

JULY 2000

FEASIBILITY STUDY FOR

**BISCAYNE BAY
DADE COUNTY, FLORIDA - 074359**

**INTERIM SECTION 905(b) (WRDA 86)
ANALYSIS
VIRGINIA KEY, FLORIDA**



**US Army Corps
of Engineers**

Jacksonville District
South Atlantic Division

Virginia Key, Biscayne Bay, Florida
Interim Section 905(B) (WRDA 86) Analysis

1 **STUDY AUTHORITY.** This preliminary assessment provides an interim report addressing pressing needs at Virginia Key, Biscayne Bay, Florida. US Senate and House Resolutions dated December 5, 1980 and September 23, 1982, respectively, provides the authorization for this study. The text of the study resolutions are enclosed (Attachment 1). The resolutions requested broad-scope investigations of existing Federal projects in the vicinity of Biscayne Bay, Florida to determine whether modifications are needed to improve water quality, biological productivity and related factors. A separate reconnaissance report for Biscayne Bay was completed in 1995. This study is now in the feasibility phase. The feasibility study consists of development of hydrodynamic, water quality and biological numerical models. The main purpose of the models' development is to address potential effects to Biscayne Bay associated with navigation (harbor and waterway) improvements and modifications to the Central and South Florida Flood Control Project for the purpose of improving water flows to the Everglades. Metropolitan Dade County, Department of Environmental Resources Management (DERM) is the study sponsor.

2. DERM requested that an interim report be prepared in partial response to the study resolutions due to the high degree of local and Congressional interest in environmental restoration and shoreline protection for Virginia Key, Florida. Approximately \$50,000 in Federal FY00 funds appropriated for the Biscayne Bay Feasibility Study was used to prepare the preliminary assessment report for Virginia Key. DERM concurs with this use of appropriated funds.

3. **STUDY PURPOSE.** The purpose of this interim analysis is to determine the need and Federal interest in ecosystem restoration and shoreline stabilization at Virginia Key, which is located south of the Federal navigation project at Miami Harbor, Florida. Federal water resources studies are generally conducted in two phases, a reconnaissance phase and a feasibility phase. The reconnaissance phase consists of the following three elements: preparation of a Section 905(b) Analysis (replaces the traditional reconnaissance report), development of a Project Management Plan (PMP) and negotiation of a Feasibility Cost Sharing Agreement (FCSA). The Section 905(B) Analysis determines the water resource problems and potential solutions, assesses the level of support for the potential non-Federal sponsor; and determines the Federal interest in proceeding into the feasibility phase.

4 **LOCATION OF PROJECT/CONGRESSIONAL DISTRICT.** Virginia Key is a barrier island located along Eastern Biscayne Bay on the Atlantic coast of Dade, County, Florida, south of Miami Beach and north of Key Biscayne (see Figure 1). Virginia Key is in Florida's 17th Congressional District.

5 **DISCUSSION OF PRIOR STUDIES, REPORTS AND EXISTING WATER PROJECTS.** Three Federal studies and six Federal projects exist in the vicinity of the study area, and are discussed in the following paragraphs.

STUDIES

6. **Coast of Florida Erosion and Storm Effects Study** The study was authorized by Section 104 of PL 98-360, and by resolution passed by the Committee on Public Works and Transportation, US House of Representatives dated 8 August 1984. The study includes the entire Florida coastline consisting of five major coastal regions. The feasibility study has two specific purposes: a review of existing Federal shore protection projects to determine if modifications were warranted; and development of a comprehensive body of knowledge, information and data on coastal area changes and processes in Florida. The feasibility study was undertaken as a series of five regional feasibility reports. A Chief of Engineers report summarizing the review of the authorized Federal shore protection projects in Dade, Broward and Palm Beach Counties (Region III) was completed 27 December 1996, and included the shoreline of Virginia Key. The Chief's report is included in House Document 105-163/105/1. Only one project modification was recommended, a new sand transfer plant at Lake Worth Inlet. The feasibility study for the remaining regions in Florida have not been funded for completion (Federal funds were last appropriated in Fiscal Year 1996).

7. **Watson Island Park, FL.** The Committee on Public Works, US House of Representatives on September 8, 1988 authorized a shore protection study of Watson Island. Watson Island is located at the western end of Miami Harbor, adjacent to the Intracoastal Waterway. The study has not been funded to date.

8. **Miami Harbor, FL.** The Committee on Transportation and Infrastructure of the US House of Representatives passed a resolution dated October 27, 1997 requesting a review of past reports to determine the feasibility of providing channel improvements in Miami Harbor and channels. This feasibility study has not been funded.

PROJECTS

9 **Miami Harbor, FL.** The current project was authorized by Section 101(a)(9) of the 1990 Water Resources Development Act (WRDA) and prior acts. The project is described in House Document 105-62/105/1. The project consists of 7.7 miles in the main ship channel. The authorized depths in the main ship channel are a depth of 44 feet and a width of 500 feet in the Bar channel and a depth of 42 feet and a width of 500 feet in Government Cut. The Miami River project segment consists of 5.8 miles in length to an authorized depth of 15 feet and widths varying from 90 to 150 feet. The project has 1.8 miles of connecting channels. The South Lummus Island Channel has an authorized depth of 42 feet

and a width of 400 feet. Stone jetties north and south of Government Cut protect the main ship channel. The project also has a turning basin 1,700 feet long by 1,650 feet wide adjacent to Biscayne Boulevard. The project improvements are approximately 65 percent complete. The Federal and non-Federal implementation costs through Fiscal Year 1998 are \$45.4 million and \$24.3 million, respectively. The Federal operation and maintenance costs through Fiscal Year 1998 are \$6.3 million. The 1997 traffic was 6.6 million tons.

10 Section 315 of WRDA 1999 authorized modifications to the Miami Harbor project. Section 315 provides authority to construct artificial reefs and related environmental mitigation required by Federal, state and local environmental permitting agencies for the project, if the Secretary (of the Army) determines that the project as modified is technically sound, environmentally acceptable, and economically justified.

11 **Intracoastal Waterway, Jacksonville to Miami.** The Intracoastal Waterway from Jacksonville to Miami, 349 miles in length, is a major segment of the Federal inland waterway system, which serves both commercial barges and recreational vessels. The Fort Pierce to Miami segment provides for a depth of 10 feet and a channel width of 125 feet. The US Army Corps of Engineers has maintenance responsibility of the waterway and side channels. The existing project was completed in 1965. Total project construction costs through Fiscal Year 1998 were \$19,251,600 Federal and \$61,000 non-Federal. Total Federal project operation and maintenance costs through Fiscal Year 1998 were \$51,858,100. The 1997 traffic was 424,000 tons.

12. **Dade County, FL.** The Federal hurricane and storm damage reduction project for Dade County, Florida was authorized by Section 501(a) of the 1986 Water Resources Development Act and prior acts. The project provides for restoration and periodic nourishment of 2.5 miles of shoreline at Sunny Isles and 1.2 miles of shoreline at Haulover Beach Park for storm damage reduction. The project provides for restoration and periodic nourishment of a hurricane and storm damage reduction project along 9.3 miles of shoreline from Bakers Haulover Inlet to Government Cut. The Sunny Isles, Haulover Beach Park and Bakers Haulover Inlet to Government Cut segments were initially restored in 1982, 1988 and 1982, respectively. Approximately 15.6 million cubic yards was initially placed for this project. Total project construction costs through Fiscal Year 1998 were \$55.9 million Federal and \$45.4 million non-Federal.

