

U.S. Army Corps of Engineers, Jacksonville District. September 1994. Tampa Harbor - Big Bend Channel. Draft Feasibility Report and Environmental Assessment.

Taylor Biological Company. July 1973. *Biological Studies and Inventory Tampa Harbor - Florida Project.*

U.S. Army Corps of Engineers, Jacksonville District. July 1986. Tampa Harbor, Florida. General Design Memorandum. Branch Channels.

U.S. Army Engineer Waterways Experiment Station. October 1983. *Tampa Bay Dredged Material Disposal Site Analysis.*

United States Department of the Interior Geological Survey. 1980. *Preliminary Simulated Tidal Flow and Circulation Patterns in Hillsborough Bay, Florida.*

U.S. Department of the Interior Fish and Wildlife Service. December 1984. *Tampa Bay Environmental Atlas.*

U.S. Department of the Interior Fish and Wildlife Service. September 1988. *The Ecology of Tampa Bay, Florida: An Estuarine Profile.*

Department of the Army Jacksonville District, Corps of Engineers Jacksonville, Florida. April 1980. *Navigation Study for Tampa Harbor, Big Bend Channel, and Alafia River, Florida. Reconnaissance Report - 10128 (Stage I).*

Springer and Woodburn. January 1960. *An Ecological Study of the Fishes of the Tampa Bay Area.*

United States Geological Survey Water-Supply Paper 2282. 1987. *Tidal-Flow, Circulation, and Flushing Changes Caused by Dredge and Fill in Tampa Bay, Florida.*

Tampa Bay Management Study Commission, Tampa Bay Regional Planning Council. *The Future of Tampa Bay.*

United States Department of the Interior Fish and Wildlife Service. Fishery Bulletin, Volume 65 No. 2.

U.S. Environmental Protection Agency. April 1995. *Final Environmental Impact Statement for the Designation of an Ocean Dredged Material Disposal Site Located Offshore, Tampa, Florida.*

U.S. Army Corps of Engineers, Jacksonville District. 1995. Draft Dredged Material Management Plan, Tampa Harbor.

U.S. Fish and Wildlife Service, December 1998. Fish and Wildlife Coordination Act Report, *Tampa Harbor – Alafia River Navigation Channel, Feasibility Study, Hillsborough County, Florida.*

APPENDIX I

COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIO

## COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS.

1. **National Environmental Policy Act of 1969, as amended.** Environmental information on the project has been compiled and the Environmental Assessment is available for review by the public in compliance with Regulation 33 CFR Parts 335-338. These regulations govern the Operations and Maintenance of U.S. Army Corps of Engineers Civil Works Projects involving the Discharge of Dredged or Fill Material into Waters of the US or Ocean Waters. Public Notice PN-SP-193 dated 7 November 1994 was issued soliciting comments from all interested parties (Appendix IV). A second public notice PN-CO-HIL-254 dated 8 June 2001 was issued for the placement of material in Harbor Isle Lake from the Tampa Harbor Navigation Project. A public notice PN-TH-222 dated 17 July 1998 was also issued for restoration of the seagrass beds at the MacDill Hole. Information and issues received from these responses and meetings are used in preparation of the environmental assessment. This public coordination and environmental impact assessment complies with the intent of NEPA. The process will fully comply with the Act once the Finding of No Significant Impact has been signed by the District Commander.

2. **Endangered Species Act of 1973, as amended.** The USFWS concluded that the dredging in Tampa Harbor work would not likely jeopardize the continued existence of the manatee, if the Standard manatee protection conditions are implemented by letter dated 17 May 1997. A Biological Opinion dated Mar 25 1997 was issued by the US Fish and Wildlife Service for impacts on manatee as part the Alafia River Navigation Project Feasibility Study for impacts at the MacDill Hole. Consultation with the National Marine Fisheries Service was conducted by letter dated April 20, 1994, requesting a concurrence in a "No effects" determination. Consultation with the National Marine Fisheries Service for dredging in the entrance area of Tampa Bay was conducted by letter dated April 24, 1995. They issued a Biological Opinion by letter dated June 2, 1995, for the use of hopper dredges. Since this project is within this area it is being adopted for this project. This project was fully coordinated under the Endangered Species Act; therefore, this project is in full compliance with the Act.

3. **Fish and Wildlife Coordination Act of 1958, as amended.** The project has been coordinated with the USFWS during the public notice period. No response was received.

4. **National Historic Preservation Act of 1966, as amended (PL 89-665).** The State Historic Preservation Officer responded to a request for a cultural resources assessment by letter dated 22 December 1994. The SHPO stated that a review of the Florida Site File indicates that no significant archeological or historical sites are recorded for or likely to be present in the project area. Because of the nature of the project it is likely that any such sites would be affected. Therefore, in the opinion of the SHPO, there would be no effect on historic properties listed on or eligible for listing on the National Register of Historic Places. Coordination with the SHPO is in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, the Archeological and Historic Preservation Act, and Executive Order 11593.

5. **Clean Water Act of 1972, as amended.**

5.1. Section 401. (Water Quality) A Florida Department of Environmental Protection (DEP) Water Quality Certificate (WQC) has been issued for the maintenance dredging of this area and to allow placement of material in the hole. A modification of this certificate has been requested to allow dredged material to be placed in the Harbor Isle lake even though it has previously been authorized in conjunction with dredging at St Petersburg Harbor. State water quality standards will be adhered to during construction. The project will cause temporary increases in turbidity where dredging is taking place and at the disposal site. The Florida water quality regulations require that water quality standards not be violated during dredging operations. The standards state that turbidity outside the designated mixing zone shall not exceed 29 NTU's above background. Various protective measures and monitoring programs will be conducted during construction to ensure compliance with State water quality standards. Should monitoring determine that the State turbidity standards have been exceeded, the contractor will be required to cease operations until conditions return to normal.

