

A STUDY IN BIRD ECOLOGY OF INDIAN RIVER MARSH

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INTRODUCTION

The purpose of studying a typical marsh of northeastern United States is to grasp a fuller realization of the fact that there is a never-ending change of plant communities toward a common climax situation - in this case, a climax forest. The steps in these changes are called successional stages. The change in bird life accompanying these stages is quite evident when one is studying a marsh with successional plant communities from the open water to a climax forest. It is of special interest to organize the notes taken afield and learn what species of bird nests in a certain community and of equal interest - what birds do not nest there.

The marsh was entered at 6:30 AM and was under observation until 11:30 AM on June 26, 1948. Five persons, using two boats and wading, covered the typical plant communities as thoroughly as possible, but because of so few people participating, not as many nests were found as were anticipated.

LOCATION

Burt and Mullet Lakes are two bodies of water created by the last glacial era located in Cheboygan County, Michigan. They are part of the inland water route of this state. Burt Lake empties into Mullet Lake by way of Indian River - a drop of less than one foot. The town of Indian River is located at the mouth of Burt Lake. The valley spreads to a width of more than one half a mile south of Indian River and becomes a swampy mud flat

through which Indian River meanders. ¹ The rate of flow of Indian River is apparently not natural because Scott describes the following : Upon leaving Burt Lake via Indian River, the amount of artificial control of the stream is somewhat surprising and bears strong evidence of the popularity of these lakes ¹ The broad channel of Indian River and its marsh is flanked on both sides by forested ridges mostly uninhabited except by fishing communities and tourist cabins. The channel extends almost due north and south.

CLIMATEC FACTORS

It was very clear in the early morning with little wind. The temperature, although not actually recorded, was about 45 degrees Fahrenheit. Toward midmorning the temperature rose and storm clouds covered the whole eastern sky. By 11:00 AM the sky was entirely overcast and a light steady rain fell for the remainder of our stay at the marsh. It was interesting to note the activity of bird life during these changes in the weather. Activity was naturally at its height early in the morning, but did not subside until the storm approached. Just before the rain and during the first few minutes of actual precipitation there was very little singing or activity of any kind. However after the first outbreak, activity picked up again, but did not reach its original peak.

COMMUNITIES AND ECOTONES

OPEN WATER COMMUNITY : The very basis of a marsh succession is the open water habitat. Underwater plants such as Elodea and

¹ Scott, I. D. Inland Lakes of Michigan. 1921 Wynkoop.

several kinds of algae sustain fish, mollusks, crustacians and insects of various types upon which birds feed. Seen feeding in the open water were the Pied-billed Grebe (Podilymbus podiceps), Common Tern (Sterna Hirundo), Belted Kingfisher (Megaceryle alcyon), and Tree Swallow (Iridoprocne bicolor). Other birds using this community were Black Duck (Anas rubripes), Coot (Fulica americana), and Black Tern (Chlidonias nigra).

FLOATING PLANT COMMUNITY : Before one can actually disembark from his boat when going from open water to the thick marsh, he must first pass through an edge of Water-lilies (Nymphaea) which indicates shallower water but still too deep for wading. This community attracts hosts of insects and shelter for fish. The Pied-billed Grebe, Coot and Black Duck take advantage of such a situation not only as a food area but also as a protection area. Red-wings (Agelaius phoeniceus) were seen hopping along the lily pads picking off the invertebrate life found clinging to the vegetation. This type of community did not seem to be a separate unit in the Indian River Marsh because of its almost immediate association with the following type.

BULRUSH COMMUNITY : The hollow stemmed Bulrush (Scirpus) as a pure community offers little as nesting sites for most marsh birds. It is a rather deep water plant (four to six feet) which averages about the same height above water. It affords good protection for the swimming species, however, as it is easily navigated by grebes and ducks. Where this plant is not so dense, Black Terns were found nesting on small masses of dead bulrush. One nest was found with three eggs having an olive-brown base color blotched with darker spots . The diameter of the nest was

14 cm. and height above water was 5 cm. The nest was located in 50 cm. of water. The terns were obviously annoyed at our presence and ~~dived~~^{dove} many times at our boat uttering a characteristic chattering noise.

