FLORIDA DUCK MOVEMENTS *

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ABSTRACT

During the summers of 1969 and 1970, 668 Florida Ducks (*Anas platyrhynchos fulvigula*, Ridgway) were banded from an inland and two coastal breeding populations. Of the 81 band returns, 51 (63.0%) were recovered 10 to 270 miles from the release sites. Most of the ducks (71.4%) were recovered within 49 miles of the release sites.

INTRODUCTION

The Florida Duck is considered a choice species by duck hunters in peninsular Florida. Chamberlain (1960) estimated that the species made up 45% of the duck hunting take during the early part of the season and about 10% of the total harvest. The Waterfowl Status Reports (U.S.D.I., 1961-1970) estimate that 15,300 Florida Ducks were harvested per year during that ten-year period from an unknown total population.

Very little is known about the movements of this important species because little banding has been done. The purpose of this paper is to present a preliminary view of the movements of Florida Ducks based on the intensive banding during 1969 and 1970.

The authors would like to express appreciation to the National Aeronautics and Space Administration for the cooperation extended to the personnel involved in the banding effort. While much of the work was performed beneath the launching complex of the Apollo program, banding operations were never prevented because of "security reasons." Harold O'Connor, Refuge Manager and the Merritt Island National Wildlife Refuge staff pointed out productive banding sites on the refuge. Larry H. Barwick, Jerry A. Brown, and Robert W. Phillips, Game and Fresh Water Fish Commission, and Michael Winegar, student at the University of Florida, helped with banding. Lovett E. Williams, Jr., Game and Fresh Water Fish Commission, kindly reviewed the manuscript.

METHODS

NIGHT-LIGHTING TECHNIQUES

The use of light and sound in catching birds (mainly flightless ducks) has been described briefly by Scott (1938), U. S. Fish and Wildlife Service (1956), Leitch (1958), and Lindmeier and Jessen (1961). Cummings and Hewitt (1964) and Drewien *et al.* (1967) described methods for capturing ducks capable of flight. Modifications of these techniques were used in our banding effort. A 14-foot fiberglass "Aircat" airboat manufactured by Hurricane Corporation in Auburndale, Florida, and powered by a 150 h.p. Lycoming engine was used for night-lighting. A 500-watt wide angle floodlight was mounted on the bow of the airboat, just ahead of a bow-mounted seat for the netter. A 500-watt very narrow beam spotlight was mounted in a swivel-base near the driver. The lights were powered by a 3000-watt Kohler gasoline-powered generator. The driver operated the airboat and scanned the shoreline with the spotlight. The floodlight illuminated the air in front of the boat and dazzled the birds so they were easily caught with a long-handled dip net. LaHart (1970) described the equipment and operational procedures of this method.

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Netting techniques varied with the habitat and the age of the ducks. Adult Florida Ducks were extremely wary and very difficult to approach while night-lighting. Immatures "held" on the first approach, but if the netter missed, they flushed on subsequent approaches. Adult hens with broods generally remained with their young. If the adult was netted first, the brood would remain intact, allowing easy capture. If the hen escaped, the brood would scatter, reducing the catch.

Young Florida Ducks often left the water to go overland when alarmed. This behavior was different from that described by Lindmeier and Jessen (1961) for young canvasbacks (*Aythya valisneria*). We found it necessary for the driver to maneuver the airboat between the shoreline and the brood when making a capture approach.

Special care was taken to keep the brood intact by banding and releasing one brood before a second was captured. However, when three or four broods were encountered in a small area, as many ducklings were captured as possible. They were then all banded and released. Recapture information acquired by night-lighting on following nights proved that a mass capture of several broods from the same vicinity did not destroy brood integrity.

Banding Areas

During the breeding seasons of 1969 and 1970, we night-lighted the fresh and brackish water mosquito control impoundments of Merritt Island NWR. Descriptions of this area were presented by LaHart (1970), Johnson (1968), Stieglitz and Wilson (1968), and LaHart and Cornwell (1969). In two summers, 558 Florida Ducks were banded. In 1969, 30.8 hours of night-lighting produced 287 banded ducks and in 1970, 22.5 hours resulted in 271 birds banded. These efforts represent catch rates of 9.3 and 12.0 birds per hour, respectively.

