MAY 6 1997

Planning Division
Environmental Branch

Mr. David Arnold
Bureau of Protected Species
Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Dear Mr. Arnold:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor.

I have enclosed a diagram showing the overall approach for the environmental testing. These items were developed as a result of the recent Conference on Sustainability of Renourishment held on April 24 and 25, 1997 here in Jacksonville and other meetings and discussions.

Please review and comment on the proposed environmental testing. Indicate any items needed to make the testing suitable for determining the acceptability of using foreign aragonite sands for beach nourishment in Dade County and possibly other areas of the state. Upon receipt of your comments, we plan to develop a detailed scope of work.

Since there is a critical need to develop new sand sources for Dade County, I request your comments within three weeks of the date of this letter. If you have any questions, please contact Mr. Kenneth Dugger of my staff at 904-232-1686.

Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copies Furnished:

Robin Trindell, Ph.D., Bureau of Protected Species, Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399
Ms. Ann Lazar, Environmental Specialist, Department of Environmental Protection, 3900 Commonwealth Boulevard, MS 310, Tallahassee, Florida 32399
Ms. Beth Morford, Environmental Specialist, Department of Environmental Protection, 19100 S.E. Federal Highway, Tequesta, Florida 33469
Mr. Ralph Clark, Beaches and Coastal Systems, Department of Environmental Protection, Post Office Box 38356, Tallahassee, Florida 32315

MAY 6 1997

Planning Division
Environmental Branch

Mr. Thomas Grahl
Acting Field Supervisor
U.S. Fish and Wildlife Service
Post Office Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Grahl:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copy Furnished:

Ms. Sandy MacPherson, Regional Sea Turtle Coordinator, U.S. Fish and Wildlife Service, 6620 Southpoint Drive South, Suite 310, Jacksonville, Florida 32216

MAY 8 1997

Planning Division
Environmental Branch

Mr. Andrew J. Kemmerer
Regional Director
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702-2449

Dear Mr. Kemmerer:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor. The proposed test beach would be placed on a portion of the Dade County Beach Erosion Control and Hurricane Protection Project.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copy Furnished:

Mr. Charles A. Oravetz, Chief, Protected Species Branch, National Marine Fisheries Service, 9721 Executive Center Drive North, St. Petersburg, Florida 33702-2449

MAY 6 1997

Planning Division
Environmental Branch

Mr. Carlos Espinosa
Dade County DERM
Suite 300
33 Southwest 2nd Avenue
Miami, FL 33130

Dear Mr. Espinosa:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copy Furnished:

Mr. Brian Flynn, Dade County DERM, 33 Southwest 2nd Avenue, Suite 300, Miami, Florida 33130

Planning Division
Environmental Branch

Mr. Raymond R. Carthy
Archie Carr Center for Sea
Turtle Research
University of Florida
Gainesville, Florida 32608

Dear Mr. Carthy:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copy Furnished:

Jeanne A. Mortimer, Ph.D., Carribbean Conservation Corporation,
Post Office Box 2865, Gainesville, Florida 32602-2866

MAY 6 1997

Planning Division
Environmental Branch

Ms. Sandy MacPherson
Regional Sea Turtle Coordinator
U.S. Fish and Wildlife Service
6620 Southpoint Drive South, Suite 310
Jacksonville, Florida 32216

Dear Ms. MacPherson:

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copy Furnished:

Mr. Thomas Grahl, Acting Field Supervisor, U.S. Fish and Wildlife Service, Post Office Box 2676, Vero Beach, Florida 32961-2676

MAY 6 1997

Planning Division
Environmental Branch

Mr. Steve Higgins
Beach Erosion Administrator
Broward County DNRP
218 Southwest 1st Avenue
Ft. Lauderdale, Florida 33301

Dear Mr. Higgins:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

The test beach would consist of approximately 500,000 cubic yards of material placed on about 1 mile of beach in Dade County, Florida (see attached map). In selecting this site, we considered a number of factors including suitability for testing engineering and environmental properties. Also, since this effort is being funded as part of a civil works project, it must provide a shoreline protection benefit for an authorized Federal project and have a cost sharing local sponsor.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

MAY 6 1997

Planning Division
Environmental Branch

Mr. John Hankinson, Jr.
Regional Administrator
U.S. Environmental Protection Agency
100 Alabama Street, Southwest
Atlanta, GA 30303-3104

Dear Mr. Hankinson:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

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Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosures

Copies Furnished:

Mr. Tom Welborn, Wetlands Unit, U.S. Environmental Protection Agency, 100 Alabama Street, Southwest, Atlanta, Georgia 30303-3104
Mr. Heinz J. Mueller, Chief, Environmental Policy Section, U.S. Environmental Protection Agency, 100 Alabama Street, Southwest, Atlanta, Georgia 30303-3104

Planning Division
Environmental Branch

Mr. Bradley J. Hartman, Director
Office of Environmental Services
Game and Freshwater Fish Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

Dear Mr. Hartman:

I am writing you concerning a proposed test beach to determine the suitability of foreign aragonite sands for beach nourishment. Since your office has expertise and/or regulatory responsibility for beach nourishment, I am requesting your comments on this effort.

