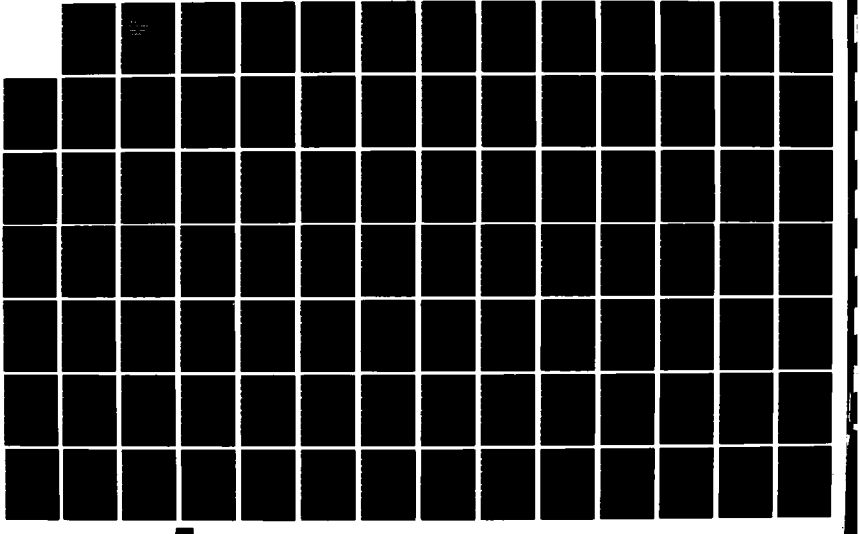
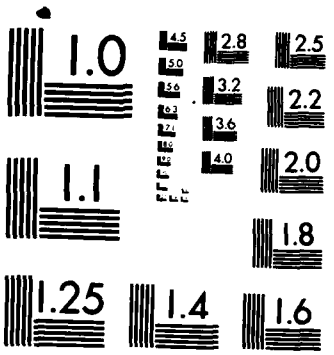
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US Army Corps
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Savannah District

Atlantic Intracoastal Waterway [AIWW]

Maintenance Program Evaluation Study

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Savannah District, U.S. Army Corps of Engineers, conducted a maintenance program evaluation study of their portion of the Atlantic Intracoastal Waterway (AIWW) which extends from Port Royal Sound, South Carolina, to the St. Mary's River at the Georgia-Florida line. The major objective of the study was to formulate a 50-year maintenance plan, as well as to identify and evaluate problems associated with maintenance of the waterway.

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Problem shoaling areas were identified, and dredging and disposal activities assessed in regard to their impacts on the environment along the waterway. Based on this data, various dredging alternatives, including existing methods, were evaluated with respect to their environmental, technical and economic feasibility.

Nineteen major shoaling areas on the main route of the AIWW and one area on the alternate route around St. Andrews Sound were identified. Maintenance of these sections of the waterway, in addition to some minor shoaling areas, has required the removal of over 50 million cubic yards of dredged material since completion of the 12' channel in 1941.

The primary method of dredged material disposal is undiked discharge into disposal tracts adjacent to the waterway (with the exception of several open water sites) and on diked area. Prior to their use, these disposal tracts were almost entirely vegetated with salt marsh vegetation dominated by salt marsh cordgrass (Spartina alterniflora). This method of disposal has obviously resulted in the loss of some of the salt marsh within the disposal tracts. Using infrared aerial photography and onsite inspection, the Coastal Resources Division of the Georgia Department of Natural Resources determined that about one-third or 1,548 acres out of 4,636 acres within active disposal easements have been impacted by dredged material disposal. Where impacts have occurred, the salt marsh vegetation has been replaced by high marsh or upland species of plants depending on the elevation of the dredged material substrate.

Various alternatives were evaluated to develop a maintenance scheme that considers technical, economic and environmental factors. Alternatives considered include construction of diked areas within existing disposal easements, construction of diked areas at new upland sites, open water disposal, open water disposal for purposes of creating substrate for possible marsh development, reuse of the dredged material, beach nourishment, continued undiked disposal into existing tracts, and elimination of the use of some active disposal tracts by concentrating the material into disposal areas that are the most significantly impacted.

Based on the results of the evaluation of alternatives, continued discharge onto existing deposits in undiked areas adjacent to the waterway is the recommended alternative for most of the 20 shoaling areas. From a technical and economic standpoint, this is the most feasible alternative since the existing disposal tracts lie next to the waterway in close proximity to the dredging sites. From an environmental standpoint, this method of disposal will result in continued, gradual encroachment of dredged material onto the wetlands within the disposal easements. However, when undiked disposal is compared to diked disposal in the wetlands, or construction of a diked area on an upland site, the loss of habitat is not nearly as severe. Also, undiked disposal allows the wetlands within the disposal tracts outside of the area of impact to remain in productivity while diking totally eliminates the habitat confined within.

ABSTRACT

Savannah District, U.S. Army Corps of Engineers, conducted a maintenance program evaluation study of their portion of the Atlantic Intracoastal Waterway (AIWW) which extends from Port Royal Sound, South Carolina, to the St. Mary's River at the Georgia-Florida line. The major study objective of the study was to formulate a 50-year maintenance plan as well as to identify and evaluate problems associated with maintenance of the waterway.

Problem shoaling areas were identified, and dredging and disposal activities assessed in regard to their impacts on the environment along the waterway. Based on this data, various dredging alternatives, including existing methods, were evaluated with respect to their environmental, technical and economic feasibility.

Nineteen major shoaling areas on the main route of the AIWW and one area on the alternate route around St. Andrews Sound were identified. Maintenance of these sections of the waterway, in addition to some minor shoaling areas, has required the removal of over 50 million cubic yards of dredged material since completion of the 12' channel in 1941.

The primary method of dredged material disposal is undiked discharge into disposal tracts adjacent to the waterway with the exception of several open water sites and one diked area. Prior to their use, these disposal tracts were almost entirely vegetated with salt marsh dominated by salt marsh cordgrass (Spartina alterniflora). This method of disposal has obviously resulted in the loss of some of the salt marsh within the disposal tracts. Using infrared aerial photography and onsite inspection, the Coastal Resources Division of the Georgia Department of Natural Resources determined that about one-third or 1,548 acres out of 4,636 acres within active disposal easements have been impacted by dredged material disposal. Where impacts have occurred, the salt marsh vegetation has been replaced by high marsh or upland species of plants depending on the elevation of the dredged material substrate.

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disposal in the wetlands, or construction of a diked area on an upland site, the loss of habitat is not nearly as severe. Also, undiked disposal allows the wetlands within the disposal tracts outside of the area of impact to remain in productivity while diking totally eliminates the habitat confined within.

While the AIWW maintenance scheme recommends continued undiked disposal in most areas, other alternatives are included. Three disposal sites are located in the State of South Carolina. Their Coastal Zone Management Program does not permit undiked disposal in wetlands. Consequently, the maintenance plan recommends diking two of these areas and discontinuing the use of the third site. In some heavy shoaling areas where more than one disposal site is located, the plan recommends concentrating the material into one site to the maximum extent possible. The maintenance plan also provides for detailed studies to investigate reduction of shoaling rates at two areas.

Where continued undiked disposal is recommended, the plan provides for concentrating the dredged material on existing disposal mounds. Existing deposits will be clearly marked in the field so contractors can easily recognize the discharge point. The plan also recommends increased monitoring through field inspection and aerial photography to identify areas where significant encroachment on the wetlands is occurring. Where wetlands are being significantly impacted, the maintenance scheme recommends further evaluation of alternatives, including open water disposal and partial diking.

ATLANTIC INTRACOASTAL WATERWAY (AIWW)
MAINTENANCE DISPOSAL STUDY

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ATLANTIC INTRACOASTAL WATERWAY (AIWW)
MAINTENANCE DISPOSAL STUDY

STUDY AUTHORITY

This study is authorized in accordance with the provisions of letter dated 16 July 1973 from the South Atlantic Division of the U.S. Army Corps of Engineers.

PURPOSE AND EXTENT OF STUDY

This study is being conducted to formulate a 50-year maintenance plan as well as to identify and evaluate problems associated with the maintenance of the Atlantic Intracoastal Waterway (AIWW) within Savannah District. Based on the results of this evaluation, the primary objective is to develop a feasible maintenance scheme that will allow continued use of the waterway as well as reduce the adverse environmental impacts associated with the dredging and disposal.

PLAN OF STUDY

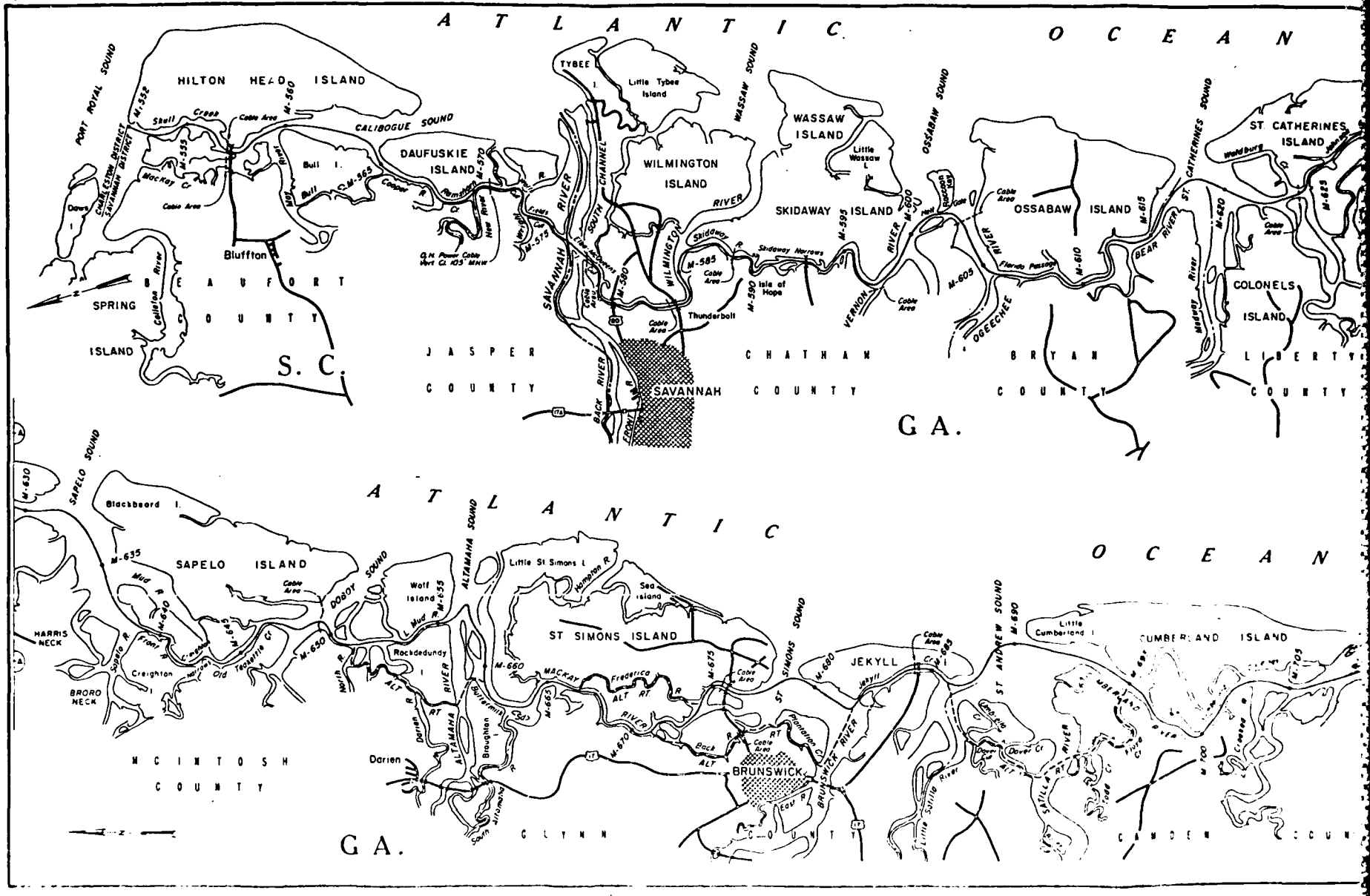
A plan of study was developed to achieve the specified purpose. This scope of study was developed after numerous discussions were held between various District elements including Planning Division, Operations Division, and Real Estate Division. In addition to the "in-house" input, the views of various other Federal agencies and State agencies were solicited. A meeting was held in Brunswick, Georgia, on 28 June 1977 to obtain comments from these agencies in regard to what the study should encompass. A review was also made of correspondence concerning maintenance of the Atlantic Intracoastal Waterway that has been received by Savannah District over the last 10 years. The comments and views submitted by other agencies proved invaluable in assisting us to identify some of the problems encountered in maintaining the waterway. Those agencies providing comments on the AIWW maintenance program include: The U.S. Fish and Wildlife Service; U.S. Environmental Protection Agency; National Marine Fisheries Service (NOAA); Governor of the State of Georgia; Commissioner of the Georgia Department of Natural Resources (DNR); and Director, Georgia Coastal Marshland Protection Section of the Georgia DNR.

DESCRIPTION OF THE WATERWAY

The Atlantic Intracoastal Waterway (AIWW) is a 739-mile inland waterway system between Norfolk, Virginia, and St. John's River, Florida, which offers a continuous, sheltered passage between these two destinations. The portion of the AIWW within Savannah District is situated between Port Royal Sound, South Carolina, (mile 552) on the north and Cumberland Sound (mile 713) on the south, which is located at the Georgia-Florida border. Thus, Savannah District's portion of the waterway constitutes approximately 22 percent of the AIWW. A map of the waterway is shown on figure 1.

