

**Queen Bess Island State Restoration (BA-05b) and
Barataria Bay Waterway Wetland Restoration (BA-19)**



Brown Pelicans on Queen Bess Island

**Department of Natural Resources
Coastal Restoration Division**



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INTRODUCTION

Louisiana experiences 80% of the nation's coastal wetland loss. This loss is represented by several different wetland types, including those found on barrier and coastal islands. These islands are the first lines of defense protecting coastal communities from tropical storms and hurricanes. They also offer breeding habitat to many coastal bird species. Since the 1890's, more than 40% of Louisiana's barrier islands have been lost (Suter et al. 1989) and some remaining islands have lost as much as 75% of their area (Penland and Boyd 1981).

Queen Bess Island is located in Barataria Bay, east of Mendicant Island and north of Grand Isle and Grand Terre Islands (Figure 1). Like many areas of Louisiana's coast, Queen Bess Island has experienced significant erosion over the last 100 years. In 1989, the island was reduced in size from 45 acres (1956) to 17 acres and decreased in elevation to the point that the island was frequently over-washed by small storms (Raynie and Sutton, 1992).

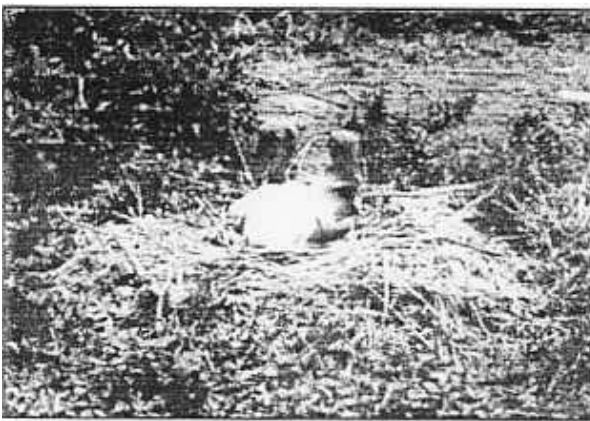


Figure 2. Brown Pelican chicks on Queen Bess Island.

Queen Bess Island, as well as the loss of black mangrove (*Avicennia germanis*) and other important vegetation, severely limited nesting habitat for the endangered brown pelican. To try and rectify this erosion and loss of pelican habitat the state of Louisiana implemented the Queen Bess Island Restoration Project (BA-05b) in the fall of 1990.

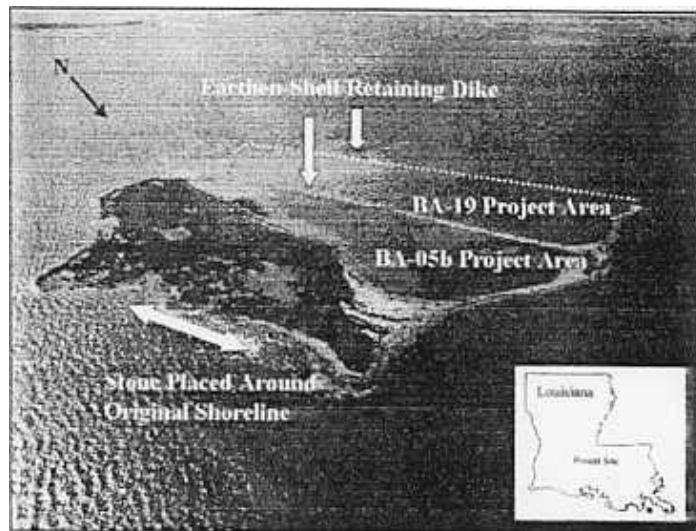


Figure 1. BA-05b and BA-19 project features.

In 1989, Queen Bess Island was also one of only three nesting sites for Louisiana's state bird, the brown pelican (*Pelicanus occidentalis*) (Figure 2). Historically, the brown pelican occurred throughout coastal Louisiana and estimates of the original pelican population were between 75,000 and 85,000. Although thousands of brown pelicans were reported in 1958, the brown pelican was virtually extinct in Louisiana by 1962. Juvenile brown pelicans were reintroduced to Louisiana from Florida in the late 1960's and early 1970's. Due to Louisiana's high rates of subsidence and land loss, however, nesting sites were becoming virtually nonexistent. Reduction in the size of

QUEEN BESS ISLAND STATE RESTORATION PROJECT (BA-05b):

The objectives of the Queen Bess Island State Restoration Project (BA-05b) were to enhance and create wildlife habitat for the brown pelican and a variety of other colonial nesting water birds; protect the island from shoreline erosion due to boat traffic, wave action, and tidal scour; and limit erosion caused by storm events. The project was implemented in 2 phases.