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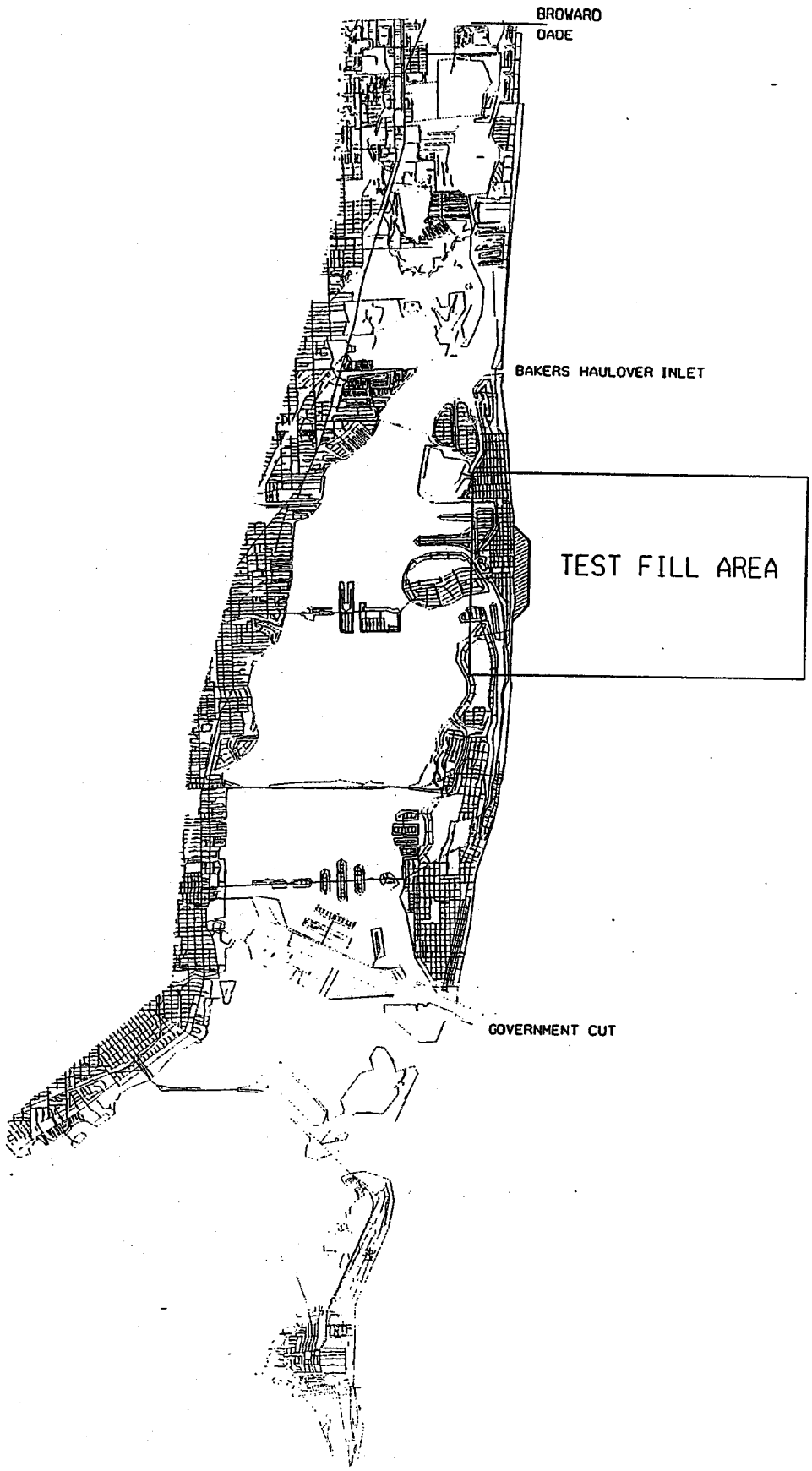
Sincerely,

