



DEPARTMENT OF THE ARMY  
 JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
 P. O. BOX 4970  
 JACKSONVILLE, FLORIDA 32232-0019



REPLY TO  
 ATTENTION OF

FINDING OF NO SIGNIFICANT IMPACT

MAINTENANCE DREDGING  
 IWW - OWW INTERFACE (CROSS ROADS)  
 MARTIN COUNTY, FLORIDA

I have reviewed the Environmental Assessment (EA) of the proposed action. Based on information analyzed in the EA, reflecting pertinent information obtained from other agencies and special interest groups having jurisdiction by law and/or special expertise, I conclude that the proposed action will have no significant impact on the quality of the human environment. Reasons for this conclusion are, in summary:

1. There will be no adverse impacts to endangered or threatened species, if the work is conducted in accordance with the Biological Opinion issued by the U.S. Fish and Wildlife Service.
2. It is the District's determination that significant cultural resources are not likely to be located in the area of impact. The State Historic Preservation officer (SHPO) concurred with this determination.
3. State water quality standards will be met.
4. The proposed project has been determined to be consistent with the Florida Coastal Zone Management Program.
5. Measures to eliminate, reduce, or avoid potential impacts to fish and wildlife resources will be implemented during project construction.
6. The proposed project has been evaluated pursuant to the Migratory Bird Treaty Act. The Migratory Bird Protection Policy for the Jacksonville District will be implemented for this project.
7. Benefits to the public will be maintenance of the navigation channel, continued local economic stimulus, and increased suitable migratory bird and sea turtle nesting habitat should the material be placed on the beach or in the nearshore area.

In consideration of the information summarized, I find that the proposed action will not significantly affect the human environment and does not require an Environmental Impact Statement.

31 <sup>40t A</sup> 5 't  
 Date

TERRY L. R. E  
 Colonel, Corps of Engineers  
 Commanding

NEPA

DECEMBER 1996

# MAINTENANCE DREDGING

## IWW - OWW INTERFACE (CROSSROADS)

MARTIN COUNTY, FLORIDA

### ENVIRONMENTAL ASSESSMENT



US Army Corps  
of Engineers  
**Jacksonville District**  
South Atlantic Division

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## 1.0 PURPOSE OF AND NEED FOR ACTION.

1.1. INTRODUCTION. The Jacksonville District, U.S. Army Corps of Engineers is proposing to conduct routine maintenance dredging of approximately 415,000 cubic yards of material from the Intracoastal Waterway (IWW) and the Okeechobee Waterway (OWW) where they intersect at St. Lucie Inlet, Martin County, Florida, to restore the authorized depths of 12 feet mean low water, with two feet of allowable overdepth. Figure 1 shows the location of the federal project and specific dredging and disposal areas. The areas include Dredged Material Management Area MSA-M5, the Beach Placement Area located south of the Inlet and the Nearshore Placement Area located off Hobe Sound. Dredging will likely be accomplished by mechanical (clamshell or bucket) or hydraulic (pipeline with cutterhead) dredge.

1.2. AUTHORITY. The maintenance of the IWW was authorized by the Rivers and Harbors Act of 2 March 1945, House Document 740, 79th Congress, 2nd Session, and Chief of Engineers Report 22 July 1960 modifying the 12-foot channel. The OWW was authorized by Authorization for this project is provided by the Harbor and River Act of 31 May 1974, House Document 294/93/1.

1.3. DECISION TO BE MADE. The decision to be made is whether to conduct maintenance dredging and where to place the dredged material.

### 1.4. RELEVANT ISSUES.

- a. Water quality
- b. Sea turtles
- c. Manatees
- d. Seagrasses
- e. Hardbottoms
- £ Cultural Resources
- g. Aesthetics
- h. Navigation
- i. Economics
- j. Recreation

1.5. PERMITS REQUIRED. In accordance with the Clean Water Act, a water quality certification would be required from the Florida Department of Environmental Protection (DEP) for the maintenance dredging and beach placement or nearshore placement.

1.6. METHODOLOGY. An interdisciplinary team used a systematic approach to analyze the affected area, to estimate the environmental effects, and to write the environmental assessment. This included literature searches, coordination with agencies and private groups having expertise in particular areas, and field investigations.



## 2.0 ALTERNATIVES.

2.1. INTRODUCTION. The alternatives section is the heart of this Environmental Assessment. This section describes in detail the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail. Then based on the information and analysis presented in the sections on the Affected Environment and the Probable Impacts, this section presents the beneficial and adverse environmental effects of all alternatives in comparative form, providing a clear basis for choice among the options for the decisionmaker and the public. The key to this section is the alternative comparison chart, Figure 2.1, page 7. This section has five parts:

- a. A description of the process used to formulate alternatives.
- b. A description of alternatives that were considered but were eliminated from detailed consideration.
- c. A description of each alternative.
- d. A comparison of the alternatives.
- e. The identification of the preferred alternative.

