DRAFT
ENVIRONMENTAL ASSESSMENT

Operation and Maintenance of the
Gulf Intracoastal Waterway Federal Navigation Project
Mobile and Baldwin Counties, Alabama

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ACRONYMS AND ABBREVIATIONS

ADEM	Alabama Department of Environmental Management
BA	Biological Assessment
BO	Biological Opinion
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers
EA	Environmental Assessment
EFH	Essential Fish Habitat
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FONSI	Findings of No Significant Impact
GMFMC	Gulf of Mexico Fishery Management Council
GIWW	Gulf Intracoastal Waterway
NAAQS	National Ambient Air Quality Standards
MDEQ	Mississippi Department of Environmental Quality
Mg/l	Milligrams per liter
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NLAM	Not Likely to Adversely Modify
MLLW	Mean Lower Low Water
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Register	National Register of Historic Places
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Officer
TSS	Total suspended solids
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1 Location. The Gulf Intracoastal Waterway (GIWW) within Alabama extends from the Alabama-Florida state line through Perdido Bay, Mobile Bay and portions of the Mississippi Sound, to the Alabama-Mississippi state line (Figure 1).

1.2 Description of the Entire Authorized Project. The GIWW is a Federal shallow-draft navigation project that extends approximately 1,115 miles along the Gulf of Mexico coast from northern Florida to the southern tip of Texas. The waterway connects southern ports with the midwest, the east, and the Great Lakes region. The U.S. Army Corps of Engineers (Corps), Mobile District has jurisdiction over that portion of the GIWW from Rigolets, Louisiana to Apalachee Bay, Florida, a total of approximately 380 miles (Figure 1). The existing project, under auspices of the Corps, Mobile District, provides for a waterway 12 feet deep, 125 feet wide at Mean Lower Low Water (MLLW) from Apalachee Bay, Florida to Mobile Bay, Alabama and a channel 12 feet deep, 150 feet wide from Mobile Bay, Alabama to the Rigolets, Louisiana (Lake Borgne Light No. 29).

1.3 Description of the Proposed Action. The proposed action would involve maintenance dredging and disposal operations for the GIWW in the State of Alabama. Approximately 300,000 cubic yards of clay, silt and sand are proposed for removal by hydraulic cutterhead dredge along various sections of the channel on an infrequent basis over the next five years. The material would be placed in previously certified open water and confined upland disposal sites: 64, 63, 62, 61, 60, 59, 58, 56, 54, 52, and 49 (Figures 2-9).

Maintenance dredging and disposal would be performed on an as needed basis. The frequency of channel dredging at any one site and the associated time between uses of any given disposal area range on an average from once every 3 to 25 years.

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 cutterhead 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 would likely 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.

1.4 Purpose and Need for the Proposed Action. The purpose and need for the proposed action is to provide 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. Table 1 below shows the waterborne commerce for various reaches of this statement portion of the GIWW from 1999 to 2004.

Table 1: Waterborne Commerce
Gulf Intracoastal Waterway Pensacola, FL to New Orleans, LA
Traffic (thousand short tons)

Year	Pensacola Bay, FL to Mobile Bay, AL	Mobile Bay, AL to New Orleans, LA
1999	7,975	21,856
2000	8,230	22,454
2001	8,082	20,841
2002	7,474	20,527
2003	8,511	20,875
2004	8,289	21,808
TOTAL	48,561	128,361
5 Year Average	8,094	21,394

Source: Waterborne Commerce of the United States: 1999-2004

Without the proposed action, the vessels utilizing the GIWW would 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 with the rest of the United States.

1.5 Authority. The existing project was authorized by the 1966 Rivers and Harbors Act (House Document 481, 89th Congress, 2nd Session) as amended and prior acts.

1.6 Environmental History & Scope. Pursuant to the National Environmental Policy Act (NEPA), this environmental assessment (EA) was prepared to update the resource description and to evaluate the potential impacts associated with the continued operation and maintenance of the GIWW Federal Navigation Project within the State of Alabama. Related environmental documents include the following:

Corps, 2007. Federally Authorized GIWW Project – Operation and Maintenance Louisiana, Mississippi, Alabama and Florida Biological Assessment (BA).

Corps, 2005. Environmental Assessment for Relocation of Disposal Area 52 for the GIWW Gulf Shores, Baldwin County, Alabama. December 2005. Finding of No Significant Impact (FONSI) signed February 13, 2006.

Corps, 1994. Statement of Findings for Proposed Maintenance Dredging and Placement Activities GIWW Navigation Project Alabama Portion Mobile and Baldwin Counties, Alabama.

Corps, 1983. Environmental Assessment for Modifications to the Maintenance Plan as Presented in the Final Environmental Statement Maintenance Dredging of the GIWW from Pearl River, Louisiana-Mississippi to Apalachee Bay,

Florida December 1983. FONSI signed February 7, 1984.

Corps, 1976. Environmental Statement for Maintenance Dredging of the GIWW from Pearl River, Louisiana-Mississippi to Apalachee Bay, Florida. Statement of Findings signed December 1, 1976.

These documents are hereby incorporated by reference.

2.0 ALTERNATIVES. 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 nonnavigable 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 with the rest of the United States. Millions of tons of commodities, a large percentage of which are petroleum products or their derivatives, annually would likely have to be shipped via other means at a higher cost. 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 not considered further.

The proposed project is the continued operation and maintenance of the GIWW within the State of Alabama. No modifications are being proposed. Alternatives to the proposed action were evaluated in existing environmental documents. As previous operation and maintenance activities of the project have proven to be effective, evaluation of additional alternatives was not deemed warranted at this time.

3.0 AFFECTED ENVIRONMENT

3.1 Fish and Wildlife Resources

*Oyster Reefs***.** Oyster reefs of commercial importance are subtidal and form aggregates that cover thousands of acres (1896 hectares of mapped oyster reef) of bay bottom throughout coastal Alabama. The primary oyster reefs of Alabama are located in the southwestern portion of Mobile Bay (Cedar Point, Sand Reef Buoy, Dauphin Island Bay, Kings Bayou, and Peavy Island Reef). Oyster reefs are also located to the east in Bon Secour Bay and to the west in Portersville Bay. There are additional small, scattered patches of oysters especially along the western shore of Mobile Bay in addition to the riparian beds located in Heron Bay and the Mississippi Sound (May 1971; Tatum *et al*. 1996).

Submerged Aquatic Vegetation. The Mobile Bay National Estuary Program funded a survey of submerged aquatic vegetation (SAV) in coastal Alabama in summer and fall 2002. This work included groundtruthed photointerpreted aerial imagery of SAVs (Vittor and Associates, 2003).

In the marine areas the 2002 SAV survey found shoal grass *Halodule wrightii* comprised most of the acreage, particularly in Mississippi Sound (819.4 acres) and southern Perdido Bay (299.6 acres, including Florida waters). In addition, relatively small patches of SAV occurred along the northern shoreline of the western end of Dauphin Island, and in Baldwin County in Little Lagoon, Bay la Launch, Arnica Bay, and Palmetto Creek.

Wetlands. Tidal marshes are located along the bay shorelines and the shoreline of the Mississippi Sound. These marshes are typically bordered along the waters edge by a strip of salt marsh grass, *Spartina alterniflora*, with scattered stands of *S. cynosuroides, S. patens, Distichilis spicata,* and *Phragmites communis*. The majority of the marsh inside of this strip is composed of *Juncus roemerianus* (Swingle, 1971). Within the vicinity of the project there are also a few isolated wetlands, some being densely vegetated with slash pine *Pinus elliotti*, a thick understory of titi *Cyrilla racemiflora*, and other shrubs.

Sediments. The sediments along the GIWW consist of sand to clays with various mixtures of sand, silt, and clay located throughout the channel. Sediments are primarily composed of sands in the lower Perdido Bay reach; a mix of estuarine silty clay and clay in Mobile Bay; and clays in the Mississippi Sound.

3.2 Terrestrial Wildlife. Animals inhabiting the terrestrial region in the vicinity of the project include reptiles, deer, small mammals (muskrat, mice, raccoon, bobcat, and fox) and birds (Gulls, terns, sandpipers, plovers, stilts, skimmers and oystercatchers herons, egrets and ibises).

3.3 Benthos, Motile Invertebrates, and Fishes. The benthic community in the Mississippi Sound and lower Mobile Bay was classified by Vittor and Associates in a study of the Mississippi Sound and selected sites in the Gulf of Mexico (Vittor, 1982). A total of 437 taxa were collected at densities ranging from 1,097 to 35,537 individuals per square meter. Generally, densities increase from fall through the spring months since most of the dominant species exhibit a late winter to early spring peak in production. These species, though sometimes low to moderate in abundance, occur in a wide range of environmental conditions. They are usually the most successful at early colonization and thus tend to strongly dominate the sediment subsequent to disturbances such as dredging activities. These species include polychaetes *Mediomastus spp*., *Paraprionospio pinnata*, *Myriochele oculata*, polychaete worm *Owenia fusiformi, Lumbrineris app.,Sigambra tentaculata*, the *Linopherus-Paraphinome* complex, and *Magelona cf. phyllisa*e. The *phoronid, Phoronis ap*. and the *cumacean Oxyurostylis* also fit this category. *M. oculata* and *O. fusiformis* are predominate species in the Mississippi Sound. The numerically dominant species collected during the study were polychaete worm *M. californiensis* and *P. pinnata*.

