet	1	1
28. Cedar waxwing	1	5
29. Solitary vireo	3	1
30. Red-eyed vireo	3	3
31. Golden-winged warbler	0	2
32. Parula warbler	0	1
33. Yellow warbler	0	Young
34. Magnolia warbler	3	1
35. Cairn's warbler	7	1
36. Black-throated green warbler	0	2
37. Chestnut-sided warbler	8	0
38. Ovenbird	1	1
39. Northern water-thrush	0	Young
40. Louisiana water-thrush	0	Young
41. Mourning warbler	4	1
42. Yellow-throat (Northern?)	4	0
43. Canada warbler	0	2
44. English sparrow	0	1
45. Eastern meadowlark	0	Young
46. Redwing	2	1
47. Grackle	0	1
48. Cowbird	2 (*)	0
49. Scarlet tanager	1	2 (**)

(*) Egg in nest of chestnut-sided warbler;
One young in nest of solitary vireo.

(**) One nest at Camp Caesar, Webster County

<u>Species</u>	<u>1945</u>	<u>1948</u>
50. Rose-breasted grosbeak	0	3
51. Purple finch	3	1
52. Towhee	1	1
53. Carolina junco	6	5
54. Chipping sparrow	3	8
55. Field sparrow	1	1
56. Swamp sparrow	1	1
57. Song sparrow	3	1

Immediate environs of Cheat Lodge constituted one of the best "northern" bird habitats in which the author has been! One nest of the sapsucker was within a few yards of the lodge as was one of the three nests found of the purple finch. From either porch of the building one could hear the winter wren, the veery, the mourning warbler and the northern water-thrush virtually day-long.

It is interesting to conjecture results had the manpower of the 1948 Foray been concentrated at Cheat Lodge or had the 1945 group conducted a breeding bird population study of the area during its stay in camp.

Physical conditions have changed at the Lodge since 1945. As an example, the former rutted, semi-passable, country road which led from Cheat Bridge post office to the Lodge has been replaced by a "hard road" with some resultant damage to the roadside from the standpoint of bird habitat. It was along this country road that numerous nests were found during 1945.

During 1945 "hard-to-find" nests of various species turned up in surprising numbers. As examples, the 1945 report listed nine nests of the veery, seven of Cairn's warbler and four of the mourning warbler. During the 1948 camp "scores" for the same three species were none, one, and one, respectively.

None present in the war-time camp of 1945 but had relatives and friends in the armed services, many of them overseas. (Nearly 30 active Brooks Club members, men and women, were then in service.) Nevertheless, the group contrived to fashion one of the most closely-knit and enjoyable of all the Forays in the event's nine-year-old history. We all were quartered under the same roof and in the same building had our meals and enjoyed campfire and other assembly programs.

Many of those who took part in the 1948 Foray literally were too tired by long and arduous field work to enjoy the after-campfire sings which have made other Forays especially memorable.

The Brooks Club Foray perhaps never again will have small enough participation to enable it to use the facilities of Cheat Lodge if, indeed, permission for its use could now be secured. But the Lodge is sufficiently isolated and the area in which it is situated is so severely afflicted by the omnipresent sand midges as to make it more or less unattractive to any except genuine enthusiasts for the outdoors.

The author is bold enough to predict that, if circumstances in the future permit a full-scale Foray based at Cheat Lodge, ornithological results would be achieved which will exceed any in the history of the Brooks Bird Club expeditions.

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409 41st St. S.E.
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BIRDS OF THE SOUTH CHARLESTON WOODLAND SWAMP

By Gordon C. Sauer, M. D.

During the year and a half from March, 1947, to September, 1948, I made forty-nine walks around the area of land in South Charleston, West Virginia, known as the "Swamp." This tract of land is unusual in that it is the largest area in the immediate vicinity of Charleston where shore and marsh birds are to be found. Secondly, the area is of interest because it is constantly undergoing a planned transition from its present status to one where it will, I believe, eventually be filled in with dirt and used for a housing subdivision. It is now completely fenced and the open fields and woods serve as feeding areas for approximately five head of livestock and two dozen swine.