5.2. Section 404. The public notice also meets the requirements of the Clean Water Act.

6. **Clean Air Act of 1972, as amended.** No air quality permits will be required for this project. Therefore, this Act would not be applicable.

7. **Coastal Zone Management Act of 1972, as amended.** The project has been evaluated in accordance with Section 307 of the Coastal Zone Management Act. It has been determined that the project would have no unacceptable impacts and would be consistent with the Florida Coastal Zone Management Plan. In accordance with the 1979 Memorandum of Understanding and the 1983 Addendum to the Memorandum concerning acquisition of water quality certifications and other State of Florida authorizations, the Draft Environmental Assessment, Coastal Zone Consistency Determination and Section 404(b)(1) Evaluation are being submitted to the State to show consistency with the Florida Coastal Zone Management Plan. The Department of Community Affairs representing the Florida State Clearinghouse has reviewed the public notice and has determined that the project is consistent with Florida Coastal Zone management Program by letter dated 4 June 2001. Final state concurrence is issued concurrently with the issuance of the Water Quality Certification.

8. **Farmland Protection Policy Act of 1981.** No prime or unique farmland will be impacted by implementation of this project. This act is not applicable.

9. **Wild and Scenic River Act of 1968, as amended.** No designated Wild and Scenic river reaches will be affected by project related activities. This act is not applicable.

10. **Marine Mammal Protection Act of 1972, as amended.** Incorporation of the safe guards used to protect manatees during dredging and disposal operations will be implemented during construction, therefore, this project is in compliance with the Act.

11. **Estuary Protection Act of 1968.** No designated estuary will be affected by project activities. This act is not applicable.

12. **Federal Water Project Recreation Act, as amended.** There is no recreational development proposed for maintenance dredging or disposal. Therefore, this Act does not apply.

13. **Resource Conservation and Recovery Act of 1976, (PL 94-580; 7 U.S.C. 100, et seq.** This law has been determined not to apply as there are no items regulated under this act being disposed of or affected by this project.

14. **Toxic Substances Control Act of 1976, (PL 94-469; U.S.C. 2601, et seq.** This law has been determined not to apply as there are no items regulated under this act being disposed of or affected by this project.

15. **Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1401 et seq.** There would be no discharge in an area regulated by this Act.

16. **E.O. 11990, Protection of Wetlands.** No wetlands will be affected by project activities. This project is in compliance with the goals of this Executive Order.

17. **E.O. 11988, Floodplain Management.** No activities associated with this project will take place within a floodplain, therefore this project is in compliance with the goals of this Executive Order.

18. **E.O. 12898, Environmental Justice.** This project has been evaluated in accordance with the subject E.O. The project would not result in adverse human health or environmental effects. There would be no impacts on subsistence consumption of fish or wildlife from this project. Therefore, the work would comply with this E.O.

19. **Essential Fish Habitat, Magnuson-Stevens Fishery Conservation and Management Act.** The affects of the existing federal navigation project have been identified in the Environmental Assessment. The effects on EFH have coordinated with the NMFS through the public notice for the MacDill Seagrass Bed Restoration. No response was received. The Harbor Isle Lake is exempt from this Act.

## **APPENDIX II**

### **ENDANGERED SPECIES CONSULTATION**

file

April 20, 1994

Planning Division  
Environmental Branch

Mr. David L. Ferrell  
Field Supervisor  
U.S. Fish and Wildlife Service  
P.O. Box 2676  
Vero Beach, Florida 32961-2676

Dear Mr. Ferrell:

This is in reference to the upcoming maintenance dredging of the St. Petersburg Harbor in Tampa Bay, Florida (see attached maps).

According to the U.S. Fish and Wildlife Service, Region 4 Handbook, *Endangered and Threatened Species of the Southeastern United States*, the following species could be found in Tampa Bay:

green sea turtle . . . . .	<i>Chelonia mydas</i>
hawksbill sea turtle . . . . .	<i>Eretmochelys imbricata</i>
Kemp's Ridley sea turtle . . . . .	<i>Lepidochelys kempii</i>
leatherback sea turtle . . . . .	<i>Dermochelys doriacea</i>
loggerhead sea turtle . . . . .	<i>Caretta caretta</i>
West Indian manatee . . . . .	<i>Trichechus manatus</i>

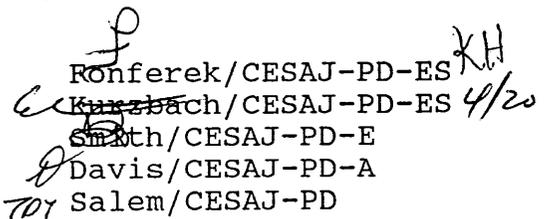
Since no food or habitat for manatees and sea turtles is located in or adjacent to the dredging area, we have made a No Effects determination concerning the impacts of the proposed dredging on these species. In addition, we will place the standard special conditions in the Plans and Specification to protect the manatees should they wander into the construction area. Pursuant to Section 7 of the Endangered Species Act, we are asking for your concurrence in this determination.

Sincerely,

A. J. Salem  
Chief, Planning Division

Enclosure

bcc:  
CESAJ-CO-ON  
CESAJ-DP


  
 Ronferek/CESAJ-PD-ES KH  
 Kurzbach/CESAJ-PD-ES 4/20  
 Smith/CESAJ-PD-E  
 Davis/CESAJ-PD-A  
 707 Salem/CESAJ-PD



# United States Department of the Interior

FISH AND WILDLIFE SERVICE

P.O. BOX 2676

VERO BEACH, FLORIDA 32961-2676

May 17, 1994

Colonel Terrence Salt  
District Engineer  
U.S. Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, FL 32232-0019

Attn: Planning Division

FWS Log No.: 4-1-94-371

Dear Colonel Salt:

This responds to your letter of April 20, 1994, regarding the upcoming maintenance dredging of the St. Petersburg Harbor in Tampa Bay, Florida, in accordance with Section 7 of the Endangered Species Act of 1973, as amended.