Seasonal patterns in benthic macroinfaunal abundance, distribution, and taxa composition were evaluated in 1999 at 19 sites in Perdido Bay in a study of the *Relative Influence of Hypoxia, Anoxia, and Associated Environmental Factors as Determinants of Macrobenthic Community Structure in a Northern Gulf of Mexico Estuary.* A total of 46 taxa from five phyla were collected. Polychaetes were numerically dominant followed by crustaceans. Seventeen taxa co-occurred in samples during all three study periods. Highest densities occurred in April throughout the bay, reflecting a fall-spring recruitment. Mean taxa richness per core ranged from

0.0 to 5.0, 1.2 to 4.6, and 0.0 to 4.4 in December, April and October, respectively. Mean densities ranged from zero to 368, 0 to 960, and 0 to 430 individuals per 0.1 square meter in December, April, and October.

A number of studies evaluating the fish and invertebrates of Alabama estuaries have been conducted (Swingle, 1971 and Swingle and Bland, 1974). These studies looked at species abundance and diversity in coastal waters. The nearshore and marsh species are comprised largely of fish in the families *Poeciliidae*, *Cyprinodontidae*, and *Atherinidae* which serve as the prey for the Southern flounder *Paralichthys lethostigma* and seatrout *Cynoscion spp.* both important sport and commercial species. Common migratory fish in the study area are Atlantic croaker *Micropogonias undulatus*, spot *Leiostomus xanthurus*, and sand seatrout *Cynoscion arenarius*. Important forage fish within the area are the pelagic species; Bay anchovy *Anchoa mitchilli*, striped anchovy *Anchoa hepsetus*, and Gulf menhaden *Brevoortia patronus*. The most commercially important shellfish found in the area include the brown and white shrimp, blue crab, and American oyster.

3.4 Essential Fish Habitat. Congress defines Essential Fish Habitat (EFH) 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 Gulf of Mexico Fishery Management Council (GMFMC) and National Marine Fisheries Service (NMFS) have identified EFHs for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine areas, such as estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates. In addition, marine areas, such as the water column, vegetated and non-vegetated bottoms, artificial and coral reefs, geologic features and continental shelf features have also been identified. The habitat within the vicinity of the project consists of estuarine waters; shell, sand, silt and clay substrates; estuarine emergent wetlands; seagrass beds; oyster reefs and artificial fishing reefs. Within the project area EFH has been designated for managed species of red drum, reef fish, coastal migratory pelagics, shrimp, stone crab, and highly migratory species.

The following describes the preferred habitat, life history stages, and relative abundance of each EFH managed species likely to occur within the project area based on information provided by GMFMC (1998, 2004 and 2005) and Fishbase (2007).

Red Drum: Red drum occupy a variety of habitats, ranging from depths of 130 feet offshore to very shallow estuarine waters. Spawning occurs in the Gulf near the mouths of bays and inlets in the fall and winter months. Eggs hatch mainly in the Gulf, and larvae are transported into the estuary where they mature before moving back to the Gulf to spawn. Adult red drum use estuaries but tend to spend most of their time offshore as they age. They are found over a variety of substrates, including sand, mud, and oyster reefs, and can tolerate a wide range of salinities (GMFMC, 1998). Juvenile red drum are most abundant around marshes, preferring quiet, shallow, protected waters with muddy or grassy bottoms (Simmons and Breuer, 1962). Sub-adult and adult red drum prefer shallow bay bottoms and oyster reef substrates (Miles, 1950). Within coastal Alabama, adult and juvenile red drums are common year-round.

Estuaries are also important to the prey species of red drum. This is essential to larvae, juvenile, and early adult red drum since they spend all of their time in the estuary. Larval red drum feed

mainly on shrimp, mysids, and amphipods, while juveniles feed on more fish and crabs (Peters and McMichael, 1988). Adult red drum feed mainly on shrimp, blue crab, striped mullet, and pinfish.

Brown Shrimp: Brown shrimp eggs are demersal and occur offshore. The larvae occur offshore and begin to migrate to estuaries as postlarvae. Postlarvae migrate through passes on flood tides at night mainly from February to April with a minor peak in the fall. In estuaries, brown shrimp postlarvae and juveniles are associated with shallow vegetated habitats but also are found over silty sand and non-vegetated mud bottoms. The density of late postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water and oyster reefs; in unvegetated areas, muddy substrates seem to be preferred. Juveniles and sub-adults of brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Sub-adults migrate from estuaries at night on ebb tide of the new and full moons. Adult brown shrimp occur in neritic Gulf waters (i.e., marine waters extending from mean low tide to the edge of the continental shelf) and are associated with silt, muddy sand, and sandy substrates (GMFMC, 1998). Brown shrimp are common to highly abundant throughout coastal Alabama year-round.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton, epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae in addition to algae and detritus (Pattillo et al., 1997).

White Shrimp: White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. Their eggs are demersal and larval stages planktonic, both occurring in nearshore marine waters. Postlarvae migrate through passes mainly from May to November with peaks in June and September. Migration is in the upper 7 feet of the water column at night and at middepths during the day. Postlarval white shrimp become benthic once they reach the estuary, where they seek shallow water with muddy-sand bottoms high in organic detritus or rich marsh where they develop into juveniles. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edges and SAVs, followed by marsh ponds and channels, inner marsh, and oyster reefs. White shrimp juveniles prefer salinities of less than 10 parts per thousand and can be found in tidal rivers and tributaries. As juveniles mature, they move to coastal areas where they mature and spawn. Adult white shrimp move from estuaries to coastal areas, where they are demersal and inhabit soft mud or silt bottoms (GMFMC, 1998). White shrimp are common to abundant throughout coastal Alabama year-round.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton, epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae but also on algae and detritus (Pattillo et al., 1997).

Gray snapper: Gray snapper are demersal mid-water dwellers inhabiting marine, estuarine, and riverine habitats. Gray snapper prefer SAV beds, mangroves, and coral reefs over rocky, sandy and muddy bottoms. Spawning occurs offshore from June to August around artificial structures and shoals. Eggs are pelagic and larvae are planktonic, both occurring in offshore shelf waters

and near coral reefs. Postlarvae migrate into the estuaries and are most abundant over shoalgrass and manatee grass beds. Juveniles seem to prefer turtlegrass beds, SAV meadows, marl bottoms, and mangrove roots within estuaries, bayous, channels, SAV beds, marshes, mangrove swamps, ponds and freshwater creeks (GMFMC, 1998). Juvenile gray snapper are common in coastal Alabama August to January.

This species is classified as an opportunistic carnivore at all life stages (Pattillo et al., 1997). In the estuary, juvenile gray snapper feed on shrimp, larval fish, amphipods, and copepods. At offshore reefs, adults feed primarily on fish and secondarily on crustaceans; larger gray snapper will eat proportionately more fish (GMFMC, 1998).

Spanish mackerel: Spanish mackerel are pelagic, occurring at depths to 250 feet throughout the coastal zone of the Gulf of Mexico. Adults are usually found along coastal areas, extending out to the edge of the continental shelf; however, they also display seasonal migrations and will inhabit high salinity estuarine areas at times. The occurrence of adults in Gulf estuaries is infrequent and rare. Spawning occurs in offshore waters during May through October. Nursery areas are in estuaries and coastal waters year-round. Larvae are most often found offshore from depths of 30 to 275 feet. Juveniles are found offshore, in the surf area, and sometimes in estuarine habitats. Juveniles prefer marine salinities and are not considered estuarine-dependent. The substrate preference of juveniles is clean sand; the preferences of other life stages are unknown (GMFMC, 1998). Juvenile Spanish Mackerel are common in coastal Alabama February to October.

Estuaries are important habitats for most of the major prey species of Spanish mackerel. They feed throughout the water column on a variety of fishes, especially herrings. Squid, shrimp, and other crustaceans are also eaten. Most of their prey species are estuarine-dependent, spending all or a portion of their lifecycle in estuarine

Sharks species: The Mississippi Sound and adjacent waters have been identified as important nursery areas for nine sharks, primarily Atlantic sharpnose, blacktip, finetooth, and bull sharks. Less prevalent species are the spinner, blacknose, sandbar, bonnethead, and scalloped hammerhead.

Typically sharks migrate inshore in the early spring around March and April, remain inshore during the summer months and then migrate offshore during the late fall around October. Most shark species in the Mississippi waters give birth during late spring and early summer, with young sharks spending just a few months of their life's in shallow coastal waters.

Most shark species are abundant around barrier islands, with adult sharks commonly located south of the barrier islands (Carlson *et al*, 2003).

The four most common inshore shark species feed primarily on fish including: menhaden, spot, croaker, speckled, trout, and hardhead catfish. In addition, researchers have found crabs in the stomachs of bonnethead shark and stingrays and smaller sharks in the stomachs of blacktip and bull sharks.

Atlantic Sharpnose shark. Common in bays and estuaries often entering rivers. Also found in offshore waters at depths of about 1,500 feet, generally less than 329 feet. Feeds mainly on small bony fishes, including wrasses, but also marine snails, squid and shrimp.