13. **Virginia Key, Key Biscayne, FL.** A Federal shore protection project for Virginia Key and Key Biscayne was authorized by the 1962 River and Harbor Act. The project is described in House Document 561/87/2. Approximately 1.8 miles of shore on Virginia Key and 1.9 miles of the northerly shore on Key Biscayne were restored in 1969 by placement of 410,000 cubic yards of sand. In 1972, 13 groins were constructed on Virginia Key to reduce sand losses. In 1974, 110,000 cubic yards were placed on Virginia Key in connection with the

project deepening at Miami Harbor. Approximately \$1,667,000 and \$715,000 have been spent by the Federal and non-Federal project sponsor through Fiscal Year 1998, respectively. The project was deauthorized in 1990 under the provisions of Section 1001(b)(1) of the 1986 Water Resources Development Act.

14. **Key Biscayne, FL.** The Chief of Engineers authorized a shore protection project for Key Biscayne in 1982 under the provisions of Section 103 of the 1962 Rivers and Harbor Act. The project provides for placement of 330,000 cubic yards of initial restoration and periodic nourishment of the southern 2.4 miles of Key Biscayne between the southern boundary of Crandon Park and the Cape Florida Lighthouse, and includes a terminal groin at the southern limit of the initial restoration. Project construction was completed in 1987 at a total cost of \$2.4 million. The Federal share was limited to \$1 million under the authority of Section 103. The project's terminal groin was rehabilitated following Hurricane Andrew in 1992 by replacement of 390 tons of armor stone and 280 tons of bedding stone under the authority of Public Law 84-99. This work was completed in 1994 at a cost of \$84,000.

15. **Bill Baggs Cape Florida State Recreation Area, Key Biscayne, FL.** The Chief of Engineers authorized a shore protection project for Key Biscayne in 1967 under the provisions of Section 103 of the 1962 Rivers and Harbor Act. The project provides for construction of a 283 foot-long stone revetment at Cape Florida Lighthouse, which is located at the southern end of Key Biscayne. Project construction was completed in 1968 at a total cost of \$48,000. The revetment was rehabilitated following Hurricane Andrew in 1992 under the authority of Public Law 84-99. This work was completed in 1994 at a cost of \$72,000.

16. **PLAN FORMULATION.** The Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the Nation's environment, in accordance with national environmental statutes, applicable executive orders, and other Federal planning requirements. Ecosystem restoration is one of the primary missions of the US Army Corps of Engineers Civil Works program.

17. The Corps planning process follows a six-step structure to solve problems in a rational framework providing for sound decision making. The six-step process is used by the Corps in all of its planning studies. The six steps are (1) identify problems and opportunities, (2) inventory and forecast conditions, (3) formulate alternative plans, (4) evaluate alternative plans, (5) compare alternative plans; and (6) select a plan.

18. Two separate water resources problems have been identified for Virginia Key. The first problem is shoreline instability, and the other is ecosystem degradation. Plan formulation for shoreline instability is discussed first, followed by plan formulation for ecosystem degradation.

SHORELINE STABILIZATION

(a) Identified Problems for Shoreline Stabilization.

(1) Existing Conditions. Virginia Key encompasses approximately 2.55 miles of shoreline facing the Atlantic Ocean. At present, the most critically eroding shoreline (Figure 2b) is 4,000 ft long and located southwest of the last groin of the deauthorized Federal Shore Protection project (Figure 2a). The shoreline area further southwest of this eroding shoreline appears to have been relatively stable during the past 50 years. A timber groin system is in existence in this particular stretch of shoreline (Figure 3). Some of the 27 groins were originally installed in 1948. In 1956, the remainder were added and some of the original groins were lengthened. The groins are approximately 50 feet long and are spaced 50 to 150 feet apart. This timber groin system, though appearing to be somewhat functional based on sand accumulation, is severely deteriorated and in need of rehabilitation. Tidal currents adjacent to the shoreline are reported at up to seven or eight knots during maximum tide conditions. The erosion along Virginia Key is reported to be attributed to the Government Cut navigation project at Miami Harbor. The jetties and bar channel of the Federal project are believed to act as a complete sediment barrier to the southward sediment transport. This is supported by examining recent aerial photography, which illustrates the remnant historical shoreline, and the accumulation of sand on the up-drift side of the jetty at Government Cut and the Virginia Key groins, as well as documented in the literature.

(2) Expected Future Conditions. Erosion at Virginia Key will continue into the foreseeable future. At present time, no local plans are underway to address the shoreline stabilization problem at Virginia Key. Therefore, the current timber groin system will continue to degrade further reducing the stability of the shoreline.

(3) Specific Problems and Opportunities. Shoreline erosion is the predominant problem at Virginia Key. Tidal currents and longshore and cross-shore wave action, along with ocean swell from tropical storms and hurricanes, has caused the shoreline to steadily recede. The following opportunities have been identified:

- a) to stabilize the eroding shoreline.
- b) to rehabilitate existing timber groins located further southwest of the area along the shoreline due to their historical significance.

(b) Alternative Plans Four alternative plans were evaluated for the shoreline stabilization of Virginia Key for this preliminary assessment. The alternatives are as follows.

- 1) Without project or no action.
- 2) Construct single breakwater parallel to the shoreline with shoreline stabilization fill and timber groin rehabilitation
- 3) Construct two groins perpendicular to the shoreline with shoreline stabilization fill and timber groin rehabilitation
- 4) Perform shoreline stabilization fill only

(c) Preliminary Evaluation of Alternatives. The Project Management Plan will be based on the refinement and analysis of these four alternatives. Based on the limited evaluations to date, it appears that the alternatives would be technically feasible, environmentally sound and could be justified for implementation. Some environmental and social impacts may be associated with some of these alternatives. Plans would be developed that would minimize impacts, but some mitigation may be required, i.e., various levels of seagrass and turtle impacts could result from the beach restoration and/or structure placement, and some structural alternatives could limit wind-surf activities.

Alternative 1. This alternative is the no-action alternative. In this case there would be no Federal involvement in the restoration of Virginia Key. Shoreline erosion would continue, likely at an accelerated rate, as the timber groins continue to deteriorate. Severe wave conditions could jeopardize the integrity of Virginia Key as a result of the diminished level of protection provided by the loss of land associated with the shoreline erosion.

Alternative 2. This alternative considers constructing a single 440 ft long groin parallel to the shoreline. This groin would begin on land and extend seaward. In addition, this alternative considers rehabilitating some timber groins existing along the shoreline of Virginia Key and removing the remaining timber groins as necessary. This alternative also involves the placement of approximately 74,000 cy of beach quality material to nourish the critically eroded shoreline. The source of this material will be a locally accessible site. Benefits for this alternative are the reduction of some wave, long-shore, and tidal influences and the stabilization of the shoreline.

Alternative 3. This alternative considers constructing two 220 ft long groins perpendicular to the shoreline. The groins would be placed approximately 375 ft apart. In addition, this alternative considers rehabilitating some timber groins existing along the shoreline of Virginia Key and removing the remaining timber groins as necessary. This alternative also involves the placement of approximately 74,000 cy of beach quality material to nourish the critically eroded shoreline. The source of this material will be a locally accessible site. Benefits for this alternative are the reduction of some wave, long-shore, and tidal

influences and the stabilization of the shoreline. This alternative is the most likely selection to address the shoreline erosion problem. Estimated costs of construction of the shoreline stabilization component are as follows.

