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INLAND NESTING OF THE BROWN PELICAN

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The Brown Pelican, *Pelecanus occidentalis*, is found mostly in coastal areas from the northern United States to the tip of South America (Palmer 1962). The species nests in colonies usually located on small to moderate size islands, with nests built on the ground or in small trees and shrubs (Palmer 1962, Nesbitt et al. 1977, Schreiber and Schreiber 1982). Spoil islands and sand bars largely free from human disturbance provide essential habitat for roosting and loafing birds (Schreiber and Schreiber 1982). In Florida, Brown Pelicans are common along both coasts and nest primarily on mangrove islands (*Avicennia germinans* and *Rhizophora mangle*) from November through July, with most egg clutches laid between February and May (Nesbitt et al. 1977, Schreiber 1980).

From 1977 through 1989, the Florida nesting population of Brown Pelicans increased by 89%, primarily in northern coastal areas (Nesbitt, in press). Prior to the 1980s the species was considered rare inland in Florida, but inland sightings increased as the population expanded, and recently Langridge (1991) stated that "this species is now seen more regularly inland."

From August 1988 through August 1992, JPS conducted an extensive ecological study of wading birds (Ciconiiformes) at Lake Okeechobee, Florida. Non-nesting Brown Pelicans, primarily sub-adult birds, were often observed around the lake from late-winter into summer each year. Numbers varied from a few to 60-70 at a time, with White Pelicans (*Pelecanus erythrorhynchos*) generally more common. From 1989 through early 1991, one wading bird nesting site, Clewiston Spit West (CSW), frequently attracted roosting Brown Pelicans. Then on 8 March 1991, we observed an adult carrying nesting material at CSW and subsequently three pairs of pelicans built nests on the island. All appeared to be incubating eggs by 18 March. According to published literature, this constitutes the first known island nesting record for Florida (Bent 1922, Palmer 1962, Nesbitt et al. 1977, Schreiber 1980) and a rare if not unprecedented event for the species.

The CSW island is the first and largest in a chain of small spoil islands that extends eastward into Lake Okeechobee near Clewiston, Florida (Fig. 1). The spoil piles resulted from dredging of the Okeechobee Waterway. CSW is located at Lat. 26°46'32"N, Long. 80°54'35"W and consists of two coarse shell-sand spoil piles connected by a narrower, often submersed (at lake levels above about 4.6 m msl) sand bar. The larger spoil pile to the west is vegetated by several *Casuarina equisetifolia* ranging in height from about 5-10m, dense stands of Brazilian pepper (*Schinus terebinthifolius*), several papaya (*Carica papaya*) in a

central open area, and scattered clumps of giant reed (*Phragmites australis*). The smaller spoil pile to the east features a ring of Brazilian pepper. A few willows (*Salix caroliniana*) and a *Casuarina* grow on the intervening sand bar and, when the bar is emerged as in 1990 and 1991, dense stands of giant reed grow with dogfennel (*Eupatorium* sp.) and other annuals. CSW is bordered by cattail (*Typha* sp.) and submergent aquatics, primarily Illinois pondweed (*Potamogeton illinoensis*).

The three pelican nests were built on the uppermost branches of a 5-6 m *Casuarina* surrounded by Brazilian pepper, with Great Egret nests scattered below. The nests were constructed of moderate sized dead twigs and branches of *Casuarina* and Brazilian pepper. Approximately 375 pairs of 5 species of wading birds nested in 1991 at the site with the pelicans, in an area of only about 600-700 m².