Blacktip shark. An inshore and offshore shark found on or adjacent to continental and insular shelves. Often off river mouths and estuaries, muddy bays, mangrove swamps, lagoons, and coral reef drop-offs. Bottom associated or pelagic. Young are common along beaches. Blacktip sharks have been captured in high turbidity areas and over bottom types dominated by mud/silt/clay (Carlson et.al, 2003). Active hunter in midwater. Feeds mainly on pelagic and benthic fishes, also small sharks and rays, cephalopods and crustaceans.

Finetooth shark. Commonly found close inshore. Finetooth sharks have been captured in high turbidity areas and over bottom types dominated by mud/silt/clay (Carlson *et al*., 2003). Forms large schools. Feeds on small bony fishes and cephalopods.

Bull shark. Bull sharks are coastal and freshwater sharks inhabiting shallow waters especially in bays, estuaries, rivers, and lakes. Readily penetrates far up rivers and hypersaline bays. Capable of covering great distances (up to 180 kilometers in 24 hours), moving between fresh and brackish water at random. Adults are often found near estuaries and freshwater inflows to the sea. Young enter rivers and may be found hundreds of kilometers from the sea. Bull sharks feed on bony fishes, other sharks, rays, mantis shrimps, crabs, squid, sea snails, sea urchins, mammalian carrion, sea turtles, and occasionally garbage.

3.5 Threatened and Endangered Species. Table 1 below contains a list of federally listed candidate (C), threatened (T) or endangered (E) species that may potentially occur within the vicinity of the project.

Table 2: Threatened and Endangered Species

Common Name	Scientific Name	Status
Fish		
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	**TCH**
Mammals		
West Indian Manatee	*Trichechus manatus*	**E**
Birds		
Piping Plover	*Charadrius melodus*	**TCH**
Red-Cockaded Woodpecker	*Picoides borealis*	**E**
Wood Stork	*Mycteria americana*	**E**
Bald Eagle	*Haliaeetus leucocephalus*	**T**
Amphibians & Reptiles		
Eastern Indigo Snake	*Drymarchon corais couperi*	**T**
Flatwoods Salamander	*Ambystoma cingulatum*	**T**
Alabama Red-Bellied Turtle	*Pseudemys alabamensis*	**E**
Gopher Tortoise	*Gopherus polyphemus*	**T**
Loggerhead Sea Turtle	*Caretta caretta*	**T**
Green Sea Turtle	*Chelonia mydas*	**E**
Leatherback Sea Turtle	*Dermochelys coriacea*	**E**
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	**E**
Hawksbill Sea Turtle	*Eretmochelys imbricata*	**E**

T - Threatened **E** - Endangered **C** - Candidate **CH** - Critical habitat

Detailed species accounts and status are contained in the Corps, Mobile District's Federally Authorized GIWW Navigation Project – Operation and Maintenance Louisiana, Mississippi, Alabama and Florida BA dated March 22, 2007.

3.6 Water Quality. The surface water within the limits of the project is generally classified as brackish water that receives saltwater from the Gulf of Mexico and freshwater inflows from area rivers. The Alabama Department of Environmental Management (ADEM) has classified the coastal water in the project area as suitable for recreation, propagation of fish and wildlife and shellfish harvesting. Water quality within the project area is influenced mainly by non-point source pollution. According to the 2006 Section 303(d) list prepared by the ADEM, the main causes of water quality degradation within the area are pathogens, introduced into the system by urban runoff and storm sewers.

3.7 Hazardous Material. No known hazardous materials are present within the project area or immediate vicinity.

3.8 Air Quality. Existing air quality in coastal Mobile and Baldwin counties was assessed in terms of types of sources contributing to emissions that are regulated by National Ambient Air Quality Standards (NAAQS). NAAQS have been developed for oxides of nitrogen, hydrocarbons, particulate matter, carbon monoxide, sulfur dioxide, lead,volatile organic compounds and other hazardous air pollutants. Sources of air pollution in the project area are mainly from 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. Mobile and Baldwin counties are in attainment for all NAAQS (EPA, 2007).

3.9 Aesthetics. The coastal region of Alabama in the vicinity of the project is aesthetically pleasing. The surrounding lands include national, state and county parks, in addition to several urbanized coastal areas.

3.10 Noise. Noise levels in the area are typical of recreational, boating, and fishing activities. Noise levels fluctuate with the highest levels usually occurring during the spring and summer months due to increased recreational activities.

3.11 Cultural Resources. The National Register of Historic Places (Register) has been consulted and no properties listed on, being nominated to or that have been determined eligible for the Register are located in the vicinity of the proposed work. Given the relatively recent maintenance dredging of the project, the potential for submerged cultural resources is low. The GIWW was authorized by Congress and completed more than 50 years ago. The existing channel and disposal areas were constructed and operated prior to the enactment of the National Historic Preservation Act (NHPA), which was signed into law in 1966. In 1979, the Corps, Mobile District, analyzed and considered the effect that continued use and maintenance of the waterway may have on historic properties as per regulations within 36 Code of Federal Regulation (CFR) 800, in order to ensure compliance with NHPA. This analysis was conducted as part of the aforementioned EIS from 1976. No cultural resources were found within the dredged material management areas (upland and openwater) or channel areas. No sites listed on the Register were located within the project area.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.1 Fish and Wildlife Resources.

Oyster Reefs. No significant adverse impacts to oyster reefs from the continued operation and maintenance of the GIWW in Alabama were identified in this evaluation. The closest oyster reefs are located more than 700 feet from any open water placement activities associated with this project with most occurring more than 2,000 feet from discharge (Table 1 and Figures 2-5).

Submerged Aquatic Vegetation. No significant impacts to the SAVs were identified in this evaluation. The closest known SAVs are located over a mile from open water placement activities associated with this project and no SAVs are located within the expected 400-foot turbidity mixing zone of channel dredging.

Wetlands. Emergent wetlands are located adjacent to confined upland dredge material management areas: 49, 56, and 59. Best management practices (BMPs) for erosion and sediment control such as, vegetation cover, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins would be implemented where appropriate to prevent impacts to adjacent wetland areas.

Sediments. The sediment quality and texture of the channel dredge material are expected to be homogenous to that existing in the dredge material management 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.

4.2 Terrestrial Wildlife. As a result of this evaluation, no adverse impacts to the terrestrial wildlife located in the vicinity of project were identified. The proposed work would create disturbance to species utilizing the terrestrial habitats within the project limits. This would mainly involve short-term disturbance from equipment, vehicles and personnel movements for the duration of work. However, these species are mobile and would generally avoid the site during construction.

4.3 Benthos, Motile Invertebrates, and Fishes. There would be temporary disruption of the aquatic community caused by the maintenance dredging and openwater placement. Non-motile benthic fauna within the area would be destroyed by dredging and open water placement operations, but should repopulate upon project completion. Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility.

The materials that will be dredged from the project area are homogenous with those that will remain in the channel and, therefore, no alteration of habitat composition is occurring. If sediment type is not changed as a result of project activities, recolonization can be expected with the similar species retuning to the disturbed areas (Stickney, 1984). The area will remain a shallow-water (defined as depths shallower than 46 feet) neritic zone that can support sub-littoral

benthic biota. Because similar habitat, in terms of both sediment composition and depth, will be present pre- and post-dredging, it is concluded that the benthic biota in the channel will have the ability to recover and re-colonize.

Rates of benthic community recovery observed after dredged material placement ranged 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 (Leathem et al., 1973; McCauley et al., 1976 and 1977; Van Dolah et al. 1979 and 1984; Clarke and MillerWay, 1992), while the more diverse communities of high salinity estuarine sediments may require a year or longer (e.g. Jones, 1986; Ray and Clarke, 1999).

Open water placement activities would utilize thin layer disposal methods (< 12 inches) to minimize impacts by allowing populations of small, shallow-burrowing infauna with characteristically high reproductive rates and wide dispersal capabilities to recover quickly. Deposition of relatively thin layers of dredged material (<10 centimeter, 4 inches) 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 20-30 cm (8-12 in) generally eliminate all but the largest and most vigorous burrowers (Maurer et al., 1978). The sediment quality and texture of the channel dredged material are expected to be homogenous 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. Placement of material similar to the ambient sediments (e.g., sand on sand or mud on mud) has been shown to produce less sever, long-term impacts (Maurer et al. 1978, 1986).

Temporary loss of benthic invertebrate populations would occur within the project footprint of the channel and openwater disposal areas. These areas combined comprise less than 0.2% of estuarine water bottom of the state within the Mississippi Sound, Mobile Bay, and Pensacola Bay systems. It should also be noted that dredging and disposal along the entire channel length in Alabama would not occur within the same dredging cycle (year). Given this and the fact that the average dredging cycle of any one location is 3 years or greater; sufficient time for an area to recover is expected.

