

2 ALTERNATIVES

The alternatives section is perhaps the most important component of this EA. It describes the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail. The beneficial and adverse environmental effects of the alternatives are presented in comparative form, providing a clear basis for choice to the decisionmaker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Probable Impacts.

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 NORTH JETTY SAND-TIGHTENING AND JETTY EXTENSION

As described in Section 1.3, the north jetty would be elevated, sand tightened, and extended 300-feet seaward. The area immediately north of the jetty would be used as a temporary construction staging area. Also, one of the three temporary upland stockpiling and staging areas would be selected and utilized for stockpiling boulders and equipment.

2.1.1.1 TEMPORARY UPLAND STOCKPILING AND STAGING AREAS 1-3

Each one of the proposed temporary upland stockpiling and staging areas 1 (2.5 acres) and 1A (0.98 acres), 2 (4.34 acres), and 3 (3.41 acres; refer to Figure 3) have different characteristics. Therefore, the environmental impact that would result from the utilization of each area coupled with the planned jetty

improvements were compared and considered as separate alternatives.

2.1.2 NO ACTION ALTERNATIVE (STATUS QUO)

If no action were taken, sand would continue to bypass the north jetty and accumulate in the entrance channel. This would result in increased risk to navigation as well as increased maintenance dredging requirements.

2.2 ISSUES AND BASIS FOR CHOICE

The primary objective of this project is to maintain a safe, navigable entrance channel for military and privately owned vessels. All of the impacts to local resources that may be caused by the proposed action have been determined to be acceptable, if certain protective measures are implemented.

2.3 PREFERRED ALTERNATIVE(S)

The preferred alternative, referred to in Section 4.0 as the Selected Plan, is to perform the permanent sand-tightening and extension of the north jetty and utilize Areas 1 and 1A as temporary upland stockpiling and staging areas.

2.4 COMPARISON OF ALTERNATIVES

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. See Section 4.0, Environmental Effects, for a more detailed discussion of impacts of alternatives.

Table 1: Summary of Direct and Indirect Impacts

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 1 and Area 1A	Alternative 2-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 2	Alternative 3-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 3	No Action Status Quo
SEA TURTLES	Unlikely to be adversely affected by construction activity with monitoring, avoidance or relocation of nests. Future accretion and erosion associated with the project may have minor impacts on sea turtle nesting areas.	Unlikely to be adversely affected by construction activity with monitoring, avoidance or relocation of nests. Future accretion and erosion associated with the project may have minor impacts on sea turtle nesting areas.	Unlikely to be adversely affected by construction activity with monitoring, avoidance or relocation of nests. Future accretion and erosion associated with the project may have minor impacts on sea turtle nesting areas.	No effect.
WEST INDIAN MANATEE	Unlikely to be adversely affected by construction activities with implementation of standard protection conditions. Future maintenance dredging would be reduced.	Unlikely to be adversely affected by construction activities with implementation of standard protection conditions. Future maintenance dredging would be reduced.	Unlikely to be adversely affected by construction activities with implementation of standard protection conditions. Future maintenance dredging would be reduced.	No effect.
WHALES	Unlikely to be adversely affected by barge related construction activities.	Unlikely to be adversely affected by barge related construction activities.	Unlikely to be adversely affected by barge related construction activities.	No effect.
SOUTHEASTERN BEACH MOUSE	A small taking of this species may occur. The catch per unit effort for Area 1 = 0.068 and Area 1A = 0.027 mice per trap night.	A small taking of this species may occur. The catch per unit effort for Area 2 = 0.029 mice per trap night.	A small taking of this species may occur. The catch per unit effort for Area 3 = 0.021 mice per trap night.	No effect.

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 1 and Area 1A	Alternative 2-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 2	Alternative 3-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 3	No Action Status Quo
GOPHER TORTOISE	Tortoises would be relocated. Active burrows for Area 1 = 9 and Area 1A = 7.	Tortoises would be relocated. Active burrows for Area 2 = 16.	Tortoises would be relocated. Active burrows for Area 3 = 10.	No effect.
ESSENTIAL FISH HABITAT	No substantial adverse impact.	No substantial adverse impact.	No substantial adverse impact.	No effect.
MIGRATORY BIRDS	Migratory bird protection plan would be implemented.	Migratory bird protection plan would be implemented.	Migratory bird protection plan would be implemented.	No effect.
VEGETATION	Minor impact would occur to classical coastal dune vegetation north of the jetty. Areas 1 and 1A consists of disturbed coastal dune/strand habitat and would not require extensive clearing and grubbing.	Minor impact would occur to classical coastal dune vegetation north of the jetty. Area 2 consists of coastal dune/strand habitat with a high density of exotic vegetation and would require extensive clearing and grubbing.	Minor impact would occur to classical coastal dune vegetation north of the jetty. Area 3 consists of disturbed coastal dune/strand habitat with a high density of exotic vegetation and would require extensive clearing and grubbing.	No effect.
WETLANDS ALTERATIONS	No wetlands present.	No wetlands present.	No wetlands present.	No effect.
SHORELINE STABILITY	Accretion would continue to occur immediately north of the jetty. The shoreline on the north side of the entrance channel and west of the jetty should remain relatively stable.	Accretion would continue to occur immediately north of the jetty. The shoreline on the north side of the entrance channel and west of the jetty should remain relatively stable.	Accretion would continue to occur immediately north of the jetty. The shoreline on the north side of the entrance channel and west of the jetty should remain relatively stable.	Current accretion processes would continue.

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 1 and Area 1A	Alternative 2-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 2	Alternative 3-North Jetty Sand-Tightening and Extension using Temporary Upland Stockpiling and Staging Area 3	No Action Status Quo
WATER QUALITY	Short-term minor increase in turbidity with the placement of rocks in the water. No effect anticipated.	Short-term minor increase in turbidity with the placement of rocks in the water. No effect anticipated.	Short-term minor increase in turbidity with the placement of rocks in the water. No effect anticipated.	No effect.
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE NAVIGATION	Major long-term benefit by performing the proposed action.	Major long-term benefit by performing the proposed action.	Major long-term benefit by performing the proposed action.	Increased risk to vessels due to increased shoaling of entrance channel.
ECONOMICS	Major long-term benefit from maintaining commercial port facilities. Reduced maintenance dredging costs.	Major long-term benefit from maintaining commercial port facilities. Reduced maintenance dredging costs.	Major long-term benefit from maintaining commercial port facilities. Reduced maintenance dredging costs.	Major long-term adverse impact from loss of commercial port facilities. Increased maintenance dredging costs.
CULTURAL RESOURCES	No effect anticipated.	No effect anticipated.	No effect anticipated.	No effect.
AESTHETICS	Minor short-term adverse impact due to presence of construction equipment and materials.	Minor short-term adverse impact due to presence of construction equipment and materials.	Minor short-term adverse impact due to presence of construction equipment and materials.	No effect.