The Corps of Engineers has determined that this action would have "no effect" on the West Indian manatee. Due to the limited impact this project is expected to have on the manatee and since the Corps of Engineers has assured us that all standard manatee conditions will be adhered to during the operation, we find the project is not likely to adversely affect the manatee. Similarly, due to the absence of known sea turtle nesting habitat in proximity to the project area, the Service finds the project is not likely to adversely affect threatened and endangered sea turtles.

If standard measures for protection of manatees cannot be implemented for any reason, this finding would be invalid and your agency would be required to reinstate consultation with the Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act.

Although this does not constitute a Biological Opinion described under Section 7 of the Endangered Species Act, it does fulfill the requirements of the Act and no further action is required. If modifications are made to the project or if additional information involving potential impacts to listed species becomes available, please call our office at (407)562-3909.

Sincerely yours,

David L. Ferrell  
Field Supervisor



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
6620 Southpoint Drive South  
Suite 310  
Jacksonville, Florida 32216-0912

MAR 25 1997

A.J. Salem  
Chief, Planning Division  
U.S. Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

In accordance with the Fiscal Years 1996-97 Transfer Fund Agreement between the Fish and Wildlife Service and the Jacksonville District Corps of Engineers, this letter transmits the Draft Coordination Act Report and biological opinion on the proposed Alafia River Main Shipping Navigation Channel Expansion Project, Hillsborough County, Florida. Figures will be included in the final report.

We look forward to your comments.

Sincerely,

Michael M. Bentzien  
Assistant Field Supervisor

**TAMPA HARBOR-ALAFIA RIVER  
NAVIGATION CHANNEL  
FEASIBILITY STUDY  
HILLSBOROUGH COUNTY, FLORIDA**

**Fish and Wildlife  
Coordination Act Report**

**DRAFT REPORT**

Submitted to:  
Department of the Army  
Jacksonville District Corps of Engineers  
Jacksonville, Florida

Submitted by:  
Department of the Interior  
U. S. Fish and Wildlife Service  
Ecological Services  
Jacksonville, Florida

FEBRUARY 1997

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## **1.0 Introduction**

The purpose of this study is to assess and recommend minimization of impacts to existing fish and wildlife resources in and adjacent to the U.S. Army Corps of Engineers (Corps) proposed expansion of the Alafia navigation channel in Hillsborough County, Florida. The U.S. Fish and Wildlife Service (Service) has evaluated the study area and commented on project impacts, beneficial use for spoil material, and prepared a biological opinion for the Florida manatee. This study is authorized under Section 933 of the Water Resources Development Act of 1990.

## **2.0 Project Description**

The 3.6-mile Alafia channel is a federally maintained project which has a depth of 30 feet mean low water (mlw), and a width of 200 feet, with a turning basin of 700 feet wide and 1200 feet long. Preliminary investigations indicate that the Alafia River channel is currently in single owner status. The Water Resources Development Act (WRDA) of 1990 provides for future federal maintenance of a 34-foot project, if the existing 30-foot project is deepened by an additional 4 feet at non-federal expense. The cost for deepening will be incurred by local interests.

In accordance with the guidelines set forth in the EM-1110-2-1613 (1983), channel width criteria are 2.8 times the width of a Design Vessel Beam. This would require an additional 4 feet in depth, and an additional 25 feet in width on either side to accommodate the average 85-foot vessel beam. Although some vessels are larger, current users of the expanded Big Bend channel (250 ft.) are experiencing no significant problems.

Various locations are offered for the disposal of dredge spoil materials in this report, as well as recommendations and rankings for each site. These include island renourishment options, filling of marine dredge scars and channels, upland disposal, and littoral creation. The Corps will make the final location determination.

## **3.0 Background**

The Tampa Harbor-Big Bend Channel Navigation Feasibility Study (which includes the Alafia River) was requested by the Tampa Port Authority, and authorized by Senate and House Resolutions adopted May 29, 1979, and November 14, 1979, respectively. The primary purpose of the Corps study was to determine the need and feasibility of widening and deepening the Alafia River navigation channel, as well as disposing of the spoil material. The final report was completed in January, 1991. Previous studies and reports on the Alafia River are listed in table 1.

Table 1  
 Prior Studies and Reports  
 On Alafia River, Florida

Study Type	Report Date	Recommendation Chief of Engineers	Congressional Documents			
			Type	No.	Congress	Session
PE	2/5/1889	unfavorable	-	-	-	-
PE	2/17/1931	unfavorable	-	-	-	-
S	8/1/1940	favorable	S	16	77	1
S	5/19/1949	favorable	H	258	81	1

PE= Preliminary Examinations

S= Surveys

H= U.S. House of Representatives Documents

S= U.S. Senate Document

Existing Federal water projects in the study area include Tampa Harbor, which also includes the Alafia River navigation channel. Tampa Harbor provides a 43-foot channel to public phosphate terminals located in East Bay and Hillsborough Bay.

#### 4.0 Project Area Description

Tampa Bay is Florida's largest open-water estuary, spanning almost 400 square miles, and receives drainage from a 2200-square-mile watershed. A rich mosaic of habitats exist, and are highly productive in terms of wildlife resources. It has been a designated National Estuary Program site since 1990. Historically, Tampa Bay has suffered significant tidal and freshwater wetland losses due to uncontrolled dredge and fill activities associated with a burgeoning population. This, in addition to nutrient loading from various point and non-point sources, overfishing, and irresponsible boating practices, has reduced the overall quality and quantity of water resources and wildlife habitat.