Phase 1

In October 1990, an 1,800 ft (0.5 km) retainment dike was constructed on the western side of Queen Bess Island (Figure 1). This dike linked the northern and southern tips of the island, creating an 8 ac (3.2 ha) dredged material containment site. Approximately 75,000 yd³ (62,710 m³) of material was removed from a 2 mi (3.2 km) segment of the Barataria Bay Waterway (BBW) and placed in the shallow-water containment area at the western edge of the island. This area was filled with dredged material to an elevation conducive to marsh vegetation. To increase the elevation of the original island, a breach was made in the shore dike through which effluent from the 8 ac (3.2 ha) containment site was routed to the existing interior marsh.

In June 1991, wax myrtle (*Myrica cerifera*), black mangrove (*A. germinans*), baccharis (*Baccharis halimifolia*), matrimony vine (*Lycium carolinianum*), and marsh elder (*Iva frutescens*) were planted on the island and in the containment area (for planting scheme and vegetation monitoring results, see Raynie and Sutton 1992) to create vegetated habitat for brown pelican nesting and aid in stabilization of sediments (Figure 3).



Figure 3. Queen Bess vegetation plantings

Phase 2



Figure 4. Brown pelican nesting habitat on Queen Bess Island.

In October 1992, Phase 2 was completed. The design of this phase of BA-05b called for the placement of riprap and crushed limestone completely around the island along the existing natural shore rim. The dike was built to an elevation of approximately 3 ft (0.9 m) above the marsh level using roughly 3 yd³ of stone per linear foot. This dike served to armor the island and provide a raised nesting area for brown pelicans.

In May 1993, black mangrove seedlings were again planted by Natural Resources Conservation Service (NRCS) and LDNR/CRD personnel to further increase suitable brown pelican nesting habitat (Figure 4). The vegetation was planted along the western side of the island on the inside of the rocks. This completed the construction phases of the Queen Bess Island State Restoration Project (BA-05b) and laid the groundwork for future restoration under the Barataria Bay Waterway Wetland Restoration (BA-19) project (CWPPRA Priority List 1).

BARATARIA BAY WATERWAY WETLAND RESTORATION PROJECT (BA-19):

Although Queen Bess Island was a complete success and met project objectives, the State decided to further restore the Island's wetlands by implementing CWPPRA project BA-19. The BA-19 project involves the beneficial use of dredged material for the creation of an additional 9 ac (3.6 ha) of wetland habitat on Queen Bess Island. This project is similar to BA-05b in that it utilizes dredged material removed during routine maintenance of the BBW. In August 1996, construction began on a shell dike that was constructed to create an additional 9 ac (3.6 ha) containment area along the southwest side of Queen Bess Island (Figure 1). Dredged material was pumped into the containment area, with the effluent routed through the 8 ac (3.2 ha) wetland created in Phase 1 during 1990, as well as the natural wetland on the original Queen Bess Island. Project construction was completed in November 1996.

