

# Dispersal of Brown Pelicans from a Natal Site in Bay County, Florida, with an Update on Brown Pelican Status in Florida

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*Abstract:* From 1982 through 1994, 1,086 brown pelican (*Pelecanus occidentalis*) pre-fledglings were banded with U.S. Fish and Wildlife Service aluminum bands in a spoil island nesting colony in St. Andrews Bay, Bay County, Florida. The colony was newly established the year banding was initiated and at the time constituted the only nesting colony on the Florida panhandle Gulf coast, with the nearest colonies being 250 km to the west in Louisiana and 165 km to the east near Cedar Key, Levy County, Florida. Excluding band recoveries from birds <1 year old ( $N = 24$ ) from the immediate vicinity of the colony, 49 bands were recovered. Banded birds had dispersed both westerly/southwesterly ( $N = 20$ , longest distance: the Republic of Panama) and easterly/southeasterly ( $N = 27$ , longest distance: Cuba), with no apparent preferential pattern either way. Two of the returns were from >1-year-old birds from the vicinity of the colony, perhaps indicating some degree of site fidelity. Some band returns indicated fledglings from the Bay County colony contributed to at least 3 new nesting colonies being established on the Gulf Coast, 1 on Gaillard Island in Mobile Bay, Alabama, in 1983 ( $\approx 210$  km to the west); 1 on Lanark Island, Franklin County, Florida, in 1994 (110 km to the east); and 1 on Palmetto Island in Oyster Bay, Wakulla County, Florida, in 1995 (129 km to the east). Bay County birds may have been primarily, if not altogether, responsible for the establishment of the latter 2 colonies. The statewide Florida brown pelican population remains relatively stable following a peak in the late 1980s, with an annual average of 9,834 nests distributed among 40 colonies from 1992 through 1995, comparable to numbers documented in 1991 (10,208 nests, 37 colonies).

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Knowledge of post-fledging brown pelican dispersal from natal sites is limited. Based on sighting reports of color-marked fledglings, Schreiber (1976) documented a generally southern dispersal from natal sites in South Carolina (to as far as the Florida Keys), and likewise natal sites in Pinellas and Brevard counties, Florida (on the Gulf and Atlantic coasts, respectively). Schreiber and Mock (1988) analyzed 3,106 band recoveries from birds banded in North Carolina, South Carolina, and Florida from 1925 to 1983, and confirmed a southern dispersal of Carolina pelicans, but found much less distinct movement patterns of Florida birds.

Those previous results, however, were obtained from pelicans banded at colony sites on north/south oriented coastlines. This paper reports results of band recoveries from birds banded at a natal site in Bay County in Florida's panhandle, whose coastline is east/west oriented. The colony was established in 1982 and pre-fledglings there have been banded each year of its existence. That initial year of banding was the first record of brown pelicans nesting in Bay County, and the colony at the time was only the third on record for the entire Florida panhandle. The others were on St. George Island in Franklin County and near Port St. Joe in Gulf County, 100 km and 55 km east of the new site, respectively. The St. George Island colony apparently disappeared early in this century and the Port St. Joe colony was effectively abandoned subsequent to 1971 when 13 nests were recorded (nesting was initiated again there in 1976 but failed) (Nesbitt et al. 1977). The Port St. Joe site has since washed away. Otherwise, the nearest active colonies to the west and east at that time were 250 km in Louisiana and 165 km near Cedar Key, Levy County, Florida, respectively.

Florida Game and Fresh Water Fish Commission personnel have been monitoring Florida's brown pelican population since 1968. At various times since then, 58 individual sites, distributed among 17 counties, have been monitored. Total population numbers remained relatively stable until the mid-1980s, then increased for several years. Williams and Martin (1969) counted 6,705 nests (24 colonies) in the initial year, and Nesbitt et al. (1977) counted 5,491 nests (25 colonies) in 1976 and documented a 1971–1976 average of 6,339 nests per year. Wilkinson et al. (1994) reported 6,373 nests (34 colonies) in 1983, a peak of 12,312 (34 colonies) in 1989, and 10,208 (37 colonies) in 1991, the final year of data collection in that study. Data collection has continued since the 1991 total was reported, and a secondary focus of this paper is to report those 1992–1995 data.