2.2. HISTORY OF ALTERNATIVE FORMULATION. The St Lucie Inlet Management Plan has been prepared for the Inlet by a consultant for the local sponsor (ATM, 1995). It looks at the natural processes along the coast line and what effects the inlet has on those processes. Various alternatives to maintaining the inlet are discussed and recommendations have been made to the FDEP concerning maintenance dredging and disposal options. These options are reviewed by the Corps and additional engineering evaluations are made to FDEP regarding the plan.

2.3. ELIMINATED ALTERNATIVES. There were no eliminated alternatives.

### 2.4. DESCRIPTION OF ALTERNATIVES.

2.4.1. No Action Alternative. No maintenance dredging and placement of material would occur. The existing shoaling would continue to decrease the channel depth and could render the channel unnavigable.

2.4.2. Dredging and Disposal at Dredged Material Management Area MSA-M5. This alternative involves the maintenance dredging of the IWW and OWW channels and placement of the material in the adjacent upland disposal area. This alternative is only practicable if there is enough capacity within the disposal area or the material dredged is not suitable for placement either in the Nearshore Disposal Site or on the Beach Placement Area. There could be impacts from dredging and its auxiliary equipment on manatees.

However, this impact would be mitigated by the implementation of the standard State and Federal manatee protection conditions (Appendix I). In summary these conditions require the contractor to monitor the site for the presence of manatees, shut down the equipment if the manatees get close to the equipment and require auxiliary equipment operate at no wake speeds. In addition, the placement of material in MSA-M5 could affect migratory bird nesting during the months of April through August. This impact would be mitigated by the implementation of the Districts' Migratory Bird Protection Policy. In summary, this recommends that the work be done outside migratory bird nesting season. However, if that is not practicable, then, certain steps would be implemented which would allow construction to be undertaken and yet not affect bird nesting.

2.4.3. Dredging and Beach Placement. This alternative involves the dredging of the IWW and OWW channels and the placement of this material on the beach south of St. Lucie Inlet on the St. Lucie Inlet State Park and the Hobe Sound National Wildlife Refuge provided the material is deemed beach quality. There could be impacts from dredging and its auxiliary equipment on manatees. However, this impact would be mitigated by the implementation of the standard State and Federal manatee protection conditions (Appendix I). In summary these conditions require the contractor to monitor the site for the presence of manatees, shut down the equipment if the manatees get close to the equipment and require auxiliary equipment operate at no wake speeds. In addition, the placement of material on the beach could affect migratory bird nesting during the months of April through August. This impact would be mitigated by the implementation of the Districts' Migratory Bird Protection Policy. In summary, this recommends that the work be done outside migratory bird nesting season. However, if that is not practicable, then, certain steps would be implemented which would allow construction to be undertaken and yet not affect bird nesting. In addition, the work could affect sea turtle nesting along the beach. The adverse impacts would be mitigated by the avoidance of sea turtle nesting season.

2.4.4. Dredging and Nearshore Placement. This alternative involves the dredging of the IWW and OWW channels and the placement of this material on the beach south of St. Lucie Inlet on the St. Lucie Inlet State Park and the Hobe Sound National Wildlife Refuge provided the material is deemed beach quality. There could be impacts from dredging and its auxiliary equipment on manatees. However, this impact would be mitigated by the implementation of the standard State and Federal manatee protection conditions (Appendix I). In summary these conditions require the contractor to monitor the site for the presence of manatees, shut down the equipment if the manatees get close to the equipment and require auxiliary equipment operate at no wake speeds.

2.5. ALTERNATIVE COMPARISON.

Figure 2.2, Alternative Comparison Chart

RESOURCES	NO ACTION ALTERNATIVE	Dredging and Placement at MSA-MS	Dredging and Nearshore Placement	Dredging and Beach Placement
Water Quality	No impact.	Short-term localized increase in turbidity at dredge site.	Short-term localized increase in turbidity at dredge and disposal sites	Short-term localized increase in turbidity at dredge site and within the surf zone along the beach placement area.
Sea turtles	No impact.	No impact for dredging with other than hopper dredge. If a hopper dredge is used special conditions contained in Regional Biological Opinion would apply.	No adverse impact for dredging with other than hopper dredge. If a hopper dredge is used special conditions contained in Regional Biological Opinion would apply to mitigate for impacts on sea turtles.  The placement of material in nearshore would benefit sea turtle nesting habitat.	No impact for dredging with other than hopper dredge. If a hopper dredge is used special conditions contained in Regional Biological Opinion would apply. Minor short-term adverse impact on turtle nesting from construction activities. This impact would be mitigated by implementing a nest monitoring and relocation program and by tilling the beach area after construction and for the following year.
Manatees	No impact.	No impact with implementation of standard protection conditions.	No impact with implementation of standard protection conditions.	No impact with implementation of standard protection conditions.
Seagrasses	No impact.	No impact.	No impact.	No impact.
Hardbottoms	No impact.	No impact.	No impact.	No impact.
Cultural Resources	No impact.	No impact.	No impact.	No impact.

