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HABITAT PREFERENCE AND SURVIVAL OF FLORIDA DUCK BROODS[1]

by

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ABSTRACT

Florida Duck broods were captured and banded by nightlighting in fresh, salt, and brackish water habitats. Ducklings were most frequently observed in brackish water areas. Duckling survival as determined by brood size observations was lower than in other mallard subspecies. Most duckling mortality occurs immediately after hatching. Ducklings are very terrestrial, a behaviorism that reduces exposure to an abundance of predators associated with Florida's aquatic environments.

Introduction

Data regarding population parameters and ecology of the Florida Duck *(Anas platyrhynchos fulvigula)* are virtually nonexistent. Lotter (1969) and LaHart (1970) effectively report existing autecological knowledge. This nonmigratory subspecies of Mallard is confined largely to peninsular Florida from Alachua County south to Cape Sable and Key Largo (Johnsgard 1961).

Florida Duck brood ecology was studied as part of a banding operation utilizing nightlighting in 1969. Data were collected from 35 broods in three basic habitat types.

Brood Habitats

Coastal salt marsh habitat is characteristic of many areas along the Florida coast. Indicator plants include red mangrove *(Rhizophora mangle)*, black mangrove *(Avicennes niteda)* and salt grass *(Disticheis specata)*. In sheltered sites dense areas of widgeon grass *(Ruppia maritima)* may occur. At Sanibel Island, Florida Duck broods used this habitat extensively in the impoundments and in the Gulf. A freshwater ditch (Sanibel River) flows through the middle of the island, but no Florida Duck broods were found using it. This suggests a preference by broods for saltwater habitat at Sanibel.

At Merritt Island, brood preference was not as clearly defined. The Banana River is a tidal stream that flows from the interior of Merritt Island into the Indian River. Before the construction of the Kennedy Space Center, the Banana River drained extensive portions of the island. The habitat along its edges is typical of the coastal salt marsh. Lying to the north and running

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parallel to the Banana River are two freshwater impoundments. The more easterly of these impoundments held a number of Florida Duck broods; while the other, mantained at higher water levels that covered most of the emergent grasses, had none. More birds were banded in the grassy, freshwater impoundment.

Other freshwater habitats nightlighted included the Kissimmee Chain-of-Lakes and their associated marshes. The few broods encountered were on the edges of the lakes and usually in the ecotone between California bulrush *(Scirpus californicus)* and the grassy pastures associated with the lakes.

Broods seemed to be eating largely animal foods while under observation. Ducklings pecked in dense, water pennywort *(Hydrocotyle spp.)* and widgeon grass that were swarming with aquatic invertebrates. During the June, 1969 waterfowl survey of the Kissimmee Chain-of-Lakes, May flies *(Ephemeroptera)* were hatching by the thousands and crawled on emergent vegetation to dry. Florida Ducks concentrated near this vegetation and were eating the newly emerged insects. This is similar to the behaviour described by Beard (1964) for feeding Wood Duck *(Aix sponsa)* broods. Two Florida Duck ducklings collected from freshwater habitats both contained insect larvae.

The most productive Florida Duck brood habitat is the brackish water marshes on Merritt Island and Sanibel. Needlerush *(Juncus roemerianus)*, salt grass, and cord grass *(Spartina bakeri)* are characteristic emergents; spiny naiad *(Naias marina)* and widgeon grass are the common submergents. The highest concentration of Florida Ducks was found in the large, brackish water impoundment immediately north of the Vehicle Assembly Building at the Kennedy Space Center on Merritt Island.

Broods were invariably encountered feeding in widgeon grass near mangroves. They used the heavily vegetated levees for loafing sites and escape cover. Vegetation on the levees included wax myrtle *(Myrica cerifera)*, button bush *(Cephalanthus occidentalis)*, pokeberry *(Phytolacca americana)*, and palmetto *(Sabal etonia)*. Ragweed *(Ambrosia spp.)*, sticktight *(Bidens pilosa)* and Broomsedge *(Andropogon spp.)* formed most of the understory.

Table 1 summarizes our capture success nightlighting in each habitat type.

Table 1. Number of ducks captured in basic habitat types.

	No. of hours	No. of ducks	Ducks/hr.
Freshwater	27.0	117	4.4
Saltwater	9.3	21	2.3
Brackish water	23.5	265	11.5
Totals/Means	59.8	403	6.7

Brood Survival

Comparing brood sizes to determine survival must be done with caution. As Reed (1968) emphasizes, this technique does not measure mortality between age classes because broods completely eliminated before reaching Class III are not included in the data. Johnson (1968) examined Florida Duck brood survival and found only 54 percent of the Merritt Island ducklings reached Class III. Brood survival for waterfowl closely related to the Florida Duck is summarized in Table 2.

