be completed by pipeline routed along the IWW with an easterly bearing along the south property line of the Breakers Golf Course. Three bore and jackings on Palm Beach would be necessary for this alternative. This dredged material disposal alternative would place the material on the beach within the littoral drift and within the existing authorized template or footprint (Figure 5). This alternative would also require precautions to avoid impacts to nesting sea turtles.

2.3.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL AREA (LEAST COST ALTERNATIVE).

The stockpiled material would be dry offloaded from the Port of Palm Beach DMSA unto barges for transport to an anoxic hole (Figure 6), located adjacent to the City of Lake Worth Municipal Golf Course shoreline. Bearing southerly along the IWW, the material would be placed over 99 acres of anoxic hole or tidal marine borrow site. This alternative is the more cost effective dredged material disposal alternative. In that, the area could easily accommodate the 600,000 cubic yards of material. The bottom or benthic elevation of the area would be raised to a grade which support the recruitment of marine seagrass. This alternative would assist Palm Beach County and their co-partner the Town of Palm Beach in their endeavor to provide environmental restoration adjacent to the City of Lake Worth municipal golf course. (Figures 7 & 8).

2.4 COMPARISON OF ALTERNATIVES.

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. For a more detailed discussion of impacts of alternative, see Section 4.0.

2.5 MITIGATION.

Offloading and disposal of material from Peanut Island should have no adverse impacts to emergent or submerged aquatic resources. The proposed action would employ "Best Management Practices" to ensure resources within the project's scope are avoided and protected to the fullest extent possible. Mtigation is not required to offset or compensate any adverse environment impacts. However, material disposal adjacent to the LWMGC has the potential to support the recruitment of approximately 57 acres of submerged aquatic vegetation.

3.0 AFFECTED ENVIRONMENT

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 also describes only those environmental resources that are relevant to the decision to be made. The entire environmental conditions are not discussed. A more detailed analysis and evaluation has been performed in Section 1135, the Environmental Restoration of Peanut Island. Only environmental resources that would be directly affected by disposal alternatives, if the alternatives were implemented have been described. This section, in conjunction with the description of the "no-action" alternative forms the baseline conditions for determining the environmental impacts of the proposed action and reasonable alternatives.

3.1 GENERAL ENVIRONMENTAL SETTING

The proposed project area is located in United States Climatic Zone 10 (Tropical Climate). Palm Beach County and the Intracoastal Waterway (IWW) form the eastern boundary of the site with Lake Worth Lagoon forming the southern boundary. Lake Worth Lagoon is a State of Florida designated Class III waters (recreational waterbody) and critical habitat for the West Indian manatee.

3.1.1 CREATION OF PEANUT ISLAND.

Originally called Inlet Island, Peanut Island was created in 1918 by the deposition of dredged materials from the excavation of the Inlet between Lake Worth Lagoon and the Atlantic Ocean. The Corps records indicate that maintenance of the Lake Worth Inlet between 1929 and 1993 resulted in the placement of over 1.2 million cubic yards of dredged material on Peanut Island, forming a 79-acre island. Over 2.8 million cubic yards of dredged material at this time, was also deposited at sea (much of the Peanut Island placement was sand mixed with rock and/or finer sediments, and therefore, was not suitable for beach placement).

3.1.2 PORT OF PALM BEACH.

By 1923, the Port of Palm Beach acquired the island, then 47 acres in size. Since 1934, the Corps has maintained the Palm Beach Harbor Navigation Project, using Peanut Island as a placement site for material dredged from maintenance of the IWW. The Port of Palm Beach also uses the island for placement of dredged material during maintenance dredging of the port's slips (see Figure 2).

3.1.3. OWNERSHIP.

In 1984, Palm Beach County and the Port of Palm Beach entered into an agreement for maintenance of the island, provided, it remained a passive recreational area. The Port held complete ownership of the island until December 1991, when 40 acres at the extreme north end was sold to the Florida Inland Navigation District (FIND). Palm Beach County owns 3.6 acres also on the north end of Peanut Island. Palm Beach County in 1994, entered into lease agreements with the Port of Palm Beach and FIND for development of the island's perimeter for public use (Figure 2).

3.2 VEGETATION

3.2.1 PEANUT ISLAND.

Peanut Island is currently dominated by exotic plant species, primarily Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*), but retains an impounded mangrove habitat on the western side of the island. The results of a Peanut Island vegetative survey conducted for FIND as part of their Peanut Island DMSA (Dredged Material Storage Area) are listed in Figure 9. Peanut Island is a site that is scheduled to provide dredged material management capacity to service the maintenance requirements of Reach III of the IWW in Palm Beach County (IWW mile 274.60 to mile 291.72) and the port's slips. Thick pine litter in most locations of the DMSA has eliminated or reduced ground cover. Portions of the shoreline experience erosion due to energy from boat wakes, northeasterly winds, and the poor stabilizing capability of Australian pine. Pronounced escarpments of exposed sand and large fallen trees are prominent along the southeastern shoreline.

3.2.1.1 LAKE WORTH LAGOON.

Lake Worth Lagoon's shoreline is approximately 70 linear miles. Natural vegetation along the shoreline has been lost to alterations from dredging, filling, and bulkhead construction, (Dames and Moore, 1999 – see Figure 9). Between 1940 and 1975, an estimated 87% of shoreline mangroves were eliminated by shoreline development (Harris et. el., 1983). Vertical bulkheads comprise approximately 65% of the shoreline (see Figure 11).

3.2.2 SEAGRASS DISTRIBUTION.

Seagrass communities can be found throughout Lake Worth Lagoon (see Figure 12). The highest concentrations of seagrass communities are located in the northeast lagoon area and in the vicinities of the Lake Worth and South Lake Worth Inlets. In 1975, a resource inventory found only 161 acres of seagrass in the Lagoon. This was a 96% decrease from surveys done in 1940 (4,271 acres) (Harris et al.1983). In a more recent survey, a total of 2,010 acres of

seagrass were inventoried (Dames & Moore, 1999), still a 42% decrease from the 1940 survey. In northeast Lake Worth Lagoon, extensive turtle grass and (*Thalassia testudinum*) shoal grass (*Halodule wrightii*) communities exist in the area east of the IWW between Palm Beach Isles and Big Munyon Island (Dames and Moore, 1999). In general, seagrass are most abundant and dense in the shallow areas and those areas that contain good water quality. The greatest abundance of manatee grass is located in the vicinity of Lake Worth Inlet. Areas north of Lake Worth Inlet contain significant communities of mixed *Halophila* and *Halodule*. Seagrass and macroalgal communities are very important habitat for many marine species.

3.2.3 SEAGRASS PRODUCTIVITY.

Seagrasses are the second most important primary habitats in estuaries, the most important of which (in South Florida) is turtlegrass (*Thalassia testudinum*). Heald and Odum (1969) noted in Waldner, 1989, that, in addition to mangroves, turtlegrass contributes significantly to the detrital food chain in estuaries. Seagrass and macro algal communities provide very important habitat for many marine species. Their continued survival and proliferation in Lake Worth Lagoon is dependent upon protection from direct impacts and maintenance of good water quality.

3.2.4 SEAGRASS RECRUITMENT.

Within the 20-acre wetland habitat created on nearby Munyon Island, Palm Beach County staff have recorded the presence of a number of seagrass and algal species growing within shallow areas of the tidal channels including *Halodule wrightii, Thalassia testudinum, Halophila johnsonii, Halophila decipiens, Caulerpa sertularioides*, and *Gracilaria tikvahiae*. *Halophila johnsonii* is a Federally listed threatened seagrass species under the Endangered Species Act (ESA) and is designated critical habitat.