Hillsborough County is located in west central Florida and plays an integral part in the economy of the Tampa Bay region. Hillsborough Bay provides access and berthing facilities for international and national shipping firms which serve the phosphate, coal, and petrochemical industries. It is bounded on the east by Polk County, Tampa Bay on the south and southeast, and Pinellas County on the north and west. Historically, the bay has been plagued by contaminants. Urbanization and fertilizer runoff from berthing areas caused water quality degradation.

The geographical confines of the bay also contribute to the problem by restricting tidal flushing, hence the cleansing action of the bay. Water quality in the bay has improved significantly in recent years, as improvements in municipal waste water facilities, stormwater treatment, and industrial discharge are implemented (TNEP 1993).

The mouth of the Alafia River is located on the eastern shore of Hillsborough Bay approximately 6 miles south of the city of Tampa, just north of the town of Gibsonton. Nautically, it is located at mile 28 of the Tampa Harbor main shipping channel (figure 1). A map of the project area is shown in figure 2. The Alafia navigation channel connects the Alafia River to the main shipping channel in the middle of Tampa Bay. Two historic spoil islands exist (Sunken Island and Bird Island) just outside of the mouth of the river, and form the southern terminus of the channel. Two major spoil receptacles (islands 2D and 3D) built by the Corps, are located just to the north and south of the channel. A phosphate tailings stack is also located at the mouth of the Alafia on the north side of the channel.

#### Water and Sediments

Studies done by the Environmental Protection Commission of Hillsborough County (EPCHC), Manatee County, and Long et al. (1991), offer comprehensive information for stations near the proposed dredge area. EPCHC information for Hillsborough Bay is based on randomly sampled, 4.4 km<sup>2</sup> (11-acre) cells, to provide a bay "segment" perspective, versus exact locations on a yearly basis (S. Grabe, G. Blanchard, pers. comm. 1996). (Explanation of ratings and measurements given can be found in the EPCHC publication in the literature cited). Field work was done by biologists from the Service and EPCHC to provide the most current observations. Checkpoints were chosen based on the Corps proposed dredge areas, and were mainly in the shallows adjacent to the channel. No checkpoints occur in the channel itself, as access was limited and considered unsafe to dive. The following checkpoints describe the current conditions of the areas being considered for dredging and restoration:

Checkpoint number 1- approximately one-quarter mile west of the mouth of the Alafia River on the north side of the channel (Lat: 27.51.16N, Long: 82.24.43W) (figure 3). Sampling occurred at a depth of 3-feet. Water clarity was approximately 2-feet. A water quality rating of "poor" is given to the immediate mouth of the river (EPC 1996). Sediments extracted from the bay bottom appeared to be predominantly gray sand with some shell hash, silts and organics (figure 4). Observed aquatic species were Florida crown conch (*Melongena corona*) (figure 5), jellyfish, and tubeworms. Attached alga (*Gracilaria* spp.) were also present.





Checkpoint 2- directly across the channel on the south side and just north of Bird Island, (Lat:27.51.08N, Long: 82.24.41W). Sampling occurred in 2.5-feet of water. Water clarity was approximately 2-feet. Water quality rated poor. Sediments extracted appeared sandy with minimal shell content, and dark with organics (figure 6). EPCHC sediment information for these exact sites is not available, however, information is available for sites in close proximity to the checkpoints. Amphipods were present in the sediment samples. Examination of the substrate revealed an absence of seagrasses, but the presence of algae. Unidentified tubeworms were abundant. A pod of bottlenose dolphins (*Tursiops truncatus*) were also spotted in the shipping channel near marker 10.

PCHC station HB36 (Lat: 27.86.0N, Long: 82.38.8W) is located in the general vicinity of the checkpoints above. Recorded measurements for 1995 at 1m depth are: 4.9% silts, 7.58 pH, dissolved oxygen of 0.81mg/l, and salinity of 19.4 ppt. A low measurement of fines in this location is atypical for the bay as a whole, and is possibly due to station location. Strong currents from passing ships and daily tides may disperse or resuspend fines from the area (S. Grabe, pers. comm. 1996).

Station HB19 (Lat:27.90.9N, Long: 82.47,45W) taken in 1993-94 for an upstream location, indicates a silt/clay content of 21.8%, and a dissolved oxygen level of 5.4 and 2.35 mg/l respectively, obtained at a depth of 3m. The elevated level of fines is more typical of shallow, minimally disturbed areas, or places near freshwater outfalls.

#### Dissolved Oxygen and Contaminants

Low dissolved oxygen content (DO) results from a shortage of oxygen in bay waters caused by the influx of excess nutrients, which may trigger algae "blooms". Their subsequent decomposition increases oxygen demand, and may result in stress or elimination of aquatic species. Additionally, accumulated contaminants in bay sediments from industry discharge and stormwater runoff renders portions of the bay unsuitable for wildlife habitat.

The EPCHC has conducted water quality monitoring since the mid-1970's. Results from 1986-1990 indicate deeper waters in lower Hillsborough Bay, and waters in the northern navigation channels have the lowest levels of dissolved oxygen. Station data taken from locations along the channel and in the mouth of the Alafia River indicate levels less than 5 mg/l, and are the lowest in Tampa Bay (Long et al. 1991).

Sediments near the mouth of the Alafia contain elevated levels of cadmium, chromium, lead, Hg, zinc, and PCB's (Long et al, 1991). This may result from activities occurring at the Cargill fertilizer plant. The combination of low DO and contaminant laden sediments, create a low -quality, and mostly unsuitable wildlife habitat.