3 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 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.

3.1 GENERAL ENVIRONMENTAL SETTING

3.1.1 REGIONAL DESCRIPTION

Canaveral Harbor is located on an outer barrier island known as Cape Canaveral, which is bordered by the Atlantic Ocean on the east and by the Banana River and Indian River lagoon systems as well as Merrit Island on the west. These lagoon systems are comprised of shallow water bodies, salt marsh, and mangrove communities. Hardwood hammock and pine flatwoods and other habitat types can be found within the undeveloped interior portions of the islands. Perhaps best known for the Kennedy Space Center, this area has long been a focal point in space exploration and many thousands of tourists visit the center every year. The U.S. Air Force, National Park Service, and U.S. Fish and Wildlife

Service share stewardship responsibilities over Cape Canaveral and Merrit Island.

3.1.2 SITE DESCRIPTION

The north jetty was constructed in 1954 in association with initial improvements to the harbor and port. It is a rubble-mound structure consisting of large angular granite boulders. Construction of the harbor's entrance channel and lock for barge traffic was completed in 1966. Accreting sand on beaches north of the jetty was transferred to beaches south of the entrance channel in 1995 and 1998. This is a man-made and regularly maintained harbor.

3.1.3 SITE OWNERSHIP

The U. S. Air Force and the Canaveral Port Authority own the lands adjacent to the north jetty.

3.2 FEDERALLY THREATENED AND ENDANGERED SPECIES

3.2.1 SEA TURTLES

The loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles can occur within the coastal waters near the project area (Dodd 1992; Ogren 1992; Meylan 1992; Ehrhart 1992; Pritchard 1992). All of these species are federally endangered except the loggerhead, which is classified as threatened. The loggerhead is also the only sea turtle known to nest in the project area. Table 2 lists the number of loggerhead nests and false crawls recorded within 1000 meters north of the north jetty.

TABLE 2. LOGGERHEAD SEA TURTLE NESTING DATA FOR AREA 1000 METERS NORTH OF NORTH JETTY, CANAVERAL HARBOR.

YEAR	# NESTS	# FALSE CRAWLS
1998	25	21
1999	43	35
2000	36	43
2001	31	12

Source: Dynamac Corporation

The north inlet shoreline west of the jetty has not been monitored in the past, but will be during calendar year 2002.

3.2.2 WEST INDIAN MANATEE

The West Indian manatee (*Trichechus manatus*), a federally endangered species, can be found within the coastal waters adjacent to the north jetty project area (O'Shea and Ludlow 1992).

3.2.3 WHALES

Right whales (*Eubalaena glacialis*) are known to occur in the nearshore waters off the eastern coast of Florida, including Cape Canaveral, during the months of December through March. These waters lie within the federally designated critical habitat for this highly endangered species (National Marine Fisheries Service 1995).

3.2.4 SOUTHEASTERN BEACH MOUSE

A survey was conducted between April 8 and April 11, 2002, to determine the presence of the federally threatened southeastern beach mouse (*Peromyscus polionotus niveiventris*) in project areas (see Environmental Site Survey, Appendix D). All animals were captured using live traps and released unharmed. Specific locations surveyed included Areas 1, 1A, 2, 3, which as previously described, are proposed temporary upland stockpiling

and staging areas (refer to Figure 5). Area 4, which has been proposed as the temporary construction staging area, was surveyed as well (refer to Figure 2). Finally, the beach zone along the north face of the north jetty, was also added to the survey and was designated as Area 5. Table 3 lists the catch per unit effort (CPUE) of beach mice captured per trap night at each location and number of mice captured.

TABLE 3. SOUTHEASTERN BEACH MICE TRAPPED IN PROJECT AREAS.

AREA	CPUE	NUMBER
1A	0.027	1
1	0.068	10
2	0.029	3
3	0.021	2
4	0.097	4
5	0.057	3

Source: Dynamac Corporation

Dynamac Corporation, the contractor for this survey, stated the following: "Overall these capture rates are relatively low based on our experiences along the Cape Canaveral region. In 1990-1991, Provancha et al (1993) performed seasonal sampling of multiple transects located 24 kilometers north of the current study site yielding a CPUE of 0.136 for beach mice. Transects with consistently high CPUEs ranged from 0.16 to 0.35. Provancha and Smith (unpublished data) captured beach mice along transects/grids from 1996-1998 in the vicinity of the shuttle pads resulting in an overall CPUE of 0.08. Provancha and Chambers (unpublished 2001) performed 3-day assessments near several inactive launch pads 11 to 15 kilometers north of the current sites with CPUEs of 0.002 to 0.19. Humphrey and Frank (1992) encountered a CPUE of 0.32 for southeastern beach mice during a survey

at Treasure Shores Park in Indian River County, Florida.”

3.3 STATE LISTED SPECIES- GOPHER TORTOISE

A survey was conducted between April 2 and April 6, 2002, to determine the presence of the gopher tortoise (*Polyphemus gopherus*), a state listed species of special concern, in areas that may be impacted by the proposed action (see Environmental Site Survey, Appendix D). The same locations described in Section 3.2.3 were surveyed for gopher tortoises. Table 4 lists the number and status of gopher tortoise burrows found in each area.

TABLE 4. NUMBER AND STATUS OF GOPHER TORTOISE BURROWS FOUND IN EACH AREA.

AREA	ACTIVE	INACTIVE	ABANDONED
1A	7	4	3
1	9	4	3
2	16	15	8
3	10	13	4
4	0	0	0
5	0	3	1

Source: Dynamac Corporation

A large number of gopher tortoises are known to inhabit the east spoil berm. These tortoises are known to regularly traverse the access road located along the base of the berm; the same road that would be utilized by project personnel.

3.4 ESSENTIAL FISH HABITAT

The sea floor within the project footprint lies within the shallow sublittoral zone. This area is non-vegetated and has an extremely dynamic sandy substrate. Diverse communities of haustoriid and other amphipod groups, Donax, Tellina, gastropods, polychaetes, burrowing callianassid shrimps, as well as a variety of

fishes are typically found within this habitat type along the central east coast of Florida (Spring 1981; Gorzelany 1983; Peters and Nelson 1987; Nelson and Collins 1987). Managed species that may occur within the project area include various life stages of penaeid shrimp, red drum, the snapper-grouper complex, and coastal migratory pelagic fishes (South Atlantic Fishery Management Council 1998).