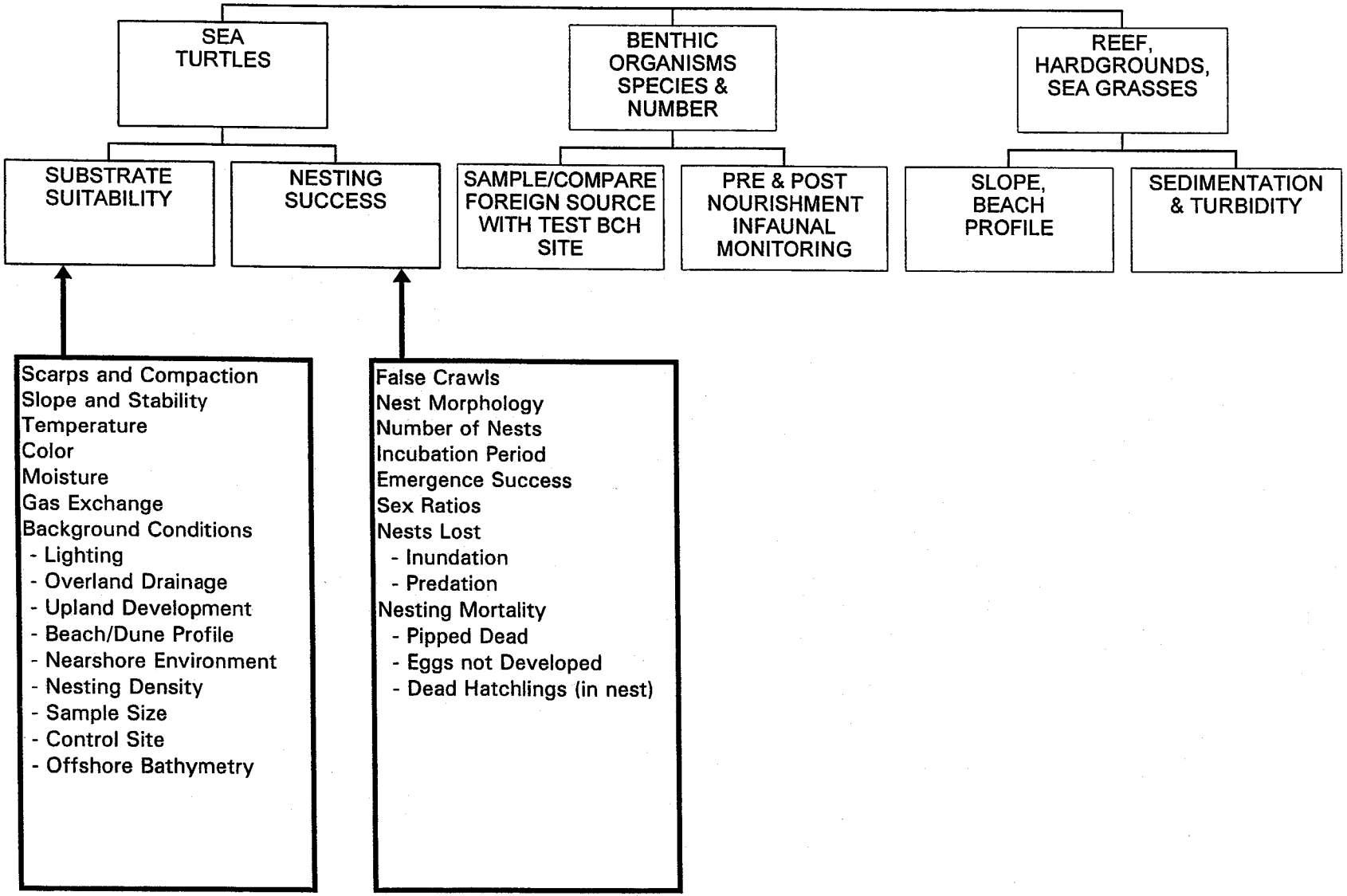
Hanley K. Smith
Acting Chief, Planning Division

Enclosures




# DADE COUNTY TEST FILL SITE

ENVIRONMENTAL TESTING
TEST BEACH
FOREIGN ARAGONITE



April 8, 1997

Programs and Project Management Division
Project Management Branch

Dear Conference Attendee:

This is to invite you or your representative to attend a conference to be held in Jacksonville, Florida, on April 24 and 25, 1997, concerning the future renourishment of the Dade County Beach Erosion Control and Hurricane Protection Project.

The purpose of the conference is to evaluate the schedule and tasks required for use of alternative sand sources for future renourishment of the project. The conference is open to all interested parties. Enclosed is an agenda for the conference.

The conference will be held at the Omni Hotel, 245 Water Street, which is across the street from our office. The hotel currently has a room rate of $119 per night available. This rate is subject to change depending upon availability. Please reference the U.S. Army Corps of Engineers conference if you desire to reserve a room and secure this rate. To make a reservation with the hotel, please call 904-355-6664 or 1-800-THE-OMNI.

A block of 40 rooms has also been reserved at the Radisson Riverwalk Hotel for the night of April 24th. The room rate is $65 per night, which equals the Federal government per diem rate. The hotel will accept a tax exempt form. To make a reservation with this hotel, please call 904-232-0842 or 1-800-333-3333.

If you have any questions or desire to be included on one of the panels, please contact Mr. Charles Stevens of our office at 904-232-2113.

