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**A REPORT ON BIRD COMMUNITIES OF THE INDIAN RIVER MARSH
OF CHEBOYGAN COUNTY, MICHIGAN**

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INTRODUCTION

The Advanced Ornithology Class of the University of Michigan Biological Station made a survey of bird communities of the Indian River Marsh of Cheboygan County, Michigan on June 28, 1947 under the leadership of Dr. O. S. Pettingill. The purpose of the survey was to observe the location of different species of birds, especially their nests, with relation to the types of plants and animals in their immediate vicinity. To accomplish this the following method was employed: (1) the class of eighteen was divided into four groups; (2) each group searched the open-water, bulrush and cattail areas; (3) then, by wading, the class searched the sedge area. As birds and nests were discovered, their locations were made known to the whole class. Measurements and observations were noted. This survey was made during the forenoon from 6:15 A.M. to 11 A.M.

LOCATION

Located in the northern part of the lower peninsula of Michigan in Cheboygan County are two large lakes, namely, Burt and Mullet Lakes. They are joined by Indian River which is the outlet of Burt Lake. Originally Sturgeon River emptied into Indian River and deposited a large amount of silt, so that Indian River was nearly cut off from Burt Lake. About 1885 a channel was cut

through this deposit to make Indian River navigable. The course of Sturgeon River above this point was changed by digging a channel to Burt Lake, so that it no longer emptied into Indian River.

The factors which led to the formation of the marsh in the lower end of Indian River are explained by Scott (1921:88-89)¹ as follows: "_____ the drop from Burt Lake to Mullet is less than one foot, most of which occurs in the first mile and a half. Also, the valley spreads to a width of more than one-half mile south of Indian River and becomes a swampy mud-flat through which Indian River meanders. The stream was unable to keep a channel open at its mouth and in its lower course, which was undoubtedly a shallow arm of Mullet Lake, now filled by the silt carried down by Sturgeon River before its diversion."

CLIMATIC FACTORS

The weather during the morning varied. At 6:15 there was a slight northwest breeze, the sky had a few scattered clouds and the temperature was about 65° F. At 9:30 a thunderstorm occurred, making it necessary for the group to seek shelter. By 10:00 the weather cleared with about the same temperature and a fresh breeze from the northwest. The temperature increased to about 70° F. by 11:00 A.M.

THE COMMUNITIES

Using the distribution of plant life as an indication, four communities were ascertained. They are as follows: (1) Open-

¹Scott, I. D. Inland Lakes of Michigan Publ. 30 Geol. Series 25 Michigan Geological and Biological Survey 1921

water Community. The area of the marsh which was free of emergent vegetation was the meandering channel where there was a noticeable current. The plants growing submerged in this area were Chara, Myriophyllum and Potamogeton. (2) Bulrush Community. Bordering the open-water where it is from three to five feet deep was a growth of bulrush (*Scirpus americanus*). There were patches of yellow pond lily (*Nymphaea advena*) among the bulrushes. (3) Cattail Community. The cattails (*Typha latifolia*) were most abundant in water fifteen to thirty inches deep. Growing among them were clumps of large-leaved sedge (*Carex* sp.). The bottom in this area was unsound. (4) Sedge Community. Various types of sedge (*Carex*) were present. The water depth varied from two or three inches to about a foot. Other plants growing there were buckbean (*Menyanthes trifoliata*), aspen (*Populus* sp.) and willow (*Salix* sp.).

THE ECOTONES

There were two areas where there was a definite overlapping of vegetation from one community into another. These areas, which are called ecotones, were as follows: (1) Bulrush-Cattail Ecotone. There were wide areas where the water was deep enough for *Scirpus* and shallow enough for *Typha*, making good cover for the birds. It could be penetrated with a boat. (2) Sweet-gale (*Myrica gale*)-Sedge (*Carex* sp.) Ecotone. Between the sedge community described previously and the bordering spruce-cedar bog community is an area where clumps of sweet-gale are growing as islands in the sedge.

BIOLOGICAL RELATIONSHIPS

Probably the most abundant food available throughout the marsh is insects. Many other invertebrate animals are present, for example, worms, snails, etc. Small fish and frogs are plentiful also.

The open-water community* apparently is a feeding place. A black duck with ten young, a blue-winged teal and a herring gull were seen there. At a point where the channel comes near dry land a kingbird built a nest on the top of a piling over open water. The nest in this position is quite safe from land predators.