3.5 MIGRATORY BIRDS

Various species of migratory birds have been observed in the project area. Common migrating species as well as residents undoubtedly nest within the project area where suitable conditions are found.

3.6 VEGETATION

Groups of plant species were identified and delineated within the areas that may be impacted by the proposed action. Areas 1 and 1A, the preferred temporary upland stockpiling and staging area, was described as disturbed coastal dune/strand habitat. Both of these areas appeared to be previously cleared and dominated by grasses. All of the other surveyed areas were described as coastal dune/strand or coastal dune, some of which were also disturbed (refer to the Environmental Site Survey in Appendix D for more information). Brazilian pepper (*Schinus terebinthifolius*), an exotic and invasive species, was especially dominant in the other proposed temporary upland and stockpiling staging areas (Areas 2 and 3).

State listed species of plants were noted during the vegetation survey. The state endangered beach star (*Remirea maritima*) as well as the state threatened inkberry (*Scaevola plumeri*) and shell mound prickly pear cacti (*Opuntia stricta*)

were found. The same locations described in Section 3.2.3 were surveyed for state listed species of plants. Table 5 identifies those areas where these plants were observed.

TABLE 5. STATE LISTED SPECIES OF PLANTS IDENTIFIED IN PROJECT AREAS.

AREA	PROTECTED PLANTS		
	<i>R.maritima</i>	<i>O.stricta</i>	<i>S.plumieri</i>
1A	N	N	N
1	N	Y	N
2	N	Y	N
3	N	Y	N
4	Y	N	N
5	N	Y	Y

Source: Dynamac Corporation

3.7 WETLANDS

Wetland surveys were conducted throughout the proposed project area in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual. No wetlands were identified.

3.8 SHORELINE STABILITY

The sand beach from the existing north jetty to a point at least 15,000 feet north (updrift) has extended seaward at 15 ft/yr or greater since the harbor's channel and jetties were constructed in 1953/54.

Since the inception of sand bypassing in 1995, the sublittoral zone from the jetty to a point 8500 feet north has been dredged and the sand placed on the beach south (downdrift) of the entrance channel to Canaveral Harbor. The federal sand bypass project dredges sand from the mean high water line (mhw) to -16 ft mean low water (mlw). Dredging is scheduled for 6-year intervals, and was last completed in 1998. Per predictions, this dredging resulted in a measured, average shoreline retreat of 100 feet

within 3 years after the 1998 dredging event, with local retreat ranging from 50 feet to about 180 feet between 1000 and 5000 ft north of the north jetty, respectively. The shoreline and beach profile recovers to its pre-bypass condition at or prior to the next dredging event, with the borrow area accumulating sand at a net apparent rate of up to 250,000 cy/yr. The overall result, both intended and predicted, is a dynamic beach and berm profile within 8500-ft north of the north jetty that fluctuates in width by up to 180 feet between each 6-year bypass event.

There is a 1000-ft long ephemeral sand beach immediately south of the project jetty, offset approximately 900 feet landward from the end of the existing structure. This shoreline is within the harbor's channel. Historically, this beach's existence, width and configuration have exhibited significant variability. Recently, its width and stability have both increased, apparently as a result of the interim sand-tightening of the north jetty in 1998. A rock revetment that is mostly buried within dense vegetation armors the entirety of this beach. This revetment extends from the landward end of the north jetty to the channel throat and westward into the harbor.

3.9 WATER QUALITY

The waters adjacent to the project area are classified by the state of Florida as Class III waters, suitable for recreation as well as propagation and maintenance of a healthy and well-balanced population of fish and wildlife.

3.10 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

There are no known sources of hazardous, toxic, or radioactive wastes in the project area.

3.11 NAVIGATION

The U.S. Navy maintains a Trident submarine base at Canaveral Harbor. Deep draft commercial vessels also utilize this port. In 2000, commercial vessels in and out of Canaveral Harbor made a total of 1,735 inbound and 1,748 outbound trips. These vessels transported 4,247,000 short tons of freight that included petroleum products, chemicals, crude materials, manufactured goods, food and farm products, and manufactured equipment (Waterborne Commerce of the United States 2000).

3.12 ECONOMICS

The transport of commercial freight in and out of the harbor provides a

significant stimulus to the regional economy. Also, the port provides employment and generates income for the local community through the purchase of goods and services.

3.13 CULTURAL RESOURCES

There are no known cultural resources within the north jetty sand tightening and extension project area. Consultation with the Florida State Historic Preservation Officer (see Appendix C) indicated that due to the location, past surveys, and the nature of the proposed project there will be no effect on historic properties eligible for listing in the National Register of Historic Places.

3.14 AESTHETICS

Development associated with the harbor and the Cape Canaveral Air Station has impacted the aesthetics of the area. However, the beach and dune system in the vicinity of the north jetty remain relatively natural and picturesque.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. See table 1 in section 2.0 Alternatives, for summary of impacts. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.1 THREATENED AND ENDANGERED SPECIES

4.1.1 SELECTED PLAN

Coordination with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) in regards to the proposed action was conducted pursuant to Section 7 of the Endangered Species Act (see Appendix C). The NMFS has determined that the proposed north jetty improvements are unlikely to adversely affect any listed species under its purview. Also, the USFWS has determined that the project may affect, but is unlikely to adversely affect the West Indian manatee with the implementation of the standard manatee protection measures. The Service further determined that the project is unlikely to jeopardize the continued existence of nesting sea turtles and the southeastern beach mouse.

4.1.1.1 Sea Turtles

The proposed action would be performed in compliance with the terms and conditions of the biological opinion issued by the USFWS. Sea turtle nest surveys and relocation would be initiated 65 days prior to construction or by March 1, whichever is the later date, and continue until construction is complete, or

November 30, whichever is earliest. No construction would be performed at night during the sea turtle nesting season.

Accretion and erosion associated with this project may have a minor impact on areas utilized by nesting sea turtles (refer to Section 4.6.2 for a detailed evaluation of shoreline stability).