3.2.5 MANGROVES.

An isolated mangrove strand currently exists on the west side of the island which consists of all three species of mangroves; red, (*Rhizophora mangle)*; black, (*Avicennia germinans)*; and white, (*Laguncularia racemosa)*, as noted by Palm Beach County Department of Environmental Resources Management. The system is impounded by a sand berm that is traversed only at spring high tides, and is therefore, not functioning to capacity due this obstruction. Lack of flushing precludes the detritus export, an important food source and the basis of primary production, from entering the tidal system. The existing Impoundment also affects the nutrient removal and sediment trapping capabilities of the mangrove system.

3.3 THREATENED AND ENDANGERED SPECIES.

In accordance with Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service was contacted for their input concerning Federally listed threatened (T) and endangered (E) species that are known to occur in the project area. The West Indian Manatee (*Trichechus manatus*) (E) and Sea Turtles [loggerhead sea turtle (*Caretta caretta* – T) green sea turtle (*Chelonia mydas* - E), leatherback sea turtle (*Dermochelys coriacea* -E), hawksbill sea turtle (*Eretmochelys imbricata* - E)] are also known to inhabit the project area.

The seagrass *Halophilia johnsonii*, johnson's seagrass, has been listed by the National Marine Fisheries Service (NMFS) as a Federally threatened species due to its very limited range, threatened habitat destruction, and the fragile nature of the plant's shallow root system. *H. johnsonii* is recognized as a successional seagrass species whose water depth limitations are

TABLE 1: SUMMARY OF DIRECT AND INDIRECT IMPACTS

ALTERNATIVES ENVIRONMENTAL FACTORS	Change Palm Beach Harbor Winter Hopper Dredging to Summer Pipeline	Peanut Island Winter Offloading Event	Disposal on Beach, South of the South Jetty of Lake Worth Inlet	Disposal at Midtown Beach, Palm Beach, FL	Lake Worth Golf Course & IWW Disposal Dryload Barge & Dump in Hole – Least Cost Alternative	No Action – Status Quo
PROTECTED SPECIES	Manatee & Sea Turtle Concerns	Manatee Concerns	Manatee & Sea Turtle Concerns	Manatee & Sea Turtle Concerns	Manatee & Sea Turtle Concerns	No Impact
OTHER FISH AND WILDLIFE RESOURCES	No Adverse Effects Anticipated	No Adverse Effects Anticipated	No Adverse Effects Anticipated	No Adverse Effects Anticipated	Potential to create 57 ac. of Seagrass & 17.9 ac of other Aquatic Habitat	No Impact
VEGETATION	No Impacts Anticipated	Little if any Vegetation	Minor if any Impacts	Impacts are Likely	Benefits to with ±15 ac. of habitat creation	No Impact
WATER QUALITY	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	Improvements to by filling dredged hole & creating seagrass & wetland habitats	No Impact
HISTORIC PROPERTIES	No historic Properties or Setting Impacts	No historic Properties or Setting Impacts	No historic Properties or Setting Impacts	Potential Impacts to Historic Properties	No historic Properties or Setting Impacts	No Impact
RECREATION	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	No Impact
AESTHETICS	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	No Impact
ECONOMICS	May Have Positive Impact to Port	Could be More Costly than Summer	Closest Disposal Option	Mid Range Dist.-Boring & Jacking Req.	Farthest Away – Good Enviro. Benefits	No Impact
MIGRATORY BIRDS	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impact
ENERGY REQUIREMENTS AND CONSERVATION	Could Require Less Energy	Could Save Future Energy Costs With Closest Disposal Option	Closest Disposal Option for Pipeline Dredge Disposal	Mid Distance Disposal Option – Bore & Jackings Required	Could be Energy Efficient With Dryloading and Barging to Disposal Site	No Impact
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES	Harbor Dredging is not a Project Alternative	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No Impact
NAVIGATION	No Impacts Anticipated	No Impacts Anticipated	Minor/Temp. Impacts during disposal	Minor/Temp Impacts during disposal	Minor/Temp. Impacts during disposal	No Impact
HARDGROUNDS	No Impacts Anticipated	No Impacts Anticipated	Potential nearshore impacts	Potential nearshore impacts	Benefits with Creation of 2.8 ac. of oyster reef & Breakwater. Habitat	No Impact

LAKE WORTH LAGOON.

