

would have served to identify the species. Besides the "pewee" note, described by writers, there was heard a louder, more resonant note which may be suggested by likening it to the minified honk of a Goose. Dr. Barrows says, evidently referring to the southern part of the state, that reliable records of nesting are not very numerous.

Protonotaria citra. PROTHONOTARY WARBLER.—May 25, 1922, at Nunica, Ottawa County, a nest with five eggs. The birds were seen again in the same locality, May 13, 1923. On June 20, 1926, I saw a single bird in a wooded swamp in Newaygo County. The latter observation would seem to be the northernmost record for the state.

Nannus hiemalis. WINTER WREN.—July 30, 1920, in Wexford County, I saw a fledgling, fairly well able to fly, attended by the parent birds.

Regulus s. satrapa. GOLDEN-CROWNED KINGLET.—In July, 1920, in Wexford County this bird was observed and frequently heard singing in deep hemlock woods.—EDWARD R. FORD, 317 Washington St., Grand Rapids, Mich.

Relation of Water Level to Bird Nesting Sites in Florida.—The Western half of Wakulla County, Florida, and a large part of neighboring counties, are flat and sandy, with innumerable shallow depressions averaging perhaps an acre or two in extent and a foot or so in depth scattered over the country at the rate of something like one to every fifty acres or a dozen to the square mile. These hold water in the rainy season (roughly June to September), but are apt to be dry in early summer.

The greater part of the area was originally covered with park-like open forests of long-leaf pine, a type of vegetation known in Florida as flatwoods; but the best timber has all been cut out, and the remainder is being worked for turpentine. The shallow depressions nearly always contain a dense growth of evergreen shrubs about ten feet tall, mostly of two species (*Cyrilla parvifolia* and *Cliftonia monophylla*) belonging to the family Cyrillaceae, and known throughout their range as "tyty" (also spelled titi and tighteye). There may be in addition scattered trees of cypress (*Taxodium imbricarium*), bay (*Magnolia glauca*), slash pine (*Pinus Elliottii*), black pine (*Pinus serotina*), or black gum (*Nyssa biflora*), and a few smaller shrubs and vines. These evergreen thickets on perpetually saturated soil are known in Georgia and Florida as bays (occasionally bay-galls), probably on account of the frequent occurrence of bay trees; and they are very similar to the "pocosins" of eastern North Carolina. On account of the sterile soil this region is hardly one percent cultivated, and the population is very sparse¹.

In June, 1920, the writer, with one companion, made a two-days' tour of exploration on foot through the wilds of western Wakulla County. On the afternoon of the 13th, at a point in the flatwoods about twelve

¹ For a more complete description of the region see Ann. Rep. Fla. Geol. Surv. 6: 247-253. 1914. The environmental requirements of bays are mentioned briefly on page 203 of the same volume.

miles west of Arran (which is the nearest railroad station to the county-seat) and probably three miles from the nearest house, we noticed a considerable number of water birds flying around a tyty bay of average size. This aroused our curiosity, and we soon pushed into the center of the bay to see what the attraction was for the birds. We found that particular bay to differ from most others in having the water too deep in the middle for any trees or shrubs to grow, leaving an open space perhaps 50 by 100 feet, which could not be seen from outside, on account of the density of the shrubbery. The water was then about knee-deep in the middle, and at least a few inches deep around the bases of the nearest *Cyrilla* bushes. And as that was just about at the beginning of the rainy season, the depth of the water probably increased as summer advanced.

Birds to the number of several hundred were flying overhead or sitting on the bushes, and many of them had nests with half-grown young. There seemed to be four or five species represented, but with our limited knowledge of ornithology the only one we could identify with certainty, was the White Ibis (*Guara alba*). The others were probably mostly Herons.

The presence of nesting birds in this one bay and not in any other near by was evidently due mostly to the fact that it was the only one with enough water in it to surround the bases of the bushes and protect them from animals which might otherwise have climbed up and robbed the nests. The water (which was covered with some sort of unicellular alga) may also have contained frogs if not fish, and thus contributed to the food supply.

Six years elapsed before another opportunity came to visit the place. On June 21, 1926, I went to it by automobile with Messrs. H. L. Stoddard and Wallace Grange of the U. S. Biological Survey, who were working in the southern edge of Georgia and adjacent parts of Florida.

We found the placè without much trouble, and it was undisturbed, but there was not a bird of any kind in it. The reason was immediately apparent. The year 1925 was drier than usual in this part of Florida (and in most other southern states), and the precipitation had been deficient in the first half of 1926 also. In the middle of the bay which had formerly sheltered such a large colony of birds the water was only a few inches deep, and the bushes were no longer protected from invasion by land animals. The algal scum of former years had completely disappeared, and the water was filled pretty well with *Juncus repens* and *Sphagnum macrophyllum*, which are fairly common in such places. Careful search revealed the remains of a few nests (made of twigs), but the birds may have been gone three or four years. Whether the low stage of the water reduced their food supply, or they realized that it was too low for protection, or they were actually driven away by their natural enemies (or by hunters), we may never know.—ROLAND M. HARPER. *State Geological Survey, Tallahassee, Fla.*