CESAM-OP 29 July 1991

MEMORANDUM FOR DISTRICT COMMANDER

SUBJECT: Potential Opportunities for Beach Improvement on Dauphin Island

1. FOR DECISION

2. PURPOSE. To determine the appropriate course of action for the Corps regarding the erosion problems currently being experienced at Dauphin Island.

3. DISCUSSION.

a. Erosion problems on Dauphin Island have been the subject of recent newspaper articles and letters dating from 6 May 1991 from Mr. Michael Henderson, Executive Director of the Dauphin Island Park and Beach Board (DIPBB). The erosion problems at Dauphin Island are more complex than first impression indicates. There are three separate erosion sites along a 2.6 mile reach with, apparently, three separate causes (see attached map):

(1) At the southeast tip of the island, the sand around the riprap protecting Fort Gaines has disappeared. Also the Dauphin Island Sea Lab property and the USCG recreation area west of the fort are both eroding severely. (Erosion on the USCG property is a long-standing problem.) It appears that the problem here is caused by the island attempting to migrate westward, which it cannot do because of the protection at the fort. There are reports of minor failures (undermining) in the riprap structure. Dr. Douglas, at the University of South Alabama, has offered a structural solution that will alleviate two problems. He suggested that the southern most groins be removed and used as additional shoreline protection. It would reinforce the structure and move the scour currents further offshore. In light of recent drownings, we may not want to assume liability associated with this fix unless we can determine that increased safety would result.

(2) There is a chronic erosion problem at the Isle Dauphine Golf Course, opposite the eleventh and eighteenth holes. This is a short reach, on the order of 1000 feet. This also is a long-standing problem and one we have been aware of for at least 20 years. The actual cause of erosion here is unknown. A temporary fix would be a one time beach nourishment via a special congressional action. Renourishment events are an unknown issue.

(3) The erosion on the property administered by the Dauphin Island Park and Beach Board (DIPBB) is occurring on a reach about 2000 feet long with the worst erosion concentrated in the center half. This is the result of the

tip of the offshore island (debateable Sand or Pelican Island, but usually referred to as Sand Island) accreting northward, reducing the width of Pelican Pass. It appears that this is a natural process that occurs periodically. It usually terminates when Sand Island breaches, diverting the tidal flow through the breach and away from the shore. Typically, the end of the island migrates slowly onshore and repairs the previously eroded reach. A suggested fix would be to accelerate the natural process by dredging the breach in Sand Island and placing the material on the critical area, then await the completion of the natural process for additional nourishment.

b. Maintenance dredging in Mobile Bar Channel usually extends 4 to 5 miles out in the gulf since sand moving in the system is deposited out near the end of the ebb tidal shoal area. Undoubtedly, our practice of dredging this area and placing the material in the designated gulf disposal area removes sand from the littoral system. It appears, however, that our work has an insignificant, if any, adverse impact on the island.

c. Preliminary cost analysis of various scenarios for addressing the erosion problems were considered, including using the material from the dredging of Mobile Bar Channel to renourish the beach, creating a borrow area along the southwest side of Sand Island, and dredging at the tip of Sand Island in Pelican Pass to provide the needed material. The dredging at the Bar location is usually performed by a medium (3600cy) hopper dredge, although a small (1300cy) hopper dredge can and has performed the work. The amount of suitable material removed annually is approx. 250,000cy from this high energy area. The beach at Dauphin Island is approximately 4-5 miles from the dredging location at the Bar Channel, and the depths of water surrounding the Island are such that a hopper dredge could not approach closer than about 1/2 mile on the south side and about 1 mile on the north side. Dredging would have to include pumpout capability/station in the vicinity of the Island. This scenario is in sharp contrast to those other areas where beach nourishment is the usual disposal method, such as Perdido Pass or East Pass. Both of those projects are jettied projects, with the beach to be nourished within 1000 ft. of the dredging location. At Pensacola, a similar situation exists where the cheapest alternative is beach disposal along Perdido Key. The dredging options are as follows:

(1) Small Class, 1300 cubic yard hopper Dredge at Mobile Bar, pumpout facility on the north side of Dauphin Island, material pumped in the vicinity of Fort Gaines. Unit Cost = $5.59.

(2) Medium Class, 3600 cubic yard hopper Dredge at Mobile Bar, pumpout facility located approximately 5000 feet off the beach, material pumped near Fort Gaines. Unit Cost = $3.33.

(3) Use a 27 inch hydraulic cutter suction dredge to transport the material from the Sand Island area to the beach replenishment area on Site 3. Unit Cost = $2.73.

