

A BRIEF STUDY OF THE BIRD ECOLOGY
OF THE INDIAN RIVER MARSH

Zoology 119

Jean M. Batts
4930 Washtenaw
Ypsilanti, Michigan

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TABLE OF CONTENTS

	Page
Introduction	1
Location	1
Climatic Factors	1
The Communities	1
The Ecotones	2
Biological Relationships	
Open Water Community	2
Floating Plant Community	4
Bulrush Community	4
Bulrush-Cattail Ecotone	5
Cattail Community	6
Cattail-Sedge Ecotone	6
Sedge Community	7
Sedge-Shrub Ecotone	7
Remaining Communities and Ecotones	7
Discussion and Summary	8
References	9

INTRODUCTION

Early Saturday morning, June 28, 1947, the advanced ornithology class at the University of Michigan Biological Station set out to study the bird ecology of the Indian River Marsh. After a breakfast cooked over an open fire in a sand pit in the mixed woodland near the marsh, we embarked in row boats at 6:30 A. M., to observe the birds and their relationships to their environment.

LOCATION

The Indian River Marsh is located at the southwest end of Mullet Lake, Cheboygan County, Michigan, a portion of the drainageway of Lake Michigan to Little Traverse Bay to Burt Lake to Indian River to Mullet Lake to Lake Huron. All of these lakes were formed originally by glaciation. Till and outwash material, as well as fluvial deposits from the Sturgeon and Indian Rivers have nearly filled up the Indian River channel, leaving the area just right for marsh vegetation, which in time will succeed into a climax forest.

CLIMATIC FACTORS

As usual, our trip began in the rain, but from five o'clock, on, the weather was good, but overcast. At about nine o'clock there was a brief thunderstorm, which drove us to shelter; after that the day was very clear and bright, with an estimated temperature of 75-80° F. The wind velocity was estimated at 4-5 miles per hour.

THE COMMUNITIES

A marsh has an interesting history. It begins as open water, which in time comes to contain submerged plants such as algae, Potamogeton, and Elodea. As the decaying remains of these plants are deposited on the

bottom, such floating plants as Nymphaea and Castalia take root near the edge, and send their leaves and flowers to the surface. These, in turn, fill in the area still more, and bulrushes (Scirpus) and sometimes reeds (Phragmites) come in. Thus the water lilies are pushed farther into the pond as the pond becomes shallower, and the open water area becomes smaller. Bulrushes are then encroached upon by cattails (Typha), if conditions are right, which grow in water not deeper than four feet. Next come the sedges (Carex), which grow in water of approximately one foot depth, or on a floating mat. Shrubs are the next state of vegetation, the chief genera being leather leaf (Chamaedaphne), willow (Salix), dogwood (Cornus), and alder (Alnus). The most prevalent shrub in the Indian River Marsh was sweet gale (Myrica gale).

In time short trees, such as Abies, Picea, Thuja, and Tilia, find conditions right, and move in, shading out the shrubs. These, in turn, are replaced by taller trees, and eventually the dominant species for the region will take over. In southern Michigan these are maple (Acer) and beech (Fagus), but in northern Michigan the oak (Quercus borealis) seems to be the climax species.

THE ECOTONES

As would be expected, these stages are not completely cut off from each other, but adjacent ones merge into each other, with a combination of species. These overlapping areas are termed ecotones. Their characteristics are intergrading between those of the adjacent communities. These will be discussed more fully later, in connection with the birds found there.

BIOLOGICAL RELATIONSHIPS

Open Water Community

No nests were found in the open water community, but several species

of birds were seen there. One adult and ten young Black Ducks were swimming, single file, across the open water. The nest was not found, as Blacks are particularly adept at hiding their nests, and may build in a variety of places. Usually they build on the ground, but one was reported found in an old crow's nest, 45 feet up (Bent, 1923). In summer their food is largely vegetable matter, including seeds of burr reed, pondweed (Potamogeton), bulrush, and eelgrass, and buds and rootstocks of wild celery. Their animal food, comprising about one tenth of their summer diet, consists of snails, ants, larvae, bivalves, crustaceans, insects, salamanders, tadpoles, leeches, and an occasional small mammal. The Black Duck, a dabbler, usually feeds in shallow water, putting his head under water to pick food off the bottom or from submerged stems.