In summary, this area consists of varying sediment size, depressed dissolved oxygen levels, and elevated contaminant content. We recommend a more thorough investigation of the sediments to be dredged. This will provide an in-depth evaluation for beneficial use of spoil material.

#### **5.0 Fish and Wildlife Resources**

On August 9, September 14 and 26, 1996, a Service biologist inspected the project area and areas adjacent to it. The purpose of these trips was to ascertain the impact of the proposed project on fish and wildlife resources, offer mitigation and management plans, and to evaluate locations for beneficial use of spoil material.

The areas immediately adjacent to the Alafia channel are comprised of spoil islands, saltwater shallows, mudflats, mangrove forests, and high and low saltmarsh. This landscape provides habitat for many aquatic and terrestrial species, both native, part-time resident, and passerine. The following is a discussion of the fish and wildlife resources, their status, and importance.

### Taxa and Important Species

#### Macroinvertebrates

The 10 dominant (dominance as determined by Windell 1971) benthic macroinvertebrates for Hillsborough Bay include 7 species of Polychaetes, one species of Bivalvia, one species of Amphipoda, and *Branchiostoma* spp. (TNEP 1996). Site-specific benthic composition data was obtained from sampling studies conducted by the EPCHC (Steve Grabe, pers. comm. 1996). Applicable sampling locations include station HB36 at the mouth of the Alafia, and HB19, upstream near the Cargill berthing area. Station HB36 was sampled in 1995 at a depth of one meter, and indicated a total of 7 species, including 3 species of amphipods, 3 species of isopods, and one species of decapod. Station HB19 was sampled in 1993 and 1994 at a depth of 3 meters, and indicated 29 species including 17 species of polychaetes, 2 species of molluscs, 2 species of amphipods, 2 species of decapods, 2 species of echinoderms, *Enteropneusta* spp., *Athenaria* spp., *Turbellaria* spp., and *Nemertea* spp. These species serve as an integral link of the Tampa Bay food chain, and provide nutrients for several aquatic and avian species.

Hillsborough Bay differed from other segments of Tampa Bay in that the cephalochordate *Branchiostoma* spp. was less abundant, while several polychaetes were significantly more abundant. Typically *Branchiostoma* spp. is a common inhabitant of relatively clean, sandy substrates. The presence of several polychaete species, especially *Mediomastus* spp. may indicate a fine, organically enriched substrate. This would agree with documented sediment and macroinvertebrate samplings in locations adjacent to the main channel. Dominant species of polychaetes present in Hillsborough Bay include species considered to be indicators of a perturbed environment (TNEP 1995, 1996).

#### Fish

Springer and Woodburn (1960) report 253 species of fishes in their study of Tampa Bay. Comp (1985) identified 125 species in Tampa Bay. EPCHC identified 36 species of fish from 88 trawls during the September/October 1993 survey period (TNEP 1996). The most abundant species were mojarras (*Eucinostomus argenteus* complex) (46.7%), pinfish (*Lagodon rhomboides*) (11.6%), and gaftopsail catfish (*Bagre marinus*) (7.2%). Fishes observed in the Alafia River in waters possessing greater than 10 ppt salinity include *Dasyatis* spp., *Lepisosteus* spp., ladyfish (*Elops saurus*), tarpon (*Megalops atlanticus*), *Brevoortia* spp., *Dorosoma* spp., thread herring (*Opisthonema oglinum*), scaled sardine (*Harengula jaguana*), lizardfish (*Synodus foetens*), hardhead catfish (*Arius felis*), toadfish (*Opsanus tau*), needlefish (*Strongylura* spp.), killifish (*Fundulus* spp.), mosquito fish (*Gambusia affinis*), sailfin molly (*Poecilia latipinna*), silversides (*Menidia* spp.), *Syngnathus* spp., *Prionotus* spp.,

*Centropomus* spp., mojarra, pinfish, *Cynoscion* spp., jack (*Oligoplites saurus*), silver perch, (*Bairdiella chrysoura*), spot (*Leiostomus xanthurus*), bumper (*Chloroscombrus chrysurus*), drum (*Sciaenops ocellatus*), *Menticirrhus* spp., mullet (*Mugil* spp.), flounder (*Ancyclopsetta quadrocellata*), and puffer (*Sphoeroides nephelus*) (CCI 1992). The occurrence of such a diverse assemblage of fish species indicates the importance of Tampa Bay and its tributaries as productive nursery grounds.

Hypoxic and anoxic conditions affect fish assemblages, with lower species diversity in areas of low DO. Catfish catch was considerably higher at stations with low oxygen levels, and this species may indicate degraded conditions. Based on documented low DO levels in the project area and Hillsborough Bay in general, it appears this species can tolerate environmental stress. Their presence may be based upon a shift in their prey to burrowing species. This would agree with study findings of several species of polychaetes in the study area. Other fish able to tolerate degraded water conditions include cobia (*Rachycentron canadum*), cownose ray (*Rhinoptera bonasus*), puffer, kingfish (*Menticirrhus americanus*), and lookdown (*Selene romer*), which appear almost exclusively in Hillsborough Bay (TNEP 1996).

#### Birds

A total of 83 species of birds are associated with marine habitats in Tampa Bay (Dunstan and Lewis (1974). Of significance to this project, adjacent spoil islands 2D,3D, and the Alafia Banks provide nesting habitat for 22 species of birds, including 10 state-designated "species of special concern", and 2 federally endangered species (see table 2). According to the National Audubon Society and the Florida Game and Fresh Water Fish Commission (GFC), these spoil islands serve as important breeding areas. The Alafia Banks are one of the nation's outstanding and most diverse bird colonies, as well as being ranked as Florida's number one colony. It appears the spoil islands provide desirable nesting habitat for many species due to substrate and vegetative conditions, and absence of humans. With appropriate management, these areas will continue to serve as breeding grounds for several species.