SUMMARY

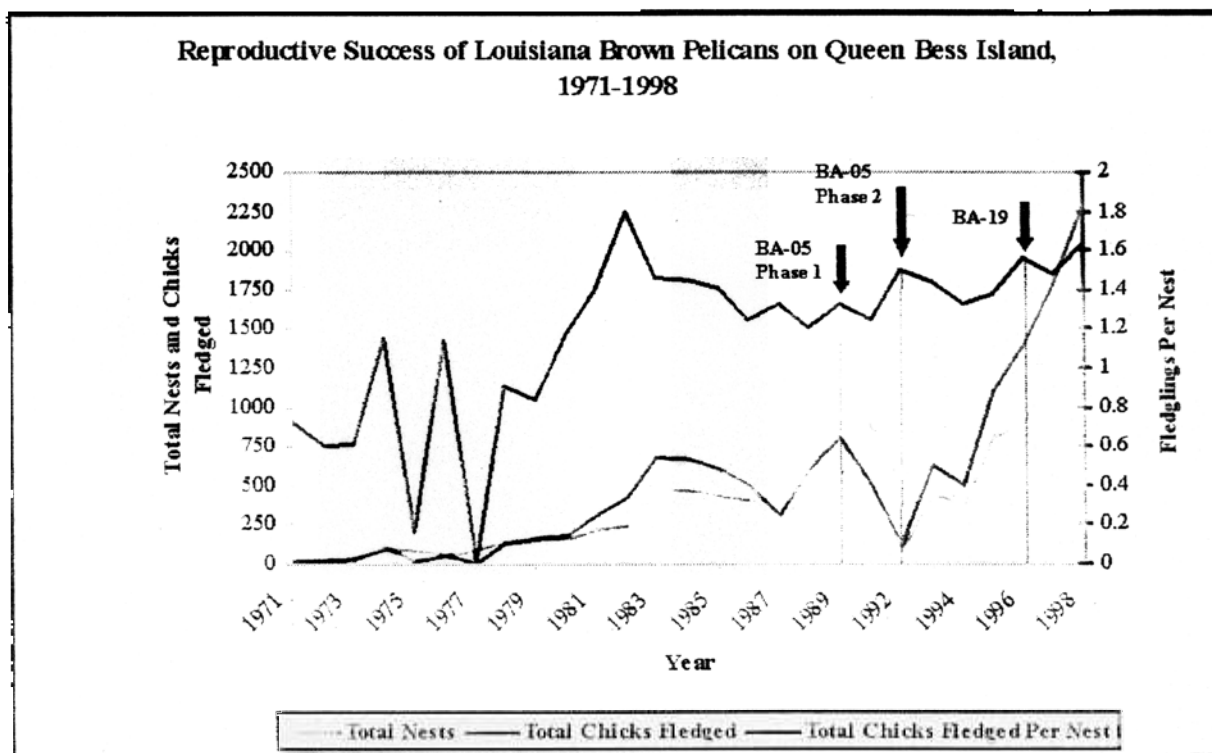
Two restoration projects, one state and one CWPPRA project, have been implemented on Queen Bess Island with goals of enhancing wildlife habitat and protecting the island from erosion. So far, restoration efforts have been very successful. In less than 10 years, many of the losses experienced in the previous 30 years have been reversed. By constructing dikes on and around the island, planting vegetation, and utilizing dredged material from nearby canals, the size of Queen Bess Island has nearly doubled since 1989. Engineering estimates showed that the island's total area had increased from 17 acres (1989) to 32.3 acres (1996) (Figure 5). Elevation of the island has also increased as to prevent overwashing from small storms and the crushed limestone placed around the entire island should help maintain shoreline stability. Though still fragile, the use of beneficial dredged material and vegetative plantings has helped to stabilize Queen Bess Island. Growth of smooth cordgrass (*Spartina alterniflora*) from the island's natural seed bed has helped to stabilize and consolidate sediment while providing wetland habitat for waterfowl and colonial shorebirds.



Figure 5. Queen Bess Island showing increase in overall acreage.

Vegetation plantings for pelican nesting habitat were also successful with most plant species having high survival rates and vigorous growth. Queen Bess Island will continue to be monitored to evaluate overall success of the wetland restoration project and determine if overall objectives have been accomplished.

Increases in vegetation and island size have created quality habitat for the endangered brown pelicans. The brown pelican population was heavily impacted in 1990 due to harsh environmental conditions, but numbers of breeding pairs on the island have greatly increased recently. The number of successful nests and chicks fledged were the highest ever recorded for the island, while fledglings per nest ranked the second highest ever on record (Figure 6; Larry McNease, Louisiana Dept. of Wildlife and Fisheries pers. comm.). Biological data suggest that the brown pelican is recovering coast wide in Louisiana, having established 10 known nesting sites (compared to 3 in 1989). Restoration efforts like those on Queen Bess Island have played a vital ecological role in providing nesting habitat for Louisiana's endangered state bird. As Queen Bess and other barrier islands continue to benefit from coastal restoration efforts, it is hopeful that the brown pelican population will respond with continued growth.



REFERENCES

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