An adult Pied-billed Grebe with one chick was seen swimming in open water, near the bulrushes. Grebes dive for food, which consists of fish, crustaceans, insects, mollusks, and other aquatic animals. They are not known to eat any vegetable material.

A large green frog sat perfectly still on a pile of floating debris, while our boat passed within three feet of him.

Many Black Terns flew over this area continuously, squawking and catching insects. They feed their young with spiders, water scorpions, flies, and other insects. The adults catch some minnows, and eat crayfish, small molluscs, dragonflies, moths, grasshoppers, crickets, beetles, spiders, water scorpions, flies, and many other insects. Most of the insects are caught on the wing, but the other animals are found chiefly on the higher stalks of bulrushes, cattails, and sedges.

One Herring Gull flew over this community.

A few Red-winged Blackbirds were flying over the open water, catching insects, but they seemed to stay more where there was vegetation, and their flights were much shorter than the terns'.

Fifteen feet from the shore, on an old pier post in open water, we found a Kingbird's nest containing three white eggs. The nest was made of coarse grasses, and lined with cattail down. Two adult Kingbirds were flying over the nearby land and water, catching insects on the wing. In summer their diet is about 90% animal matter, mostly insects—beetles, grasshoppers, butterflies, bees, wasps, two-winged flies, and caterpillars. Kingbirds have been accused of being detrimental to honey bees, but in an examination of stomachs made by the United States Department of Agriculture, only 50 honey bees were found, 40 of which were drones and only four of which were definitely identified as workers. Kingbirds sometimes obtain insects from the surface of the water, in the manner of swallows. In August they flock, and feed on berries of sassafras and spice bush, and sometimes on wild cherries, Amelanchier, honeysuckle, and blackberries.

Three Tree Swallows were seen flying over the open water, diving for insects. They also take an occasional bath here.

Floating Plant Community

No nests were found in the floating plant community. The same birds were flying overhead as in the open water area. This community is an important feeding place, however, with its minnows, crayfish, molluscs, and insects.

Bulrush Community

In the bulrush community we found a Black Tern's nest, Number 1. It consisted of a floating mass of debris, chiefly dead bulrushes, in the center of which a depression about ten inches in diameter had been made, for the nest proper.

A Black Duck and two Pied-billed Grebes were seen swimming in this community, but no other nests were found.

Bulrush-Cattail Ecotone

Forming the other two points of a 75-foot equilateral triangle with Nest 1, were two more Black Tern nest. These were on floating masses of dead cattails and bulrushes, with a very slight hollow in the center. Each nest contained three eggs, showing much individual variation. Several other nests of this species were observed, no two closer together than 75 feet.

Some nests of the Pied-billed Grebe were located in this ecotone. They were on smaller floating masses, and showed more construction than those of the terns. They were fashioned of wet cattail leaves, slightly hollowed out, and lined with finer vegetation. One young grebe was found, with head injuries which had probably been inflicted by a tern. Two grebe eggs were found floating near the nests. They are rather reptilian-looking, having two pointed ends.

On a small hummock up away from the water we found an American Bittern sitting on a nest among the cattails and bulrushes. It took me several seconds of looking directly at the bird, to distinguish it from the surrounding stems, so well was it camouflaged by the stripes on its breast. It remained on the nest, even when one member of the party put his foot on its nest. It rose only enough to show us four light-colored eggs, one of which was ready to hatch. The American Bittern feeds on small frogs, fish, meadow mice, lizards, crayfish, molluscs, dragonflies, grasshoppers, and other insects, most of which were plentiful near the nest.

Many Red-wing nests were found in this ecotone. They were from 20 to 25 inches above the surface of the water, attached to cattail stems or bulrushes. The nests were cup-shaped, and none within 40 feet of each other, although near Ann Arbor I found some closer than 10 feet. They were built of sedges and coarse grasses, and lined with sedges and small pieces of cattail. One nest was still wet, indicating that it was just, or not quite, finished.

