

#### d. Palm River Restoration

### **2.2 History of Alternative Formulation.**

There was no other dredging alternative except No Action. The only alternatives were the disposal options. The traditional dredged material placement area CMDA-2D has limitations on the space available for dredged material placement. The other DMMA CMDA-3D was located too far away for consideration. In our search for Beneficial Uses of Dredged Material (a Corps sponsored program with environmental benefits as its goal), the local sponsor the Tampa Port Authority and meetings with the Habitat Restoration Committee of the Agency on Bay Management, various alternatives including restoration projects were identified. Some of the restoration projects in Tampa Bay could use dredged material to assist in the restoration effort. The following alternatives were considered for inclusion:

- a. CMDA-2D
- b. CMDA-3D
- c. Garrison Channel
- d. Wetland Creation adjacent to CMDA-2D
- e. Hooker Point
- f. Former open-water disposal area adjacent to Davis Island.
- g. Palm River Restoration

### **2.3 Eliminated Alternatives.**

The following alternative disposal options were eliminated either because they were cost prohibitive, not available at this time or they were not readily accessible:

- a. CMDA-3D
- b. Wetland Creation adjacent to CMDA-2D
- c. Former open-water disposal area adjacent to Davis Island.

### **2.4 Description of Alternatives.**

In addition to the No Action Alternative, there were several construction and placement alternatives. These included placing the material in the Dredged Material management Area CMDA-2D, Hooker Point, and Garrison Navigation Channel.

#### **2.4.1 No Action Alternative.**

No construction would occur as a result of this alternative.

#### **2.4.2 Construction and CMDA-2D Placement.**

The turning basin would be excavated and the material transported to Dredged Material Management Area (DMMA) CMDA-2D. Prior to construction the oyster beds would be excavated and moved to a nearby location containing existing oyster beds. The dredging and placement in the upland DMMA's would meet State water quality standards. The impacts to migratory birds would be mitigated by the implementation of the Districts Migratory Bird Protection Plan. The basics of the plan include voluntary avoidance of the bird-nesting season, monitoring during the season and avoidance of nesting areas during construction. The impacts to manatees would be mitigated by the implementation of the standard manatee protection conditions (Appendix II).

#### **2.4.3 Construction and Hookers Point Placement.**

The turning basin would be excavated and the material transported to Hookers Point construction area. Prior to construction the oyster beds would be excavated and moved to a nearby location containing existing oyster beds. The dredging and placement in