Excavation/Placement:	\$1,525,000
Construction	\$1,760,000
Removal of existing structures:	\$ 98,000
Navigation Aids.	\$ 14,000
Lands and Damages:	<u>\$ 19,000</u>
SUBTOTAL	\$3,416,000
Engineering and Design:	\$ 271,000
Construction Management:	<u>\$ 338,000</u>
ESTIMATED COSTS	\$4,025,000

* Note: Excavation and Disposal costs include Mobilization and Demobilization

Alternative 4. This alternative considers the placement of approximately 74,000 cy of beach quality material at Virginia Key to nourish the critically eroded shoreline. The source of this material will be a locally accessible site. This alternative would restore the beach to a straightened shoreline, but it would require long term nourishment.

ECOSYSTEM RESTORATION

(a) Identified Problems for Ecosystem Restoration.

(1) Existing and Future Conditions. Virginia Key, approximately 1,253 acres, is a natural barrier island located south of Fisher Island and north of Key Biscayne and bounded by the Atlantic Ocean to the east and Biscayne Bay to the west. Significant dredging and filling in the past, including the construction of the Rickenbacker Causeway, the dredging of the marine stadium basin and Fisherman Channel, transformed Virginia Key into its present form. The northern end of Virginia Key has also been previously used as a disposal site for harbor dredged materials associated with improvements to Government Cut and the Miami Harbor Federal navigation project. Approximately 66 acres of northern Virginia Key have been directly impacted by previous disposal operations and additional areas have been indirectly impacted. This upland disposal site is presently reserved for future disposal operations such as may be required for the upcoming Miami Harbor channel deepening project. Restoration at this site, therefore, is not possible due to its continued use as a potential disposal site. Instead, a 132 acre site located south the disposal site contiguous on Virginia Key has been identified for this restoration effort. This area is a public park belonging to the City of Miami. The park area has also been overrun by exotic vegetation and has associated habitat degradation. Restoration efforts at this

park would have direct beneficial desired ecosystem improvements to Virginia Key as well as to the overall Biscayne Bay and South Florida ecosystem restoration goals.

Many areas of the island, including some park lands, have been cleared of native vegetation for human usage such as a marine stadium, a sewage treatment facility, a municipal landfill, parks and parking lots for these areas as well as docks and buildings for several restaurants, marinas and commercial fishing operations. Man's impact on Virginia Key has negatively impacted many different habitat areas as described below. Existing natural areas consist of seagrass beds, intertidal sand and mud flats, mangrove and herbaceous wetlands, beach dune communities, coastal strand and tropical hardwood hammock. Of the remaining vegetated areas on the island most are infested, to varying degrees, with noxious exotic vegetation.

(i). Vegetation. Outside of the developed areas on the island, several different plant communities exist which include dune community, coastal strand community, tropical hardwood hammock, and tidal coastal band mangrove community. Vegetation typically found within the dune community include sea oats, *Uniola paniculata*, inkberry, *Scaevola plumieri*, bay cedar, *Suriana maritima*, and salt wort, *Batis maritima*. Cabbage palm, Sabal palmetto, *Serenoa repens*, beach sunflower, *Helianthus debilis*, and cocoplum, *Chrysobalanus icaco*, are typical of the vegetation found in the coastal strand community. The tropical hardwood hammock area are typically dominated by seagrape, *Coccoloba uvifera*, with extensive strands of Spanish stopper, *Eugenia foetida*. Additional trees and shrubs present in these areas include gumbo limbo, *Bursera simaruba*, saffron plum, *Bumelia celastrina*, strangler fig, *Ficus aurea*, torchwood, *Amyris elemifera*, mahogany, *Swietenia mahogoni*, and wild coffee, *Psychotria nervosa*. The coastal band mangrove community is made up primarily of red mangrove, *Rhizophora mangle*, black mangrove, *Avicennia germinans*, and bottonwood, *Conocarpus erectus*. All of these communities are infested to some greater or lesser degree with noxious exotic vegetation. The most common noxious exotics present include Australian pine, *Casurina equisetifolia*, Brazillian pepper, *Shinus terebinthifolius*, and lather leaf, *Colubrina asiatica*. The exotic vegetation in these areas have replaced native vegetation and offer little to no habitat value. In addition, the existing exotics are currently a seed source for the undesirable spread of these plants.

The nearshore area surrounding Virginia Key is almost completely colonized by seagrass. Dense seagrass beds comprised mainly of turtle grass, *Thalassia testudinum*, manatee grass, *Syringodium filiforme*, and shoal grass, *Halodule wrightii*, can be found within ten to fifteen feet of the shoreline along sandy beach and fringe mangrove. The nearshore seagrass habitat offers refuge from predators forage and recruitment opportunities for many of the important recreational and commercial fisheries species, as well as other invertebrates, birds and mammals

(ii). Threatened and Endangered Species. The loggerhead, *Caretta caretta*, sea turtle, which is federally listed as threatened, has been documented to nest on the beach and dune within the study area. Both the loggerhead and green, *Chelonia mydas*, are known to forage in the nearshore waters adjacent to Virginia Key. The endangered West Indian manatee, *Trichechus manatus*, also frequents the waters surrounding the island. Seagrass and algae are some of the principle forage for this species.

(iii). Fish. Biscayne Bay and the Atlantic Ocean waters adjacent to Virginia Key contain a large and diverse fish fauna. Both temperate and tropical species are represented, and somewhat seasonal fluctuation occurs with tropical species more prevalent in the summer and temperate species replacing them in the winter. Many of these species are dependent on mangrove, seagrasses and wetlands for forage and predator avoidance areas. Some examples include the spotted seatrout, *Cynoscion nebulosus*, snook, *Cetropomus undecimalis*, permit, *Trachinotus falcatus*, various members of the grunt, snapper, mullet, and grouper families and a number of prey fish.

(iv). Invertebrates. A large number of invertebrates inhabit the bay and ocean waters surrounding Virginia Key. The mangrove, wetland and seagrass communities act as a refuge and recruitment area for many of these species. Penaeid shrimp, blue crab, *Callinectes sp.*, and stone crabs, *Menippe mercanaria*, are all known to frequent this area during various life history stages.

(v). Birds. A variety of wading birds utilize the barrier islands in the area for foraging, roosting, and nesting. The tidal wetland communities generate many of the prey species of invertebrates and fish needed for wading birds. Some examples of birds that can be found on Virginia Key include: great blue herons, *Ardea herodias*, little blue herons, *Florida caerulea*, great egrets, *Casmerodeus albus*, reddish egrets, *Dichromanassa rufescens*, brown pelican, *Pelecanus occidentalis*, osprey, *Pandion haliaetus*, wood stork, *Mycteria americana*, common flickers, *Colaptes auratus*, and red bellied woodpeckers, *Centurus carolinus*.

(2) Expected Future Conditions. Environmental degradation and reduced habitat quality would continue. Exotic species would continue to spread, eventually dominating and replacing more productive native species.