FIGURE 9. LAND USE AND VEGETATION ON PEANUT ISLAND

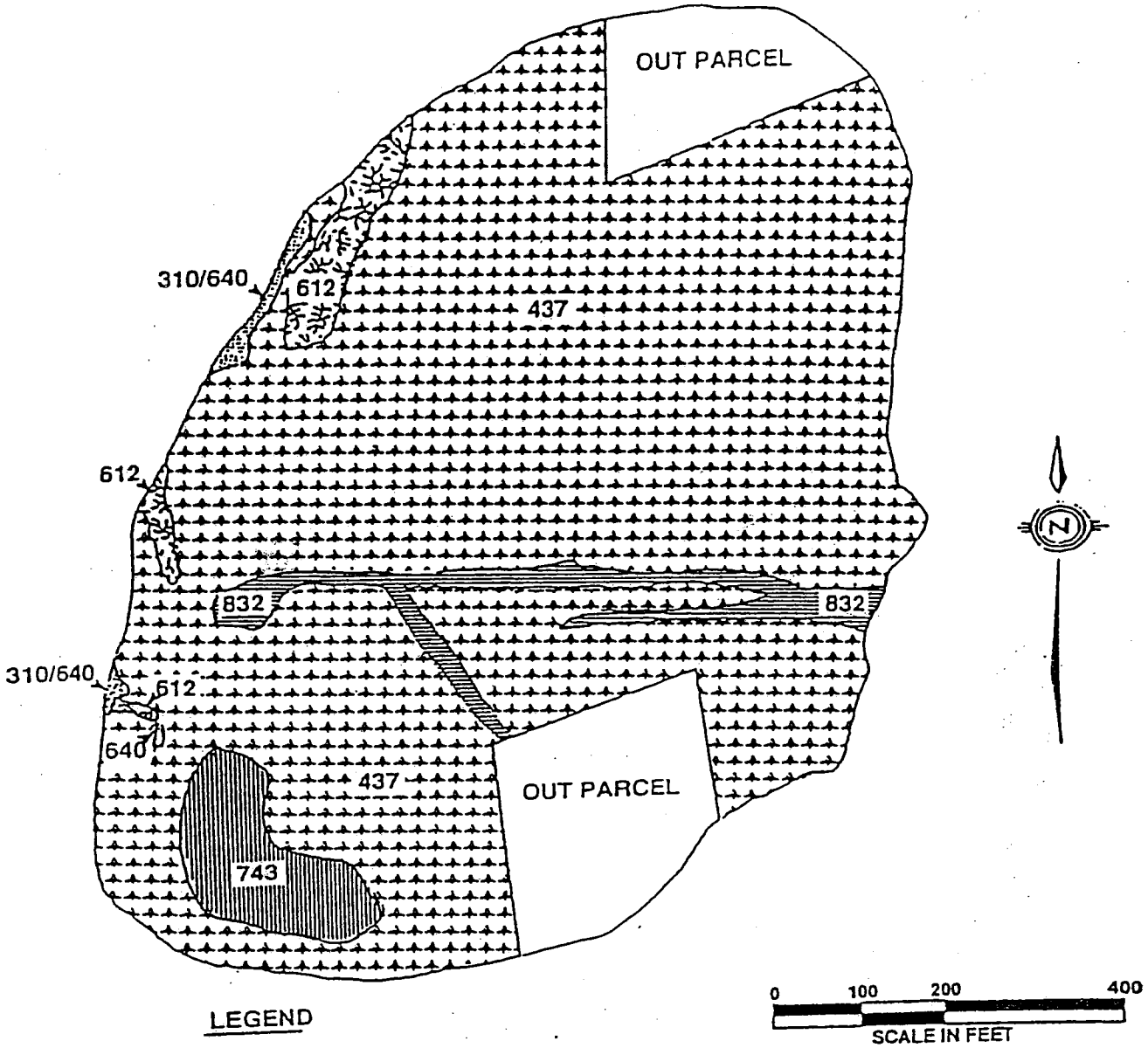
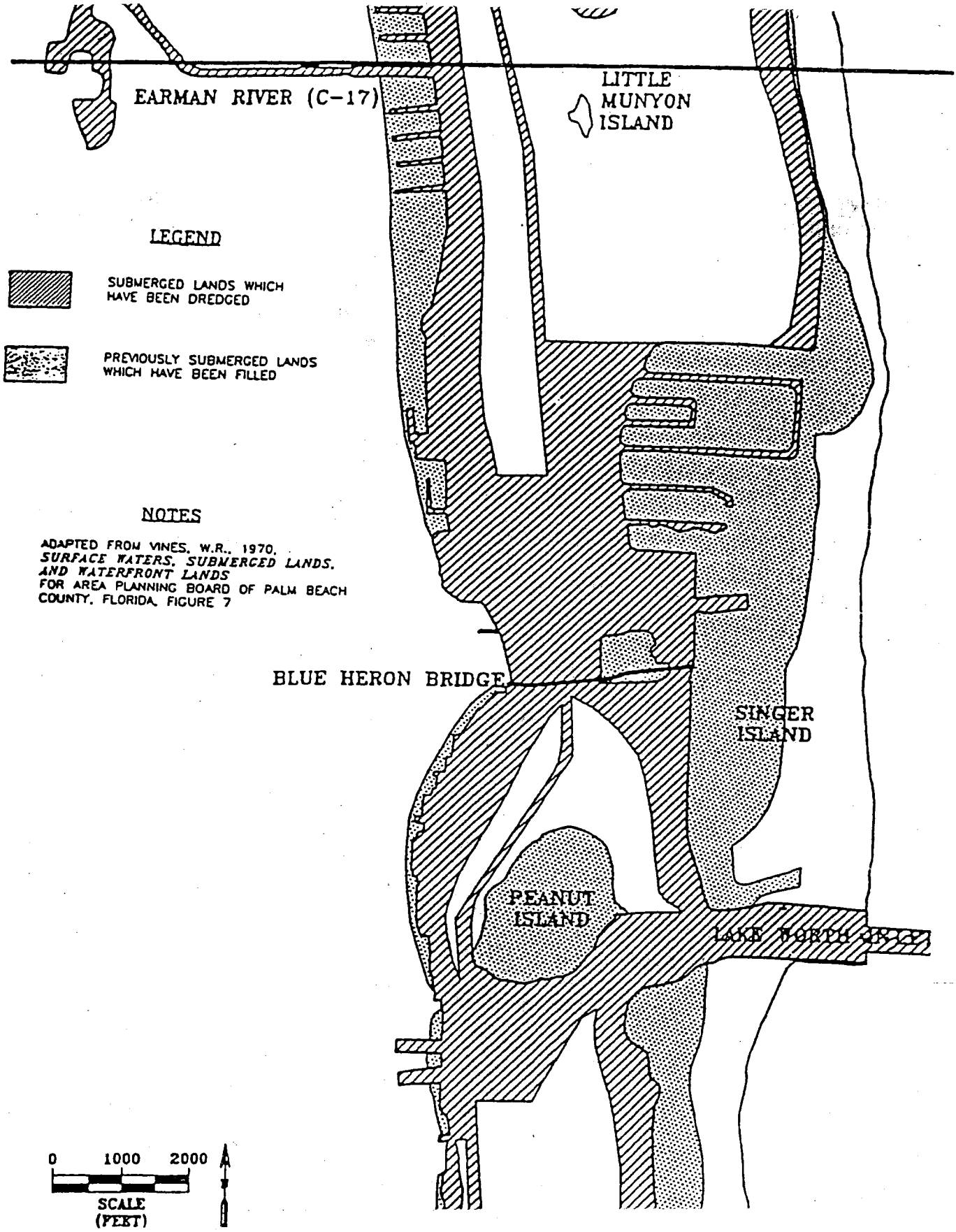


FIGURE 9

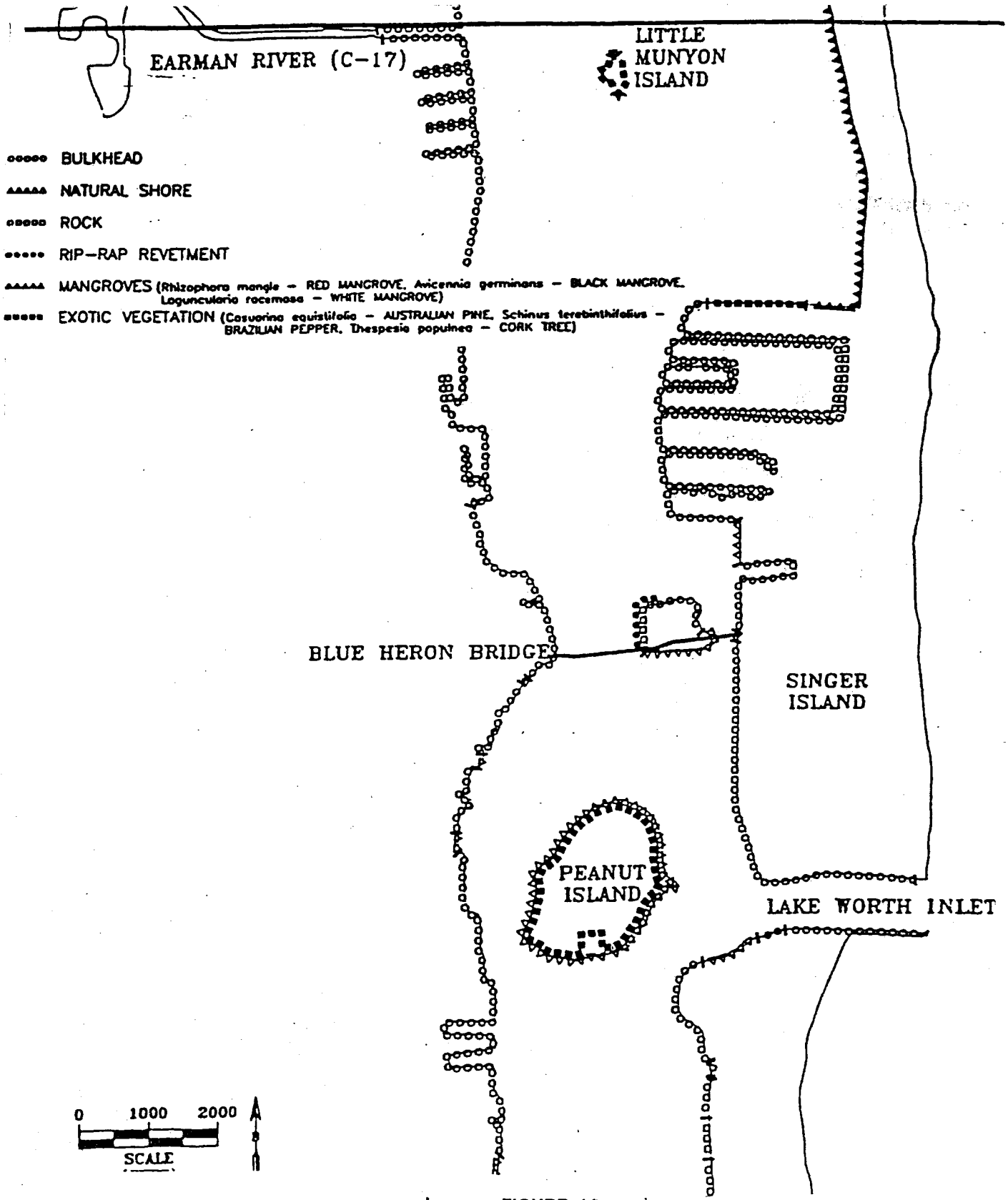
DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT U.S. ARMY CORPS OF ENGINEERS JACKSONVILLE, FLORIDA	**LAND USE AND VEGETATION MAP OF PEANUT ISLAND**	CHANGE OF MAINTENANCE OPERATIONS AT PALM BEACH HARBOR AND PEANUT ISLAND