This area of over four acres is bounded on the north by U. S. Route 60, on the east by the Naval Ordnance Plant, on the south by Davis Creek, and on the west by the Dunn Hospital. The water, which makes up about 30% of the area, gives the appearance of being stagnant, but in reality it has a source from the overflow of a reservoir of the Ordnance Plant and flows into Davis Creek. The latter in turn empties into the Kanawha River, which is a quarter of a mile northwest of the area. Another 30% of the area contains woods of sycamore, elm, ash, and maple, with some shagbark hickory, sweet gum, and willow (near the water). Grass, swamp, and a very small area of marsh make up the remainder of this mixed habitat. There are several roads and paths over which one can walk, but the marshy places with cattails are almost impassable, especially in late summer.

Seventy-nine species of birds have been seen in this area during the above period. Thirty-four species are believed to breed there, but definite proof, such as finding a nest or young, was found for only fifteen. The greatest number of species seen on any one trip was thirty-three found on both May 9, 1948 (B.B.C. Century Day) and on July 4, 1948. I spent four hours there on both of those trips, and that was the most time spent on any of my trips.

The type and number of birds naturally varied with the seasons. An average winter day's trip in January or February, should, according to my notes, yield approximately twelve species. If one were very fortunate, though, the following might be observed as winter residents: sparrow hawk**, bob-white**, killdeer**, flicker**, downy woodpecker*, blue jay*, Carolina chickadee*,

* Breeds in area. ** Breeding proved. (W.R.D.) Seen by DeGarmo.

tufted titmouse*, Carolina wren*, robin**, bluebird**, starling*, English sparrow*, redwing**, rusty blackbird (spring migrant), cardinal*, goldfinch, towhee*, slate-colored junco, field sparrow*, white-throated sparrow, and song sparrow*.

In a typical day's walk in the summer months of July and August a census will average nineteen, but if one is lucky and knows birds and their songs well, which I didn't in the early part of 1947, one might see the following: great blue heron, American egret, green heron**, sparrow hawk**, bob-white**, killdeer**, mourning dove*, yellow-billed cuckoo*, black-billed cuckoo, nighthawk, chimney swift, ruby-throated hummingbird, belted kingfisher*, flicker**, red-headed woodpecker**, downy woodpecker*, Eastern kingbird**, phoebe**, wood pewee, blue jay*, Carolina chickadee*, tufted titmouse*, house wren**, Carolina wren*, catbird*, brown thrasher**, robin**, wood thrush**, bluebird**, cedar waxwing, starling*, warbling vireo*, yellow warbler**, yellow-throat*, redstart, English sparrow*, meadowlark, redwing**, bronzed grackle*, cowbird*, cardinal*, indigo bunting, goldfinch, towhee*, and song sparrow*.

In addition to the above seen in the summer months, the following could be observed during the spring migration months (March, April, and May) and the fall migration months (September and October): mallard, coot, spotted sandpiper, solitary sandpiper, greater yellow-legs, lesser yellow-legs (W.R.D.), least sandpiper, golden-crowned kinglet, ruby-crowned kinglet, white-eyed vireo, worm-eating warbler, myrtle warbler, black-throated green warbler, palm warbler, Louisiana waterthrush, mourning warbler (W.R.D.), Baltimore oriole, savannah sparrow, tree sparrow, white-crowned sparrow, and swamp sparrow.

The turkey vulture, red-shouldered hawk (W.R.D.), ruffed grouse, rock dove, screech owl, barred owl (W.R.D.), crow, winter wren, and hermit thrush (W.R.D.), have been seen only once or twice and at varying times.