Several studies of turbidity from total suspended solids (TSS) associated with dredging operations have concluded that dredging had no substantial effects on nekton (Ritchie, 1970; Stickney, 1972; Wright, 1978); however, other studies have shown that elevated TSS levels and prolonged exposure can suffocate and reduce growth rates of adult and juvenile nekton and reduce viability of eggs (Moore, 1977; Stern and Stickle, 1978). Detrimental effects are generally recognized at TSS concentrations greater than 500 milligrams per liter (mg/L) and for durations of continuous exposure ranging from several hours to a few days. Turbidities exceeding 500 mg/L have been observed around maintenance dredging and placement operations (EH&A, 1978), and such turbidities may affect some aquatic organisms near the active dredges. In a study in Corpus Christi Bay, Schubal et al. (1978) reported TSS values greater than 300 mg/L but only in a relatively small area near the bottom. They also found that TSS from maintenance dredging in Corpus Christi Bay is not greater than that from shrimping and affects the bay for

much shorter time periods. In a study of the Laguna Madre, Sheridan (1999) found elevations in turbidity only over the subtidal placement material fluid mud pile. In this study they found that even 16.5 feet from the edge of the placed material, turbidity was not statistically greater than that 1 kilometer or more away. May (1973) found that TSS was reduced by 92 percent within 100 feet of the discharge point, by 98 percent at 200 feet, and that concentrations above 100 mg/L were seldom found beyond 400 feet from the point of placement. Elevated turbidities during construction and maintenance dredging may affect some aquatic organisms near the dredging activity; however, turbidities in open-water habitats can be expected to return to near ambient conditions within a few hours after dredging ceases or moves out of a given area. Schidler (1984) reports similar TSS levels from dredging and storm events. Overall, motile organisms are mobile enough to avoid highly turbid areas (Hirsch et al., 1978). Under most conditions, fish and other motile organisms are only exposed to localized suspended-sediment plumes for short durations (minutes to hours) (Clarke and Wilber, 2000).

Due to the phased nature of the channel maintenance, the small area (percentage wise) of ecosystem that will be affected at a given point in time and the use of thin layer open water disposal methods, no significant long-term impacts to the benthos, motile invertebrates, and fishes are expected to occur as a result of the proposed action.

4.4 EFH. EFH for adult and juvenile brown and white shrimp; red drum; as well as adult gray snapper, Spanish mackerel and several species of shark occurs within the vicinity of the project. No estuarine emergent wetlands, oyster reefs, or SAVs would be adversely affected by the proposed action. Approximately 1,045 acres of open water, based on open-bay/sound bottom impact, would be affected, however, only a small fraction of this total area would likely be affected during any single routine maintenance dredging event. Initial placement operations would cover benthic organisms with dredged material. However, as detailed in section 4.3 of this assessment no significant long-term impacts to this resource is expected as result of this action.

Increased water column turbidity during dredging would be temporary and localized. The spatial extent of elevated turbidity is expected to be within 400 feet of the operation, with turbidity levels returning to ambient conditions within a few hours after completion of the dredging activities. Due to the phased nature of the channel maintenance and the small area (percentage wise) of ecosystem that would be affected at a given point in time no significant long-term impacts are expected to occur.

Notwithstanding the potential harm to some individual organisms, no significant impacts to managed species of finfish or shellfish populations are anticipated from the maintenance dredging and placement operations. The public notice and the effects determination of the EA will be forwarded to the NMFS for review and comment.

4.5 Threatened and Endangered Species. Through consultation with the NMFS and the United States Fish and Wildlife Service (USFWS) the Corps, Mobile District has determined that the following threatened and endangered species: Gulf sturgeon; West Indian manatee; and the loggerhead, green and Kemp's ridley sea turtles maybe affected by the continued operation and maintenance of the GIWW within the State of Alabama. The Corps, Mobile District assessed the

potential impacts of the proposed action on threatened and endangered species and known designated critical habitat areas within the action area in a BA dated March 22, 2007. Based on this assessment the Corps, Mobile District determined that no federally-protected species or designated critical habitat were likely to be adversely affected as a result of the proposed project. A letter requesting concurrence with the District's Not Likely to Adversely Affect (NLAA) and Not Likely to Adversely Modify (NLAM) determination was sent to the NMFS and USFWS on April 19, 2007. The USFWS concurred, by letter dated August 29, 2007 that the proposed project would NLAA Gulf sturgeon provided that: 1) the intake portion of the dredge is kept within the substrate whenever operating and 2) dredging operations are temporarily stopped if a Gulf sturgeon is observed during dredging. At this time, the USFWS stated they can not concur with a NLAA on the West Indian manatee given recent data indicating the increasing presence of the species within coastal Alabama and the potential strikes from project equipment. The USFWS; however, stated in their August 29, 2007 that provided the Alabama Standard Manatee Construction Conditions are implemented during dredging operations, potential impacts to West Indian Manatee would be minimized (Enclosure 3). NMFS concurred with the Corps, Mobile District's determination on a NLAA threatened and endangered species and NLAM designated critical habitat determination, under their purview by letter dated 23 October 2007.

To reduce the likelihood of take the Corps, Mobile District has agreed to incorporate the following conditions during operations and maintenance dredging of the GIWW with Alabama:

- Dredging will be conducted utilizing hydraulic or mechanical methods reducing the potential for entrainment of Gulf sturgeon and sea turtles associated with hopper dredges.

- During active hydraulic dredging operations the cutterhead will be located within the substrate.

- Thin layer disposal will be utilized when practicable.

- If threatened or endangered species are observed during dredging operations, the operation will be temporarily stopped until the species has left the area.

- Alabama Standard Manatee Construction Conditions will be followed during operations.

4.6 Water Quality. The dredging and disposal operations are expected to create some degree of construction-related turbidity in excess of the natural condition in the proximity of the channel and placement site. 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 GIWW. Suspended particles are expected to settle out within a short time frame (hours), with no long-term measurable effects on water quality. No measurable changes in temperature, salinity, PH, hardness, oxygen content or other chemical characteristics are expected.

The State of Alabama has granted a 400-foot mixing zone for past maintenance dredging operations, which allowed state water quality standards to be exceeded for a limited time during excavation and placement. During construction, turbidity levels would be monitored at the

dredge and the open water placement sites, to ensure compliance with ADEM's Water Quality Certification.

4.7 Hazardous Materials. No hazardous materials are known to exist in the project area. The contractor would be responsible for proper storage and disposal of any hazardous material such as oils and fuels used during the dredging and disposal operation.

4.8 Air Quality. The proposed action would have no significant long-term affect on air quality. Air quality in the immediate vicinity of the construction 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 area. The proposed action would not affect the attainment status of the project area or region.

4.9 Aesthetics. Only temporary degradation to the aesthetic environment would occur as a result of the proposed action. Impacts would primarily occur as a result of the physical presence of heavy equipment. Some minor increases in turbidity maybe noted in the immediate vicinity during dredging operations, but these increases would be minor and short term in nature.

4.10 Noise. Noise impacts from project equipment are expected to increase in the vicinity during maintenance dredging work. These impacts would be short term and restricted to the immediate vicinity of the activity. No long-term increase in noise would occur in or around the project area.

4.11 Cultural Resources. In compliance with the NHPA, coordination with the Alabama State Historic Preservation Officer (SHPO) has been conducted. No cultural resources are known to occur in the confined upland disposal, open-water disposal or channel areas. No sites listed on the Register are located within the project area.

The GIWW was authorized by Congress and completed more than 50 years ago. The existing channel and disposal areas were constructed and operated prior to the enactment of the NHPA, which was signed in to law in 1966. In 1979, the Corps, Mobile District, analyzed and considered the effect that continued use and maintenance of the waterway may have on historic properties as per regulations within 36 Code of Federal Regulation (CFR) 800, in order to ensure compliance with NHPA. This analysis was conducted as part of the aforementioned EIS from 1976. No cultural resources were found within the upland disposal, open-water disposal or channel areas. No sites listed on the Register were located within the project area. As the lead Federal agency the Corps, Mobile District, determined that the continued operation and maintenance activities would have no effect on historic properties.

The present project includes no new action as defined by the NHPA. The Corps, Mobile District has determined that maintenance dredging operations within existing channels and utilizing existing disposal areas has no potential to cause effects to historic properties as per 32CFR 800.3(a)(1). The public notice with this effects determination will be forwarded to the SHPO's for review and comment.

5.0 CUMULATIVE EFFECTS SUMMARY. Cumulative effects 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 nonfederal) or person undertakes such other actions. This section analyzes the proposed modification as well as any connected, cumulative, and similar existing and potential actions occurring in the area and surrounding the site.

The Corps is required by Congress to maintain the federally authorized GIWW to a depth of minus 12 feet to provide for safe navigation by commercial and recreational vessels. The location of a disposal area at or near this site is essential for future dredging events to meet this Congressional mandate. Future development of the surrounding area would likely proceed under the "no action" or the "preferred action" plan as development in the immediate area is not specific to the proposed action but connected with existing local attractions and urbanization of the area. Due to the close proximity of the subject to jurisdictional wetlands and the GIWW, any future development that may occur on or adjacent to this property would likely require Federal involvement. Those future plans could be considered through a separate NEPA process at that time.

6.0 OTHER CONSIDERATIONS

6.1 Coastal Zone Management Act of 1972. The Corps, Mobile District determined that the proposed action is consistent with the Alabama Coastal Management Program to the maximum extent practicable. Coastal Zone Consistency is being requested from ADEM.

6.2 Clean Water Act of 1972. Section 401 water quality certification is being requested from the ADEM. No work would occur until the State has issued water quality certification for the proposed action. All State water quality standards would be met. A draft Section 404(b) evaluation is included in this report as Enclosure 1.

6.3 Rivers and Harbors Act of 1899. The proposed work would not obstruct navigable waters of the United States.

6.4 Marine Mammal Protection Act of 1972, as amended. Incorporation of the safe guards used to protect threatened or endangered species during project implementation will also protect any marine mammals in the area; therefore, the project is in compliance with this Act.