RESOURCES	NO ACTION ALTERNATIVE	Dredging and Placement at MSA-MS	Dredging and Nearshore Placement	Dredging and Beach Placement
Aesthetics	No impact.	<p>Short-term adverse impact on recreational and navigation along the IWW from dredging.</p> <p>Short-term adverse impact at disposal site from odors caused by exposing anaerobic material to the air.</p>	Short-term adverse impact on recreational and navigation along the IWW from dredging.	<p>Short-term adverse impact on recreational and navigation along the IWW from dredging.</p> <p>Short-term adverse impact from disruption of beach activities such as fishing, sunbathing, surfing etc.</p> <p>Long-term beneficial impact for beach aesthetics from reducing erosion rate thereby maintaining the beach.</p>
Economics	Long-term reduced channel capacity limits recreational boat traffic and a reduction in the sale of goods and services in support of same.	<p>Short-term benefit from the sale of goods and services in support of the dredging.</p> <p>Long-term benefits from generating income to local commercial facilities from the maintenance of navigation channel.</p>	<p>Short-term benefit from the sale of goods and services in support of the dredging.</p> <p>Long-term benefits from generating income to local commercial facilities from the maintenance of navigation channel.</p>	<p>Short-term benefit from the sale of goods and services in support of the dredging.</p> <p>Long-term benefits from generating income to local commercial facilities from the maintenance of navigation channel.</p>
Recreation	<p>Moderate impact to recreational boat traffic from loss of navigable capacity of channel.</p> <p>Moderate impact to recreational beach activities from beach erosion.</p>	<p>Long-term moderate impact on recreational navigation from maintaining the navigable capacity of the channel.</p> <p>There would be a short-term impact to recreational boat traffic and beach activities from construction vessel congestion.</p>	<p>Long-term moderate impact on recreational navigation from maintaining the navigable capacity of the channel.</p> <p>There would be a short-term impact to recreational boat traffic and beach activities from construction vessel congestion.</p>	<p>There would be a short-term impact to recreational boat traffic and beach activities from construction vessel congestion and beach placement activities.</p> <p>There would be a long-term benefit from the increased navigable capacity of the channel and the increased beach area.</p>
Navigation	Reduction in navigable capacity of channel	<p>Long-term maintenance of navigable capacity</p> <p>There would be a moderate short-term impact on navigation from presence and operation of dredging equipment</p>	<p>Long-term maintenance of navigable capacity</p> <p>There would be a moderate short-term impact on navigation from presence and operation of dredging equipment</p>	There would be a moderate short-term impact on navigation from presence and operation of dredging equipment. Long-term moderate benefit in navigation from maintaining the channel.

2.6. PREFERRED ALTERNATIVE. The preferred alternative would be to conduct maintenance dredging and use the upland, nearshore or beach disposal areas.

### 3.0. 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. Sea turtles
- c. Manatees
- d. Seagrasses
- e. Hardbottoms
- f. Cultural Resources
- g. Aesthetics
- h. Navigation
- i. Economics
- j. Recreation

3.2. GENERAL DESCRIPTION. The natural resources of the surrounding area of the St. Lucie Inlet include beach and dune, uplandherrestrial, wetlands/estuary, and nearshore zones.

3.2.1. The beach and dune systems surrounding the St. Lucie Inlet form a natural barrier between the ocean, the developed properties, and the roadway landward. Stabilized beach and dune systems provide storm protection against high tide levels and wave runup, and supply the sand to offshore sand bars, thereby reducing large waves during the active storm period.

3.2.2. The Hobe Sound National Wildlife Refuge and the State Park on the south side of the inlet include several unique upland habitats and are the only area within the vicinity of the inlet that is formally designated for conservation. These islands serve as unique habitats for the county as nesting sites for many wading and diving birds. Snowy egrets (special status species) and tricolored herons together comprise a large percentage of breeding pairs. Upland areas of these islands were colonized primarily by the introduced Australian Pines. The islands also provide shallow-water habitat for growth of mangroves, seagrasses and upland hardwoods trial plantings.