Table 2- Breeding Pairs of Alafia Bank and Tampa Port Authority Spoil Islands 2D and 3D for 1996 (National Audubon Society 10-96).

<u>Species</u>	<u>Alafia Bank</u>	<u>Island 2D</u>	<u>Island 3D</u>
Brown Pelican*	600		
Double-crested Cormorant	200		
Great Blue Heron	80		
Great Egret	80		
Snowy Egret*	200		
Little Blue Heron*	90		
Tricolored Heron*	230		
Reddish Egret*	45		
Cattle Egret	700		
Black-crowned Night Heron	50+		
Yellow-crowned Night Heron	50+		
White Ibis*	8100		
Glossy Ibis	525		
Roseate Spoonbill*	100		
Clapper Rail	+	+	
American Oystercatcher*	18	34	11
Willet	6+	10+	5+
Laughing Gull		500	3400
Caspian Tern			93
Royal Tern			180
Sandwich Tern			135
Black Skimmer*			320
Total Pairs	11,074	544+	4,144

#- designates federal listing

\*-designates state listing

Note: Gull-billed Terns and Least Terns#\* have nested on 2D and 3D in the past; not seen nesting there in 1996.

The following birds were observed in the project area: brown pelicans (*Pelecanus occidentalis*), laughing gulls (*Larus atricilla*), ring-billed gulls (*Larus delawarensis*), cormorants (*Phalacrocorax auritus*), roseate spoonbills (*Ajaia ajaja*), reddish egrets (*Egretta rufescens*), tricolored egrets (*Egretta tricolor*), snowy egrets (*Egretta thula*), great egrets (*Casmerodius albus*), little blue herons (*Egretta caerulea*), great blue herons (*Ardea herodias*), willets (*Catoptrophorus semipalmatus*), black-necked stilts (*Himantopus mexicanus*), ruddy turnstones (*Arenaria interpres*), white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), Caspian terns (*Sterna caspia*), sandwich terns (*Sterna sandvicensis*), black skimmer (*Rynchops niger*), American oystercatchers (*Haematopus palliatus*), and yellow-crowned night herons (*Nycticorax violaceus*).

The Service supports the conservation of migrating birds under the Migratory Bird Act of 1918, as amended (16 USC 703). The Migratory Bird Protection Policy (June 1994), created and implemented by the Jacksonville District of the U.S. Army Corps of Engineers and the Migratory Bird Protection Interagency Committee, also provides protection to nesting migratory bird species which commonly use dredged material disposal sites, while facilitating actual disposal of such. Included are conditions which address spoil placement activities with respect to the nesting season, and subsequent management strategies. These would also apply to beneficial use areas. We believe the implementation of the policies above will adequately protect avian species in the study area.

#### Sea Turtles

Marine sea turtles inhabit the Gulf of Mexico, and frequent Tampa Bay to forage. Species which occur are the Atlantic Green turtle (*Chelonia mydas*), the Loggerhead (*Caretta caretta*), Kemp's Ridley (*Lepidochelys kempii*), and the Leatherback (*Dermochelys coriacea*).

The Service regulates these species only while beach nesting. For this project, and others which impact the marine environment, the National Marine Fisheries Service should be contacted.

#### West Indian Manatee

The endangered West Indian manatee (*Trichechus manatus latirostris*) is found within the vicinity of the Alafia channel and berthing areas. One was observed in the field near the Alafia banks, along the north side of Bird Island, near channel marker 12. According to surveys done by the Florida Marine Institute, a small number of manatees travel north and south along the shoreline and mouth of the Alafia River year round. In the winter months, they travel between warm-water discharges at Port Sutton and Big Bend. They occur in the channel in larger numbers in the warmer months (B. Ackerman, pers. comm., 1996). Dredging and its effects on manatees are discussed further in the biological opinion at the end of this report.

#### Seagrass

Seagrass beds are important as they offer habitat to several fish species (red drum, spotted seatrout, spot, silver perch, sheepshead, and snook), invertebrates, algae, dolphin, and the manatee. Historically, Tampa Bay has lost much of its seagrass as a result of dredge and fill

activities, and degraded water quality associated with urbanization and industry discharge. Since 1950, losses equal approximately 15 thousand acres. A recent increase has been documented, and is attributed to improved bay water quality.

Seagrass beds of significant size do not exist in the immediate project area (main channel and 25-feet on either side). However, they do exist at the south sides of Sunken and Bird Islands, and north of the mouth of the river. Turbidity could be a problem at the islands due to their close proximity (R. Johansson, pers. comm., 1996).

## 6.0 Project Impacts

The Service has concerns regarding the impacts to the benthic community, existing seagrasses, sediment quality, and traveling manatees. According to past studies, the widening and deepening of this channel should cause only temporal mortality to stationary or slow-moving benthic invertebrates through suffocation or burial. Populations should return to original numbers within a few years (Nelson 1992). Motile species such as fish, will swim out of the area during dredging activities. Some species may initially suffocate during substrate removal due to suspended fine sediments. When dredging is completed, fish are expected to return within a relatively short period of time, pending water quality. Turbidity should be anticipated, and control measures taken to avoid impact to aquatic species.

Important sea grass beds in adjacent shallows need protection from direct impact, and associated turbidity. Actual dredging operations should not impact beds due to project location. However, burial and/or light reduction from suspended and settling sediments could cause mortality to grasses in the immediate and surrounding areas. Measures to prevent turbidity should be made a priority. If grasses are adversely affected, we recommend mitigation at a ratio of 2:1 to ensure replacement of the resource.