A number of individuals contributed to or otherwise provided significant input in this project. Assisting with banding were Wilson Baker, Bill Bartush, Dana Bryan, Erik Egensteiner, Tom Francis, Derek Fussell, Louis Jeter, Arlo Kane, Tom Logan, Paul Schulz, Steve Schweikert, Billy Sermons, Boyd Weaver, and Eddie White. Steve Schweikert served as pilot for the nesting surveys. David Cook reviewed and critiqued a preliminary draft of the manuscript. Donna White labored through the initial and several subsequent drafts.

## Methods

From 1982 through 1994, 1,086 pre-fledgling brown pelicans were banded with U.S. Fish and Wildlife Service aluminum bands on a 0.3-ha spoil island colony in St. Andrews Bay within the city limits of Panama City, Bay County, Florida. The island was created by the Panama City Port Authority in 1969 and dredge spoil has been added several times since then. It was sparsely vegetated in the early 1980s, but that vegetation had disappeared by the late 1980s. Pelicans nest on the ground there and on low (1–2 m) wooden platforms constructed by volunteer groups. Locally, the island is variously called “Bird Island,” “Audubon Island,” and “Pelican Island,” and typically 125–175 fledglings are produced there each year.

Banding occurred each year on a selected date sometime between the last week of June and the second week of July. The banding date selected during that time frame in a given year was predicated on the maximum availability of young of an appropriate age for banding. The island was accessed by boat 30 minutes prior to sunup, with banding episodes lasting 1.5–2.0 hours. From 75 to 175 pre-fledglings were banded each year, representing approximately one-half the total production in the colony in a given year. Banding crews consisted of 2 banders and 3–5 capture personnel.

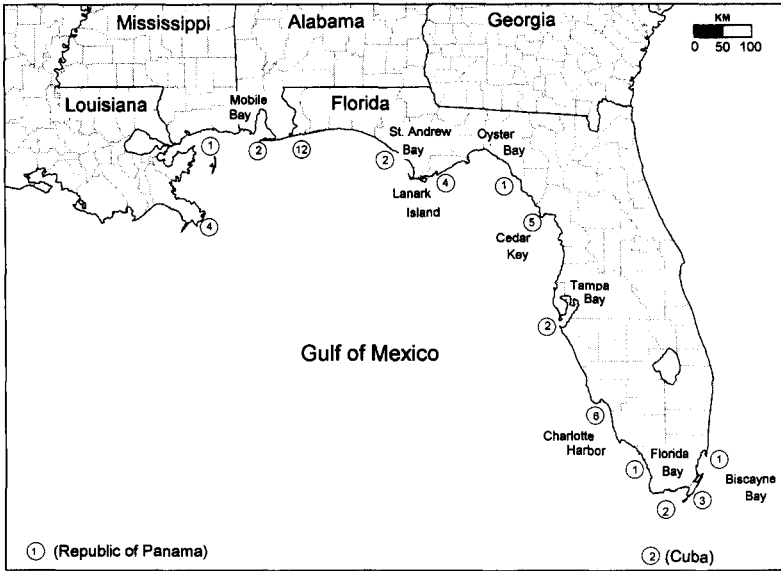
Aerial inventories of brown pelican nesting colonies were made from a single-engine airplane. Colonies were circled at a speed of 120 km/hour and altitude of  $\approx 45$  m to make counts. Onsite reproductive success data (young/nest) were collected by physically entering selected colonies. U.S. Department of Commerce National Oceanic and Atmospheric Agency (NOAA) nautical charts were used to maintain orientation and plot new colony locations. These surveys were initiated in 1968 and previous status reports were provided by Williams and Martin (1969, 1970), Nesbitt et al. (1977), and Wilkinson et al. (1994). The latter report encompassed data through 1991, and this current report supplements that database with the survey results from 1992, 1993, 1994 and 1995.