Other areas night-lighted were the Kissimmee "Chain of Lakes" (Lakes Tohopekaliga, East Lake Tohopekaliga, Cypress, Hatchineha, and Kissimmee) and J. N. "Ding" Darling NWR (on Sanibel Island) and Matlacha Pass, Lee County, Florida. A description of these areas was presented by LaHart (1970). A total of 110 ducks were banded at these two locations.

For the purposes of this report, the terms "moved" or "away from the banding area or release site", etc. mean a recovery of more than nine miles.

RESULTS AND DISCUSSION

Previous Recovery Data

Between 1956 and 1963, 111 Florida Ducks were banded by Frank Ligas, Florida Game and Fresh Water Fish Commission, near Andytown, Broward County. Of the 14 returns from these banded ducks, 13 were recovered away from the banding station. A Florida Duck banded 10 miles west of Hollywood, Broward County, was recovered near Miami nearly seven years later. Another was banded at the Loxahatchee NWR, Palm Beach County, and recovered near Canal Point, Palm Beach County. Figure 1 shows the directions and distance traveled by Florida Ducks from these release sites.

Three recoveries have resulted from Florida Ducks trapped by Game and Fresh Water Fish Commission personnel on Paynes Prairie, south of Gainesville, Alachua County. Two were recovered near the release site and the third was shot 13 miles southwest of the release site.

A single Florida Duck banded near Ft. Myers, Lee County, was recovered near the release site the same year.

Current Recovery Data

Of the 40 returns of birds banded at Merritt Island in 1969, 24 were recovered elsewhere. Of the 24 band returns of ducks banded in the summer of 1970, there were 12 recoveries from locations more than ten miles distant. The movements of ducks banded at Merritt Island during these years are presented in Figures 2 and 3. Included in these figures

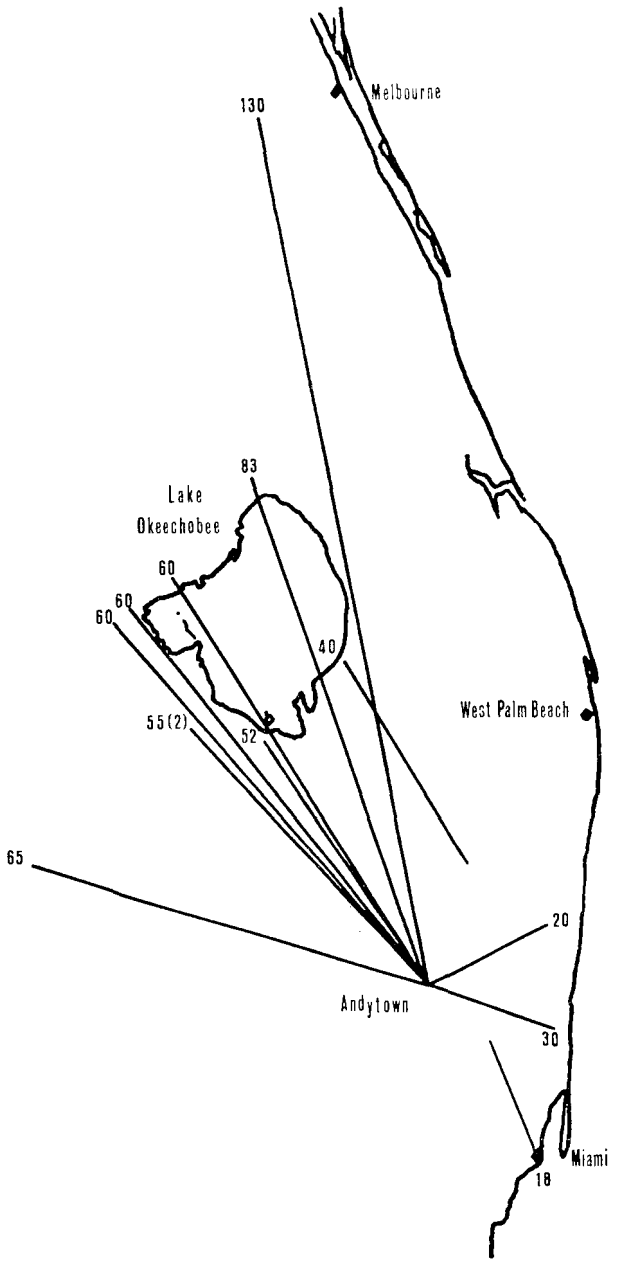

FIGURE 1. Recovery locations and distances traveled by Florida Ducks banded near Andytown.