BULRUSH - CATTAIL ECOTONE : The Bulrush - Cattail (Typha) association was a common sight at the marsh. Several Red-wing nests were found here. The dead, dried cattail stalks make excellent supports for their nests. The nests looked as though they were made of dried sedge interwoven about four or five supporting cattail stalks. One nest contained four eggs having a light brown ground color and speckled lightly with a darker brown. One egg I noticed was light blue-gray with no markings whatever. This nest was 30 cm. from the water level and had a diameter of 10 cm.

CATTAIL COMMUNITY : The pure cattail stand seemed to attract more kinds of birds than any other. Red-wings nested abundantly in this community. A nest was found which was interesting because of its unusual depth of 25 cm. It was woven around four dead Typha stalks and made of grass and stripped cattail. It contained three eggs. The bird was apparently not satisfied with the height of her nest and kept building it higher. The base of the nest measured 25 cm. from the water. Another nest was found with two eggs and two young. Behavior of the parent at the nest was characteristic of Red-wings. She would fly over low several times then settle near by and call noisily, but made no other attempt to lure or frighten us away.

Several false nests of the Long-Billed Wren (Telmatodytes palustris) were located and several with singing males, but

none that were occupied. Dr. Pettingill observed a wren building his nest. The bird used the dried Typha as support and wove in a few green blades, but most of the nest was made of the easily maneuverable, wet, dead stalks which the bird gathered from the water. After each weaving he would mold the structure with his body. These ball shaped homes are usually 60 to 70 cm. from the water level.

An apparently abandoned nest of the Pied-billed Grebe was found with one white egg covered with the mornings' dew. The nest measured 40cm. in depth with only four cm. above water. It was more or less just a massive pile of dead cattail with a slight depression measuring 20 cm. in diameter.

Dr. Pettingill located a Sora Rail's (Porzana carolina) nest containing a dead chick about a week old. The nest was merely a platform-like affair of dead cattail built about ten cm. above the water level among very dense Typha growth. No adult bird was heard or seen in the vicinity.

Also of interest was a Kingbird's (Tyrannus tyrannus) nest located in a post situated in open water which was surrounded by cattail. One half of the post was rotted away leaving the nest fully exposed to the elements. It contained one egg and three young developing pin feathers. The nest measured 45 cm. above the water level and ^{nine} 9 cm. in diameter. It was constructed of rootlets, string, paper, cotton and grass. Oddly enough the adult bird made no attempt at defense. The bird perched some distance away during the entire inspection.

CATTAIL - SEDGE ECOTONE : The Cattail - Sedge (Carex) association was found to be in water shallow water and makes perfect cover for the American Bittern (Botaurus lentiginosus) and rails. Another tall plant, Fragmites, was noticed

interspersed throughout this ecotone. A Virginia Rail (Rallus limicola) was seen flying into this type of cover, but no nests were found.

SEDGE COMMUNITY : This grass-like shallow water plant extends not more than two or three feet above the water. Such plants as the Arrow-head (Sagittaria) and the Pitcher-plant (Sarracenia) were found growing throughout the Carex. Three American Bitterns were flushed from this area. At least one of them was an immature bird. This would indicate a rather early nesting season. This species no doubt uses the sedge community mostly for foraging , as it is rich in insect and amphibian life.

SEDGE - SHRUB ECOTONE : Immediately adjacent to the forest edge a mixture of Carex and low shrub such as the Leather Leaf (Chamaedaphne) is perfect habitat for the Swamp Sparrow (Melospiza georgiana). Although no nests were found, several singing males were observed. Two Yellow-throats (Geothlypis trichas) were also heard singing , but again no nests were located.