Sincerely,

SIGNED: Richard E. Bonner

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

Enclosure

WINWORD/DADELT46.DOC

Dade County Beach Erosion Control
and Hurricane Protection Project

Conference on the Sustainability of Renourishment

Jacksonville, Florida
April 24 and 25, 1997

-AGENDA-

Thursday, April 24, 1997

| | | |
|---|---|---|
| 1:00 - 1:15 | Welcome | Mr. Richard Bonner, CE |
| 1:15 - 1:45 | Opening Remarks | Mr. Carlos Espinosa, DERM<br>Mr. Steve Higgins, DNRP |
| 1:45 - 2:00 | Project Overview/ Status | Mr. Charles Stevens, CE |
| 2:00 - 2:15 | Sponsors' Overview | Mr. Brian Flynn, DERM<br>Mr. Steve Higgins, DNRP |
| 2:15 - 2:45 | Network Analyses For Sand Sources | Mr. Stevens, CE |
| 2:45 - 3:00 | Geotechnical Update/ Status of Sand Source Specification | Mr. Doug Rosen, CE |
| 3:00 - 3:15 | BREAK | |
| 3:15 - 3:30 | Coastal Engineering Report on Sediment Budget | Mr. Harvey Sasso, Coastal Systems International, Inc. |
| 3:30 - 3:50 | Environmental Criteria Suitability of Material For Beach Placement | Mr. Kenneth Dugger, CE |
| 3:50 - 4:20 | Update on Turtle Nest Hatchery Study | Mr. Dave Nelson, CEWES |
| 4:20 - 4:30 | Summary Discussion on Network Analyses Revisions/ Impacts for Next Days Conference | Panel Discussion |

Dade County Beach Erosion Control
and Hurricane Protection Project

Conference on the Sustainability of Renourishment

Jacksonville, Florida
April 25, 1997

-AGENDA-

Friday, April 25, 1997

| | | |
|---|---|---|
| 9:00 - 9:45 | Panel on Potential Sand Sources: Upland and non-Domestic Sources | Companies and Consultants with Information on Sand Sources |
| 9:45 - 10:15 | Panel on Test Beach Proposal : Identification of Goals and Monitoring Objectives | CE, CEWES, DEP, DERM, DNRP Other Federal Agencies |
| 10:15 - 10:30 | BREAK | |
| 10:30 - 11:00 | Summary of Anticipated Environmental Coord. Requirements | Mr. Dugger, CE |
| 11:00 - 11:30 | Summary of Anticipated Engineering & Design Requirements | Mr. Tom Martin, CE |
| 11:30 - 12:00 | Discussion of Work Planned Prior to the Next Conference | Mr. Stevens, CE |
| 12:00 | ADJOURN | |

*Abbreviations:

CE: U.S. Army Corps of Engineers
CEWES: U.S. Army Corps of Engineers Waterways Experiment Station
DEP: State of Florida, Department of Environmental Protection
DERM: Metropolitan Dade County, Department of Environmental Resources Management
DNRP: Broward County, Department of Natural Resource Protection

# APPENDIX E- DRAFT FISH AND WILDLIFE COORDINATION ACT REPORT AND BIOLOGICAL OPINION

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

March 1, 2001

James C. Duck
Chief, Planning Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

In accordance with the Fiscal Year 1999 Transfer Fund Agreement between the Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers (Corps), Jacksonville District, the Service is providing the enclosed draft Fish and Wildlife Coordination Act (FWCA) report on the Alternate Test Beach Renourishment Project. The Corps requested an evaluation on the environmental effects of securing and placing fill material on 1.5 miles of public beach, Miami Beach, Florida. This report is submitted in accordance with the Fish and Wildlife Coordination Act of 1956, as amended (16 U.S.C. 661 *et seq.*).

By copy of this letter, the Service is providing an opportunity for the National Marine Fisheries Service, the Florida Fish and Wildlife Conservation Commission, and the Florida Department of Environmental Protection to comment on this draft FWCA report.

If you have any questions, please contact Trish Adams at (561) 562-3909, extension 232.

Sincerely yours,

Robt J. Lee for

James J. Slack
Field Supervisor
South Florida Ecological Services Office

Enclosures

cc:
NMFS, Habitat Conservation Division, St. Petersburg, Florida
NMFS, Protected Resources Division, St. Petersburg, Florida
EPA,West Palm Beach, Florida
FWC, Tallahassee, Florida (Robin Trindell)

FDEP, Tallahassee, Florida (Keith J. Mille)
Miami-Dade County DERM, Miami, Florida (Stephen Blair)
Service, Jacksonville, Florida (Sandy MacPherson)
Service, Raleigh, North Carolina (Tracey Rice)