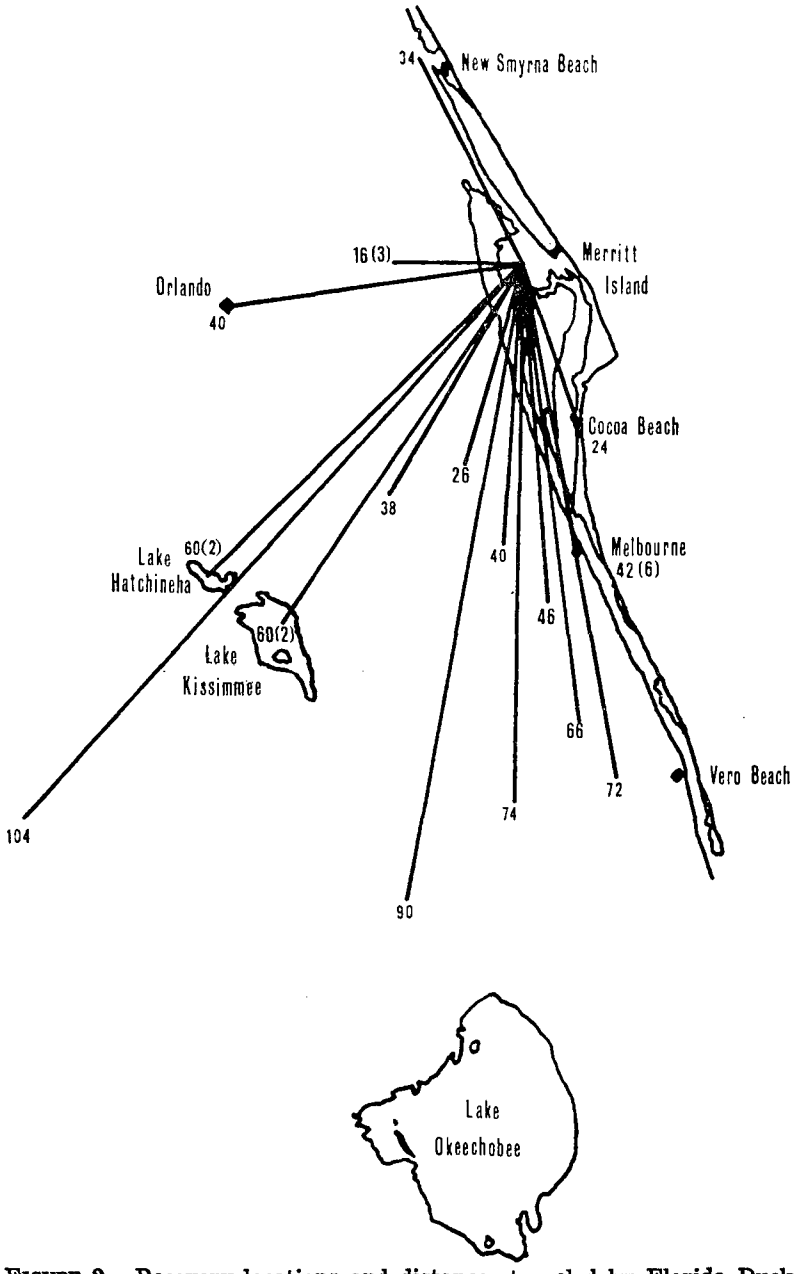

FIGURE 2. Recovery locations and distances traveled by Florida Ducks banded at Merritt Island in 1969.