(3) Specific Problems and Opportunities. The extensive intrusion of exotic species is the primary element contributing to the environmental degradation throughout much of Virginia Key. These exotics do not provide the same quality habitat as natural communities for fish and wildlife resources. In addition, man's impact on the ecology of this fragile ecosystem, including its use as an up-land disposal site, has contributed to the degradation of the Key. Reconnaissance

phase studies have identified opportunities to restore and enhance native environmental features and wetlands.

A portion of the 132 acre Park area identified for ecosystem restoration is presently under consideration for designation as a National Historic Area. This 77 acre site, located in the southern portion of the Park, is the former "Colored Beach" in Miami - one of the few places that African Americans could go to swim in Miami from the 1940s through early 1960s. Both the ecosystem restoration work as well as the shoreline restoration efforts would be undertaken in concert with this designation. This would be important to local interests in preserving historic recreation features at the Virginia Key Beach site. These ancillary recreational features would be designed to be compatible with, and without impact to, the ecosystem restoration and shore protection efforts. Both restoration efforts would help preserve important National historic cultural aspects of our Country's development.

(b) Alternative Plans. Several potential alternatives for ecosystem restoration at Virginia Key are being considered. The alternatives being considered include removing exotic vegetation from wetland and upland sites and restoring with native vegetation, restore tidal flushing to areas as appropriate, create beach dune habitat, and provide recreational features such as pedestrian bridges, dune crossovers, boardwalks, interpretive signage and swimming buoys or other designated and approved facility features.

(c) Preliminary Evaluation of Alternatives. The Project Management Plan will be based on further refinement and analysis of these alternatives. Based on the limited evaluations to date, it appears that the alternatives would be technically feasible, environmentally sound and could be justified for implementation. The exact acreage, magnitude, and detailed plans for the restoration within the identified 132 acre site would be developed during further negotiations with the non-Federal Sponsor and other interested parties. Figure 4 shows the areas on Virginia Key that are being considered for restoration and the conceptual plans.

Alternative 1 This alternative is the no-action alternative. In this case there would be no Federal involvement in the ecosystem restoration of Virginia Key. The ecosystem would continue to degrade as the exotic species continue to overtake and replace native species.

Alternative 2. Areas 1a and 1b are currently remnant tropical hardwood hammock communities that have been invaded with noxious exotic vegetation. Area 1a is approximately 27.0 acres in size and contains approximately 25 percent exotic vegetation. Area 1b is approximately 9.0 acres in size and is infested with between 26 and 50 percent exotic vegetation. Areas 1a and 1b would be selectively cleared of exotic vegetation, selectively scraped and graded to optimum elevations for recruitment of desired vegetation and species, and then planted with native vegetation typical of a tropical hardwood hammock. To

help ensure a successfully restored ecosystem, the restored areas will be mulched and routinely irrigated as required to maintain healthy vegetation. Until the native vegetation becomes established, the restored areas would be routinely surveyed for new infestations of exotics, which would then be removed.

Alternative 3. Area 2 is a tidal mangrove community approximately 5.6 acres in size that has been invaded with exotic vegetation. Restoration in this area would include selectively clearing exotic vegetation, selectively scraping and grading the area to establish optimum elevations for successful recruitment, and then planting native mangrove species. Until the native vegetation becomes established, the restored area would be routinely surveyed for new infestations of exotics, which would then be removed.

Alternative 4. Areas 3 and 4 are currently a coastal strand community totaling approximately 36 acres. These areas are heavily infested with exotic vegetation covering between 51-100 percent. Restoration of area 3 would include the selectively removing exotic vegetation, selectively scraping and grading the area, and planting with native coastal strand vegetation. To help ensure a successfully restored ecosystem, the restored areas will be mulched and routinely irrigated as required to maintain healthy vegetation. Until the native vegetation becomes established, the restored areas would be routinely surveyed for new infestations of exotics, which would then be removed. Restoration of area 4 would involve creating approximately 4.5 acres of isolated freshwater wetland. This would entail removing all the existing vegetation and excavating and grading the area to approximately -0.5 feet NGVD. Upon completion, the area would be planted with native aquatic and wetland plant species. Until the native wetland vegetation becomes established, this area would be routinely monitored for infestations of exotic aquatic vegetation, which would then be removed.

The purpose of the project is to restore native plant communities in selected areas on Virginia Key, Florida. These areas currently contain a high percentage of exotic vegetation, primarily Australian pine and Brazilian pepper, which offer little to no habitat value. In addition, the existing exotics are currently a seed source for the undesirable spread of these plants. Restoration of these areas would remove the exotic vegetation from the environment and replace them with the historical plant communities including mangrove, coastal strand, tropical hardwood, and aquatic/wetland species. The proposed project would restore approximately 36 acres of tropical hardwood hammock, 5.6 acres of mangrove wetland, 31.5 acres of coastal strand and would create approximately 4.5 acres of freshwater wetland. This would provide a more suitable habitat for fish and wildlife resources than what currently exists.

The alternatives listed above are considered part of the overall effort to restore the environment at Virginia Key. An incremental analysis will be performed during the feasibility phase to identify the most effective features.

Estimated costs of construction of the ecosystem restoration component are as follows

Mob/Demob:	\$300,000
Clearing:	\$1,300,000
Grading:	\$1,100,000
Channels.	\$240,000
Plants:	\$1,100,000
Lands and Damages	\$60,000
SUBTOTAL	\$4,100,000
Preconstruction Engineering and Design:	\$600,000*
Construction Management:	\$900,000
SUBTOTAL ESTIMATED COSTS	\$5,600,000
Ancillary Recreational Component	\$1,000,000
TOTAL	\$6,600,000
Feasibility Phase	\$400,000
TOTAL ESTIMATED COST	\$7,000,000

* Includes \$200,000 Plans and Specs and \$400,000 Additional Contingency

Environmental Effects

19. Fish and Wildlife Resources. Adverse environmental effects could occur as a result of storm damage protection alternatives. Beach renourishment and associated activities have the potential to impact sea turtles. Potential impacts include disruption of nesting activity, reduced nesting and hatching success, and disorientation of hatchlings by artificial lighting from dredge and construction equipment on the beach. In addition, seagrass beds can be found immediately seaward of the beach. Direct coverage from the placement of beach fill and the placement of stone to construct the groins could impact some seagrasses. Increased turbidity and sedimentation during construction could also affect seagrasses. Dredging of the borrow area and the placing sand on the beach would affect benthic invertebrates, however, recolonization would be expected to occur within a minimal amount of time. Impacts to fish and wildlife resources including any designated essential fish habitat will be investigated during the feasibility phase. The environmental restoration of areas on the island would remove exotics and allow restoration of native vegetation. The areas would be restored with native vegetation including tropical hardwood hammock, mangroves, coastal strand vegetation and aquatic and wetland plants, thus improving the overall environment.

20 Historical, Archeological, and Cultural Resources. During the feasibility phase cultural resources investigations will be conducted, if needed, to

determine if historic properties may be located within the study area. A qualified archeologist will conduct the cultural resources investigations. Reports resulting from those investigations will be coordinated with the Florida State Historic Preservation Officer, according to the procedures outlined in the National Historic Preservation Act and 36 CFR Part 800 Protection of Historic Properties. Restoration aspects of each separable element would be undertaken with a keen awareness and attention to the maintenance of the cultural history of the area.