The 161-mile section of the AIWW within Savannah District is comprised of a 24-mile section in the State of South Carolina with the remaining 137 miles

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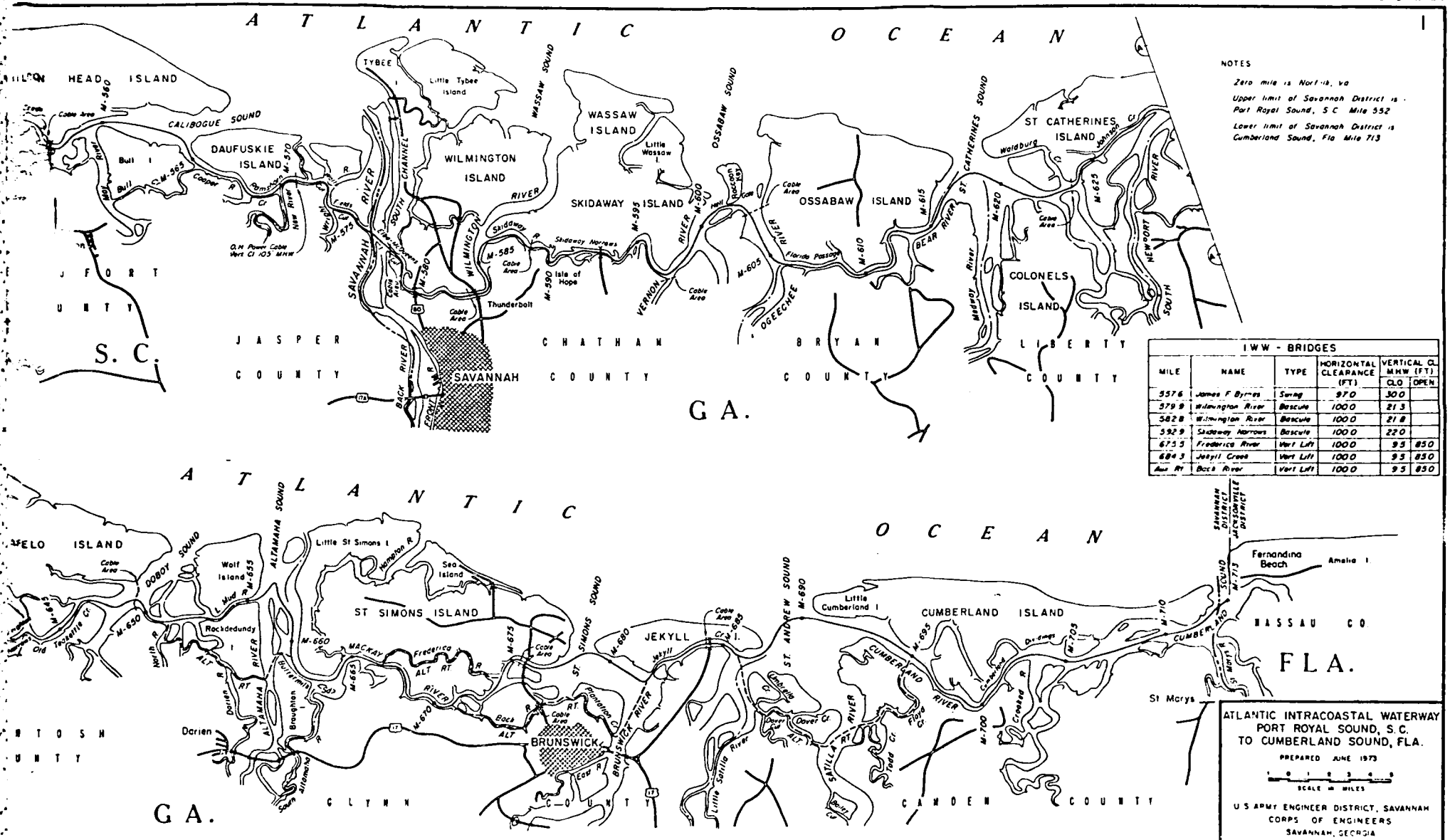

A T L A N T I C O C E A N
HILTON HEAD ISLAND
CALIBOGUE SOUND
DAUFUSKIE ISLAND
TYBEE
Little Tybee Island
WASSAW SOUND
WASSAW ISLAND
Little Wassaw
OSSABAW SOUND
ST CATHERINES SOUND
ST CATHERINES ISLAND
Waldburg
Johnson Cr
WILMINGTON ISLAND
SKIDAWAY ISLAND
OSSABAW ISLAND
COLONELS ISLAND
SAVANNAH RIVER
SOUTH CHANNEL
WILMINGTON RIVER
SKIDAWAY RIVER
VERNON RIVER
OGEECHEE RIVER
BEAR RIVER
NEWPORT RIVER SOUTH
Isle of Hope
Thunderbolt
SAVANNAH
BACK RIVER
FRONT RIVER
JASPER COUNTY
CHATHAM COUNTY
BRYAN COUNTY
LIBERTY COUNTY
S. C.
G A.
NOTES
Zero mile is Norfolk, Va
Upper limit of Savannah District is Port Royal Sound, S C Mile 552
Lower limit of Savannah District is Cumberland Sound, Fla Mile 713
IWW - BRIDGES
MILE | NAME | TYPE | HORIZONTAL CLEARANCE (FT) | VERTICAL CL MHW (FT) CLO | OPEN
5576 | James F Byrnes | Swing | 970 | 300 |
5799 | Wilmington River | Bascule | 1000 | 213 |
5828 | Wilmington River | Bascule | 1000 | 218 |
5929 | Skidaway Narrows | Bascule | 1000 | 220 |
6755 | Frederica River | Vert Lift | 1000 | 95 | 850
6803 | Jekyll Creek | Vert Lift | 1000 | 95 | 850
Aux Rt | Back River | Vert Lift | 1000 | 95 | 850
A T L A N T I C O C E A N
SAPELO ISLAND
DOBOY SOUND
ALTAMAHA SOUND
Wolf Island
Little St Simons I
Hampton R
Sea Island
ST SIMONS ISLAND
ST SIMONS SOUND
JEKYLL
JEKYLL I.
ST ANDREW SOUND
Little Cumberland I
CUMBERLAND ISLAND
CUMBERLAND SOUND
Fernandina Beach
Amelia I
NASSAU CO
FLA.
SAVANNAH DISTRICT
JACKSONVILLE DISTRICT
Rockdedundy I
Old Tarrytte Cr
North R
ALT RT
L Mud R
MACKAY RIVER
Frederica R
ALT RT
Darien R
RT
Darien
Broughton I
Back R
ALT
BRUNSWICK
Plantation Cr
Cabin Area
Egg R
BRUNSWICK RIVER
Little Satilla River
Cabretta Cr
Dorset Cr
Dorset Cr ALT
SATILLA RIVER
Jones Cr
Floyd Cr
Crooked R
St Marys
MCINTOSH COUNTY
GLYNN COUNTY
CAMDEN COUNTY
G A.
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA.
PREPARED JUNE 1973
SCALE IN MILES
U S ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

FIGURE 1

located in Georgia. The various waterways that constitute the AIWW are shown in table 1.

PROJECT AUTHORIZATION AND CONSTRUCTION

The AIWW between Savannah, Georgia, and Fernandina, Florida, was initially authorized by the River and Harbor Act of 2 August 1882, House Document 19, 46th Congress, which provided improvements in portions of the waterway. Additional sections of this part of the AIWW not included in the 1882 Act were incorporated into the project in 1892. The River and Harbor Act of 13 July 1892, House Document 41, 52d Congress, 1st Session, provided for a 7-foot channel between Savannah and Fernandina. The AIWW between Beaufort, South Carolina, and Savannah, Georgia, was originally authorized by the River and Harbor Act of 3 June 1896, House Document 295, 53d Congress, 3d Session. It also provided for a 7-foot channel.

After authorization and construction, several other Acts modified the route of the waterway to abandon old sections and include new ones which were either more convenient to traffic or easier to maintain. In 1936, the authorized project consisted of a channel 7 feet deep at mean low water with a width of 75 feet between Beaufort, South Carolina, and Savannah, Georgia, and a width of 150 feet between Savannah, Georgia, and Fernandina, Florida. However, in 1937 the first piece of legislation that would create the waterway as we know it today was passed. The River and Harbor Act of August 26, 1937, provided for a 7-foot protected route around St. Andrew Sound (Senate Committee Print, 74th Congress, 1st Sess.) and for a 12-foot channel between Beaufort, South Carolina, and Savannah, Georgia (Rivers and Harbors Committee Doc. No. 6, 75th Congress, 1st Sess.). On 20 June 1938, a 12-foot channel between Savannah, Georgia, and Fernandina, Florida, with various cut-offs, and an anchorage basin at Thunderbolt was authorized (House Doc. No. 618, 75th Congress, 3d Sess.). The widths of the AIWW were to be 90 feet in land cuts and narrow streams and 150 feet in open waters.

Work on the above improvements commenced in 1939 with the removal of 53,530 cubic yards of material in dredging the protected route around St. Andrew Sound. The protected route was completed in 1940 with the removal of 619,458 cubic yards. Dredging of the 12-foot channel between Beaufort, South Carolina, and Fernandina, Florida, was initiated in 1940 with the excavation of 507,275 cubic yards and completed in 1941 with the removal of 6,168,556 cubic yards.

In addition to the main route and the protected route around St. Andrews, the project provides for two other alternate channels. An alternate and more protected route 7 feet deep at mean low water from Doboy Sound to Brunswick, Georgia, was incorporated into the project in 1912, and the River and Harbor Act of March 2, 1945, approved an alternate route 9 feet deep and 150 feet wide in Frederica River. This alternate route did not require dredging since it had formerly been the main route prior to its abandonment in 1938 for a new route via Mackay River. Although all three of these routes are part of the AIWW project today, maintenance is only performed in the protected route around St. Andrews Sound. The waterways comprising the three alternate routes shown in table 2 and figure 1.

TABLE 1

AIWW CREEKS AND RIVERS

From	To	Mileage
Skull Creek	Calibogue Sound	552-560
Calibogue Sound	Cooper River	560-564
Cooper River	Ramshorn Creek	564-568
Ramshorn Creek	New River	568-569.25
New River	Walls Cut	569.25-572
Walls Cut	Wrights River	572-572.5
Wrights River	Fields Cut	572.5-573.5
Fields Cut	Middle of Savannah Harbor (Georgia-South Carolina line)	573.5-576
State line	Elba Cut	576-576.5
Elba Cut	South Channel	576.5-576.75
South Channel	McQueens Cut	576.75-577
McQueens Cut	St. Augustine Creek	577-578
St. Augustine Creek	Wilmington River	578-579
Wilmington River	Skidaway River	579-586
Skidaway River	Skidaway Narrows	586-591
Skidaway Narrows	Burnside River	591-594.5
Burnside River	Vernon River	594.5-597
Vernon River	Ossabaw Sound	597-599
Ossabaw Sound	Hell Gate	599-601
Hell Gate	Ogeechee River	601-602.5
Ogeechee River	Florida Passage	602.5-605.5

TABLE 1 (continued)

From	To	Mileage
Florida Passage	Bear River	605.5-608.5
Bear River	St. Catherine Sound	608.5-618
St. Catherine Sound	North Newport River	618-620
North Newport River	Johnson Creek	620-623.5
Johnson Creek	South Newport River	623.5-629
South Newport River	Sapelo Sound	629-631
Sapelo Sound	Front River	631-639.25
Front River	Creighton Narrows	639.25-640.5
Creighton Narrows	Old Teakettle Creek	640.5-643
Old Teakettle Creek	Doboy Sound	643-648
Doboy Sound	Little Mud River	648-650
Little Mud River	Altamaha Sound	650-655.5
Altamaha Sound	Buttermild Sound	655.5-660
Buttermilk Sound	Mackay River	660-665.5
Mackay River	Frederica River	665.5-674
Frederica River	St. Simons Sound	674-676.5
St. Simons Sound	Jekyll Creek	676.5-682
Jekyll Creek	St. Andrew Sound	682-686.25
St. Andrew Sound	Cumberland River	686.25-691
Cumberland River	Cumberland Sound	691-703
Cumberland Sound	Georgia-Florida line	703-713
Totals - 161 miles long		
24 miles - South Carolina		
137 miles - Georgia		

TABLE 2

ALTERNATE ROUTES

AIWW

I. Doboy Sound to Brunswick Harbor (mile 650 - vicinity, mile 682)

Doboy Sound
Darien River
Three Mile Cut
Altamaha River
One Mile Cut
Buttermilk Sound
Mackay River
Back River
Clubbs Creek
Plantation Creek
Brunswick Harbor

II. Protected Route Around St. Andrews Sound (vicinity, mile 686 - mile 695)

Jekyll Creek
Jekyll Sound
Little Satilla River
Umbrella Cut
Umbrella Creek and its south branch
Dover Cut
Dover Creek
Satilla River
Floyd Creek
Cumberland River

III. Frederica River - part not traversed by main route (mile 666 - mile 674)

In addition to providing for the 12-foot channel between Beaufort, South Carolina, and Fernandina, Florida, the River and Harbor Acts of August 26, 1937, and June 20, 1938, imposed upon local interests the responsibility to furnish free of cost to the United States: (1) All lands or easements needed for the 7-foot protected channel around St. Andrews Sound and (2) all necessary rights-of-way and spoil-disposal areas for new work and subsequent maintenance of the 12-foot channel between Beaufort, South Carolina, and Fernandina, Florida. Titles to all lands and easements needed for the 7-foot protected route around St. Andrews Sound were accepted as satisfactory by the Chief of Engineers March 28, 1939, titles to all necessary rights-of-way and spoil-disposal areas for the 12-foot channel between Savannah, Georgia, and Beaufort, South Carolina, were accepted as satisfactory March 27, 1939, and necessary rights-of-way and suitable spoil-disposal areas for initial work and for subsequent maintenance of the 12-foot channel between Savannah, Georgia, and Fernandina, Florida, were approved by the Chief of Engineers April 4, 1940.

EXISTING CONDITIONS

NATURAL RESOURCES

The AIWW is contained entirely within the Coastal Plain geological province of the State of Georgia. As indicated by Johnson, et al., (1974) the Coastal Plain is overridden by many sedimentary strata tilted towards the sea. These deposits were formed during the many changes in sea level associated with glaciation during the Tertiary and Quaternary periods. The thickest deposits are in the coastal area (about 6,000 feet at Savannah), tapering to a thin edge at the Fall Line (the approximate location of which extends in a diagonal line across the state from the city of Columbus, Georgia through Macon to the city of Augusta), where the oldest (Creteacous) sediments are exposed. Limestone of Tertiary and Quaternary age underlies the Coastal Plain to form one of the most productive aquifer systems in the United States. The principal artesian aquifer beneath the city of Savannah is the primary bed for this aquifer system. The Tertiary limestone is several thousand feet thick, ranging in age from the Paleocene to the Pliocene. As indicated by Johnson, et al., (1974) the chain of barrier islands extending from the South Carolina border into the State of Florida were formed during the last 10,000 years probably as a result of dune ridges and sea level dropping; they formed at low stands of the sea and were inundated when sea level rose again. Barrier beaches formed on the islands from littoral sands. Wind blown sand from the beaches became trapped by pioneering vegetation to form the dune ridges which were ultimately stabilized by salt tolerant vegetation. The dunes protected the island from sea winds, salt spray and storm tides and allowed the establishment of forest vegetation. The major habitats of the island interior are live oak forests, pine forests, fields and sloughs. The lagoonal systems behind the barrier island become filled with sediments to form marshes. Deposition on the marsh continues as the waters spill onto the marsh at high tide, but increases in marsh elevation due to deposition are nearly offset by rising sea levels. Few plant species can withstand the stress imposed by high salinity and daily inundation by tidal waters, and marsh vegetation is montonously uniform. The tidal marsh is predominantly smooth cordgrass (Spartina alterniflora), although there is a zonation of species related to gradients in salinity and elevation.

