DRAFT
ENVIRONMENTAL ASSESSMENT

MAINTENANCE DREDGING OF THE GULF INTRACOASTAL WATERWAY
FROM ALABAMA/FLORIDA STATELINE TO CARABELLE, FLORIDA

A FEDERALLY AUTHORIZED PROJECT

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Environmental Resources Branch
Coastal Environment Team

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MAINTENANCE DREDGING OF THE GULF INTRACOASTAL WATERWAY FROM THE ALABAMA/FLORIDA STATE LINE TO CARABELLE, FLORIDA

A FEDERALLY-AUTHORIZED NAVIGATION PROJECT

1.0 INTRODUCTION

The purpose for the proposed action is to update the National Environmental Policy Act (NEPA) documentation, as the original 1976 Environmental Impact Statement (EIS) predates some changes in the environmental setting and there have been new designations since then, such as Essential Fish Habitat (EFH) and Gulf sturgeon critical habitat designation, delisting of the bald eagle to protection under the Bald and Golden Eagle Protection Act, and implementation of Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 13045 - Protection of Children from Environmental Health Risks and Safety Risks. This Environmental Assessment (EA) will address the continual maintenance dredging and disposal for the federally-authorized Gulf Intracoastal Waterway (GIWW), Florida portion.

1.1 Project History. In 1909, Congress directed an investigation of a continuous waterway, "inland where practicable," along the Gulf of Mexico from St. George Sound, Florida to the Mississippi River and New Orleans. Several surveys between 1907 and 1925 resulted in the construction of numerous disconnected reaches of channel along the coast, with dimensions ranging from five feet by 40 feet to 12 feet by 90 feet.

The completion of the canal between Choctawhatchee Bay and St. Andrews Bay, Florida, in 1938, made the continuous waterway from St. George Sound to New Orleans a reality. In addition, the extension of the channel from Apalachicola through St. George Sound and Carabelle and thence inland to St. Marks, Florida was authorized in 1937. The waterway, however, has only been completed as far as Carrabelle, Florida. Barge traffic destined for St. Marks precedes from St. George Sound through the open Gulf of Mexico, Apalachee Bay, and the St. Marks River.

1.2 Environmental History. An EIS was prepared for maintenance dredging activities for the portion of the waterway within the Mobile District. This portion starts from Lake Borgne (GIWW Mile 36.3) and ends at its intersection with Carrabelle Harbor Channel (GIWW Mile 376.3), including the Gulf County Canal. An 1976 EIS entitled, *Environmental Statement for Maintenance Dredging of the Gulf Intracoastal Waterway from Pearl River, Louisiana-Mississippi to Apalachee Bay, Florida, U.S. Army Corps of Engineers, (USACE), Mobile District*, was prepared to address the impacts associated with the maintenance dredging of the GIWW. In 1984 an EA entitled, *Environmental Assessment for Modifications to the Maintenance Plan as Presented in the Final Environmental Statement Maintenance Dredging of*

the Gulf Intracoastal Waterway from Pearl River, Louisiana-Mississippi to Apalachee Bay, Florida (USACE, 1984), was prepared to address changes to the existing maintenance plan presented in the 1976 EIS. Changes to the plan addressed in the 1984 EA consisted of following: adjustments in the average timing and frequency of maintenance dredging; subdivision and renumbering of disposal areas; the addition of 14 disposal areas; size modifications to 11 upland and eight open water disposal areas; and changes in estimates of dredging quantities. The 1984 EA resulted in a Finding of No Significant Impact (FONSI), which was signed on February 7, 1984.

Since 1984, a number of environmental resource changes, such as the addition of threatened and endangered (T&E) species, and critical habitat designations as well as changes to state water quality requirements that require updating to this EA. In addition, some environmental conditions have changed with regards to the addition of seagrasses, oyster reefs, and/or wetlands that need to be updated for the project in this EA.

1.3 Impact Analysis. This EA evaluates the potential environmental impacts associated with the maintenance dredging and disposal activities for the portion of the federally authorized GIWW Navigation Project from the Alabama/Florida state line to Carrabelle, Florida. This EA has been prepared by the USACE, Mobile District, and meets the requirements of the NEPA.

2.0 DESCRIPTION OF ENTIRE AUTHORIZED PROJECT

The GIWW is a federally authorized, shallow-draft navigation project that extends approximately 1,115 miles along the Gulf of Mexico coast from southern tip of Texas to northern Florida. The waterway connects southern ports with the midwest, east, and the Great Lakes regions. The USACE, Mobile District has jurisdiction over the portion of the GIWW from Rigolets, Louisiana to Apalachee Bay, Florida, for a total of approximately 380 miles (see Figure 1). The maximum dredge depth includes a design depth of -12 feet MLLW, two (2) feet of advance maintenance and a (paid) over dredge depth of two (2) feet. Maintenance of a flotation access channel to disposal area 2.1 is also authorized up to 300 feet in length, 100 feet wide and to a depth of -2 MLLW. The federally-authorized channel width (at bottom) is 125 feet, with a naturally- adjusted side slope. While the entire Mobile District portion has been authorized, the segment from Carrabelle, Florida to Apalachee Bay, Florida as stated earlier, has not been constructed. Barge traffic destined for St. Marks, Florida transits via St. George Sound through the open Gulf of Mexico, Apalachee Bay, and St. Marks River. The project also includes a tributary channel, which is the Gulf County Canal. The Gulf County Canal is about six miles long, and connects the GIWW at White City, Florida with St. Joseph Bay. This assessment is relevant to the operation and maintenance of that portion of the waterway within the USACE, Mobile District from the Alabama/Florida state line to Carrabelle, Florida.

3.0 PROPOSED ACTION

The proposed action is to continue maintenance dredging and placement activities associated with the GIWW federally authorized navigation project that extends from the Alabama/Florida state line to Carrabelle, Florida. Maintenance of the project consists of the removal of approximately 1.2 million cubic yards of silts, clays, and sand each year on an as needed basis to

maintain an elevation of –16 feet mean lower low water (MLLW) (this depth includes 2 feet of advanced maintenance and 2 feet of allowable overdepth dredging). In addition, five upland disposal sites would require dike construction prior to their continued use: 17B, 18B, 19B, 20B, and 34B. These upland sites have been used in the past as undiked disposal areas. Dredging is typically done via a hydraulic pipeline dredge except during emergencies. The sediment removed during maintenance activities is placed in pre-approved, 64 existing diked uplands, 11 open water, and 7 estuarine shore disposal sites as listed in Table 1. In addition, locations of the disposal sites along the maintenance channel are shown in the figures 2 -22 located in Appendix I, of this document.

A barge-mounted dragline or snagboat may be utilized under emergency situations to remove rapidly formed, unexpected shoals or other hazards to navigation. This material would be placed on the side slopes of the channel to allow for immediate passage of vessels until a hydraulic pipeline dredge could be mobilized at the shoal areas. Channel side slopes would be restored to original project dimensions when practicable. Emergency dredging activities are infrequent and usually are the result of specific incidents, such as storm events or barge groundings. Historical data indicates that only a few channel segments would require such action. However emergency dredging may be required at any location along the waterway.

4.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose and need for the proposed action is to update the EA, as the original 1976 EIS predates existing environmental conditions. The EA addresses the continual maintenance dredging and disposal for the GIWW in Florida. The GIWW federally authorized dredging maintenance project provides barge tows and other small craft, that are not well suited for use in the Gulf of Mexico a secure and safe means of navigating the great inland rivers of the country. The GIWW has historically been a vital means for transporting heavy freight and continues to be one today. Without the proposed action, the vessels utilizing the GIWW will be subjected to adverse navigational conditions caused by shoaling along various reaches of the project. This action would in turn eliminate a vital and economical link in a waterway that connects the Gulf coastal ports of Florida with the rest of the U.S.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

5.1 No Action Alternative. NEPA defines a No Action as the continuation of existing conditions in the affected environment without the implementation, or in the absence of the proposed action. Inclusion of the No Action alternative is prescribed by the Council on Environmental Quality (CEQ) regulations as the benchmark against which Federal actions are to be evaluated. The implementation of the No Action alternative would result in discontinuing project maintenance dredging to depths of -16 feet MLLW (this depth includes 2 feet of advanced maintenance and 2 feet of allowable overdepth dredging). This alternative would result in a waterway that would eventually fill with sediments and become unsafe and non-navigable for commercial and recreational boats. Shoaling would develop at various times and places. This would forego the benefits of the waterway by eliminating a major link connecting the Gulf coastal ports of Florida with the rest of the U.S. Over 17 million tons of commodities, a large percentage of which is petroleum products or their derivatives, annually would have to be

shipped via other means at a higher cost. This would be a vital threat to the nation because fuel to shipped to numerous military bases along the Florida panhandle. Project abandonment would place an economic stress on the industrial and commercial investments already dependent on the project. Therefore, the "no action" alternative was deemed unacceptable and is not considered further.

Table 1: Florida GIWW Disposal Areas

UPLAND DISPOSAL AREA		OPEN WATER DISPOSAL AREA	BEACH PLACEMENT AREA
(BY DA NUMBER)		(BY DA NUMBER)	(BY DA NUMBER)
2.2*	16A	1G	3A*
9A*	17A	1F	3.1
9B*	17B**	1E	3.2B
12B	18A	1D	10.1
12A*	18B**	1C	39.5
10.2	20A	1B	46.1
10A	19B**	1A	46
10B	20B**	2S	
10C	19A	2M	
12C	20C	2.1	
12D	21	2N	
12E	20D	4A*	
12F	22	5A*	
12G1	24	5*	
12G2	23	6*	
12G3	25	7A*	
12G4	26	7*	
12G5	27	14A	
12G5A	28	37*	
12H1A	30	39*	
12HB1	31	40*	
12H2	32	40.3*	
12H3	29		
12I	29B		
12J	33		
12K	34A		
11A	34A2		
13.1	35B		
13.2*	34B**		
13.3*	35A		
15A1*	34C		
15A	36		
15B	40.1		
15B1	40.2		
15C	45		
Total of 70 Upland Sites		Total of 22 Open Water Sites	Total of 7 Beach Sites
*Existing D/As not included in the Draft Water Quality Certification permit. ** Existing D/As that require dikes to be constructed.			

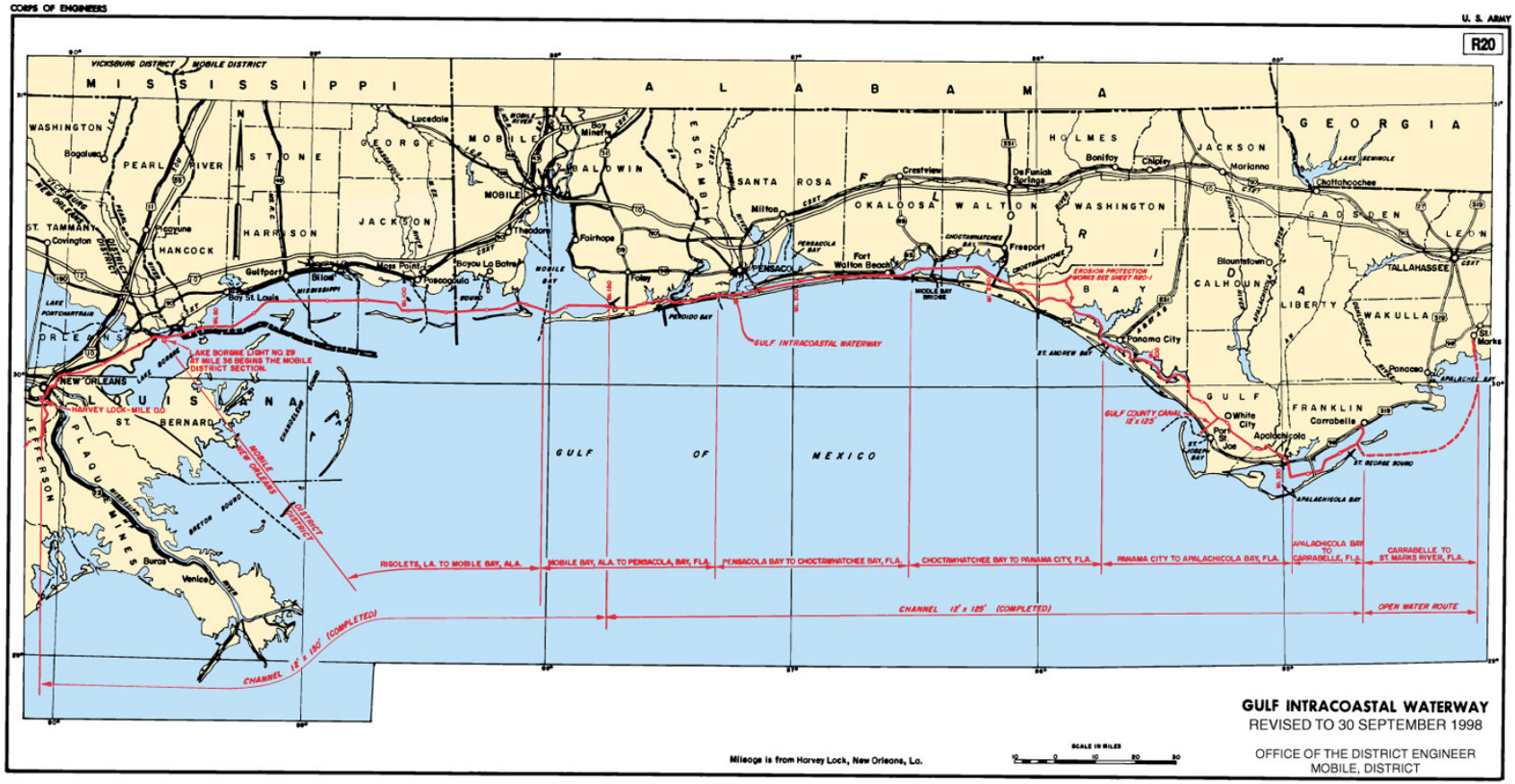

Figure 1. Gulf Intracoastal Waterway, Louisiana thru Florida

6.0 AFFECTED ENVIRONMENT

6.1 Physical Environment

6.1.1 Climate. The climate of the Florida Panhandle is typical of that experienced along the northern Gulf Coast. Because of the moderating effects of the Gulf, the range in both temperature and humidity extremes is small. These ranges decrease even more when southerly winds prevail and impart characteristics of a marine climate. Continental influences are felt with northerly winds that usually bring relatively dry air and larger diurnal temperature ranges. The annual average precipitation for the western portion of the Florida Panhandle is greater than 56 inches. Frequency of rainfall is consistent through most of the year. Afternoon thunderstorms increase the amount of rainfall during the summer. Hurricanes can also contribute significantly to rainfall accumulation from summer to early fall.

The average annual maximum daily temperature is approximately 77° Fahrenheit (F). Average annual minimum daily temperature falls around 55° F. Temperatures in the area range greater than 88° F within the summer months of July and August to lows of 40° F in January. Summer and early fall humidity is high, usually between 80 and 100 percent in the afternoon. Winter and early spring humidity is much lower, often less than 20 to 40 percent during the warmest time of day.

6.1.2 Topography, Geology and Soils. The Florida Panhandle is comprised of a relatively flat terrain, ranging in elevation from 0 to about 50 feet above mean sea level. The project lies entirely in the Gulf coastal lowlands physiographic province, and is characterized by low energy barrier islands, beaches, saltwater marshes and dunes, which surround numerous small creek drainages, alluvial rivers, bays and sounds. All of the streams in the vicinity empty into one of a series of estuarine bays or bayous on the Gulf Coast (see Table 2).

Soils in the coastal panhandle of Florida consist predominately of medium to fine grain sands and silts associated with recent Pleistocene formations. Specifically, lower marine and estuarine deposits are prevalent from accumulated deposition from the Gulf of Mexico. The stratigraphy generally includes light sandy moderately well-drained top soils overlaying dark somewhat poorly drained sandy subsoil. The wetland soils tend to have a higher clay content, but the marine origins of the predominate parent materials tend to make sand the dominate grain size throughout. Parent material includes Quaternary marine and estuarine sediments.

Because the sediments of the placement sites predominantly consist of dredged material, the texture of each site varies from one to another. Observable differences are attributed by many years of dredge deposition as well as natural disturbances.

6.1.3 Hydrology and Water Resources. There is an abundant supply of both surface and groundwater along the coastline of the Florida panhandle. The project is located within the coastal section of four of the region's main drainage basins: Pensacola Bay, the Choctawhatchee River and Bay, the St. Andrew Bay and the Apalachicola River and Bay. There are also two

major groundwater systems located in the general vicinity: the Sand and Gravel Aquifer located in the western portion of the panhandle and the Florida Aquifer System in the east.

Table 2
Major River Discharges within Project Area

Receiving Body of Water	AVERAGE DISCHARGE (Cubic Feet per Second)**
Perdido Bay	
Perdido River*	773
Escambia Bay	
Escambia River	6,245
Pine Barren Creek*	160
East Bay	
Yellow River*	1,165
Shoal River*	1,118
Blackwater River	352
Juniper Creek	93
Big Coldwater Creek*	555
Pond Creek	80
Choctawhatchee Bay	
Choctawhatchee River*	7,131
Alaqua Creek	218
North Bay	
Econfina Creek	542
Apalachicola River	
Apalachicola River	26,380
St. George Sound	
New River	161

Source: Northwest Florida Water Management District, 2003

***** Denotes river or stream is interstate in that one or more of its tributaries has its origin in the states of Alabama or Georgia.

****** Average annual discharges (river flows) were obtained from USGS period of record.

The Pensacola Bay watershed covers nearly 7,000 square miles in northwest Florida and southern Alabama (Northwest Florida WMD, 1997). It includes a series of interconnected estuaries, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound. Principal tributaries of the estuary include the Escambia, Blackwater, and Yellow River. The average depth of water in the estuary is 19 feet (NOAA, 1985; 1997). The entire system discharges into the Gulf of Mexico south of Pensacola, Florida.

The Choctawhatchee River and Bay drainage system covers approximately 3,422,154 acres. About 42 percent of this is within Florida, and the remainder is in Alabama. Major tributaries of the river include the Pea and Little Choctawhatchee rivers in Alabama, as well as Holmes, Wrights, Bruce, and Pine Log Creeks in Florida (Northwest Florida WMD, 2002). Several other small tributary springs enter the estuary along the north shore; these include Alaqua, Rocky, Black, and Turkey Creeks. The watershed also includes a portion of the Sand Hill Lakes in Washington County, including a recharge area for the Florida Aquifer springs which discharges into Holmes Creek. The average depth of the Choctawhatchee estuary is about 22 feet; however, the bay is deepest to the west and shallows to the east (NOAA, 1985, 1997). The bay discharges into the Gulf of Mexico at East Pass, adjacent to the City of Destin.

The St. Andrew Bay watershed covers about 750,000 acres in Walton, Washington, Jackson, Calhoun, Gulf and Bay counties. It is the only major basin that lies entirely within the Florida panhandle. The average depth of the bay is 27 feet. Several embayments are included in the watershed; these are the St. Joseph Bay and the interconnected St. Andrew, West, East and North bays.

The Apalachicola River and Bay Basin encompasses approximately 280 square miles and incorporates St. Vincent Sound, East Bay, Apalachicola Bay, and St. George Sound. The watershed is only part of a larger basin, the Apalachicola-Chattahoochee-Flint (ACF) River system, which covers the southeastern part of Alabama, north-central and southwestern portions of Georgia, as well as the central part of the Florida panhandle. The Bay water depths range from 6 to 9 feet at mean low water. The floor slopes towards the barrier islands where depths generally increase to 10 to 12 feet. The major freshwater inflow to the bay is the Apalachicola River. Headwaters for this alluvial river system originate in the Blue Ridge physiographic province (NOAA, 1997).

The groundwater in this area is abundant and generally of good quality, this stems from two factors; a high annual rainfall and an aquifer of unconsolidated quartz sand and gravel that serves as an immense reservoir. The groundwater in this region supplies nearly 80 percent of the wells in the panhandle and is one of the softest and least mineralized groundwater within the state.

6.1.4 Air Quality. Sources of air pollution in the project area are minor and mainly due to non-point sources, such as boat motors and vehicular traffic emissions. No major sources of air pollution were found within the vicinity of the project area.

The Clean Air Act of 1970, as amended, mandated that the U. S. Environmental Protection Agency (EPA) establish ambient standards for certain pollutants, regarding all identifiable effects a pollutant may have on the public health and welfare. The EPA subsequently developed the National Ambient Air Quality Standards (NAAQS) identifying levels of air quality, which it judged necessary to protect public health and welfare, and account for the environment. Areas in compliance with the NAAQS are termed as in attainment areas, while areas not meeting the standards are termed non-attainment areas. The Florida Department of Environmental Protection (FDEP)-Division of Air Resource is responsible for administrating the Clean Air Act in the state of Florida.

According to the monitored ambient air quality measurements, the following counties: Bay, Escambia, Franklin, Gulf, Okaloosa, Santa Rosa, and Walton are considered attainment areas for all monitored pollutants including Carbon Monoxide (CO), Ozone (O3), Particulate Matter (PM-10), Sulfur Dioxide (SO2), and Lead (Pb).

6.1.5 Noise. Noise, generally, can be defined as unwanted sound and, therefore, is considered a relative environmental parameter. Noise levels in the area are primarily from commercial and recreational vessels. Noise levels fluctuate with highest levels usually occurring during the spring and summer months due to the increased boating and coastal beach activities.

6.1.6 Water Quality. Water quality within the project area is influenced by point and non-point source pollution. The Surface Water Improvement Management (SWIM) Plans for Pensacola, St. Andrew and Choctawhatchee River and Bay watersheds indicated a number of sources of water quality degradation within the watersheds. The most notable throughout the region was urban and agricultural runoff. In spite of these notable pollution sources the 2010 305(b) Water Quality Assessment found the State of Florida's surface and groundwater resources to be predominantly in good condition based on the indicators assessed. In addition, water quality in the NW sections of the state was found to be generally better than in other areas of the state.

6.1.7 Sediment Quality. Table 3 provides the reaches dredged over the past 18 years along with the frequency of dredging within each reach and the sediment types. These reaches are generally located in Apalachicola Bay and within the land cuts between Perdido Bay and Pensacola Bay; Choctawhatchee Bay and West Bay; and East Bay and Lake Wimico. The majority of the 55 miles frequently dredged consists primarily of sand. The only exceptions are miles 250-254 and Apalachicola Bay. Grain size in these areas consists of a finer grain material.

Table 3 Florida GIWW
Reaches Dredged and Frequency (1993-2011)

Reach	Frequency	Sediment Types
167 - 180	11	sand and sandy silt
250-275	14	sand and silty sand and silty clay
310-315	3	silty clay and silty sand
315-335	8	sand, sandy silt
Gulf Co. Canal	5	sand, silty sand and silty clay
345-350	3	sand and sandy silt
350-360	15	sand, sandy silt and silty clay
Total	59	

A Tier I Evaluation was conducted as outlined in the Inland Testing Manual. In accordance with the Tier I evaluation procedure, the chemical characteristics of the bottom sediments along the GIWW were evaluated by reviewing previous chemical sampling, bottom sediment size, and assessing possible pollutant sources.

A monitoring program by the National Oceanic and Atmospheric Administration-National Ocean Service (NOAA) gives an analysis of the status and trends of chemical constituents in sediments and tissues for estuaries, bays and sounds along the U.S. coastline. NOAA summarized the NOAA's Status and Trend (NS& T) Program data from 1984 through 1989 from estuaries nationwide for the period of in 1991 (NOAA, 1997). This data revealed that the concentrations of a number of chemicals were significantly elevated in sediments. In light of these studies a further in depth evaluation was conducted for four bays in the Florida Panhandle: Pensacola, Choctawhatchee, St. Andrew and Apalachicola to determine concentrations of trace metals, pesticides, other chlorinated compounds, and polynuclear aromatic hydrocarbons. The study indicated that the tributaries of the bay systems contained higher concentrations of chemical constituents than the main bays. This is likely attributed to the highly urbanized areas surrounding these systems. The GIWW traverses the open bay systems and manmade land cuts, and is far removed from the tributaries identified above. Upon reviewing the dataset of point location of facilities containing or producing hazardous materials, no obvious potential point sources of contamination were identified. The majority of the sites identified adjacent to the GIWW were water treatment facilities.