# DRAFT

# FISH AND WILDLIFE COORDINATION ACT REPORT

# MIAMI-DADE COUNTY BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT

## ALTERNATE TEST BEACH RENOURISHMENT MIAMI BEACH, FLORIDA

## MIAMI-DADE COUNTY

Submitted to: U.S. Army Corps of Engineers, Jacksonville, Florida
Prepared by: Trish Adams, Project Biologist
Approved by: James J. Slack, Field Supervisor

---

U.S. Fish and Wildlife Service
South Florida Ecological Services Office
Vero Beach, Florida

March 2001

TABLE OF CONTENTS

## EXECUTIVE SUMMARY

The proposed site is located along between 83 rd and 63 rd Streets (DEP monuments R-36 to R-47) in northern Miami Beach, Miami-Dade County, Florida. The total volume of fill is expected to be approximately 600,000 cubic yards and will extend along approximately 1.5 miles of shoreline. Renourishment material will be obtained from an unspecified upland sand source; therefore, dredging offshore will not be required for this project. However, there have been changes with respect to how the material will be transported and deposited on the beach since our preliminary draft Fish and Wildlife Service Coordination Act (FWCA) Report was submitted in September 1999. Comments addressing those changes are provided in this draft FWCA Report. The Service will provide a final FWCA Report after review of the forthcoming Environmental Assessment.

Offshore hard bottom/live rock habitat in the project vicinity is found to be significant, as defined by the Service's Mitigation Policy. Anticipated direct impacts to the offshore hardbottom habitat are restricted to the hardbottom communities within the slurry pipeline corridor. The proposed alignment was identified through habitat surveys to be the least damaging alignment. Actual pipe placement will be micro-sited by Miami-Dade County biologists. Mitigation for unavoidable impacts is targeting in-kind habitat through artificial reef modules at a 1 to 1 square meter footprint ratio. The Service supports this mitigation as proposed. Shore deposition of the sand slurry may affect biological resources, including nearshore hardbottom. Past experience indicates that turbidity is not expected to be generated at the offshore pump station. The Corps of Engineers (Corps) has proposed an extensive turbidity/sedimentation monitoring program that includes monitoring stations throughout the project area. The Service believes the monitoring program, to be conducted by Miami-Dade County, will help protect natural resources in the project area.

The Corps is proposing artificial reef modules, designed in part by Miami-Dade County biologists, for mitigation in this project. The actual additional surface area provided by the reef modules, over and above the base footprint 1:1 mitigation, may provide the additional compensation which would be required through temporal loss calculations. We recommend that the Corps evaluate this scenario, and provide additional mitigation if evidenced by an uncompensated temporal loss.

The Corps has determined that the Biological Opinion dated October 24, 1996, for Region III of the Coast of Florida Erosion and Storm Effects Study includes the project area considered for the proposed renourishment and that the "Reasonable and Prudent Measures" and "Terms and Conditions" apply to the proposed renourishment. The Corps plans to incorporate these requirements into the project plans and specifications and any contracts as appropriate. Service guidance on section 7 Endangered Species Act (ESA) consultations on sea turtles has been revised and has resulted in project specific changes in the "Reasonable and Prudent Measures" and "Terms and Conditions" of the Coast of Florida Biological Opinions (FWCA Report appendix). The Service has provided recommendations for revising the Corps' current sand

specifications in order to ensure suitable beach material is utilized. Continued consultation under section 7 is necessary to address these sand suitability issues as they relate to sea turtles. Additionally, consultation should be initiated for possible effects to any listed species associated with the upland borrow site(s) and sand transport and loading.

Comments regarding the preliminary draft FWCA Report were received from the National Marine Fisheries Service (NMFS), Habitat Conservation Division, on July 14, 2000. In their letter, NMFS included a recommendation to conduct an updated post-Coast of Florida Study benthic survey of the nearshore area to ensure that no hard bottom habitat will be affected. NMFS also expressed concern regarding assurances that sand material will be of suitable quality for beach deposition. Miami-Dade County has not, at this time, undertaken a recent nearshore survey of this project area, but plans to provide this information in the near future (B. Flynn, pers.com. 2001). The Service supports the NMFS concerns.

# I. INTRODUCTION

Nourishment of the Atlantic shoreline of Miami-Dade County was authorized by the Flood Control Act of 1968, and referred to as the Beach Erosion Control and Hurricane Protection Project (BEC&HP). The original BEC&HP encompassed approximately 10.5 miles of shoreline extending from Government Cut north to the northern boundary of Haulover Beach Park. The Supplemental Appropriations Act of 1985, and the Water Resources Development Act of 1986 (Public Law 99-662), provided authority for extending the northern limit of the authorized BEC&HP to include the construction of a protective beach along an additional 2.5 miles of shoreline north of Haulover Beach (Sunny Isles) and for periodic renourishment of all the BEC&HP beaches. This authority also provided for the extension of the period of Federal participation in the cost of nourishing the modified BEC&HP from 10 years to 50 years, which is the life of the BEC&HP. The beaches in the City of Miami Beach, Florida, were initially nourished in 1978, renourished in 1980, 1987, 1994, 1997, and scheduled for renourishment again in 2002.