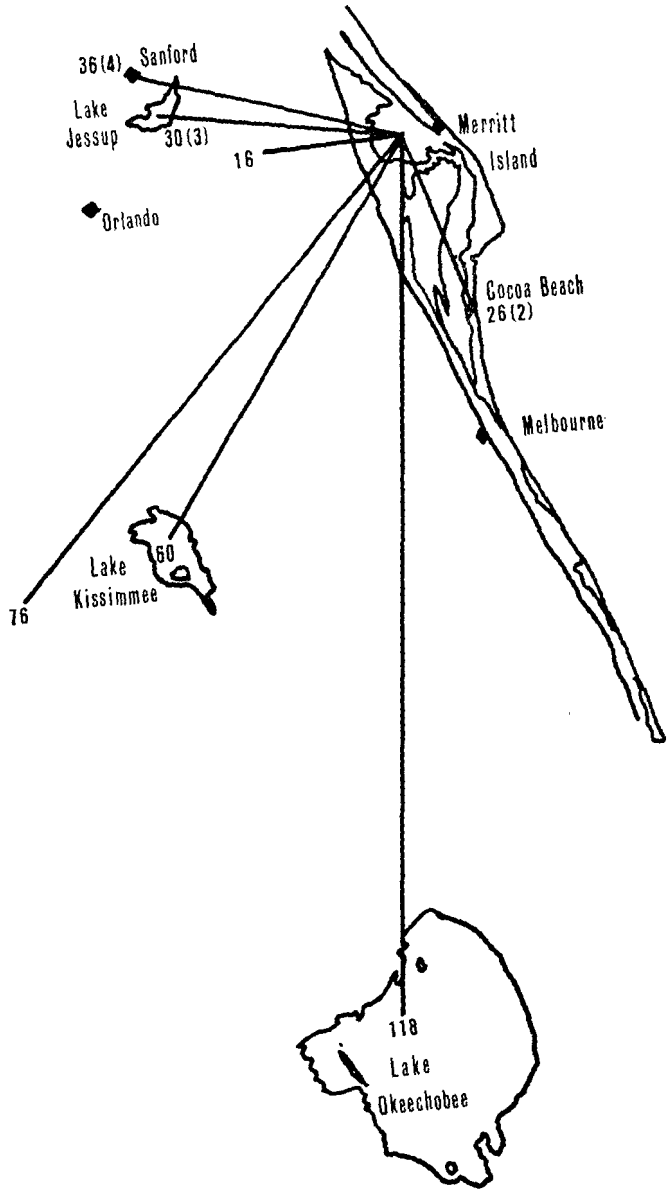

FIGURE 3. Recovery locations and distances traveled by Florida Ducks banded at Merritt Island in 1970.

are two recoveries resulting from 67 ducks banded by Johnson in 1967 and a Florida Duck banded in 1957 by Merritt Island NWR personnel.

Six recoveries have resulted from the 51 ducks banded within the Kissimmee Chain of Lakes. All were recovered away from the release site (Fig. 4).

Nine bands have been recovered from the 59 birds banded at Sanibel Island. All were recovered away from the release site (Fig. 5).

In 1969, four Florida Ducks were banded at Loxahatchee NWR and two at Matlacha Pass (Lee County, 20 miles north of Sanibel Island). No recoveries have resulted from these bandings.

Recovery Distances

Recovery data show that the species is mobile within its range. Nearly two-thirds (65.7%) of all the recovery data (105 band returns) available for this study demonstrate movement from the release site. When all recovery data are considered (both band returns from birds recovered at and away from the release sites), the average distances traveled by Florida Ducks banded at Sanibel Island was 73.1 miles; Andytown—52.0 miles; Kissimee Chain of Lakes—38.3 miles; Loxacatchee NWR—36.0 miles; Merritt Island NWR—28.9 miles; and Paynes Prairie—4.7 miles. Florida Ducks banded at Fisheating Creek Wildlife Management Area and near Fort Myers were shot near the release sites.