A major concern to the Service is the quality of bay sediments which occur in proposed dredge areas. Elevated contaminant levels such as metals, organic, and nutrients occur in Tampa Bay waters, and originate from both point and non-point sources (EPCHC 1996). These substances settle in bay bottom sediments, where they continue to degrade the surrounding habitat. The introduction of these sediments to otherwise healthy systems could be hazardous, and remains an issue of caution. Documentation of sediment characteristics for the shallows in the study area also indicate high levels of silts. We believe grain size dictates where and how the spoil material may be utilized. We recommend studies to determine sediment characteristics and contaminant levels to determine their effect on fish and wildlife resources.

Traveling manatees are documented to travel throughout the project area year round. Special conditions in addition to the standard precautions are recommended, and are included in the biological opinion.

## 7.0 Beneficial Use of Spoil Material

Large dredging projects in Tampa Bay have historically been the responsibility of the U.S. Army Corps of Engineers. Disposal of dredge spoil from past projects have been placed at upland spoil sites around the bay, or spoil islands such as 2D and 3D in Hillsborough Bay. Current spoil areas are rapidly reaching their capacity. Since alternate sites are not readily available in the area, the Corps is currently working to resolve the problem.

An alternative supported by the Corps is to utilize dredge spoil in ways beneficial to the environment. Quality spoil material would be placed in locations that would restore, enhance, or create wildlife habitat for terrestrial and aquatic species. Several meetings with interagency personnel, and various project reports from the Service and others, have addressed this issue. It appears a consensus regarding beneficial use exists, however, exact uses and locations are mostly undecided. The following is a description of sites currently under consideration for spoil material placement, and contains a variety of projects from a number of state and local agency personnel:

### Upland Disposal Islands 2D and 3D

These are man-made spoil islands approximately 500 acres in size, located one and a one-half miles offshore in Hillsborough Bay. The islands were constructed by the Corps, and are designed as spoil areas. The islands have become important as nesting areas for a variety of birds (see table 2). Spoil additions and enlargements are rare, and require specific timetables to avoid the nesting season (April-September). We support the previous recommendation to place the spoil at other sites, unless a critical situation exists at the islands (USFWS 1994).

### Alafia Banks

The Alafia banks include two islands, Sunken Island and Bird Island, and were created from the side-casting of dredge materials during channel construction in the late 1920's (Audubon 1993). Renourishment, creation of a cove, and the planting of vegetation has resulted in a mosaic of habitats. Mangrove swamps, upland beach flats, two interior creeks, mussel bars, salt terns, spartina marsh, and a sand bar just off the southeastern arm currently provide nesting and feeding areas for a variety of shore, wading, and migratory birds. This colony is one of the largest and most diverse in the U.S.

The western end of the chain suffers chronic erosion from major storm events or routine annual forces. Although nourishment has taken place through the years, erosion continues on the northwest and southwest corners of the islands. Accretion does occur at some sites, but does not balance erosional loss. Significant habitat loss has occurred in recent years. It is hoped the creation of additional shallows and shoreline will provide safe, undisturbed habitat to encourage increased nesting for threatened and endangered species.

Conceptual plans for spoil nourishment include the creation of a "shark's tooth" configuration in the current fishhook/cove area on the NW/SW side of the island. Desired ecotones are low uplands (4-6 feet), with a waterward slope to shallow lagoons. A large amount of spoil material would be necessary. Preliminary calculations indicate 15-25 acres would need filling at two or three placement points, as well as additional land contouring. Material would not be placed in areas of seagrass beds. This would provide a more diverse habitat for nesting, and encourage the return of the endangered least tern. No new material is required for Bird Island due to accretion of drifting material from Sunken Island. Limestone rock encountered in the dredging process could also be utilized as a breakwater on the northwest side of the island (R. Paul, pers. comm., 1996).

#### Cockroach Bay

This area is located south of the project area, and consists of an ecologically important nursery area with an abundance of seagrasses. The Southwest Florida Water Management District's Surface Water Improvement and Management Program (SWIM) has undertaken the restoration of 500 acres of fallow farm fields and decommissioned shell pits. Two stormwater ponds designed to treat agricultural runoff require littoral shelves, which would provide fish and wildlife habitat and water quality improvements. The expected need is approximately 750,000-1 million cubic yards of spoil material. The importance of this project has been discussed with the Corps, and there appears to be interest in providing material for the project when available (Dial and Deis 1986; B. Henningsen, 1996).

The old shell pits south of Apollo Beach (Leisey Pits-Section 31) were recently purchased by Hillsborough County for preservation and restoration purposes. Aerial photography indicates a complex of old pits which are currently deep water ponds (10-20 feet). Spoil material, especially if high in silt/clay content, could be placed and contained in these to shallow up deep water, and to create littoral shelves for habitat enhancement in the Cockroach Bay area. There also exist several other scars in Tampa Bay and Hillsborough Bay which were mined for road fill. If suitable material exists (low in fines), the holes which are readily identifiable should be considered for restoration (A. Burdett, pers. comm. 1996).

#### MacDill Air Force Base

Just off the Interbay Peninsula, southwest of the runways at MacDill, there exist several old borrow holes used for runway fill. These cuts range in depth from 1-15 feet, and extend in a northwest-southeast orientation. The largest hole is due west of the end of the runway. Substrate material consists of fine sand and an overburden of silt. Although no vegetation occurs in within these areas, seagrasses and drift algae occur in the shallow, subtidal shelves adjacent to the scars (Dial and Deis, 1986, SWFMD 1996, R. Johansson, pers. comm. 1996). Fish and wildlife usage is expected to be minimal in the pit (scar) areas, depending on the season. Typical fishes of the adjacent coastal fringe community would be pinfish, anchovy (*Anchoa hepsetus*), mullet, mojarra, spot, pigfish, herring, pipefish (*Syngnathus scovelli*), and gobies (*Elecatinus oceanops*) (Schomer et al.). Restoration plans are to fill the deepest areas of the cuts to the photic level to allow establishment of sea grass beds.