21. Feasibility Phase Coordination. During further development of the PMP and throughout the feasibility phase, project objectives and alternatives will be coordinated with appropriate local, State and Federal agencies and other interested parties. A National Environmental Policy Act (NEPA) document will be prepared to assess project impacts and will be coordinated with local, State, and Federal Agencies and other known interested parties. As part of the NEPA documentation a Federal consistency determination will be prepared in accordance with 15 CFR 930 Subpart B. In addition, a hazardous, toxic and radioactive waste (HTRW) evaluation will be conducted to identify any HTRW issues, if any. An aesthetic resources assessment for this study will be conducted and included in the NEPA document. Since the proposed project would involve the placement of material in waters of the United States, an evaluation pursuant to Section 404(b) of the Clean Water Act would be required along with certification of water quality pursuant to Section 401 of the Act. Coordination with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service under Section 7 of the Endangered Species Act will also be conducted during the feasibility stage.

22. Mitigation Requirements. The U.S. Army Corps of Engineers will take the necessary precautions to minimize impacts to sea turtles, migratory birds species, seagrass beds, and other fish and wildlife resources. Environmental mitigation will be addressed in the feasibility phase if and when specific project impacts are identified.

23. **FEDERAL INTEREST.** Based on a preliminary appraisal consistent with Army policies, costs, benefits, mitigation for down-drift impacts associated with a Federal deep draft navigation project and environmental impacts of the identified potential project alternatives, Federal interest exists at Virginia Key. There is also a Federal interest in other related outputs of the alternatives including ecosystem restoration that could be developed within existing policy.

24. **PRELIMINARY FINANCIAL ANALYSIS.** The Miami-Dade County Department of Environmental Resource Management (DERM) has been identified as the local sponsor for the ecosystem restoration study. As indicated in the attached letter, Attachment 2, the non-Federal sponsor is willing to cost share in feasibility phase studies described in the Project Management Plan and, execute a Feasibility Cost Sharing Agreement (FCSA). The non-Federal sponsor also has also expressed an interest in sharing in the costs of construction.

25. **SUMMARY OF FEASIBILITY ASSUMPTIONS.** Considerable engineering, economic and environmental analysis has been performed with regard to the shoreline stabilization project at Virginia Key. The available data includes sediment budget, shoreline surveys, environmental resources mapping, SBEACH storm response modeling and RMA-10 hydrodynamic and salinity modeling. The time and cost estimate of \$100,000 and 12 months for the Section 111 feasibility phase studies takes into account the availability of this information and analysis.

26. **FEASIBILITY PHASE MILESTONES.**

Shoreline Stabilization:

Milestone 1 - FCSA Signed cost of feasibility study is limited to \$100,000.	Not Required, since
Milestone 2 - Receipt of Funds/Initiate Study	Oct 2000
Milestone 3 - Technical Review Conference (AFB)	Feb 2001
Milestone 4 - Complete Draft Report/NEPA	April 2001
Milestone 5 - Independent Technical Review (ITR)	May 2001
Milestone 6 - Initiate Coordination of Draft Report (NEPA)	June 2001
Milestone 7 - Complete Final Report	Sept 2001

Ecosystem Restoration:

Milestone 1 - Receipt of Funds	Oct 2000
Milestone 2 - Submit Draft Ecosystem Restoration Report (ERR) to Sponsor for Review	Aug 2001
Milestone 3 - Independent Technical Review (ITR)	Aug 2001
Milestone 4 - Submit Draft ERR and NEPA Document to CESAD for Review	Oct 2001
Milestone 5 - Coordinate Draft ERR and NEPA Document with Agencies and Public	Oct 2001
Milestone 6 - Submit Draft Project Coordination Agreement (PCA) and Fact Sheet to CESAD	Oct 2001
Milestone 7 - Submit Final ERR and NEPA Document to CESAD	Mar 2002
Milestone 8 - Report Approved	
Milestone 9 - PCA Approved	

27 **FEASIBILITY PHASE COST ESTIMATE.** The recommended shoreline stabilization efforts at Virginia Key, Florida under Section 111 has an estimated construction cost of \$4 million. The Federal implementation cost limit for Section 111 is \$5 million per Section 214 of the 1999 Water Resources Development Act. Preparation of the required feasibility report and environmental document for the Section 111 shoreline stabilization project is estimated to cost \$100,000. Under Section 111 authority, preparation of the required feasibility report and other

design costs up to \$100,000 are 100% Federal, with the balance being cost shared 50% Federal and 50% non-Federal. Preparation of the feasibility report and construction plans and specifications is forecast to take 12 months and cost approximately \$300,000.

28. Section 1135 allows ecosystem restoration for mitigation related to environmental impacts of constructed Federal projects. Costs would be shared 75% Federal / 25% Local and include the preparation of an Ecosystem Restoration Report, construction plans and specifications, credit to the sponsor for all required lands and easements, and project construction costs. The total cost for the restoration work is estimated at \$6 million, so the Federal costs and non-Federal costs will be \$4.5 million and \$1.5 million, respectively. The Federal cost limit is \$5 million for Section 1135 projects. Section 1135 also allows for the inclusion of recreation features of up to 10% of project cost to be cost shared 50/50. Preparation of the required feasibility report and environmental document for the Section 1135 ecosystem restoration effort is forecast to take 18 months and cost approximately \$400,000.

29. **RECOMMENDATIONS.** I recommend that feasibility phase studies be undertaken at Virginia Key, Florida for shoreline stabilization and ecosystem restoration as two separate studies under the Continuing Authorities Program.

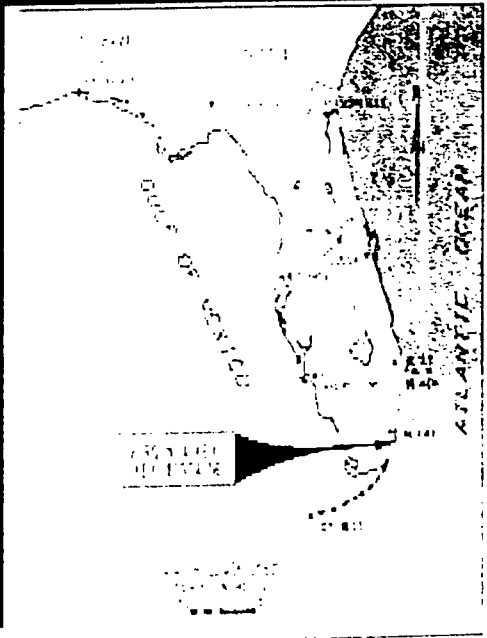
30. **POTENTIAL ISSUES EFFECTING INITIATION OF FEASIBILITY PHASE.** Timely approval to proceed with each study, availability of funding, and timely completion of the Project Management Plan, are required to meet the expectations of the study sponsor. There are no other issues affecting the initiation of the feasibility phase.

31. **VIEWS OF OTHER RESOURCE AGENCIES.** The following Resource Agencies and other interested organizations are in support of restoration efforts at Virginia Key: City of Miami, Virginia Key Park Civil Rights Task Force, Tropical Audubon Society, and the Sierra Club.