The average recovery distance (105 band returns) was 35.1 miles. Most ducks (71.4%) were recovered within 49 miles of the release sites. These data are comparable with the results of banding studies on other species of non-migratory waterfowl. Wainwright (1966) reported that 67% of Mallard recoveries were from within 30 miles of the release site at Abberton (Essex County), England. Balham and Miers (1959), working with Grey Ducks (*Anas superciliosa*) in New Zealand, found that 48.6% of the ducks were recovered within 25 miles of the release sites and 60.2% were recovered within 50 miles of the release sites.

The recovery distances are summarized in Table 1.

Sex as Related to Movement

Cummings and Hewitt (1964) found a predominantly male sex ratio among the immature waterfowl they night-lighted at Montezuma NWR in central New York. Bellrose et al. (1961) showed Mallard juveniles have a significantly larger percentage (53.2) of males trapped on the breeding grounds in Manitoba.

Our data showed these same trends. While the sex ratio of fightless young captured in the present study (from partial data) was 275 males (51.1%) to 263 females or 1.04:1.00, the ratio for flying immatures captured was 63 males (63.0%) to 37 females or 1.70:1.00.

The sex ratio of recovered Florida Ducks banded at Merritt Island NWR, Sanibel Island, and the Kissimmee Chain of Lakes as locals and immatures was 47 males to 31 females or 1.52:1.00. The sex ratio of the recovered birds that had moved from these banding areas was 32 males to 19 females (1.68:1.00). The ratio of banded young killed near the release sites was 15 males to 12 females (1.36:1.00). The unbalanced sex ratio remained consistent suggesting that there was no differential mortality between the sexes.

The average distance traveled by males was 39.4 miles and for females, 39.7 miles. A "t-test" was applied to these figures. There was no statistical difference between the recovery distances of males and females.

Dispersion

There have been 38 recoveries of Florida Ducks banded at Merritt Island as locals or immatures in 1969. Of this total, 28 (16 males and 12 females) were recovered the following hunting season (about six months later). These birds were recovered an average distance of 34.9 miles from the release site. The remaining 10 birds were recovered during the 1970-71 season and had moved an average distance of 34.2 miles. Eight of these ducks were recovered near the release site. A male was