One nest contained four young, estimated to be five days old. They opened their mouths wide when we jiggled the nests or touched their bills, and swallowed when cattail leaves were put in their mouths. They showed no evidence of fear. An adult female perched on a cattail about twenty feet away, with a damsel fly in her bill, apparently patiently waiting for us to leave her family. Occasionally she flew down and dipped the insect in the water, as if to keep it fresh till we left. The male scolded from overhead or nearby cattails.

The food of Red-wings, while occasionally consisting of farmers' grain, is chiefly weed seeds, and injurious insects. Most of the insects are obtained from the ground— weevils, cutworms, span-worms, chafers, and grasshoppers.

Cattail Community

The cattail community had about the same species of birds, with the Least Bittern substituted for the American Bittern. No nests were found here except a few Red-wings' and one Pied-billed Grebe's.

Cattail-Sedge Ecotone

Black Terns and Red-wings were very common in this area, flying overhead, calling, and catching insects. The Kingbirds were seen here, also. Several globular nests made of dead cattails and rushes, and opening on the side, were found here, fastened to cattails and sedges, about two feet above the surface of the water. Only one of these was lined with fine grasses and cattail down, and this one contained young Long-billed Marsh Wrens. As we stood nearby the father bird hopped and flew from stalk to stalk, calling, and flicking his tail up over his back till it nearly touched his head. Finally he apparently decided we were harmless, and he took an insect to his family. The food of this species consists chiefly of aquatic insects which are caught as they creep up the vegetation

as they transform from the larval condition. They also eat many crustaceans, spiders, and caterpillars. Their only bad habit is piercing the eggs of other marsh birds. The reason for this is not known, as they apparently do not eat the egg material.

Sedge Community

Only one nest was found in this area— another "cock Nest" of the Long-billed Marsh Wren. Black Terns were common here, too, and the Kingbirds were busy catching insects in the air. Two new species were seen in this community— the Virginia Rail and the Sora. The Virginia Rail, with its long bill, gathers up earth worms, slugs, snails, small fish, caterpillars, beetles, and other insects. Bent (1926) reports a member of this species in captivity which swallowed a 12-inch garter snake. However, the process took two hours of exhausting effort, so probably this would be done only in an emergency. The Sora eats small molluscs, dragonflies, and some vegetation, especially seeds of late summer marsh plants.

Sedge-Shrub Ecotone

In this ecotone, with its small islands of Myrica surrounded by sedges, where the ground was wet but mostly above standing water, we heard several Swamp Sparrows. Their nests are placed in such a location, but our search for them was fruitless. We were successful, however, in finding two nests of Northern Yellow-throats, each containing four white eggs speckled with brown. They were composed of sedges, lined with fine grass, and hidden in the shrubs, about a foot above the ground.

Remaining Communities and Ecotones

We did not study the pure shrub community or the others in any detail. However, the Kingbirds, Northern Yellow-throats, and Swamp Sparrows were busy among the shrubs. Near our breakfast area, which was located

among the mixed woods of Picea , Thuja, Betula, and Populus(probably all grown in after destruction of original flora), several species were seen or heard. Among these were the Cuckoo, a pair of Belted Kingfishers, which had a nest in the sand bank, Hairy Woodpecker, Crested Flycatcher, Phoebe, Least Flycatcher, Blue Jay, Crow, Black-capped Chickadee, Winter Wren, Robins, Veery, Cedar Waxwing, Red-eyed Vireo, Black and White Warbler, Yellow Warbler, Oven-bird, American Redstart, Scarlet Tanager, Rose-breasted Grosbeak, Indigo Bunting, Purple Finch, Chipping Sparrow, and Song Sparrow.

DISCUSSION AND SUMMARY

From this brief study of the ecology of a marsh, it is evident that certain birds are found in certain places, and not in certain other places where other birds are found. This distribution seems to depend upon the food requirements of the bird, type of cover needed, and nesting materials. Usually the food and nesting materials are found near the nesting site— seldom more than one or two stages away. The ecotones are much more densely populated than the pure communities, no doubt because they furnish a greater variety of cover, nesting materials, and food. More specialization is necessary in a pure community. There is a constant struggle for existence, and those animals survive whose environment furnishes the most necessities.

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DIAGRAMMATIC MAP OF A SECTOR OF THE
INDIAN RIVER MARSH

Communities

Ecotones