This would provide additional fish nursery /invertebrate habitat. It may be beneficial for some holes to remain for fishing and refugia purposes.

A Service biologist, and marine biologist Tom Ash from EPCHC surveyed the area. The following checkpoint descriptions characterize the general vicinity:

Checkpoint 1 (27.49.81N; 82.32.50W) - southwest of the airforce guidance pier, in approximately 8-9 feet of water. Water clarity was 8 feet. The bottom is described as barren, coarse sand with little to no relief, with some attached *Caulerpa* spp. It appeared scouring does not occur here. Worms (*Dioptra* spp.), few starfish, and horseshoe crabs (*Limulus polyphemus*) were present. No fish were observed.

Checkpoint 2 (27.50.00N; 82.32.50W) - shoreward from above. Sediments were composed of sands, more shell hash, and a higher content of fines. Uncharacteristic of this area, limerock outcrops and clay nodules occurred sporadically, with a one inch sand layer in most areas. Water clarity was approximately 8-8.5 feet. This area was unlike the last in that live bottom species inhabited the substrate, and extended shoreward. The occasional rock outcrops were inhabited by sea whips (*Leptogorgia* spp.), orange sponge (*Cliona lampa*), and *Caulerpa* spp. Tubeworms, starfish, stone crabs (*Menippe mercenaria*), blue crabs (*Callinectes sapidus*), and hermit crabs (*Coenobita clypeatus*) were also present.

Checkpoint 3 (27.50.31N; 82.32.58W) - a quarter mile north of last checkpoint. Water depth was 8 feet. Water clarity was approximately the same. Bottom sediments were predominantly fines mixed with organic (leaves and grass). No live bottom existed here. Starfish and tubeworms were present. This site was similar to the first site, but much dirtier.

Checkpoint 4- the exact location of the hole as originally requested by the Corps:

Northern boundary: 27.50.55N;82.32.78W

Southern boundary: 27.50.23N;82.32.55W

Western boundary: 27.50.23N;82.32.73W

Eastern boundary: 27.50.33N;82.32.49W

The benthic community found at this site was consistent with prior checksites in the area, and ranged in depth from 2 feet deep on the edges, to 14 feet deep in the center. No fish were present at the time of field work.

The deepest area of the runway cut off MacDill was checked per the Corps request. The hole is located southeast of Picnic Island and north of the eroded shoals (27.50.49N;82.33.28W) (figures 7 and 8).

Diving took place at depths of 30-32 feet. Currents were very rough, and the bottom sediments appeared scoured. Sediments consisted of very fine, hard-packed sands with shell hash (figure 9). A low and live bottom was present, with aquatic species which could only survive in a turbulent environment. Remnant quahog shell and large orange sponges form extensive beds attached to sand and shell remnants in the sand (figure 10). Tubeworms, conchs, and hermit crabs were also present. No fish were observed. We speculate fish species such as sea robins (*Prionotus* spp.) and shore lizards inhabit this community. Some attached *Caulerpa* spp. was also observed.



The rough currents in this area are due to its geographical location and topographical character. The hole is located in the narrows of Tampa Bay, and is steeply contoured. These two factors combine to create a scouring action from daily tides and normal wave patterns. Eroded shoals nearby exacerbate this by forming a "riptide" action. Filling this area would not be advisable based on the potential for severe erosion and turbidity problems, which would adversely affect seagrass beds nearby.

It is evident this area consists of a variety of substrate and sediments, which harbor a consistent benthic community. One area of live-bottom was found, which was atypical of the other checkpoints. Since this is a somewhat unique community, we recommend its preservation. Further investigation is needed to determine the geographical character of the substrate, and the extent of live-bottom communities in the study area. Subsequent restoration plans should consider these issues.

### The Palm River

Historically the river and its upstream component, Six Mile Creek, was an aesthetic and ecologically valuable waterway along the eastern fringe of Tampa's urban and industrial center. Fifty years ago, it became the dumping ground for industrial and domestic waste, which resulted in heavy organics pollution. In the late 1960's to the early 1980's, this waterway was incorporated into the Tampa Bypass Canal project, which channelized the river for flood control and navigational purposes. Extensive hydrological modification and habitat loss occurred. In the 1970's, several agencies joined efforts to eliminate point source pollutants, and have been mostly successful.

A study conducted by HDR Engineering for the Palm River Management Committee (1994) stated several conclusions about the current problems which plague the river:

1. Altered bathymetry adversely affects the dissolved oxygen characteristics of the river.
2. Untreated stormwater adversely affects the water quality on a local basis.
3. The surficial sediments underlying the river appear to be highly contaminated with toxic materials.
4. An abandoned landfill on the river's north bank adversely affects habitat and aesthetic values, and possibly water quality.
5. Despite constraints with flood control functions, opportunities for habitat restoration exist.

Recommendations from the report advocate data collection and restoration efforts to include a reevaluation of the Corps canal design, modification of the river bathymetry, sediment analysis, total elimination of point source and non-point source pollution, and creation of historic upland and wetland communities.

A staff biologist toured the river with Tampa Baywatch and DEP personnel on October 10, 1996. Several interconnected problems currently affect the normal functioning of the river, those being a 9-foot elevation sill at the highway 41 bridge, reduced tidal flushing, heavy algal