In 2008, the Apalachicola National Estuarine Research Reserve published a report focusing on the Apalachicola River and Bay system. The study focused on general hydrologic and physical characteristics, habitat, biota, and contaminants in the system. For the most part, this review reported historical information on the presence of contaminants in the area. In one study contracted by the Reserve in 1993 pesticides, herbicides, polyaromatic hydrocarbons, and nutrients were analyzed in sediment samples. Forty-seven EPA priority pollutants were analyzed from the 8 stations in the bay. In all cases little anthropogenic influence was detected with the values of all parameters below detectable limits. Organic contaminant levels were minimal and overall sediment quality was good. Small amounts of inorganic nitrogen and total phosphorus were found, indicating the source of these nutrients is natural.

In response to the Deepwater Horizon oil spill of 2010, EPA monitored air, water and sediment along the affected coastline and bays from Louisiana to Florida. Sediment samples were collected and analyzed for Nickel (Ni), Vanadium (V), and oil related organic compounds. In the four bays in the Florida Panhandle: Pensacola, Choctawhatchee, St. Andrew and Apalachicola Florida bays, results indicated that the overall, organic and metal contaminant levels were minimal and overall sediment quality was good.

6.1.8 Hazardous Material. The USACE Emergency Management site files were examined and information on all recorded potential hazardous material sites adjacent to the GIWW in Florida was obtained. No known hazardous materials are stored on or near the project site.

6.1.9 Biological Resources.

6.1.9.1 Aquatic Environment.

6.1.9.1.1 Benthos, Motile Invertebrates, and Fishes. The estuaries and bays in the vicinity of GIWW provide habitat for several crustacean species, which include brown shrimp *(Penaeus aztecus),* pink shrimp (*P. Duorarum*), white shrimp *(P. setiferus),* marsh grass shrimp

(Palaemonetes pugio), and common blue crab *(Calinectes sapidus).* Important commercial and recreational fishes, which feed on these invertebrates or on aquatic primary producers, would include: striped mullet *(Mugil cephalus)*, spotted seatrout *(Cynoscion nebulosus)*, sand seatrout *(Cynoscion arenarius*), red drum *(Sciaenops ocellata)*, black drum *(Pogonias cromis)*, silver perch *(Bairdiella chrysura*), Atlantic croaker *(Micropogon undulates*), spot *(Leiostomus xanthurus*), southern king *(Menticirrhus saxatilis*), southern flounder *(Paralichthys lethostigma*), Gulf flounder *(Paralichthys albigutta*), Gulf menhaden *(Brevoortia patronus*), striped mullet *(Mugil cephalus*), Florida pomano *(Trachinotus carolinus*), and Spanish mackerel *(Scomberomorus maculates).* The freshwater lakes and rivers located throughout the project area include species such as white and channel catfish (*Ictalurus punctatus*), yellow bullheads (*Ictalurus natalis*), largemouth bass (*Micropterus salmoides*), numerous sunfish and pickerel. The migratory Alabama shad and skipjack herring can also be expected throughout various reaches of the project.

Microinvertebrate populations are dictated by substrate type, temperature, salinity and biological factors, they therefore vary significantly throughout the vicinity of the project. Studies conducted in the Escambia Bay and the Pensacola-Bay System indicate the macroinvertebrate population is dominated by *Mulinia lateralis* and *Grandidierella bonnieroids* that made up 60% of the total number of organisms. Those two species along with *Laonereis culveri*, *Odostomia sp.*, *Tagelus plebeius* and *Haustorius sp*. comprised 89% of the total organisms found in the summer months. In the winter months, *G. bonnieroids* and *M. lateralis* were still the dominant species, but the relative abundances reverse with *G. bonnieroides* becoming the dominant species over *M. lateralis*. During winter months, the secondary species composition shifts more to *Neanthes succinea* and *Monaculodes edwardsi*. Studies in the East Bay-Apalachicola Bay and others in the Choctawhatchee complex indicate that predominate species in the spring months tend to be *Mediomastus ambiseta, Heteromastus filiformis, Ampelisca vadorum, Hargeria rapax,* and *Grandidierella bonnieroids.* In the summer and fall months, *Steblospio benedicti and Hypaneola florida* tend to dominate. It is important to note that all listed species, as well as less prevalent species, are present year-round in various numbers as these species are non-motile in nature.

6.1.9.1.2 Oyster Resources. Oyster reefs of commercial importance are subtidal and form aggregates that cover thousands of acres of bay bottom throughout the region. Oyster beds in the East Bay-Apalachicola Bay complex are scattered throughout the central portion of Apalachicola Bay area and near the John Gorrie Bridge. Oyster beds are among the most important and common feature of Apalachicola Bay contributing to 90% of Florida's oyster harvest. Choctawhatchee Bay also supports an active commercial oyster harvest in the south and eastern portions of the bay. The most active oyster beds are west of Highway 331 Bridge causeway and south of the GIWW. However, oyster beds are known to exist in the northeastern portion of the bay. There are also extensive oyster beds on the east side of the Highway 331 Bridge, which are located in Class II shellfish prohibited waters. Other known reefs are within the western portion of West Bay, near Coon Point, located to the north of the GIWW and at Breakfast Point south of the GIWW. A large complex also exists in the Class II prohibited waters of the lower western portion of the Bay.

6.1.9.1.3 Submerged Aquatic Vegetation. Communities of submerged vegetation for this stretch of coast occur within shallow protected waters where bottom conditions and light penetration provide suitable habitat. Studies indicate that the most extensive and diverse seagrass beds exist in the St. Andrew and St. Joseph Bays, which are dominated mostly by turtle grass *(Thalassia testudinu*m) and shoal grass *(Halodule wrightii).* Other seagrass communities that exist in these estuarine systems and within North, East and West Bay include manatee grass *(Syringodium filiform*e), star grass (*Halophilaengelmannii*), and widgeon grass *(Ruppia maritima*). Choctawhatchee Bay, although less diverse, is dominated by *H. wrightii* except in Hogtown Bayou where scattered patches of *R. maritima* exist (NWFWMD, 1983). Seagrass beds in Apalachicola Bay and western St. George Sound are restricted to the shallow lagoon portions of Dog and St. George Islands and are dominated by *H. wrightii, Gracilaria spp*., and *S. filirorme* (USFWS, 1984). More recent seagrass surveys conducted by the Corps of Engineers in 2009, found *Halodule wrightii* along the shallow sandy shoals near the mouth of the Apalachicola river and *V. Americana* in the brackish reaches of the Apalachicola River along the river banks. Within Pensacola Bay, there is a limited amount of *T. testudinum* and *H. wrighti* due to past seagrass losses in the system. Only *V. americana* and *R. maritima*, persistent brackish-water species, are surviving in limited areas of Escambia Bay. These species are also apparently doing well in portions of Blackwater Bay; and *H. wrightii, T. testudinum, S. filiform*e, and *R. maritima* communities are surviving in portions of Santa Rosa Sound (Northwest Florida WMD, 1988, 1997; DER, 1988). Studies have also indicated that a healthy growth of submerged vegetation, including: Water Naiads (*Najas guadalupensis)*, Eel Gras (*Vallisneria spp*.), and *Hydrilla* exists in Lake Wimico.

6.1.9.2 Terrestrial Environment. The Florida Panhandle typically contains a large percentage of natural pine flatwoods, planted pine plantations, and scrub. Beach and dune vegetation include a wide variety of shrubs and sea oats. Most of the dunes along the project area are generally associated with high-energy shorelines and are continuously shifting and sparsely vegetated. In areas where dunes are stable, plants such as sea oats *(Uniola paniculat*a) and dune elder *(Iva imbricat*a) usually establish on the seaward side. On the backside, myrtle oak *(Q. myrtifoli*a), greenbriar *(Smilax auriculat*a), and saw palmetto are characteristic species. Marsh habitats are commonly located near the mouths of the rivers and along the brackish water shorelines in the project vicinity. Characteristic plants include needlerush *(Juncus roemerianu*s), sawgrass *(Cladium jamaicens*e), cattails *(Typha sp*p.), giant reed *(Phragmites communi*s), arrowhead *(Sagittaria lancifoli*a), saltmarsh cordgrass *(Spartina alternifloro*a), saltmeadow cord grass *(S. patens*), giant cutgrass *(Zizaniopsis miliance*a), pickerel weed *(Pontederia cordat*a), and softstem bulrush *(Scirpus validu*s) (NWF WMD, 1997).

Terrestrial wildlife that may be found within the project area consists of a wide variety of birds, mammals, reptiles and amphibians. Some of the highest diversity of reptiles and amphibian groups in the U.S. exists within the region. The surrounding drainage basins also provide some of the most important bird habitats, which receive large numbers of migratory birds from both the Midwest and Atlantic Seaboard.

6.1.9.2.1 Shorebirds

Various shorebirds can be found throughout the project area. The most commonly found species are listed in Table 4 below.

Table 4. Common Shorebird species in Project Area

Common Name	Scientific Name
Spotted Sandpiper	*Actitis macularia*
Ruddy Turnstone	*Arenaria interpres*
Sanderling	*Calidris alba*
Dunlin	*Calidris alpina*
Red Knot	*Calidris cantutus*
Western Sandpiper	*Calidris mauri*
Least Sandpiper	*Calidris minutilla*
Willet	*Catoptrophorus semipalmatus*
Snowy Plover	*Charadrius alexandrinus*
Piping Plover	*Charadrius melodus*
Semipalmated Plover	*Charadrius semipalmatus*
Wilson's Plover	*Charadrius wilsonia*
Common Snipe	*Gallinago gallinago*
American Oystercatcher	*Haematopus palliates*
Black-necked Stilt	*Himantopus mexicanus*
Short-billed Dowitcher	*Limnodromus griseus*
Whimbrel	*Numenius phaeopus*
Black-bellied Plover	*Pluvialis squatarola*
American Woodcock	*Scolopax minor*
Lesser Yellowlegs	*Tringa flavipes*
Greater Yellowlegs	*Tringa melanolevea*

Disposal areas 10.1, 2.1 and 40.1 have historically been utilized as nesting sites by various shorebirds. Table 5 lists the disposal areas with the likelihood of occurrence. Disposal area 2.1 is an island managed for shorebirds.

6.1.9.3 Essential Fish Habitat. Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity". The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The National Marine Fisheries Service (NMFS) has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine areas, such as estuarine emergent wetlands, mangrove wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. Table 6 lists the managed species for the Gulf of Mexico. The habitat in the project area consists of estuarine waters and unvegetated bottoms with sand substrates. Of the species managed, the following would be expected to utilize the project area: brown shrimp (*Penaeus axtecus)*, pink shrimp (*P. duorarum)*, white shrimp (*P. setiferus)*, king mackerel (*Scomberomorus cavalla)*, Spanish mackerel (*S. maculate)*, gray snapper *(Lutjanus griseus)*, and lane snapper (*L. synagris).*

Table 5. Likelihood of Shorebirds occurrence within Disposal Areas

High Likelihood	Low Likelihood			Absent
40.1	46	19A	12C	14A
10.1	46.1	19B	10C	20D
2.1	39.5	20A	10B	15B1
	34C	20B	10A	13.3
	35A	18A	12B	13.2
	35B	18B	12A	13.1
	34A	17A	9B	12I
	34B	17B	9A	12H2
	29	16A	3.1	2N
	33	15C	3.2B	2M
	32	11A	20C	2S
	31	12J	20D	1A
	30	12K	15A	1B
	45	12H3	15B	1C
	40.2	12H1B		1D
	28	12H1A		1E
	27	12G5		1F
	26	12G4		1G
	25	12G3		
	23	12G2		
	24	12G1		
	22	12F		
	21	12E		

Table 6 provides a list of the species that NMFS manages under the federally implemented Fishery Management Plan.

The habitats which occur within the vicinity of the project area include: estuarine emergent wetlands, mangrove wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column.

6.1.9.4 Endangered and Threatened Species. A list of the federally protected species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) for the seven panhandle Florida counties within the project area are shown in Table 7.

Table 6: Fishery Management Plans and Managed Species for the Gulf of Mexico. (NMFS 2008)

Shrimp Fishery Management Plan
- brown shrimp – *Farfantepenaeu aztecus*
- pink shrimp - *F. duorarum*
- royal red shrimp - *Pleoticus robustus*
- white shrimp - *Litopenaeus setiferus*

Reef Fish Fishery Management Plan
- almaco jack – *Seriola rivoliana*
- anchor tilefish - *Caulolatilus ntermedius*
- banded rudderfish – *S. zonata*
- blackfin snapper - *Lutjanus buccanella*
- blackline tilefish - *Caulolatilus cyanops*
- black grouper- *Mycteroperca bonaci*
- blueline tilefish – *C. microps*
- cubera snapper – *L. cyanopterus*
- dog snapper – *L. jocu*
- dwarf sand perch - *Diplectrum ivittatum*
- gag grouper - *M. microlepis*
- goldface tilefish – *C. chrysops*
- goliath grouper - *Epinephelus itajara*
- gray snapper – *L. griseus*
- gray triggerfish - *Balistes capriscus*
- greater amberjack – *S. dumerili*
- hogfish - *Lachnolaimus maximus*
- lane snapper - *Lutjanus synagris*
- lesser amberjack - *S. fasciata*
- mahogany snapper – *L. mahogoni*
- marbled grouper – *E. inermis*
- misty grouper – *E. mystacinus*
- mutton snapper – *L. analis*
- Nassau grouper – *E. striatus*
- queen snapper - *Etelis oculatus*
- red hind - *Epinephelus guttatus*
- red grouper – *E. morio*
- red snapper - *L. campechanus*
- rock hind – *E. adscensionis*
- sand perch - *Diplectrum formosum*
- scamp grouper - *M. phenax*
- schoolmaster – *L. apodus*
- silk snapper – *L. vivanus*
- snowy grouper – *E. niveatus*
- speckled hind - *E. drummondhayi*
- tilefish - *Lopholatilus chamaeleonticeps*
- vermilion snapper - *Rhomboplites aurorubens*
- Warsaw grouper – *E. nigritus*
- wenchman - *Pristipomoides aquilonaris*
- yellowedge grouper *E .lavolimbatus*

Stone Crab Fishery Management Plan FL
- stone crab - *Menippe mercenaria*
- gulf stone crab – *M. adina*

Spiny Lobster Fishery Management Plan
- spiny lobster - *Panulirus argus*
- slipper lobster - *Scyllarides nodife*

Coral and Coral Reef Fishery Management Plan
- varied coral species and coral reef communities comprised of several hundred species

Coastal Migratory Pelagic Fishery Management Plan
- cobia - *Rachycentron canadum*
- king mackerel – *Scomberomorus cavalla*
- Spanish mackerel - *S. maculatus*

Red Drum Fishery Management Plan
- red drum - *Sciaenops ocellatus*

Table 7. T&E Species in Project Area, GIWW, Florida			
Species	**Scientific Name**	**Status**	**County**
Fish			
Gulf sturgeon	*Acipenser oxyrhynchus desotoi*	TCH	All Counties[1]
Amphibians & Reptiles			
Green sea turtle	*Chelonia mydas*	E	All Counties[1]
Loggerhead sea turtle	*Caretta caretta*	T	All Counties[1]
Kemp's ridley sea turtle	*Lepidochelys kempii*	E	All Counties[1]
Leatherback sea turtle	*Dermochelys comacea*	E	All Counties[1]
Flatwoods salamander	*Ambystoma cingulatum*	TCH	Franklin
Hawksbill turtle	*Eretomchelys imbricata imbricata*	E	All Counties[1]
Eastern indigo snake	*Drymarchon corais couperi*	T	All Counties[1]
Birds			
Red-cockaded woodpecker	*Picoides borealis*	E	Franklin, Okaloosa, Escambia, Gulf, Bay
Piping plover	*Charadrius melodus*	TCH	All Counties[1]
Bald eagle	*Haliaeetus leucocephalus*	BGEPA	All Counties[1]
Plants			
Telephus spurge	*Euphorbia telephioides*	T	Franklin
Mammals			
West Indian manatee	*Trichechus manatus*		All Counties[1]
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	ECH	Okaloosa, Walton, Bay
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	ECH	Escambia
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*	ECH	Gulf, Bay
[1]Counties- Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin			

The federally listed species that may be found within the vicinity of the project area include; loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), Gulf sturgeon *(Acipenser oxyrinchus desotoi)*, Choctawhatchee beach mouse (*Peromyscus polionontus allophrys*), piping plover (*Charadrius melodus*), St. Andrews beach mouse (*Peromyscus polionotus peninsularis*), Perdido Key beach mouse (*Peromyscus polionotus trissyllepsis*), West Indian manatee (*Trichechus manatus)*, red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), eastern indigo snake (*Drymarchon corais couperi*), and flatwoods salamander (*Ambystoma cingulatum*). A review of the listed plant species for the project vicinity indicated a low likelihood of occurrence of listed species within the project area. In addition, the bald eagle (*Haliaeetus leucocephalus)* is protected under the Bald and Golden Eagle Protection Act.

The following is a detailed review of the species listed above:

Loggerhead Sea Turtle (*C. caretta*)

The loggerhead sea turtle is a medium to large turtle. Adults are reddish-brown in color and generally 31 to 45 inches in shell length with the record set at more than 48 inches. Loggerheads weigh between 170 and 350 pounds with the record set at greater than 500 pounds. Young loggerhead sea turtles are brown above and whitish, yellowish, or tan beneath, with three keels on their back and two on their underside.

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Gulf of Mexico, Pacific, and Indian Oceans. This species may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, and the mouths of large rivers. Loggerhead turtles feed primarily on sea urchins, sponges, squid, basket stars, crabs, shrimp, and a variety of mollusks. Their strong beak-like jaws are adapted for crushing thick-shelled mollusks. Although loggerhead sea turtles are primarily bottom feeders, they also eat jellyfish and mangrove leaves obtained while swimming and resting near the sea surface.
As loggerheads mature, they travel and forage throughout near shore waters until their breeding season, when they return to the nesting beach areas. The majority of mature loggerheads appear to nest on a two or three year cycle. This species nests within the U.S. from Texas to Virginia, although the major nesting concentrations are found along the Atlantic coast of Florida, Georgia, South Carolina, and North Carolina. Nesting in the northern Gulf outside of Florida occurs primarily on the Chandeleur Islands in Louisiana and to a lesser extent on adjacent Ship, Horn, and Petit Bois Islands in Mississippi (Ogren, 1977). Ogren (1977) reported a historical reproductive assemblage of sea turtles, which nested seasonally on remote barrier beaches of eastern Louisiana, Mississippi, and Alabama.

Loggerhead sea turtles are considered turtles of shallow water. Juvenile loggerheads are thought to utilize bays and estuaries for feeding, while adults prefer waters less than 165 feet deep (Nelson 1986). Aerial surveys suggest that loggerheads (benthic immature and adults) in U.S. waters are distributed in the following proportions: 54% in the southeast U.S. Atlantic, 29% in the northeast U.S. Atlantic, 12% in the eastern Gulf of Mexico, and 5% in the western Gulf of Mexico. During aerial surveys of the Gulf of Mexico, the majority (97%) of loggerheads were seen off the east and west coasts of Florida (Fritts 1983). Most were observed around mid-day near the surface, possibly related to surface basking behavior (Nelson 1986).

Green Sea Turtle (*C. mydas*)

The green sea turtle is mottled brown in color. The carapace is light or dark brown. It is sometimes shaded with olive, often with radiating mottled or wavy dark markings or large dark brown blotches. This species is considered medium to large in size for sea turtles with an average length of 36 to 48 inches. Its weight ranges from about 250 to 450 pounds. The upper surfaces of young green turtles are dark brown, while the undersides are white.

Although green sea turtles are found worldwide, this species is concentrated primarily between the 35° North and 35° South latitudes. This species migrates often over long distances between

feeding and nesting areas (Carr and Hirth 1962). During their first year of life, green sea turtles are thought to feed mainly on jellyfish and other invertebrates. Adult green sea turtles prefer an herbivorous diet frequenting shallow water flats for feeding (Fritts et al., 1983). Adult turtles feed primarily on seagrasses, such as *T. testudinum*. This vegetation provides the turtles with a high fiber content and low forage quality (Bjorndal 1981a). In the Gulf of Mexico, principal foraging areas are located in the upper west coast of Florida (Hirth 1971). Nocturnal resting sites may be a considerable distance from feeding areas, and distribution of the species is generally correlated with grassbed distribution, location of resting beaches, and possibly ocean currents (Hirth 1971).

Historically in the U. S., green sea turtles have been known to nest in the Florida Keys and Dry Tortugas. Yet, these turtles primarily nest on selected beaches along the coast of eastern Florida. In the southeastern U.S., nesting season is roughly June through September. Nesting occurs nocturnally at 2, 3, or 4-year intervals.

Leatherback Sea Turtle (*D. coriacea*)

The leatherback sea turtle is the largest of all sea turtles. It may reach a length of about 7 feet and weigh as much as 1,600 pounds. The carapace is smooth and gray, green, brown and black in color. The plastron is yellowish white. Juveniles are black on top and white on the bottom.

This species is highly migratory and is the most pelagic of all sea turtles (NMFS and USFWS 1992). They are commonly found along continental shelf waters (Pritchard 1971; Hirth 1980; Fritts et al. 1983). Leatherbacks are found in temperate waters while migrating to tropical waters to nest (Ross 1981). Distribution of this species has been linked to thermal preference and seasonal fluctuations in the Gulf Stream and other warm water features (Fritts et al., 1983). General decline of this species is attributed to exploitation of eggs (Ross, 1981).

Leatherbacks feed mainly on pelagic soft-bodied invertebrates, such as jellyfish and tunicates. Their diet may also include squid, fish, crustaceans, algae, and floating seaweed. Highest concentrations of these prey animals are often found in upwelling areas or where ocean currents converge.

Nesting of leatherback sea turtles is nocturnal with only a small number of nests occurring in the U.S. in the Gulf of Mexico (Florida) from April to late July (Pritchard 1971; Fuller 1978; Fritts et al. 1983). Leatherbacks prefer open access beaches possibly to avoid damage to their soft plastron and flippers. The Pacific coast of Mexico supports the world's largest known concentration of nesting leatherbacks. There is very little nesting in the U.S. (Gunter 1981).

Gulf Sturgeon *(A. oxyrhynchus desotoi)*

The NMFS and USFWS listed the Gulf sturgeon as a threatened species on September 30, 1991. The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is a subspecies of the Atlantic sturgeon. Adults are 71-95 inches in length, with adult females larger than adult males. The skin is scaleless, brown dorsally and pale ventrally and imbedded with 5 rows of bony plates.

Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. Gulf sturgeons are anadromous, with reproduction occurring in freshwater. Most adult feeding takes place in the Gulf of Mexico and its estuaries. The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms. River systems where the Gulf sturgeons are known to be viable include the Mississippi, Pearl, Escambia, Yellow, Choctawhatchee, Apalachicola, and Suwannee Rivers, and possibly others.

Gulf Sturgeon Critical Habitat

The primary constituent elements essential for the conservation of the Gulf sturgeon are those habitat components that support foraging, riverine spawning sites, normal flow regime, water quality, sediment quality, and safe unobstructed migratory pathways. The proposed action is found within Gulf sturgeon critical habitat.

Generally, adults and subadults could be described as opportunistic benthivores typically feeding on benthic marine invertebrates including amphipods, lancelets, polychaetes, gastropods, shrimp, isopods, mollusks and crustaceans.

The "water quality" constituent element is important for Gulf sturgeon critical habitat. Temperature, salinity, pH, hardness, turbidity, oxygen concentrations, and other chemical characteristics must be protected in order to preserved normal behavior, growth, and viability of all Gulf sturgeon life stages. If water quality is severely degraded, adverse impacts to Gulf sturgeon and its critical habitat may result.

The "sediment quality" constituent element is listed to ensure the sediment is suitable (i.e. texture and other chemical characteristics) for normal behavior, growth, and viability of all life stages. In addition, the sediment quality is important to support a viable benthic community in order to allow the Gulf sturgeon continual foraging of the area.

The "migration habitat" constituent element is concerned with ensuring safe unobstructed passage for the species. It is intended primarily for the more confined areas near the river mouths or the rivers themselves. The species could potentially migrate through the project area.

The GIWW within the Mobile District's civil works boundary for Florida is located within five of the fourteen units designated as Gulf sturgeon critical habitat (units: 6, 9, 10, 12, and 13). The five unit areas are as follows: Unit 6, Apalachicola River; Unit 9, Pensacola Bay; Unit 10, Santa Rosa Sound; Unit 12, Choctawhatchee Bay; and Unit 13, Apalachicola Bay.

Unit 6 Apalachicola River – Unit 6 encompasses 174 river miles within the main stem of the Apalachicola and Brother Rivers and the Apalachicola distributaries of the East River, Little St. Marks River, and St. Marks River. This unit provides spawning and resting habitat and young-of-the-year and juvenile feeding habitat for the Apalachicola River Gulf sturgeon subpopulation (68 FR 13395).