The wetlands through which the Atlantic Intracoastal Waterway passes are feeding and nursery grounds for birds, mammals and fishes. The water-soil-plant complex forms a nutrient processing area where important phases of the carbon, nitrogen, phosphorous and sulfur cycles take place. Wetlands are sources of organic compounds in detrital food webs. Wetlands act as metering systems, controlling the output of nutrients in non-point source runoff to aquatic systems. Wetlands are buffers between storm driven water and adjacent high ground and help to reduce shoreline erosion. Wetlands have a study value as open places in wildlife habitat.

Primary production activity measurements for many areas along the coastal salt marshes in Georgia range from an average of 3,108 grams per square meter for Spartina alterniflora (tall form) to 913 grams per square meter for Juncus roemarianus. Primary productivity ranges from 3,990 grams per square meter per year for Spartina alterinflora to 2,261 grams per square meter per year. Other freshwater marsh areas in Georgia vegetated by Typha latifolia have a net primary productivity of approximately 680 grams per square meter per year measured as a standing crop biomass. These values indicate that marsh areas, depending on the species of vegetation present, are some of the most productive areas in the world. This conclusion is based on data generated by Kibby (1980) and is compared to data from areas of intensive agriculture, jungle rain forests and continental shelf fisheries.

Hydrology.

The tides and currents in the waterway proper vary since the waterway traverses rivers, sounds, estuaries and land cuts in winding its way along the coast between the barrier islands of Georgia and the mainland. Generally, the waterway can be considered to have semidiurnal tides; high tide usually varies between 6 and 10 feet above mean low water. Most of the salt marshes that lie adjacent to the waterway are covered twice daily by tidal waters. The few areas that are not covered by normal tides are saturated by seasonal high tides.

The flow from most of the coastal rivers, including the Savannah River and the Altamaha River, constitutes a large source of turbid freshwater which mixes in the coastal area and slows in velocity. The sediment loads, upon slowing, tends to be deposited and moved according to the tidal regime into the salt marsh areas. This provides a substrate for the vegetation present as well as part of the nutrient supply.

Sediment and elutriate test analyses were performed at sampling locations along the AIWW during 1974 (see Final Environmental Impact Statement, Atlantic Intracoastal Waterway, U.S. Army Engineer District, Savannah, January 1976). The major constituents considered in this study were mercury, lead, zinc, total Kjeldahl nitrogen, volatile solids and chemical oxygen demand. Bulk analysis of the 10 sediment samples indicated that only 4 of the sampling areas (Site 2 at Thunderbolt, Site 4 near Sapelo Island, Site 6 at Wolf Island and Site 8 at Skyll Island) contained moderate concentration volatile solids, chemical oxygen demand, total Kjeldahl nitrogen, oil and grease. However, the disposal of dredged material in these areas would not be overboard disposal. In areas where overboard disposal methods would be used, the sediments contained low

concentrations of pollutants. Bulk analyses in all instances indicated that the sediments were relatively free of heavy metals.

Climate.

The climate of southeast Georgia through which the AIWW extends is considered to be of a temperate nature. Summers are warm and humid and winters are mild. Rainfall is abundant and most of the soils are moist or saturated during most of the year. The total annual rainfall is 50.1 inches ranging from a monthly precipitation of 3.18 in January to 8.94 inches in August. The average annual temperature is 66.4° F with an average temperature of 44.1° F in January and 81.4° F in August.

Barrier Islands.

Barrier island formation has given Georgia and South Carolina both their expansive salt marshes and the "Golden Isles" beaches. Varying mean sea level elevations, sedimentation and the hydraulics of the nearshore area have produced a succession of roughly parallel barrier island shores; the three most evident (and geologically most recent in formation) are the eastern edge of the mainland, the seaward sides of the intermediate line of barrier islands, and the shores of the Golden Isles. Because of the wide salt marshes, access to the islands has been difficult and expensive. The lack of easy access and a history of large land holdings on the islands have left the majority of them nearly untouched. At present extensive development has occurred only on Tybee Island, St. Simons Island and Jekyll Island. The biggest existing problem of the more inaccessible islands is over-grazing; the biggest potential problem is over-development. Federal and state acquisitions of much of these coastal lands provided some protection against over-development. The Georgia Bight, consisting of the curvature of the Atlantic Ocean from Cape Romain, South Carolina, to Cape Canaveral, Florida, represents an area of significant mixing of freshwater from the upland rivers and the sea water brought to the area by the Gulf Stream that flows along the east coast of North America.

The total acreage of the six coastal Georgia counties is 1,974,480; of this 358,198 acres are estimated by the U.S. Department Agriculture, Soil Conservation Service to be salt marshes. Another 1,023,700 acres or 51 percent is forested and about 300,000 acres are agricultural land.

Ecological Zones.

There are three predominant ecological zones adjacent to the salt marshes which surround the AIWW within the State of Georgia. These are the high marsh zone, the shrub zone and the upland community which is designated in this area, oak-juniper-palm forest. The high marsh zone, beginning at the marsh/land line is regularly flooded by spring tides and is infrequently flooded during abnormal high tides. The dominant vegetation in this zone consists of a canopy of smooth cordgrass Spartina alterniflora with a substory of saltgrass (Distichlis spicata). The high marsh zone often has several intermixed plant communities, including the salt panne association and stands of black needle rush (Juncus roemarianus), sea lavender (Limonium nashii) and salt bulrush (Scirpus robustus). In the high marsh zone areas which are only occasionally

flooded, shrub zone type vegetation is frequently present and forms an ecotone or transitional community.

The shrub zone, which is located at elevations which are only occasionally flooded by high spring tides or abnormally high storm tides, forms the border between the high marsh zone and the terrestrial vegetation. This zone contains a variety of herbaceous and woody plant species with shurbs being dominant. The characteristic shrub vegetation present in this zone includes marsh elder (Iva frutescens), sea ox-eye (Borrica frutescens), groundsel bush (Baccharis halimifolia), Florida privet (Forestiera porulosa), wax murtle (Myrica cerifera) and yaupan (Ilex vomitoria). Herbaceous vegetatation occurring in this zone consists of black needle rush, salt water cordgrass, saltgrass and sea lavender.

In areas above the scrub zone exists an upland community called oak-juniper-palm forest. This association is essentially a forest border or an upland forest area. These communities are best developed on peninsulas of high ground in the salt marsh zone with an elevation of 5 feet (Hillestad, 1975). An oak-juniper-palm forest can also be found on dredged disposal sites. The dominant canopy vegetation found in these areas consists of live oak (Quercus - virginiana), southern red cedar (Juniperus silicicola) and cabbage palm (Sabal - minor) with a wide variety of understory vegetation. Commonly, shurbs and vines associated with this vegetation type consists of wax myrtle, Florida privet, and saw palmetto (Serenoa repens).

Some marshland areas along the AIWW have been altered by maintenance dredging of the channel. The vegetative changes which have resulted are varied depending upon disposal techniques and the material dredged. In unconfined disposal areas where the elevation has not precluded tidal action, smooth cordgrass has revegetated the area. However, hammocks have formed in disposal sites which have been used often enough to build up the elevation above the mean high water level. Vegetation on hammock areas is similar to high marsh and shrub marsh zones previously discussed, depending on elevation and the sediments dredged. Along the edge of the hammocks, where flooding duration is about 1 hour each day, vegetation commonly found consists of glasswort, salt grass and sea ox-eye. In areas with higher elevations, myrtles, marsh elder and southern red cedars have become established and may also develop into an oak-juniper-palm forest community. In some areas where the dredged material consists mostly of sterile sands with little organic material, the area is unable to support any vegetation.

Because of the large number and diversity of invertebrates occurring in salt marshes and estaurine areas, only the most common invertebrate forms have been identified in this study. Jacobs (1968) reported three species to be common among the zooplankton found in DoBoy Sound and the waters near Sapelo Island. These were Acartia tonsa, Pseudodioptomus caronaius, Paracalanus parvus. Windom, et al., (1974), in investigating the impacts of dredging on benthic organisms for the U.S. Army Corps of Engineers, identified over 70 species of benthic organisms found within the estuarine waters of the State of Georgia. (See Appendix E and table 6 of the Final Environmental Impact Statement, Atlantic Intracoastal Waterway, U.S. Army Engineer District, Savannah, January 1976.)

The most extensively studied invertebrates are the macroinverbrates of commercial importance, namely oysters, blue crab and shrimp species. The American oyster (Crassostrea virginica) harvested along the Atlantic Coast has diminished in the past due primarily to pollution and human development along coastal areas. The blue crab, harvested in coastal waters of the AIWW, consists of two similar species, Callinectes sapidus and C. ornatus.

Additional information concerning fisheries, fisheries harvest, amphibians, reptiles, mammals, birds as well as public areas and the recreational use and public access to the AIWW can be found in the Final Environmental Impact Statement, Atlantic Intracoastal Waterway, U.S. Army Engineer District Savannah, January 1976.

CULTURAL RESOURCES

Archeological investigation of the coastal Georgia area began in the nineteenth century with the surveys of Clarence B. Moore (1897). Moore was responsible for identifying many coastal shell deposits but set a precedent for much of the subsequent coastal archeology by excavating a number of ceremonial mounds.

Scientific data gathering had begun at the Stallings Island site near Augusta (Claflin 1931) and the Ocmulgee complex at Macon (Kelly 1938) when Federal relief archeology programs were initiated in the coastal zone. Major excavations near the mouth of the Savannah were conducted by Caldwell and McCann (1941) at the Irene Mound and by Waring (1968) at a series of sites including Bilbo and the Indian King's Tomb.

In the early 1950's research led by Larson (1955, 1957) attempted to locate aboriginal archeological sites evidencing contact with Spanish cultures. These investigations led to an elaboration on Irene phase ceramics and the identification of the Pine Harbor ceramic complex.

The University of Georgia began investigations on St. Catherines Island in 1968 (Caldwell 1971) that resulted in the recovery of early mission period Spanish artifacts and late period aboriginal ceramics. These excavations have been followed by the work of Thomas, et al., (1978) from the American Museum of Natural History.

The Irene Phase of the aboriginal sequence continues to be a focus of archeological attention. Recently, Pearson (1977) reported on the Irene Phase settlement complex on Ossabaw Island and Cook (1978) presented his findings in the Kent Mound study. Irene Phase research also continues at the Seven Mile Bend National Register site in Bryan County (Cook 1971, 1978).

During the 1970's, the results of studies with broad scopes appeared in print. Larson (1970) discussed late prehistoric environments and subsistence patterns in the southeastern U.S. coastal plain and Milanich (1971) provides an extensive analysis of the Deptford culture. Phase I (site identification) surveys have been conducted on the Georgia barrier islands by DePratter (1973, 1974, 1977) and Marrinan (1978) as well as in the Harris Neck and Wassaw National Wildlife Refuges (Fryman, et al., 1979; Pearson and Pearson 1978).

Archeologists with Professional Analysts (Miller et al. 1981) have conducted a cultural resource assessment of the Fort Stewart Military Reservation including a review of prehistoric through modern settlement and land use patterns within the 280,000-acre tract.

The prehistoric cultural sequence for coastal Georgia is well documented and discussed in detail by Waring (1969), Caldwell (1952), DePratter and Howard (1977) and most recently by Millet, et al., (1981). The following is a brief description of the prehistoric culture sequences of the research area.

The earliest documented occupation of the Georgia coast is dated 2500 B.C. and is identified as the St. Simons I phase of the Late Archaic. Due primarily to fluctuations in sea level, habitation sites from earlier cultural periods have yet to be identified. It is assumed by most researchers (DePratter and Howard 1977; Miller, et al., 1981; Pearson and Pearson 1978) that Paleo-Indian hunters inhabited the Georgia coast 10,000 to 20,000 years ago.

While there is little supporting evidence, the Paleo-Indian hunters were probably followed by Early and Middle Archaic Period (8,000 to 3,000 B.C.) hunter-gatherers whose technology probably evidenced an increasing diversity in lithic tools and reliance on plant, vegetal, and marsh-estaurine resources.

The St. Simons phase marks the technological transition of the production of fibertempered pottery. This phase is also characterized by an almost total dependence on salt marsh-estuary resources including a variety of shellfish (DePratter 1976). According to DePratter (1976) and Pearson and Pearson (1978) known St. Simons sites generally consist of extensive shell middens located in or adjacent to salt marshes.

The Woodland Period of coastal Georgia begins with the Deptford phase (600 B.C. to A.D. 600) and continues with the Wilmington - St. Catherines phases A.D. 600 to A.D. 1150). Deptford phase pottery is sand tempered and decorated with various stamped design motifs. Wilmington - St. Catherines ceramics are predominantly clay tempered with a cord-marked surface treatment (Pearson and Pearson 1978:14).

Woodland Period occupations tend to be located near or adjacent to salt marshes and evidence more dispersed shell middens than their Late Archaic predecessors. The Woodland Period peoples continued to rely heavily on shellfish and were the earliest builders of burial mounds in coastal Georgia. These mounds "are generally constructed of sand, often with shell inclusions" and "a variety of artifacts are often interred with burials". (Pearson and Pearson, 1978:14).

The Mississippian Period in coastal Georgia is represented by the Savannah phase (A.D. 1350) and the Irene phase (A.D. 1350 to A.D. 1550). Savannah phase ceramics evidence a reintroduction of sand tempered ceramics with stamped, cord marked and plain exterior decoration. Savannah phase sites continue to exhibit burial mounds with additional cultural elaboration in the form of rectangular platform or temple mounds.

Irene phase ceramics continue to be sand tempered with the primary surface decoration consisting of a "filfot cross" stamp design. A probable population

increase and dispersed settlement pattern is evident during this phase in that "Irene phase sites occur in far greater numbers than any other prehistoric sites on the middle and northern Georgia coast". (Pearson and Pearson, 1978:15) Other characteristics of Irene occupation areas include a continued construction of burial and temple mounds, heavy reliance on marsh-estuary resources, and an emerging use of domesticated corps. (Larsen, 1970)

The Early Contact Period (A.D. 1580 to A.D. 1733) represents that era when aboriginal populations were initially contacted and influenced by Europeans. At the time of contact much of coastal Georgia was inhabited by the Muskhogean-speaking Guale. The Guale were probably the descendents of the prehistoric Irene people and are also represented archeologically at historic Altamaha phase sites.