The project, as originally proposed in 1997 by the Corps, called for the use of imported oolitic aragonite as a test of material for use in beach renourishment particularly in areas where offshore borrow sites are nearly exhausted. However, in the Conference Report for FY 1999 appropriations, Congress directed that no funds provided for the Miami-Dade County Project shall be used for the acquisition of foreign source materials for the project unless the Secretary of the Army provides written certification to the Committees on Appropriations that domestic sources of material are not available. Due to these circumstances, the Corps changed the source material from aragonite to an unidentified domestic upland sand source which would be transported and deposited by dump trucks. The Service submitted a preliminary draft Fish and Wildlife Coordination Act (FWCA) Report to the Corps in September 1999. Currently, a revised transportation and deposition plan calls for the material obtained to be transported, loaded and barged offshore where it will be saturated, then pumped through a fixed slurry pipeline to the beach.

The beach in the vicinity of 63rd Street between DEP monuments R-44 to R-46A (a portion of this Alternate Test Beach project) is experiencing accelerated erosion and may not provide hurricane and flood protection of shoreline structures until the scheduled renourishment for this project. As an interim measure, the Corps proposes to renourish this 2,800 feet of shoreline in the vicinity of 63rd Street. Material for the 63rd Street project will be obtained from offshore borrow areas and will be transported through the same slurry pipeline corridor proposed for this project. The Service submitted a final FWCA Report for the 63rd Street project to the Corps in February 2001. The purpose of this draft FWCA Report is to assess the impacts to existing fish and wildlife resources in and adjacent to the Corps proposed beach renourishment. The Service has evaluated the study area and provides comments on project impacts, including recommendations for conservation measures.

## II. DESCRIPTION OF STUDY AREA

Miami-Dade County is a heavily populated county on Florida's Atlantic coast and receives a tremendous volume of tourists, particularly during the winter months. Those beaches which can be accessed by the general public are heavily used year round. Those beaches which are associated with condominiums, apartments, and hotels have more restricted access for the general public, but receive use from the many visitors who frequent these facilities as well as those members of the general public who walk or jog along the beachfront.

The beaches in Miami Beach have public access and receive heavy use by swimmers and sunbathers. Adjacent to these beaches are many condominiums and hotels used by long term and short term visitors and residents of the area. Other water related activities within the project area include onshore and offshore fishing, snorkeling, SCUBA diving, wind surfing, and recreational boating. Most of the boating activity in the area originates from either Bakers Haulover Inlet or Government Cut. Both offshore fishing and diving occur on the natural and artificial reefs located within and adjacent to the project area.

## III. PROJECT DESCRIPTION

The proposed action is the placement of about 600,000 cubic yards of material along the beach in the northern Miami Beach between 83rd and 63rd street (Figures 1a and 1b). The beach fill would cover approximately 1.5 miles of shoreline from DEP monument R-36 to R-47. The beach will have a berm width of 205 feet from the Erosion Control Line (ECL) at an elevation of +9 feet mean low water (MLW), with a construction tolerance of +/- 0.5 feet. The front slope of the fill will be 1 vertical on 15 horizontal. A 50-foot wide access corridor is proposed for placement of the pipeline to pump sand to the beach (Figure 2).

## IV. FISH AND WILDLIFE RESOURCES

Fish and wildlife resources that could be affected by this project include the upper beach zone, which serves as nesting habitat for four species of sea turtles; any nearshore rock outcrops, which could be damaged by placement of the sand-slurry pipeline and/or nourishment material coverage; and offshore coraline reefs, which could be damaged by pipeline scraping or crushing.

### A. Community Descriptions

Beach zone

Florida has approximately 744 miles of beaches, mainly along the shorelines of barrier islands. Wind and waves are constantly changing the shape of barrier islands and their beaches. On the east coast of Florida, general patterns of sand transport or littoral drift have been well documented. During winter, net littoral drift is to the south; whereas, during summer, the net transport of sand may retreat slightly to the north if southeasterly winds prevail. Inlets inhibit

littoral drift. As a result, beaches on the up-drift or north side of these inlets accumulate sand, while those on the down-drift side are deprived of this sand.

Florida's beaches function as nesting habitat for four species of federally listed sea turtles: the threatened loggerhead turtle (*Caretta caretta*) as well as the endangered green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*) and hawksbill turtle (*Eretmochelys imbricata*). Approximately 40 percent of all loggerhead nesting occurs in the southeastern United States, primarily in Florida. Nesting beaches in Miami-Dade County experience considerable anthropogenic impacts from public use of the beaches. As a result, Miami-Dade County has initiated a program that relocates nests to more isolated beaches and fenced areas.