Unit 9 Pensacola Bay – Unit 9 encompasses 94,080 acres within Pensacola Bay, Big Lagoon, Escambia Bay, East Bay, Blackwater Bay, Bayou Grande, Mackey Bay, Saultsmar Cove, Bass Hole Cove, and Catfish Basin. The Pensacola Bay system provides winter feeding and migration habitat for Gulf sturgeon from the Escambia River and Yellow River subpopulations (50 FR 226). Movement of the Gulf sturgeon in this unit is generally along the shoreline area of Pensacola Bay. Gulf sturgeon have shown a preference for several areas, including Redfish Point, Fort Dickens, and Escribano Point, near catfish Basin (50 FR 226). Sandy shoal areas, located along the south and east side of Garcon Point and south shore East Bay and near Fair point are used in the fall and early spring. During mid winter sturgeon are commonly found in deep holes located north of the barrier island at Ft. Pickens, south of the Pensacola Naval Air Station, and at the entrance of the Pensacola Pass (50 FR 226).

Unit 10 Santa Rosa Sound – Unit 10 encompasses 24,960 acres of the Santa Rosa Sound. This unit provides wintering and migration habitat for juvenile and adult species from the Choctawhatchee River, Escambia and Yellow River Gulf sturgeon subpopulations (Frank Parauka 2007, pers. comm). Gulf sturgeon have been located mid-channel and in the shoreline areas in 6.6 to 17.1 ft depths and sand substrates (50 FR 13370).

Unit 12 Choctawhatchee Bay – Unit 12 encompasses 79,360 acres in the main body of Choctawhatchee Bay, Hogtown Bayou, Jolly Bay, Bunker Cove, and Grassy Cove. This unit provides winter feeding and migration habitat for juvenile and adult species from the Choctawhatchee River Gulf sturgeon subpopulation. Tagged subadults show a preference for shoreline habitats which are predominated by sandy substrates, low salinity and water depths of less than 10 ft (FWS, 1998; and Fox et. al., 2002). Most adult Gulf sturgeons in this unit have been located in areas of shallow water (6.6 to 13.1 ft) with predominately sandy sediments.

Unit 13 Apalachicola Bay - Unit 13 encompasses a total of 168,773 acres within the main body of Apalachicola Bay and the adjacent sounds, bays and nearshore waters of the Gulf of Mexico. This unit provides winter feeding and migration habitat for juvenile and adult species from the Apalachicola River Gulf sturgeon subpopulation. Gulf sturgeons have been documented by sightings, incidental captures, and telemetry studies throughout Apalachicola Bay, East Bay, St. George Sound, St. Vincent Sound, and Indian Lagoon (Odenkirk, 1989).

Piping Plover (*C. melodus*)

The piping plover is a small, pale-colored North American shorebird. The bird's light sand-colored plumage blends in with the sandy beaches and shorelines that are its primary habitat. Historically, piping plovers bred across three geographic regions. These regions include: the U.S. and Canadian Northern Great Plains from Alberta to Manitoba and south to Nebraska; the Great Lakes beaches; and the Atlantic coastal beaches from Newfoundland to North Carolina. Generally, piping plovers favor open sand, gravel, or cobble beaches for breeding. Breeding sites are generally found on islands, lake shores, coastal shorelines, and river margins.

Birds from all three populations build their nests in the north but spend the winter along the south Atlantic and Gulf coasts, sometimes arriving as early as mid-July. Piping plovers winter in

coastal areas of the U.S. from North Carolina to Texas. They also winter along the coast of eastern Mexico and on Caribbean islands from Barbados to Cuba and the Bahamas. Piping plovers begin arriving on the wintering grounds in early July, with some late nesting birds arriving in September. A few individuals can be found on the wintering grounds throughout the year, but sightings are rare in June and early July.

Piping plovers feed along beaches and intertidal mud and sand flats. Primary prey for piping plovers includes worms, various crustaceans, insects, and occasionally bivalve mollusks.

The primary constituent elements essential for the conservation of the wintering plovers are those habitat components that support foraging, roosting, sheltering and the physical features necessary to maintaining the natural processes that support these habitat components. The primary constituent elements are found in geologically dynamic coastal areas that support or have the potential to support intertidal beaches and flats and associated dune systems. Important components of intertidal flats include sand and or mud flats with no or sparse emergent vegetation.

Choctawhatchee Beach Mouse (*P. allophrys*)

The Choctawhatchee beach mouse has a small body, haired tail, relatively large ears, and protuberant eyes. Its head and body length is 2.7 to 3.5 inches; and tail length is 1.7 to 2.5 inches. The upper parts are colored orange-brown to yellow-brown, the underparts are white, and the tail has a variable dorsal stripe. The Choctawhatchee beach mouse is a nocturnal herbivore, and feeds primarily on the seeds of sea oats and bunch-grass. Arthropods are eaten seasonally in spring and summer. To date, no studies on life history or ecology have been conducted on this species.

A population of Choctawhatchee beach mice is capable of producing a maximum of six generations per year. Actual reproduction rates are probably less. Breeding may occur at any time, but reaches its peak during fall and winter. Litter size may range from two to seven. Beach mice are monogamous and remain in the same home range until the death of either mate. Their average lifespan is 180 days. Females reach sexual maturity at 6 weeks of age.

Historically known from Okaloosa, Walton and Bay counties, Florida, the Choctawhatchee beach mouse was originally found along the Gulf on mature coastal dunes between Choctawhatchee and St. Andrew Bays. Its current distribution is apparently limited to two areas: (1) approximately 4.9 miles of beach from around Morrison Lake eastward to Stalworth Lake (Topsail Hill area, Walton County), and (2) Shell Island at St. Andrews Bay in Bay County. In 1979, the species' total population was conservatively estimated at 515, consisting of 357 beach mice on Shell Island, and 158 mice in the Topsail Hill area. In addition to that estimate, in 1987-88, thirty Choctawhatchee Beach Mice were reestablished on Grayton Beach State Recreation Area. Surveys indicate that these mice are reproducing. The habitat is restricted to the mature coastal barrier sand dunes along the Gulf.

Critical habitat for the Choctawhatchee beach mouse is located in Walton and Bay Counties, Florida. Within these areas the major constituent elements that are known to require special management considerations or protection are dunes and interdunal areas, and associated grasses and shrubs that provide food and cover.

St. Andrews Beach Mouse (*P. peninsularis*)

The St. Andrews Beach mouse has white feet, large ears, and black eyes, and is one of seven subspecies of beach mice that occur only in coastal sand dunes where they excavate burrows and feed on plant seeds and insects. This species is a nocturnal herbivore, and feeds primarily on the seeds of sea oats and bunch grass. Arthropods are eaten seasonally in spring and summer. The St. Andrews beach mouse can be found in well-developed high front dunes where the dominant plant cover is sea oats; and in older and higher back dunes, where burrows are often at the base of blow-outs held up by roots of live oak shrubs (sea oats and rosemary also may be present). It also inhabits low front dunes and lower back dunes covered with bunch grass and beach grass (Panicum) on Crooked Island (James, 1992).

The species reduced range in coastal Florida (two occurrences, totaling several hundred individuals) has experienced significant habitat destruction. The small sizes of populations render it vulnerable to tropical storms and other perturbations including introduced mammals.

The species formerly occurred from Crooked Island East, Bay County, Florida, southeast to Indian Peninsula, Gulf County, Florida. More recently, they are restricted to east end of Crooked Island and at the St. Joseph Peninsula, in Gulf County.

Perdido Key Beach Mouse (*P. trissyllepsis*)

The Perdido Key Beach Mouse is a small pale mouse with a white belly, white feet, and a white to pale grayish-brown tail that lacks a dorsal stripe, and membranous ears. The preferred habitat of the mouse is dry, sandy, sparsely vegetated frontal coastal dunes of medium height with no or very few secondary dunes lying inland. Vegetation of inhabited dunes consists mainly of sea oats and bluestem at moderate density. The beach mouse is monogamous and resides most of the day underground in burrows with their mate.

Historic range has been coastal dunes between Perdido Bay, Alabama, and Pensacola Bay, Florida. The present range is Gulf State Park at the western end of Perdido Key in Alabama and Gulf Islands National Seashore at the eastern end of Perdido Key in Florida (reintroduced; Holler et al. 1989). The species is not known to occur in the intervening area.

Habitat has been lost to real estate development; potential threats include catastrophic mortality associated with severe storms, predation by domestic cats and red foxes, and competition with introduced house mice.

Critical Habitat: Critical Habitat was designated for the Alabama, Choctawhatchee and Perdido Key beach mice on June 6, 1985 (50 FR 23872). Critical habitat has recently been updated for all three subspecies (October 12, 2006 [50 FR 60239] and January 30, 2007 [50 FR 4330]). Designation of critical habitat for the St. Andrews beach mouse was established on Oct 12, 2006 (50 FR 60239). Critical habitat for the Alabama, Perdido Key, Choctawhatchee, and St. Andrew beach mice includes habitat throughout the subspecies' ranges in Baldwin County, Alabama, and Escambia, Okaloosa, Walton, Bay, and Gulf Counties, Florida. The primary constituent

elements of critical habitat for these beach mice are the habitat components that provide: (1) a contiguous mosaic of primary, secondary, and scrub vegetation and dune structure, with a balanced level of competition and predation and few or no competitive or predaceous non-native species present, that collectively provide foraging opportunities, cover, and burrow sites, (2) Primary and secondary dunes, generally dominated by sea oats, that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators, (3) scrub dunes, generally dominated by scrub oaks, that provide food resources and burrow sites, and provide elevated shelter during and after intense flooding due to rainfall and/or hurricane-induced storm surge, (4) functional, unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements and re-colonization of locally extirpated areas, and (5) a natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth, and viability of all life stages. Critical habitat for the Alabama beach mouse is along the Ft. Morgan peninsula. No designated critical habitats for the beach mice are located within the action area of the project.

Reproduction: Monogamous; pair bonding strong and parental cooperation in rearing has been noted (Blair, 1951; Margulis, 1997; Swilling and Wooten, 1992). Litter sizes range from two to eight (Caldwell and Gentry, 1965; Smith, 1966). Reproduction occurs throughout the year, but typically slows during summer and peaks during late fall/early winter in correlation with availability of forage seeds. Beach mice live 9 months to a year in the wild.

Foraging: Beach mice feed primarily on seeds and fruits, but have been shown to prey on insects. Sea oats make up the bulk of a beach mouse's diet. However, based on seasonal availability, beach mice also feed on bluestem, ground cherry (*Physallis angustafolia*), evening primrose (*Oenothera humifusa*), beach pea (*Galactia spp*.), dune spurge (*Chamaesyce ammannioides*), jointweed (*Polygonella gracilis*), seashore elder (*Iva imbricata*), and seaside pennywort (*Hydrocotyle bonariensis*).

Movements: Home range size varies among subspecies but averages about 54,000 ft^2. Individual home ranges commonly overlap. Young mice have the ability to disperse several kilometers from their birthplace to establish their own home ranges.

A beach mouse family will often use as many as 10 burrows within their home range. Burrows are used for sleeping, nesting, feeding, caching seeds, or as predator escapes. Beach mice are nocturnal, spending the day sleeping in their burrows. Upon nightfall mice emerge from their burrows to forage and gather seeds to store. During the course of one night, mice make several trips to and from their burrows.

West Indian Manatee (*T. manatus)*

The species occurs in coastal areas from the southeastern U.S. to northeastern South America. It is found in rivers, estuaries, and coastal areas of subtropical and tropical areas of northern South America, West Indies/Caribbean region, Gulf of Mexico (now mainly western and southwestern portions) and southeastern North America. U.S. populations occur primarily in Florida where they are effectively isolated from other populations by the cooler waters of the northern Gulf of

Mexico and the deeper waters of the Straits of Florida (Domning and Hayek 1986). A few may remain year-round in Cumberland Sound, southeastern Georgia, where factory warm-water outfalls allow survival of colder winter months (Reeves et al. 1992). Occasionally manatees are found in summer from Texas to North Carolina. The species occurs along most of the Gulf coast of Florida, but infrequently occurs north of the Suwannee River and between the Chassahowitzka River and Tampa Bay. They also occur all along the Atlantic coast of Florida, from the Georgia coast to Biscayne Bay and the Florida Keys, including the St. Johns River, the Indian River lagoon system, and various other waterways (O'Shea and Ludlow 1992).

The species is primarily dependent upon submergent, emergent, and floating vegetation. Their diet varies according to plant availability, and they may opportunistically eat other foods.

Red-Cockaded Woodpecker (*P. borealis*)

The species typically inhabit open, mature pine woodlands, rarely deciduous or mixed pine-hardwoods located near pine woodlands. The optimal habitat is characterized as a broad savanna with a scattered overstory of large pines and a dense groundcover containing a diversity of grass and shrub species midstory vegetation is typically sparse or absent (Hooper et al. 1991).

Foraging occurs in a diversity of forested habitat types that includes pines of various ages as well as some hardwood-dominated habitats. Most foraging appears to take place on older pine trees or in open pine habitats (Lennartz ,1988).

The six largest populations are in the Apalachicola National Forest (Florida), North Carolina Sandhills, Francis Marion National Forest (South Carolina), Kisatchie National Forest (Louisiana), Eglin Air Force Base and Blackwater State Forest (Florida), and Red Hills hunting plantations in southern Georgia (James, 1995).

Bald Eagle (*H. leucocephalus*)

The Bald eagle is no longer listed as threatened or endangered, but is still protected under the Bald and Golden Eagle Protection Act. Bald eagles roost in winter. The preferred roosts are in conifers or other sheltered trees. Perching in deciduous and coniferous trees is equally common in other areas (e.g., Bowerman et al. 1993). Their breeding habitat commonly include areas close to coastal areas, bays, rivers, lakes, or other bodies of water that reflect the general availability of primary food sources (Campbell et al. 1990). Typical nest trees include pines, spruces, firs, cottonwoods, oaks, poplars, and beeches. They tend to avoid developed areas with nearby human activity (Buehler et al. 1991). The same nest may be used year after year, or may alternate between two nest sites in successive years.

Eastern Indigo Snake (*D. couperi*)

The current range of population includes southern Georgia and Florida. The snake is very rare or extirpated in Alabama, Mississippi, and South Carolina. Recent reintroductions have been made in Florida, Alabama, Georgia, South Carolina, and Mississippi. One reintroduced population may be thriving in Covington County, Alabama. Habitat includes high pinelands (sandhills, scrub,

etc.), flatwoods, and most types of hammock in Florida and southeastern Georgia. The species is found near wetlands and in association with gopher tortoise burrows. It prefers pineland habitats that are maintained by periodic fires. The species requires relatively large tracts of suitable terrestrial habitat. When inactive, it often occupies tortoise burrows, stump holes, or land crab burrows.

Flatwoods Salamander (*A. cingulatum*)

The salamander is native to the southeastern U.S. Coastal Plain. Post-larval individuals inhabit mesic longleaf pine (*Pinus palustris*), wiregrass (*Aristida stricta*) flatwoods and savannas. The terrestrial habitat is best described as topographically flat or slightly rolling wiregrass-dominated grassland having little to no midstory and an open overstory of widely scattered longleaf pine. Low-growing shrubs, such as saw palmetto (S*erenoa repens*), gallberry (I*lex glabra*) and blueberries (V*accinium spp*.), co-exist with grasses and forbs in the groundcover. Groundcover plant diversity is usually very high. The underlying soil is typically poorly drained sand that becomes seasonally inundated.

Critical habitat for the flatwoods salamander is located in the northern portion of Franklin County, Florida. This area is outside the project area and would not be affected by the project activities.

6.2 Social Economic Environment.

6.2.1 Economic Activity. The Florida Panhandle relies on its coastal waters to provide a variety of economic and social benefits to its residents and visitors, alike. The coastal ecosystems in the project area support a wide variety of commercial and recreational activities that contribute significantly to the State's economy. Sport and commercial fisheries are some of the most notable economic highlights, within the region and the State. Apalachicola Bay provides 90% of the state's oyster harvest. The marine environments within the area also provide essential transportation links, support a variety of water-dependent facilities, and offer an array of recreational opportunities that attract thousands of visitors to the area each year (FDEP, 1994).

6.2.2 Land Use. The location of the proposed action is along the coastal region of northwest Florida. Lands surrounding the project vicinity include national, state and counties parks, large military holdings and several urbanized areas. Agricultural lands are generally scattered across the Northern Highlands portion of the panhandle. The remainder of the land is divided between forested and non-forested wetlands, barren lands and water bodies.

The panhandle is generally rural with an overall population density of less than 75 persons per square mile (Northwest Florida WMD, 1996). Urban areas account for only about 6% of northwest Florida. High population densities of the region exist mainly along the coast in Pensacola, Ft Walton Beach vicinity, and Panama City (Northwest Florida WMD, 1996).

6.2.3 Cultural Resources. The GIWW was authorized by Congress and completed more than 50 years ago. The existing channel and the majority of the upland disposal areas were constructed and operated prior to the enactment of the National Historic Preservation Act (NHPA), which was signed into law in 1966. The Mobile District has previously considered the

effect that continued use and maintenance of the waterway (to include disposal on existing disposal areas) may have on historic properties as per regulations at 36 CFR 800. This was consulted with the Florida State Historic Preservation Officer (SHPO) in 1990 (DRH Project File No. 902865). A "no effect" on historic properties was concurred on by the Florida SHPO (letter dated September 21, 1990).

In 2002, cultural resources surveys were conducted for 8 additional proposed upland disposal sites on the GIWW in Walton and Bay Counties, Florida. No significant archeological sites or historic structures were identified in any of the areas. As part of this contract effort, the Florida State Master site files were examined and information on all recorded archeological sites adjacent to the GIWW in Florida was obtained. This was consulted with the Florida SHPO in 2002 (DRH Project File No. 2002-07354B). A "no effect" on historic properties was concurred on by the Florida SHPO (letter dated November 6, 2002).

7.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

7.1 Introduction. This section will discuss the impacts of implementing the preferred alternative on resources of significance in the area, since no other alternatives are reasonable or feasible to attain need for the action.

7.2 Physical Environment.

7.2.1 Climate. The preferred alternative is not anticipated to have any impacts on the existing climatic conditions with the project vicinity.

7.2.2 Topography, Geology and Soils. The preferred alternative would have no adverse impacts on the existing topography, geology or soils within the project vicinity. The project would result in the removal of substrate as needed to a depth of 12 feet MLLW with 2 feet of advanced maintenance and 2 feet of allowable overdepth within the project area. The placement of the dredged material would result in alterations to the topography and geology within the disposal sites, as designed.

7.2.3 Hydrology and Water Resources. The proposed action would not alter drainage or circulation patterns within the region. Furthermore, it is not anticipated that the project will significantly alter local flow patterns or rates.

7.2.4 Air Quality. The proposed action would have no significant long-term effect on air quality. Air quality in the immediate vicinity of the dredge and other equipment would be slightly affected for a short period of time by the fuel combustion and resulting engine exhausts. The exhaust emissions are considered insignificant in light of prevailing breezes and when compared to the existing exhaust fumes from other vessels using the project.

The project area is in attainment with the NAAQS parameters. The proposed action would not affect the attainment status of the project area or region. A State Implementation Plan conformity determination (42 U.S. Code 70569(c)) is not required since the project area is in attainment for all criteria pollutants.

7.2.5 Noise. Noise from the dredge and other job-related equipment is expected to increase during the proposed operations in the project vicinity. Noise levels will resume to prior conditions once the dredging and disposal operations are complete. No long-term increase in noise will occur in or around the project area.

7.2.6 Water Quality. Under the proposed action little to no impacts to water resources is anticipated. Short-term impacts would involve increased, localized turbidity and decreased dissolved oxygen associated with dredging and disposal operations. However, these impacts are expected to be temporary and minimal. During dredging and disposal operations, turbidity levels would be monitored to ensure compliance with the state water quality certification from the State of Florida Department of Environmental Quality, Office of Pollution Control (OPC). All OPC guidelines shall be maintained during the proposed activity.

7.2.7 Hazardous Material. No known hazardous, toxic or radioactive waste concerns are known to exist within the confines of the project. The proposed action would not generate any hazardous, toxic or radioactive wastes. The dredging contractor would be required to secure and properly dispose of any hazardous materials or wastes associated with the dredging and disposal operation.

7.2.8 Sediment Quality. No adverse impacts to sediment quality are likely to occur from the disposal and placement of dredged material from maintenance operations. The dredged material within the channel has a low likelihood of contamination due its course grain size The land cut area utilizes upland disposal areas with the embayments typically utilizing open water DAs. The areas that utilize open water disposal traverse bays that are far removed from potential sources of contamination and have minute probability as a carrier of contaminates. The composition of dredged material removed from the channel is similar to the composition at the disposal sites, due to their close proximity to the channel. Therefore, the project would not adversely affect sediment quality or change sediment bottoms.

7.2.9 Biological Resources.

7.2.9.1 Aquatic Environment.

7.2.9.1.1 Benthos, Motile Invertebrates, and Fishes. No significant impacts to the benthos, motile invertebrates, and fishes from the proposed action were identified in this evaluation. There would be temporary disruption of the aquatic community caused by the dredging and disposal operations. Non-motile benthic fauna within the area would be destroyed by dredging and within-bay disposal operations, but should repopulate within 6 to 12 months upon project completion (Culter and Mahadevan, 1982), (Saloman et al., 1982). Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes, would avoid the disturbed area and should return shortly after the activity is completed. However, larval and juvenile stages of these forms may not be able to avoid the activity due to their limited mobility. However, significant losses to the benthic and pelagic fauna are not anticipated due to the phased nature of the channel maintenance and small area (percentage wise) of ecosystem that will be affected at a given point in time.

7.2.9.1.2 Oyster Resources. Studies have indicated the existence of oyster reefs are in or near the project vicinity of the Apalachicola-East Bay, West Bay, and Choctawhatchee Bay systems. Past coordination with the Florida Department of Agriculture concerning the existence of oyster reefs in and adjacent to open-water placement sites 1A-1G and 2N, 2M, and 2S prior to their usage have been made. This coordination effort has been successful in allowing the project to continue while avoiding impacts to the existing oyster reefs in the project vicinity. This coordination effort will continue for these disposal areas and similar coordination will be made for sites 37, 39, and 14A if bottom surveys at these sites conclude oyster reefs exist within close proximity of the project. To insure avoidance of any adverse impacts to oyster reefs a 500-foot buffer would be placed around any established oyster reefs during open water placement activities in these areas. No other oyster resources are known to be located in or near the project vicinity.

7.2.9.1.3 Submerged Aquatic Vegetation. Historic survey data obtained from the USGS, FWC and the USACE, Mobile District have indicated the possible existence of submerged aquatic vegetation (SAV) near estuarine disposal areas: 46.1, 39.5, 10.1, 3.1 and 3.2b; upland disposals and/or island disposal areas: 40.1, 45, and 2.1 and along segments of the channel in Santa Rosa Sound, Choctawhatchee Bay, East Bay, Apalachicola River and Apalachicola Bay. More detailed information on these locations are provided in Table 8 below. All other known areas of seagrasses are located greater than 500 feet of the channel and/or disposal areas. All reaches of the project where seagrasses are located closer than 500 feet are areas of high sand content where side slope adjustments and turbidity generated from the hydraulic pipeline dredging is expected minimal. To ensure that increased turbidity is not occurring within the seagrass beds turbidity measurements will be measured during dredging operations at the seagrass edge and compared to background readings. In areas where seagrasses must be crossed by a pipeline between the channel and disposal area, best management practices will be utilized such as the use of plastic to float pipe or collars to raise the pipe over the seagrass beds. Prior to any dredging or placement activities within these areas, proper coordination with all appropriate agencies will be made, and suitable disposal plans would be determined as to avoid adverse impacts to these productive and vital environments.