During the Early Contact Period prehistoric aboriginal ceremony and technology is evident with increasing European influence through time. Early Contact ceramics continued to be sand tempered but often have European-like surfaces designs and shapes. Caldwell (1972) and Cook and Pearson (1973) report that sites and burials from this time period often yield Spanish ceramics, metal goods, and trade beads.

History

European contract in the coastal Georgia area began in the sixteenth century when the Spanish Government claimed all coastal plain territories south of the Savannah River. To exercise control over these territories, a series of missions were established from the St. Johns River in Florida along the Georgia coast to Parris Island near Beaufort, South Carolina.

In 1733, the colony of Georgia was formed when several Creek Indian "micos" or headmen entered into a treaty with General James Oglethorpe. The Creek Nation ceded all of the lands between the Savannah and Altamaha Rivers extending inland as high as the tide flows (including all barrier islands except Ossabaw, St. Catherines and Sapelo).

During the course of Colonial exploration and expansion, forts and settlements were established along the mainland and islands in the coastal area. Since the exploration of the coastal area was achieved in part by using water routes, several significant historic sites are along the AIWW. Of these sites, Fort Pulaski National Monument (located on Cockspur Island) and Fort Frederica National Monument (located on St. Simons Island) are listed in the National Register of Historic Places.

Dredging and disposal of sediments from the AIWW has been an ongoing process since 1896. It is important to note that the first Federal legislation concerning cultural resources was the Antiquities Act of 1906. While the Federal government has evidenced concern for significant cultural resources since the 1906 Act and the National Historic Preservation Act of 1966, it was not until the passage of the Archeological and Historic Preservation Act of 1974 that agencies were directed to identify and mitigate the affects of activities such as the disposal of dredged sediments on significant cultural resources.

Considering the above facts, it is difficult to assess the effects of disposing dredged materials on significant archeological or historic sites. Most of the known sites along the AIWW have been identified long since the advent of maintenance dredging. There are certainly sites which have been disposed on that were previously unrecorded. Since there is no information concerning the buried sites, it is impossible to assess the affects of the disposal materials. However, in accordance with Federal laws and regulations, in those areas to be used as future disposal sites significant cultural resources will be identified, evaluated, and any adverse impacts will be avoided or mitigated.

ECONOMICS.

Commercial and recreational fishing boats make extensive use of the waterway. These vessels, plus touring pleasure craft, make up the overwhelming proportion of waterway users. The total number of vessel trips (includes northbound, and southbound movements of vessels) on the waterway for 1980 was 24,614. In 1971, the total annual commercial tonnage moved was 1,018,192 tons. In 1979, the total annual tonnage was 844,659 tons. (See table 3).

MAINTENANCE DREDGING ON THE AIWW

Since the waterway as we know it today was completed in 1941 and almost all disposal areas currently used were acquired 1939 - 1940, our study of the maintenance of the Atlantic Intracoastal Waterway will focus on the period of Fiscal Years 1942 - 1980. A Fiscal Year (until 1977) ran from 1 July - 30 June. For instance, FY 42 would be 1 July 1941 - 30 June 1942. After 1977, a fiscal year runs from 1 October - 30 September.

Table 4 shows the amounts of dredged material that have been removed from the AIWW during maintenance operations for FY 1942 - 1977. Dredging during this period was performed each fiscal year with the exception of FY 75, 62, 61, 59, 58, 57, 55 and 54. From FY 42 - 50, all work was performed by Government plants, and the remainder of the maintenance was performed by contract dredge. Most of the yardage removed was determined by a review of the contract for each dredging operation. For those years where Government plants performed the job, records kept in the District office were consulted. For most years both "credited" and "gross" yardages were available. The credited amount is the exact amount of yardage that the Government pays for, while gross yardage is the credited plus any material removed from outside of the specified dredging prism. While the Government does not pay for the removal of material outside of the channel limits, this practice is allowed due to inaccuracies in the dredging process. The contractor has no way to tell when he has exactly achieved the authorized project depth of 12 feet mean low water. Subsequently, some material outside of the dredging prism will be removed to insure that the requirements of the contract are met since it would be extremely costly for the contractor to return to a site.

If a contract calls for advanced maintenance in a particular section of the waterway, it simply means that the contractor will achieve the project depth of 12 feet plus a specified depth below the authorized depth (usually 3

Table 3

Comparative Statement of Traffic

Year	Tons	Passengers
1971	1,018,192	40
1972	1,352,763	96
1973	1,235,784	146
1974	1,231,890	25,900
1975	901,101	54,878
1976	1,067,671	48,470
1977	975,078	43,206
1978	926,702	46,782
1979	816,504	25,960
1980	844,659	37,734

SOURCE: Waterborne Commerce of the United States - 1980

TABLE 4
AIWW MAINTENANCE DREDGING

FY	Credited	Gross	Percent Overdredging
1942	1,167,401	1,680,474*	--
1943	3,597,875	5,179,141*	--
1944	3,425,808	4,931,451*	--
1945	1,408,130	2,027,003*	--
1946	1,332,569	1,918,233*	--
1947	1,032,476	1,486,249*	--
1948	1,922,576	2,767,548*	--
1949	3,866,455	5,565,762*	--
1950	69,651	100,262*	--
1951	1,036,560	1,492,128	43.95
1952	1,085,701	1,194,652	10.04
1953	1,644,637	1,832,696	11.43
1954	no dredging	no dredging	--
1955	no dredging	no dredging	--
1956	590,779	959,706	62.45
1957	no dredging	no dredging	--
1958	no dredging	no dredging	--
1959	no dredging	no dredging	--
1960	1,501,536	2,295,288	52.86
1961	no dredging	no dredging	--
1962	no dredging	no dredging	--

TABLE 4 (continued)

FY	Credited	Gross	Average Percent Overdredging
1963	2,295,307	3,339,734	45.50
1964	837,860	1,313,827	56.81
1965	1,184,060	1,969,978	66.37
1966	184,506	265,127	43.70
1967	922,660	1,504,946	63.11
1968	529,339	709,434	34.02
1969	690,550	1,098,611	59.09
1970	488,415	769,047	57.46
1971	962,544	1,471,246	52.85
1972	1,050,317	1,303,760	24.13
1973	287,116	358,138	24.74
1974	1,668,953	2,209,956	32.42
1975	no dredging	no dredging	--
1976	649,482	860,757	32.53
1977	1,198,232	1,511,764	26.17
1978	1,468,054	2,203,311 *	--
1980	376,678	457,699 *	
Totals	38,476,227	54,787,928	
Average Per year	1,241,169	1,767,675	

* Estimated

feet) and 2 feet allowable overdepth. This is only practiced in those sections of the waterway where siltation occurs at a very rapid rate.

For those years where gross yardage was not available, it was estimated. The estimation was made by determining the average percent of overdredging in those years where gross yardage was ascertained and applying it to the credited yardage. This estimation is felt to be fairly accurate.

Since the AIWW within Savannah District is quite long (161 miles), the waterway has been divided into various sections to facilitate discussion. Each section of the waterway is discussed in regard to its shoaling areas and rate, maintenance requirements and disposal areas. Table 5 shows various dredging data for each section of the waterway that has required maintenance. Numerous disposal areas are located along the Atlantic Intracoastal Waterway. A description of these disposal sites is provided in table 6 while their location can be determined by referring to Figures 2 - 18. Disposal areas that were utilized during a particular dredging operation were determined by a review of contract drawings. When contract drawings were not available, the waterway mileages of the work were checked and subsequently the sites determined.

EFFECTS OF MAINTAINING DREDGING

As shown in table 5, over 54 million cubic yards of dredged material have been removed from the AIWW between FY 1942 and 1977 during maintenance dredging operations. Most of the material has been deposited in undiked marsh areas adjacent to the waterway.

This type of disposal involves placing the discharge line on a previously formed mound. The heavier material (sand) settles on and around the mound while the finer particles (silts and clays) filter through the marsh. The fines either are eventually trapped in the marsh or filter out or enter finger streams or creeks down slope of the mound. Some of the material probably also reenters the dredging area.

During its maintenance dredging coordination procedures, Savannah District has received numerous comments that this type of dredged material disposal should be stopped and alternatives implemented because of damage occurring gradually to the salt marsh. As more material is pumped onto the mounds, the mounds no longer support the predominant wetland plant along the AIWW, salt marsh cordgrass (Spartina alterniflora).

Although there is no doubt that some wetland vegetation has been altered along the AIWW as a result of disposal operations, Savannah District has maintained that this method of disposal is not as environmentally damaging as many parties have asserted, and in some cases where hammocks form, a net positive benefit is realized. It was this District's opinion that some of the suggested alternatives (e.g. diking of wetland areas) would be more environmentally destructive that the current method of disposal.

A thorough analysis of the changes in the salt marsh that have resulted from maintenance dredging was undertaken. Color infrared photography was obtained to cover the AIWW and all disposal areas adjacent to the waterway.

TABLE 5

CUBIC YARDS REMOVED BY WATERWAY

AIWW 1942 - 1980

Waterway	Credited	Gross	No. of Dredging Occasions	Average Frequency of Dredging	Year Last Dredged	Average Quantity - Gross
Ramshorn Creek, SC	276,696	397,021	3	13 years	1980	132,340
Walls Creek, SC	157,150	214,914	4	10 years	1980	53,729
Fields Cut, SC	1,149,742	1,596,455	11	3 years	1977	145,132
Elba-McQueens Cut, GA	891,658	1,258,825	8	5 years	1980	151,373
St. Augustine Creek, GA	828,751	1,261,309	11	3 years	1972	114,664
Wilmington River, GA	9,478,149	13,567,713	19	2 years	1978	714,090
Skidaway River, GA	214,907	309,358	2	18 years	1943	154,679
Skidaway Narrows, GA	47,477	68,344	2	18 years	1945	34,172
Hell Gate, GA	2,587,886	3,562,291	20	2 years	1980	178,115
Florida Passage, GA	253,797	363,562	5	7 years	1977	72,712
Bear River, GA	212,329	310,767	4	9 years	1977	79,172
North Newport River, GA	53,195	67,110	1	36 years	1964	67,110
Johnson Creek, GA	547,385	797,422	2	18 years	1974	398,711
Front River, GA	57,059	82,136	2	18 years	1944	41,068
Creighton Narrows, GA	2,041,021	2,933,443	11	3.5 years	1978	266,677
Old Teakettle Creek, GA	112,840	162,433	1	36 years	1943	162,433
Doboy Sound, GA	541,115	834,752	9	4.5 years	1978	92,750
North River Crossing, GA	146,044	204,482	4	9 years	1977	51,120
Rockedundy River, GA	686,091	988,147	7	5 years	1949	141,164
South River, GA	864,382	1,196,873	16	2.5 years	1980	74,805
Little Mud River, GA	1,642,825	2,381,542	12	3 years	1977	198,462
Altamaha Sound, GA	1,346,047	1,746,771	16	2.5 years	1978	121,690

TABLE 5 (continued)

Waterway	Credited	Gross	No. of Dredging Occasions	Average Frequency of Dredging	Year Last Dredged	Average Quantity - Gross
Buttermilk Sound, GA	2,915,737	4,029,790	20	2 years	1978	201,490
Mackay River, GA	85,752	123,440	2	18 years	1946	61,720
St. Simon Sound, GA	221,341	313,780	3	12 years	1969	104,593
Jekyll Creek, GA	10,063,336	14,373,590	23	1.5 years	1978	624,939
Cumberland Sound, GA	154,709	226,286	3	12 years	1965	75,429
Back River, GA	59,251	85,292	1	36 years	1944	85,292
Plantation Creek, GA	31,079	44,738	1	36 years	1944	44,738
Umbrella Creek, GA	301,148	464,289	9	4 years	1977	51,588
Floyd Creek, GA	42,013	68,159	2	18 years	1977	34,079

TABLE 6
DISPOSAL AREAS
AIWW - SAVANNAH DISTRICT

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
Ramshorn 3	Ramshorn Creek mile 568	undiked 278 acres	Spoil Disposal Perpetual Easement State of South Carolina	FY 44, 66, 80
No. 2	Walls Cut mile 572	undiked 58.6 acres	Spoil Disposal Perpetual Easement State of South Carolina	FY 42, 43, 64, 80
No. 1	Fields Cut mile 573.5	diked on front side 480 acres	Spoil Disposal Perpetual Easement State of South Carolina	FY 42, 43, 44, 45, 48, 60, 64, 68, 72, 74, 77
1-A-1	Elba Cut mile 576.5	undiked 38.7 acres	Spoil Disposal Easement Estates of Fred Wessels and F. H. Opper	FY 48, 53, 63, 70, 74, 80
A	McQueens Cut mile 577.5	undiked 184.59 acres	Use permit - National Park Service Terminated May 1, 1953	FY 53, 63
1-A	South Channel mile 579	undiked 204.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
2-A	St. Augustine Creek & Wilmington River mile 579	undiked 45 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 44, 45, 46, 48, 49, 60, 63, 65
2B-3A	St. Augustine Creek & Wilmington River mile 579.5	diked 155.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 60, 63, 65, 67, 68, 70, 72

TABLE 3 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
5-A	Wilmington River mile 581	undiked 128.7 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 60, 63, 65, 67, 68, 70, 72
5-B	Wilmington River mile 581.5	undiked 37.4 acres	Spoil Disposal Perpetual Easement City of Savannah, Georgia	FY 44, 47, 48, 51, 63, 65
7-A	Wilmington River mile 582.5	undiked 52.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 47, 48, 51, 63, 65
8-A	Wilmington River mile 583	undiked 46.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 45, 47, 48, 51, 63, 72
9-A	Wilmington River mile 584	undiked 133.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 45, 47 48, 51, 63, 68, 80
9-B	Wilmington River mile 584	undiked 126 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
10-C	Wilmington River mile 585	undiked 57.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
11-K	Skidaway River mile 590	diked on north side, partial dike on south side 24.7 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43

TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
11-L	Skidaway River mile 590	diked on one side 39.6 acres	Spoil Disposal Perpetual Easement Florida S. Tideman, et. al.	FY 42, 43,
11-H	Skidaway River mile 591	undiked 19.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
11-B	Skidaway Narrows mile 591.5	undiked 48.8 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 44, 45, 74
12-A	Skidaway Narrows, mile 592.5	undiked 67.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
13-A	Skidaway Narrows mile 594	undiked 162.1 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
14-A	Skidaway Narrows mile 594	undiked 44.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
14-B	Burnside River mile 595	undiked 32.8 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
15-A	Hell Gate mile 601	undiked 109 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 45, 46, 48, 49, 53, 60, 63, 64, 65, 66, 68, 70, 74

TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
15-B	Hell Gate mile 601	undiked 66.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 45, 46, 48, 49, 53, 60, 63, 64, 65, 66, 68, 70, 72
16-A	Florida Passage mile 608	undiked 131 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 63, 66, 74, 77
17-A	Bear River mile 611	undiked 244.7 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 63, 66, 77
805 E-2	North Newport River mile 622.5	undiked 77.4 acres	10-year spoil disposal easement. Estate of Edward J. Noble - terminated March 30, 1974	FY 64
805 E-1	North Newport River mile 623	undiked 103.6 acres	10-year spoil disposal easement. Estate of Edward J. Noble - terminated March 30, 1974	FY 64
19-A	Johnson Creek mile 624	undiked 97.8 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 74
20-A	Johnson Creek mile 625	undiked 71.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 74
21-A	Johnson Creek mile 626	undiked 34.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance

TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
24-A	Front River and Creighton Narrows mile 641	undiked 128.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 46, 49, 71, 74
25-A	Creighton Narrows mile 642	diked on all sides except front 104.2 acres	Spoil Disposal Perpetual Easement E. G. & H. M. Atwood	not used for maintenance
25-C	Creighton Narrows mile 642	undiked 133.8 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 49, 63, 67, 71, 74, 77
25-E	Creighton Narrows mile 642.5	undiked 43.13 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 44, 63, 77, 80
26-A	Old Teakettle Creek mile 643	diked on all sides except front 31 acres	Spoil Deiposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43
27-A	Old Teakettle Creek mile 644.5	undiked 80.2 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43
27-B	Old Teakettle Creek mile 645	undiked 101.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
28-A	Doboy Sound mile 648	undiked 155.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
Dumping Area 28	mile 649.5	open water		FY 43, 46, 49, 63, 67, 70, 74, 77

TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
29-A	North River Crossing - mile 652	undiked 158.3 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
29-D	North River mile 652	undiked 65.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
29-C	North River mile 652	undiked 92.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 52, 56, 63, 65 67, 70
29-B	North River mile 652.5	undiked 120 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 65, 70, 73, 77
30-A	Rockedundy River & South River mile 653	undiked 230.1 acres	Spoil Deiposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 45, 46, 47, 49, 52, 56, 63, 65, 67, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 80
30-B	South River and Little Mud River mile 653.5	undiked 353.4 acres	Georgia Dept. of Natural Resources terminated July 9, 1973	FY 63, 65, 67, 68
32-A	Little Mud River and Altamaha Sound mile 654	undiked 228.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 44, 49, 63, 65, 67, 68, 70, 71, 73, 74, 76, 77, 78, 80
31-A	Altamaha Sound mile 655.5	undiked 80.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	Fy 63, 69
31-B	Altamaha Sound mile 655.5	undiked 125 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance

TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
Dumping Area 32	Altamaha Sound mile 656	open water		FY 74
Dumping Area 34	Altamaha Sound mile 657	open water		FY 65, 71
34-A	Altamaha Sound mile 657.5	undiked 80.9 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 65, 71, 78
36-A	Altamaha Sound mile 659	undiked 260.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 44, 46, 49, 60, 63, 67, 69, 71, 72, 74, 77, 78
42-C & adjacent dumping area	Buttermilk Sound mile 660.5	undiked 14.5 acres	Spoil Deiposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 63
42-B	Buttermilk Sound mile 662	undiked 65 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 53, 60, 63, 64 65, 69, 77
Dumping Area 42	Buttermilk Sound mile 662.5	open water (experimental marsh development site)		FY 44, 45, 46, 53, 60, 63, 64, 65, 69, 71, 72, 74
43-A	Buttermilk Sound mile 662.5	undiked 138.3 acres	Herman Goldman, et. al. terminated June 17, 1972	FY 42, 43, 44, 45, 46, 47, 52, 53, 56, 60, 67
Dumping Area 43	Buttermilk Sound mile 663	open water		FY 52, 53, 56, 60, 64, 67, 71, 72, 74, 78
Dumping Area 44	Buttermilk Sound mile 663.5	open water		FY 43, 45, 46, 52, 56, 64, 74, 78

TABLE 6 (continued)

Dredged Material Disposal Area No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
43-A	Buttermilk Sound mile 664	undiked 176.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 44, 45, 46, 47, 53, 60
44-A	Buttermilk Sound mile 666	undiked 76.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
45-B	Buttermilk Sound mile 666	undiked 167.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
45-C	Frederica River mile 667	undiked 59.5 acres	Spoil Deiposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
46-A	Mackay River mile 667.5	undiked 96.7 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 45
47-A	Frederica River alternate route	undiked 167.3 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
48-B	Mackay River mile 670.5	undiked 52.1 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
48-A	Mackay River mile 670.5	undiked 52.1 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not use for maintenance
48-A	Mackay River mile 671.5	undiked 59.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance

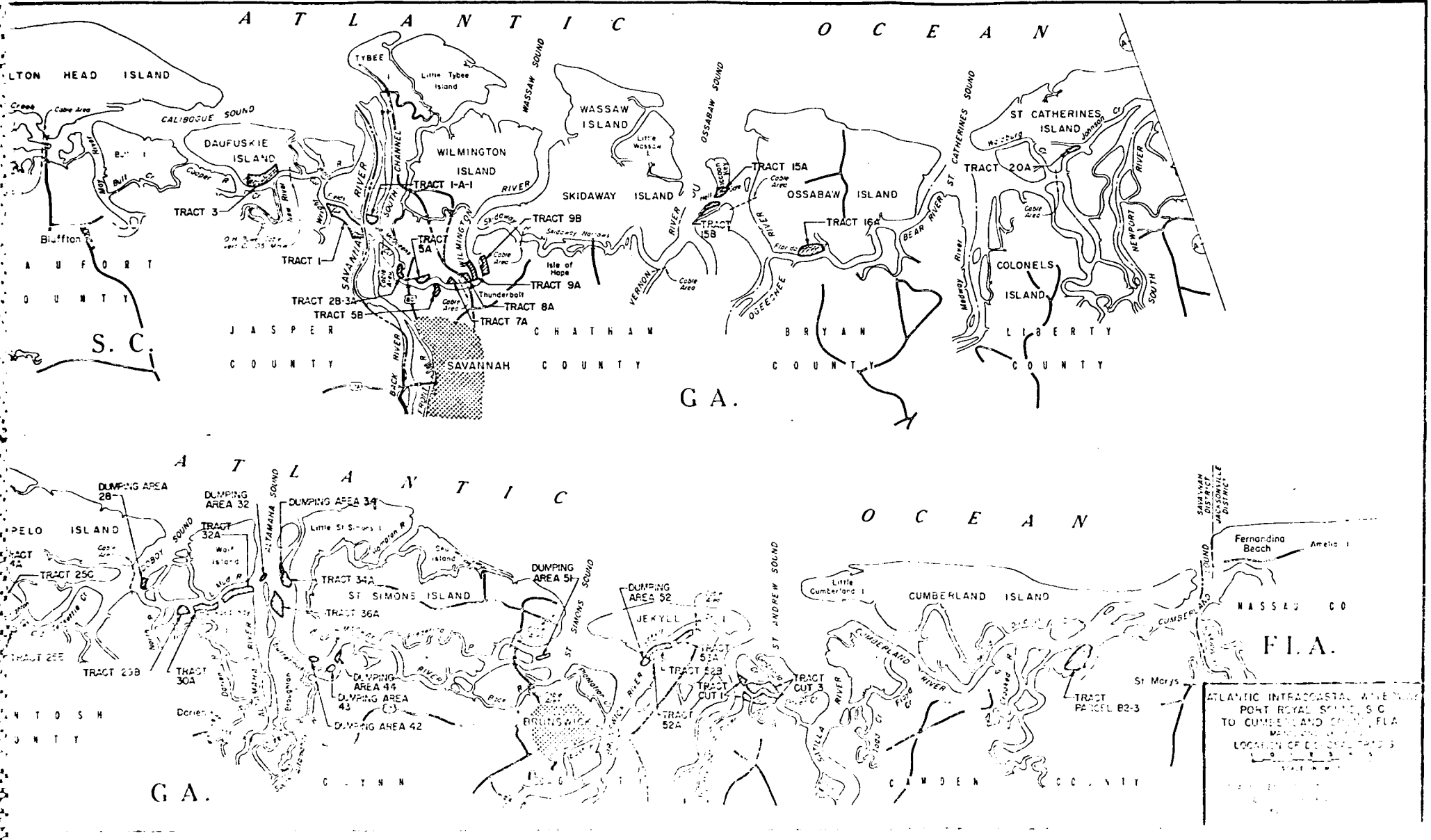
TABLE 6 (continued)

Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
49-B	Mackay Sound mile 672.5	undiked 103.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 46
49-C	Mackay River mile 673	undiked 66.2 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
49-A	Frederica River mile 674	undiked 69.5 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	not used for maintenance
51-A	St. Simon Sound mile 677	undiked 67.6 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 43, 63
Dumping Area 51	St. Simon Sound mile 677.5	open water		FY 43, 63, 69
Dumping Area 52	Jekyll Creek mile 682	open water - jetty on front side		FY 42, 43, 44, 45, 46, 47, 49, 53, 56, 60, 63, 64, 65, 67, 69, 71, 72, 74, 77
52-A	Jekyll Creek mile 682.5	undiked 115.7 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 45, 46, 47, 49, 56, 60, 63, 64, 65, 67, 69, 71, 72, 74, 77, 78
52-B	Jekyll Creek mile 683	jetty on front side - 95 acres	90-year easement Jekyll Island State Park Authority	FY 52, 53, 60, 71, 72, 74, 76, 78
53-A	Jekyll Creek mile 683.5	undiked 180.4 acres	Spoil Disposal Perpetual Easement Georgia Dept. of Natural Resources	FY 42, 43, 44, 45, 48, 49, 52, 53, 56, 63, 64, 65, 67, 69, 71, 72, 74, 76, 77, 78

TABLE 6 (continued)

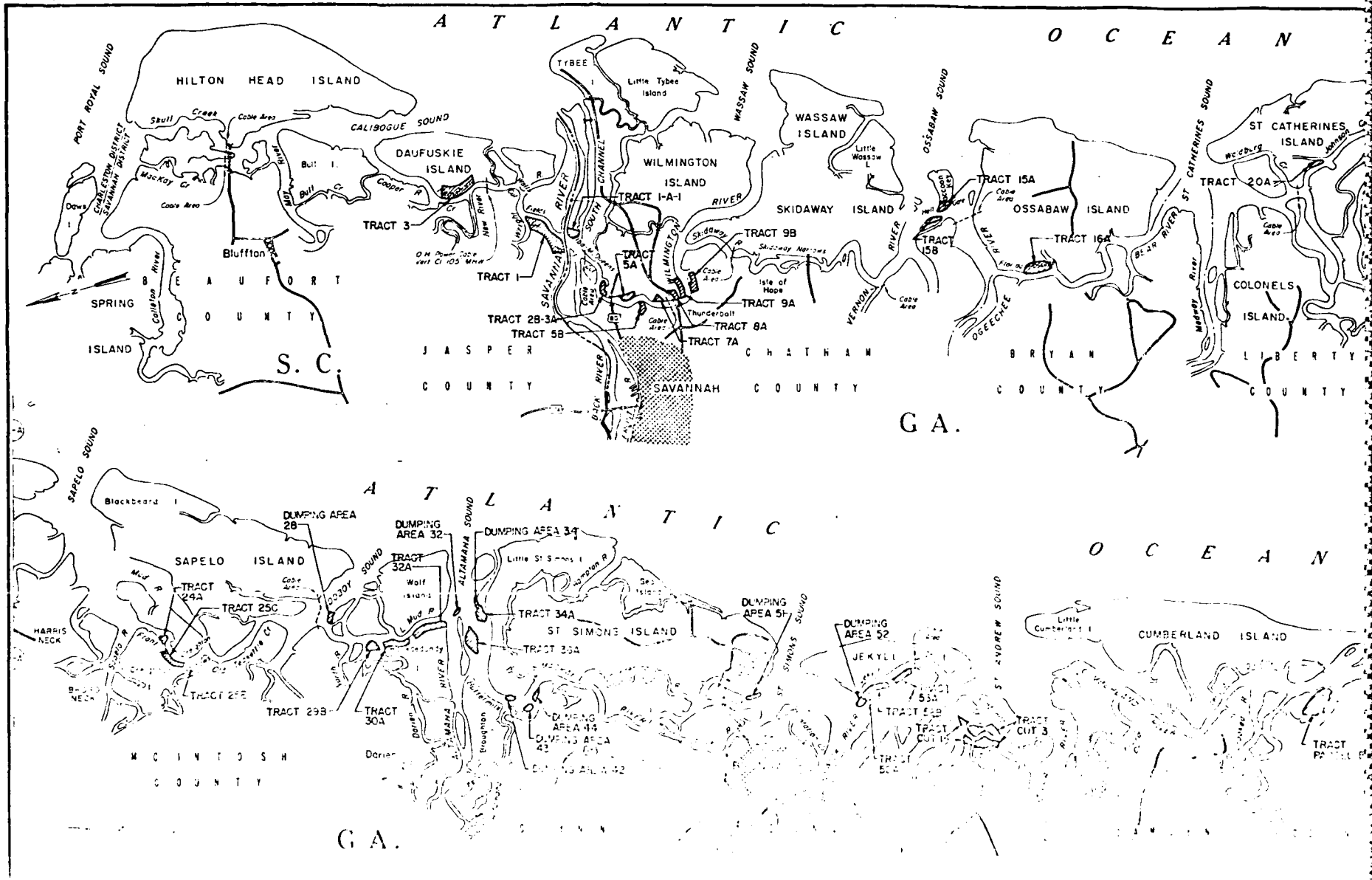
Tract No.	Waterway	Type & Size	Owner and Type of Easement	Years Used
Parcel 8-3	Cumberland Sound mile 705	diked 885.2 acres	Transferred to Dept. of the Army, Kings Bay on February 22, 1974	FY 42, 65
Parcel No. 1	Cumberland Sound mile 707	undiked 54.64 acres	Transferred to Dept. of the Army, Kings Bay on February 22, 1974	not used for maintenance
Parcel No. 5	Cumberland Sound mile 707	1,199.1 acres	Perpetual Spoil Disposal Use Permit Dept. of the Army, Kings Bay	not used for maintenance
Parcel No. 6	Cumberland Sound mile 708.5	undiked 139 acres	Perpetual Spoil Disposal Use Permit Dept. of the Army, Kings Bay	not used for maintenance
Parcel No. 7	Cumberland Sound mile 708.5	undiked 542.4 acres	Perpetual Spoil Disposal Use Permit Dept. of the Army, Kings Bay	not used for maintenance
Parcel No. 4	Cumberland Sound mile 710	undiked 492 acres	Transferred to Dept. of the Army, Kings Bay on February 22, 1974	
Tract Cut 1	Umbrella Creek alternate route	undiked 140 acres	Land Cut Right-of-Way Perpetual Easement Georgia Dept. of Natural Resources	FY 72
Tract Cut 3	Umbrella Creek alternate route	undiked 673 acres	Spoil Disposal Perpetual Easement R. B. Zachry, et. al.	Fy 47, 48, 49, 64, 67, 71, 72, 74, 77,