4.1.1.2 West Indian Manatee

Protective measures would be taken during construction activities to ensure the safety of manatees. To make the contractor and his personnel aware of the potential presence of this species in the project area, their endangered status, and the need for precautionary measures, the contract specifications would include the following standard manatee protection clauses. The contractor would instruct all personnel associated with construction activities about the potential presence of manatees in the area and the need to avoid collisions with them. If a manatee were sighted within 100 yards of the project area, all appropriate precautions would be implemented by the contractor to ensure protection of the manatee. These precautions would include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee were closer than 50 feet to moving equipment or the project area, the equipment would be shut down and all construction activities would cease to ensure protection of the manatee. Construction activities would not resume until the manatee has departed the project area. All vessels associated with the project would operate at 'no wake' speeds at all times while in shallow waters or channels where the draft of the boat provides less than three feet clearance from the bottom. Boats used to transport personnel would be shallow draft vessels, preferably of the light-

displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any workboat would follow routes of deep water to the greatest possible extent. Shore crews would use upland road access if available. All personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act.

4.1.1.3 Whales

Even though the proposed action may include the transport of materials by barge through the designated critical habitat of the right whale, this species should not be adversely impacted by this activity.

4.1.1.4 Southeastern Beach Mouse

The utilization of the temporary construction staging area adjacent to the jetty and the preferred temporary upland and stockpile and staging areas (1 and 1A) may result in the incidental taking of a small number of southeastern beach mice. The USFWS determined that trapping and relocation of this species is not possible as the staging areas and work corridor would continue to be accessible to beach mice throughout the life of the project. Once the project is completed; however, mice should recolonize these areas.

4.1.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to threatened and endangered species if the no action alternative were selected.

4.2 STATE LISTED SPECIES- GOPHER TORTOISE

4.2.1 SELECTED PLAN

Gopher tortoises would be relocated from project areas according to the relocation plan described in the Environmental Site Survey (see Appendix D).

4.2.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to fish and wildlife resources if the no action alternative were selected.

4.3 ESSENTIAL FISH HABITAT

4.3.1 SELECTED PLAN

The proposed action would impact approximately 0.5 acres of shallow littoral zone utilized by various life stages of penaeid shrimp, red drum, species within the snapper-grouper complex, and coastal migratory pelagic fishes. The Corps' initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries along the eastern coast of Florida. The NMFS determined that no long-term and significant adverse impacts to high quality aquatic habitats, including Essential Fish Habitat, are anticipated.

4.3.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to essential fish habitat if the no action alternative were selected.

4.4 MIGRATORY BIRDS

4.4.1 SELECTED PLAN

The Corps would implement the standard migratory bird protection plan which

includes monitoring the site and avoiding nesting locations.

4.4.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to migratory birds if the no action alternative were selected.

4.5 VEGETATION

4.5.1 SELECTED PLAN

The temporary construction staging area would be restored to its previous condition once construction is complete. Colonies of the state listed species, beach star, would also be temporarily or permanently lost. Stockpiling materials in the preferred temporary upland stockpile and staging areas (1 and 1A) would not require, unlike the other possible sites, extensive clearing and grubbing. The existing grasses should eventually regenerate after construction is completed. However, known colonies of the state listed species, shell mound prickly pear cactus, could be temporarily or permanently lost.

4.5.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to the plant communities in the project area if the no action alternative were selected.

4.6 WETLANDS ALTERATIONS

4.6.1 SELECTED PLAN

The proposed action would not impact any wetlands.

4.6.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to wetlands if the no action alternative were selected.

4.7 SHORELINE STABILITY

4.7.1 SELECTED PLAN

Replacement of the existing, interim sand-tightening of the north jetty with permanent works would maintain and slightly increase the beach width, elevation and stability produced by the 1998 interim project; by a 3- to 5-ft vertical increase and 100-ft approximate advance of the beach against the north jetty with the effect tapering to between 700 and 1300 feet north of the jetty. Contrary to intuition, the interior beach south of the jetty also increased in width and stability. This was plausibly due to the elimination of chronic wave overwash of the jetty and the establishment of a structurally stabilized "pocket" in which the beach could expand. Without jetty extension, there would be no significant additional increase in shoreline width beyond current conditions (because the structure is mostly saturated with sand). Sand transport from the north beach, around the sand-tightened jetty (without extension) and into the inlet is computed to be about 104,000 cy/yr.

Numerical shoreline modeling (GENESIS) indicates that sand-tightening of the jetty with a 300-ft extension, with no sand bypassing, would result in a 115-ft seaward advance of the shoreline at the north jetty after 6 years. (This is equivalent to 19.2 ft/yr, which is similar to the rate observed after the original jetty construction.) The effect would extend about 3,800 feet north of the jetty; with 80-ft advance predicted at 1,500-ft updrift and 30-ft advance

predicted at 3,000-ft updrift. At year six, sand transport past the extended jetty and into the inlet is predicted as about 16,000 cy/yr. This represents the maximum anticipated shoreline advance with sand bypassing. The 6-yr interval sand bypass project has and would continue to result in 50 to 180 ft of shoreline recession along the impoundment area affected by the jetty. This ultimately yields a net retreat of the shoreline, followed by shoreline advance associated with recovery of the dredged area.

Jetty extension would normally be expected to adversely effect the small interior beach immediately south of the jetty; however, the unexpected increase in width and stability of this beach after the interim sand-tightening project suggests that this beach may plausibly remain stable or otherwise improved relative to its 1998 pre-construction condition. The principal reason for this effect is the establishment of an equilibrium shoreline condition adjacent to the jetty, which was otherwise prone to frequent and severe overwash. Despite the large transport rates of sand into the channel that are known to exist at the north jetty since at least the 1960's, this ephemeral beach has otherwise never significantly accreted until the interim sand-tightening project. It is therefore believed that this small beach responds more as a pocket shoreline in the lee of the jetty and, in the absence of overwash, requires little or no sand input to maintain an approximate equilibrium. The uplands and diked spoil area behind this small beach, and the landward end of the jetty, are protected from catastrophic erosion and flanking by the presence of the original rock revetment along the entirety of the shoreline south of the jetty and along the inlet entrance.

4.7.2 NO ACTION ALTERNATIVE (STATUS QUO)

In the no action alternative, the existing conditions are anticipated to continue. Fluctuations in width and overtopping of the ephemeral beach south of the jetty, and within about 1500 ft north of the jetty, would increase as the interim sand-tightening tubes continue to deteriorate and are eventually removed.