The eight most abundant birds in the summer months are, in order of decreasing number: starling, redwing, flicker, bronzed grackle, catbird, yellow-throat, robin, and song sparrow. In the winter several hundred starlings are found at dusk in the area before going to their roosts in the steel structure of one of the nearby chemical plants. Song sparrows, Carolina chickadees and bob-whites are next in abundance.

Of unusual interest is the fact that six green herons have been observed at one time, and one of these was an immature bird. Also four to five sparrow hawks, two pairs of killdeers and offspring, a family of five red-headed woodpeckers and a pair of Eastern kingbirds have been residents in this area during the summer. One or two great blue herons are always found in late summer, and on July 19, 1948, an American egret was feeding in the pond.

In conclusion, then, I might say that the area is an interesting one for the Charleston region; it is small and of mixed habitat; it is undergoing a slow transition, and it yields a good total census of birds but a small census at any one season, and it is especially limited with respect to the warblers.

New York City
New York

NOTES ON THE BIRDS
OF
JACKSON AND WEBSTER COUNTIES, WEST VIRGINIA

By George H. Breiding

The following comments may be considered as a partial supplement to: (1) "List of Birds of Mason, Cabell, Jackson, and Putnam Counties, West Virginia" (Haller, The Redstart, VIII: (7-8): 37-52, 1940); and to (2) "Notes on the Breeding Birds of Webster County" (DeGarmo, Report of the Brooks Bird Club Foray, 1947).

In the case of the first report, nothing new is listed insofar as additional species; also, the remarks made below refer only to Jackson County. Haller's report, in some instances, does not apply specifically to Jackson County, but to the four counties in general. It is about 10 years since the completion of Haller's study, and notes on the species listed here may help to add new light on some of the birds of Jackson County. On the other hand, some of the species are discussed because of their distribution and their status is worth recording. The Jackson County observations which refer to Divide Hill are near Kenna. The other accounts are chiefly from the area along U. S. Route 2 between Ravenswood and Ripley Landing.

The annotations made on the birds of Webster County reveal that two species not included in the 1947 Foray Report may occur as breeding birds. The other comments are included for what they are worth as locality records.

Jackson County

1. Green heron (*Butorides virescens*). One was perched by a nest on May 7, 1949, near Willow Grove. One was flushed off the same nest on May 27, 1949. The location of the nest did not offer an opportunity to check the contents.
2. Scaup (*Aythya affinis*). A female which I identified as this species was seen on a farm pond on May 27, 1949, between Willow Grove and Ripley Landing.
3. Upland plover (*Bartramia longicauda*). One was heard at Willow Grove on May 27, 1949. Another was heard on May 7, 1949, a little more than a mile south of the place mentioned above. The bird observed on May 27 undoubtedly can be considered a breeding bird. Well-developed young identified as this species were reported by conservation officer J. H. Branham in adjacent Kanawha County on June 14, 1949.
4. Solitary sandpiper (*Tringa solitaria*). Two were flushed on a farm pond between Willow Grove and Ripley Landing on May 27, 1949.
5. Black-billed cuckoo (*Coccyzus erythrophthalmus*). This species was observed repeatedly during May, 1949, in the vicinity of Divide Hill. As yet it has not been observed during the breeding season.
6. Whip-poor-will (*Caprimulgus vociferus*). First heard April 13, 1949, near Divide Hill. During the summer, it was possible to hear the birds singing from two to four stations in the Divide Hill area.