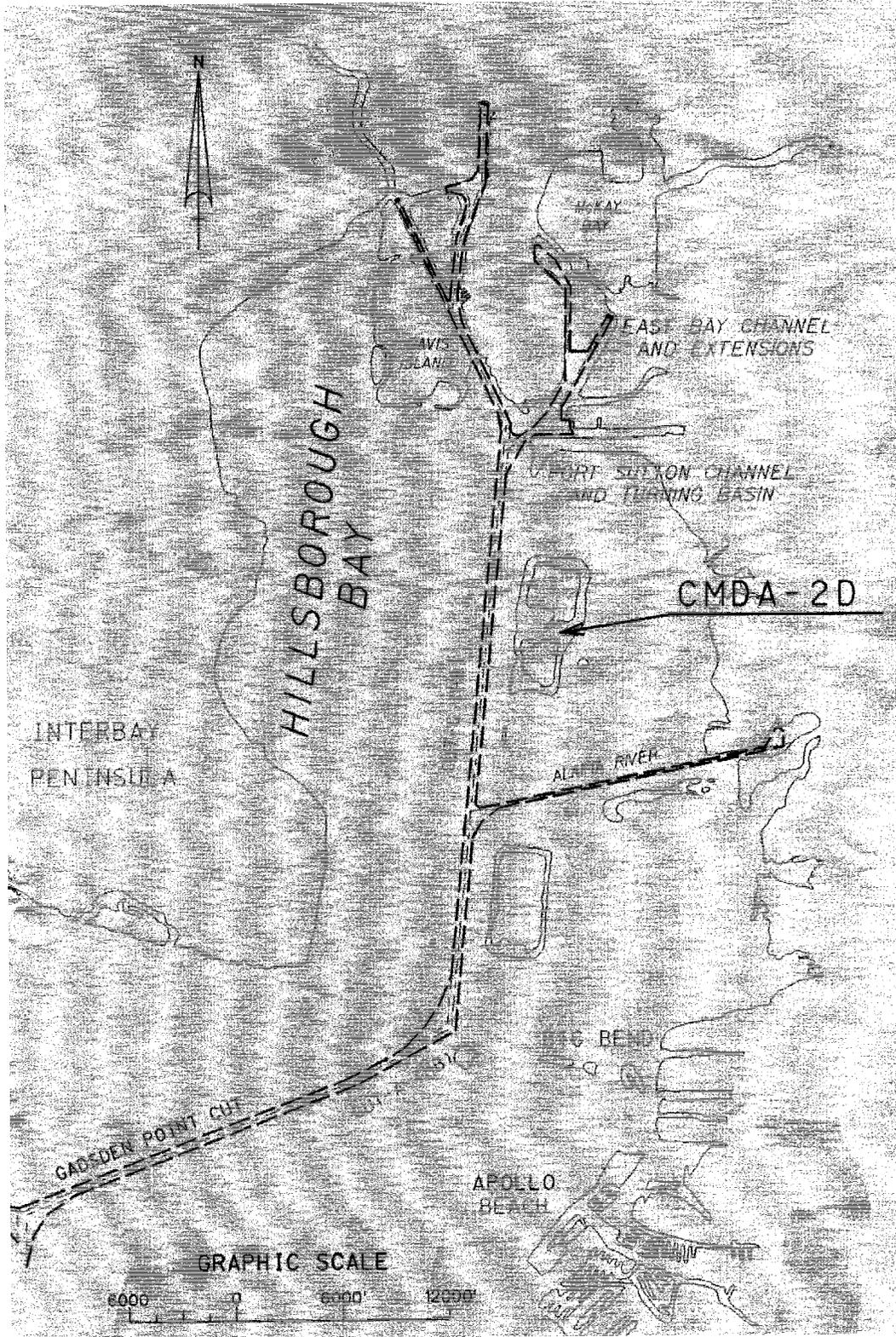


Figure 3, Dredged Material Management Area CMDA-2D

the upland DMMA's would meet State water quality standards. The impacts to migratory birds would be mitigated by the implementation of the Districts Migratory Bird Protection Plan. The impacts to manatees would be mitigated by the implementation of the standard manatee protection conditions (Appendix II).

#### **2.4.4 Construction and Garrison Channel Placement.**

The turning basin would be excavated and the material transported to the Garrison Channel. Prior to construction the oyster beds would be excavated and moved to a nearby location containing existing oyster beds. The dredging and placement in the navigation channel would require turbidity control measures such as turbidity screens or curtains in order to meet State water quality standards. The impacts to manatees would be mitigated by the implementation of the standard manatee protection conditions (Appendix II).

#### **2.5 PREFERRED ALTERNATIVE.**

The preferred alternative is to use this alternative placement area and to restore the bottom elevation and potential seagrass bed.

### **3. AFFECTED ENVIRONMENT.**

#### **3.1 INTRODUCTION.**

The Affected Environment section succinctly describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented.

This section, in conjunction with the description of the "no-action" alternative forms the base line conditions for determining the environmental impacts of the proposed action and reasonable alternatives. The environmental issues that are relevant to the decision to be made are the following:

- a. Water quality.
- b. Navigation.
- c. Benthos
- d. Manatees.
- e. Fisheries.
- f. Shellfish
- g. Migratory Birds
- h. Historic Properties.
- i. Recreation.
- j. Aesthetics.
- k. Economics