4.8 WATER QUALITY

4.8.1 SELECTED PLAN

The only anticipated change in water quality at the proposed construction site would be a temporary increase in turbidity. According to the state of Florida's water quality standards, turbidity levels during dredging are not to exceed 29 nephelometric turbidity units (NTUs) above background levels within a 150 meter mixing zone. In order to comply with this standard, turbidity will be monitored according to state protocols during the proposed construction work. If at any time the turbidity standard is exceeded, those activities causing the violation will cease.

4.8.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no effect to water quality if the no action alternative were selected.

4.9 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

4.9.1 SELECTED PLAN

There are no known sources of hazardous, toxic, or radioactive wastes in the project area. However, the site would be re-mediated in the event contaminants were unexpectedly found during construction.

4.9.2 NO ACTION ALTERNATIVE (STATUS QUO)

There are no known sources of hazardous, toxic, or radioactive wastes in the project area.

4.10 NAVIGATION

4.10.1 SELECTED PLAN

Implementation of the selected plan would significantly help maintain the navigable capacity of the Canaveral Harbor channel.

4.10.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be an increased risk to vessels, especially deep draft military and commercial vessels, due to increased shoaling within the entrance channel if the no action alternative were selected.

4.11 ECONOMICS

4.11.1 SELECTED PLAN

There would be a major long-term benefit to the regional economy by maintaining the harbor's facilities. Also, the proposed action would reduce maintenance dredging costs.

4.11.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be a major long-term adverse impact to the regional economy if the harbor's facilities were not maintained. Not performing the proposed action would result in increased maintenance dredging costs.

4.12 CULTURAL RESOURCES

4.12.1 SELECTED PLAN

In accordance with the procedures contained in 36CFR800, consultation

between the Jacksonville District Corps of Engineers and the Florida State Historic No. 2001-06429) determined that the project would have no effect on any sites listed, or eligible for listing, in the National Register of Historic Places. Preservation Officer (August 10, 2001, Division of Historic Resources Project File

4.12.2 NO-ACTION ALTERNATIVE (STATUS QUO)

There would be no impact to cultural resources without the North Jetty Sand Tightening and Extension project.

4.13 AESTHETICS

4.13.1 SELECTED PLAN

There would be a minor short-term adverse impact to the aesthetic quality of the area due to the presence of construction equipment and materials.

4.13.2 NO ACTION ALTERNATIVE (STATUS QUO)

There would be no impact to the aesthetic quality of the area if the no action alternative were selected.

4.14 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 regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). The proposed action would significantly reduce the amount of shoaling in the harbor's channel. This would result in less maintenance dredging which in turn would reduce adverse cumulative impacts associated with more frequent dredging events.

4.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.15.1 IRREVERSIBLE

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. There would be no permanent loss of resources other than the consumption of materials necessary for construction of the project.

4.15.2 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. A small number of southeastern beach mice may be taken by the proposed action; however, this is not expected to have a long-term adverse impact on the population of this species in this area. Colonies of certain state listed species of plants may be temporarily or permanently lost. Benthic organisms and common vegetation types within the project area would be temporarily lost due to construction but are expected to recover.

4.16 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

The proposed action may result in the taking of a small number of the federally endangered beach mouse as well as the temporary or permanent loss of colonies of certain species of state listed plants. There would be an unavoidable temporary increase in turbidity levels limited to the waters immediately adjacent to the north jetty. Benthic organisms in the waters or on the beach would be impacted by the proposed action. Populations of these organisms are known to recover within a short period of time after construction.

4.17 ENVIRONMENTAL COMMITMENTS

The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

1. All terms and conditions set out in the Biological Opinion of the USFWS for those federally endangered or threatened species identified in this Environmental Assessment would be complied with. The standard migratory bird protection measures would also be implemented. Gopher tortoises would be relocated.
2. All project activities would be in compliance with the terms and conditions of the water quality certification issued by the state of Florida.
3. The contractor would establish and maintain quality control for environmental protection of all items set forth in the project plans and specifications. The contractor would record on daily quality control reports or attachments thereto, any problems in complying with laws, regulations and ordinances, and corrective action taken.
4. The contracting officer would notify the contractor in writing of any observed noncompliance with federal, state, or local laws or regulations, permits and other elements of the contractor's Environmental Protection Plan. The contractor would, after receipt of such notice, inform the contracting officer of proposed corrective action and take such action as may be approved. If the contractor fails to comply promptly, the contracting officer would issue an order stopping all or part of the work until satisfactory corrective action has been

taken. No time extensions would be granted or costs or damages allowed to the contractor for any such suspension.

5. The contractor would train his personnel in all phases of environmental protection. The training would include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities to insure adequate and continuous environmental pollution control. Quality control and supervisory personnel would be thoroughly trained in the proper use of monitoring devices and abatement equipment, and would be thoroughly knowledgeable of federal, state, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by the contractor.

6. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract would be protected during the entire period of this contract. The contractor would confine his activities to areas defined by the drawings and specifications.

7. As stated in the standard contract specifications, the disposal of hazardous or solid wastes would be in compliance with federal, state, and local laws. A spill prevention plan would also be required.

4.18 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

4.18.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this Environmental Assessment has been prepared. The project is in compliance with the National Environmental Policy Act.

4.18.2 ENDANGERED SPECIES ACT OF 1973

Consultation with the NMFS and the USFWS has been completed (see Appendix C). This project is in full compliance with the Act.

4.18.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project has been coordinated with the U.S. Fish and Wildlife Service (USFWS). A Coordination Act Report (CAR) is not required for this project. This project is in full compliance with the Act.

4.18.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

(PL 89-665, the Archeology and Historic Preservation Act (PL 93-291), and executive order 11593) Archival research, and consultation with the State Historic Preservation Officer (SHPO), have been conducted in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. SHPO consultation has been conducted. In a 10

August 2001 response, the SHPO concurred with the Corps' no effect determination (see Appendix C). The project will not affect historic properties included in or eligible for inclusion in the National Register of Historic places. The project is in compliance with each of these Federal laws.

4.18.5 CLEAN WATER ACT OF 1972

The project will be in compliance with this Act. A draft Section 401 water quality certification has been received from the Florida Department of Environmental Protection. All State water quality standards would be met. A Section 404(b) evaluation is included in this report as Appendix A.

4.18.6 CLEAN AIR ACT OF 1972

No air quality permits would be required for this project.

4.18.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix B. State consistency has been issued.

4.18.8 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of this project. This Act is not applicable.

4.18.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project

related activities. This act is not applicable.

4.18.10 MARINE MAMMAL PROTECTION ACT OF 1972

Incorporation of the safe guards used to protect threatened or endangered species during construction activities would also protect any marine mammals in the area, therefore, this project is in compliance with the Act.