32. **PROJECT AREA MAP.** A project area map for Virginia Key is enclosed as Figure 1

Enclosures

JAMES G. MAY
COL, Corps of Engineers
Commanding



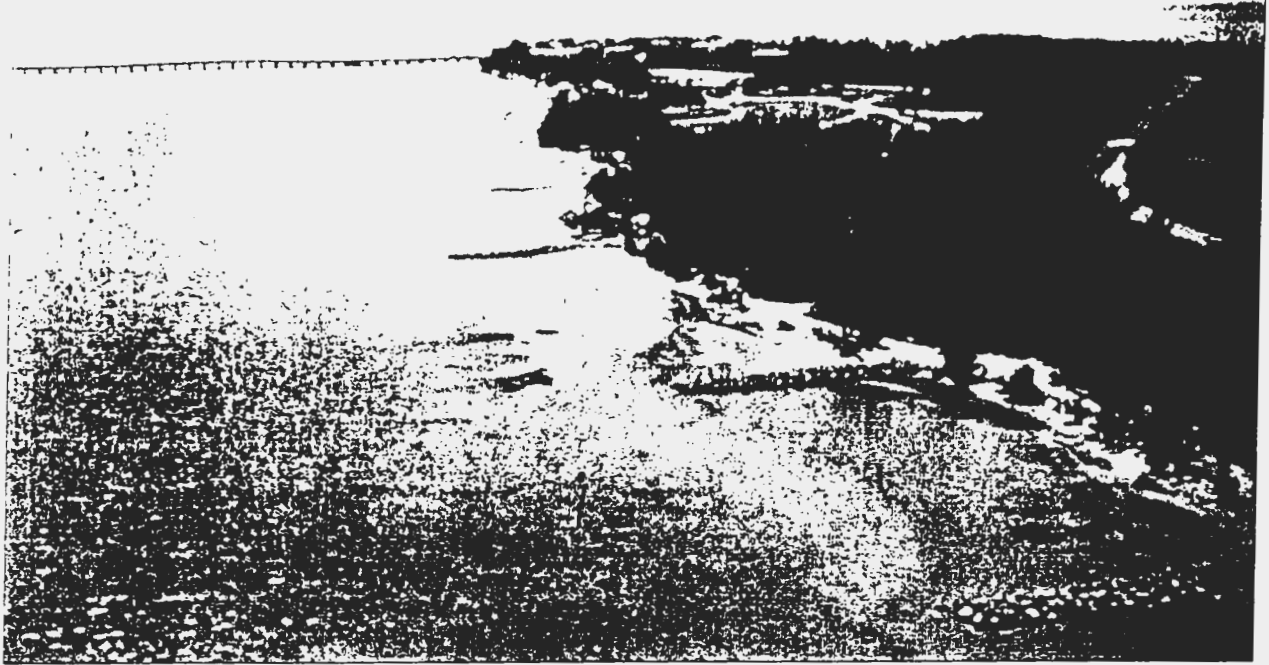
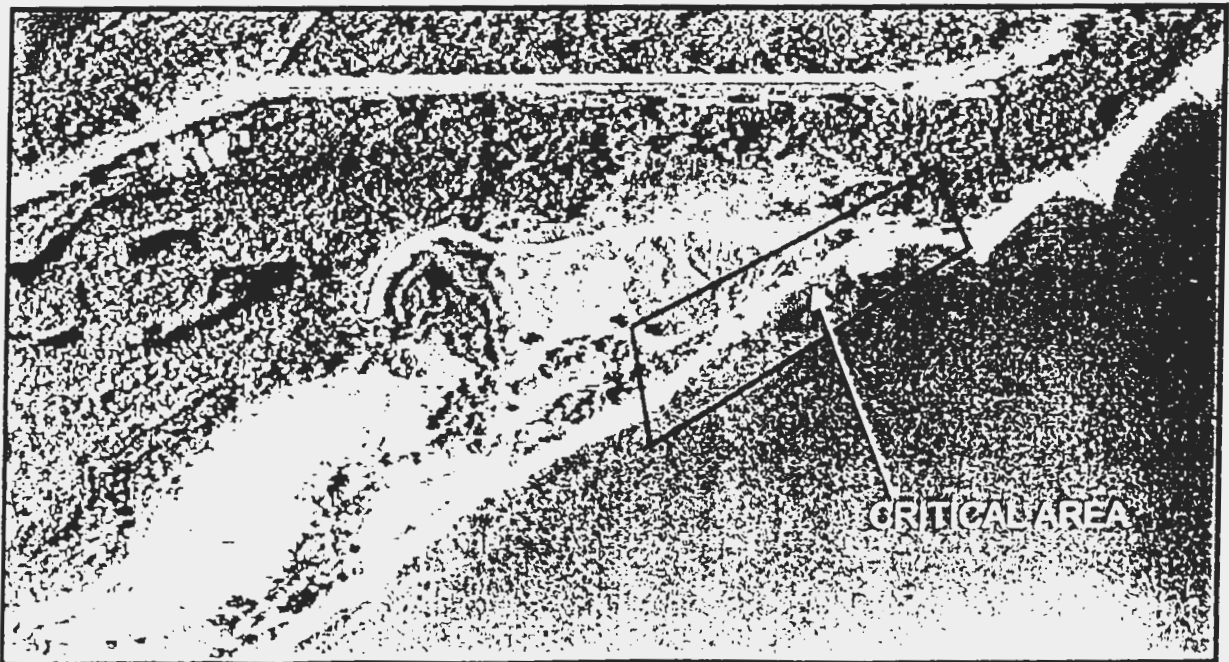


FIGURE 2a Existing Federal Groins facing south towards Rickenbacker Causeway (Aug 1973)



CRITICAL AREA (boxed) No. 10 Line Area in plan view of Federal Groins (Sept 1979)