3.2.3. The Indian River is a wide, shallow tidal lagoon which lies between the inlet and the St. Lucie River estuary. The Indian River extends northward to Ft. Pierce Inlet, 22 miles away. Located between the inlet and the St. Lucie River estuary, the water quality of the River is influenced by the physical processes of these boundaries. At the Indian River and Inlet interphase, water flowing at ebb and flood tidal phases will generally slow down and deposit heavier sediments it may be carrying onto the shoals just west of sailfish point, just inside the inlet. Further within the inlet where the channel from the inlet intersects the IWW is considered the southern end of the Indian River Lagoon. The IWW is dredged as necessary to maintain project depth. In this area, dredging usually takes place every four to five years. If the dredged material is acceptable, it is deposited on the beaches nearby.

3.2.4. Mangroves. Four species of mangrove trees, the Red mangrove (*Rhizophora mangle*), Black mangrove (*Avicennia germinans*), White mangrove (*Laguncularia racemosa*), and Buttonwood (*Conocarpus erectus*) represent the dominant vegetation of the estuarine waters. The Red mangrove is dominant, both in and near the water at low tide. The Black mangrove is generally upland of and mixed with the Red. The White mangrove is generally upland of and mixed with the Blacks, while Buttonwood is usually found upland of and mixed with Whites. All four species appear along the fringe of the various water bodies in the area in grouped and mixed communities.

3.2.5. Wetlands. Only a small percentage of the original saltmarsh acreage remains open today due to habitat conversion to mosquito impoundments in the 1950's and 1960's. Saltmarsh vegetation typically grows in transitional areas between mangroves and freshwater marshes with typical species of this habitat form including: smooth cordgrass, saltwart, glasswort, salt grass, and sea ox-eye. Mangroves, cabbage palms, and exotics frequently mix with these species and a small portion of saltmarsh remains in the HSNWR just south of St. Lucie Inlet.

3.2.6. Extensive seagrass communities exist within the Indian River Lagoon with the most dense grass beds near inlets, in a band along the western shoreline, and in scattered patches on the eastern shoreline. Flood tidal shoal growth west of Sailfish Point may be covering portions of seagrass beds.

3.2.7. Hardbottom Communities. A limestone rock outcrop reef extends along the full length of Martin County with an especially large community just north of the inlet which has become known as the Bathtub Reef. The reefs continue past the inlet (Where it has been cut through for the channel) and southward along Jupiter Island. The reef lies approximately 500 ft to 1,500 ft off of Jupiter Island. One section intersects the shoreline at the Hobe Sound Public Beach and the other area of nearshore outcrops intersects the shoreline just north of Coral Cove Park where it forms the intertidal feature known as Blowing Rocks.

### 3.3. RELEVANT PHYSICAL, BIOLOGICAL, SOCIAL, AND ECONOMIC FACTORS

OF THE ENVIRONMENT THAT WOULD BE AFFECTED.

3.3.1. Physical

a. Water quality. The waters in the study area are used for fishing, boating and other recreational uses. The standard quality of the AIWW is affected by these activities. The State of Florida lists the area's waters as being of Class III quality (suitable for recreation and the propagation of fish and wildlife). No other water use classification is known to be within the project area.

b. Cultural Resources. Since this is a man-made channel there would be no properties of a cultural or historic nature within the dredging area. The beach and nearshore areas are relatively dynamic with shifting sand eroding, accreting and moving along the shoreline. Unknown cultural or historic properties could be located in these areas. The State Historic Preservation Officer has not recorded any known properties within these areas.

3.3.2. Biological.

a. General. The presence of wildlife in the vicinity of the dredging and disposal sites is dependent on man's use of the area and vegetative cover. The vegetative cover is scattered and sparse. The presence of wildlife in the area is further dependent on migrations of species from surrounding areas. Small mammals such as shrews, muskrats, rats, raccoons, and otters may appear in the general vicinity. Dolphins, porpoise, and manatees also inhabit the nearby waters. Birdlife is abundant. An estimated 30 species of waterfowl, consisting of grebes, pelicans, cormorants, frigate-birds, herons, bitterns, storks, ibis, mergansers, and ducks are present seasonally or year round. Marshhawks, ospreys, and kestrels are common. Various marsh and shorebirds may use the beach disposal area. Other species common along the open waters and contiguous wetlands include Kingfishers, swallows, crows, wrens, warblers, and sparrows. Many sport and commercial species of fish are common to the area. These include tarpon, bluefish, drum, weakfish, sheepshead, flounder, jacks, snook, sea catfish, and mullet.

b. Threatened and Endangered Species. The following species listed as threatened or endangered by U.S. Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) pursuant to the Endangered Species Act (USFWS, 1987) could possibly be located in the project area:

- Green sea turtle ..... *Chelonia mydas*
- Hawksbill sea turtle ..... *Eretmochelys imbricata*
- Kemp's Ridley sea turtle ..... *Lepidochelys kempii*
- Leatherback sea turtle ..... *Dermochelys coriacea*
- Loggerhead sea turtle ..... *Caretta caretta*