6.5 Fish and Wildlife Coordination Act of 1958, as amended. This project has been coordinated with the FWS, and will be in full compliance with the act.

6.6 E.O. 11988, Protection of Children. The proposed action complies with Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks", and does not represent disproportionally high and adverse environmental health or safety risks to children in the United States. The proposed site is not used disproportionally by children.

6.7 E.O. 11990, Environmental Justice. The proposed action complies with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", and does not represent disproportionally high and adverse human health or

environmental effects on minority populations and low-income populations in the United States. The proposed site is not used disproportionally by these populations.

7.0 COORDINATION. The general public is being notified of the proposed action via public notice. The public notice is being mailed to Federal and state agencies and the interested public for a 30-day review period. All comments on the action will be considered prior to a decision on the action.

8.0 CONCLUSION. The proposed action would have no significant environmental impacts on the existing environment. The implementation of the proposed action would not have a significant adverse impact on the quality of the environment and an environmental impact statement is not required.

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Gulf of Mexico, Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic; Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council, The Commons at Rivergate, 3018 U.S.Highway301 N., Suite 1000, Tampa, Florida 33619.

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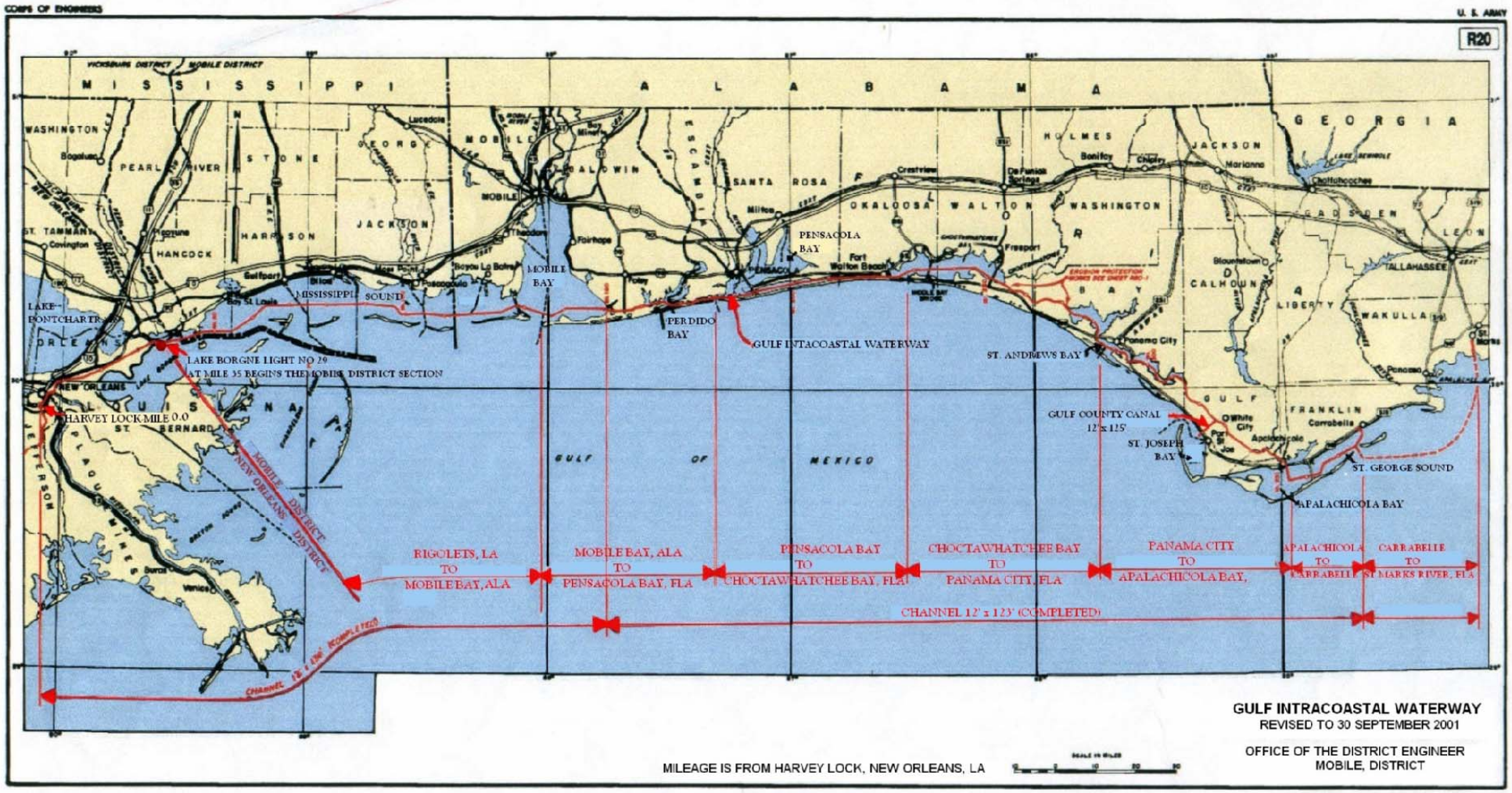

Figure 1: Gulf Inracoastal Waterway (Louisiana, Mississippi, Alabama, and Florida) Vicinity Map