The beaches of Miami-Dade County are typical of other Atlantic Coast beaches in Florida that are subject to the full force of ocean waves. Sandy bottom beaches are populated with small, short-lived infauna with high species density and substantial reproductive potential and recruitment. Common species include haustoriid amphipods, decapod crustaceans, bivalves, and spionid worms. These beaches usually have low species diversity, but populations of individual species are often very large. Species such as ghost crabs (*Ocypode quadrata*), mole crabs (*Emerita talipoda*), and polychaetes are highly specialized to survive in this high-energy environment.

Thirteen species of birds nest on Florida's beaches, generally between April and August. All nest on the ground, with the nest consisting of a scrap in the sand. Nesting shorebird populations in Florida have declined due to loss of beach habitat to real estate development. On the remaining few natural nesting beaches, human visitors disrupt nesting birds.

Reefs

Florida is endowed with several reef types: subtropical coral reefs, live bottom communities, nearshore sabellariid worm (*Phragmatopoma lapidosa*) reefs, vermetid reefs, and deep-water *Oculina varicosa* reefs.

Coral reefs are best developed in the United States in south Florida. Most of the Florida Keys' coral reefs are well known due to the clarity of the water and the popularity of SCUBA diving. Farther north, through Miami-Dade and Broward Counties on the east coast and Collier County on the west coast, water clarity and temperature declines, as do reef-building corals. Continuing north, hard corals are fewer, and "live rock" communities are more prevalent. Live rock communities within the project area are populated by sponges, small (ahermatypic) hard corals, tunicates, bryozoans, algae, and sabellariid worms. Live rock communities typically, are also more common in or near the high energy surf zone.

Sabellariid worms can dominate the reef community and form a unique live rock reef type known as "worm rock." These are most often formed in high-energy surf zones particularly between Martin and Brevard counties on the east coast. Such reefs are composed of sand particles loosely

cemented together by a mucus secreted by the worms when building their casing. *Oculina* reefs occur in depths greater than 100 feet and are found from St. Lucie County to Jacksonville. Intertidal vermetid reefs off the Ten Thousand Islands are a remnant of structures formed by the reef-building gastropod, *Petaloconchus* spp.

The reefs of the project area can be classified as live bottom or live rock communities with scattered hard coral. The South Atlantic Fishery Management Council has developed a Fishery Management Plan (FMP) for Coral, Coral Reef, and Live/Hard Bottom Habitats of the South Atlantic Region. Furthermore, damaging, harming, and killing of live rock is prohibited by the current FMP and all harvesting of live rock has been prohibited since January 1, 1996.

The extent of reefs is well known in Miami-Dade, Broward, and Palm Beach counties because the sea floor out to the 60-foot depth contour has been mapped with side-scan sonar by the Corps (Continental Shelf Associates, 1993). Other mapped areas include Venice Beach in Sarasota County, Hutchinson Island in Martin County, and Vero Beach in Indian River County. Nevertheless, with deeper reef areas taken into account, the Service estimates that less than one percent of areas statewide, which may contain live rock communities, have been mapped. Reefs in Miami-Dade County and specifically those reefs east of the proposed beach renourishment are typical of the classical reef profile described for southeast Florida. In addition to any nearshore high energy reef, the inner reef is in approximately 15 to 25 feet of water, the middle patch reef is in about 30 to 50 feet of water, and the outer reef is in approximately 60 to 100 feet of water. The composition of the hardground biological assemblages along Florida's east coast has been detailed by many authors (Goldberg 1970, 1973; Marszalek and Taylor 1977; Continental Shelf Associates, Inc.1984, 1985, 1987, 1993). Although the reefs in the project area and those north of Government Cut support a large variety of hard coral species, these corals are no longer actively producing the reef features seen there. The reef features seen north of Government Cut have been termed "gorgoniod reefs" (Goldberg, 1970; Raymond and Antonius, 1977). Blair and Flynn (1989) described the reefs and hardbottom communities off Miami-Dade County and compared them to the offshore reef communities from Broward and Palm Beach Counties. They documented a decrease in the hard coral species density moving northward from Miami-Dade County to Palm Beach County.

Borrow site

Location of the upland sand source has not been verified at this time.

B. Important Species and Taxa

Epibiota

Reef fauna may be divided into sessile and motile components. The sessile component contains the primary producers, some grazers or first order consumers, planktivores, and filter feeders. Hard corals occupy niches as both producer and consumer. Zooxanthellic algae within coral

polyps photosynthesize while the polyps themselves capture planktonic organisms for consumption. As with the hard corals, carbon fixed far offsite is also concentrated on the reefs by tunicates, sabellariid worms, and sponges. These attached filter-feeding organisms contribute to the organic base by trapping nutrient-rich plankton as it is swept past the reef by wave and wind generated currents. Tunicates, sponges, and sabellariid worms add structure to the reef, providing shelter from predation for the numerous fishes of the reef.