West Indian Manatee ..... *Trichechus manatus*  
 Brown Pelican ..... *Pelecanus occidentalis*  
 Southern Bald Eagle ..... *Haliaeetus leucocephalus*  
 American Alligator ..... *Alligator mississippiensis*  
 Eastern Indigo Snake ..... *Drymarchon corals couperi*  
 Atlantic Salt Marsh Snake... *Neridua fascuata taebuata*

c. Manatees. The West Indian Manatee (*Trichechus manatus*) is known to frequent St. Lucie Inlet using it for access to overwintering areas. Manatee overwintering areas designated by the Florida Department of Natural Resources (FDNR) include all of the waters between St. Lucie Inlet and Jupiter Inlet. Manatees are often sighted around the inlet both inside and in the ocean indicating that frequent passage through the inlet is common.

d. Sea turtles. Three sea turtle species nest regularly on beaches of the southeastern U.S.. Within the United States the Loggerhead (*Caretta caretta*) nests primarily on beaches from North Carolina to Florida with Approximately ninety percent occurring in Florida. The highest density nesting beaches in Florida occur from Canaveral National Seashore, Volusia County south to John V. Lloyd State Recreation Area in Broward County. The Loggerhead nesting season encompasses late April - August with most nesting occurring in June and July and occasionally in September. Green Sea Turtle (*Chelonia mydas*) nesting within the U.S. occurs principally along east central Florida beaches with the majority of nesting occurring in south Brevard County and south Jupiter Island in Palm Beach County. Nesting occurs from May - September with the peak nesting occurring in July - August. The Leatherback (*Dermochelys coriacea*) nests in the U.S. primarily in Puerto Rico and the Virgin Islands. However, eighty-nine Leatherback nests were recorded on Florida east coast beaches in 1985. Much of the Florida nesting effort is centered in Palm Beach County. Nesting begins as early as late February and terminates by late July.

e. Seagrasses. The many shallow water areas in the St. Lucie Inlet/Indian River Lagoon area are dominated by productive seagrass communities. Approximately 2,480 acres have been identified in Martin County. Two dominant seagrasses; Cuban shoal grass (*Halodule wrightii*) and manatee grass (*Syringodium filliforme*) proliferate to provide an increase in bottom surface area by 15 to 20 times as a result of leaf surfaces. In addition to the two species listed above, these five species occur in the St. Lucie Inlet, Indian River Lagoon area: Johnson's seagrass (*Halophila johnsonii*); turtle grass (*Thalassia testudinum*); paddle grass (*Halophila decipens*); star grass (*Halophila englemanii*); and widgeon grass (*Ruppia maritima*). Johnson's seagrass is a proposed threatened species and critical habitat for this species has been proposed for the portion of the Indian River Lagoon adjacent to the St. Lucie Inlet by the National Marine Fisheries Service (NMFS).

£ Hardbottom Communities. Lying parallel to the shoreline of Martin County is an

extensive system of limestone outcrops which often provide a suitable substrata for saballeriid worm (*Phragmatoponza lopicosa*) colonization. These worms construct a tube-like reef structure over submerged rocks by cementing sand and platy shell fragments together with a protein-based secretion. A total of approximately 1,150 acres of hardbottom habitat exists in the St. Lucie Inlet and offshore Jupiter Island. These hardbottom habitats are characterized by limestone, worm rock, and limestone/worm rock mix reefs.

g. Migratory birds. The Least tern (*Sterna albifrons*) is known to nest on former sandy disposal material along the shoreline of the St. Lucie State Park. Approximately 20 pairs of terns have been recorded at this site. This beach area is also used by killdeer, snowy plovers and Wilson's plovers. MSA-5 is also used by migratory birds until overgrowth prohibits nesting.

### 3.3.3. Social.

a. Aesthetics. The project area offers scenic rural views along the AIWW and adjacent forested lands. Salt marshes, pocket wetlands, mixed hardwood flatlands, and largely unspoiled river views characterize the positive visual elements of the immediate area. The St. Lucie Inlet is a picturesque waterway which connects the Intracoastal Waterway to the Atlantic Ocean. This Inlet is used by small vessels. The breakers at the entrance to the Inlet protects these vessels from the ocean generated wave action which can be severe at times. The nearshore disposal area is located south of Hobe Sound Park along a residential housing area. The beach disposal area is located within the rustic St. Lucie State Park and Hobe Sound National Wildlife Refuge.

b. Recreation. Much of the recreation along the IWW and OWW is associated with recreational navigation. The major activity associated with the waterway is boating and fishing. Major activities along the beach includes sunbathing, swimming and nature watching.