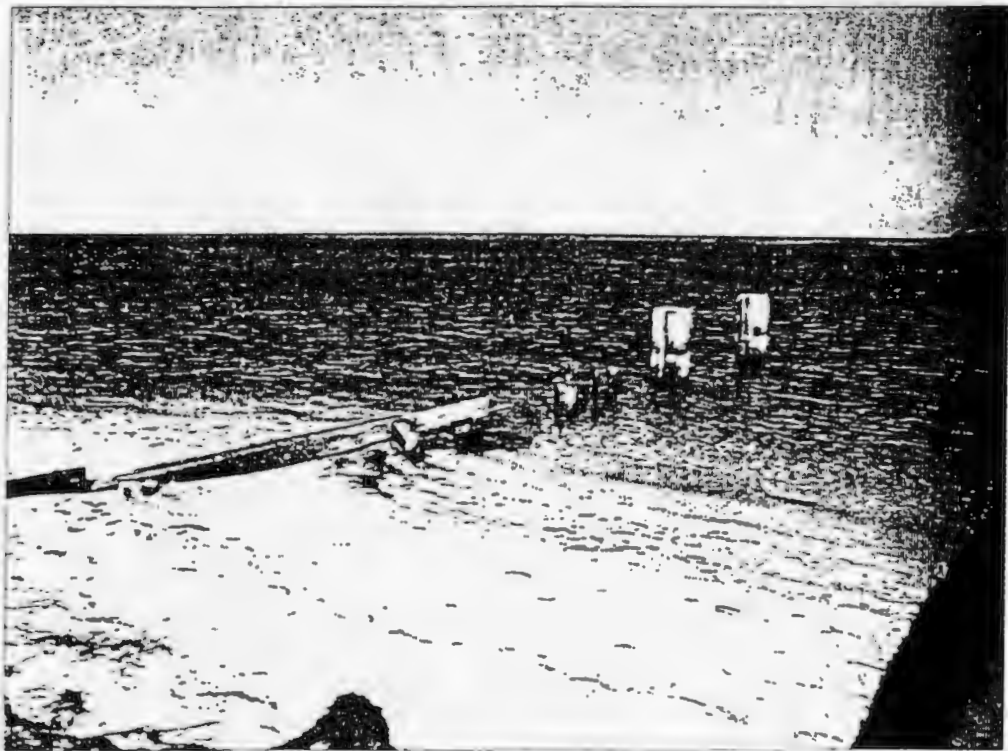
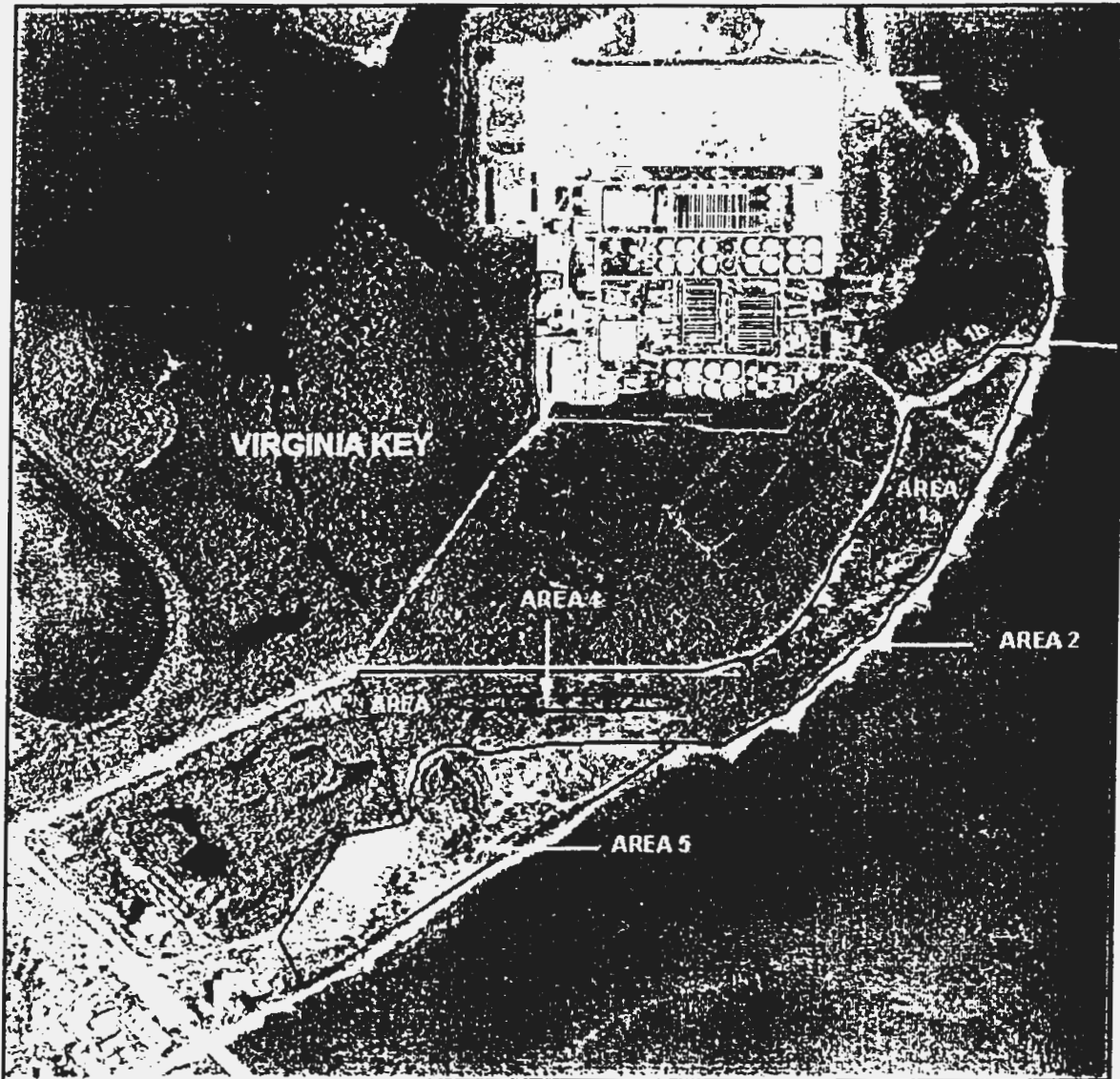


FIGURE 3 Existing Timber Groins (June 2000)

FIGURE 4. AREAS CONSIDERED FOR RESTORATION



AREAS 1a & 1b TROPICAL HARDWOOD HAMMOCK TO BE RESTORED
AREA 2 TIDAL MANGROVE COMMUNITY TO BE RESTORED
AREA 3 COASTAL STRAND TO BE RESTORED
AREA 4 ISOLATED WETLAND TO BE CREATED
AREA 5 TO BE DETERMINED

ATTACHMENT 1

U.S. SENATE RESOLUTION

"RESOLVED BY THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the following reports of the Chief of Engineers:

1. Intracoastal Waterway	House Document	740/72/2
2. Haulover Inlet	House Document	189/86/1
3. Central & South Flood Control	House Document	643/80/2
4. Government Cut & Miami Rivers	House Document	662/56/18
	House Document	554/62/2
	House Document	517/67/4
	Rivers & Harbors Committee Document	15/71/2
	Rivers & Harbors Committee Document	86/74/2
	Senate Committee Document	73/2
	House Document	91/79/1
	Senate Document	71/85/2
5. Causeway Constructions		

with a view to determine whether the modifications are advisable with particular references to Biscayne Bay, including its biological communities and water quality. Investigations undertaken under this resolution shall include, but not be limited to, a determination of the effects of dredging and filling on circulation patterns, the effects of spoil islands on water quality, and the effects of modified fresh water inputs on the bay's biological communities and water quality. The Board is authorized to propose solutions that would alleviate problems associated with the aforementioned projects."

U.S. HOUSE OF REPRESENTATIVES RESOLUTION

"Resolved by the Committee on Public Works and Transportation of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the report of the Chief of Engineers on the Intracoastal Waterway from Jacksonville to Miami, Florida, published as House Document Numbered 740, 79th Congress, 2nd Session, with the view to determine whether the existing project should be modified in any way at the present time, with particular reference to Biscayne Bay and improvement of water quality in the bay. Investigations undertaken in response hereto shall include, but not limited to, determination of the effects of dredging and fill on circulation patterns, identification of circulatory problem areas and of measures to relieve such problems, identification of the effect of fresh water inputs, and development of solutions to other allied water problems."



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

31 JUL 2000

REPLY TO
ATTENTION OF:

Honorable Carrie P. Meek
U.S. House of Representatives
Washington, D. C. 20515

Dear Ms. Meek:

Reference your letter dated July 25, 2000, and our telephone conversation of July 28, 2000, regarding local interest in restoration of the historic beach area on Virginia Key, Florida, a coastal barrier island in Miami, Florida.

As you are aware, the United States Army Corps of Engineers, Jacksonville District, was already involved in a 905(b) preliminary assessment of shoreline and upland environmental conditions on Virginia Key. The draft report is scheduled to be submitted for review in the next few days and will recommend Federal participation in shoreline and upland environmental restoration efforts at this site.