FIGURE 10. DREDGED AND FILLED AREAS WITHIN THE PROJECT VICINITY



DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT U.S. ARMY CORPS OF ENGINEERS JACKSONVILLE, FLORIDA	**DREDGED AND FILLED AREAS WITHIN PROJECT AREA**	CHANGE OF MAINTENANCE OPERATIONS AT PALM BEACH HARBOR AND PEANUT ISLAND

FIGURE 11. SHORELINE CHARACTERISTICS WITHIN THE PROJECT VICINITY



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FIGURE 11

PORT OF PALM BEACH

CHANGE OF MAINTENANCE OPERATIONS AT PALM BEACH HARBOR AND PEANUT ISLAND

FIGURE 12. SEAGRASS COMMUNITIES WITHIN THE PROJECT VICINITY

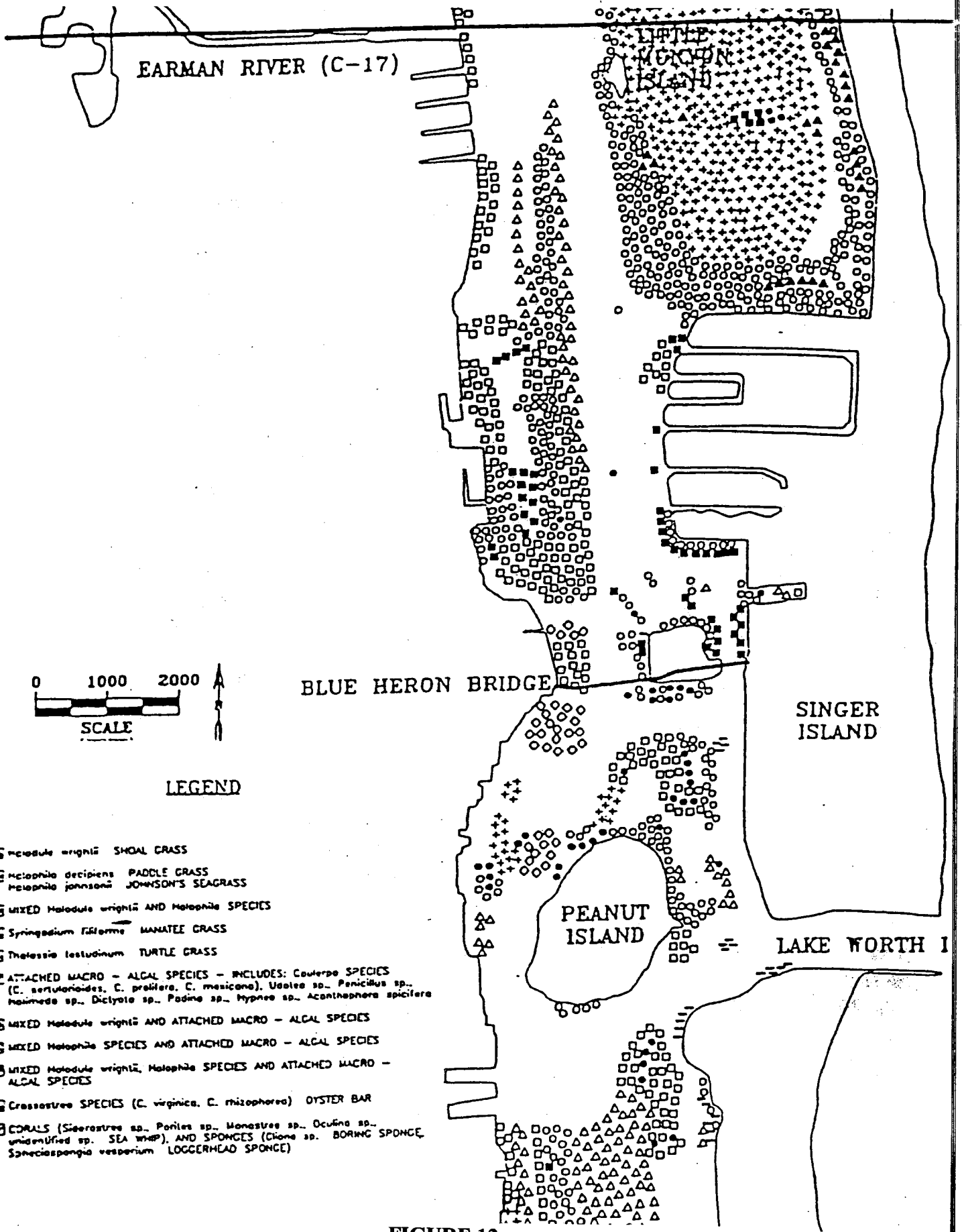


FIGURE 12

DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT U.S. ARMY CORPS OF ENGINEERS JACKSONVILLE, FLORIDA	PEANUT ISLAND SEAGRASS DISTRIBUTION MAP	CHANGE OF MAINTENANCE OPERATIONS AT PALM BEACH HARBOR AND PEANUT ISLAND

approximately ten feet based on natural light penetration. Seagrass is abundant in Lake Worth Lagoon and does exist adjacent to Peanut Island. Dredged material disposal in this area has the potential to impact approximately 0.25 acre of Johnson seagrass and 0.58 acre of sparse to moderate seagrass impacted at the LWMGC. The proposed impacts would not be directly attributable to the proposed disposal, but seagrass impact in this area were coordinated under Section 7 of the Endangered Species Act with NMFS (National Marine Fisheries) with conservation recommendations for survival of the species.

3.4 FISH AND WILDLIFE RESOURCES

The U. S. Fish and Wildlife Service reported in their November 18, 1997 Coordination Act Report the presence of several Federally listed threatened and endangered species that are known to occur in the project vicinity (see Appendix C – Pertinent Correspondence). Additional species noted within the project area by the USFWS are included in Table 2A. In addition to the Federally protected species that could inhabit the project area, below is a list of State Species of Special Concern that have been observed in the Munyon Island Restoration Project area by State Biologists and County Environmental staff:

Table 2

STATE SPECIES OF CONCERN		
Wood Stork,	Peregrine Falcon	Least Tern
Little Blue Heron	Great Blue Heron	Reddish Egret
Snowy Egret	Brown Pelican	White Ibis,
Osprey	Gopher Tortoise	

3.4.1 BIRD SPECIES IN LAKE WORTH LAGOON.

Table 4 provides a list of birds observed in nearby John D. MacArthur Beach State Park. Munyon Island, within the Park, once supported such a large bird rookery that the Seminoles called the Island "Nuctsachoo", meaning "pelican" and early white settlers referred to it as Pelican Island (Duever et. al.,1981). The rookery was reportedly decimated by collecting activities and the name, literally, disappeared with the birds. More that 50 percent of the commonly observed bird species are linked to the aquatic environs and are expected to utilize the habitat provided by the restoration of Peanut Island. The proposed change in maintenance operations project will not adversely affect the proposed habitat creation on Peanut Island or the potential for additional rookery habitat.