The bulrushes afford a screen and material for nest building. Many of the black terns took advantage of this. The nests were usually made of dead bulrushes on a floating pile of the same material. They were about ten inches in diameter and, although the raft was wet, they were fairly dry. There were generally two to three eggs in these nests. Sora rails apparently stay in the bulrushes where they are concealed from view and can move quite freely. Several were heard among the bulrushes. An adult pied-billed grebe with two young were seen swimming among the bulrushes.

The Bulrush-Cattail Ecotone forms a denser screen and also is a source of much nesting material. Black terns nest in this community also. The nests were made of decayed bulrush and cattail leaves on a muskrat house or a floating log or a raft of cattail and bulrush leaves. Some of the nests were not very well

*See the sketch of area studied on page 9.

concealed. Not far from a black tern's nest a young pied-billed grebe nearly drowned was found. An injury on the head looked like a peck by a black tern. Perhaps the grebe family came too close to the tern nest, which is guarded jealously. A least bittern was flushed from this ecotone and it flew to the bulrush community. An American bittern on a nest full of eggs was found in this ecotone where the water was about a foot deep and the *Typha* and *Juncus* were about five feet high. The nest was made of cattails and bulrushes, and was wedged in among the cattails so that it was an inch or two above the water. The eggs were being pipped. We were unable to flush the adult from the nest. The color and shape of the bird's head made it blend in well with the surroundings. An adult Virginia rail was flushed along the edge of the bulrush-cattail ecotone. It alighted in the same area. Several coot were heard in the bulrush-cattail ecotone.

The cattail community with the tall *Carex* affords a still denser screen. Swimming birds would find navigation more difficult there. A pied-billed grebe's nest was found in this community floating on a raft of wet cattails. The nest was covered with decayed debris and was wet. The water was twenty-five inches deep. There was nothing in the nest. Two nests of the long-billed marsh wren were found in the cattails, one with eggs, the other with young. The nests were globular, being covered over the top, and having an entrance on the side. There were three dummy nests made near the occupied nest. They were poorly constructed of *Carex* and were fairly conspicuous. These "cock" or "dummy" nests lacked a lining. The nest with eggs was placed in a clump of cattails and was well-constructed of *Carex*. It was lined with cattail down. All of the nests were about fifteen inches above the water, and the

water was about twelve to fifteen inches deep. In the vicinity of the long-billed marsh wren's nest among the cattails redwing blackbird nests were found. The cup-shaped nest was supported in a clump of cattails. The material from which it was made was small *Scirpus* and the lining was of fine needle-like grass. It was about one foot above the water level. In one locality two nests were about thirty feet apart and they were less than that from an occupied black tern's nest with young.

No nests were found in the sedge community. A few swamp sparrows were flushed from this area.

The dominant bush bordering the spruce-cedar bog was sweet-gale. Among these bushes were found two northern yellow-throat nests. they were supported partly by the bush and partly by the *Carex*. The nest was about ten inches above the water and the water was six inches deep. It was made of *Carex* and lined with fine grass. A swamp sparrow's nest was found in a sweet-gale bush which was well out in the open. It was about two feet above the water. The nest material consisted of fine sedge. A robin's nest was found in a cedar which was located out in the sedge. It was about six feet above the ground.

DISCUSSION

Referring to the sketch on page 9 which shows the location of the birds and nests seen, it appears that certain species of birds confine themselves to certain of the plant successional communities, thus forming definite marsh bird communities. That those different species living in the same community have learned to tolerate each other, as, for example, the redwing nests in

close proximity with a black tern nest and the nearness of a redwing nest to long-billed marsh wren nests, was apparent. Intruders are not welcome, as was shown by the act of a black tern injuring a young pied-billed grebe, which must have happened when the family of grebes came too close to the nest. In all communities where there were nests, the birds objected to the invasion made by the members of the class.

The question, "Why do birds distribute themselves into communities?" might well be asked. The observations which were made for the survey were too brief and too few to give a definite answer, but indications show that several factors probably enter into the picture. Since most of the community life was centered around nesting, probably seclusion is the first factor. The choice of a place for nesting depends upon the physical structure of the bird, that is, size, mode of activity as regards swimming, perching, wading, etc., on the kind of nest which it builds instinctively, and on the materials used for the nest. Another factor which is important is the development of the young and how they leave the nest, that is, whether they are precocial or altricial. A third factor which was observed that is important from the standpoint of selecting a marsh is the source of food. Probably a combination of these three factors and others not observed in this brief study explain why birds confine themselves to communities.