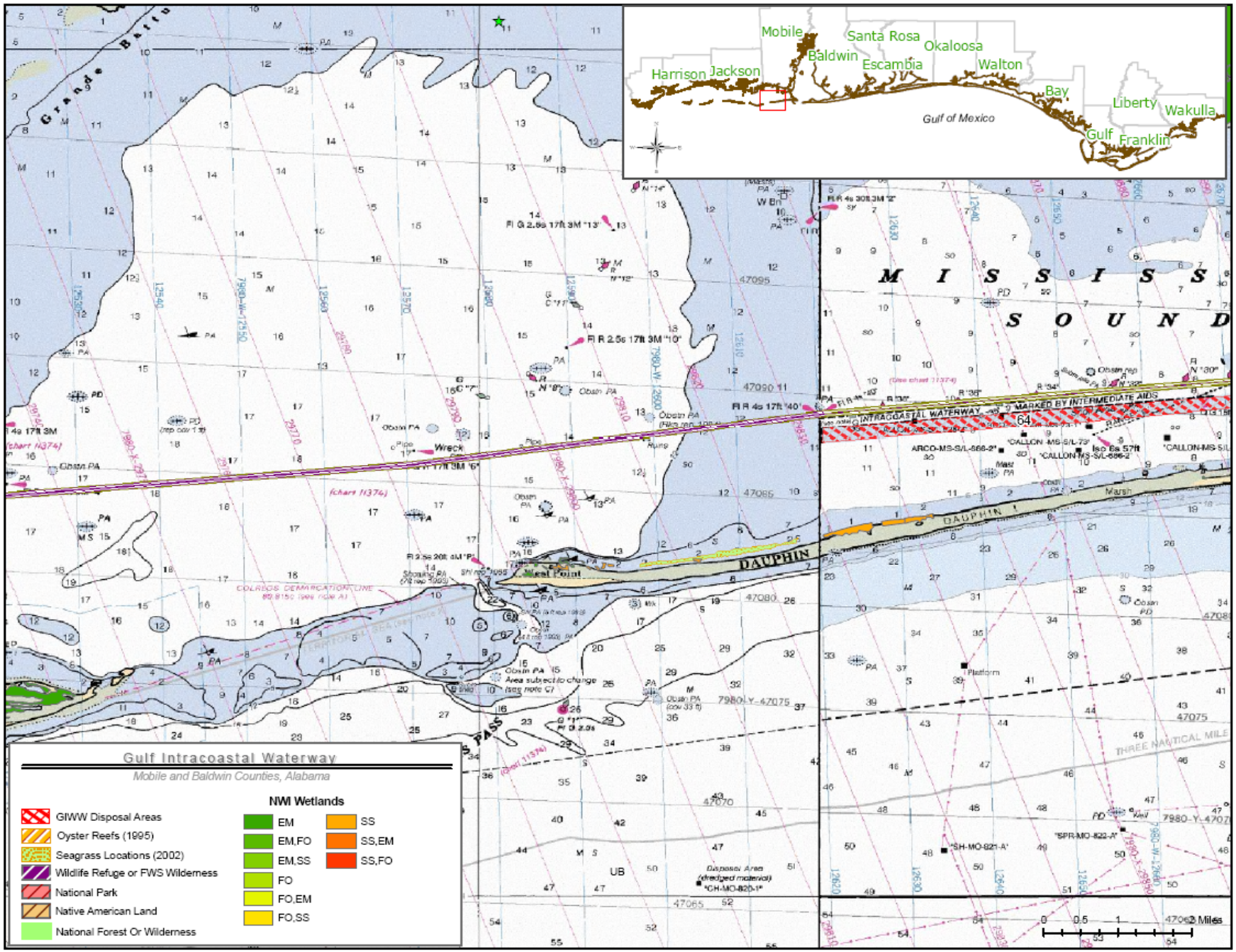

Figure 2: Gulf Intracoastal Waterway, Alabama Information Map 1

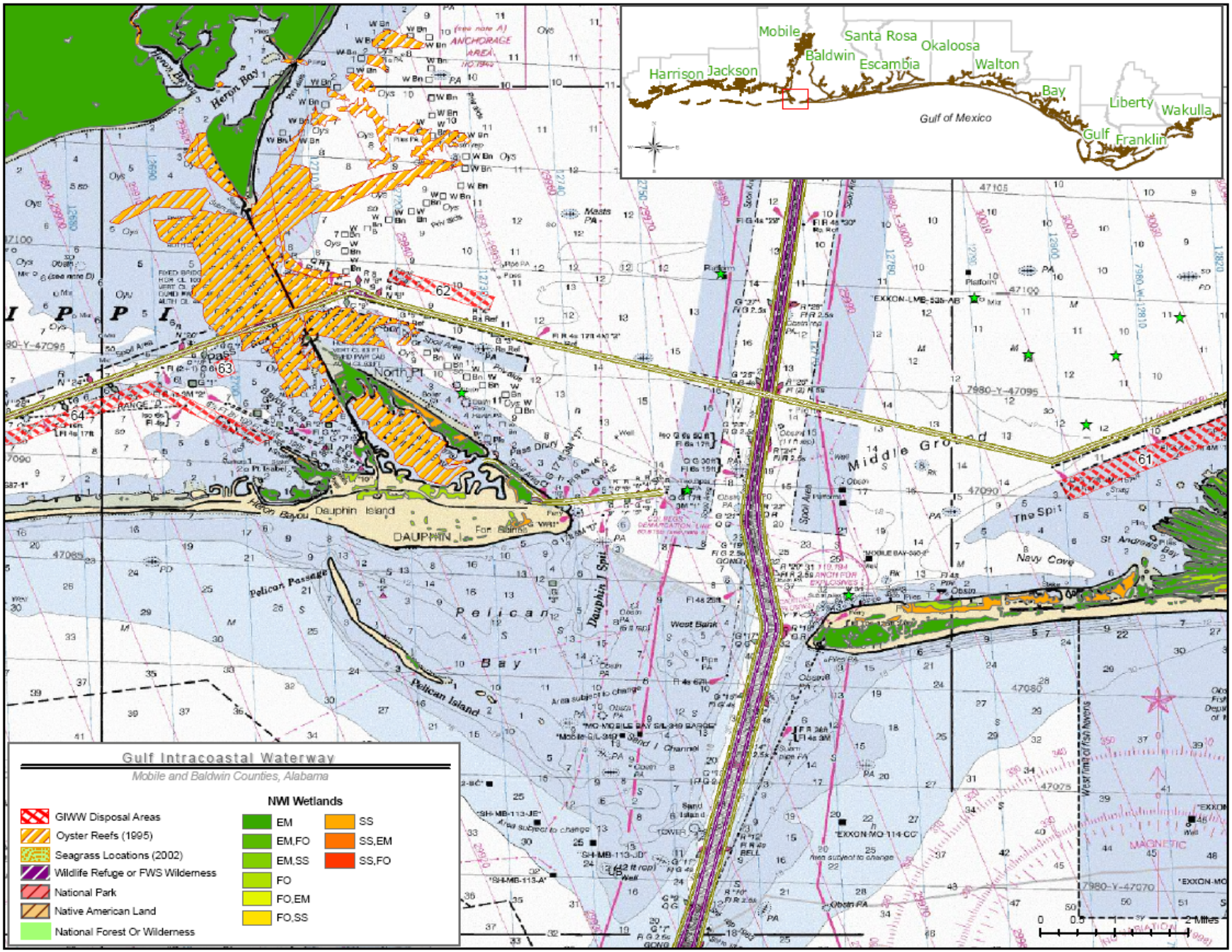

Figure 3: Gulf Intracoastal Waterway, Alabama Information Map 2

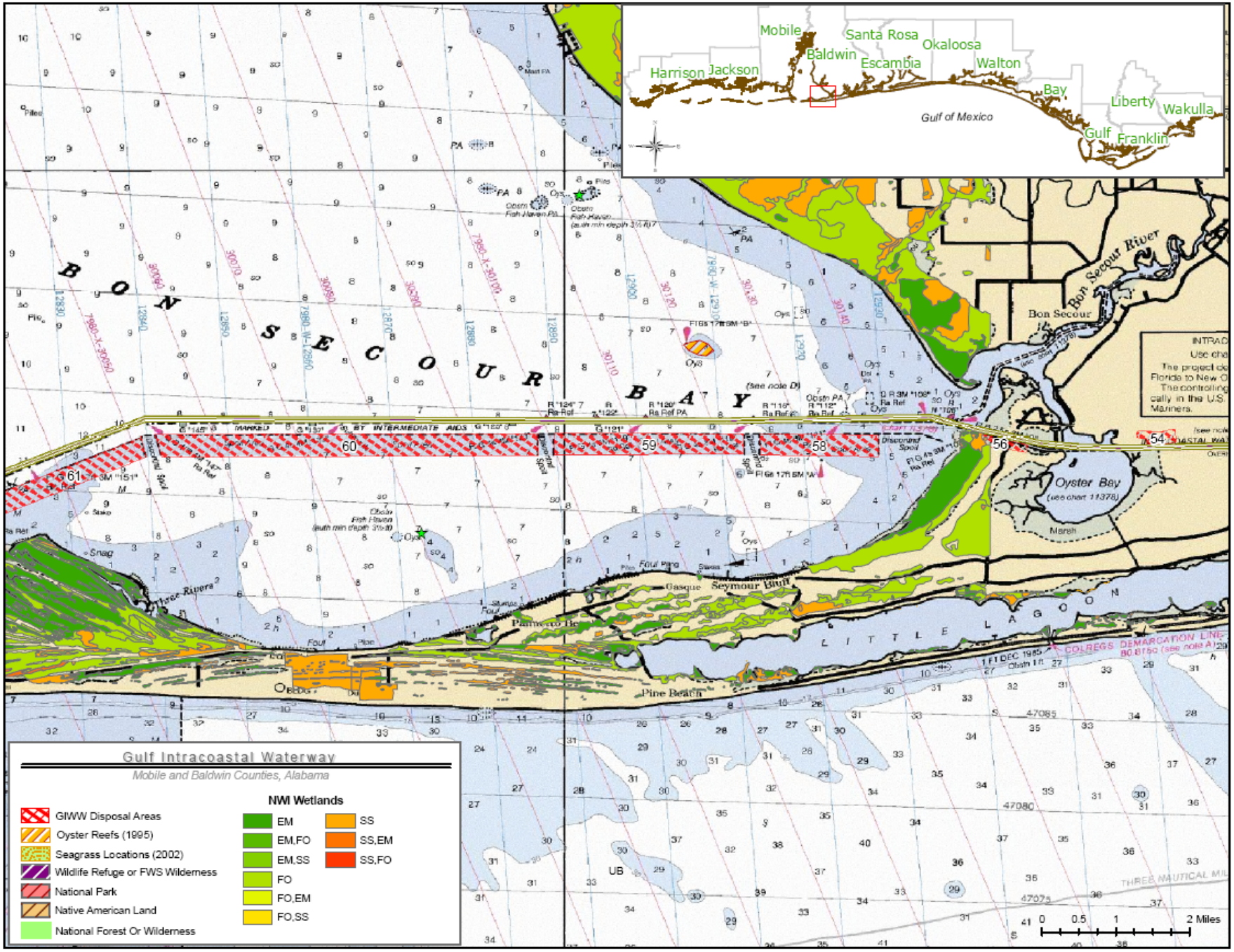

Figure 4: Gulf Intracoastal Waterway, Alabama Information Map 3

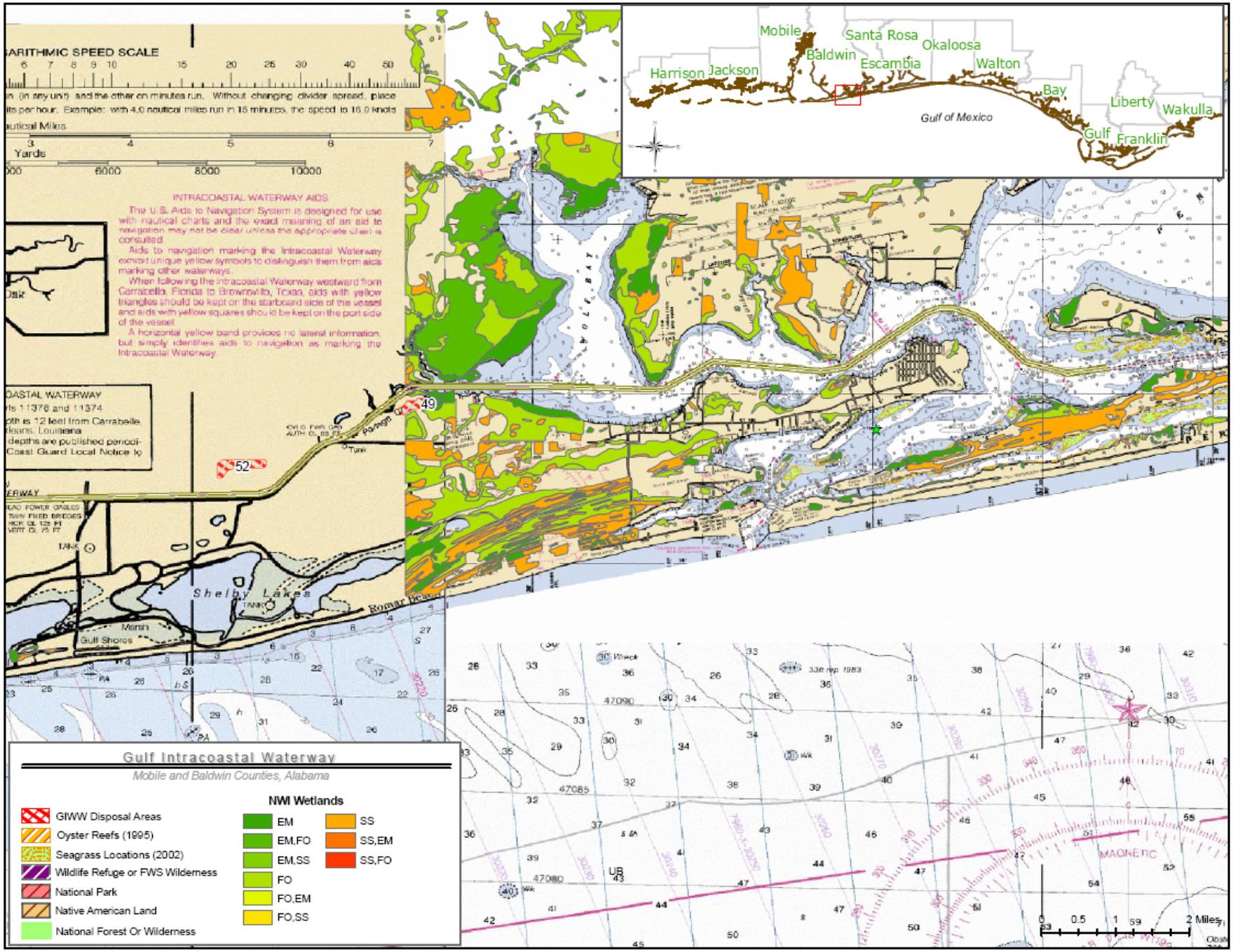

Figure 5: Gulf Intracoastal Waterway, Alabama Information Map 4

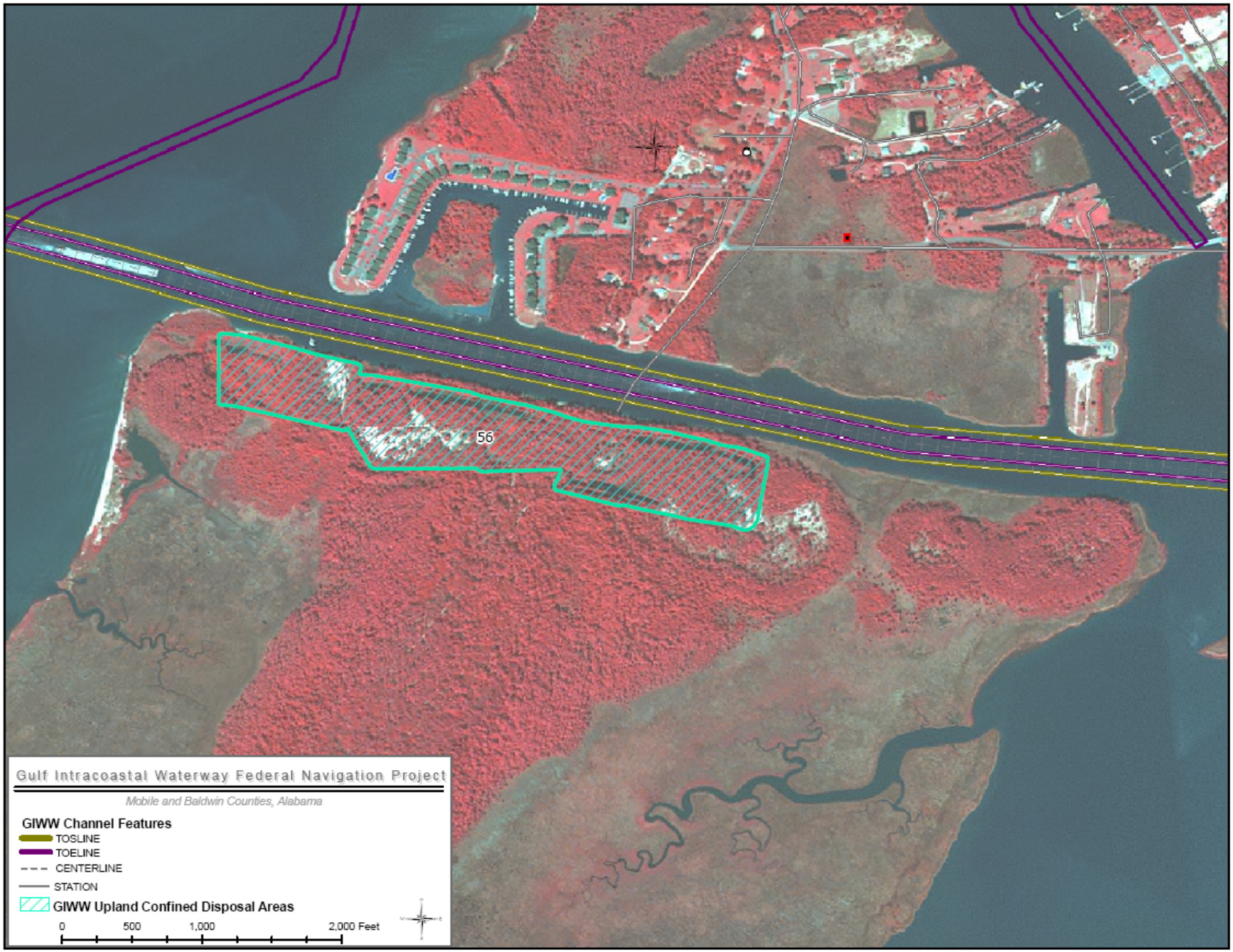

Figure 6: Confined Upland Disposal Area 56

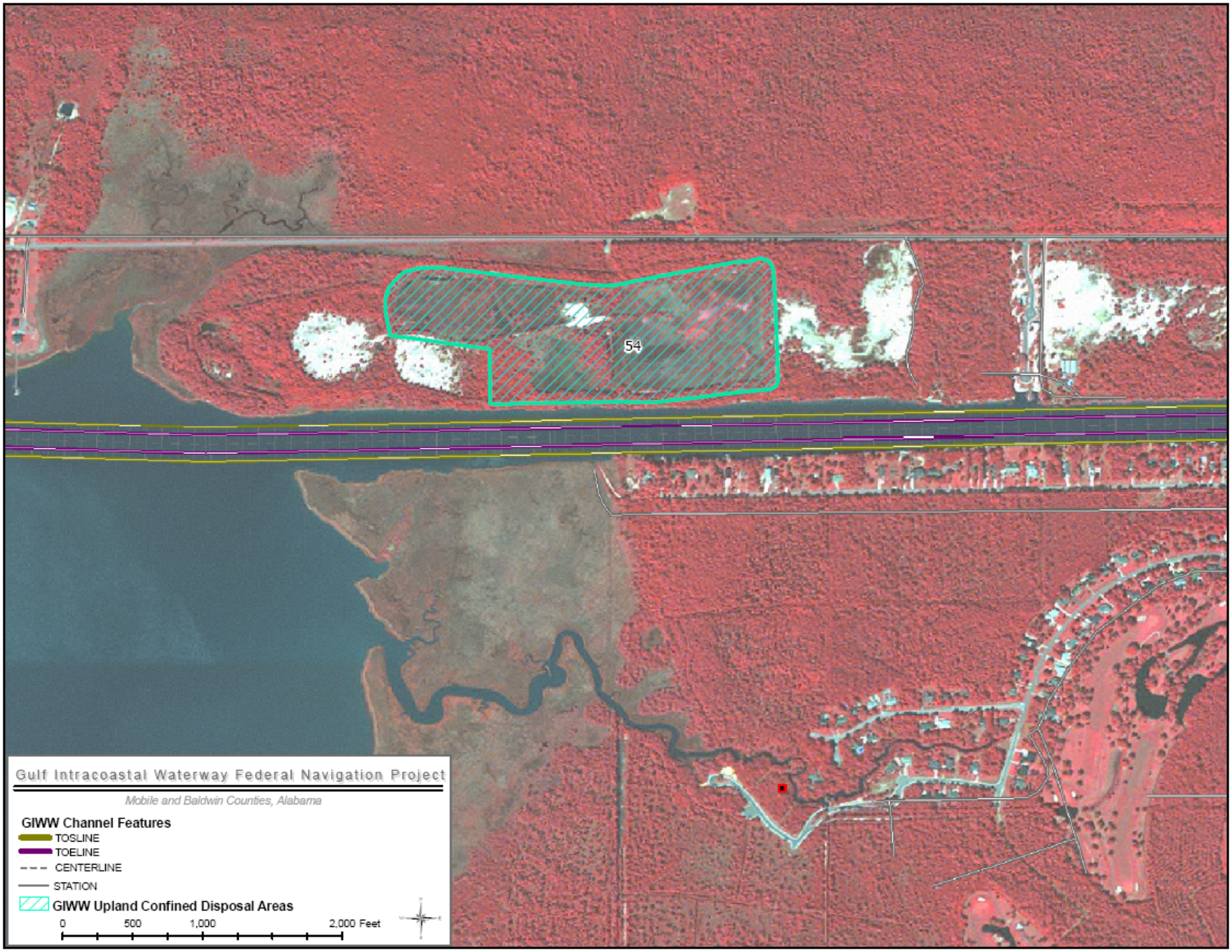

Figure 7: Confined Upland Disposal Area 54

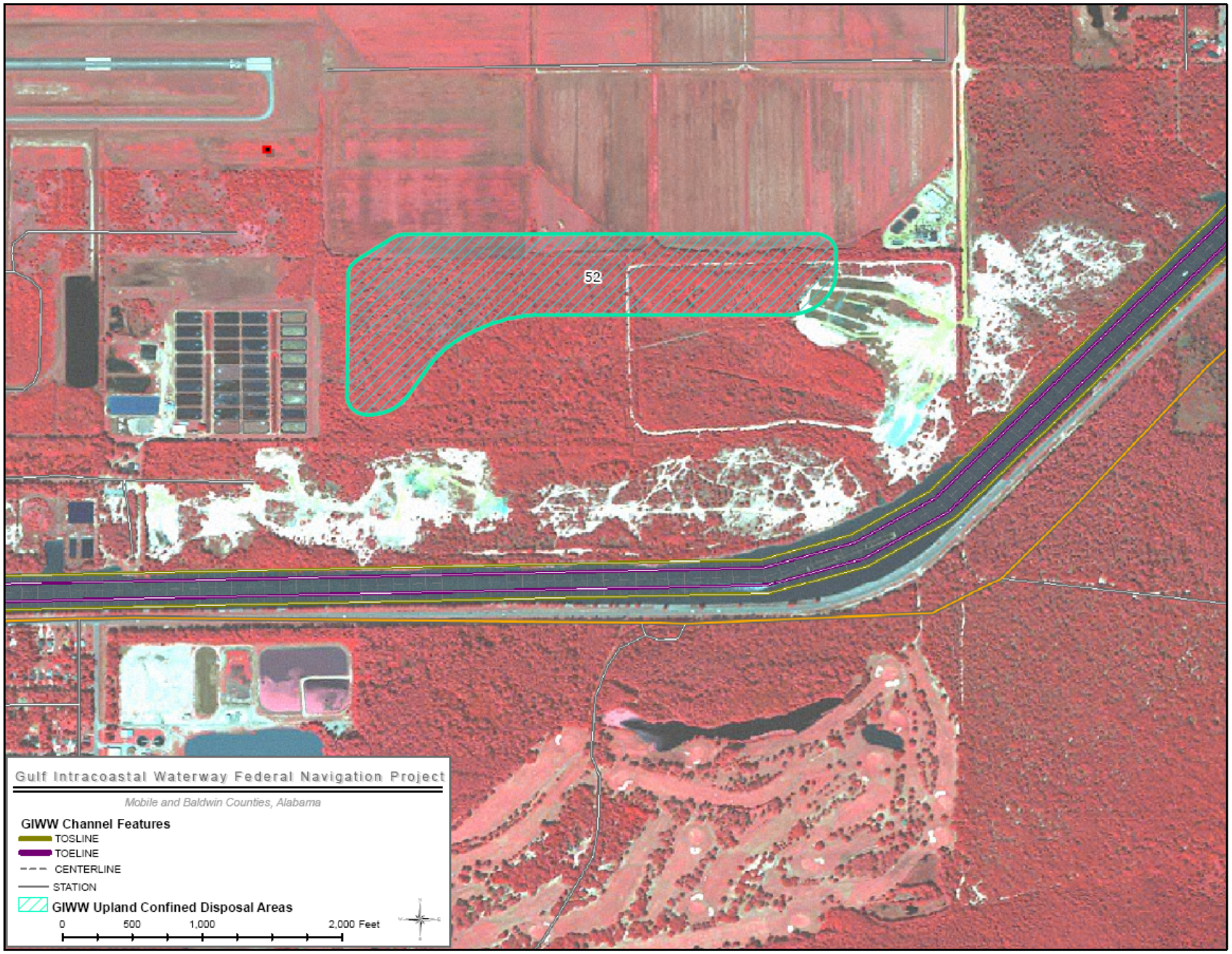

Figure 8 Confined Upland Disposal Area 52

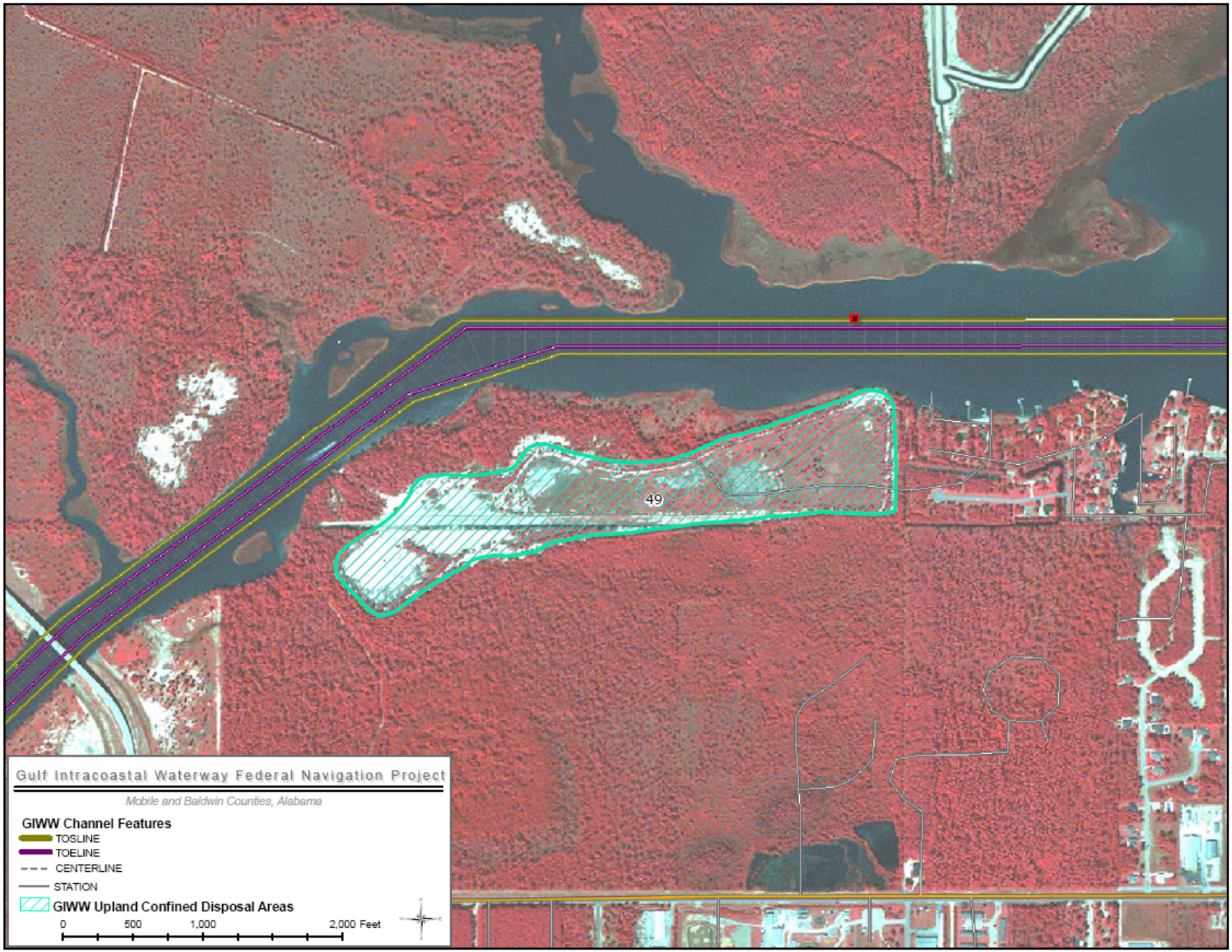

Figure 9: Confined Upland Disposal Area 49

Table 3: Description of GIWW Alabama Disposal Area

DA	GIWW MILE	ACRES	DA TYPE	REMARKS
64	123.0	949	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located across the Dauphin Island Village channel approximately 3,000 feet east of the easternmost portion of the open water site. Closest seagrasses are located north of Dauphin Island over a mile southwest of the westernmost portion of the open water site.
63	126.5	32	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located 700 feet northeast of eastern most portion of the open water site.
62	129.5	148	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located approximately 2,200 feet southwest and 2,500 feet west of the open water site.
61	139.0	728	Open Water Placement	Dredge sediments are predominately silty clays. Closest reef is an artifical fishing reef located 2,500 feet northwest of the openwater site.
60	144.0	827	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located over a mile from discharge.
59	147.0	389	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located over a mile from discharge.
58	149.0	244	Open Water Placement	Dredge sediments are predominately silty clays. Closest oyster reefs are located over a mile northwest of the open water site.
56	151.5	42	Confined Upland Disposal	Dredge sediments are predominately sands.
54	153.0	44	Confined Upland Disposal	Dredge sediments are predominately sands.
52	157.0	47	Confined Upland Disposal	Dredge sediments are predominately sands.
49	159.5	51	Confined Upland Disposal	Dredge sediments are predominately sands.