3.5 FISH SPECIES IN LAKE WORTH LAGOON.

The *Lake Worth Lagoon Natural Resources Inventory and Resource Enhancement Study,* completed in 1999 by Dames and Moore for Palm Beach County, contains a list of 195 fish species that have been collected and identified in the Lake Worth Lagoon. The list was compiled from six studies conducted from 1962 to 1985, Table 3. A total 261 species of fish have been recorded from northern Lake Worth Lagoon to just south of the Lake Worth Inlet. These species are associated with a marine plant community composed of the seagrass *Halodule wrightii*, *Halophila spp.*, and *Thalassia testudinum*, and marine algae species such as *Caulerpa sertularioides, Acanthophora spicifera*, and *Dictyota bartayresii* (Herrema, et al.,1973).

3.6 COASTAL BARRIER RESOURCES.

The proposed Peanut Island change in maintenance operations project is not within a Coastal Barrier Resources (CBR) Unit or adjacent to any designated Coastal Barrier Resource Unit. The closest CBR Unit is FL-18P (John D. MacArthur Beach State Park), just over two miles to the north and east.

3.7 WATER QUALITY

Water quality data has been collected in Lake Worth Lagoon since the late 1960's. This data indicate the lagoon is a moderately polluted estuarine system. A trend analysis indicates water quality remained fairly constant or slightly improved over a fifteen-year period. Analysis of sediments for heavy metals and organic compounds indicate a system that chronically receives runoff from urban development (Dames and Moore, 1999). The hydraulic characteristics of Lake Worth Lagoon have been greatly altered from historic conditions by changes in tidal influence and fresh-water inflows. Peanut Island is located in the north-central Lake Worth Lagoon Estuary in designated Class III-Outstanding Florida Waters. The island's eastern border is the Lake Worth Inlet with the IWW and Palm Beach Harbor forming the western boundaries.

3.8 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE.

The proposed changes in maintenance operations at Palm Beach Harbor and Peanut Island project would include summer pipeline dredging instead of winter hopper dredging and offloading of the Palm Beach Harbor DMSA on the southern end of Peanut Island. A review of the HTRW database on June 2, 2000 indicated that no contamination exists on Peanut Island or the dredged material disposal site. The investigation was conducted in accordance with the Hazardous, Toxic or Radioactive Waste (HTRW) assessment requirements of ER 1165-2-123, HTRW Guidance For Civil Works Projects. A Phase I, Environmental Assessment For Peanut Island was prepared by Palm Beach County, Department of Environmental Resources Management, in November of 1997. The subject site was examined for "Recognized Environmental Conditions" in accordance with the American Society of Testing and Materials (ASTM) Standard 1527-94. The assessment revealed no evidence of recognized environmental conditions in connections with the subject parcel.

3.9 AIR QUALITY.

The existing air quality of the project site vicinity is typical of an urban area near the beach influenced by southerly trade winds. Air quality overall within the project area is good on most days with poor air quality the exception. At some times, air quality can appear to be lowered during the days that are very still and traffic congestion or fires from the everglades significantly influence air quality on a more regional basis.

3.10 NOISE

Airplane traffic overhead of the Peanut Island is the most noticeable sound within the project area. The area sustains some localized vehicular traffic and boat noise but not to any significant degree or amount. Ocean breezes rustling through the trees is a noticeable background sound.

3.11 AESTHETIC RESOURCES.

The surrounding proposed project aesthetics are typical of a tropical urban area with water frontage. In general, aesthetic resources within the project area are better to the east than the west as beachside development is residential and reflects human activity. Landscapes are well maintained with fairly lush tropical plant materials present in many viewsheds. Foreground project views to the west are of commercial development and not as scenic as the beachside panorama. Views of the immediate waters surrounding Peanut Island are considered aesthetically pleasing.

3.12 RECREATION RESOURCES.

The main recreational resource utilized within the project area is boating on the IWW and contiguous waters. Other ancillary recreation resources that occur while boating include fishing,

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES
AND CANDIDATE SPECIES FOR FEDERAL LISTING
IN PALM BEACH COUNTY

Scientific Name	Common Name	Status
Amphibians and Reptiles		
Alligator mississippiensis	American alligator	T (S/A)
Caretta caretta	Loggerhead sea turtle	T
Chelonia mydas	Green sea turtle	E
Dermochelys coriacea	Leatherback sea turtle	E
Drymarchon corais couperi	Eastern indigo snake	T
Eretmochelys imbricata	Hawksbill sea turtle	E
Lepidochelys kempii	Kemp's (=Atlantic) ridley sea turtle	E
Birds		
Aphelocoma coerulescens	Florida scrub-jay	T
Campephilus principalis (probably extinct in south Florida)	Ivory-billed woodpecker	E
Charadrius melodus	Piping plover	T
Dendroica kirtlandii	Kirtland's warbler	E
Haliaeetus leucocephalus	Bald eagle	T
Mycteria americana	Wood stork	E
Picoides borealis	Red-cockaded woodpecker	E
Polyborus plancus audubonii	Audubon's crested caracara	T
Rostrhamus sociabilis plumbeus	Everglade snail kite	E*
Sterna dougalli dougalli	Roseate tern	T
Vermivora bachmanii	Bachman's warbler	E
Mammals		
Felis concolor	Mountain lion	T (S/A)
Felis concolor coryi	Florida panther	E
Trichechus manatus latirostris	West Indian manatee	E*
Ursus americanus floridanus	Florida black bear	C
Plants		
Family Annonaceae		
Asimina tetramera	Four-petal pawpaw	E
Family Convolvulaceae		
Jacquemontia reclinata	Beach jacquemontia	E
Family Cucurbitaceae		
Cucurbita okeechobeensis	Okeechobee gourd	E

* Critical habitat has been designated for this species in this county.

TABLE 3

THREATENED AND ENDANGERED SPECIES

ENDANGERED SPECIES, THREATENED SPECIES, RARE SPECIES AND SPECIES OF SPECIAL CONCERN THAT MIGHT BE FOUND IN AND AROUND LAKE WORTH LAGOON, PALM BEACH COUNTY, FLORIDA

LATIN NAME	COMMON NAME	STATUS
PLANTS		
Acrostichum aureum	Golden Leather Fern	E
Acrostichum danaeifolium	Giant Leather Fern	T
Cereus pentagonus	Dildo Cactus	T
Chrysophyllum oliviforme	Satin Leaf	E
Encyclia tampensis	Butterfly Orchid	T
Ophioglossum palmatum	Hand Fern	E
Opuntia humifusa	Twistspine Prickly Pear	T
Opuntia stricta	Prickly Pear	T
Phlebodium aureum	Golden polypody	T
Psilotum nudum	Whisk Fern	T
Tillandsia paucifolia	Wild Pine	T
Tillandsia valenzuelana	Soft Leaf Wild Pine	T
Vittaria lineata	Shoestring Fern	T
VERTEBRATES		
MAMMALS		
Trichecus manatus latirostris	West Indian Manatee	E
REPTILES		
Caretta caretta caretta	Loggerhead Turtle	T
Chelonia mydas mydas	Green Turtle	E
Gopherus polyphemus	Gopher Tortoise	SSC
Drymarchon corais couperi	Indigo Snake	SSC
BIRDS		
Ajaia ajaja	Roseate Spoonbill	SSC
Aramus guarana	Limpkin	SSC
Casmerodius albus	Great Egret	SSC
Charadrius melodus	Piping Plover	T
Egretta rufescens	Reddish Egret	SSC
Egretta thula	Snowy Egret	SSC
Egretta tricolor	Tricolored (Louisiana) Heron	SSC
Egretta caerulea	Little Blue Heron	SSC
Eudocimus albus	White Ibis	SSC
Falco peregrinus tundrius	Artic Peregrine Falcon	E
Haematopus palliatus	American Oystercatcher	SSC
Nyctanassa violacea	Yellowcrowned Nigh Heron	SSC