Table 8.	**Seagrasses Locations**
Channel Miles	
172.5 to 174	Edge of *T. testudinaum* /*H. wrighitti* seagrass bed located approx. 110 feet to > 500 feet north and south of the channel
179 to 180	Edge of *H. wrighitti* seagrass bed located approx. 20 feet to > 500 feet north and south of the channel
204 to 208	Edge of *H. wrighitti* seagrass bed located approx.120 feet to > 500 feet north and south of the channel
219 to 226	*Edge of H. wrighitti* seagrass bed located immediately adjacent to the south side of the channel near mile marker 225 and between 40 to > 500 north and south of the channel
291.5 to 292.5	Edge of *H. wrighitti* seagrass bed located approx. 250 feet north of the channel
296.5 to 297	Edge of *H. wrighitti* seagrass bed located approx. 330 feet northeast of the channel
305 to 305.5	Edge of *H. wrighitti* seagrass bed located approx. 250 feet northeast of the channel
312 to 313	Edge of *H. wrighitti* seagrass bed located approx. 230 feet to 340 feet east and west of the channel
345.5 to 348	Edge of *V. americana seagrass* seagrass bed located approx. 155 feet to greater than 500 feet north and south of the channel
351.5 to 353	Edge of *H. wrighitti* seagrass bed located east and west of the channel at distances of approx. 55 feet to 450 feet
Disposal Areas	
46.1	Edge of *H. wrighitti* seagrass bed located approx. 500 feet southeast of the disposal area
45	Edge of *H. wrighitti* seagrass bed located along the southern and eastern perimeter of the disposal area
40.1	Edge of *H. wrighitti* seagrass bed located along the southern shoreline adjacent to the disposal area
39.5	Edge of *H. wrighitti* seagrass bed located approx. 200 feet north of the disposal area
10.1	Edge of *H. wrighitti* seagrass bed located approx. 400 feet northwest of the disposal area
3.1	Edge of *V. americana* seagrass bed located approx. 300 feet upriver along the river banks and along the perimeter of the disposal area
3.2b	Edge of *V. americana* seagrass bed located approx. 150 feet downriver along the river banks
2.1	Edge of *H. wrighitti* seagrass bed located approx. 250 feet to the north and west of the disposal area

7.2.9.2 Terrestrial Environment. As a result of this evaluation, no adverse impacts to the terrestrial ecosystem located in the vicinity of project were identified. Disposal activities would occur within pre-disturbed, pre-approved disposal areas. Impacts from dredged material placement in the existing upland project areas were considered in previous NEPA documents. No new impacts are proposed for these areas. For upland sites where dike construction is required prior to their continued use: 17B, 18B, 19B, 20B, 34B, a field inspection will be conducted prior to the construction to minimize effects to the jurisdictional waters, including any wetlands. Dikes would generally be constructed following the back easement line and previous limits of dredged material placement to avoid significant impacts to the terrestrial environment.

7.2.9.2.1 Shorebirds. No adverse impacts to nesting migratory shorebirds are anticipated with the implementation of the project. The USACE has established a shorebird management plan in 2004, which has been coordinated with Florida Fish and Wildlife Commission (FWC). Under the management plan, in areas of high likelihood of shorebird nesting, a shorebird survey would be done prior to disposal activities. If nesting is evident, construction activities would be halted until coordination with the Florida FWC has been made, and a 175 meter buffer zone is established. In addition, low likelihood sites would be inspected prior to dredging and the Florida FWC would be contacted if nesting is identified and appropriate actions would be taken to avoid adverse impacts.

7.2.9.3 Essential Fish Habitat. The Gulf of Mexico Fishery Management Council in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265) has developed management plans for the following fisheries: shrimp, red drum, reef fish, stone crab, spiny lobster, coral and coral reef and coastal migratory pelagic species. The Gulf of Mexico Fishery Management Plans (2008) identifies EFH in the project area to be intertidal wetlands, submerged aquatic vegetation, non-vegetated bottoms, shell reefs, and the estuarine water column. The proposed action will not significantly affect coastal habitat identified as EFH in the project area due to the fact that impacts will be temporary in nature. Species identified to be present within the project area are motile and will likely exit the area upon initiation of dredging operations. The exception is non-motile benthic invertebrates that will be impacted by the project. As previously mentioned, impacts to these species will be negligible as they will re-colonize the area within a few months. Based on the minor nature of the project in relation to impacts to fisheries resources the overall impact is considered negligible.

7.2.9.4 Threatened and Endangered Species. The proposed project was coordinated with USFWS and the NMFS in 2007 through a Biological Assessment which was prepared by the USACE, Mobile District for the entire GIWW, Louisiana thru Florida portions. By letters dated October 4, 2007 and October 23, 2007, both USFWS and NMFS agencies concurred with the USACE's determination that no adverse impacts to any federally-listed endangered or threatened species would occur nor is the project likely to destroy or adversely modify critical habitat for piping plover, Gulf sturgeon and beach mice.(Appendix I).

In addition, one recommendation was submitted by USFWS relative to the Gulf sturgeon and unit 6 for critical habitat. The USFWS concurred provided that the maintenance dredging

activities would not occur during peak migration periods of March thru April, and October thru November. The USACE Mobile District has implemented that recommendation.

In the 2007 Biological Assessment, the USACE concluded that the project is not likely to adversely affect the listed T&E species or adversely modify any critical habitat (see Table 8). No critical habitat of the piping plover is located within the action area of the project.

Potential impacts to listed sea turtles and Gulf sturgeon resulting from the proposed dredging and disposal activities would be confined to direct impacts associated with the dredge equipment. No effects are anticipated with the use of a hydraulic cutter-head dredge, as they are not known to impact sea turtles and Gulf sturgeon as determined by the NMFS in 2003 in the Gulf Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts (GRBO) (Consultation Number F/SER/2000/01287) dated November 19, 2003. Impacts associated with construction activities should be temporary and isolated to actual construction limits.

Manatees could be in the project area; however there is not a potential for adverse impacts to occur. As a precaution, standard manatee conditions would be followed during construction activities. It is anticipated these species would avoid the construction areas due to noise and activity. A hydraulic cutter-head dredge would be utilized to avoid adverse impacts to listed species. Due to the current range of the beach mice populations and the surrounding habitat at the disposal areas it is unlikely that beach mice would be in the area of disposal activities. Four upland and/or estuarine disposal areas are located on Santa Rosa and Perdido Key Islands. However, these disposal areas are not located in primary or secondary (frontal) dunes or scrub habitat of relatively high elevation known to support beach mice.

Gulf sturgeon Critical Habitat

The action area includes both riverine and estuarine critical habitat units; therefore, it may contain all of the primary constituent elements (PCE)s: abundant prey items, riverine spawning sites, riverine aggregation areas, flow regime, water quality, sediment quality, and safe unobstructed migratory pathways. Potential impacts on the seven PCEs are analyzed below.

Water Quality: Potential water quality impacts as a result of dredging and disposal were considered. Dredging and disposal are expected to create some degree of turbidity in excess of the natural condition. Impacts from sediment disturbance during these operations are expected to be temporary, minimal and similar to conditions experience during past routine operation and maintenance of the channel. Suspended particles will settle out within a short time frame, with no measurable effects on water quality. No measurable changes in temperature, salinity, pH, hardness, oxygen content or other chemical characteristics are expected.

During dredging and disposal operations, turbidity levels would be monitored, to ensure compliance with state water quality certification. The USACE, Mobile District Corps does not expect measurable impacts to Gulf sturgeon critical habitat as a result of water quality impacts related to the proposed action.

Riverine Spawning Area: Unit 6 is the only unit that the GIWW occurs in, which supports riverine spawning. No Gulf sturgeon spawning habitat is located within the action area of the project. The known areas which support Gulf sturgeon spawning are located upstream-near mi 7 of the Apalachicola River; a rough limestone outcrop at river mi 105 and a smooth consolidated clay outcrop at river mi 99 (USFWS, 2006). All sights which have been identified as containing substrate potentially suitable for spawning are located between Woodruff Dam and the State Highway 20 Bridge near Blountstown and Bristol, Florida. Therefore, the USACE, Mobile District concludes that the proposed project would have "no effect" on the riverine spawning of Gulf sturgeon.

Riverine Aggregation Areas: Unit 6 is the only area within the GIWW that supports riverine aggregation area. No known Gulf sturgeon aggregation sites are located within the project area. Wooley and Crateau (1985) reported that Gulf sturgeon occupied the area immediately downstream of Woodruff Dam during the summer months. This area is the deepest available in the upstream-most 15.5 mile of the river, with a mean depth of 27.6 ft. They monitored movements of 15 radio-tagged Gulf sturgeon in this reach from May through September, 1983, finding that all remained within 0.5 mi of the dam. Odenkirk (1991) also found that radio-tagged sturgeon showed a strong tendency to remain immediately downstream of the dam during the summer. An area approximately 10 km upstream on the Brothers River has also been documented by the USFWS as an aggregation area for the species. Based on this information, the USACE, Mobile District concludes that the proposed project will have "no effect" on the riverine aggregation of Gulf sturgeon.

Migratory Pathway: Neither the disposal of dredged materials, nor the operation of the dredging equipment is expected to create barriers to the migration of the species. The Apalachicola River portion of the GIWW and the Santa Rosa Sound provide sufficient width and appropriate habitat depth for sturgeon passage and foraging around the dredging activities. However, to minimize potential impacts to Gulf sturgeon migration, the USACE, Mobile District concurred with the USFWS recommendation in 2007 that maintenance activities for the Unit 6, Apalachicola River portion of the GIWW, would not occur during peak migration periods of March thru April, and October thru November. Therefore, the USACE, Mobile District concludes that the proposed project would not adversely modify the migratory pathways of Gulf sturgeon.

Sediment Quality: The land cut area utilizes upland DAs with the embayments typically utilizing open water disposal areas. The areas that utilize open water disposal traverse bays that are far removed from potential sources of contamination and have minute probability as a carrier of contaminates. The composition of dredged material removed from the channel is similar to the composition at the disposal sites, due to their close proximity to the channel. Therefore, the project would not adversely affect sediment quality or change sediment bottoms, which is a primary constituent element for gulf sturgeons.

Flow regime: The proposed action is the maintenance dredging of an existing Federal navigation project. Dredging is limited to the authorized channel dimensions of -12 ft MLLW, with up to two feet of over dredging and two feet of advanced maintenance dredging, for a maximum depth of -16 ft. MLLW. No alterations to the length, width, or depth of the project will be made. Therefore, the USACE, Mobile District concludes that the proposed action will not adversely

modify the flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of the species.

Prey Abundance: Units 6, 9, 12 and 13 provide foraging habitat for the Gulf sturgeon. Upon exiting the rivers where the Gulf sturgeon have spent the summer months foraging sparingly in freshwater, the species initially concentrate around the mouths of the rivers, lakes and bays; they then disperse into nearshore areas and continue to forage. Due to the presence of prey and the belief that sturgeon feed heavily upon entering the estuary, it is likely that some Gulf sturgeon may forage in the action area.

Dredging would impact epibenthic crustaceans and infaunal polychaetes within the navigation channel and open water/estuarine disposal areas. These impacts are primarily short-term in nature, consisting of a temporary loss of benthic invertebrate populations in the project footprint of the channel and open water disposal areas. The total area comprises less than 0.8% of estuarine area within Units 9, 10, 12, and 13 and 2% of the river length in Unit 6. It should be noted that dredging and disposal along the entire channel length would not occur within the same dredging cycle (year), therefore sufficient time for an area to recover would be expected (please refer to Table 2 for areas typically dredged along with the dredging frequency). The estuarine shoreline placement and bird island disposal area would be more intrusive. Disposal in these areas would result in a loss of benthic productivity in areas filled above MHW. These areas comprise less than 0.03% of the estuarine area in Unit 13 and 0.6% of the river length in Unit 6. The conversion of sub-tidal habitat to emergent shoreline at the estuarine shoreline disposal areas is expected to reverse over time as currents continue to erode the material along the edges of the disposal areas. Therefore, the loss is expected to be a temporary (1-5 years) alteration.

The materials that will be removed (dredged) from the project area are homogenous with those that will remain in the channel and, therefore, no alteration of habitat composition is occurring. The area will remain a shallow-water (defined as depths shallower than 46 feet) neritic zone that can support sub-littoral benthic biota. Due to the fact that similar habitat is expected to be present pre- and post-dredging, it is anticipated that the benthic biota in the dredging areas will have the ability to rapidly recover and re-colonize.

Observed rates of benthic community recovery, after placement of dredged material, range from a few months to several years. The relatively species-poor benthic assemblages associated with low salinity estuarine sediments can recover in periods of time ranging from a few months to approximately one year, while the more diverse communities of high salinity estuarine sediments may require a year or longer. Placement of materials similar to ambient sediments (e.g., sand on sand or mud on mud) has been shown to produce less severe impacts in contrast to placement of dissimilar sediments, which generally results in more severe, long-term impact. Deposition of dredged material in thin layers (<10 cm; 4 in) can minimize impacts by allowing many populations of small, shallow-burrowing infauna with characteristically high reproductive rates and wide dispersal capabilities to recover quickly. Deposits greater than 20 to 30 cm (8 to12 in) generally eliminate all but the largest and most vigorous burrowers. Based on the similarities between the dredged material, the depth of disposal, erosion processes and the ambient

sediments at the disposal areas, it is believed that the benthic biota in the open water and estuarine disposal areas will have the ability to rapidly recover and re-colonize over time.

Table 9. T & E determination of effects

Species	Determination (species/CH)
Gulf Sturgeon	NLAA/NLAM
Manatee	NLAA/NE
Alabama beach mouse	NE/NE
Choctawhatchee beach mouse	NE/NE
St. Andrew beach mouse	NE/NE
Perdido key beach mouse	NE/NE
Piping plover	NLAA/NE
Red cocckaded woodpecker	NLAA/NA
Bald eagle	NLAA/NA
Eastern indigo snake	NLAA/NA
Flatwoods salamander	NE/NA
Alabama red-bellied turtle	NE/NA
NA = not applicable	
NE = no effect	
NLAA = not likely to adversely affect	
NLAM= not likely to adversely modify	

7.3 Social Economic Environment

7.3.1 Economic Activity. No significant impacts to the economic activity in the project vicinity were identified in this evaluation. The proposed action will benefit the regional and national economy by ensuring a safe and economical transportation link for a variety of water-dependent facilities.

7.3.2 Land Use. All lands have been previously used in dredged material placement activities. No new impacts being proposed to the land; therefore, it is not anticipated to have any adverse impacts.

7.3.3 Cultural Resources. The GIWW was authorized by Congress and completed more than 50 years ago. The existing channel and the majority of the upland disposal areas were constructed and operated prior to the enactment of the NHPA, which was signed into law in 1966. The Mobile District has previously considered the effect that continued use and maintenance of the waterway (to include disposal on existing disposal areas) may have on historic properties as per regulations at 36 CFR 800. This was consulted with the Florida SHPO in 1990 (DRH Project File No. 902865). A “no effect” on historic properties was concurred on by the Florida SHPO (letter dated September 21, 1990).

In 2002, cultural resources surveys were conducted for 8 additional proposed upland disposal sites on the GIWW in Walton and Bay Counties, Florida. No significant archeological sites or historic structures were identified in any of the areas. As part of this contract effort, the Florida State Master site files were examined and information on all recorded archeological sites adjacent to the GIWW in Florida was obtained. This was consulted with the Florida SHPO in 2002 (DRH Project File No. 2002-07354B). A "no effect" on historic properties was concurred on by the Florida SHPO (letter dated November 6, 2002).

As the lead Federal Agency for Section 106 of the NHPA compliance, the Mobile District has determined that maintenance and dredging operations utilizing existing disposal areas has no potential to cause effects as per 36 CFR 800.3(a)(1). In accordance with this determination, the Mobile District has "no further obligations under Section 106".

7.4 Cumulative Effects Summary. Cumulative impacts are those impacts on the environment that result from the incremental impacts 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. This section analyzes the proposed dredging maintenance project as well as any connected, cumulative, and similar existing and potential actions occurring in the area surrounding the site.

The potential direct environmental and socioeconomic impacts associated with the proposed action are insignificant. In general, the proposed dredging and disposal operations would have no significant adverse cumulative effects. No future projects were known to be dependent upon this action.

7.5 Regulatory Requirements. All necessary state and Federal permits and approvals will be obtained before actions of the preferred alternative are taken. The proposed action will not cause adverse environmental impacts requiring environmental mitigation.

7.5.1 Water Quality Certification. Water quality certification has been requested from the State of FDEP for the proposed action. The Federal navigation channel will be dredged to a depth consistent with those previously described. All FDEP guidelines shall be maintained during the proposed activity.

7.5.2 Coastal Zone Management Act Considerations. The proposed action has been determined to be consistent with the Florida Coastal Program to the maximum extent practicable. The USACE, Mobile District has requested concurrence from FDEP with its determination.

7.6 Protection of Children. On April 21, 1997, the President issued Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The EO recognizes a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because children's bodily systems are not fully developed; because children eat, drink, and breathe more in proportion to their body weight; because their behavior patterns may make them more susceptible to accidents. Based on these factors, the President directed each Federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may

disproportionately affect children. The President also directed each Federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Evaluation of the project and project area reveals no environmental health or safety risks to children due to the project occurring away from children.

7.7 Environmental Justice. On February 11, 1994, the President issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*. The EO focuses Federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The EO directs the Federal agencies to develop environmental justice strategies to aid the USACE to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority and low-income populations. The proposed action poses no disproportionately high adverse impacts to the human health or environment of minority or low-income communities populations in the vicinity of the project.

7.8 Coordination. Under the agency and public coordination guidelines of the NEPA process, numerous persons have been contacted for input on the proposed action. The general public will be notified of the proposed action via public notice. Copies of the public notice will be made available to Federal and state agencies and the interested public for a 30-day review period. Comments on the proposed action are requested in writing by the end of that 30-day period. Comments on the action will be considered prior to a decision on the action.

8.0 LIST OF AGENCIES, INTERESTED GROUPS AND PUBLIC CONSULTED.

Apalachicola National Estuarine Research
Engineering Research and Development Center
Florida Department of Agriculture
Florida Department of Environmental Protection
Florida Marine Research Institute
Florida State Historic Preservation Office
Gulf of Mexico Fishery Management Council
National Oceanic and Atmospheric Administration Fisheries
National Register of Historic Places
Northwest Florida Water Management District
U.S. Department of the Interior, Fish and Wildlife Service, Panama City, FL
U.S. Environmental Protection Agency, Region 4

9.0 REFERENCES

Baird, B. 1995. Biological Assessment: Impacts of Navigation Channel Hopper Dredging on Threatened and Endangered Species in Louisiana. Corps of Engineers, New Orleans, LA.

Baird, B. 1995. Biological Assessment: Impacts of Navigation Channel Hopper Dredging on Threatened and Endangered Species in Louisiana. Corps of Engineers, New Orleans, LA.

Balazs, G.H. 1982. Growth rates of immature green turtles in the Hawaiian Archipelago, pp. 117-125. In: K.A.

Banks, G.E., M.P. Alexander. 1994. Development and Evaluation of a Sea Turtle-Deflecting Hopper Dredge Draghead. Miscellaneous Paper HL-94-5, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Bjorndal (ed.), Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washington, DC.

Bjorndal, K.A. 1980. Demography of the breeding population of the green turtle, *Chelonia mydas*, at Tortuguero, Costa Rica. Copeia. 3:525:530.

Bjorndal, K.A. (ed.). 1981. Biology and Conservation of Sea Turtles. Proceedings of the World Conference on Sea Turtle Conservation, Washington, D.C., 26-30 November, 1976. Smithsonian Institution Press, Washington, D.C.

Bjorndal, K.A. (ed.). 1981a. Biology and conservation of sea turtles. Proceedings of the world conference on sea turtle conservation. 26-30 November 1979, Washington, D.C., Smithsonian Institution Press, Washington, D.C.

Bjorndal, K.A. 1981b. The consequences of herbivory for the life history pattern in the Caribbean green turtle, *Chelonia mydas*, pp. 111-116, In Bjorndal, K.A. 1981a.

Cake, Edwin W. and J. Cirino, 1997. An Assessment of Molluscan Shellfish Resources in West Bay, Bay County, Fl.

Caldwell, D.K., A. Carr, T.R. Heller, Jr. 1955. Natural history notes on the Atlantic loggerhead turtle, *Caretta caretta*. Quart. J. Fla. Acad. Sci. 18(4): 292-302.

Carr, A. and H. Hirth. 1962. The ecology and migrations of sea turtles, five comparative features of isolated green turtle colonies. Am. Mus. Nov. 2091: 1-42.

Carr, A. 1980. Some problems of sea turtle ecology. Amer. Zool. 20:489-498.

Carr, A.F., and D.K. Caldwell. 1956. The ecology and migrations of sea turtles, 1. Results of field work in Florida, 1955. Am. Mus. Noviates 1793.

Carr, A.F., D.R. Jackson, and J.B. Iverson. 1979. Marine turtles. Chapter XIV In A summary and analysis of environmental information on the Continental Shelf and Blake Plateau from Cape Hatteras to Cape Canaveral (1977). Vol. I, Book 3. Center for Natural Areas, South Gardiner, Maine.

Chavez, H. 1969. Tagging and recapture of the lora turtle (*Lepidochelys kempi*). Int. Turtle Tortoise Soc. J. 3(4): 14-19; 32-36.

Coastal Zone 80: Proceedings of the second symposium on coastal and ocean management. Vol. III. American Society of Civil Engineers, N.Y.

Culter, J.K., Mahadevan S. 1982. "Long-Term Effects of Beach Nourishment on the Benthic Fauna of Panama City Beach, Florida." Report submitted to the USACE Coastal Engineering Research Center, Vicksburg, MS.

Department of the Interior. 1994. Gulf of Mexico Sales 152 and 155: Central and Western Planning Areas Final Environmental Impact Statement. OCS EIS/EA MMS 94-0058. Mineral Management Service, New Orleans, LA.

Ehrhart, L.M. 1977. Cold water stunning of marine turtles in Florida east coast lagoons: rescue measures, population characteristics and evidence of winter dormancy.

Federal Register Vol. 65, N0. 130/ Thursday, July 6, 2000/ Proposed Rules, Wintering Piping Plovers

Fernald, Edward A. and Elizabeth D. Purdham (editots), 1992. The Atlas of Florida. University Press of Florida, Gainesville.

Fish and Wildlife Service and National Marine Fisheries Service. 1992. Recovery Plan for the Kemp's ridley sea turtle (*Lepidochelys kempi*). National Marine Fisheries Service, St. Petersburg, Fl.

Florida Department of Environmental Protection, 1994. Florida Sediment Quality Assessment Guidelines (SQAGs) – 1994.

Florida Department of Environmental Protection, 2000. Florida Water Quality Report – 2000. Pursuant to Section 305(b) of the Clean Water Act.

Florida Department of Environmental Regulation. 1988. "A Special Monitoring Project Basin Survey, Biological and Physiochemical Assessment of Pensacola Bay 1987-1988." Northwest District, Biology Section, 67 pp.

Frazier, J.G. 1980. Marine turtles and problems in coastal management, pp. 2395-2411, In. B.L. Edge (ed.).

Frazer, N.B. and L.M. Ehrhart. 1985. Preliminary growth models for green, *Chelonia mydas*, and loggerhead, *Caretta caretta*, turtles in the wild. Copeia 1985:73-79.

Frick, J. 1976. Orientation and behavior of hatchling green turtles (*Chelonia mydas*) in the sea. Anim. Behav. 24: 849-857.

Fritts, T. 1983. Distribution of cetaceans and sea turtles in the Gulf of Mexico and nearby Atlantic Waters, p. 3-5, In C.E. Keller and J.K.Adams (eds).

Fritts, T.H., in. Hoffman, and M.A. McGehee. 1983. The distribution and abundance of marine turtles in the Gulf of Mexico and nearby Atlantic waters. J. Herpetology 17(4): 327-344.

Fritts, T.H., A.B. Irvine, R.D. Jennings, L.A. Collum, W. Hoffman, and M.A. McGhee. 1983a. Turtles, birds, and mammals in the northern Gulf of Mexico and nearby Atlantic waters. FWS/OBS-82/64, U.S. Fish and Wildlife Service, Washington D.C.

Fuller, D.A. 1978. The habitats, distribution, and incidental capture of sea turtles in the Gulf of Mexico. Appendix A. Shrimp Fishery Management Plan of the U.S. Gulf of Mexico. Center for Wetland Resources, Louisiana State University, Baton Rouge.

Fuller, D.A., A.M. Tappan and M.C. Hester 1987. Sea turtles in Louisiana's coastal waters. LSU-CFI. Baton Rouge, La. Louisiana State University, Center for Wetland Resources.

FWS/OBS-80/41, .U.S. Fish and Wildlife Service, Washington, D.C.

Gunter, G. 1981. Status of turtles on Mississippi coast. Gulf Research Report 7(1):89-92.

Hildebrand, H.H. 1981. A historical review of the status of sea turtle populations in the western Gulf of Mexico, pp. 447-453, In Bjorndal, K.A.