U S ARMY


A T L A N T I C O C E A N
LTON HEAD ISLAND
CALIBOGUE SOUND
DAUFUSKIE ISLAND
Bluffton
TRACT 3
TRACT 1
TYBEE
Little Tybee Island
WASSAW SOUND
WILMINGTON ISLAND
TRACT 1-A-1
SAVANNAH RIVER
SOUTH CHANNEL
WASSAW ISLAND
Little Wassaw I
OSSABAW SOUND
SKIDAWAY ISLAND
TRACT 9B
TRACT 5A
TRACT 9A
Isle of Hope
Thunderbolt
TRACT 8A
TRACT 7A
TRACT 28-3A
TRACT 5B
VERNON RIVER
TRACT 15A
OSSABAW ISLAND
TRACT 15B
TRACT 16A
OSSEECHEE
BEAR RIVER
ST CATHERINES SOUND
ST CATHERINES ISLAND
TRACT 20A
COLONELS ISLAND
NEWPORT RIVER
MEDWAY RIVER
A U F O R T
C O U N T Y
S. C.
J A S P E R
C O U N T Y
C H A T H A M
C O U N T Y
B R Y A N
C O U N T Y
L I B E R T Y
C O U N T Y
SAVANNAH
BACK RIVER
G A.
A T L A N T I C O C E A N
DUMPING AREA 28
DUMPING AREA 32
DUMPING AREA 34
TRACT 32A
TRACT 34A
ST SIMONS ISLAND
TRACT 36A
DUMPING AREA 51
DUMPING AREA 52
JEKYLL ISLAND
TRACT 52A
TRACT 53A
TRACT 53B
TRACT CUT 1
TRACT CUT 3
ST ANDREW SOUND
CUMBERLAND ISLAND
Little Cumberland I
CUMBERLAND RIVER
TRACT PARCEL 82-3
St Marys
Fernandina Beach
Amelia I
NASSAU CO
F L A.
TRACT 25C
TRACT 25B
TRACT 30A
DUMPING AREA 44
DUMPING AREA 43
DUMPING AREA 42
BRUNSWICK
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S C
TO CUMBERLAND SOUND, FLA
LOCATION OF DISPOSAL AREAS
A N T O S H
U N T Y
C A M D E N
C O U N T Y
G A.

2

CORPS OF ENGINEERS



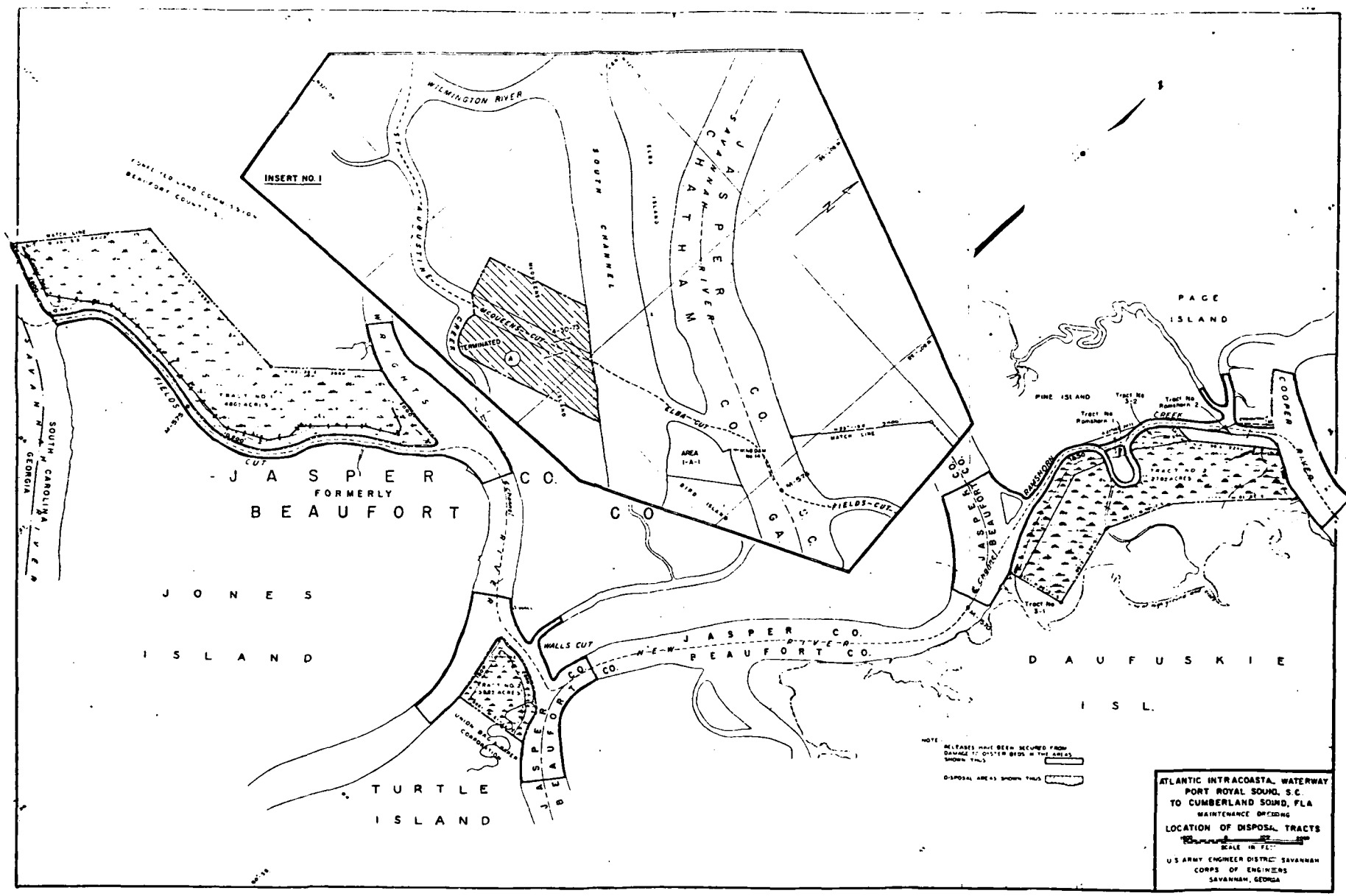

INSERT NO. 1
WILMINGTON RIVER
SAVANNAH RIVER
SOUTH CHANNEL
HOUSTON CREEK
MCQUEENS CUT
TERMINATED
ELBA CUT
FIELDS CUT
WALLS CUT
JASPER CO.
FORMERLY
BEAUFORT CO
BEAUFORT CO.
JONES ISLAND
TURTLE ISLAND
DAUFUSKIE ISL.
PAGE ISLAND
PINE ISLAND
COOPER RIVER
CRACKER CREEK
SAVANNAH RIVER
SOUTH CAROLINA
GEORGIA
NOTE
RELEASES HAVE BEEN SECURED FROM DAMAGE TO OYSTER BEDS IN THE AREAS SHOWN THUS
DISPOSAL AREAS SHOWN THUS
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
U.S. ARMY ENGINEER DISTRICT SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

FIGURE 3

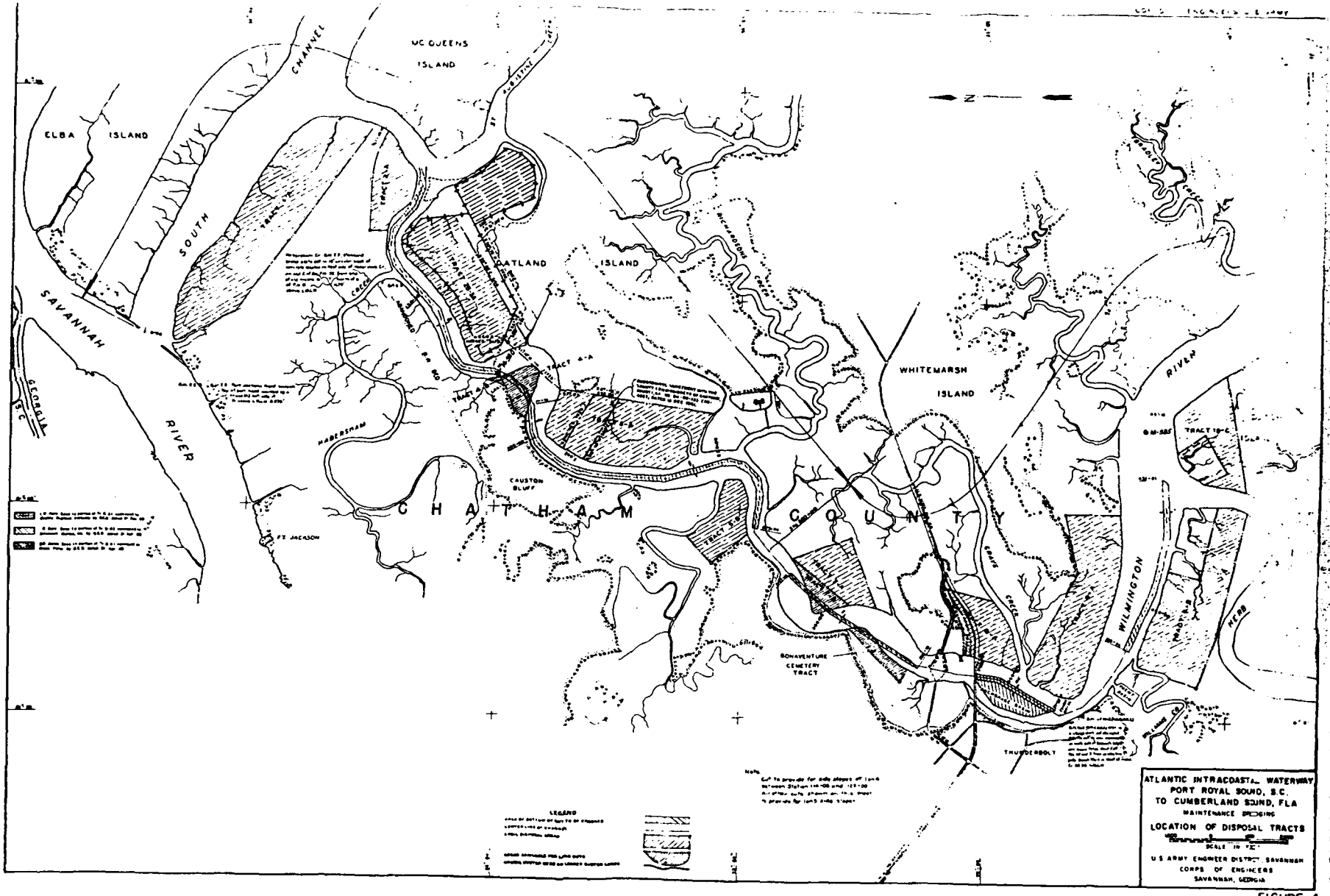

MC QUEENS ISLAND
ELBA ISLAND
SOUTH CHANNEL
SAVANNAH RIVER
GEORGIA S.C.
FT. JACKSON
HABERSHAM
CAUSTON BLUFF
C H A T H A M
C O U N T Y
WHITEMARSH ISLAND
WILMINGTON RIVER
BONAVENTURE CEMETERY TRACT
THUNDERBOLT
LEGEND
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
U.S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

FIGURE 4

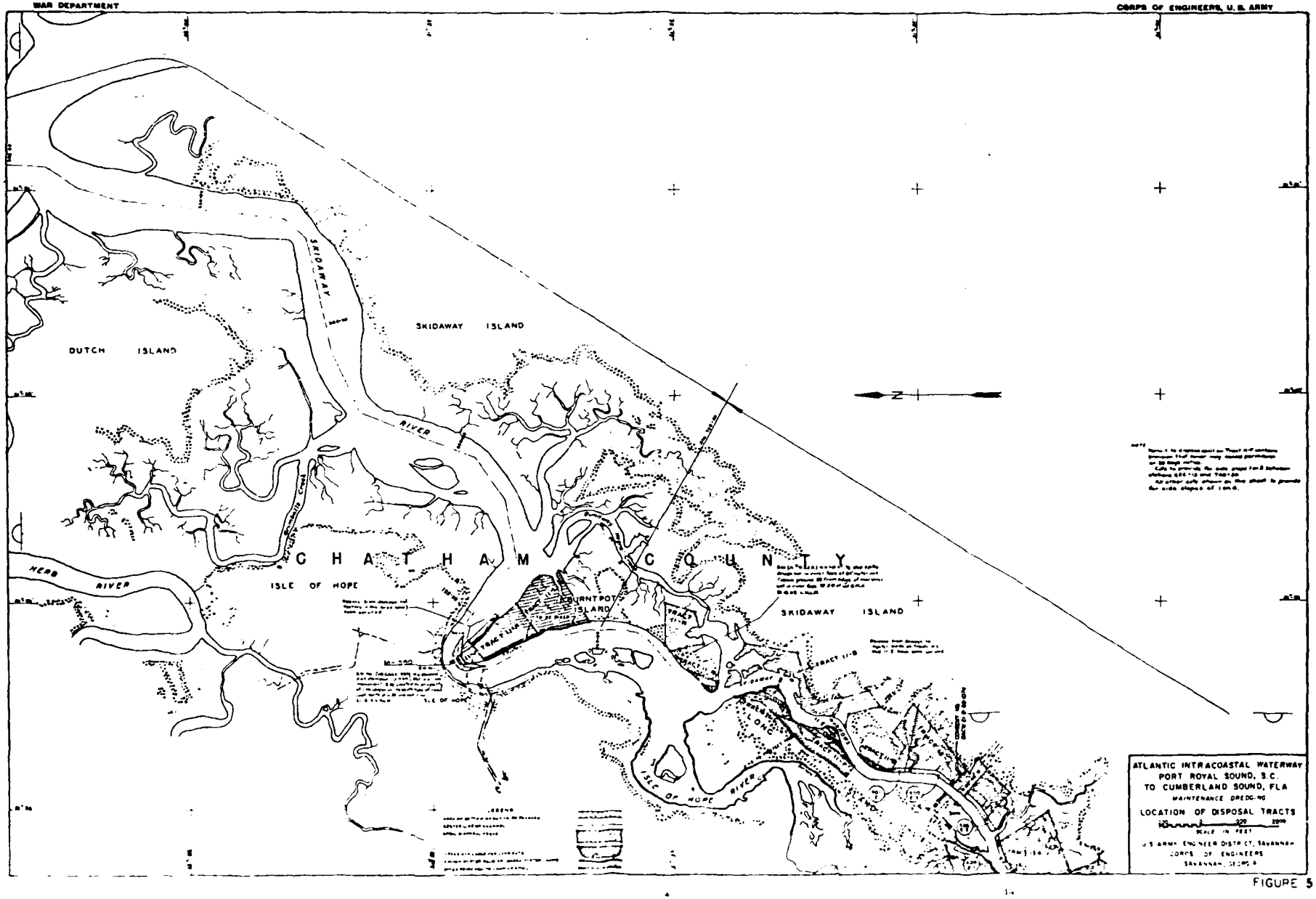

WAR DEPARTMENT
CORPS OF ENGINEERS, U.S. ARMY
SKIDAWAY ISLAND
DUTCH ISLAND
SKIDAWAY
RIVER
HERB RIVER
ISLE OF HOPE
C H A T H A M C O U N T Y
SKIDAWAY ISLAND
ATLANTIC INTRACOASTAL WATERWAY
PORT royal SOUND, S.C.
TO CUMBERLAND SOUND, FLA
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
U.S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS

FIGURE 5

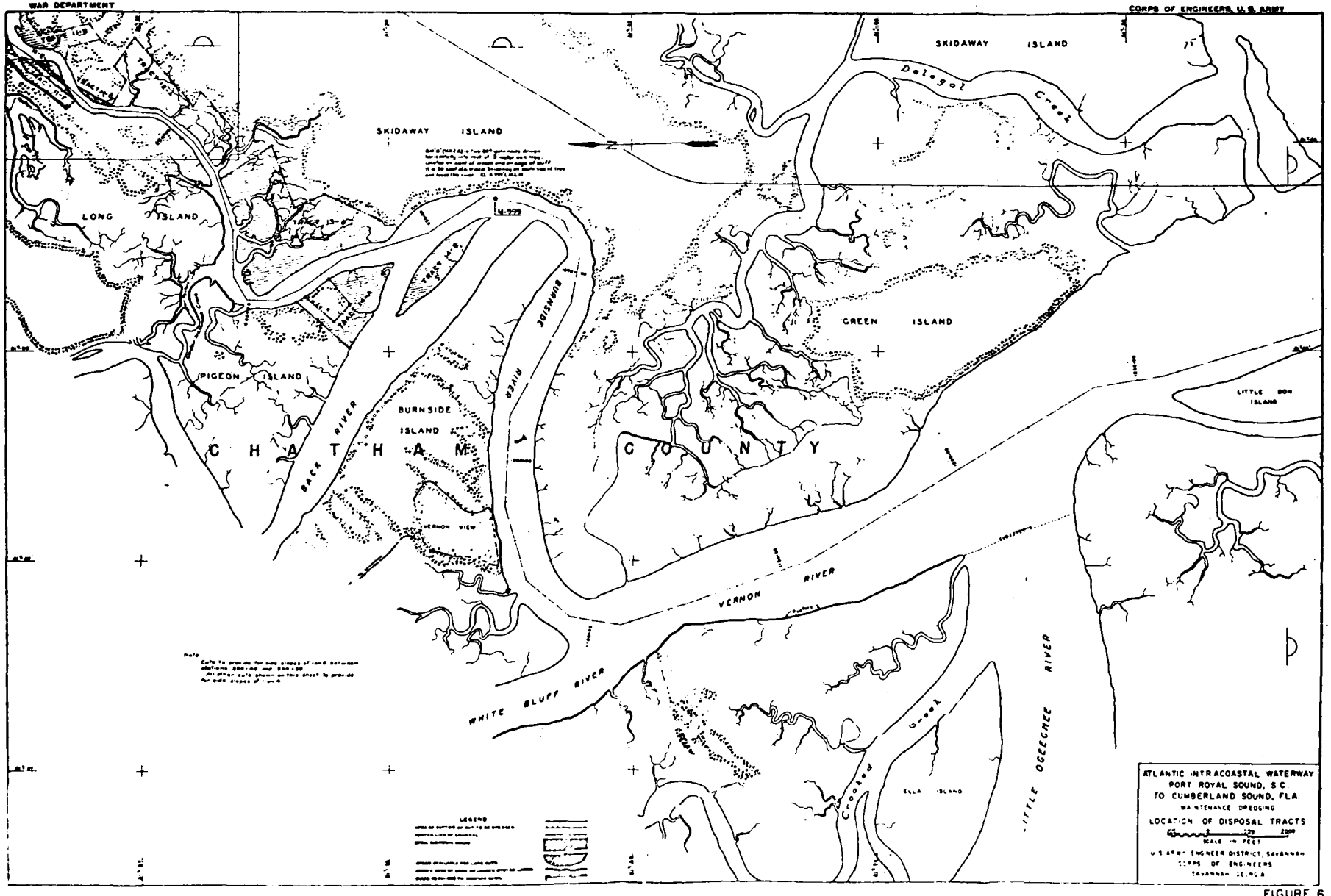

WAR DEPARTMENT
CORPS OF ENGINEERS, U.S. ARMY
SKIDAWAY ISLAND
Delegal Creek
LONG ISLAND
PIGEON ISLAND
BACK RIVER
BURNSIDE ISLAND
BURNSIDE RIVER
GREEN ISLAND
C H A T H A M
C O U N T Y
VERNON VIEW
VERNON RIVER
WHITE BLUFF RIVER
LITTLE OGEECHEE RIVER
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA.
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
SCALE IN FEET
U.S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

FIGURE 6

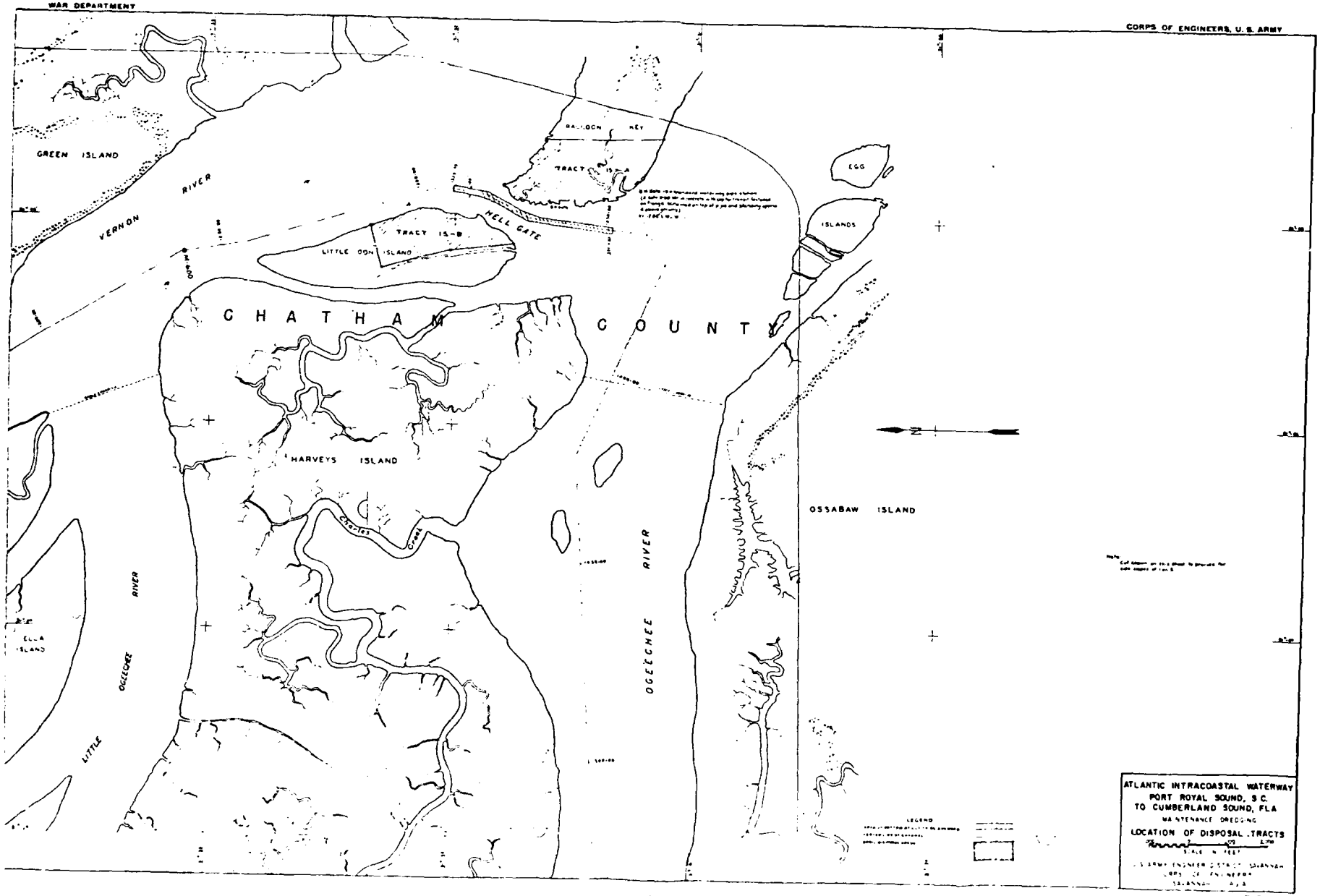

WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
GREEN ISLAND
VERNON RIVER
RAILROAD KEY
TRACT 15-A
EGG ISLANDS
HELL GATE
TRACT 15-B
LITTLE OON ISLAND
CHATHAM COUNTY
HARVEYS ISLAND
OSSABAW ISLAND
OGEECHEE RIVER
OGEECHEE RIVER
LITTLE ELLA ISLAND
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA.
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
LEGEND

FIGURE 7

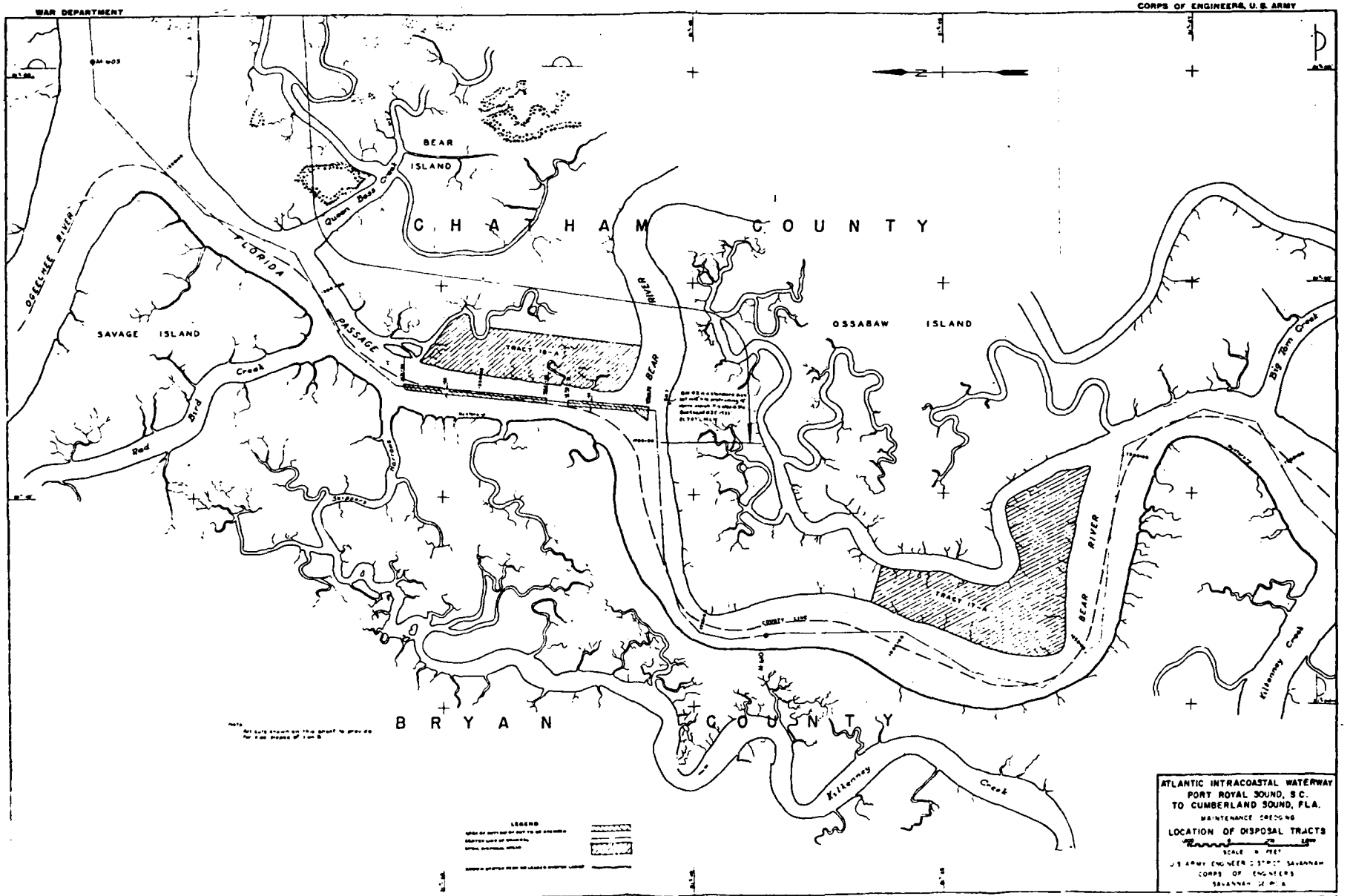

WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
BEAR ISLAND
CHATHAM COUNTY
OSSABAW ISLAND
SAVAGE ISLAND
FLORIDA PASSAGE
OSSABAW SOUND
Big Bam Creek
Red Bird Creek
Sweeper
BEAR RIVER
TRACT 10-A
TRACT 10-B
BRYAN COUNTY
Killarney Creek
LEGEND
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S.C.
TO CUMBERLAND SOUND, FLA.
MAINTENANCE DREDGING
LOCATION OF DISPOSAL TRACTS
SCALE IN FEET
U.S. ARMY ENGINEER DISTRICT SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GA.