7. Pileated woodpecker (Hylatomus pileatus). Haller mentions only one record and that is for Putnam County. Jane Breiding and I saw this species as it was flying across Highway U. S. 21 on May 27, 1949, between New Era and Odaville.
8. Bank swallow (Riparia riparia). One example of this species was seen flying over a farm pond between Willow Grove and Ripley Landing on May 27, 1949. A record for this date may indicate that this species may have been breeding in the area. The bird was in the company of rough-winged and barn swallows.
9. Mockingbird (Mimus polyglottos). I have several records for this species for Divide Hill from January 1, 1949, to mid-March, 1949. Apparently this was a winter visitor that was attracted by large thickets in the vicinity.
10. Mourning warbler (Oporornis philadelphia). As a matter of record for this county, Jane Breiding saw and heard this species at very close range on May 1, 1949, on Divide Hill.
11. Bobolink (Dolichonyx oryzivorus). Several males were observed between Willow Grove and Ripley Landing on May 7, 1949.
12. Rose-breasted grosbeak (Pheucticus ludovicianus). Occurred as a migrant during May, 1949, records are for Divide Hill.
13. Dickcissel (Spiza americana). Two singing males in a red clover-alfalfa field were heard and seen at Willow Grove on May 27, 1949. Another male was recorded a mile south of Willow Grove on the same date.
14. Lark sparrow (Chondestes grammacus). One was seen on May 14, 1949, on the west slope of Divide Hill. On May 21, 1949, at the same location, a singing male and another individual were seen, but a completely satisfactory observation was not made of the latter. Several short glimpses of it disclosed that the plumage greatly resembled that of an immature bird.
15. Bachman's sparrow (Aimophila aestivalis bachmanni). Recorded by the writer near the top of one of the ridges southwest of Divide Hill on April 26, 1949. On April 30, 1949, in the same general vicinity, a song of this species was heard at five stations. A singing male, seen on May 1, 1949, was in the company of another bird of the same species which was presumed to be a female.

Accounts in some of the popular bird books claim this species to be aloof and retiring. One bird under observation on April 30, 1949, and the male on May 1, 1949, showed very little concern. The male of the two that were thought to be paired permitted me to get much closer than perhaps some other species would tolerate a human intruder. The bird which was presumed to be the female, however, stayed close to the ground and when flushed darted in and out of the brush and grass, keeping well concealed. The companion bird, singing from an open perch, would drop out of sight and immediately return to its post, only as I moved about in plain view at relatively close range. At one time the bird was within about 15 feet or less giving its full song.

Webster County

1. Ruffed grouse (Bonasa umbellus). Although this species is a common resident of this county, the 1947 Report did not establish it as a breeding bird. I. B. Boggs reported that he saw an adult with chicks during the week of May 29, 1949.
2. Raven (Corvus corax). This species was not listed in the 1947 Foray Report. I have records for a group of three ravens for May, 1948, and the birds were observed at various intervals during the week of May 29, 1949. On the morning of June 1, 1949, a small flock was flushed on the edge of woodland clearing. There were at least five and perhaps six of the birds.
3. Chickadee (Parus). Parus carolinensis extimus is listed for the Camp Caesar area, and P. atricapillus paracticus is recorded for the higher elevations of the County. On several occasions during the week of May 29, 1949, chickadees were heard uttering songs that were typical of P. atricapillus. This was on Camp Caesar proper. Richard May, throughout the same week, made similar observations.
4. Olive-backed thrush (Hylocichla ustulata). Since the 1947 list is primarily one dealing with breeding birds and does not include this species, it is mentioned here only as a matter of record. One was heard singing on the upper eastern slope above Camp Caesar on the evening of May 30, 1949. Several return visits were made to the area, but the bird was not seen or heard thereafter.
5. Mourning warbler (Oporornis philadelphia). This species evidently was not "turned up" during the 1947 study. I. B. Boggs and Richard May found this species above Camp Caesar along the river in the direction of Bolair. On June 3, 1949, a party of observers including the writer heard and saw a male at the same site. Although a female was not observed, the general behavior of the male led me to believe that it had set up a nesting territory.