Hopkins, Gary. 2002. Personal Communication with Howard Ladner of the U.S. Army Corps of Engineers, Mobile District, Alabama.

http://www.mvn.usace.army.mil/ED/MRT/Usace_no/Content/threatened_and_en dangered_specie.htm

http://www.nmfs.noaa.gov/prot_res/PR3/Turtles/turtles.html

http://northflorida.fws.gov/SeaTurtles/Turtle%20Factsheets/green-sea-turtle.htm

http://northflorida.fws.gov/SeaTurtles/Turtle%20Factsheets/loggerhead-sea-turtle.htm

http://serendip.brynmawr.edu/biology/projects97/DuComb.html

http://state-of-coast.noaa.gov/bulletins/html/ief_03/case.html

http://southeast.fws.gov/es/T&E%20Species.htm

http://plover.fws.gov/

Joyce, J.C. 1982. Protecting sea turtles while dredging. Military Engineer 74:282-285

Landry, A. 1986. Stranding and natural history of sea turtles in the northern Gulf of Mexico. Presented at Seventh Annual Minerals Management Service, Gulf of Mexico OCS Region, Information Transfer Meeting. Session IV. D. Sea turtle problems in the Gulf of Mexico, 5 November, 1986.

Layne, J.N. 1965. Observations on marine mammals in Florida waters. Bulletin of the Florida State Museum of Biological Science. 9:131-181.

Livingston, R,J, 1984. U.S. The Ecology of the Apalachicola Bay system: an estuarine profile. U.S. Fish and Wildlife Service. FWS/OBS 82/05. 148 pp.
Lund, F. 1974. Marine turtle nesting in the U.S. Unpublished MS.

Mann, Tom. 2001. Presentation from the Proceedings of the Singing River Symposium. Mississippi Natural Heritage Program, Mississippi Museum of Natural Science, Mississippi Department of Wildlife, Fisheries, & Parks.

Meylan, A. B. 1988. Spongivory in hawksbill turtles. A diet of glass. Science 239:393-395.

Moulding, J.D. 1988. Implementation of the Endangered Species Act, Canaveral Navigation Channel Dredging, a Case History. pp. 26-29. In Proceedings of the National Workshop on Methods to Minimize Dredging Impacts on Sea Turtles, 11 and 12 May, 1988.

National Marine Fishery Service, 1999. Essential Fish habitat: New Marine Fish Habitat Conservation mandate for Federal Agencies. National Marine Fishery Service, habitat Conservation Division, Southeast Regional Office.

Nelson, D.A. 1986. Life History and Environmental Requirements of Loggerhead Turtles. Technical Report EL-86-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Ms.

Northwest Florida Water Management District. 1996. Hydrogeology of the Northwest Florida Water Management District. Water Resources Special Report 96-4.

Northwest Florida Water Management District. 1983. Inventory of Submerged Vegetation in Choctawhatchee Bay, Fl. Water Resources Special Report 83-4.

Northwest Florida Water Management District. 1988. Surface Water Improvement and Management Program, Pensacola Bay System. Program Development Series

89-2 and Technical Appendix.

Northwest Florida Water Management District. 2002. The Choctawhatchee River and Bay System Surface Water Improvement and Management Plan 2002 Update. Program Development Series 2002-2.

Northwest Florida Water Management District. 1997. The Pensacola Bay System Surface Water Improvement and Management Plan. Program Development Series 97-2.

Northwest Florida Water Management District. 2000. The St. Andrew Bay Watershed Surface Water Improvement and Management Plan. Program Development Series 2000-2.

National Oceanic and Atmospheric Administration (NOAA). 1997. Magnitude and extent of sediment toxicity in four bays of the Florida panhandle: Pensacola, Choctawhatchee, St. Andrew and Apalachicola. NOAA, ORCA. Silver Spring, MD.

Hendrickson, J.R. 1980. The ecological strategies of sea turtles. Amer. Zool. 20:597-608.

Ogren, L. 1977. Survey and reconnaissance of sea turtles in the northern Gulf of Mexico. Unpublished report NMFS.

Ogren, L. 1988. The biology and ecology of juvenile sea turtle: Kemp's ridley (*Lepidochelys kempi*) in the Gulf of Mexico and western North Atlantic. Draft report.

Olvey, Whitney 2002. Phase I Historic Resources Survey Eight Upland Sites Gulf Intracoastal Waterway Walton and Bay Counties, Florida.

Paper presented at 1977 American Society of Ichthyologists and Herpetologists meeting, Gainesville, Fla.

Plotkin, P.T., M.K. Wicksten, and A.F. Amos. 1993. Feeding ecology of the loggerhead sea turtle *Caretta caretta* in the Northwestern Gulf of Mexico. Marine Biology 115, 1-15 (1993)

Pritchard, P.C.H. 1971. The leatherback or leathery turtle. *Dermochelys coriacea*. IUCN Monog. No. 1.

Pritchard, P.C.H. and R. Marquez. 1973. Kemp's Ridley Turtle or Atlantic Ridley. IUCN Monograph No. 2. Marine Turtle Series.

Proceedings of a workshop on cetaceans and sea turtles in the Gulf of Mexico: study planning for effects of Outer Continental Shelf development, 6-8 April, 1982. FWS/OBS-83/03.

Rabalais, S.C. and N.H. Rabalais. 1980. The occurrence of sea turtles on the South Texas Coast. Contrib. Mar. Sci. 23:123-129.

Rebel, T.P. 1974. Sea turtles and the turtle industry of the West Indies, Florida, and the Gulf of Mexico. Univ. Miami Press, Coral Gables, FL.

Renaud, M.L. and J.A. Carpenter, in press. Movements and submergence patterns of Loggerhead turtles (*Caretta caretta*) in the Gulf of Mexico determined through Satellite Telemetry. Bulletin of Marine Science.

Richardson, J.I., 1988. The Sea Turtles of the King's Bay Area and the Endangered Species Observer Program Associated with Construction Dredging of the St. Mary's Entrance Ship Channel. pp 32-46. In Proceedings of the National Workshop on Methods to Minimize Dredging Impacts on Sea Turtles, 11 and 12 May, 1988.

Ross, J.P. 1981. Historical decline of Loggerhead, Ridley, and Leatherback sea turtles, p. 189-195, In K.A. Bjorndal, 1981.

Schmidly, D.J. 1981. Marine mammals of the southeastern U.S. coast and the Gulf of Mexico.

Sean Bulletin. 1980. Natural history specimens. Marine turtles. Smithsonian Institution, SEAN (Scientific Event Alert Network). Vol. 5(9): 13-14.

Saloman, C.H., Naughton, S.P., Taylor J.L. 1982. "The Benthic Community Response to Dredging Borrow Pits, Panama City Florida." Report submitted to the USACE Coastal Engineering Research Center.

Solt, V. 1981. Denver scientist makes first sea turtle transmitter. In Fish and Wildlife News, Special Edition: Research. pp. 88-89. U.S. Fish and Wildlife Service, Washington, D.C. In Rabalais and Rabalais. 1980.

United States Army Corps of Engineers, 1976. Environmental Statement for Maintenance Dredging of the Gulf Intracoastal Waterway from Pearl River, Louisiana-Mississippi to Apalachee Bay, Florida.

United States Army Corps of Engineers, 1985. Environmental Assessment for Modifications to the Maintenance Plan as Presented in the Final Environmental Statement Maintenance Dredging of the Gulf Intracoastal Waterway from Pearl River, Louisiana-Mississippi to Apalachee Bay, Florida.

Viosca, Jr. 1961. Turtles, tame and truculent. LA. Conserv. 13:5-8.

Witzell, W.N. 1983. Synopsis of biological data on the hawksbill turtle, *Eretmochelys imbricata* (Linnaeus, 1776). FAO Fisheries Synopsis 137:78.

Ziewitz, J. W., J. G. Sidle, and J. J. Dinan. 1992. Habitat conservation for nesting least terns and piping plovers on the Platte River, Nebraska. Prairie Naturalist 24(1):1-20.

Zug, G.R., A.H. Wynn, and C. Ruckdeschel. 1986. Age determination of loggerhead sea turtles, *Caretta caretta*, by incremental growth marks in the skeleton. Smithson. Contrib. Zool. 427.

Zwinenberg, A.J. 1977. Kemp's Ridley, *Lepidochelys kempi* (Garman 1980), undoubtedly the most endangered marine turtle today (with notes on the current status of *Lepidochelys olivacea*). Bull. Maryland Herp. Soc. 13:170-192.

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APPENDIX I

Project Maps/
Section 7 Coordination Letters (USFWS and NMFS)

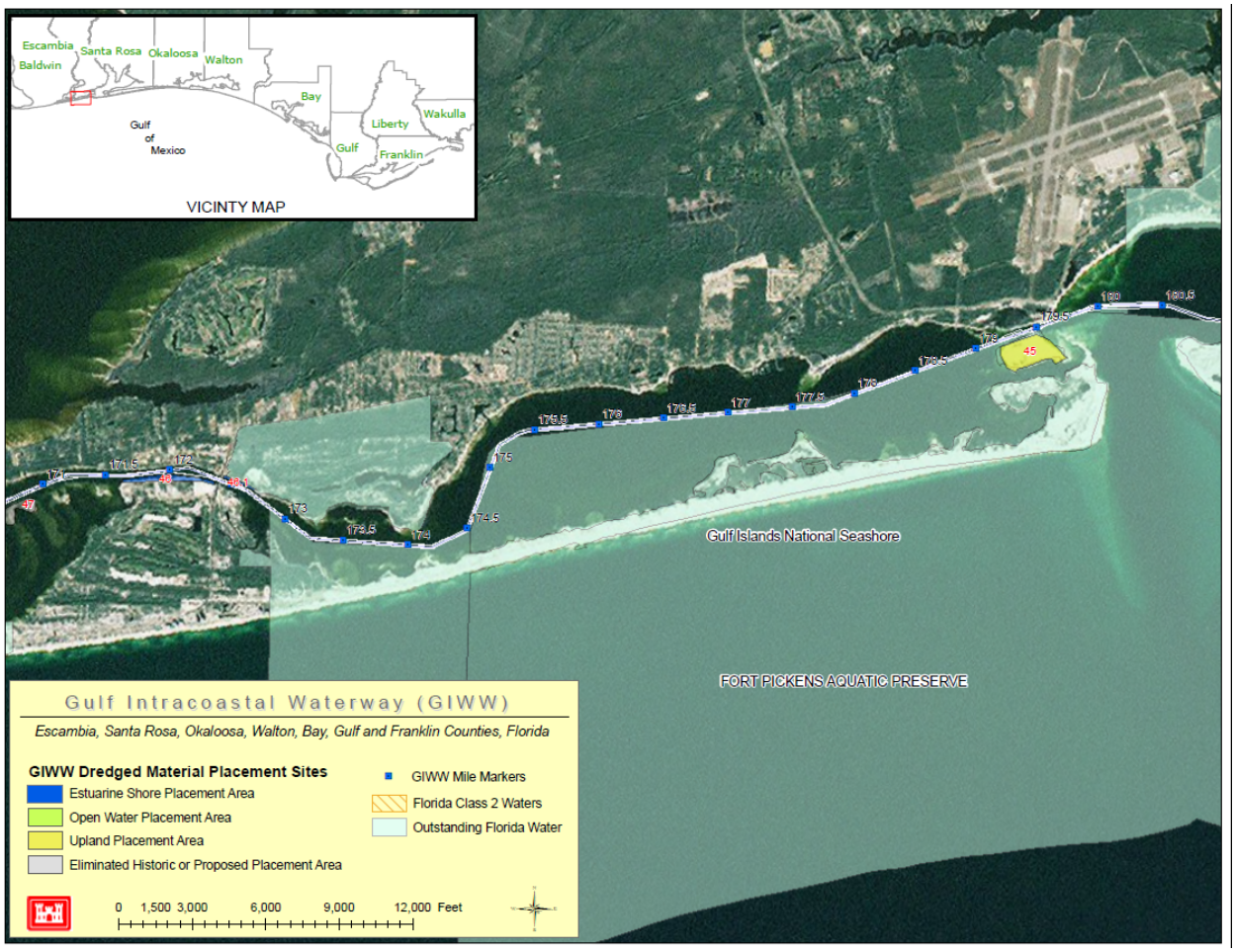
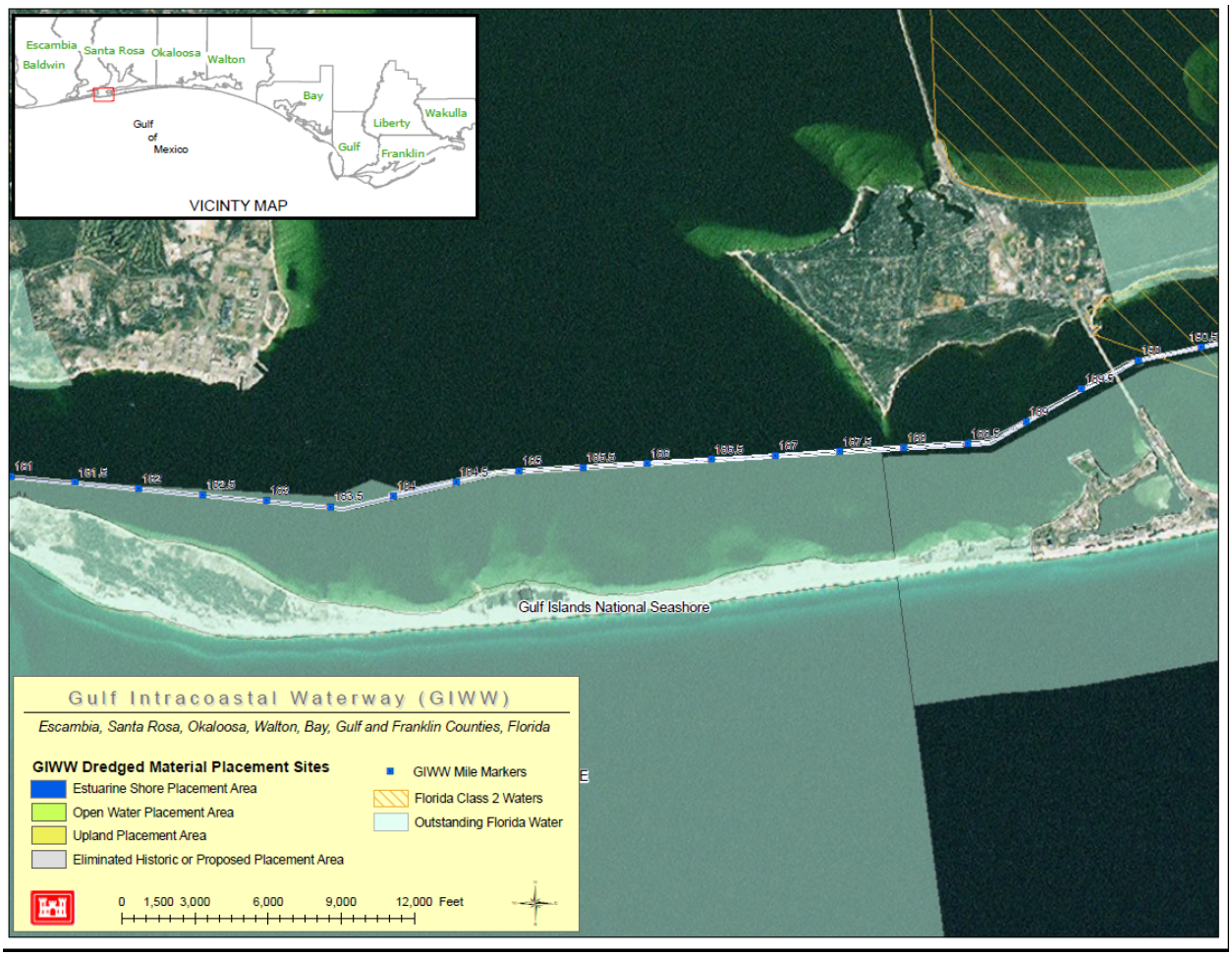


Figure 2. GIWW Project Area (miles 171-180.5)



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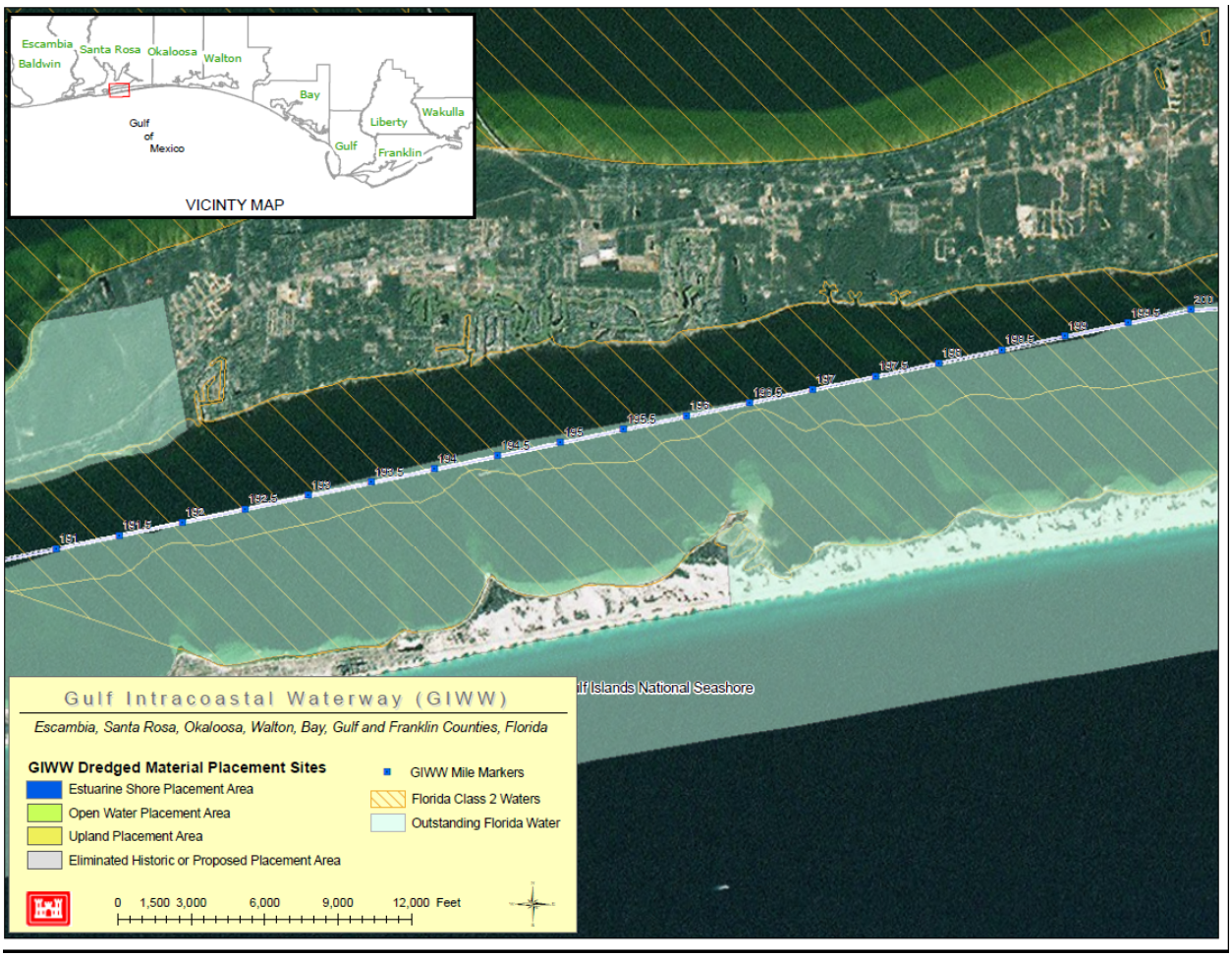

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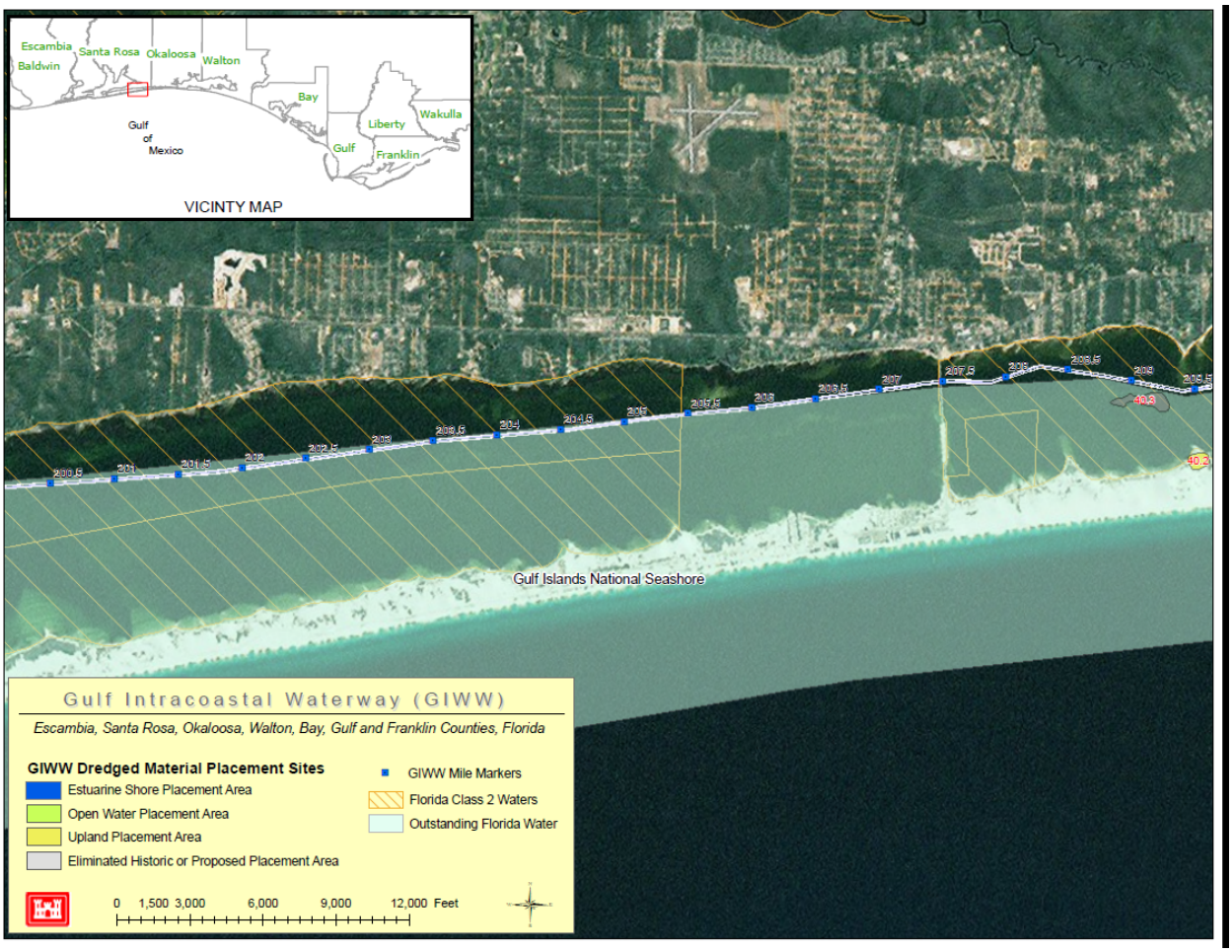

Figure 5. GIWW Project Area (miles 200.5-209.5)