## Results and Discussion

### Dispersal

As of 10 August 1995, 72 bands had been returned from the total 1,086 pelicans banded (0.07%). Schreiber and Mock (1988) reported a much higher band recovery rate (8.8%), but those recoveries occurred over a span of nearly 60 years. Recoveries associated with this study should continue to increase in number for a considerable number of years.

Recoveries of bands from recent fledglings in the immediate vicinity of the colony, i.e., Bay County ( $N = 24$ ), were not included for post-fledging dispersal analysis purposes. Of the 49 which were included, 27 recoveries were from areas easterly/southeasterly of Bay County (long distance recovery: Cuba), 20 were from areas westerly/southwesterly (long distance recovery: the Republic of Pan-



**Figure 1.** Post-fledging dispersal of brown pelicans from a colony in St. Andrews Bay, Bay County, Florida, 1982–1995.

ama), and 2 were from  $\geq 1$ -year-old birds in the vicinity of the colony (Fig. 1). The band recovery data thus far do not reveal any discernable post-fledging dispersal patterns. The 2 Bay County recoveries from  $\geq 1$ -year-old birds perhaps indicates some degree of site fidelity, but it is unknown whether those birds had returned after initial dispersal or remained in the area since hatching.

Dispersal was analyzed as a function of age using a contingency table and chi-square distribution. When age ( $\leq 1$  year old, 1–3 years old,  $> 3$  years old) and dispersal distance ( $\leq 50$  km, 50–100 km,  $> 100$  km) were compared, no significant differences were found between dispersal distance and age ( $P \geq 0.05$ ). Schreiber and Mock (1988) found significant differences in movements from banding to recovery locations between certain age classes, but those results encompassed recoveries from several banding locations on both the Atlantic and Gulf coasts, and different age break downs were used (2- to 3-year-olds were a lumped group, and  $> 3$ -year-old birds were lumped with adults). Those variables could account for the apparent inconsistency in the respective results.

Of particular note are the 14 returns from and in the general vicinity of a colony on Gaillard Island in Mobile Bay, Alabama, 210 km westerly of the banding site, and the 4 returns from a colony on Lanark Island in Franklin County, Florida, 110 km easterly of the site (Fig. 1). Neither of those colonies existed when the Bay County colony was established in 1982; the Mobile Bay colony was established in 1983 and the Lanark Island colony in 1994. Pelicans from the Bay County colony could have augmented, if they were not instrumen-

**Table 1.** Results of brown pelican nesting surveys in Florida, 1992–1995.

Year	Active colonies	Nests estimated	Young/nest	Total young produced
1992	37	9,335	1.28 ( $N = 418$ )	11,949
1993	39	8,866	1.38 ( $N = 1,189$ )	12,236
1994	35	10,858	1.31 ( $N = 1,144$ )	14,234
1995	40	10,277	1.54 ( $N = 286$ )	15,827
<i>Average</i>	38	9,834	1.38 ( $N = 759$ )	13,561

tal in, establishing the Mobile Bay colony, and they may have been altogether responsible for the Lanark Island colony being established. In 1995, the Mobile Bay colony consisted of  $\approx 2,500$  nests (Roger Clay, pers. commun.). The Lanark Island colony consisted of  $\approx 50$  nests in late May 1995, but Hurricane Allison on 5 June reduced it to 26 active nests. An additional new colony appeared on Palmetto Island in Oyster Bay in late June of 1995, consisting of  $\approx 50$  nests. That colony is 19 km easterly of Lanark Island and was in a relatively early stage of nesting at that time, and in consideration of those factors may well have been established by Lanark Island birds displaced by Hurricane Allison.

#### Status

Table 1 provides the results of the annual monitoring surveys from 1992 through 1995. The 35–40 annual range of active colonies recorded, the average 9,834 nests counted annually over the 4 years, and the relative stability of the data year to year indicates a relatively stable statewide population following the population peak in the mid- to late-1980s (1989 peak: 34 active sites, 12,312 nests; 1991 levels: 37 active sites, 10,208 nests) (Wilkinson et al. 1994).

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