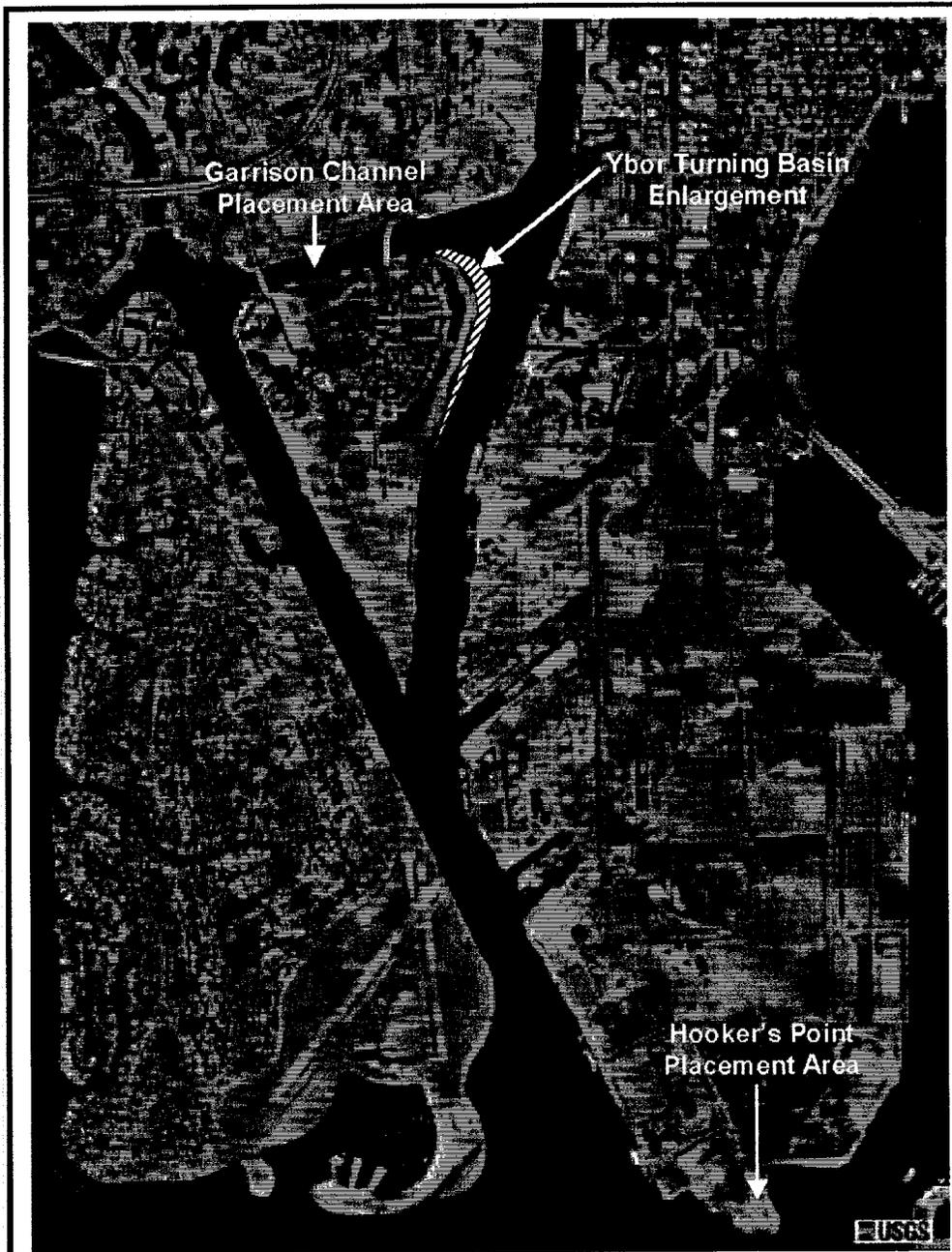
#### **3.2 GENERAL DESCRIPTION.**

Tampa Bay is the largest estuary on the west coast of Florida (USFWS, 1984). As man developed the Bay, the resources have been impacted. The Bay has been excavated for navigation purposes; islands and fast land have been created from the dredged material; ports and residential development have encroached on the aquatic environment; and numerous effluents have been discharged into the Bay. Tampa Bay has mangrove and emergent wetlands along

**b. Table 2.1, Alternative Comparison**

<b>RESOURCES</b>	<b>NO ACTION</b>	<b>DREDGING AND CMDA-2D PLACEMENT</b>	<b>DREDGING AND HOOKERS POINT PLACEMENT</b>	<b>DREDGING AND GARRISON CHANNEL PLACEMENT</b>
<b>Water Quality</b>	No impact	Minor increase in turbidity at dredge site.	Minor increase in turbidity at dredge site.	Minor short-term increase in turbidity at dredge site and from mixing in the water column at the placement site  Improved water quality in channel for aquatic life.
<b>Navigation</b>	Long-term adverse impact on safety and efficient ship handling capabilities in this area of the port	Major long-term benefit to navigation.	Major long-term benefit to navigation.	Major long-term benefit to navigation.
<b>Benthos</b>	No impact	Minor long-term reduction of benthos at the dredging site	Minor long-term reduction of benthos at the dredging site	Minor long-term reduction of benthos at the dredging site and disposal site  Increased benthic diversity from improved water quality and shallow-water habitat.
<b>Manatees</b>	No impact	No impact with inclusion of special manatee protection conditions in contract	No impact with inclusion of special manatee protection conditions in contract	No impact with inclusion of special manatee protection conditions in contract.
<b>Fisheries</b>	No impact.	No impact	No impact	Increased shallow-water fish habitat in nearshore area.