The ecotone appears to be a popular nesting place. Referring to the sketch on page 9, it will be noticed that the cattail-bulrush ecotone does not have any species confined to it (with the exception of one American bittern nest), but rather species of the two adjoining communities use it. The black terns nest in the bulrush community and also in the cattail-bulrush ecotone. Like-

wise, the redwing nests in the cattail community and also in the cattail-bulrush ecotone. This may or may not be true in the case of the sweet-gale-sedge ecotone. A study of the adjoining spruce-cedar bog was not made.

SUMMARY

The Advanced Ornithology Class of the University of Michigan Biological Station carried out a study of the bird communities of the Indian River Marsh located in Cheboygan County, Michigan on June 28, 1947. A census of the bird population and the nests was made and the location of each plotted on a map. It was found that some birds, such as the long-billed marsh wren ~~and the redwing blackbird~~, confine their nesting to one community, while others, such as the black tern, may nest in a community and an ecotone.

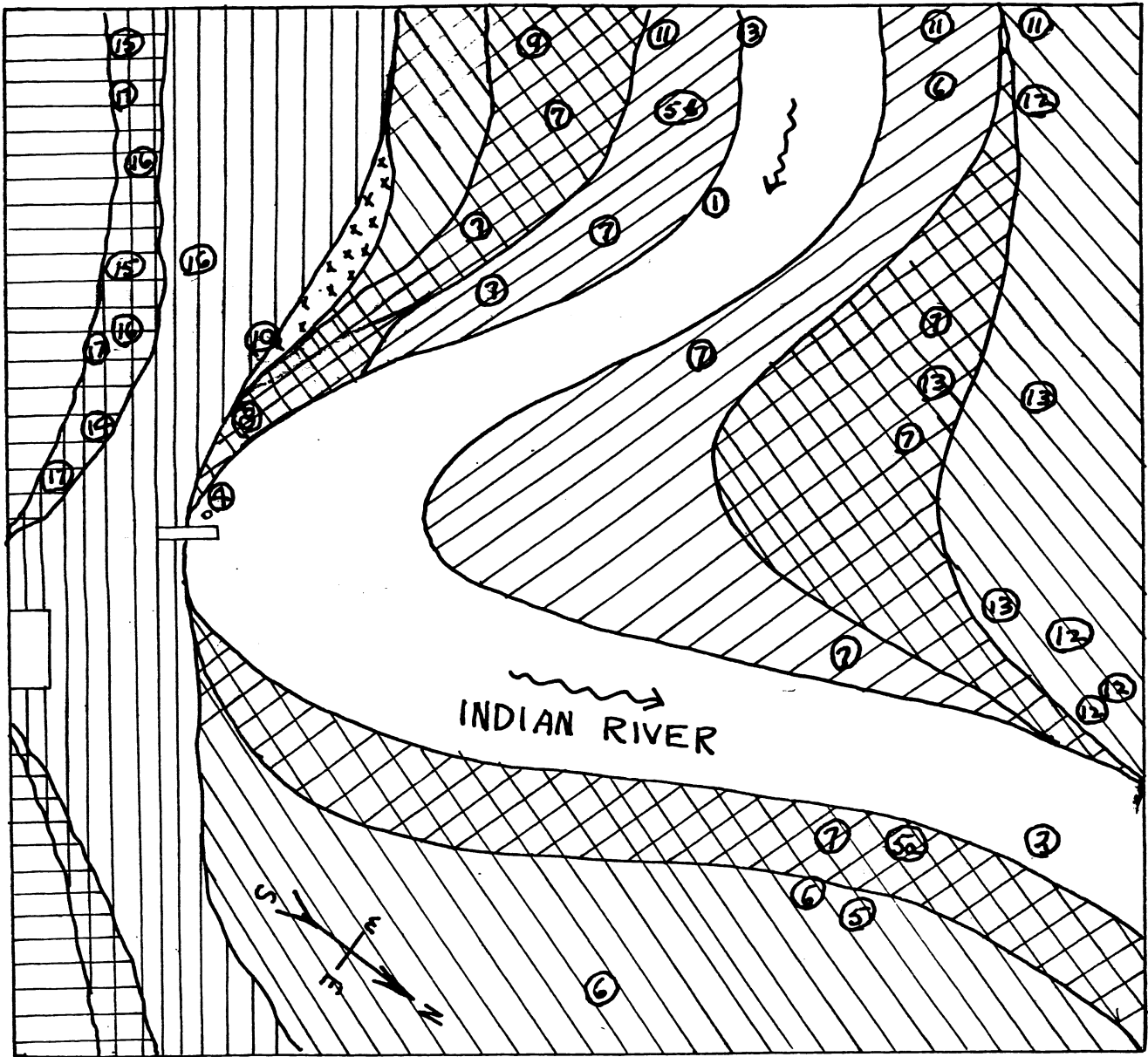
In all, four communities were found to be present. They were (1) Open-water, (2) Bulrush, (3) Cattail, and (4) Sedge.