THREATENED AND ENDANGERED SPECIES

TABLE 3

Nycticorax nycticorax	Blackcrowned Nigh Heron	SSC
Pandion haliaetus	Osprey	SSC
Pelecanus occidentalis	Brown Pelican	SSC
Plegadis falcinellus	Glossy Ibis	SSC
Sterna antillarum	Least Tern	T
Vireo altiloquus	Blackwhiskered Vireo	R

FISHES

Centropomus undecimalis	Common Snook	SSC
Gobionellus stigmaturus	Spottail Goby	SSC
Oostethus lineatus	Opossum Pipefish	R
Rivulus marmoratus	Rivulus	SSC

STATUS DESIGNATION KEY:

E=Endangered
T=Threatened
R=Rare
SSC=Species of Special Concern

The status of the above listed plant and animal species was determined by one or more of the following agencies and/or publications:

Florida Game and Freshwater Fish Commission; United States Fish and Wildlife Service; Florida Department of Agriculture; Rare and Endangered Biota of Florida (Pritchard Series).

BIRD SPECIES OBSERVED AT JOHN D. MACARTHUR BEACH STATE PARK

Common Loon	*Gavia immer*
Pied-Billed Grebe	*Podilymbus Podiceps*
Brown Pelican	*Pelecanus occidentalis carolinensis*
Double-Crested Comorant	*Phalacrocorax auritus*
Water-Turkey	*Anhinga anhinga*
Man-O'-War Bird	*Fregata magnificens*
Great Blue Heron	*Ardea herodias*
Snowy Egret	*Egretta thula*
Reddish Egret	*Dichromanassa rufescens*
Louisiana Heron	*Hydranassa tricolor*
Little Blue Heron	*Florida coerula*
Green Heron	*Butorides striatus*
Black-Crowned Night Heron	*Nycticorax nycticorax*
Yellow-Crowned Night Heron	*Nyctanassa violacea*
American Bittern	*Botaurus Lentiginosus*
Least Bittern	*Ixobrychus exilis*
Wood Stork	*Mycteria americana*
White Ibis	*Eudocimus albus*
Roseate Spoonbill	*Ajaia ajaja*
Lesser Scaup	*Aythya affinis*
White-Winged Scoter	*Melanitta deglandi*
Surf Scoter	*Melanitta perspicillata*
Red-Breasted Merganser	*Mergus serrator*
Turkey Vulture	*Cathartes aura*
Black Vulture	*Coragyps atratus*
Sharp-Shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Red-Tailed Hawk	*Buteo jamaicensis*
Red-Shouldered Hawk	*Buteo lineatus*
Bald Eagle	*Haliaetus leucocephalus*
Osprey	*Pandion haliaetus carolinensis*
Peregrine Falcon	*Falco peregrinus*
Merlin	*Falco columbarius*
Kestrel	*Falco sparverius*
Limpkin	*Aramus guarauna*
Clapper Rail	*Rallus longirostris*
Virginia Rail	*Rallus limicola*
Sora	*Porzana carolina*
Coot	*Fulica americana*
American Oystercatcher	*Haematopus palliatus*
Semipalmated Plover	*Charadrius semipalmatus*
Wilson's Plover	*Charadrius wilsonia*
Killdeer	*Charadrius vociferus*
Black-Bellied Plover	*Pluvialis squatarola*
Ruddy Turnstone	*Arenaria interpres*
Spotted Sandpiper	*Actitis macularia*
Willet	*Catoptrophorus semipalmatus*
Greater Yellowlegs	*Tringa melanoleuca*
Lesser Yellowlegs	*Tringa flavipes*
Least Sandpiper	*Calidris minutilla*
Dowitcher	*Limnodromus griseus*
Semipalmated Sandpiper	*Calidris pusillus*
Western Sandpiper	*Calidris mauri*
Sanderling	*Calidris alba*
Dunlin	*Calidris alpina*
Great Black-Billed Gull	*Larus marinus*
Ring-Billed Gull	*Larus delawarensis*
Laughing Gull	*Larus atricilla*
Bonaparte's Gull	*Larus philadelphia*
Forster's Tern	*Sterna forsteri*
Least Tern	*Sterna albifrons*
Royal Tern	*Sterna maxima*

BIRD SPECIES OBSERVED AT JOHN D. MACARTHUR BEACH STATE PARK - CONTINUED

Sandwich Tern	*Sterna sandvicensis*
Caspian Tern	*Sterna caspia*
Black Skimmer	*Rynchops niger*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Ground Dove	*Columbina passerina*
Yellow-Billed Cuckoo	*Coccyzus americanus*
Screech Owl	*Otus asio*
Great Horned Owl	*Bubo virginianus*
Chuck-Will's Widow	*Caprimulgus carolinensis*
Common Nighthawk	*Chordeiles minor*
Ruby-Throated Hummingbird	*Archiochus colubris*
Belted Kingfisher	*Megaceryle alcyon*
Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Red-Bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Great Crested Flycatcher	*Myiarchus crinitus*
Tree Swallow	*Iridoprocne bicolor*
Barn Swallow	*Hirundo rustica*
Purple Martin	*Progne subis*
Blue Jay	*Cyanocitta cristata*
Fish Crow	*Corvus ossifragus*
House Wren	*Troglodytes aedon*
Carolina Wren	*Thryothorus ludovicianus*
Mockingbird	*Mimus polyglottos*
Catbird	*Dumetella carolinensis*
Brown Thrasher	*Toxostoma rufum*
Robin	*Turdus migratorius*
Blue-Gray Gnatcatcher	*Polioptila coerulea*
Starling	*Sturnus vulgaris*
White-Eyed Vireo	*Vireo griseus*
Solitary Vireo	*Vireo solitarius*
Black-Whiskered Vireo	*Vireo altiloquus*
Red-Eyed Vireo	*Vireo olivaceus*
Black and White Warbler	*Mniotilta varia*
Parula Warbler	*Parula americana*
Cape May Warbler	*Dendroica tigrina*
Black-Throated Blue Warbler	*Dendroica caerulescens*
Yellow-Rumped Warbler	*Dendroica coronata*
Yellow-Throated Warbler	*Dendroica dominica*
Prairie Warbler	*Dendroica discolor*
Palm Warbler	*Dendroica palmarum*
Oven-Bird	*Seiurus aurocapollus*
Northern Waterthrush	*Seiurus noveboracensis*
Yellow-Throat	*Geothypis trichas*
American Redstart	*Setophaga ruticilla*
Red-Wing Blackbird	*Agelaius phoeniceus*
Spotted Oriole	*Icterus pectoralis*
Boat-Tailed Grackle	*Quiscalus major*
Common Grackle	*Quiscalus quiscula*
Cardinal	*Cardinalis cardinalis*

* Information From: Resource Inventory and Analysis of the John D. MacArthur Beach State Recreation Area (Duever, et al., 1981)