I am pleased to report that preliminary information reviewed by my staff supports the Jacksonville District's draft recommendation, and we anticipate quick approval for initiation of detailed design and construction efforts. We are also pleased that Miami-Dade County has indicated their interest in being the local sponsor for this project.

The recommended plan of improvements includes shoreline improvements consisting of granite and timber groins and placement of approximately 80,000 cubic yards of beach sand to restore and protect Virginia Key where beach erosion has been accelerated due to previous Federal improvements to the Port of Miami. Shoreline improvements, as mitigation for negative impacts of previous harbor improvements, are authorized under our existing Continuing Authorities Program, Section 111

Under Section 111 authority, preparation of the required feasibility report and other design studies are a 100 percent Federal cost for the first \$100,000, with the balance being cost shared 50 percent Federal and 50 percent local. For construction, the local sponsor will be responsible for all lands and easements while the Federal Government will be responsible for all construction costs. Preparation of the feasibility report and construction plans and specifications is forecast to take 12 months and cost approximately \$300,000. The preliminary construction cost estimate is about \$4 million. We anticipate awarding the construction contract in late Fiscal Year (FY) 2001, provided that funds are available and significant permit issues involving seagrasses and turtle nesting are resolved without restrictions on the timing of construction activities. Approximately \$300,000 in Federal funds is required in FY 2001 to prepare the feasibility report, prepare construction plans and specifications, and award the construction contract.

Also recommended are upland environmental restoration improvements on Virginia Key. About 50 to 100 acres of the island were previously used for dredged material disposal during earlier Federal improvements to the Port of Miami. As mitigation for previous negative impacts, the 905(b) report will recommend removal of invasive exotic plants and restoration of natural wetlands and native coastal plant communities on 150 to 200 acres of the Virginia Key Beach Park area owned by the city of Miami. These upland environmental improvements are authorized under our existing Continuing Authorities Program, Section 1135.

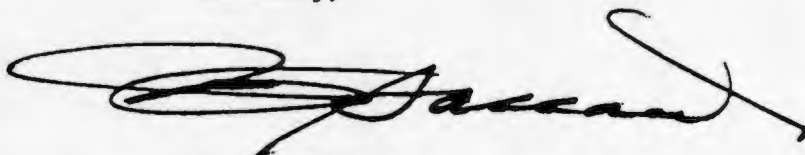
Under the terms of Section 1135, the local sponsor is required to cost share both design and construction. The total project cost will be shared 75 percent Federal and 25 percent non-Federal and includes preparation of an Environmental Restoration Report and construction plans and specifications, credit to the local sponsor for all required lands and easements, and project construction costs. Preparation of the required Environmental Restoration Report and construction plans and specifications is forecast to require 24 months, cost approximately \$600,000, and will be completed using 100 percent Federal funds. Local contributions are not required until the start of construction. We anticipate awarding the construction contract in late FY 2002. The preliminary construction cost estimate is about \$6 million, so Federal and non-Federal costs will be about \$4.5 million and \$1.5 million, respectively. Approximately \$300,000 in Federal funds is required in FY 2001 to initiate the Environmental Restoration Report.

Section 1135 also authorizes inclusion of recreation features up to 10 percent of project cost with costs shared 50 percent Federal and 50 percent non-Federal. This is important to local interests working to preserve historic recreation features at Virginia Key Beach Park.

This project provides a good example of the value of the Continuing Authorities Program as no new legislation is required to authorize the recommended Virginia Key improvements. However, implementation will depend on availability of funding. Historically, funding for this program has been very limited and competition for available funds has increased in recent years. In recognition of this, Congress has identified specific projects in various appropriations bills to ensure funds are made available for those projects.

The Corps looks forward to working with you on the Virginia Key project. If you need additional information on this project or another Corps effort, please feel free to contact me or my staff.

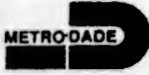
Sincerely,

A handwritten signature in black ink, appearing to read "Joe N. Ballard", written over a horizontal line.

Joe N. Ballard
Lieutenant General, U.S. Army
Commanding

ATTACHMENT 2

METROPOLITAN DADE COUNTY, FLORIDA



STEPHEN P. CLARK CENTER

OFFICE OF COUNTY MANAGER
SUITE 2010
111 N.W. 1st STREET
MIAMI, FLORIDA 33128-1004
(305) 375-5311

July 28, 2000

Colonel Joseph R. Miller
U.S. Army Corps of Engineers
Jacksonville District
400 West Bay Street
Jacksonville, Florida 32232

RE: Virginia Key Restoration

Dear Colonel Miller:

As you are aware, members of my staff and representatives of the City of Miami have been working closely with the District in evaluating the potential for Corps participation in various elements of the above referenced project. Several objectives of the restoration plan, such as environmental restoration and beach erosion control, may be consistent with existing Corps authorities, and we would request your assistance in implementing a full evaluation of these potential opportunities.

We were recently informed that a preliminary commitment for local sponsorship of the project would be desirable prior to the initiation of a full feasibility study. This letter is to preliminarily confirm the willingness of the County, through the Department of Environmental Resources Management (DERM), to serve as local project sponsor in an effort to expedite the approval and completion of a feasibility study of potential Corps projects on Virginia Key. Formalizing this commitment would be contingent upon the willingness of the City of Miami to participate in the funding as landowner and to have the County assume the local sponsor role, and upon an understanding of the total non-federal funding commitment the project would entail. We are confident that these and other issues can be easily addressed following the completion of a study to more specifically identify the scope of the project, and the potential for Corps participation.

Please contact Mr. John Renfrow, Director of DERM, if you have any questions or need any additional information regarding this issue. Thank you in advance for your assistance in moving ahead on this important project.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. R. Stierheim', with a long horizontal line extending to the right.

M. R. Stierheim
County Manager

cc: Honorable Carrie Meek, Congresswoman, District 17
Honorable Alex Penelas, Mayor, Miami-Dade County
Honorable Chairperson and Members, Board of County Commissioners
Richard Bonner, United States Army Corps of Engineers
Albert Ruder, City of Miami

<u>Name</u>	<u>Agency</u>	<u>Phone</u>
Lori Billberry	City Asset Mgt	305-416-1452
David V. Schmidt	USACE - Planning	904-232-1697
BOB NACHINGER	CITY	305-416-1034
GLENN LANDERS	USACE - Project Mgmt	904-232-2125
George Strain	USACE - Planning	904-232-383
ALBERT RUDEN	Miami Parks	305-416-1320
TERRY GRIFFIN	CITY PARKS & RECREATION	305-416-1311
Alex J. Martinez	G. S. A.	(305) 545-513
JOHN JACKSON	CITY - Public Works Dept.	(305) 416-1223
ROBERT WEINER	COM. WINTON	305 250-5333
ANA GELAROFF	PLANNING + ZONING	305 416 1470
FRANK POLLARD	ASST. CITY MANAGER	305 416-1042
"Chip" Iglesias	City Manager's Office	305 416-1024
Steve Bauer	Dod. G. DERM	305 322-6857
Dianne Johnson	City Real Estate & Econ. Dev.	305. 416. 1426
Gene S. Tinnie	Virginia Key Park Tank Force	305-751-9791