RESOURCES	NO ACTION	DREDGING AND CMDA-2D PLACEMENT	DREDGING AND HOOKERS POINT PLACEMENT	DREDGING AND GARRISON CHANNEL PLACEMENT
Shellfish	No impact.	Loss of 1,021 square feet of oyster beds. Impacts mitigated by relocating beds to nearby shallow-water area.	Loss of 1,021 square feet of oyster beds. Impacts mitigated by relocating beds to nearby shallow-water area.	Loss of 1,021 square feet of oyster beds. Impacts mitigated by relocating beds to nearby shallow-water area.
Migratory Birds	No impact.	Short-term disruption to bird nesting. Impacts mitigated by implementing protection conditions and monitoring.	No impact.	No impacts
Historic Properties	No adverse effect.	Potential effect to unidentified target, no adverse effect for CMDA-2D placement.	Potential effect to unidentified target, no adverse effect for Hookers Point placement.	Potential effect to unidentified target, unknown effects to placement of dredged material in Garrison channel.
Recreation	Minor long-term adverse impact on cruise ship operation.	No impacts.	No impacts	Short-term disruption to fishing at placement site.
Aesthetics	No impact	Minor short-term impact from the presence and operation of construction equipment in a commercial port and adjacent residential area	Minor short-term impact from the presence and operation of construction equipment in a commercial port and adjacent residential area	Minor short-term impact from the presence and operation of construction equipment in a commercial port and adjacent residential area
Economics	Loss of revenues due to limited cruise ship mooring capacity and inefficient cargo vessel handling capabilities	Increased revenues generated from cruise ship accessibility and efficient cargo vessel handling  Medium short-term impact on the local economy from the sale of goods and services in support of the construction.	Increased revenues generated from cruise ship accessibility and efficient cargo vessel handling  Medium short-term impact on the local economy from the sale of goods and services in support of the construction.	Increased revenues generated from cruise ship accessibility and efficient cargo vessel handling  Medium short-term impact on the local economy from the sale of goods and services in support of the construction.



Selected Plan: Enlarge basin by moving southwest edge 200 feet, except northernmost point which moves 100 feet, incorporate wedge to turn in Sparkman Channel. Project depth is 34 feet. Placement of dredged material at Hooker's Point and Garrison Channel.

Not To Scale

**Figure 4. Selected Plan  
Ybor Turning Basin  
Department of the Army  
Jacksonville District, Corps of Engineers  
Jacksonville, Florida**

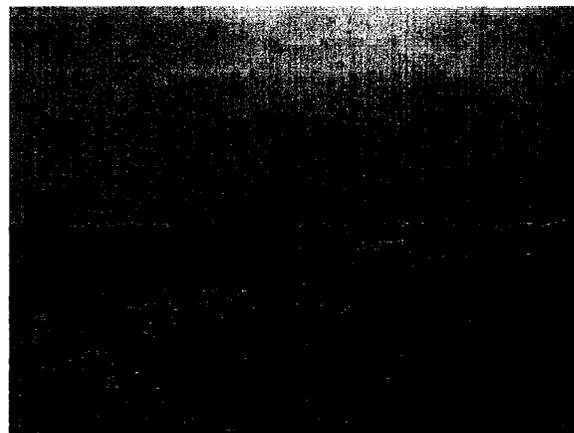
the fringe of the bay where development has not occurred. These wetland areas provide cover and spawning areas for fish and shrimp. The mature mangroves provide nesting areas for birds such as the pelican. These wetlands cause improved water quality of the Bay from trapping sediments and nutrient uptake.

### **3.3 Garrison Channel.**

The de-authorized Garrison Channel enters the Ybor Channel Turning Basin from the west, the Sparkman Channel enters from the south, and the Ybor Channel enters from the north. Vertical bulkheads form the northern shoreline of the Garrison Channel. Its southern shoreline is the north shore of Harbour Island, a largely man-made island of multi- and single family residences. A cove rimmed by Brazilian pepper (*Schinus terebinthifolius*), riprap, and wooden bulkheads, and containing a dilapidated boathouse forms the south shoreline of the Garrison Channel adjacent to the turning basin. The Beneficial Road Bridge crosses the channel immediately west of the cove. A permit has been issued for constructing a vertical bulkhead from the bridge westward for the length of the channel not presently bulkheaded. Piers for mooring recreational boats will be constructed from the bulkhead.