4.18.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. This Act is not applicable.

4.18.12 FEDERAL WATER PROJECT RECREATION ACT

This Act is not applicable to this project.

4.18.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

The project has been coordinated with the National Marine Fisheries Service (NMFS) and is in compliance with the Act.

4.18.14 SUBMERGED LANDS ACT OF 1953

The project would occur on submerged lands of the state of Florida. The project is being coordinated with the state and will be in compliance with the Act.

4.18.15 COASTAL BARRIER RESOURCES ACT AND

COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These Acts are not applicable.

4.18.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the Act. The project is in full compliance.

4.18.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. The project has been coordinated with the National Marine Fisheries Service and is in compliance with the Act.

4.18.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

The Corps' standard migratory bird protection plan would be implemented. The project is in compliance with these Acts.

4.18.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The term "dumping" as defined in the Act (33 U.S.C. 1402(f)) does not apply to the disposal of material for beach nourishment or to the placement of material for a purpose other than disposal

(i.e. placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this EA have been evaluated under Section 404 of the Clean Water Act.

4.18.20 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Impacts caused by this project to Essential Fish Habitat have been coordinated with the NMFS. This project is in full compliance with this Act.

4.18.21 E.O. 11990, PROTECTION OF WETLANDS

No wetlands would be affected by project activities. This project is in compliance with the goals of this Executive Order.

4.18.22 E.O. 11988, FLOOD PLAIN MANAGEMENT

The project is in the base flood plain (100-year flood) and has been evaluated in accordance with this Executive Order. Project is in compliance.

4.18.23 E.O. 12898, ENVIRONMENTAL JUSTICE

The proposed action would not result in adverse human health or environmental effects. Any impacts of the action would not be disproportionate towards any minority. The activity does not (a) exclude persons from participation in, (b) deny persons the benefits of, or (c) subject persons to discrimination because of their race, color, or national origin. The activity would not impact

“subsistence consumption of fish and wildlife.”

4.18.24 E.O. 13089, CORAL REEF PROTECTION

No coral reef or coral reef organism would be impacted by this project.

4.18.25 E.O. 13112, INVASIVE SPECIES

The proposed action may result in the removal of invasive species.

5 LIST OF PREPARERS

5.1 PREPARERS

Preparer	Discipline	Role
Paul Stodola, U.S. Army Corps of Engineers	Biologist	Principal Author
Kevin Bodge, Olsen Associates, Inc.	Engineer	Engineering
Grady Caulk, U.S. Army Corps of Engineers	Archaeologist	Cultural Resources

5.2 REVIEWERS

Personnel in the Planning Division of the U.S. Army Corps of Engineers, Jacksonville District, reviewed this Environmental Assessment.

6 PUBLIC INVOLVEMENT

6.1 SCOPING AND DRAFT EA

A scoping letter dated June 29, 2001, was issued for this action.

6.2 COMMENTS RECEIVED AND RESPONSE

Letters received from scoping and appropriate responses are provided in Appendix C.

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APPENDIX A - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION

NORTH JETTY PERMANENT SAND-TIGHTENING AND JETTY EXTENSION CANAVERAL HARBOR BREVARD COUNTY, FLORIDA

I. Project Description

a. Location. The north jetty project area is located immediately north of the entrance channel to Canaveral Harbor, Brevard County, Florida.

b. General Description. The proposed plan calls for sand-tightening and elevating 940-feet of the existing north jetty using rock boulders and a geo-grid/geo-textile barrier (see Figures 2,3,4). In addition, the jetty would be extended by 300-feet using steel sheet-pile and rock armor. Upland areas north of the jetty would need to be used for staging and stockpiling purposes.

c. Authority and Purpose. The River and Harbor Act of 2 March 1945 (Public Law 79-14) authorized the construction of the entrance channel and jetties at Canaveral Harbor. Congress authorized additional project improvements including channel maintenance and shore protection via sand bypassing through the River and Harbor Act of 23 October 1962 (Public Law 87-874). Permanent sand-tightening and extension of the jetty is recommended to minimize future transport of sand from the northern beach area into the harbor's entrance channel. This action would significantly reduce maintenance dredging requirements in this area. The sand that accumulates on the beach, north of the jetty, would then be available for transport to the beaches downdrift or south of the inlet via the Canaveral Harbor Federal Sand Bypass Project. In summary, the proposed project would result in decreased maintenance dredging requirements of the inlet, improved navigation reliability for privately owned vessels as well as U.S. Navy warships, and decreased offshore dredging requirements to renourish the downdrift beaches. This would yield both economic and environmental benefits to federal and local governments.

d. General Description of Construction/Fill Material.

(1) General Characteristics of Material. Rock boulders, geo-grid/geo-textile barrier, steel sheet-pile.

(2) Quantity of Material. Approximately 5000 tons (total) of boulders ranging from 1 ft to 5 ft in diameter, a dozen 12 to 20 ft long rolls of

geogrid/geotextile material, 300 pieces of 1-ft wide steel panels of 30- to 45-ft length.

(3) Source of Material. Commercial source would be dependent on contractor.

e. Description of the proposed construction site.

(1) Location. The location is the north jetty, adjacent waters, and adjacent upland areas.

(2) Size. Stockpile Area 1 (usable area, excludes dike slope, excludes area 1A): 1.2 acres west of existing dirt road plus 1.3 acres east of existing dirt road = 2.5 ac total.

Stockpile Area 1A = 0.98 acres, Stockpile Area 2 = 4.34 acres, Stockpile Area 3 = 3.41 acres.

Staging area adjacent to jetty (usable area above wave zone and exclusive of existing jetty stones): 0.98 acres in the 75-ft wide strip next to jetty, plus another 0.66 Ac shown on the beach-berm, for a total of 1.64 acres.

Length of existing jetty overall is 1140 feet, of which landward 180 feet is within the upland dense vegetation, for net of 960' length exposed. Existing footprint above sand seabed varies; typically 25 feet.

Sand-tightening of existing jetty will increase existing footprint above sand seabed by about 12 feet on average (to 37 ft, more or less).

Jetty extension to be 300 feet long; seabed footprint varies from 40 ft at landward commencement to 55 ft at seaward end, with footprint of about 80 feet at seaward head (maximum of 90 feet).

(3) Type of Site. The jetty extends from a sand beach and runs parallel to the Canaveral Harbor entrance channel. Stockpiling and staging activities would be performed in upland areas.