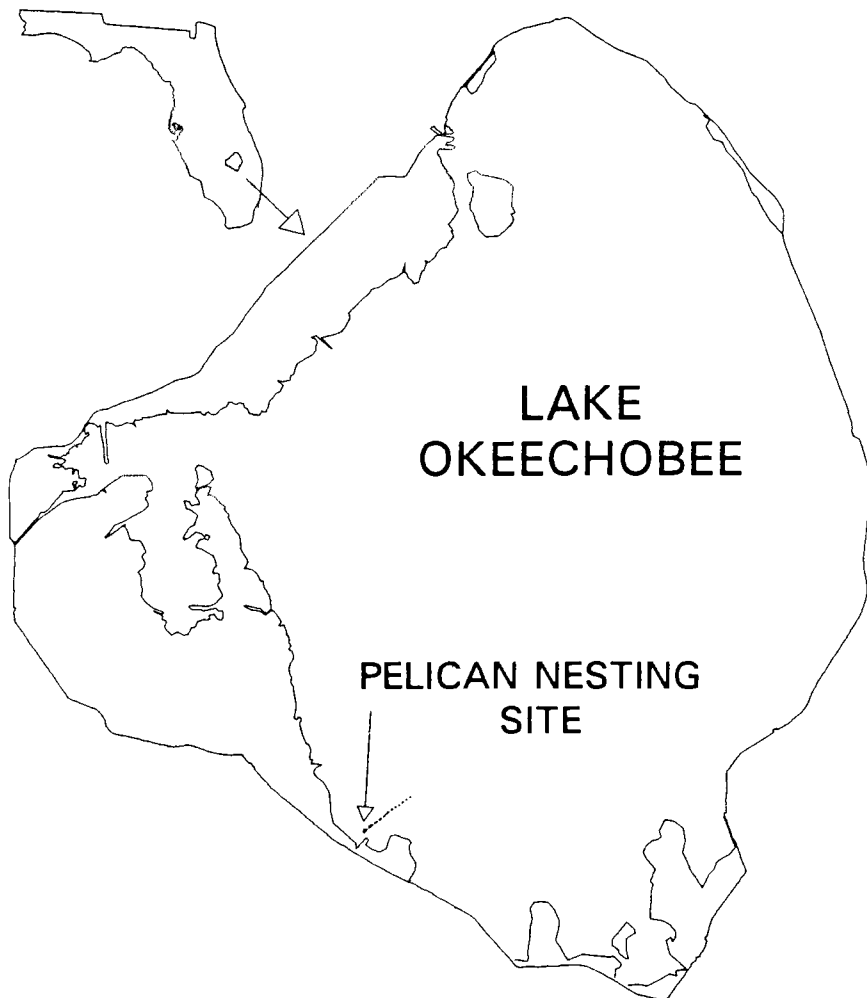


Figure 1. Location of inland Florida nesting by the Brown Pelican in 1991 - 1992.

In late March, several storms with moderate to high winds impacted the area and dropped over 13 cm of rain. By 6 April, one pelican nest and about 15% of the Great Egret nests were abandoned. We discovered the shell of a single, hatched pelican egg under the nests on 15 April. By 24 April only one nest remained active (Fig. 2). The mean clutch size of 328 Florida Brown Pelican nests was 2.62 (Schreiber 1979); we were unable to determine if more than one egg was laid or if additional young hatched, but on 8 May only one nestling was present.

We last visited CSW in 1991 on 16 July at which time the young pelican was nearly full grown and appeared healthy, but at 91 days of age it did not fly off when we approached. Schreiber (1976) identified 76 days as the age of first fledging and gave 3 months as the average duration of the nestling stage (Schreiber 1980). We believe the young pelican did eventually fledge.

Some evidence of the chick's diet was obtained. Once the attendant adult regurgitated a large mullet (*Mugil cephalus*) and on another occasion the nestling regurgitated several 5-10 cm sunfishes (*Lepomis* sp.).

On 17 February 1992, JPS returned to the Clewiston site. The lake level had risen to near 4.6 m msl and the island was largely flooded. Along with about 20 pairs of Great Egrets, at least four pairs of Brown Pelicans were incubating nests at the same location as in 1991. By 13 March, several more pelicans had built nests in both *Casuarina* and Brazilian pepper on both sections of CSW, and the number of Great Egret nests had also increased to over one hundred. Ultimately, at least 14 pelican nests were built in 1992 and at least 7-8 fledged young, in several cases probably two young each.