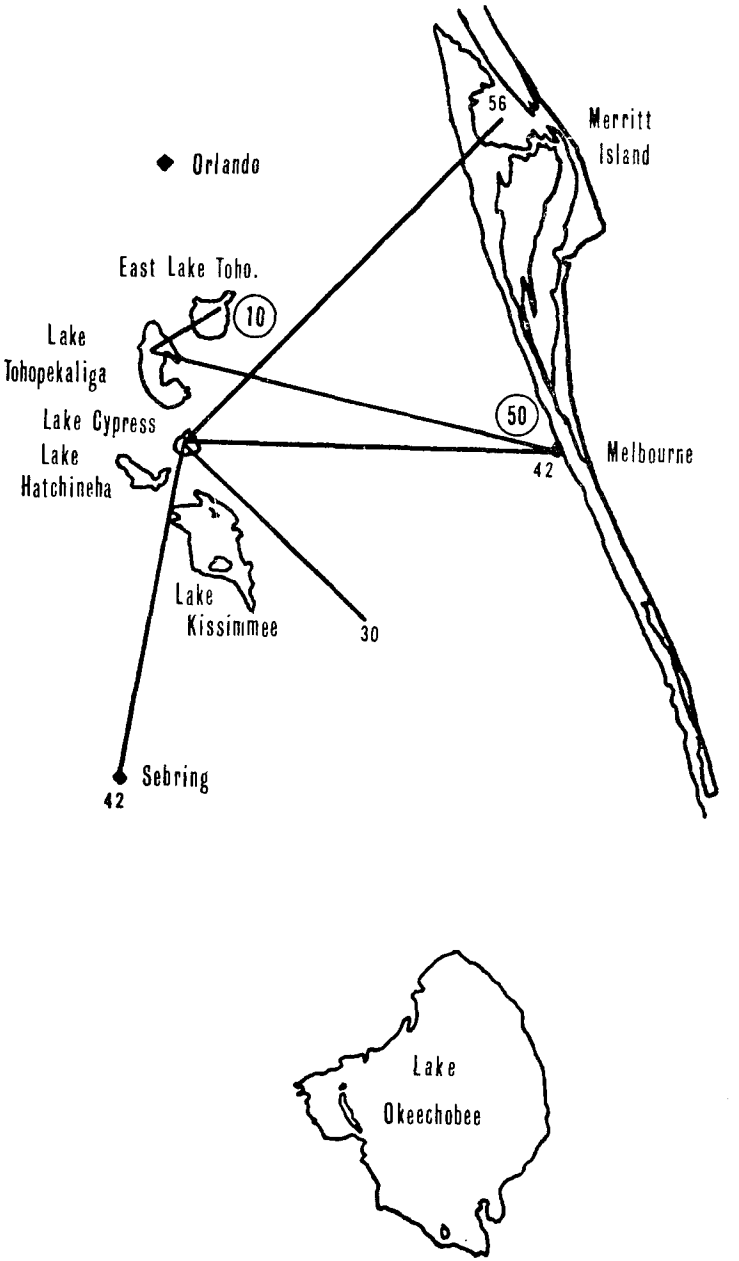

FIGURE 4. Recovery locations and distances traveled by Florida Ducks banded in the Kissimmee Chain of Lakes.

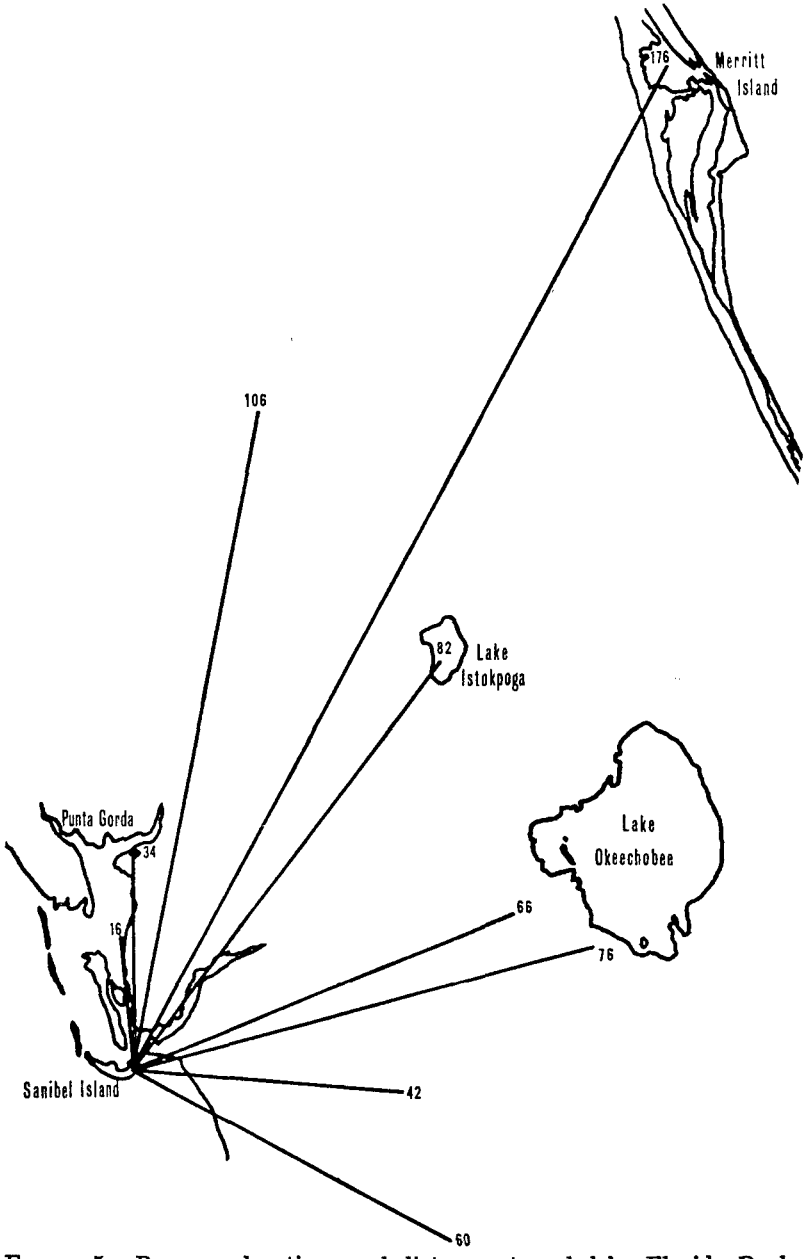

FIGURE 5. Recovery locations and distances traveled by Florida Ducks banded at Sanibel Island.