Table 2. Brood survival of Florida Ducks and close relatives.

Species	Class I		Class II		Class III		Source
	No. of broods	Ave. size	No. of broods	Ave. size	No. of broods	Ave. size	
Mallard	238.0	7.2	270.0	6.2	440.0	6.0	Yocum and Hansen 1960
Black Duck	23.2	8.0	12.4	5.7	16.2	5.8	Wright 1954
Black Duck	429.0	6.7	381.0	5.7	427.0	5.8	Reed 1968
Mottled Duck	20.0	9.4	22.0	7.5	18.0	6.4	Engeling 1950
Florida Duck	7.0	7.0	11.0	6.5	13.0	3.8	Johnson 1968
Florida Duck	12.0	7.1	16.0	6.0	7.0	5.6	Present study

Grice and Rogers (1965:66) found survival was better among early hatched Wood Duck broods. Their data indicate that 67 percent of the early and 22 percent of the late broods reached flying stages. The scanty data we have on Class III broods show no difference between early and late broods.

Class I broods averaged 7.1 ducklings, yet Stieglitz and Wilson (1968) found an average of 9.0 Florida Ducks hatching per nest. This indicates that immediately after hatching, 58 percent of duckling mortality occurs. Most of the losses in Ring-necked Duck *(Aythya collaris)* broods occur within 48 hours after hatching (Mendall 1958:140). McGilvery (1969) found 90 percent of the total mortality of Wood Duck broods occurred during the first two weeks of life.

Keith (1961) shows the average Class III brood size for 8 species of ducks to be 6.5. We found the mean Class III Florida Duck brood to be 5.6 (15 percent lower) and Johnson's (1968) mean data are 3.8 (46 percent) lower. These estimates indicate that the Florida Duck produces fewer young per breeding pair to the flying stage than any of the other mallards. This lowered productivity should be a consideration in the determination of acceptable harvest rates. Brood mortality is probably the most significant population parameter.

Causes of brood mortality include disease, accident and predation. A list of possible duckling predators would include most of the carnivorous, terrestrial and aquatic vertebrates in Florida. Florida Ducks respond to danger like most anatinae by moving toward land. Ducklings are very terrestrial, a behaviorism undoubtedly with survival value because of the great variety and abundance of duckling predators associated with Florida's coastal marsh-water ecotone.

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SOME ECOLOGICAL CONDITIONS UNDER WHICH SELECTED WATERFOWL FOOD PLANTS GROW IN SOUTH CAROLINA[1]

Percival, H. Franklin[2], Lloyd G. Webb[3], and Norwood R. Page[4]

There are approximately one-half million acres of marshland in South Carolina and a total of almost seven million acres of coastal marshes in the Gulf and South Atlantic coasts (Wilson, 1967). These figures do not include the vast acreage of upland wetland areas suitable for waterfowl habitat. The importance of these vast areas has to be recognized as an important resource or potential resource in the Southeastern United States.

The South Carolina Wildlife Resources, United States Fish and Wildlife Service, and many private landowners are developing some of these wetland areas for wildlife habitat. Often the private landowner looses in his attempts due largely to lack of technical assistance. The Belle W. Baruch Foundation, The South Carolina Wildlife Resources Department and the South Carolina Agricultural Experiment Station initiated a joint study directed toward determining the food habits of waterfowl wintering in the coastal areas and defining some ecological conditions of some of the more important waterfowl food plants in that area.

The first step to accomplishing this goal was to conduct a food habit study to determine the more important food plants of waterfowl wintering in the state. James A. Kerwin, working under a grant from the South Carolina Agricultural Experiment Station, completed these analyses in 1967.

This paper is a result of a second task to determine some of the factors surrounding the growth of some of the plants selected from Kerwin's (1967) data and Conrad's (1965) food habit study of waterfowl collected on the Pee Dee and Waccamaw Rivers.

METHODS AND TECHNIQUES

The plants considered in this study were selected because of their importance to waterfowl as food plants as indicated by food habit studies by Kerwin (1967) and Conrad (1965). Sampling sites were determined on the basis of the presence of a "historically pure stand" of a selected plant. A historically pure stand was defined as a local condition wherein a specific plant, whether under the same management practices or by natural phenomena, had been maintained for more than one growing season. If a plant maintained itself year after year in the same location, those factors surrounding the growth of that plant were conducive to the survival of that species.

South Carolina Wildlife Resources Department biologists and/or area managers familiar with the vegetation in their respective areas aided in the selection of the historically pure stands of these plants.

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