Fishes and motile invertebrates

Fish and motile invertebrates are attracted to the reef by its structure. The numerous crevices, holes, undercut ledges, and epibiotic structure provide these organisms with a refuge from larger predatory fish. The reef also provides a barrier to currents and substrate for attaching demersal eggs. In addition to these features, the sessile organisms of the reef provide a large diverse food base on which some fish species feed directly. Others benefit from this indirectly by feeding on invertebrates and other smaller fish which are nurtured by sessile plant material.

The "food fish" species observed on Miami-Dade County reefs include hogfish *(Lachnolaimus maximus)*, porkfish (*Anisotremus virginicus*), gray snapper (*Lutjanus griseus*), spadefish (*Chaetodipterus faber*), gag grouper (*Mycteroperca microlepis*), and gray triggerfish (*Balistes carpiscus*). Species such as the gray snapper use shallow nearshore reefs as a staging area before recruitment into the offshore commercial and recreational fishery (Stark and Schroeder 1970). All reef fish species are ecologically or scientifically important and some value to recreational divers. Many species are collected for aquariums, such as angelfish (Pomacanthidae), butterflyfish (Chaetodontidae), wrasses (Labridae), damselfish (Pomacentridae) and doctorfish (Acanthuridae).

The spiny lobster (*Panulirus argus*) is the most popular fishery of the nearshore reefs. After spending its early post-larval life stages in estuarine habitats, young lobsters move to the nearshore reefs, where they may spend a good part of their adult lives. Many of these adults move further offshore seasonally (Lyons *et al.* 1981).

Other motile invertebrates include sea urchins, conch, octopus, polychaetes, and decapod crustaceans, which include penaeid shrimp (*Penaeus* spp.), portunid crab (*Portunus* spp.), stone crab (*Menippe mercenaria*), and spiny lobster. Crustaceans consume sessile and epiphytic algae and are, in turn, consumed by higher predators such as grunts (Pomadasydae) and snappers (Lutjanidae) (Odum 1969). Gastropods graze on algae, thereby passing nutrients and energy produced on the reef up the food chain. Predators of gastropods include other invertebrates, such as the spiny lobster.

Sea turtles

Miami-Dade County supports a small percentage (0.6 percent) of Florida's total sea turtle nesting (Meylan *et al.* 1995). Four species are known to nest in Miami-Dade County. The loggerhead

sea turtle constitutes by far the largest percentage (approximately 95%) of Miami-Dade County's total nesting activity, with an average of 400 loggerhead nest constructed each year. Small numbers of green and leatherback turtle nests are also present. The Service believes recommendations based upon the Service's Biological Opinion for the Coast of Florida Study, Region III are valid for this project. A summary of the Reasonable and Prudent Measures of the October 24, 1996 Biological Opinion are: (1) substantial monitoring of compaction will be conducted and appropriate corrective actions will be taken, if needed; (2) relocation of nests will be required during periods of nesting activity; (3) escarpments will be leveled, if they occur; and (4) only beach quality sand suitable for sea turtle nesting shall be used. The Corps plans to incorporate these, with Terms and Conditions, as requirements into the project plans and specifications and any contracts as appropriate. It should be noted that Service guidance on section 7 (ESA) consultations on sea turtles has been revised with minor changes in the Reasonable and Prudent Measures and Terms and Conditions of the Coast of Florida BO (see FWCA Report appendix).

The Service has provided recommendations for revising the Corps' current sand specifications in order to ensure suitable beach material is utilized. Continuing consultation under section 7 is necessary to address these sand suitability issues as they relate to sea turtles. Additionally, consultation should be initiated for possible affects to listed species associated with the upland borrow site(s) and possibly the West Indian manatee, depending on sand transport plans.

## V. DISCUSSION

Potential impacts of the proposed beach nourishment include those to the upper beach zone, surf zone, any nearshore high energy reefs, and offshore hardbottom reefs. Impacts may include burial from actual fill placement, burial and suffocation from turbidity generated from surf zone washing of the fill material, burial and suffocation from turbidity generated from transfer of sediment from barge to slurry pipeline, and scarring damage to the hardbottom reefs from the slurry pipeline. Also warranting research and consideration are cumulative effects from past renourishment projects such as changes in beach composition, increased turbidity, and compaction of the existing beach material.

### Service Mitigation Policy

In developing the Service's Mitigation Policy (Federal Register 46 (15), Pg. 7656), the definition of mitigation contained in the Council on Environmental Quality's National Environmental Policy Act regulations (40 CFR 1508.20[a-e]) was used. As such, mitigation can include:

1. avoiding the impact all together by not taking a certain action or parts of an action;

2. minimizing impacts by limiting the degree of magnitude of the action and its implementation;