### 3.3.4. Economic

a. Navigation. The St. Lucie Inlet provides an outlet from the Intracoastal waterway for recreational and commercial boat traffic. Prior to construction of the inlet, large draft vessels of or more could not use the inlet and smaller vessel navigation was perilous due to extensive shoaling.

b. Economics. The recreational and charter boat industry which uses the OWW and IWW provide economic stimulus to the local communities. Numerous marinas provide goods and services such as gasoline, slip rental, foods services and boat repair for their use.

## 4.0 ENVIRONMENTAL CONSEQUENCES.

4.1. INTRODUCTION. This section describes the probable consequences of implementing each alternative on selected environmental resources. These resources are directly linked to the relevant issues listed in Section 1.4 that have driven and focus the environmental analysis. The following includes anticipated changes to the existing environment including direct and indirect impacts, irreversible and irretrievable commitment of resources, unavoidable effects and cumulative impacts.

4.1.1. Cumulative Impacts. Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

4.1.2. Irreversible and Irretrievable Commitment of Resources.

a. Irreversible. An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource.

b. Irretrievable. An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction.

4.2. NO ACTION ALTERNATIVE.

4.2.1. Physical: No Impact

4.2.2. Biological: No Impact

4.2.3. Social: Recreation on the AIWW would be affected if the channel were to become unnavigable.

4.2.4. Economic: A loss of revenues from the recreational and commercial use of the AIWW would be felt if this alternative were to be implemented due to the possibility of the channel becoming unnavigable.

4.2.5. Recreation: Impacts to recreational boat traffic along the AIWW would result from increased shoaling and decreased navigable capacity of the channel. In addition, recreational beach activities would be impacted due to continued loss of beach area.

4.2.6. Cumulative effects: Cumulative effects on the project area if this alternative were implemented would be the shoaling of the navigation channel which would affect

navigation and therefore, the local economy.

4.2.7. Unavoidable effects: No Impact

4.2.8. Irreversible and Irretrievable Resource Commitments: There would be no utilization of resources if this alternative were implemented. Therefore, there would be no irreversible or irretrievable resource commitments.

4.3. DREDGING AND DISPOSAL AT DREDGED MATERIAL MANAGEMENT AREA MSA-M5

4.3.1. Physical:

- a. Water Quality. Since the area to be dredged is composed of fine sandy material deposited from flood shoaling, the dredging operations would result in some minor temporary changes in water quality. Turbidity in the area of dredging would be elevated above normal but would not exceed state established levels. Minor visible plumes at the water surface would be expected in the immediate vicinity of the dredging operation. Minor elevated turbidity levels would be expected to dissipate rapidly, returning to background levels in a short period of time. Water quality would return to normal levels shortly after completion of the proposed project.
- b. Cultural Resources. Consultation with the State Historic Preservation Officer (SHPO) was initiated by public notice dated 9 February 1995. The SHPO responded by letter dated 28 April 1995 and expressed concerns for known sites in the area. Based on conversations the SHPO responded by letter dated 12 May 1995 stating it withdrew its concerns and that no further cultural resource coordination was necessary.

4.3.2. Biological:

- a. General. Maintenance dredging would disrupt the benthic communities in the areas to be dredged. However, benthos would quickly recolonize the newly dredged areas and no long-term adverse effects would result,
- b. Manatees. Manatees could be affected during dredging, generally from the operation of crew boats or auxiliary equipment. In order to minimize this potential current US Fish and Wildlife Service Standard Manatee Conditions would be implemented during maintenance dredging. This would ensure manatee protection should any wander into the work area during construction.
- c. Sea turtles. There would be no impacts to sea turtles from the dredging should the equipment to be used is other than a hopper dredge. If a hopper dredge is used there could be impacts to sea turtles in the area. These impacts would be reduced

by the use of the new deflector draghead, monitoring the intake and restricting its use to the winter hopper dredging window (1 December to 15 April).

d. Seagrasses. There would be no direct impact on seagrasses from the maintenance of the exiting channel. If the dredging operation produces turbidity, then, there would be a minor adverse, short-term impact on seagrasses.

e. Hardbottoms. No hardbottoms would be affected.

#### 4.3.3. Social:

a. Recreation. Recreational boat traffic would experience temporary delays due to construction traffic and congestion and minor temporary impacts to recreational beach activities would occur during beach placement. However, recreational boat traffic along the IWW would benefit from the increased navigable capacity of the channel and recreational beach activities would benefit from the increased beach area as a result of the dredging and beach placement.

b. Aesthetics. Since the only aesthetic impacts would result from construction activities (vessel traffic and noise), all impacts to the aesthetics of the area would end following project completion and no permanent impacts would occur.

4.3.4. Economic: Any expansion to the movement of commodities through the AIWW in the vicinity of St. Lucie Inlet may be a stimulus for attracting new business and small industry to the area including commercial interests directly or indirectly associated with charter and head boats and commercial fisheries. This could possibly increase employment in the area. Transportation cost savings may be derived through the use of deeper draft vessels and from potential new commodity movements which would utilize the IWW and OWW.