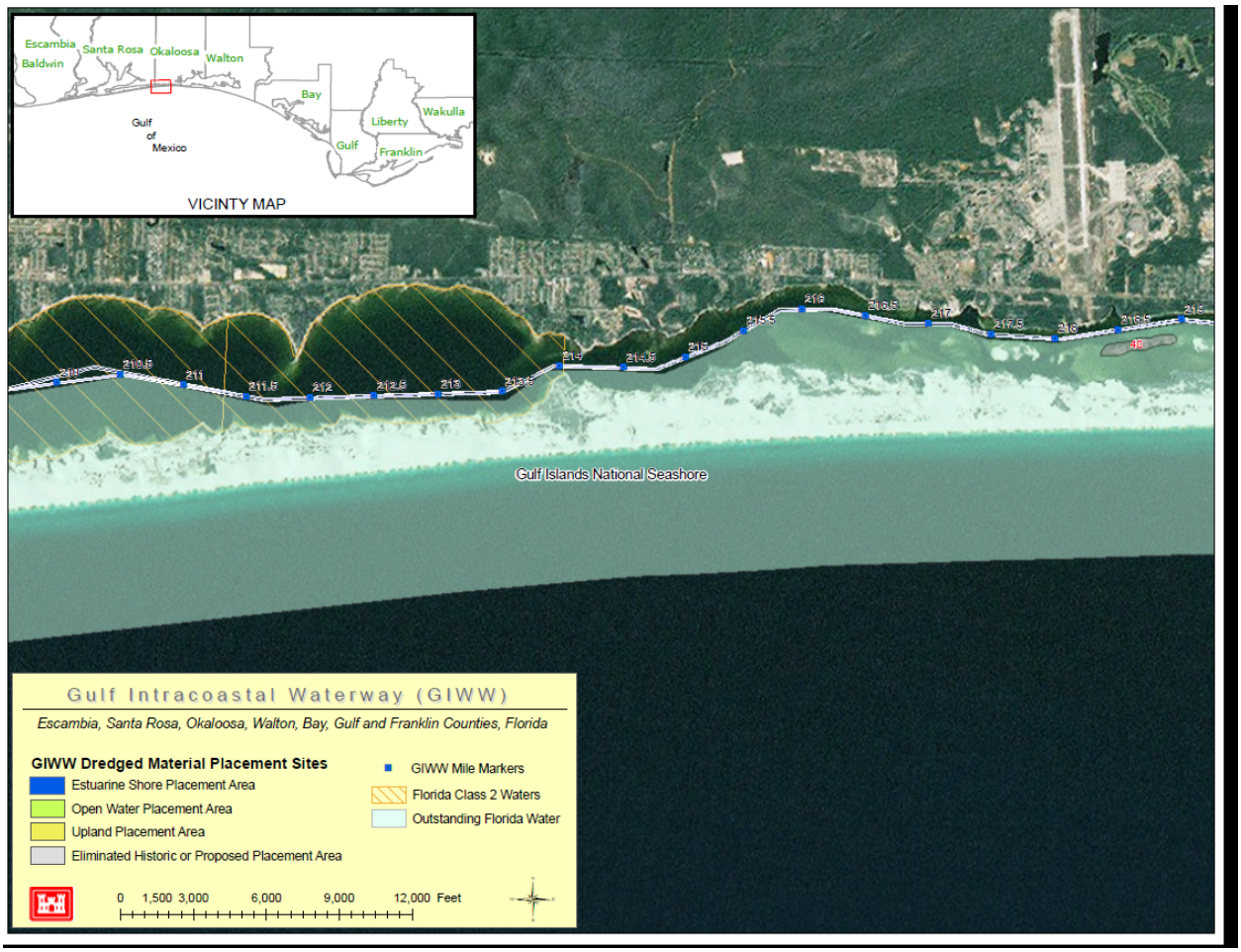

Figure 6. GIWW Project Area (miles 210-219)

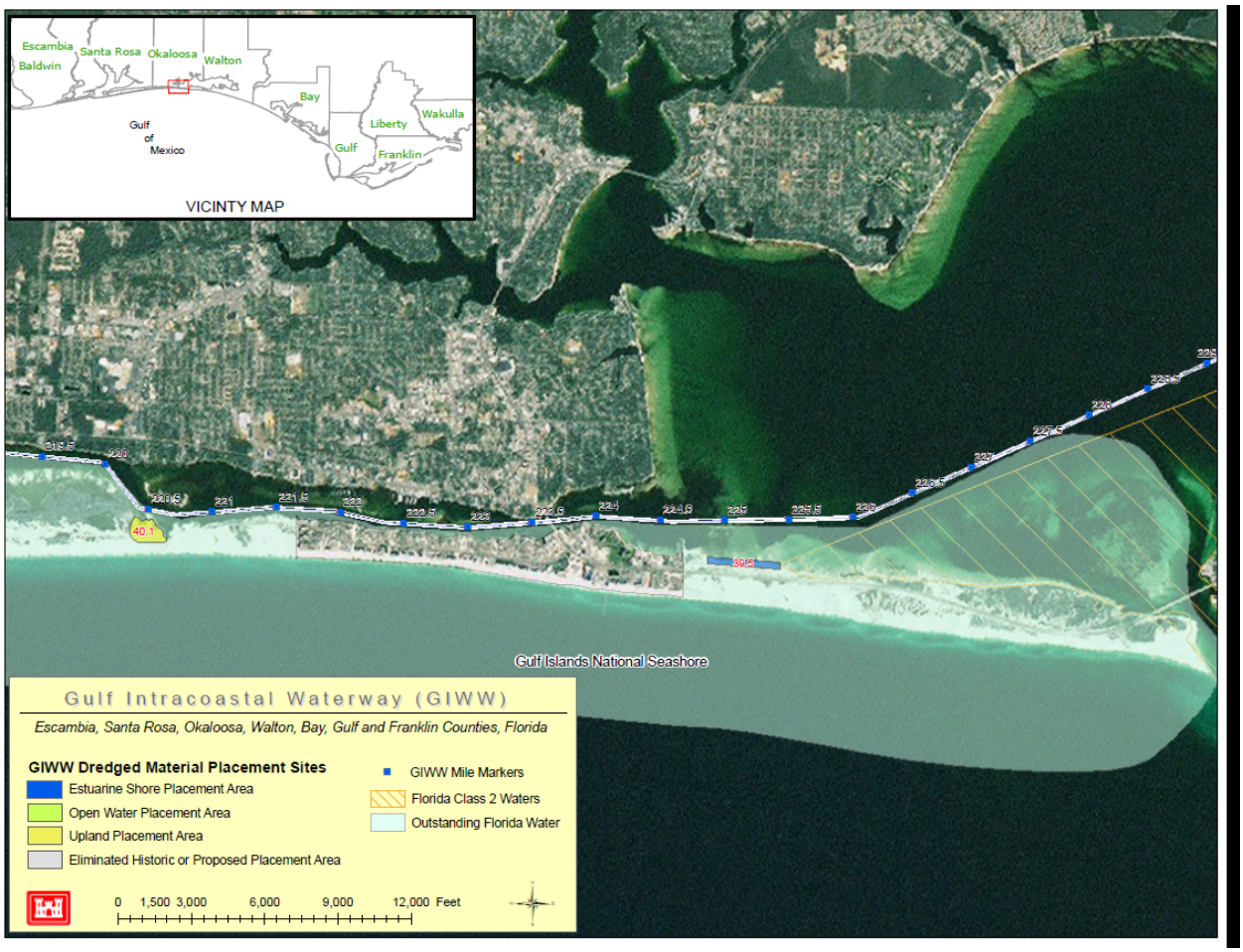

Figure 7. GIWW Project Area (miles 219.5-229)

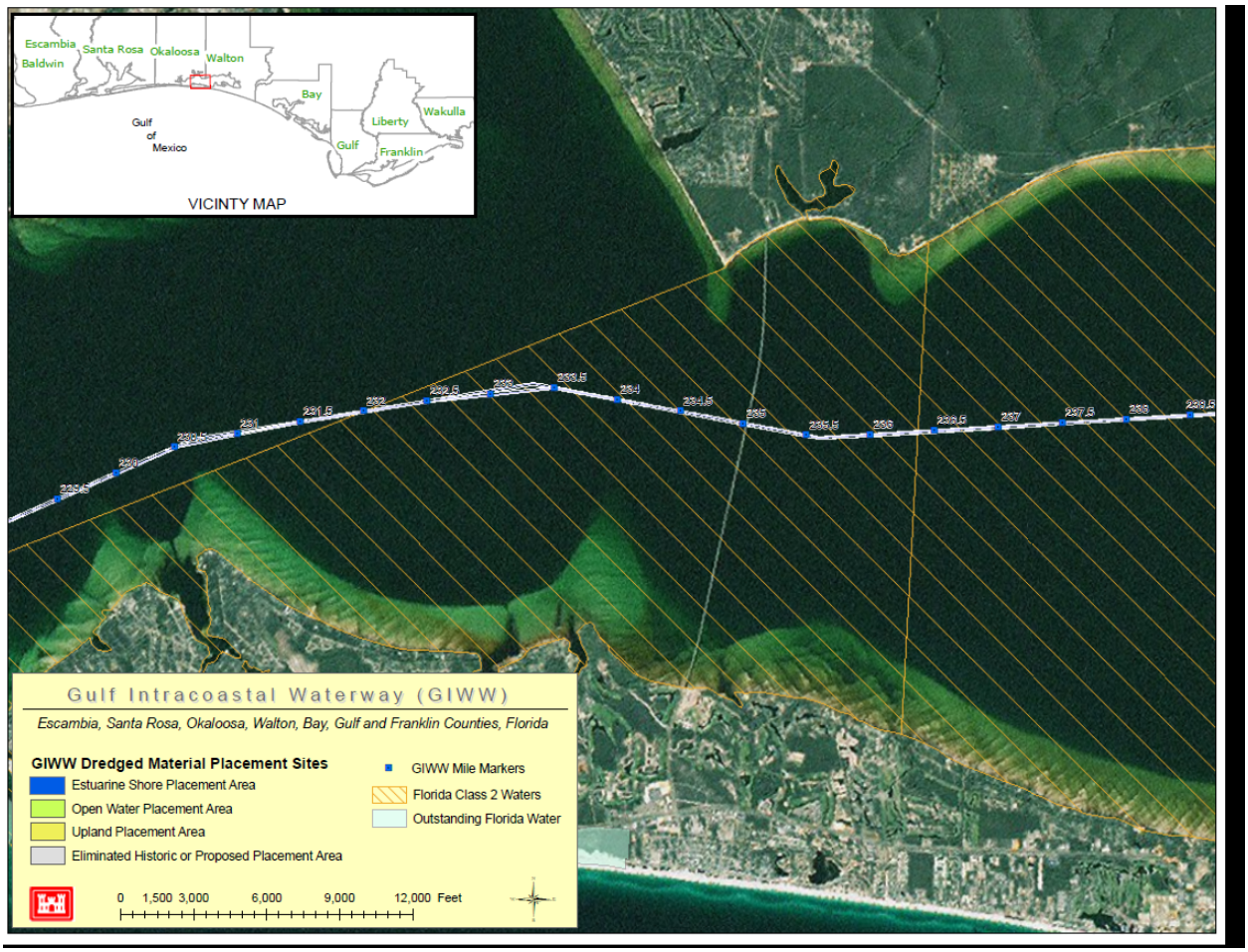

Figure 8. GIWW Project Area (miles 229.5-238.5)

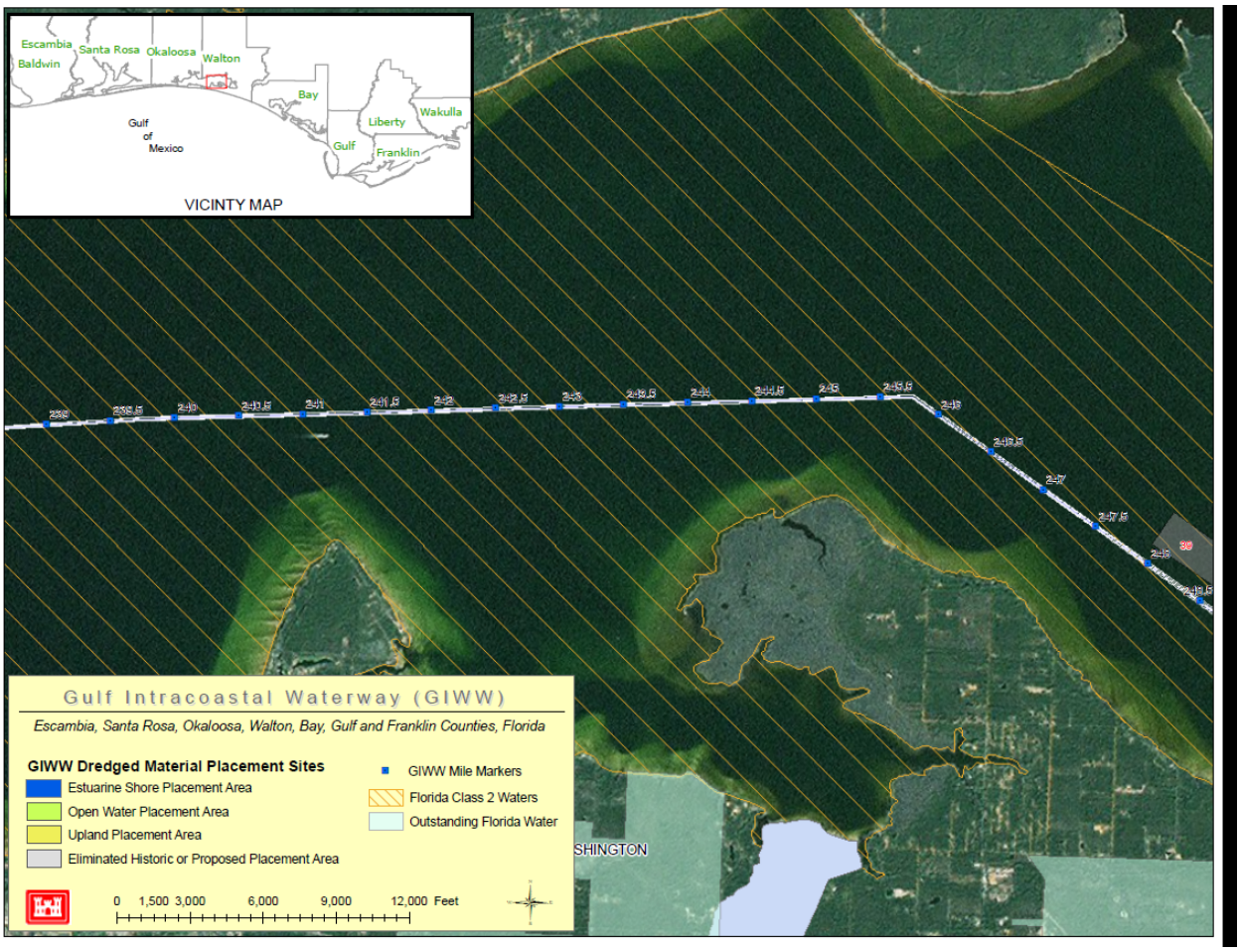

Figure 9. GIWW Project Area (miles 239-248.5)

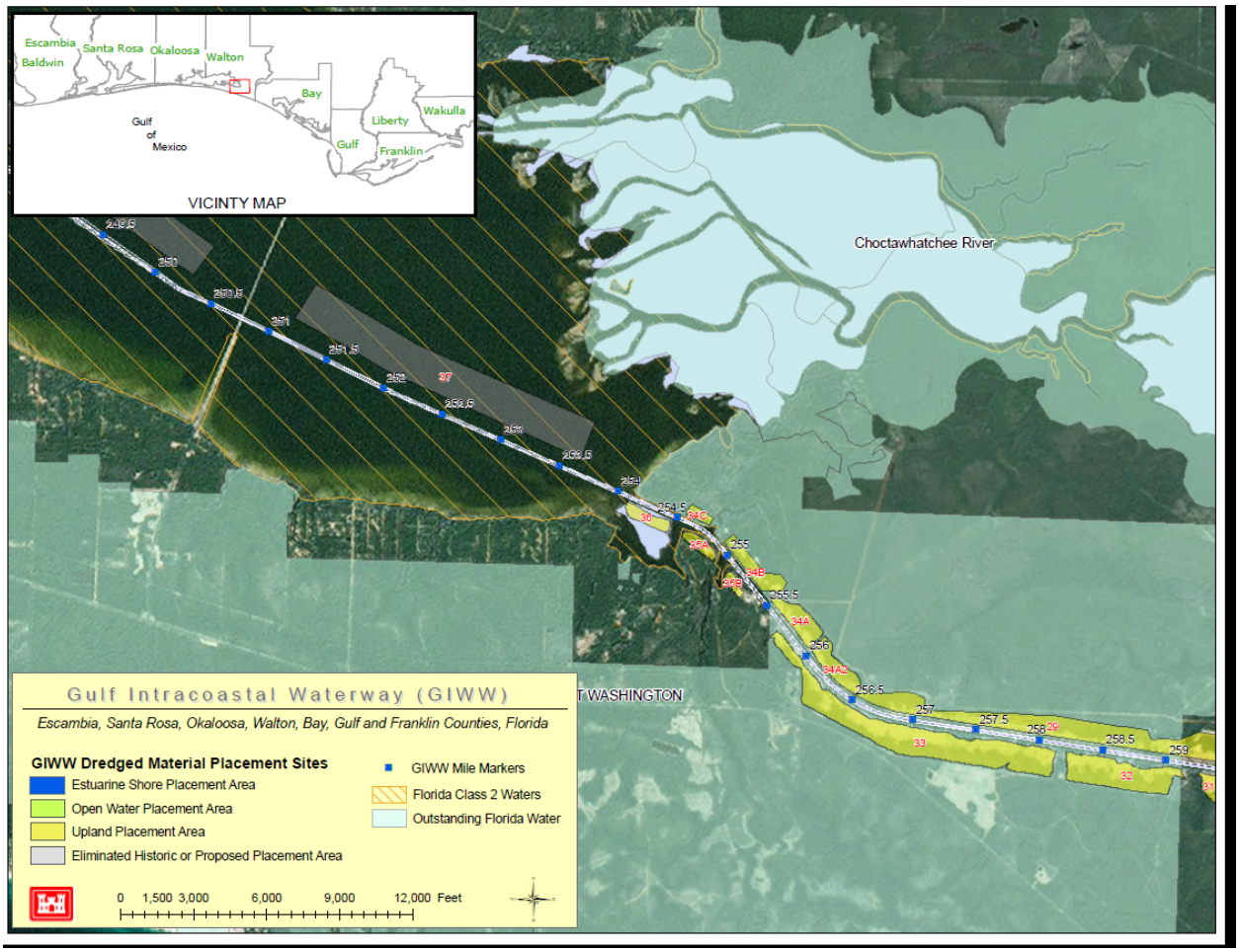

Figure 10. GIWW Project Area (miles 249.5-259)

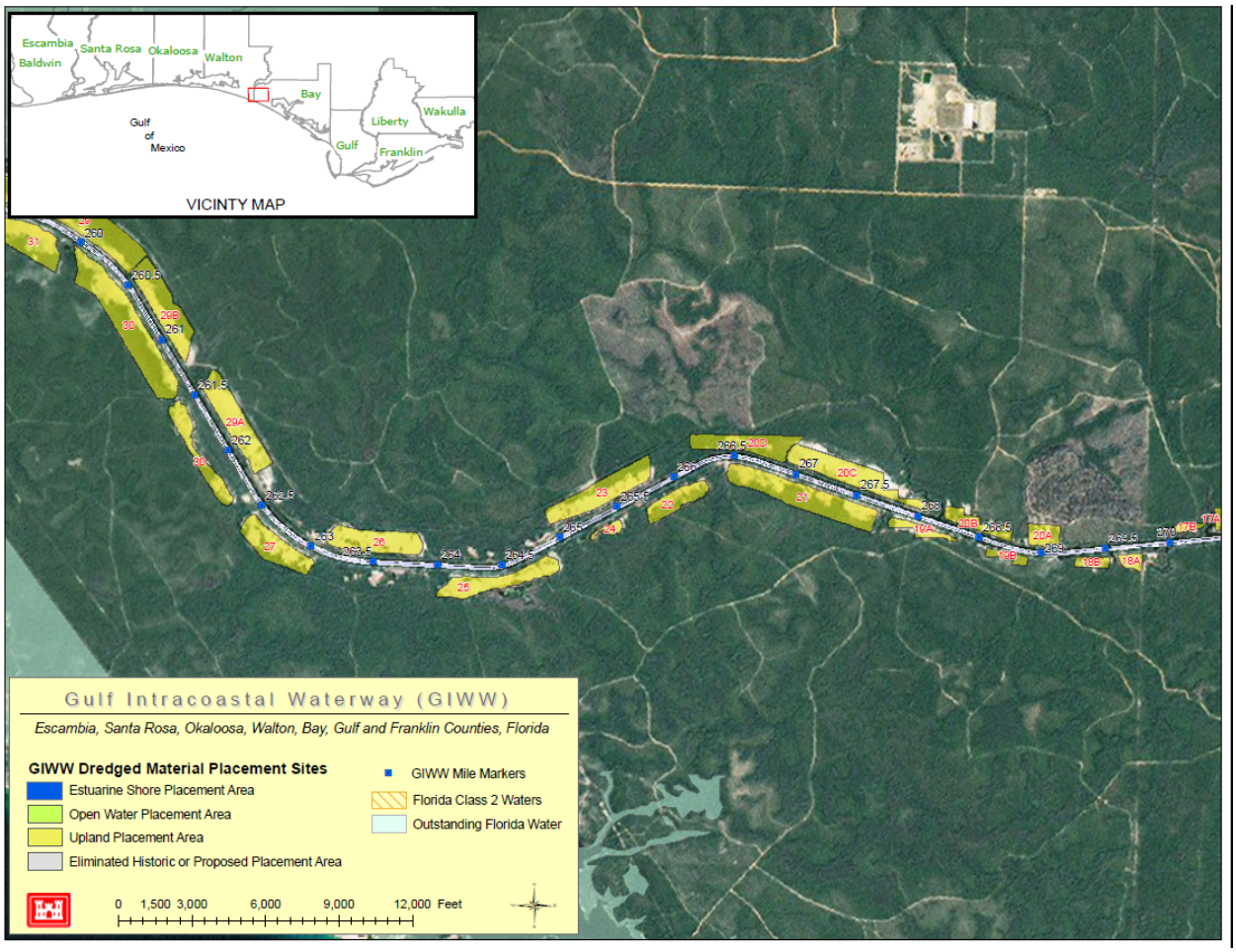

Figure 11. GIWW Project Area (miles 260-270)

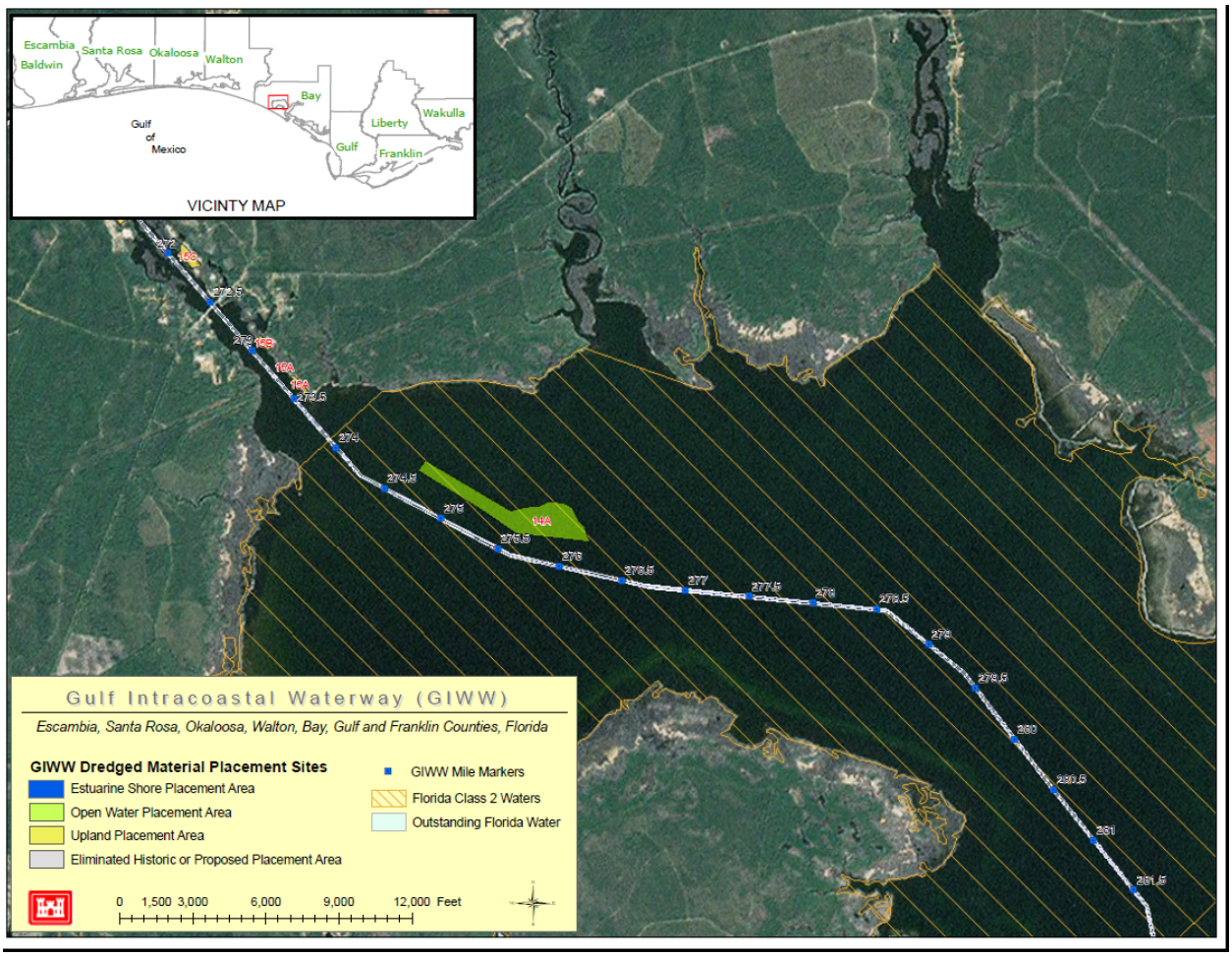

Figure 12. GIWW Project Area (miles 272-281.5)