(4) Type of Habitat. The jetty is made up of boulders that are partially exposed at low tide. The areas adjacent to the jetty consist of a sand beach and classical coastal dune. The preferred temporary upland stockpile and staging area is disturbed coastal dune/strand.

(5) Timing and Duration of construction. The proposed activity may begin at any time during the year and is expected to take approximately 6-10 months.

f. Access to Construction Site. Access to the construction site could be either over land through the Cape Canaveral Air Force Station or by barge.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Refer to Figures 3 and 4 of the EA.

(2) Type of Fill Material. Rock boulders, geo-grid/geo-textile barrier, steel sheet-pile.

(3) Fill Material Movement. Fill material is not expected to move.

(4) Physical Effects on Benthos. Benthic organisms that are not mobile and are located within the footprint of the sand-tightening and extension would be buried. Adjacent areas that are compacted during construction should be re-colonized soon after project completion.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Construction activities may cause a temporary and minor increase in turbidity. Similar projects constructed in the past did not exceed the state turbidity standards.

(2) Current Patterns and Circulation. Currents in the project area are both tidal and longshore. Net movement of water due to the longshore current is from the north to the south. The project would have no significant effect on existing current patterns, current flow, velocity, stratification, or the hydrologic regime in the area.

(3) Normal Water Level Fluctuations and Salinity Gradients. The proposed action would not affect normal tide fluctuations or salinity.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. Construction activities may cause a temporary

and minor increase in turbidity. Similar projects constructed in the past did not exceed the state turbidity standards.

(2) Effects on the Chemical and Physical Properties of the Water Column.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the jetty during construction. This effect would be temporary, limited to the immediate area of construction and would have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels would not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released as a result of the project.

(d) Aesthetics. The aesthetic quality of the water adjacent to the jetty would be reduced during construction due to increased turbidity. This would be a short-term and minor change.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. The proposed action would not have a significant impact on primary productivity.

(b) Suspension/Filter Feeders. An increase in turbidity could adversely impact burrowing invertebrate filter feeders within and adjacent to the construction area. This would not be a long-term impact as these are highly fecund organisms.

(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

d. Contaminant Determinations. The proposed action would not introduce, relocate, or increase contaminants.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. No adverse impacts on plankton are expected.

(2) Effects on Benthos. No adverse long-term impacts to benthic organisms are expected.

(3) Effects on Nekton. No adverse long-term impacts to nektonic organisms are expected.

(4) Effects on the Aquatic Food Web. No adverse long-term impacts to any trophic level is expected.

(5) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. Other than the communities associated with the existing jetty, there are no hardground or coral reef communities located in the immediate area that would be impacted by construction activities. The jetty is intermittently buried by sand, and visual inspection of the jetty has not revealed any significant biological resources.

(b) Sanctuaries and Refuges. The proposed action would not adversely impact any sanctuary or refuge.

(c) Wetlands. The proposed action would not adversely impact any wetlands.

(d) Mud Flats. The proposed action would not adversely impact any mud flats.

(e) Vegetated Shallows. The proposed action would not adversely impact any vegetated shallows.

(f) Riffle and Pool Complexes. The proposed action would not adversely impact any riffle or pool complexes.

(6) Endangered and Threatened Species. There would be no significant adverse impacts on any endangered or threatened species or on any critical habitat of any endangered or threatened species.

(7) Other Wildlife. The proposed action would not significantly adversely affect any other wildlife species.

(8) Actions to Minimize Impacts. All practical safeguards would be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area.

f. Proposed Construction Site Determinations.

(1) Mixing Zone Determination. The boulders, geo-textile fabric, metal sheet pile would not have an adverse impact on the mixing zone.

(2) Determination of Compliance with Applicable Water Quality Standards. Due to the nature of the materials to be used and type of construction, Class III water quality standards would not be violated.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. The proposed action would not impact municipal and private water supplies.

(b) Recreational and Commercial Fisheries. The proposed action would not impact recreation and commercial fisheries.

(c) Water Related Recreation. The proposed action would not impact water related recreation.

(d) Aesthetics. The proposed action would not impact aesthetics.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. No such designated sites area located within the project area.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. There would be no cumulative effects that result in a significant impairment of the existing aquatic ecosystem caused by the proposed action.

h. Determination of Secondary Effects on the Aquatic Ecosystem. There would be no secondary effects on the aquatic ecosystem caused by the proposed action.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

c. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The proposed permanent sand-tightening and jetty extension will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.

APPENDIX B - COASTAL ZONE MANAGEMENT CONSISTENCY

**FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**NORTH JETTY PERMANENT SAND-TIGHTENING AND JETTY EXTENSION
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA**

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed plans and information will be voluntarily submitted by the U.S. Army Corps of Engineers to the state of Florida.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the state's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been coordinated with various federal, state and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the shorefront development and infrastructure.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project involves the permanent sand-tightening and extension of the north jetty in order to reduce shoaling and provide safer navigation through the Canaveral Harbor entrance channel. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities;

swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: No seagrass beds, reef communities, and wetlands are located within the project area. The proposed project would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership, this chapter does not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project area does not contain any state parks or aquatic preserves nor are there any within the immediate vicinity of the project that would be affected. The project is consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Historic Property investigations were conducted in the project area. An archival and literature search, in addition to a magnetometer survey of the proposed borrow area were conducted. The SHPO concurred with the Corps determination that the proposed project will not adversely affect any significant cultural or historic resources. The project will be consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed action would decrease shoaling of the Canaveral Harbor entrance channel. This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

9. Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: The proposed action would provide safer navigation through Canaveral Harbor and therefore is consistent with the goals of this chapter.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed action may represent a temporary short-term impact to filter feeders and other infaunal invertebrates. However, these organisms are highly adapted to the periodic burial by sand in the intertidal zone. These organisms are highly fecund and are expected to return to pre-construction levels within 6 months to one year after construction. No adverse impacts to marine fishery resources are expected. It is not expected that sea turtles would be significantly impacted by this project. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project will have no significant effect on freshwater aquatic life or wild animal life.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications will prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor

adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed action will not have any regional impact on resources in the area. Therefore, the project is consistent with the goals of this chapter.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project will not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: An environmental assessment of project impacts has been prepared and will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. Water Quality Certification will be sought from the State prior to construction. The project complies with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to

cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; therefore, this chapter does not apply.