4.3.5. Cumulative effects: Cumulative effects may include benefits to the economy of the area through expanded vessel use of the waterway and increased migratory bird habitat and sea turtle nesting habitat.

4.3.6. Unavoidable effects: Temporary degradation in water quality at the dredging sites will occur. The material to be dredged is predominately sand and adverse impacts should be short-term and minor.

4.3.7. Irreversible and Irrecoverable Resource Commitments: Some loss of benthic organisms at the dredging sites will occur. However, this impact will be minimized by the repopulation of various benthic organisms at the dredged sites.

#### 4.4. DREDGING AND BEACH PLACEMENT AT JUPITER ISLAND

#### 4.4.1. Physical:

- a. **Water Quality.** Since the area to be dredged is composed of fine sandy material deposited from flood shoaling, the dredging operations would result in some minor temporary changes in water quality. Turbidity in the area of dredging would be elevated above normal but would not exceed state established levels. Minor visible plumes at the water surface would be expected in the immediate vicinity of the dredging operation. Minor elevated turbidity levels would be expected to dissipate rapidly, returning to background levels in a short period of time. Water quality would return to normal levels shortly after completion of the proposed project.
- b. **Cultural Resources.** Consultation with the State Historic Preservation Officer (SHPO) was initiated by public notice dated 9 February 1995. The SHPO responded by letter dated 28 April 1995 and expressed concerns for known sites in the area. Based on conversations the SHPO responded by letter dated 12 May 1995 stating it withdrew its concerns and that no further cultural resource coordination was necessary.

#### 4.4.2. Biological:

- a. **General.** Maintenance dredging would disrupt the benthic communities in the areas to be dredged. However, benthos would quickly recolonize the newly dredged areas and no long-term adverse effects would result.
- b. **Manatees.** Manatees could be affected during dredging, generally from the operation of crew boats or auxiliary equipment. In order to minimize this potential current US Fish and Wildlife Service Standard Manatee Conditions would be implemented during maintenance dredging. This would ensure manatee protection should any wander into the work area during construction.
- c. **Sea turtles.** There would be no impacts to sea turtles from the dredging should the equipment to be used is other than a hopper dredge. If a hopper dredge is used there could be impacts to sea turtles in the area. These impacts would be reduced by the use of the new deflector draghead, monitoring the intake and restricting its use to the winter hopper dredging window (1 December to 15 April). Sea turtles nest along the beach. During dredging a placement along the beach sea turtles could be affected. In order to minimize this impact, a nest monitoring and relocation program would be implemented during the sea turtle nesting season.
- d. **Seagrasses.** There would be no direct impact on seagrasses from the maintenance of the exiting channel. If the dredging operation produces turbidity, then, there would be a minor adverse, short-term impact on seagrasses.
- e. **Hardbottoms.** There would be no adverse impact on hardbottoms should the

material be placed within the design foot print.

#### 4.4.3. Social:

a. Recreation: Recreational boat traffic would experience temporary delays due to construction traffic and congestion and minor temporary impacts to recreational beach activities would occur during beach placement. However, recreational boat traffic along the AIWW would benefit from the increased navigable capacity of the channel and recreational beach activities would benefit from the increased beach area as a result of the dredging and beach placement

b. Aesthetics. Since the only aesthetic impacts would result from construction activities (vessel traffic and noise), all impacts to the aesthetics of the area would end following project completion and no permanent impacts would occur.

4.4.4. Economic: Any expansion to the movement of commodities through the AIWW in the vicinity of St. Lucie Inlet may be a stimulus for attracting new business and small industry to the area including commercial interests directly or indirectly associated with charter and head boats and commercial fisheries. This could possibly increase employment in the area. Transportation cost savings may be derived through the use of deeper draft vessels and from potential new commodity movements which would utilize the IWW-OWW.

4.4.5. Cumulative effects: Cumulative effects may include benefits to the economy of the area through expanded vessel use of the waterway and increased migratory bird habitat and sea turtle nesting habitat.

4.4.6. Unavoidable effects: Temporary degradation in water quality at the dredging sites will occur. The material to be dredged is predominately sand and adverse impacts should be short-term and minor.

4.4.7. Irreversible and Irrecoverable Resource Commitments: Some loss of benthic organisms at the dredging sites will occur. However, this impact will be minimized by the repopulation of various benthic organisms at the dredged sites.