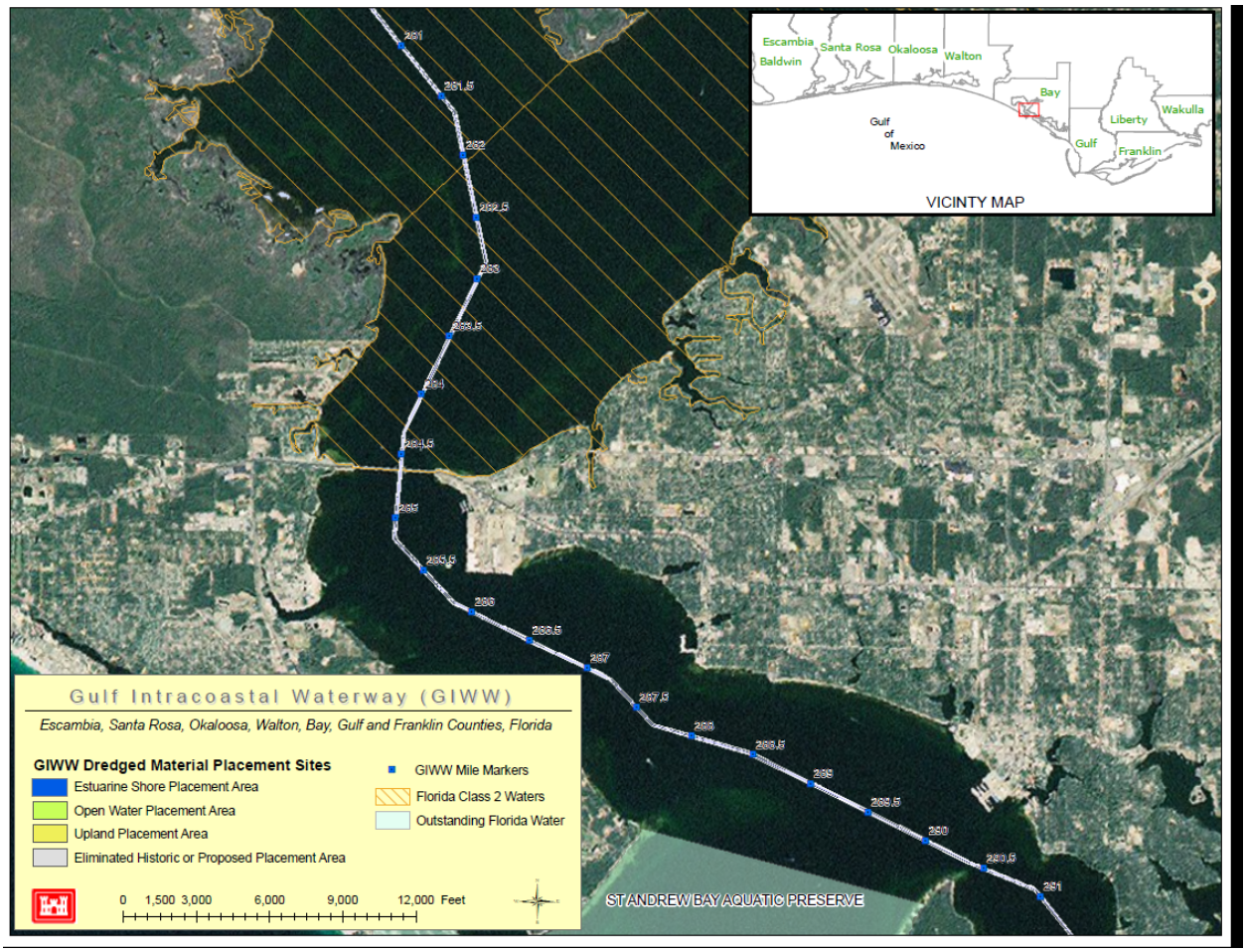

Figure 13. GIWW Project Area (miles 281-291)

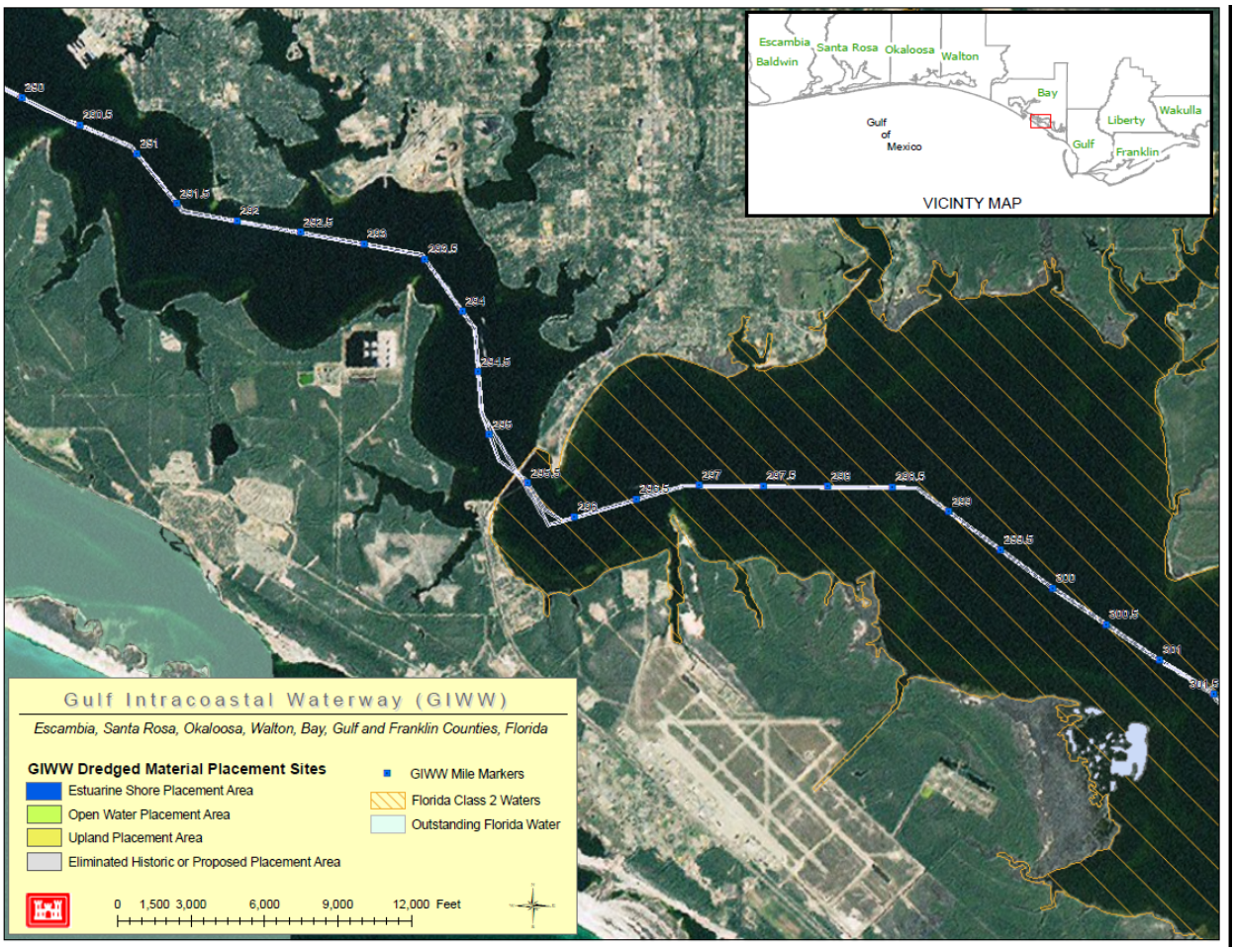

Figure 14. GIWW Project Area (miles 290-301.5)

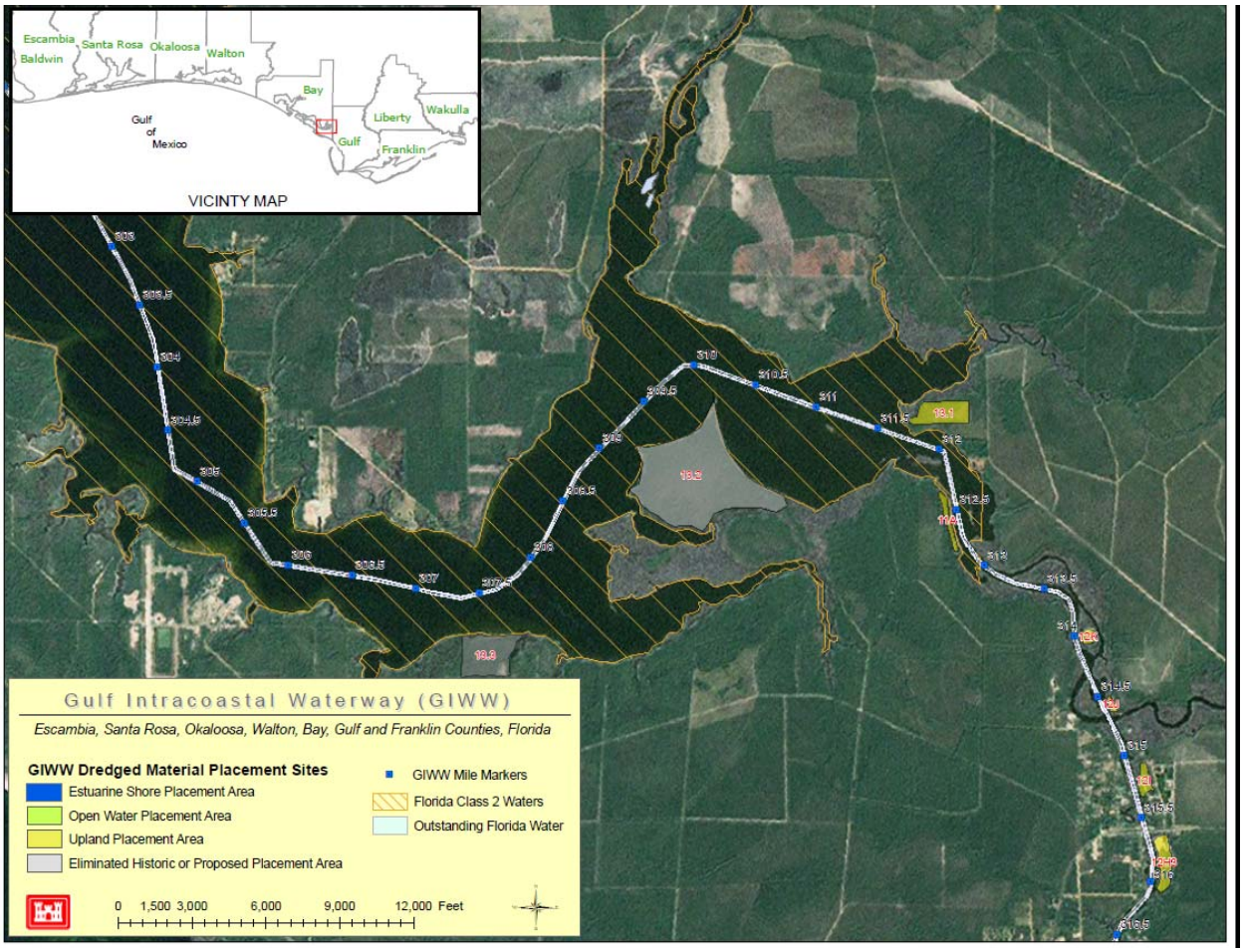

Figure 15. GIWW Project Area (miles 303-316.5)

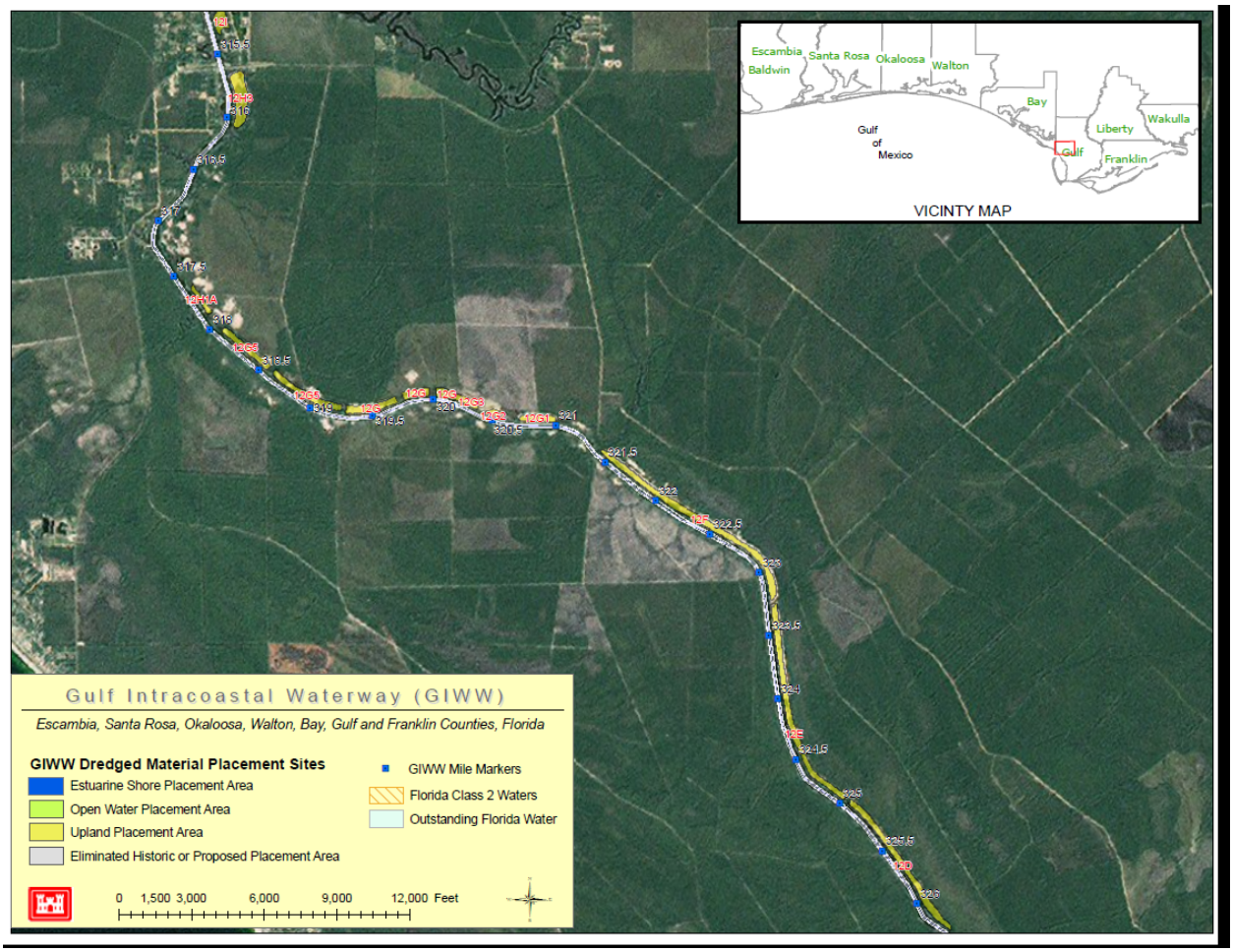

Figure 16. GIWW Project Area (miles 315.5-326)

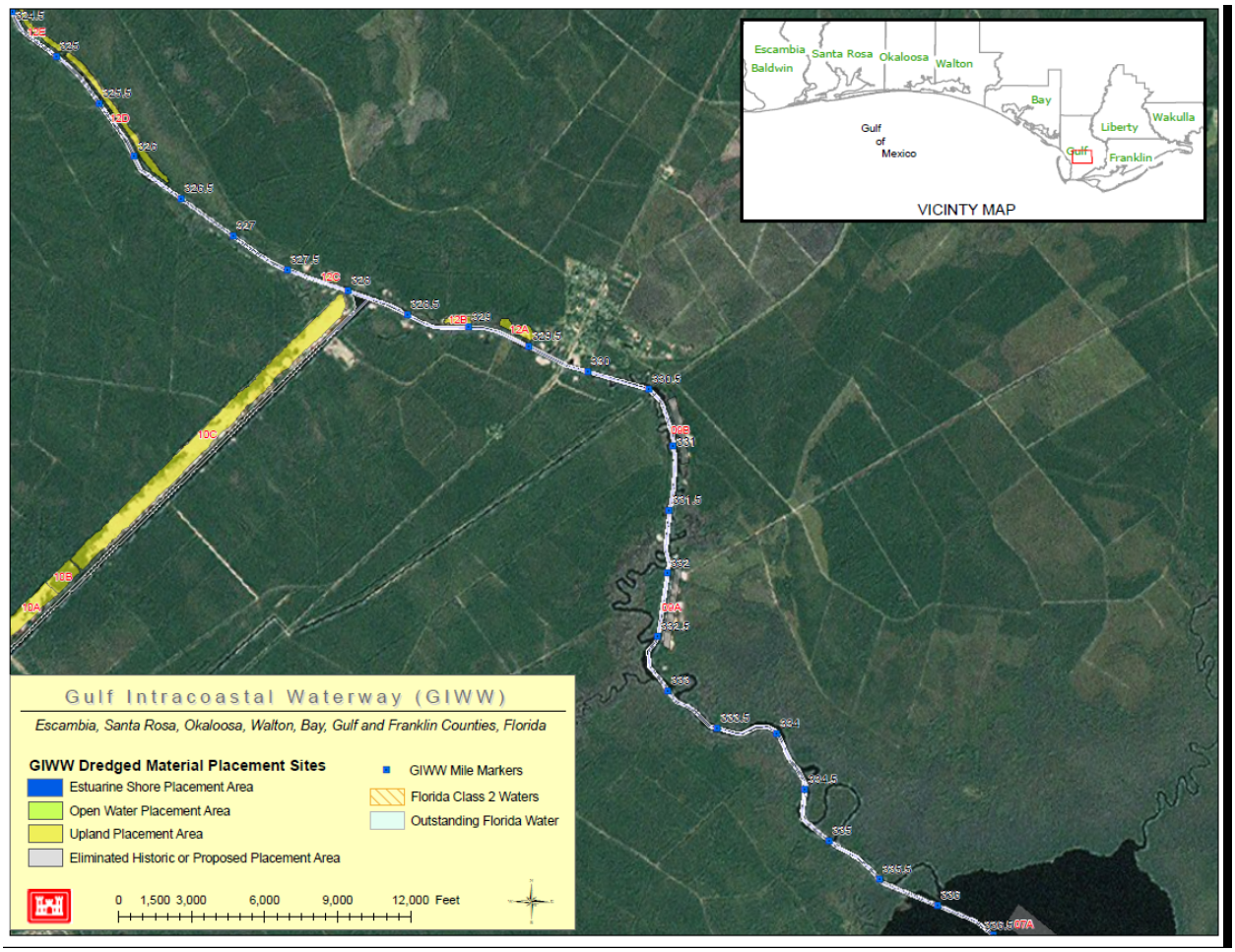

Figure 17. GIWW Project Area (miles 324.5-336.5)

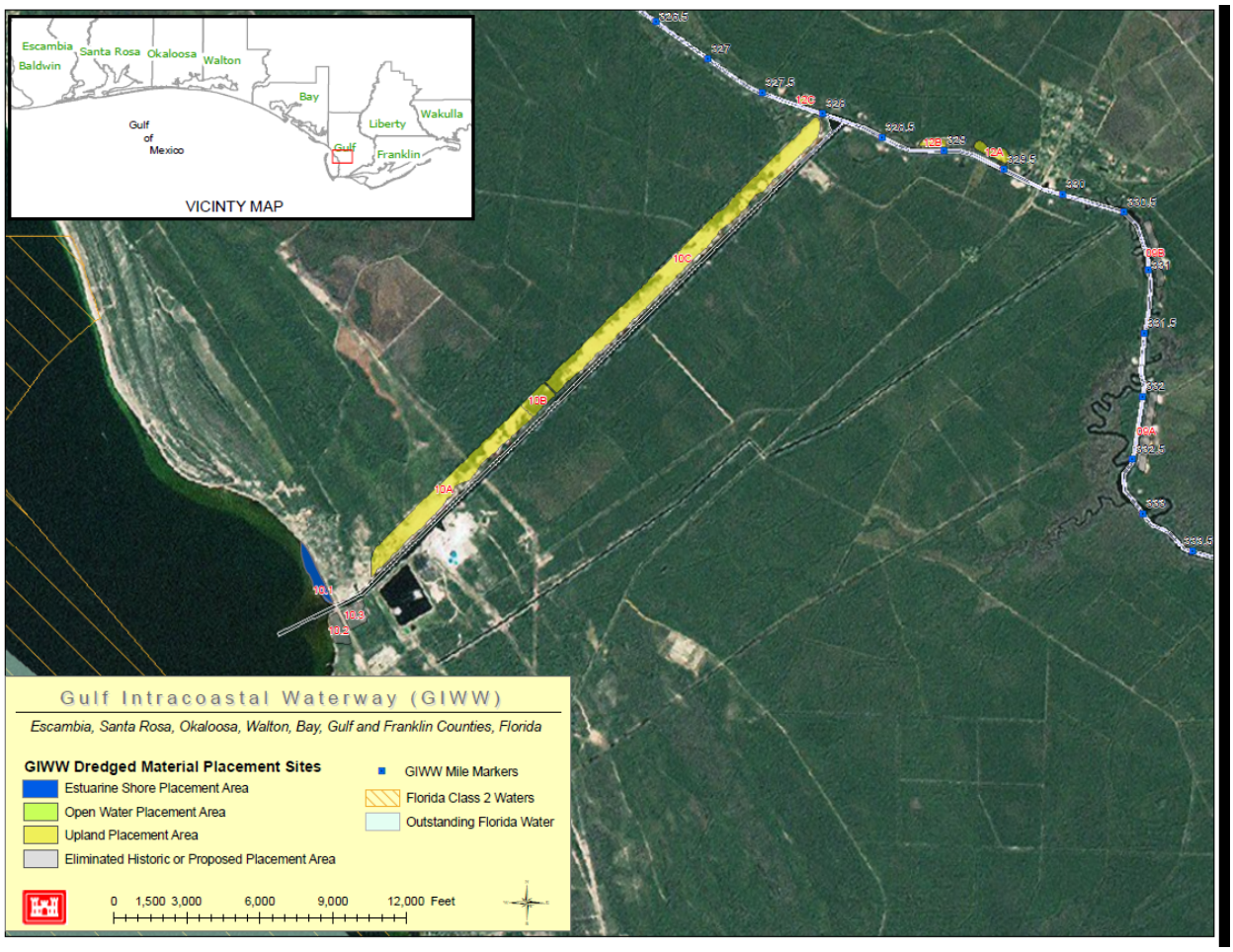

Figure 18. GIWW Project Area (Gulf Co. Canal)