Conservation Commission
Charleston, West Virginia

WATERFOWL OF CHEAT LAKE, WINTER OF 1949

By William L. Wylie

Cheat Lake, or Lake Lynn as it is sometimes called, is located about seven miles northeast of Morgantown, in Monongalia County, West Virginia. This past winter, 1949, I tried to keep an accurate check on the waterfowl of this lake as to species and number of individuals within each species. There were several factors which led to an incomplete fulfillment of this original plan. First was my complete lack of transportation facilities. I had to depend on hitching a ride most of the time, which is unsatisfactory to say the least. I could have made many more trips to the lake had transportation been available. The second factor in the downfall of this undertaking was the open winter and a very early spring. Boats in numbers appeared on the lake by the first of March, and from

that time it was next to impossible to observe waterfowl, let alone get an accurate count. The whole situation became so hopeless that by the middle of March I could not depend on a "decent" trip to the lake so abandoned the original plan. What lists and counts I have past the middle of March are so spotty, incomplete, and inaccurate, that I feel they should not be included in this report.

As can be seen from the accompanying chart, I have included a total of ten trips from February 5 to March 13. In that time I recorded ten species of waterfowl. The species are listed in the order in which they were observed. That is, on the 5th of February I saw one old squaw, and a flock of scaup and goldeneyes. New species were added in the order of their observance.

I was just beginning to get a good trend and the trips were really getting fascinating when the boat traffic so completely fouled up the project that I had to abandon it. I only hope that in future years a more complete and accurate record can be kept of the waterfowl of this area, as it proves interesting and very much worth while.

Record of Waterfowl Observed at Cheat Lake,
February and March, 1949.

	FEBRUARY							MARCH		
	5	6	12	19	22	24	26	27	6	13
Old squaw	1	1		2				4	4	
Scaup, spp.	15	15	20	25	30	20	15	30	10	10
Goldeneye	15	15	15	20	20	15	10	30	7	
Ruddy		2				4				10
Horned grebe		1		1			2			2
Bufflehead			3							
Am. merganser			3							
Redhead						6	10	8	30	30
Ring-necked							1	1	10	15
Baldpate									1	1

709 Snyder Street
Morgantown, West Virginia

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Allegheny Knapsack	Pittsburgh, Pa.
Audubon Magazine	National Audubon Society, New York, N. Y.
Carnegie Magazine	Carnegie Museum, Pittsburgh, Pa.
Cassinia	Delaware Valley Orn. Club, Philadelphia, Pa.
Cleveland Bird Calendar	Cleveland, Ohio
Ecologists Union	Bloomfield Hills, Michigan
Indiana Audubon Yearbook	Ind. Aud. Soc., Inc., Indianapolis, Ind.
Iowa Bird Life	Iowa Orn. Union, Cedar Rapids, Iowa
Kentucky Warbler	Louisville, Kentucky

Lancaster County Bird club Bulletin	Lancaster, Pennsylvania
Library	Cleveland Mus. of Nat. Hist., Cleveland, O.
Library	Fish & Wildlife Service, Washington, D.C.
Library	Ohio County Public, Wheeling, W. Va.
Library	West Virginia University, Morgantown, W. Va.
Maryland	Nat. History Soc. of Md., Baltimore, Md.
Natural History Magazine	Am. Mus. of Nat. History, New York, N.Y.
Nebraska Bird Review	Univ. of Neb., State Museum, Lincoln, Neb.
Reading Public Mus. & Art Gallery	Reading, Pennsylvania
The Chat	Huntington, West Virginia
The Migrant	Tenn. Orn. Soc., Nashville, Tenn.
The Passenger Pigeon	Wis. Soc. of Orn. Inc., Madison 5, Wisc.
The Prothonotary	Buffalo Orn. Soc. East Aurora, N. Y.
The Raven	Lexington, Virginia
The Wilson Bulletin	Univ. of Mich., Ann Arbor, Mich.
Smithsonian Institute	Washington, D. C.
Wildlife Review	U.S. Dept. of Int. Fish & Wildlife, Chicago
Wildlife Review	Patuxent Research Refuge, Laurel, Maryland