SUB-CLIMAX FOREST EDGE : The final step in any succession is reached when the plants obtain an equilibrium. This is called a climax situation and may be a prairie, deciduous woods or a coniferous forest, depending on prevailing geological changes and the climate. The final stage of succession at the edge of Indian River Marsh for the present is a Sub-canadian (coniferous-deciduous) forest edge. Typical trees being Cedar (Thuja), Balsam (Abies), Spruce (Picea), Oak (Quercus), Maple (Acer), and Beech (Fagus). Species heard singing were the usual birds of such a forest edge. They were : Black-capped Chickadee (Parus atricapillus), Great Crested Flycatcher (Myiarchus crinitus), Black-throated

Green Warbler (Dendroica virens), Black and White Warbler (Mniotilta varia), Redstart (Setophaga ruticilla) and the Red-eyed Vireo (Vireo olivaceus).

BIOLOGICAL RELATIONSHIPS

BIRD AND FOOD RELATIONSHIPS : Dr. Allen states : None of the plants of this zone- nor, in fact, any of the strictly marsh plants- supply forage for the birds, so far as observed.¹ It is only from the animal life which the plants support that the marsh birds obtain the majority of their food. The Marsh wren feeds on the insect life among the Typha; The Red-wing ranges far for his main diet of insect larvae, and the bittern is well supplied with aquatic vertebrate life in the sedge.

BIRD AND ANIMAL RELATIONSHIPS : Several Muskrat (Ondatra zibethica) houses were found in the marsh. This rodent is not usually destructive to bird life and might even be classified as a benefactor, for Black Terns not infrequently build their nests upon these structures. Raccoon (Procyon lotor) droppings were also noticed. No doubt this carnivore takes his toll of eggs but probably not in any significant numbers. A fawn (Odocoileus virginianus) was flushed from a thick stand of Chamaedaphne near the edge of the marsh. Deer probably have little, if any, effect on the bird population. The main diet of the Common Water Snakes (Natrix sipedon), which were seen several times, is fish and amphibians. Therefore the direct effect on bird life is practically absent, although one can see a small drain on the food supply of several species of marsh birds.

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Allen, A. A. The Red-winged Blackbird. 1911 Proc. Linn. Soc. #24

INTERSPECIFIC RELATIONSHIPS : Predations of the Crow (Corvus brachyrhynchos) seemed to be the most important interspecific bird relationship. Several times Crows were seen being chased by two or three Red-wings. This species is a well known egg eater. Caspian Terns (Hydroprogne caspia) , Herring Gulls (Larus argentatus) and Great Blue Herons (Ardea herodias) were seen over the marsh, but no evidence of any predation was noticed. Relations between Red-wings and Black Terns seemed to be in perfect harmony.

INTRASPECIFIC RELATIONSHIPS : Only those birds nesting in close proximity have any reason to display territorial rights within their own species. This includes the Red-wings and Black Terns. Although no outstanding event along this line occurred, it is believed that there is a definite social order among birds of the same species. Beecher states : There is no positive evidence that the more aquatic marsh species are territorial, possibly because of the relatively low densities but to some extent because many occupy somewhat different nesting niches.¹