TABLE 1. Florida duck recoveries.

Banding Site	0-9	10-29	30-49	50-69	70-89	90-109	110-129	130-149	150-169	170-189	190-209	210+ *	
Andytown	1	2	2	7	1	0	0	1					
Sanibel Island	0	1	2	2	2	1	0	0	0	1			
Loxahatchee NWR	0	0	1										
Fisheating Creek	1												
Fort Myers	1												
Paynes Prairie	2	1											
Kissimmee "Chain"	0	1	3	2									
Merritt Island NWR	31	8	18	6	3	2	1	0	0	0	0	1	
TOTALS	36	13	26	17	6	3	1	1	0	1	0	1	= 105
Percentage	34.29	12.38	24.76	16.19	5.72	2.86	0.95	0.95	0	0.95	0	0.9	= 100.00%

* Recovered 270 miles from release site (see Fig. 6).

shot on Lake Talquin (west of Tallahassee, Leon County) 270 miles from Merritt Island. A second male was recovered west of Vero Beach, Indian River County, 72 miles from the release site. All the females were recovered at Merritt Island.

During the 1970-1971 hunting season, there were 24 recoveries (13 males and 11 females) of Florida Ducks banded in June and July 1970 as locals and immatures at Merritt Island. The average dispersion distance from the banding station was 26.9 miles.

Extralimital Movement

Delacour (1956:II) stated that plumage characteristics of the throat and foreneck of *A. p. fulvigula* were variable, and it was not possible to recognize the western subspecies *A. p. maculosa* by the latter's supposedly heavier markings in these areas. Johnsgard (1961) took exception to this and described *A. p. maculosa* as a valid subspecies, basing his opinion on slight plumage diflerences, electrophoretic analysis of albumin protein, and the apparent gap between the two races. This "gap" is supposed to be from Cedar Key, Florida to the coastal boundary between Louisiana and Mississippi.

Investigators describing avian distribution in this area have made numerous sightings and collected specimens of these non-dichromatic mallards. Williams (1960) took a specimen from a group of 23 near Claiborne, Hancock County, Mississippi on 9 September 1960. He observed that the fresh and brackish marshes of western Hancock County held a "sizable population of these ducks during the summer of 1960." A clutch of seven eggs was found in this vicinity by Lovett E. Williams, Jr. on 1 July 1962 (Gandy and Turcotte 1970). Imhof (1958) collected a specimen in Alabama near the western end of Dauphin Island on 23 September 1955. Six sight records were also given by Imhof (1958). Additional probable sight records (Howell 1928) of young birds on the outer islands and peninsulas of Alabama led Imhof (1958) to state that the species "probably breeds along the coast in small numbers." A nest was later found in Alabama along with another observation of downy young. Imhof (1962) noted these records, numerous sightings, and two specimens collected in Alabama.

Neither the Mississippi specimen taken by Williams nor the Alabama specimen taken by Imhof were identified as either *A. p. fulvigula* or *A. p. maculosa* according to the plumage differences described by Johnsgard (1961). They were assumed to be individuals of the subspecies *A. p. maculosa.* However, the second Alabama specimen taken by Williams (Imhof 1962) was identified as the Florida race at the U. S. National Museum (Williams, pers. com.).