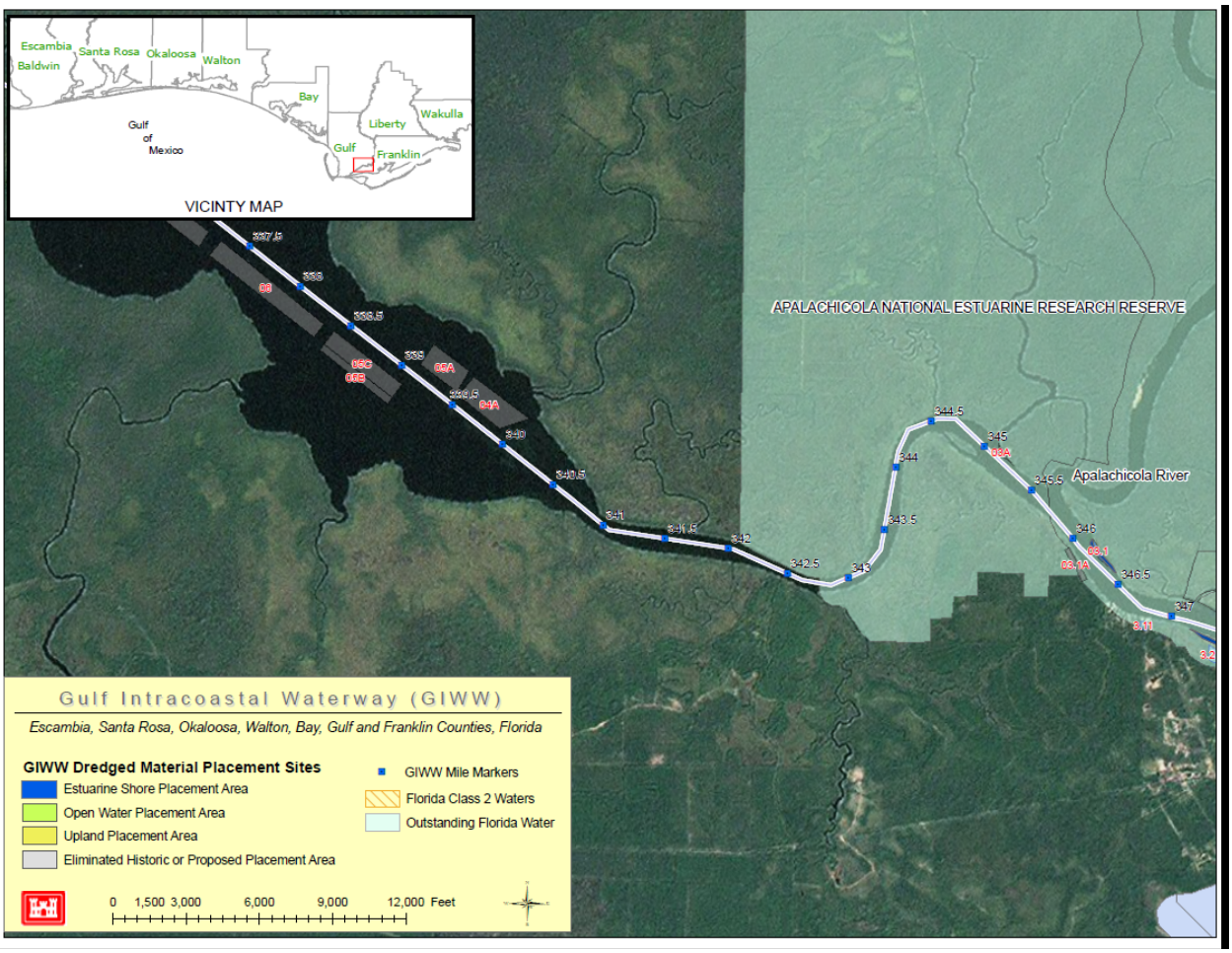

Figure 19. GIWW Project Area (miles 337.5-347)

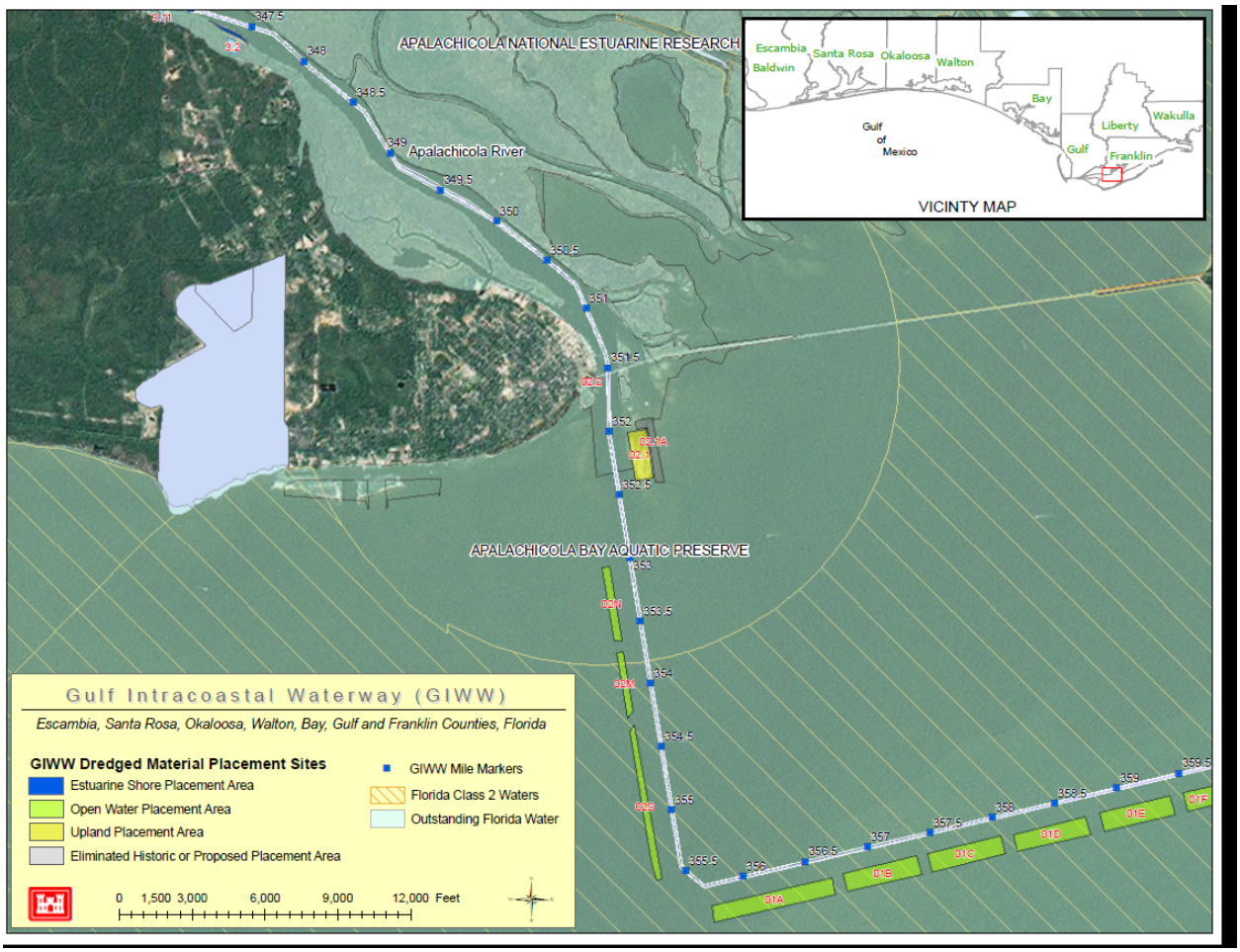

Figure 20. GIWW Project Area (miles 347.5-359.5)

Figure 21. GIWW Project Area (miles 360-368)

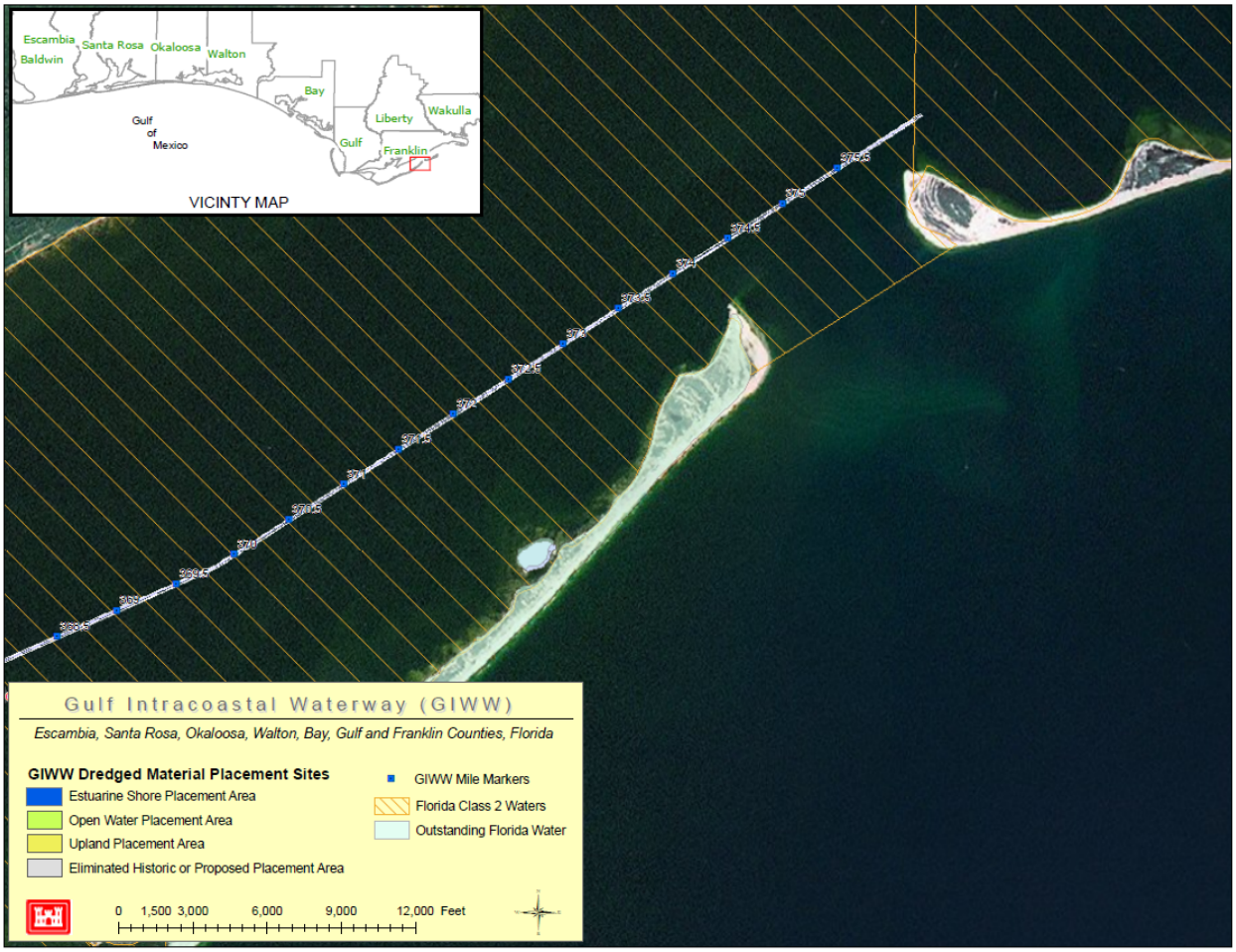

Figure 22. GIWW Project Area (miles 368.5-375.5)

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Field Office
1601 Balboa Avenue
Panama City, FL 32405-3721

Tel. (850) 769-552
Fax (850) 763-2177

October 4, 2007

Mr. Kenneth P. Bradley
Coastal Environment Team
Planning and Environmental Division
Mobile District
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628-0001

Attn: Elizabeth Godsey

Re: Gulf Intracoastal Waterway O&M
FWS Log. No. 2008-I-0027

Dear Mr. Bradley:

We are responding to your letter dated April 19, 2007, regarding continued operations and maintenance (O&M) of the Gulf Intracoastal Waterway (GIWW). Enclosed with your letter was a Biological Assessment (BA), dated March 22, 2007, of the effects of your proposed O&M activities on resources protected under the Endangered Species Act (ESA). You requested concurrence with your determination that the proposed action is not likely to adversely affect listed species or adversely modify designated critical habitats. The project spans the work areas of our Lafayette, LA, Jackson, MS, Daphne, AL, and Panama City, FL field offices, with whom you have also shared the Biological Assessment. The project may also affect ESA-protected resources for which the National Marine Fisheries Service (NMFS) has the primary jurisdiction for consultations with your agency. This letter addresses your concurrence request for the portion of the project in Florida relative to resources for which the U.S. Fish and Wildlife Service (Service) has the primary consultation responsibility. We also provide comments relative to other fish and wildlife resources in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

The BA describes O&M activities planned for the 380 miles of the GIWW within the Mobile District civil works boundaries. Of these, about 216 miles are within Florida. The planned O&M activities include dredging and disposal of dredged material to maintain the authorized 12-ft deep by 125-ft wide channel. In the past 25 years, the Corps has conducted maintenance dredging in about 110 miles or half of the Florida portion. Dredging frequency varies from

almost annually in the Apalachicola Bay portion (miles 350 to 370) to only once in 25 years in the Santa Rosa Sound section (miles 200 to 210). The average frequency is about once every 4 to 5 years.

ESA Comments

The BA reaches the following determinations relative to effects on ESA-protected resources:

Species	Determination (species/CH)
Gulf sturgeon	NLAA/NLAM
Manatee	NLAA/NE
Alabama beach mouse	NE/NE
Choctawhatchee beach mouse	NE/NE
St. Andrew beach mouse	NE/NE
Perdido Key beach mouse	NE/NE
Piping plover	NLAA/NE
Brown pelican	NLAA/NA
Red-cockaded woodpecker	NLAA/NA
Wood stork	NLAA/NA
Bald eagle	NLAA/NA
Eastern indigo snake	NLAA/NA
Flatwoods salamander	NE/NA
Alabama red-bellied turtle	NE/NA

NA = not applicable
NE = no effect
NLAA = not likely to adversely affect
NLAM= not likely to adversely modify

Of these species/critical habitats, all but the Alabama beach mouse, and Alabama red-bellied turtle may occur within the Florida Panhandle.

NMFS has the consultation lead for the Gulf sturgeon relative to the Corps' actions in estuarine waters, and most of the project occurs in, or is connected by land cuts, to estuarine waters. However, the project also includes the tidally influenced downstream-most 6 miles of the Apalachicola River in Florida, which is part of riverine unit 6 of Gulf sturgeon designated critical habitat. Dredging occurs in this section of the project about once every 3 years (Table 2 of the BA), generally in the winter months (December to March) (6-08-2007 email from Elizabeth Godsey, Corps, Mobile, AL).

NMFS defers to our office for an evaluation of riverine effects for Gulf sturgeon on this project (6-07-2007 email from Kelly Shotts, NMFS, St. Petersburg, FL). We concur with the NLAA/NLAM determinations relative to the sturgeon and critical habitat unit 6 for this portion of the project ***provided*** that maintenance activities do not occur during the peak migratory periods of March/April or October/November. Although the likelihood of take resulting from hydraulic cutterhead dredging in the river channel is probably low, it is not insignificant or

discountable at times when fish are most likely present. Conducting maintenance when fish are least likely in the area reduces the likelihood of take to a discountable level. Should the need arise to deviate from the normal practice of maintaining this portion of the project in the December to March time frame, the Service requests that the Corps reinitiate consultation.

The Corps proposes to observe the standard manatee protection conditions; therefore, we concur with NLAA for the manatee. The brown pelican in Florida is not protected under the ESA. We concur with all of the other NLAA determinations relative to species and habitats in Florida. Although concurrence on our part is not required, we find no reason to dispute the Corps' "no effect" findings.

Fish and Wildlife Coordination Act Comments

Dredged material disposal in coastal areas can be an opportunity to create bird nesting islands, particularly for terns and skimmers, which will use sand substrates that are away from people and terrestrial predators. The disposal site in Apalachicola Bay near the mouth of the Apalachicola River is a prime example of such habitat. We encourage the Corps to consider possibilities to enhance or create new bird nesting habitat as part of this project, and to contact us if such possibilities arise.

Thank you for coordinating with us on this project. This letter concludes your responsibilities under section 7 of the ESA for the species and habitats in Florida listed above. If project plans change or if new pertinent information about listed species and designated critical habitats becomes available, the Corps should reinitiate this consultation. If you have any questions regarding our comments, please contact Mr. Jerry Ziewitz of my staff at extension 223, or by email at jerry_ziewitz@fws.gov.

Sincerely yours,

Gail A. Carmody
Field Supervisor

cc:
Karla Reese, NMFS, St. Petersburg, FL
Bruce Porter, FWS, Daphne, AL
Jamie Christoff, FDEP (Bureau of Beaches and Coastal Systems), Tallahassee, FL

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5312, FAX (727) 824-5309
http://sero.nmfs.noaa.gov

F/SER31:KR

OCT 23 2007

Mr. Kenneth P. Bradley
Mobile District Corps of Engineers
P.O. Box 2288
Mobile, AL 36628

RE: GIWW Federal Navigation Project

Dear Mr. Bradley:

This responds to your April 19, 2007, letter regarding the Mobile District's continued operation and maintenance of the Gulf Intracoastal Waterway (GIWW) Federal Navigation Project from Rigolets, Louisiana, to Apalachee Bay, Florida. You requested concurrence from the National Marine Fisheries Service (NMFS), pursuant to section 7 of the Endangered Species Act (ESA), with your determinations the project is not likely to adversely affect federally-listed species and is not likely to destroy or adversely modify critical habitat. NMFS requested additional information in a letter dated May 2, 2007, and received a response dated July 11, 2007. NMFS' determinations regarding the effects of the proposed action are based on the description of the action in this informal consultation. You are reminded that any changes to the proposed action may negate the findings of the present consultation and may require reinitiation of consultation with NMFS.

Project activities include the continued operation and maintenance of 380 miles of the GIWW within the Mobile District civil works boundaries in Alabama, Florida, Lousiana, and Mississippi in the dredging reaches shown in table 1. Approximately 7.5 million cubic yards (cy) of clays, silts and poorly graded sand would be removal by hydraulic pipeline dredge on an infrequent basis over the next five years. The material would be placed in previously certified open water, upland and/or estuarine shoreline disposal areas. Maintenance dredging and disposal would be performed on an as needed basis. The frequency of dredging at any one site ranges from once a year to once every 25 years, with average dredging cycles at any given location occurring once every 3 years. The actual time and location of any dredging and disposal event varies considerably due to shoaling rates and may occur at anytime during the year. In emergency conditions, a barge mounted dragline or snagboat may be used to remove rapidly formed or unexpected shoals or other hazards to navigation. This material would be placed to the side of the channel to allow for immediate passage of vessels until a hydraulic pipeline dredge could be dispatched to restore project dimensions. Emergency disposal needs are infrequent and usually the result of storm incidents or barge groundings. Past experiences have shown that only a few

areas are likely to require such emergency action but such actions may be required at any location along the waterway. In the event of an emergency, all necessary Federal and State agencies would be notified before commencement of work.

Table 1: GIWW Dredging Reaches

Reach	GIWW Miles	Dredging Interval (years)	Sediment Description
Mississippi Sound	35-58	25	mud and sandy clay
Dauphin Island to Santa Rosa Sound	119-180	2	silty clays, silt and sand
Santa Rosa Sound	200-210	25	sand
Santa Rosa Sound/Choctawhatchee Bay	215-225	5	sand
Choctawhatchee Bay to West Bay	250-275	2	silts and sand
East Bay to Apalachicola Bay	310-350	3	silts and sand
Gulf Co. Canal		2	sand
Apalachicola Bay	350-370	1	silt and silty clays

In addition to Gulf sturgeon, five listed species of sea turtles (loggerhead, Kemp's ridley, green, leatherback, and hawksbill) may occur adjacent to the project sites. These species will likely temporarily avoid the immediate project vicinity during construction due to noise from vessels and machinery. If sea turtles and sturgeon do enter the project site during dredging activities, they are unlikely to be harmed by the hydraulic or dragline dredge. NMFS has previously determined that non-hopper-type dredging activities are not likely to adversely affect sea turtles and Gulf sturgeon. These species may also be affected by dredging operations if they were to be struck by the dredge as it transits the site or by the pipeline as it is being moved to place sand in disposal areas; however, due to their mobility and benthic habits, the likelihood of this occurring is discountable. Therefore, NMFS believes that the project is not likely to adversely affect any listed sea turtles or sturgeon.

Portions of the proposed project are located in Gulf sturgeon critical habitat units 8, 9, 10, 12, and 13 under NMFS' jurisdiction. These units contain four primary constituent elements (PCEs) that may be affected by the proposed disposal of dredged: water quality, migratory pathways, sediment quality, and abundant prey items. Potential impacts on those PCEs are analyzed below.

Impacts on water quality:
Impacts from sediment disturbance as a result of disposal are expected to be temporary and minimal, with suspended particles settling out within a short time frame without measurable effects on water quality (or on listed species directly). No changes in temperature, salinity, pH, hardness, oxygen content, and other chemical characteristics are expected. NMFS expects effects to Gulf sturgeon critical habitat as a result of water quality impacts related to this project will be insignificant.

Migratory Pathway:
Maintenance dredging is dependent on shoaling within the channel; therefore, dredging may occur during periods of Gulf sturgeon migration and winter activities. However, neither the

disposal of dredged materials, nor the operation of the dredging equipment is expected to create barriers to the migration of the species. The GIWW contains areas designated as critical habitat within the Apalachicola Bay, Choctawhatchee Bay, Pensacola Bay, Mississippi Sound, Santa Rosa Sound, and the lower Apalachicola River. All of these systems are large open water bodies with the exception of the Santa Rosa Sound and lower Apalachicola River.

The Apalachicola River landcut portion of the GIWW is located within the lower 5.5 miles of the river. This section of river ranges from 800 to 1,000 feet in width. The dredging width of the channel in this vicinity is 125 feet wide. Depths along the river's edges range from about 5-25 feet. Deeper areas to the north of the channel in this location range from 12 feet to greater than 20 feet. This deeper area forms a natural passage around the channel and estuarine shoreline disposal areas 3.1 and 3.2b. Although somewhat more restricted, the bottom depths surrounding the dredging and disposal areas inside the lower Apalachicola River landcut provide sufficient width and appropriate habitat depth for sturgeon passage and foraging.

Santa Rosa Sound ranges from 1,050 to 11,500 feet in width. The dredging width of the channel in this vicinity is 125 feet wide. Natural depths are fairly uniform throughout the Sound, averaging around 8 feet. Although somewhat more restricted, the bottom depths surrounding the dredging area within the Sound provide sufficient width and appropriate habitat depth for sturgeon passage and foraging around the dredging activities.

Actual working days along these reaches of the GIWW typically average 14 days. This work may be distributed over a 3 to 4 week period depending on weather and other unexpected dredging delays. Similar dredging operations are intermittently shut down approximately one quarter of the time. This provides ample opportunities for Gulf sturgeon to migrate through an area and provides a sufficient amount of unharassed time for the sturgeon living and foraging in the immediate area. Therefore, NMFS concludes the proposed project will have insignificant effects on the ability of critical habitat units 8, 9, 10, 12, and 13 to provide migratory pathways for Gulf sturgeon.

Impacts on sediment quality:
The proposed action will directly impact the benthos by the placement of dredged material into the littoral zone; however, the composition of dredged material removed from the channel is expected to be the same as that remaining. The sediment quality and texture of the channel dredge material are expected to be identical to that existing in the disposal areas, due to their close proximity to the channel and the fact that these areas have historically received dredged material from the adjacent reaches of the GIWW. Therefore, NMFS concludes the proposed project's effects on the sediment quality of critical habitat units 8, 9, 10, 12, and 13 will be insignificant.

Impacts on Gulf sturgeon prey abundance:
Units 8, 9, 12 and 13 provide foraging habitat for the Gulf sturgeon. Dredging will impact epibenthic crustaceans and infaunal polychaetes within the navigation channel and disposal areas. These impacts are primarily short-term in nature, consisting of a temporary loss of benthic invertebrate populations in the project footprint of the channel and openwater disposal areas. The area comprises less than 0.5 percent total of estuarine area within Units 8, 9, 10, 12, and 13

(7.3, 0.01, 0.19, 0.08, and 0.34 percent in each unit, respectively). Dredging and disposal along the entire channel length would not occur within the same dredging cycle (year); therefore, sufficient time for an area to recover is expected. Recovery of the existing macrobenthic assemblages is expected to be rapid as sediment composition pre- and post-construction at the disposal site will be similar, and littoral zone benthic assemblages are known to recover relatively quickly from physical disturbance. Disposal in the estuarine shoreline placement and bird island disposal areas would result in the conversion of nearshore shallow areas to emergent shoreline in areas filled above mean high water. These areas comprise less than 0.03% of the estuarine area in Unit 13. The conversion of sub-tidal habitat to emergent shoreline at the estuarine shoreline disposal areas is expected to reverse over time as currents continue to erode the material along the edges of the disposal areas and is expected to be a temporary (1-5 years) alteration. Therefore, NMFS concludes the proposed project's effects on the Gulf sturgeon prey abundance of critical habitat units 8, 9, 10, 12, and 13 will be insignificant.

This concludes your consultation responsibilities under section 7 of the ESA for species under NMFS' purview. A new consultation must be initiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. We appreciate your continued cooperation in the conservation of listed species and look forward to working with you and your staff in the future. PCTS or consultation related questions or comments should be directed to the attention of Karla Reece at (727) 824-5312 or by e-mail (karla.reece@noaa.gov).

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

File: 1514-22.F.1.FL
1514-22.F.1 Mobile District
Ref: I/SER/2007/04730