During the 1991 nesting season, we discovered six dead immature Brown Pelicans on CSW. One had been banded as a nestling on 2 August 1990 at a site on the Outer Banks



Figure 2. Brown Pelican parent in attendance at the first documented inland Florida nest at Clewiston Spit, Lake Okeechobee in 1991.

of North Carolina. This is generally consistent with patterns of movement documented in Schreiber and Mock (1988)—nearly 65% of all recoveries of birds banded in the Carolinas occurred in Florida; however, no inland band recoveries were reported. On 17 February 1992, JPS observed an additional 5 banded pelicans (1 adult, 4 immature) among at least 30 adult and 40-50 immature birds roosting or nesting around CSW. Sykes and Langridge (1991) documented the west-to-east coast movement of one captive-born Brown Pelican; however, the majority of band-return evidence (Schreiber and Mock 1988) suggests that this new nesting site at Clewiston was probably initiated by birds born on the Atlantic coast, most likely in Florida.

Both winter and summer populations of Brown Pelicans have generally increased in Florida over the past decade (Sykes 1988; Paul 1989; Nesbitt, in press), although Paul (1988, 1990, pers. comm.) and Kushlan and Frohring (1985) documented localized exceptions in Tampa Bay and southern Florida, respectively. Fluctuating food resources and predation have both been suggested as causes of the low nesting effort and success in the latter areas. This notwithstanding, the pelican population in Florida has increased greatly in the past decade and is undergoing a wide northward range expansion (Nesbitt, in press). The expanding population and localized food shortages may have initiated greater dispersal, and abundant food resources may be drawing pelicans to Lake Okeechobee. The availability of large numbers of mullet might have precipitated the pioneering nesting attempt. Mullet, though normally salt water fishes, do wander into freshwater at times (Robbins and Ray 1986), and JPS occasionally observed enormous schools (500-1000+) on the lake. Abundant sunfishes and shad (*Dorosoma* sp.) might also have helped to attract the pelicans.

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NEST USURPATION OF A STARLING NEST BY A PAIR OF RED-BELLIED WOODPECKERS

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Competition for nest cavities between Red-bellied Woodpeckers (*Melanerpes carolinus*) and European Starlings (*Sturnus vulgaris*) has been well documented. After conducting studies from 1984 until 1987 Ingold (1990) concluded that "starlings are intense competitors with Red-bellied Woodpeckers for freshly excavated cavities, partly because their nesting phenologies overlap considerably." After thirty years of observations, Sutton (1984) stated that the Red-bellied Woodpeckers may be in danger of local extirpation in Oklahoma "as a direct result of the Starlings (sic) unremitting piracy." Additionally, Ingold (1989) found that "52% of red-bellied nest cavities were usurped by starlings and that those pairs unable to avoid starling competition suffered apparent reductions in fecundity."

Here we report an observation of interspecific nest usurpation by a pair of Red-bellied Woodpeckers on 29 April 1990 near the eastern shore of Lake Harney in Volusia County, Florida. A male, followed by a female, Red-bellied Woodpecker was observed entering a cavity in a cabbage palm (*Sabal palmetto*) tree. Five minutes earlier a pair of starlings had entered and subsequently left the same cavity. The female red-bellied left the cavity but remained perched on the tree. The male emerged from the cavity with a naked starling nestling in its beak. It struck the nestling's skull against the tree trunk and then dropped it to the ground. It immediately reentered the cavity and flew out with another nestling to a nearby taller cabbage palm. As before, it struck the nestling's head against the tree trunk and dropped it to the ground. The male then entered the cavity a third time and repeated the same procedure. The entire incident took less than five minutes, after which both woodpeckers reentered the nest hole. After a few minutes the female exited the cavity while the male remained inside and began excavating. The adult starlings were not seen during the episode. We looked under the tree and found the starling nestlings, two dead and one barely alive.

It is likely that the nest cavity in question was originally excavated by the red-bellied pair. The starlings had probably occupied the cavity for at least a few weeks (i.e., nestlings present) prior to the nest usurpation by the woodpeckers. We are unable to ascertain if the usurped cavity was originally occupied by the red-bellieds, or, whether this particular red-bellied pair simply decided to usurp the cavity from the starlings.

We could not find any published reports of nest usurpations by Red-bellied Woodpeckers. Ingold (1989, 1990) found no evidence that Red-bellied Woodpeckers actively usurp