SUMMARY

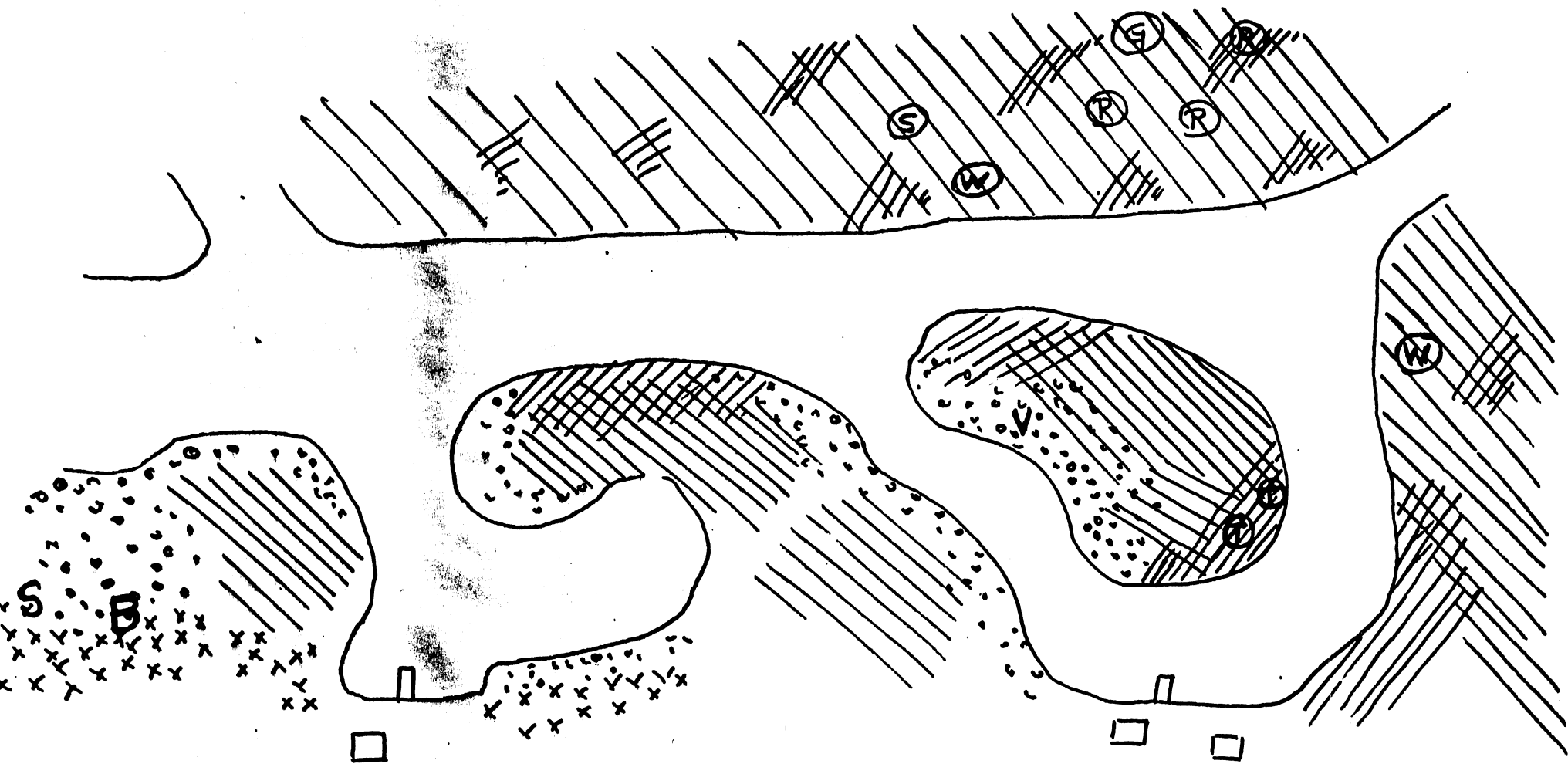
This report is an attempt to depict the present stage in the evolution of a typical marsh of northeastern United States, pointing out the different steps of succession and their relation to the birds inhabiting them. The following table summarizes this relationship.





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

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-  BULRUSH
-  CATTAIL
-  SEDGE
-  SHRUB

-  BLACK TERN NEST
-  L. B. MARSH WREN NEST
-  RED-WING NEST
-  P. B. GREBE NEST
-  SORA TAIL NEST
-  VIRGINIA RAIL SEEN
-  BITTERN SEEN
- SWAMP SPARROW SEEN

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INDIAN RIVER MARSH -