### **3.4 Hookers Point.**

The Hooker's Point site is at the southern end of the Hooker's Point peninsula that separates the Sparkman Channel from East Bay. The Hooker's Point disposal site is a Tampa Port Authority open water disposal site at the southern end of Hooker's Point that is being filled under a permit that expires in 1999. When filled it will create an upland wharf site for the port.



Photograph 1, Hookers Point

### **3.5 Dredged Material Management Area CMDA-2D.**

This 650-acre island disposal area is located at the terminus of the Alafia River Navigation Channel as it enters the main Tampa Bay Navigation Channel. This site is typically used as the receiving area for most dredged material from maintenance of the Hillsborough Bay Channels. It is a major bird-nesting site for birds along the east coast of the United States and is managed for as a rookery by the Audubon Society for the Port of Tampa.

### **3.6 Ybor Channel.**

The Ybor Channel Turning Basin and the Port Sutton Terminal Channel are among the series of channels dredged by the Corps and local port authorities to allow large vessels to navigate Tampa Bay. Port of Tampa bulk and general cargo facilities, cruise ship terminals, and ship repair and construction facilities are served by the two projects under consideration. Both sides of the 400 to 500-foot-wide, 34-foot-deep Ybor Channel are hardened and lined continuously with commercial enterprises. The Florida Aquarium is the only non-marine industry facility on the channel.

### 3.7. Sparkman Channel.

The 34-foot-deep Sparkman Channel connects the turning basin and Cut D of the Tampa Bay entrance channel. Its eastern shore is largely hardened and continuously lined with port facilities. Harbour Island forms its western shore. An underwater shelf extends from the shore of the island. The shelf's width varies, widening to the north, becoming about 250 feet wide where the channel joins the turning basin. The southern two-thirds of the Harbour Island shore adjacent to the channel is steep and vegetated predominantly by Brazilian pepper. The northern one-third is a mitigation site for development on the island. It was reshaped and planted with black mangrove (*Avicennia germinans*) and smooth cordgrass (*Spartina alterniflora*).

### 3.8 RELEVANT ISSUES.

#### 3.8.1 Physical.

a. Water quality. Tampa Bay receives storm runoff from agricultural and residential areas of Pinellas, Hillsborough and Manatee Counties as well as discharges from sewage treatment plants and other facilities. As a result bay waters are high in nitrogen and phosphorous and turbidity has reduced light penetration to 8 feet or less in many areas. The water quality tends to improve as the entrance to the bay is approached. West of the Skyway Bridge water quality improves markedly as the bay meets the Gulf of Mexico. Hillsborough Bay is considered the most impacted segment of Tampa Bay as manifested by water quality (Lewis

and Estevez 1988, Squires and Cardinale 1996) and altered tidal flow and prism (Goodwin 1987). Squires and Cardinale (1996) reviewed data on salinity, Secchi disk depth, turbidity, dissolved oxygen concentration, total phosphorus, total nitrogen, and chlorophyll-*a* concentrations as water quality indicators. Secchi disk depth and turbidity are two measures of water clarity, which is important for determining the depth of photosynthesis and allowing visually oriented organisms to find food and shelter. Dissolved oxygen is necessary for the vast majority of organisms to live and its concentration is one of the most important factors controlling the distribution of aquatic organisms; concentrations below four parts per million (ppm) are marginal for supporting aquatic life. Phosphorus and nitrogen are nutrients necessary for the survival and growth of aquatic plants, with their availability and relative concentrations affecting the types and quantities of plants in aquatic systems. Chlorophyll-*a* concentration is an indicator of phytoplankton productivity and serves as an indicator of nutrient loads and fluxes. Figures 2 - 4 show the results of the Squires and Cardinale review. Hillsborough Bay typically had shallower Secchi disk depths, lower dissolved oxygen concentrations, and greater turbidity, total phosphorus, total nitrogen, and chlorophyll-*a* concentrations than other segments of the bay, leading to their conclusion that Hillsborough Bay was the most impacted segment