Two ecotones were determined, namely, Cattail-Bulrush, and Sweet-gale-Sedge. There appears to be a definite relationship between the location of birds and their nests and the successional plant communities.

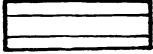
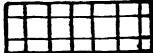

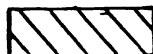

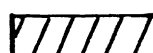
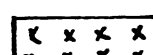
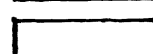
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SKETCH OF AREA STUDIED AT INDIAN RIVER MARSH SHOWING APPROXIMATE LOCATION OF SUCCESSIONAL COMMUNITIES



LEGEND

-  Cedar-Spruce Bog
-  Myrica gale-Sedge ecotone
-  Sedge
-  Cattail
-  Bulrush-Cattail ecotone
-  Bulrush
-  Phragmites
-  Open Water

BIRD AND NEST LOCATIONS

- ① Black Duck with yng.
- ② Blue-winged teal
- ③ Herring gull
- ④ Kingbird nest on piling
- ⑤ Pied-billed Grebe nest
- ⑤a " " " yng.
- ⑤b " " " Ad.yng.
- ⑥ Sora Rail heard
- ⑦ Black Tern nest
- ⑧ Am. Bittern nest
- ⑨ Least Bittern
- ⑩ Virginia Rail
- ⑪ Coot heard
- ⑫ Longbilled Marsh Wren
- ⑬ Redwing nest
- ⑭ Robin nest
- ⑮ N. Yellow-throat
- ⑯ Swamp Sparrow
- ⑰ Song Sparrow

DISTRIBUTION OF BIRDS IN SUCCESSIONAL COMMUNITIES

Location of area:
 Indian River, Chebogan County, Michigan
 Locus key: T35N/R2W/58

Date (or dates): June 28, 1947

Number persons making study: 18

Weather rating: Cloudy-Thunder Shower then clear-warm

General description of area: A river marsh with meandering channel of open water through Bulrush, Cattail, sedge marsh bordered by a spruce, cedar bog.

Communities and Ecotones

| Species | OPEN WATER COMMUNITY | BULRUSH COMMUNITY | BULRUSH-CATTAIL ECOTONE | CATTAIL COMMUNITY | SEDGE COMMUNITY | SEDGE-MYRICA GALE ECOTONE | FLYING OVER MARSH |
|------------------------|----------------------|-------------------|-------------------------|--------------------|-----------------|---------------------------------|-------------------|
| | Pied-billed Grebe | | Several Ad. yng. | Injured young | nest | | |
| Great Blue Heron | | | | | | | Adult |
| American Bittern | | | Nest - yng & Eggs | | | | |
| Least Bittern | | | Adult | | | | |
| Black Duck | Adult (10) yng. | | | | | | |
| Blue-winged Teal | Adult | | | | | | |
| Virginia Rail | | | Adult | | | | |
| Sora Rail | | Several heard | Several heard | | | | |
| Coot | | | Several heard | | | | |
| Herring Gull | Adult | | | | | | |
| Common Tern | | | | | | | (2) Adults |
| Black Tern | | (1) nest | (5) nest Eggs yng. | | | | |
| Kingbird | Nest Top of Piling | | | | | | |
| Tree Swallow | | | | | | | (3) Adults |
| Long-billed Marsh Wren | | | | (2) Nest | | | |
| Robin | | | | | | Nest in Cedar (2) nest Sev. Ad. | |
| Northern Yellow-throat | | | | | | | |
| Red-wing | | | | Several Nest + Ad. | | | |
| Swamp Sparrow | | | | | Ad. Flushed | (1) nest Sev. Ad. | |
| Song Sparrow | | | | | | Sev. Ad. | |