(4) Use a 27 inch hydraulic cutter suction dredge to transport the material from the Pelican Island area to the beach replenishment area on Site 3. Unit Cost = $2.60.

NOTE: The costs for items 1 thru 4 were derived on a dredging requirement of 250,000 cubic yards of suitable sand material.

(5) Use a 12 inch hydraulic cutter suction dredge to transport the material from the pending Section 107 Fort Gaines (Government Cut) deepening to nourish the south or north side of Fort Gaines for an incremental dredging cost increase of $24,600.

d. All existing Federal authorities have basically similar criteria for implementation. These include:

(1) The work must be economically justified, i.e., the annual benefits must exceed the annual cost.

(2) The benefits realized must accrue to the general public, not to a single user, owner or small private group.

(3) In general, the resulting project must have access for general public use provided.

(4) In general, there must be a non-Federal sponsor capable of a significant contribution to the cost of construction and of providing any required lands easements rights-of-way and disposal area dikes.

e. Section 107 - Small Navigation Projects - Federal limit $4,000,000 - see discussion in cost analysis above - subject to the same requirements as larger congressionally authorized projects. Beneficial use of dredged material must be cost shared, same as the base project. A construction contract for the Government cut deepening was advertised on 11 July. Eighteen thousand cubic yards are available for beach disposal provided a local sponsor is willing to cost share. The town of Dauphin Island and the sponsor for the navigation project ~~does not~~ Neither seem interested in funding beach nourishment.

f. Section 103 - Small Beach Erosion Control Projects - Federal limit $2,000,000 - subject to the same requirements as larger congressionally authorized projects. Requires feasibility study. Federal interest in participating in a beach nourishment project is unlikely due to private ownership of large proportions of shoreline.

g. Section 14 - Shoreline Protection for Public Facilities - Federal limit $500,000 - Intended to prevent erosion damage to highways, bridges, public works, churches, public and private hospitals, schools and other nonprofit public facilities. Profit making facilities are not eligible. Study routine accelerated. This authority would likely apply to only Fort Gaines and in the vicinity of DIPBB's fishing pier. Federal interest would be influenced by whether DIPBB is a public and non-profit entity, and budget priorities regarding recreational project outputs.

h. Section 111 - Mitigation of Shore Damage Due to Federal Navigation Projects - Federal limit $2,000,000 - Damage must be attributed to the Federal navigation project. Costs must be shared in the same proportion as the navigation project causing the damage. The Local Sponsor must assume O&M.

Applies to both public and private shores. Should mitigate only that degree of erosion attributed to the navigation project. Usual study routine required. HQUSACE utilizes this authority relatively infrequently. Only a small portion of DI's erosion is attributed to navigation projects.

i. Section 933 - Beneficial use of dredged material from inlet dredging of Fort Gaines Channel or Mobile Harbor would require 50/50 cost sharing of dredged sand placement. Must be requested by the state. Feasibility study required.

j. The following tabulation summarizes the advantages and disadvantages of the various authorities:

Authority	Advantages	Disadvantages
Section 107	Good Public Relations Good Will w/local community. Timely	Limited quantity of material does not meet all immediate needs.
Section 103	Better meets need (i.e.. one time fix)	No immediate relief. Federal interest questionable. Limited storm damage benefits.
Section 14	Quick implementation	Limited Public Fac. that are non-profit;funding limits are too low. Will not address all problem areas.
Section 111	Applies to both public and private shores	Locals must maintain (not capable); not timely; questionable impact by Fed. Navigation Project.
Section 933	Permanent Solution and source of material	Locals must pay 50% of an incremental dredging cost to get material. Study is cost shared. Not timely. Long if project is executed
Specific Cong Action	Quick "Win-Win" Fix	No provision for O&M.

NOTE: We have no authority under PL99-100.

4. CONCLUSION. There are both short run and long-run needs, but Corps involvement in a traditional beach nourishment project is unlikely due to lack of structural damages resulting from the erosion. Accordingly, Section 103 project is not likely to be implementable. Section 14 would seem to be appropriate to address the problems at Fort Gaines, but not at DIPBB's fishing pier. Disposing of material on the beach from dredging the Government cut would only be a partial solution.

5. RECOMMENDATION. Recommend Mobile District approach State of Alabama to determine their interest in a 933 study.

Encl

NORMAN L. CONNELL
Chief, Operations Division
690-2576

COORDINATION:

PD: Concur/Nonconcur _____ Date: _____

RE: Concur/Nonconcur _____ Date: _____

DX: Concur/Nonconcur _____ Date: _____

DD: Concur/Nonconcur _____ Date: _____

APPROVED _____ SEE ME _____ OTHER _____