of the bay. Upper Hillsborough Bay and the Ybor Channel were identified as among the most contaminated segments of Tampa Bay by Frithsen *et al.* (1995) in their synoptic report of Tampa Bay environmental contaminants. Concentrations of cadmium, lead and zinc that exceeded the state's Probable Effects Level were reported from individual samples in Hillsborough Bay. McConnell and Brink (1997) examined the sources of the contaminants of concern identified in Frithsen *et al.* (*Op. Cit.*) in the upper Hillsborough Bay watershed and identified the Ybor Channel as a priority sub-basin for point sources of copper and nickel and non-point sources of metals loading. Polynuclear aromatic hydrocarbons (PAH) were also identified in the Ybor Channel from both permitted stormwater outfalls and stormwater runoff. Long *et al.* (1995) examined sediment toxicity in Tampa Bay and reported it was most evident in upper Hillsborough Bay, including the Ybor Channel, East Bay and adjacent waterways of the harbor. It is evident that the area around the Port of Tampa, including the dredged channels, has a history of environmental contamination, is subject to continued contaminant loading, and tests have shown the contaminants may have a toxic effect on aquatic organisms.

### 3.8.2 Biological.

a. Benthos. The benthic areas within the navigation channel are

subject to constant sedimentation. There would likely be a few organisms within the 43-foot depths. Hillsborough Bay is heavily industrialized, channelized, has a higher sediment silt content, is considered more polluted, and has lower water quality than other segments of Tampa Bay (Lewis and Estevez 1988, Coastal Environmental 1994, Carr *et al.* 1996, Karlen 1996), all of which contribute to its limited diversity of benthic habitats and organisms. Benthic organisms are those that live in or in contact with aquatic substrates and their distribution and abundance are largely determined by water quality and sediment composition (Lewis and Estevez 1988). Information detailed in their synoptic report relates that Hillsborough Bay is one of the few segments of Tampa Bay not supporting a great diversity and abundance of benthic organisms. Karlen (1996) also reported that the fewest species of benthos (200 species, range 200 - 368), and the lowest diversity value (2.33, range 2.33 - 3.47) from benthic samples taken in Tampa Bay in September 1993 came from Hillsborough Bay.

b. Manatees. The Florida manatee, *Trichechus manatus*, is a federally listed endangered species. They use the estuary for feeding, resting and traveling. They are especially known to

congregate around the areas of seagrasses and warm water outfalls associated with manufacturing and power generation. The Florida Marine Research Institute (FMRI 1998) documents manatees in Tampa Harbor (Ybor basin area) and Port Sutton Channel year round. In the Ybor basin vicinity, the majority of animals use the channels as travel routes to the Hillsborough River to access forage and fresh water. In Ybor basin exclusively, our information indicates little manatee use, those being primarily traveling manatees. Manatee mortality records from 1974-1997 indicate seven deaths have occurred in the Ybor basin/Port Sutton area. Two have occurred in the vicinity of Ybor basin, one due to watercraft, and one undetermined.

- c. Fisheries. The Bay supports a wide variety of aquatic life including the American oyster which is harvested from the lower Tampa Bay; three species of clams, blue crab, and numerous species of fish: the red drum, spotted seatrout, snook, sheephead, southern flounder, Florida pompano, striped mullet, Gulf menhaden, and the black drum (USFWS, 1984). Many offshore fish spend their juvenile stages in the Bay estuary. These include the red and gag groupers, jewfish, scamp, and the red and mangrove snappers. Studies

have been conducted of the use of holes as habitat and cold water refugia (FMRI, 1995). Rays, crabs, and small fish use the shelf adjacent to the turning basin.

- d. Shellfish. American oysters (*Crassostrea virginica*) are one of the most visible and well-studied species of estuarine benthic organisms. They have not been extensively studied in Tampa Bay, although their commercial harvest in Tampa Bay was second only to the harvest from Apalachicola Bay through the 19<sup>th</sup> century (Lewis and Estevez 1988). The Tampa Bay industry was gone by 1970. Oyster beds are important components of estuarine systems not only for their commercial value but also their functional value. Oysters filter and clean the water passing across them and build reefs that provide habitat for many other organisms. Bahr and Lanier (1981) reported that up to 50m<sup>2</sup> of shell surface was available for epifauna for each square meter of oyster reef surface and found 42 species of invertebrates associated with the reef. Although they reported on a reef community in Georgia, most of the species noted are also present in Tampa Bay and it is reasonable to expect that they are associated with Tampa Bay oyster reefs also. Several oyster