APPENDIX C - PERTINENT CORRESPONDENCE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive South

Suite 310

Jacksonville, Florida 32216-0958

IN REPLY REFER TO:
FWS/R4/ES-JAFL

June 20, 2002

Mr. James C. Duck
Chief, Planning Division
Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232

FWS Log No: 02-1090

Dear Mr. Duck:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposal to permanently sand-tighten and elevate 940 feet of the existing north jetty at Canaveral Harbor, Brevard County, and its effects on loggerhead, green, hawksbill, and leatherback sea turtles, manatees, and southeastern beach mice, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This biological opinion is based on information provided in the May 30, 2002, Draft Environmental Assessment (EA). A complete administrative record of this consultation is on file at Jacksonville Field Office.

CONSULTATION HISTORY

On May 30, 2002, the Corps submitted the Draft EA with supporting documents to our office. The Corps determined that the proposed project may affect the above listed sea turtles and beach mice, but not likely to adversely affect the manatee.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Corps, in partnership with the Canaveral Port Authority, are proposing to sand-tighten and elevate 940 feet of the existing north jetty using rock boulders and geo-grid/geo-textile barrier. In addition, the jetty would be extended by 300 feet using sheet pile and rock armor. The

placement of the rock boulders along the existing jetty would be performed by land-based equipment such as back-hoe and front-loader or by barge. Temporary construction staging areas for equipment and certain material would be required. The preferred alternative selected staging areas 1, 1A, 2, and 3.

MANATEE

In the Draft EA, the Corps stated that the standard manatee construction precautions would be conditions of the contract. The Service, therefore, concurs with the Corps' determination of may affect, not likely to adversely affect for the manatee.

STATUS OF SEA TURTLES/CRITICAL HABITAT

Species/critical habitat description

Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*), listed as a threatened species on July 28, 1978 (43 FR 32800), inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (Hopkins and Richardson 1984).

No critical habitat has been designated for the loggerhead sea turtle.

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific Coast of Mexico are listed as endangered; all other populations are listed as threatened. The green turtle has a worldwide distribution in tropical and subtropical waters. Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). Nesting also has been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia Counties) and from Pinellas County through Collier County (Florida Department of Environmental Protection, unpublished data). Green turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources, unpublished data). The green turtle also nests sporadically in North Carolina and South Carolina (North Carolina Wildlife Resources Commission, unpublished data; South Carolina Department of Natural Resources, unpublished data). Unconfirmed nesting of green turtles in Alabama has also been reported (Bon Secour National Wildlife Refuge, unpublished data).

Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys.

Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*), listed as an endangered species on June 2, 1970 (35 FR 8491), nests on shores of the Atlantic, Pacific and Indian Oceans. Non-breeding animals have been recorded as far north as the British Isles and the Maritime Provinces of Canada and as far south as Argentina and the Cape of Good Hope (Pritchard 1992). Nesting grounds are distributed worldwide, with the Pacific Coast of Mexico supporting the world's largest known concentration of nesting leatherbacks. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992, National Research Council 1990a).

The leatherback regularly nests in the U.S. in Puerto Rico, the U.S. Virgin Islands, and along the Atlantic coast of Florida as far north as Georgia (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992). Leatherback turtles have been known to nest in Georgia, South Carolina, and North Carolina, but only on rare occasions (Murphy 1996, Winn 1996, Boettcher 1998). Leatherback nesting also has been reported on the northwest coast of Florida (LeBuff 1990; Florida Department of Environmental Protection, unpublished data); a false crawl (non-nesting emergence) has been observed on Sanibel Island (LeBuff 1990).

Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands.

Hawksbill Sea Turtle

The hawksbill sea turtle (*Eretmochelys imbricata*) was listed as an endangered species on June 2, 1970 (35 FR 8491). The hawksbill is found in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean. Within the continental U.S., hawksbill sea turtle nesting is rare and is restricted to the southeastern coast of Florida (Volusia through Dade Counties) and the Florida Keys (Monroe County) (Meylan 1992, Meylan *et al.* 1995). However, hawksbill tracks are difficult to differentiate from those of loggerheads and may not be recognized by surveyors. Therefore, surveys in Florida likely underestimate actual hawksbill nesting numbers (Meylan *et al.* 1995). In the U.S. Caribbean, hawksbill nesting occurs on beaches throughout Puerto Rico and the U.S. Virgin Islands (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1993).

Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico.

Life history

Loggerhead Sea Turtle

Loggerheads are known to nest from one to seven times within a nesting season (Talbert *et al.* 1980, Richardson and Richardson 1982, Lenarz *et al.* 1981, among others); the mean is approximately 4.1 (Murphy and Hopkins 1984). The interval between nesting events within a season varies around a mean of about 14 days (Dodd 1988). Mean clutch size varies from about 100 to 126 along the southeastern United States coast (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). Nesting migration intervals of 2 to 3 years are most common in loggerheads, but the number can vary from 1 to 7 years (Dodd 1988). Age at sexual maturity is believed to be about 20 to 30 years (Turtle Expert Working Group 1998).

Green Sea Turtle

Green turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3. The interval between nesting events within a season varies around a mean of about 13 days (Hirth 1997). Mean clutch size varies widely among populations. Average clutch size reported for Florida was 136 eggs in 130 clutches (Witherington and Ehrhart 1989). Only occasionally do females produce clutches in successive years. Usually 2, 3, 4, or more years intervene between breeding seasons (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). Age at sexual maturity is believed to be 20 to 50 years (Hirth 1977).

Leatherback Sea Turtle

Leatherbacks nest an average of five to seven times within a nesting season, with an observed maximum of 11 (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992). The interval between nesting events within a season is about 9 to 10 days. Clutch size averages 101 eggs on Hutchinson Island, Florida (Martin 1992). Nesting migration intervals of 2 to 3 years were observed in leatherbacks nesting on the Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands (McDonald and Dutton 1996). Leatherbacks are believed to reach sexual maturity in 6 to 10 years (Zug and Parham 1996).

Hawksbill Sea Turtle

Hawksbills nest on average about 4.5 times per season at intervals of approximately 14 days (Corliss *et al.* 1989). In Florida and the U.S. Caribbean, clutch size is approximately 140 eggs, although several records exist of over 200 eggs per nest (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1993). On the basis of limited information, nesting migration intervals of 2 to 3 years appear to predominate. Hawksbills are recruited into the reef environment at about 14 inches in length and are believed to begin breeding about 30 years later. However, the time required to reach 14 inches in length is unknown and growth rates vary geographically. As a result, actual age at sexual maturity is not known.