#### 4.5. DREDGING AND PLACEMENT IN THE NEARSHORE AREA

##### 4.4.1. Physical:

a. Water Quality. Since the area to be dredged is composed of fine sandy material deposited from flood shoaling, the dredging operations would result in some minor temporary changes in water quality. Turbidity in the area of dredging would be elevated above normal but would not exceed state established levels. Minor visible plumes at the water surface would be expected in the immediate vicinity of the

dredging operation. Minor elevated turbidity levels would be expected to dissipate rapidly, returning to background levels in a short period of time. Water quality would return to normal levels shortly after completion of the proposed project.

b. Cultural Resources. Consultation with the State Historic Preservation Officer (SHPO) was initiated by public notice dated 9 February 1995. The SHPO responded by letter dated 28 April 1995 and expressed concerns for known sites in the area. Based on conversations the SHPO responded by letter dated 12 May 1995 stating it withdrew its concerns and that no further cultural resource coordination was necessary.

#### 4.4.2. Biological:

a. General. Maintenance dredging would disrupt the benthic communities in the areas to be dredged. However, benthos would quickly recolonize the newly dredged areas and no long-term adverse effects would result.

b. Manatees. Manatees could be affected during dredging, generally from the operation of crew boats or auxiliary equipment. In order to minimize this potential current US Fish and Wildlife Service Standard Manatee Conditions would be implemented during maintenance dredging. This would ensure manatee protection should any wander into the work area during construction.

c. Sea turtles. There would be no impacts to sea turtles from the dredging should the equipment to be used is other than a hopper dredge. If a hopper dredge is used there could be impacts to sea turtles in the area. These impacts would be reduced by the use of the new deflector draghead, monitoring the intake and restricting its use to the winter hopper dredging window (1 December to 15 April). Sea turtles nest along the beach. During dredging a placement along the beach sea turtles could be affected. In order to minimize this impact, a nest monitoring and relocation program would be implemented during the sea turtle nesting season.

d. Seagrasses. There would be no direct impact on seagrasses from the maintenance of the exiting channel. If the dredging operation produces turbidity, then, there would be a minor adverse, short-term impact on seagrasses.

e. Hardbottoms. The placement area selected was based on the lack of hardbottoms located along the shoreline (ATM, 1995). Therefore, there would be no adverse impact on hardbottoms.

#### 4.4.3. Social:

a. Recreation: Recreational boat traffic would experience temporary delays due to construction traffic and congestion and minor temporary impacts to recreational

beach activities would occur during beach placement. However, recreational boat traffic along the AIWW would benefit from the increased navigable capacity of the channel and recreational beach activities would benefit from the increased beach area as a result of the dredging and beach placement

b. Aesthetics. Since the only aesthetic impacts would result from construction activities (vessel traffic and noise), all impacts to the aesthetics of the area would end following project completion and no permanent impacts would occur.

4.4.4. Economic: Any expansion to the movement of commodities through the AIWW in the vicinity of St. Lucie Inlet may be a stimulus for attracting new business and small industry to the area including commercial interests directly or indirectly associated with charter and head boats and commercial fisheries. This could possibly increase employment in the area. Transportation cost savings may be derived through the use of deeper draft vessels and from potential new commodity movements which would utilize the IWW-OWW.

4.4.5. Cumulative effects: Cumulative effects may include benefits to the economy of the area through expanded vessel use of the waterway and increased migratory bird habitat and sea turtle nesting habitat.

4.4.6. Unavoidable effects: Temporary degradation in water quality at the dredging sites will occur. The material to be dredged is predominately sand and adverse impacts should be short-term and minor.

4.4.7. Irreversible and Irretrievable Resource Commitments: Some loss of benthic organisms at the dredging sites will occur. However, this impact will be minimized by the repopulation of various benthic organisms at the dredged sites.

## 5.0. LIST OF PREPARERS

<u>NAME</u>	<u>DISCIPLINE</u>	<u>EXPERIENCE</u>	<u>ROLE IN PREPARING EA</u>
William J. Fonferek	Biologist	18 years environmental impacts assessment	O&M NEPA Coordinator, Environmental Impact Assessment, Endangered Species Coordination
Paul C. Stevenson	Landscape Architect	7 years landscape architect, field and design work	Aesthetic and Recreational Resource Analysis
Glen Schuster	Environmental Engineer	15 years professional engineer	Water Quality Impacts

## 6.0 CONSULTATION WITH OTHERS - PUBLIC INVOLVEMENT PROCESS

6.1 PUBLIC NOTICE. A Public Notice on the proposed maintenance dredging was circulated 16 November 1988 and again for the nearshore area on 21 July 1994. The notice, list of addressees, and comment letters appear in Appendix V. The major adverse comment was based responses received from the US Fish and Wildlife Service (USFWS) and the Florida Department of Environmental Protection (FDEP) about the suitability of material to be placed on the beach. The materials have been sampled and evaluated. Based on the evaluation of material to be dredged and the existing material on the beach, it was determined that the dredged material was suitable for beach placement. Several meetings were held with the USFWS and the FDEP to discuss the issue and the testing results.

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