Williams (1919) noted that a few pair of Florida Ducks nested yearly on the "brood marshes bordering our rivers and back from the Bay." He was referring to the estuary of St. Marks Bay, Wakulla County, Florida. In July 1971, three Florida Ducks were seen on St. George Island (Fig. 6) by Jimmmie McDaniel (pers. comm.), Game Biologist, Florida Game and Fresh Water Fish Commission. A flock of 15 was seen in the coastal marshes of western Taylor County, Florida during the summer of 1971 by Henry M. Stevenson (pers. comm.). A male Florida Duck banded at Merritt Island on 14 July 1969 as a duckling was recovered on 28 November 1970 at Lake Talquin, 20 miles west of Tallahassee (Fig. 6). We interviewed the hunter who reported the duck was with two other individuals of the same species. The three birds were with a flock of pintail (*Anas acuta*). The hunter remarked that he had seen Florida Ducks regularly on Lake Talquin during the winter of 1970-1971.

Considering these westward sightings and the recovery on Lake Talquin of *A. p. fulvigula,* the possibility now exists that the records in Mississippi and Alabama could have been representatives of either subspecies. In any event, the geographical gap which Johnsgard (1961) used to help support his belief that *A. p. maculosa* and *A. p. fulvigula* were valid allopatric races is gradually being filled.

More banding of the species will help answer these questions.

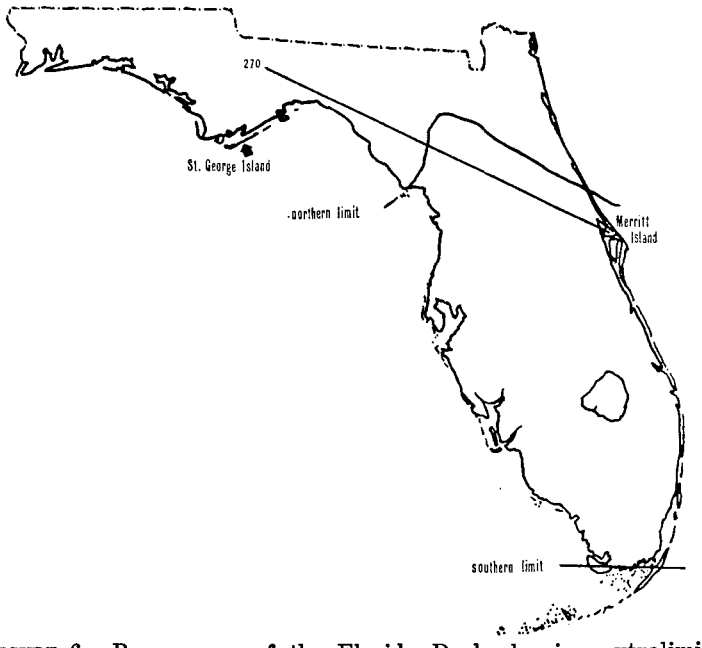

FIGURE 6. Range map of the Florida Duck showing extralimital recovery.

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INCREASING A WOOD DUCK NESTING POPULATION BY RELEASES OF PEN-REARED BIRDS

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ABSTRACT

There is a growing interest in the use of pen-reared wood ducks *(Aix sponsa)* for establishing or increasing box-nesting populations in local areas. During a 3-year period (1967-1969), 67 pen-reared hens were released on the Patuxent Wildlife Research Center, Laurel, Maryland. These releases substantially increased the nesting population. Total population averaged less than 30 hens annually with a recruitment rate averaging less than seven between 1963 and 1967. Between 1968 and 1971, the nesting population averaged about 80 hens. Annual recruitment averaged 29 between 1969 and 1971. Pen-reared hens were as successful as wild hens in hatching and rearing young. Mortality was lower among pen-reared hens than wild hens, due largely to the sedentary behavior of the pen-reared hens. Production of young to flight stage increased from an average of about 100 per year prior to the releases of pen-reared hens to about 430 annually after the last release in 1969.

Pen-reared wood ducks (*Aix sponsa*) have been released in a number of areas in the past 25 years in attempts to establish populations where the birds were absent, or to augment populations below the carrying capacity of the habitat (McCabe, 1947; Hanson, 1951; Grayson and Grayson, and 1959; Hunt and Smith, 1966). In a comprehensive review of these experiments, Lee and Nelson (1966) concluded that the data, though inadequate from these many small-scale releases, were encouraging enough to suggest the desirability of more in-depth studies. Recent interest in this technique has been particularly evident in the Southeast where the Division of Refuges, Bureau of Sport Fisheries and Wildlife,