TABLE 5

FISH COLLECTED IN LAKE WORTH LAGOON

MAP #	FAMILY GENUS, SPECIES	COMMON NAME
	BRANCHIOSTOMIDAE	
1.	*Asymmetron sp.*	lancelet
2.	*Asymmetron lucayanum*	sharptail lancelet
	CARCHARHINIDAE	
3.	*Carcharhinus limbatus*	blacktip shark
	RAJIDAE	
4.	*Raja eglanteria*	clearnose ray
	DASYATIDAE	
5.	*Dasyatis americana*	southern stingray
6.	*Dasyatis sabina*	Atlantic stingray
7.	*Dasyatis say*	bluntnose stingray
8.	*Gymnura micrura*	smooth butterfly ray
	ELOPIDAE	
9.	*Elops saurus*	ladyfish
	MEGALOPIDAE	
10.	*Megalops atlanticus*	tarpon
	ALBULIDAE	
11.	*Albula vulpes*	bonefish
	OPHICHTHIDAE	
12.	*Myrophis punctatus*	speckled worm eel
	CLUPEIDAE	
13.	*undetermined sp*	
14.	*Brevoortia smithi*	yellowfin menhaden
15.	*Brevoortia tyrannus*	Atlantic menhaden
16.	*Harengula sp.*	sardine
17.	*Harengula clupeola*	false pilchard
18.	*Harengula humeralis*	redear sardine
19.	*Harengula jaguana*	scaled sardine
20.	*Jenkinsia lamprotaenia*	dwarf herring
21.	*Jenkinsia majua*	little-eye herring
22.	*Opisthonema oglinum*	Atlantic thread herring
23.	*Sardinella aurita*	spanish sardine
	ENGRAVLIDAE	
24.	*Anchoa sp.*	anchovy
25.	*Anchoa cayorum*	key anchovy
26.	*Anchoa hepsetus*	striped anchovy
27.	*Anchoa lyolepis*	dusky anchovy
28.	*Anchoa mitchilli*	bay anchovy
	SYNODONTIDAE	
29.	*Synodus foetens*	inshore lizardfish
30.	*Trachinocephalus myops*	snakefish
	CYPRINIDAE	
31.	*Notropis maculatus*	taillight shiner
	ARIIDAE	
32.	*Ariopsis felis*	sea catfish
33.	*Bagre marinus*	gafftopsail catfish
	BATRACHOIDIDAE	
34.	*Opsanus beta*	gulf toadfish
	ANTENNARIIDAE	
35.	*Antennarius ocellatus*	ocellated frogfish
36.	*Histrio histrio*	sargassum fish
37.	*Antennaris scaber*	splitlure frogfish
	OGCOCEPHALIDAE	
38.	*Ogcocephalus radiatus*	polkadot batfish
39.	*Ogcocephalus nasutus*	shortnose batfish
	HEMIRAMPHIDAE	
40.	*Hyporhamphus unifasciatus*	halfbeak
	BELONGIDAE	
41.	*Strongylura sp.*	needlefish
42.	*Strongylura marina*	Atlantic needlefish
43.	*Strongylura notata*	redfin needlefish
44.	*Strongylura timucu*	timucu
45.	*Tylosurus acus*	agujon
	CYPRINODONTIDAE	
46.	*Floridichthys carpio*	goldspotted killifish
47.	*Fundulus confluentus*	marsh killifish
48.	*Fundulus grandis*	gulf killifish
	POECILIIDAE	
49.	*Heterandria formosa*	least killifish
50.	*Poecilia latipinna*	sailfin molly
	ATHERINIDAE	
51.	*Membras martinica*	rough silverside
52.	*Menidia beryllina*	tidewater silverside
	FISTULARIIDAE	
53.	*Fistularia tabacaria*	bluespotted cornetfish
	SYNGNATHIDAE	
54.	*Hippocampus erectus*	lined seahorse
55.	*Hippocampus zosterae*	dwarf seahorse
56.	*Syngnathus sp.*	pipefish
57.	*Syngnathus floridae*	dusky pipefish
58.	*Syngnathus louisianae*	chain pipefish
59.	*Syngnathus pelagicus*	sargassum pipefish
60.	*Syngnathus scovelli*	gulf pipefish
	SCORPAENIDAE	
61.	*Scorpaena bergi*	gooshead scorpionfish
62.	*Scorpaena calcarata*	smoothhead scorpionfish
63.	*Scorpaena grandicornis*	plumed scorpionfish
	TRIGLIDAE	
64.	*Prionotus sp.*	Searobin
65.	*Prionotus ophryas*	bandtail searobin
66.	*Prionotus scitulus*	leopard searobin
67.	*Prionotus tribulus*	bighead searobin
	CENTROPOMIDAE	
68.	*Centropomus pectinatus*	tarpon snook
69.	*Centropomus undecimalis*	common snook

FISH COLLECTED IN LAKE WORTH LAGOON

TABLE 5

MAP #	FAMILY GENUS, SPECIES	COMMON NAME
	SERRANIDAE	
70.	*Diplectrum formosum*	sand perch
	PRIACANTHIDOE	
71.	*Pristigenys alta*	short bigeye
	APOGONIDOE	
72.	*Apogon pseudomaculatus*	twospot cardinalfish
73.	*Phaeoptyx pigmentaria*	dusky cardinalfish
	POMATOMIDAE	
74.	*Pomatomus saltatrix*	bluefish
	CARANGIDAE	
75.	*undetermined sp.*	jack
76.	*Caranx bartholomaei*	yellowjack
77.	*Caranx crysos*	blue runner
78.	*Caranx hippos*	crevalle jack
79.	*Caranx latus*	horse-eye jack
80.	*Decapterus macarellus*	mackerel scad
81.	*Decapterus punctatus*	round scad
82.	*Oligoplites saurus*	leatherjacket
83.	*Selene vomer*	lookdown
84.	*Seriola sp.*	amberjack
85.	*Trachinotus sp.*	_____
86.	*Trachinotus carolinus*	Florida pompano
87.	*Trachinotus Falcatus*	permit
	CORYPHAENIDAE	
88.	*Coryphaena hippurus*	dolphin
	LUTJANIDAE	
89.	*Lutjanus analis*	mutton snapper
90.	*Lutjanus apodus*	schoolmaster
91.	*Lutjanus griseus*	mangrove (gray) snapper
92.	*Lutjanus synagris*	lane snapper
93.	*Rhomboplites aurorubens*	vermilion snapper
	LOBOTIDAE	
94.	*Lobotes surinamensis*	tripletail
	GERREIDAE	
95.	*Diapterus sp.*	_____
96.	*Diapterus auratus*	Irish pompano
97.	*Diapterus plumieri*	striped mojarra
98.	*Eucinostomus sp.*	mojarra
99.	*Eucinostomus argenteus*	spotfin mojarra
100.	*Eucinostomus gula*	silver jenny
101.	*Eucinostomus harengulus*	tidewater mojarra
102.	*Eucinostomus jonesii*	slender mojarra
103.	*Eucinostomus melanopterus*	flagfin mojarra
104.	*Gerres cinereus*	yellowfin mojarra
105.	*Gerres sp.*	mojarra
106.	*Ulaema lefroyi*	mottled mojarra
	POMADASYIDAE	
107.	*Haemulon sp.*	grunt
108.	*Haemulon aurolineatum*	tomtate
109.	*Haemulon flavolineatum*	French grunt
110.	*Haemulon macrostomum*	spanish grunt
111.	*Haemulon parrai*	sailors choice
112.	*Haemulon sciurus*	bluestriped grunt
		striped grunt

MAP #	FAMILY GENUS, SPECIES	COMMON NAME
	SPARIDAE	
115.	*undetermined sp.*	_____
116.	*Archosargus probatocephalus*	sheepshead
117.	*Archosargus rhomboidalis*	sea bream
118.	*Calamus sp.*	porgy
119.	*Calamus penna*	sheepshead porgy
120.	*Diplodus holbrooki*	spottail pinfish
121.	*Lagodon rhomboides*	pinfish
	SCIAENIDAE	
122.	*undetermined sp.*	drum
123.	*Bairdiella chrysoura*	silver perch
124.	*Cynoscion arenarios*	sand seatrout
125.	*Cynoscion nebulosus*	spotted seatrout
126.	*Leiostomus xanthurus*	spot
127.	*Menticirrhus americanus*	southern kingfish
128.	*Micropogonias undulatus*	Atlantic croaker
129.	*Odontoscion dentex*	reef croaker
130.	*Pogonias cromis*	black drum
131.	*Sciaenops ocellata*	red drum
132.	*Umbrina coroides*	sand drum
	EPHIPPIDAE	
133.	*Chaetodipterus faber*	Atlantic spadefish
	POMACANTHIDAE	
134.	*Pomacanthus arcuatus*	gray angelfish
	POMACENTRIDAE	
135.	*Abudefduf saxatilis*	sergeant major
	LABRIDAE	
136.	*Halichoeres maculipinna*	clown wrasse
137.	*Hemipteronotus novacula*	pearly razorf
	SCARIDAE	
138.	*Cryptotomus roseus*	bluelip parrotfish
139.	*Sparisoma sp.*	parrotfish
140.	*Sparisoma chrysopterum*	redtail parrotfish
141.	*Sparisoma radians*	buckotooth parrotfi
	MUGILIDAE	
142.	*Mugil sp.*	mullet
143.	*Mugil cephalus*	striped mullet
144.	*Mugil curema*	white mullet
145.	*Mugil gaimardianus*	redeye mullet
146.	*Mugil trichodon*	fantail mullet
	SPHYRAENIDAE	
147.	*Sphyraena sp.*	_____
148.	*Sphyraena barracuda*	great barracuda
149.	*Sphyraena borealis*	northern sennet
150.	*Sphyraena picudilla*	southern sennett
	POLYNEMIDAE	
151.	*Polydactylus oligodon*	littlescale threadfi
	CLINIDAE	
152.	*Paraclinus fasciatus*	banded blenny
	BLENNIIDAE	
153.	*Lupinoblennius nicholsi*	highfin blenny

FISH COLLECTED IN LAKE WORTH LAGOON

MAP #	FAMILY GENUS, SPECIES	COMMON NAME
	GOBIIDAE	
154.	*undetermined sp.*	goby
155.	*Bathygobius soporator*	frillfin goby
156.	*Coryphopterus glaucofraenum*	bridled goby
157.	*Gobionellus sp.*	goby
158.	*Gobionellus boleosoma*	darter goby
159.	*Gobionellus smaragdus*	emerald goby
160.	*Gobiosoma sp.*	goby
161.	*Gobiosoma bosci*	naked goby
162.	*Gobiosoma longipala*	twoscale goby
163.	*Gobiosoma gammaum*	frecklefin goby
164.	*Gobiosoma robustum*	code goby
165.	*Lophogobius cyprinoides*	crested goby
166.	*Microgobius gulosus*	clown goby
167.	*Microgobius microlepis*	banner goby
	NOMEIDAE	
168.	*Psenes cyanophrys*	freckled driftfish
	BOTHIDAE	
169.	*Bothus sp.*	flounder
170.	*Bothus ocellatus*	eyed flounder
171.	*Citharichthys macrops*	spotted whiff
172.	*Citharichthys spilopterus*	bay whiff
173.	*Paralichthys albigutta*	gulf flounder
174.	*Syacium sp.*	flounder
175.	*Syacium micrurum*	channal flounder
176.	*Syacium papillosum*	dusky flounder
	SOLEIDAE	
177.	*Achirus lineatus*	line sole
	CYNOGLOSSIDAE	
178.	*Symphurus sp.*	tonguefish
179.	*Symphurus arawak*	caribbean tonguefish
180.	*Symphurus plagiusa*	blackcheek tonguefish
	BALISTIDAE	
181.	*Balistes sp.*	triggerfish
	MONACANTHIDAE	
182.	*Aluterus scriptus*	scrawled filefish
183.	*Monacanthus sp.*	filefish
184.	*Monacanthus ciliatus*	fringed filefish
185.	*Monacanthus hispidus*	planehead filefish
	OSTRACIIDAE	
186.	*Acanthostracion quadricornis*	scrawled cowfish
187.	*Lactophrys sp.*	trunkfish
188.	*Lactophrys trigonus*	trunkfish
189.	*Lactophrys triqueter*	smooth trunkfish
	TETRAODONTIDAE	
190.	*Sphoeroides sp.*	puffer
191.	*Sphoeroides nephelus*	southern puffer
192.	*Sphoeroides spengleri*	bandtail puffer
193.	*Sphoeroides testudineus*	checkered puffer
	DIODONTIDAE	
194.	*Chilomycterus schoepfi*	striped burrfish
195.	*Diodon hystrix*	porcupinefish

water-skiing, sunbathing, birdwatching and sightseeing. Golf is played nearby at the Lake Worth Municipal Golf Course. Peanut Island provides swimming and sunbathing beaches as well as trail and camping facilities not associated with the proposed Federal project (change in maintenance operations).

3.13 NAVIGATION.

The Atlantic Intracoastal Waterway (IWW) borders Peanut Island on the western shoreline. The IWW is a Federally maintained navigation channel. It is authorized by the 1945 Rivers and Harbors Act, and is 10 feet deep by 125 feet wide from Fort Pierce to Miami. Estimated waterway traffic in 1997 traffic was 424,00 tons (CORPS, 1998). The Palm Beach Harbor is to the immediate west of the IWW and Peanut Island, and is 6th largest port in Florida. The project was authorized in the River and Harbor Act of 1960 and was completed in 1967 with maintenance authorized to 24 feet in the Water Resources Development Act of 1986. The harbor depths authorized range from 33 feet deep in the inner channel to 24 feet deep in the north turning basin (see Figure 13). Current channel depths are 33 to 35 feet deep and vary from 300 to 400 feet wide. Harbor traffic in 1997 was 2,922,000 tons (CORPS, 1998). A quarter of the cargo is comprised of coal and petroleum.

3.14 HISTORIC PROPERTIES.

The Corps' staff archeologist conducted research on the history of Peanut Island. Because Peanut Island was initially constructed around 1918, it is unlikely that prehistoric archeological resources are located there. A former US Coast Guard Station and the Kennedy bunker (old government magazine area) are located on the island. Both are eligible for inclusion in the National Register of Historic Places. The no adverse effect determination was coordinated with the Florida State Historic Preservation Officer (SHPO) for the Peanut Island Section 1135, Environmental Restoration Project. The SHPO concurred with the Corps' no adverse effect determination for the Section 1135 Environmental Restoration Project. All work for the Change of Maintenance Operations at Peanut Island would occur within the current footprint of existing facilities. Coordination with the State Historic Preservation Officer of the State of Florida Division of Historical Resources has been conducted with the coordination of this EA (see Appendix C – Pertinent Correspondence).

3.14.1 U.S. COAST GUARD.

The Coast Guard selected Peanut Island as a site in 1934 and, in 1937, placed in service the Lake Worth Inlet Station. The United States Coast Guard's lifesaving station and boathouse, known as the Lake Worth Inlet Station, approximately 11,980 square feet in size, was built on the southeast part of Peanut Island. The Station was one of the busiest in Florida until 1995, when the Coast Guard moved to another site, on the mainland. The station and boathouse are in the process of being restored and converted into the Palm Beach Maritime Museum.

3.14.2 KENNEDY BUNKER.

With the heightened Cold War tensions of the Cuban Missile Crisis, the Coast Guard Station took on national defense importance, due to its proximity to the Palm Beach vacation home of President John F. Kennedy. Peanut Island was only five minutes by speedboat from the Presidential Retreat. The Lake Worth Inlet Station on Peanut Island was the only secure military site suitable for a fallout shelter and command post. The Navy's Seabees, the mobile construction battalions, built the shelter, along with extensive communications facilities, in secrecy. It was designed and stocked as a command communications center to house the President and 25 to 30 others for up to 30 days. The shelter a lead-lined steel and concrete