FIGURE 9

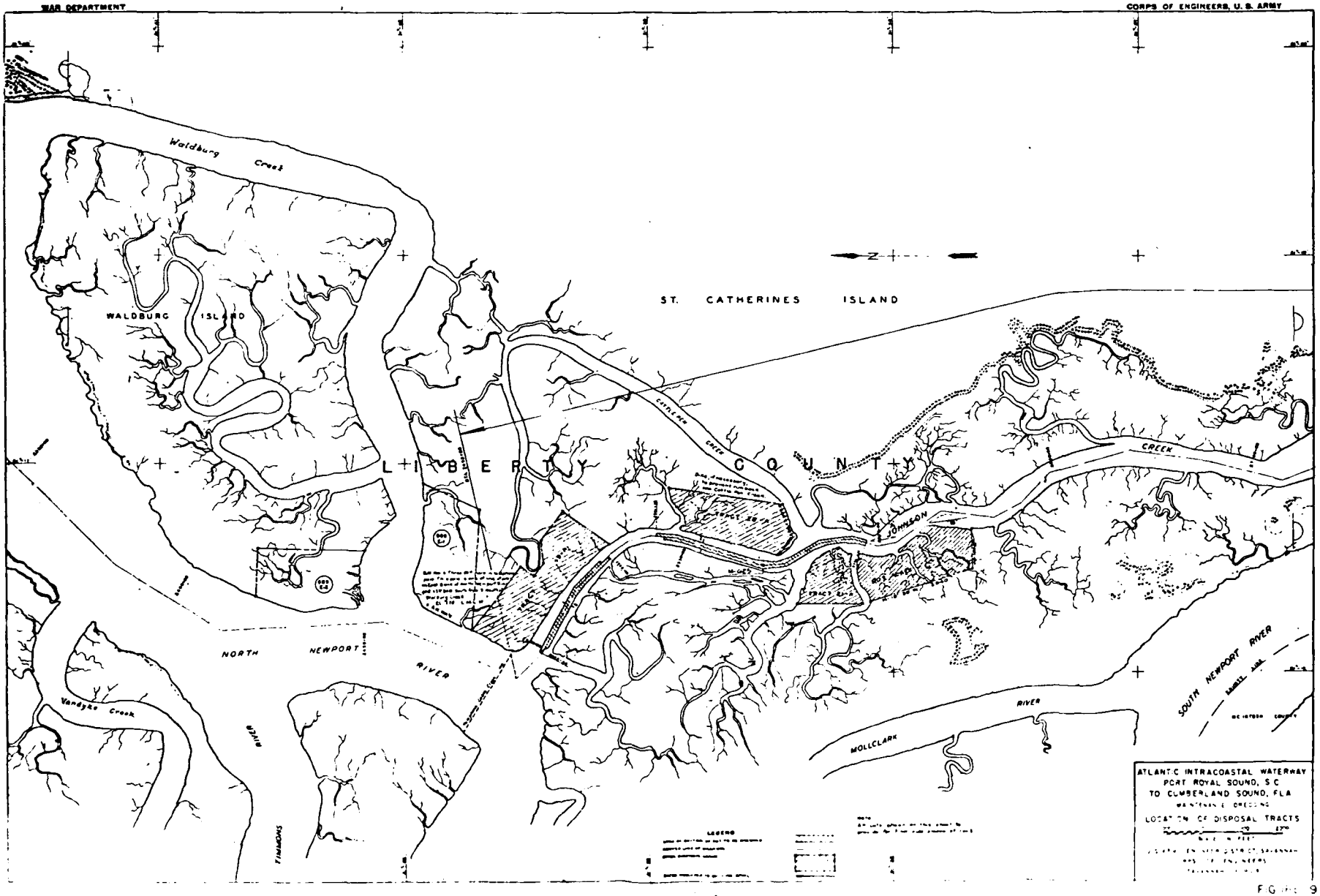
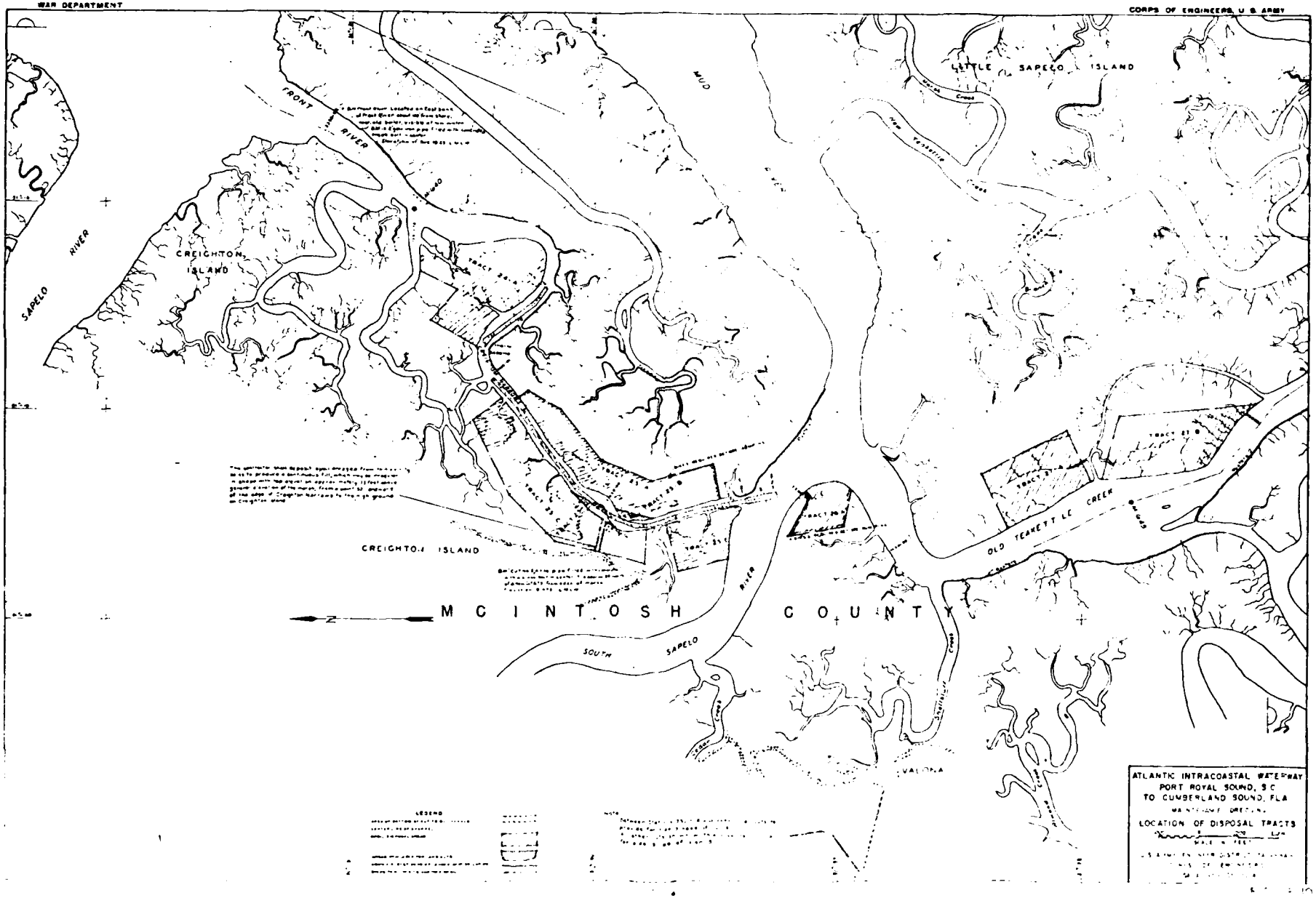
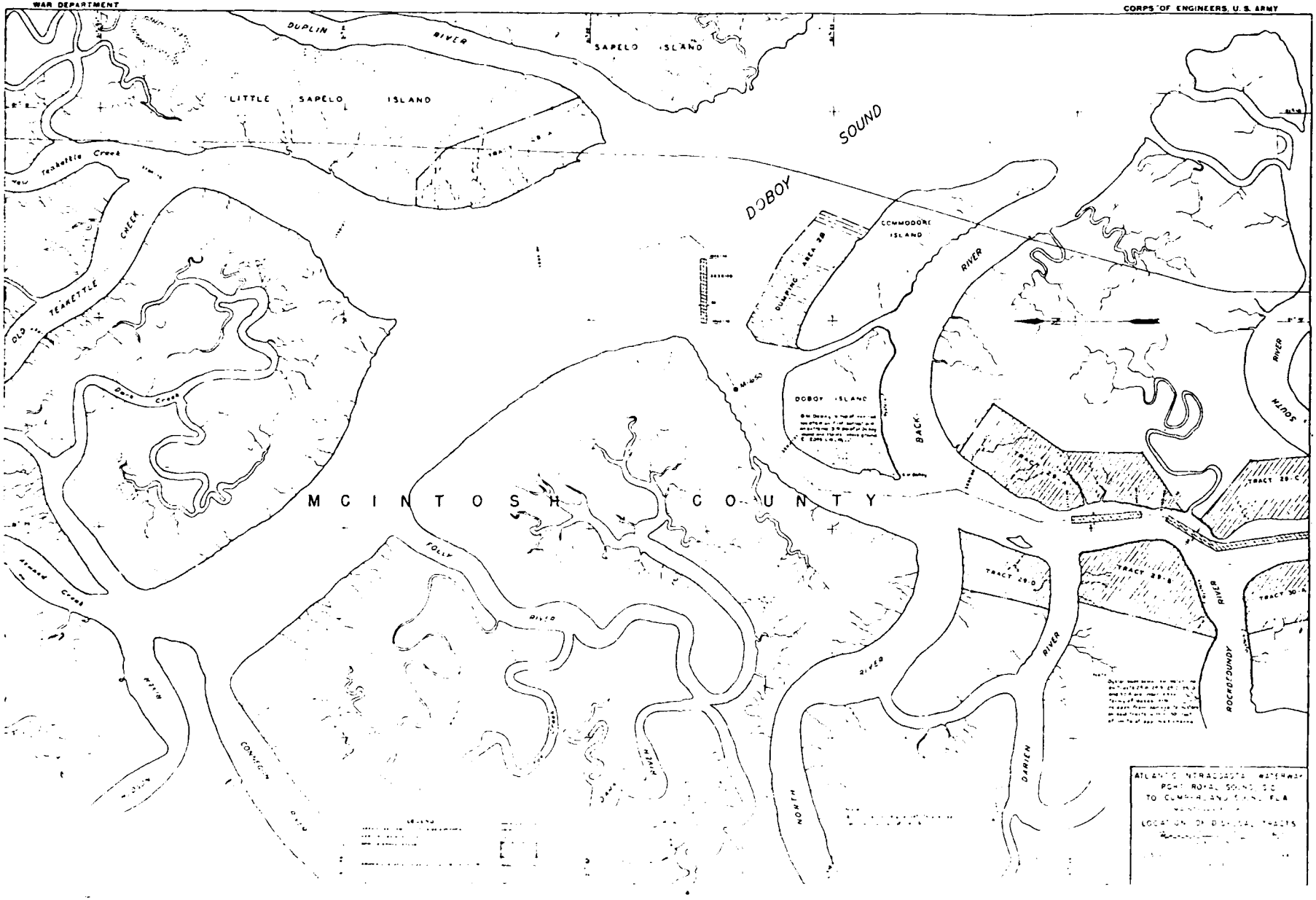
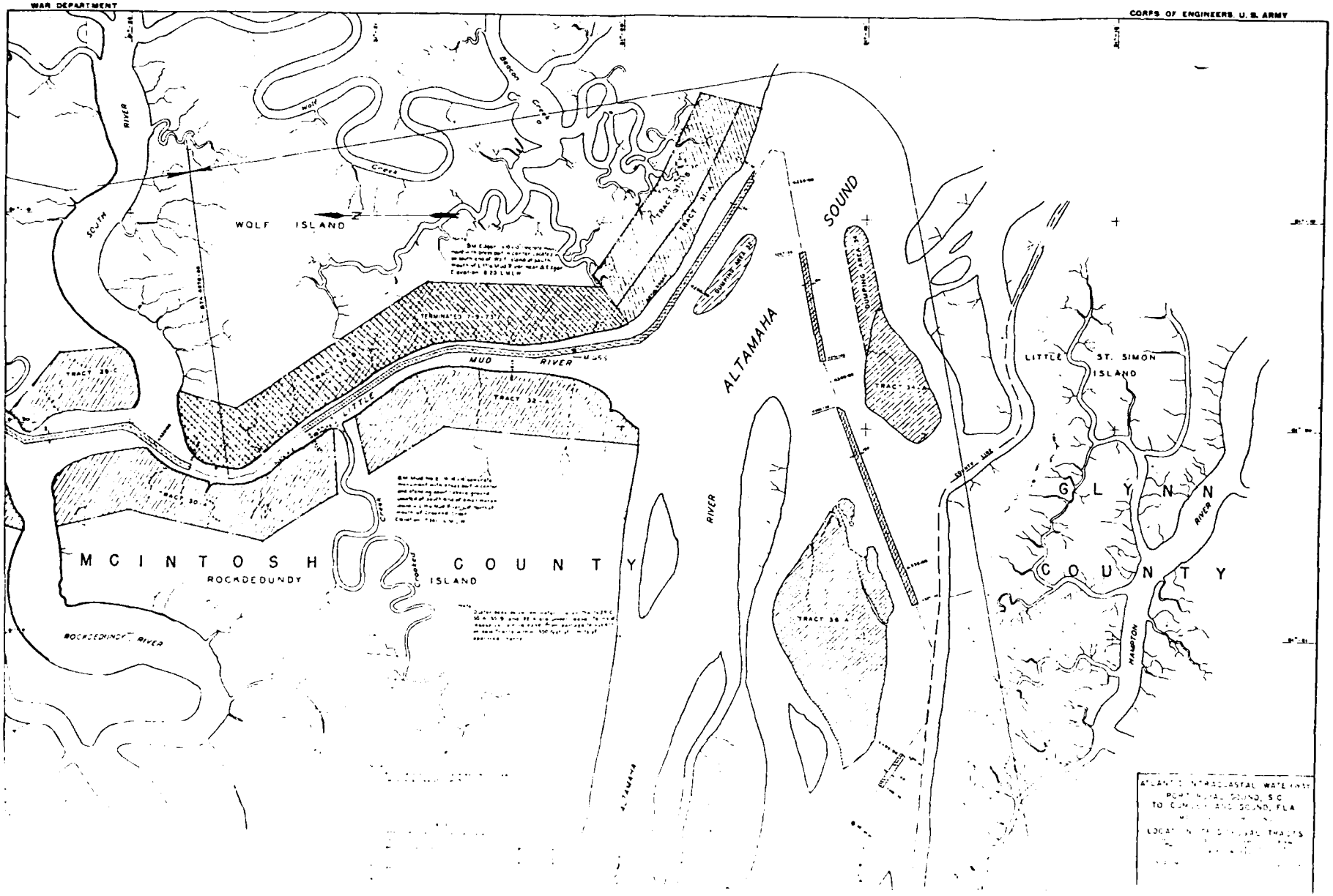
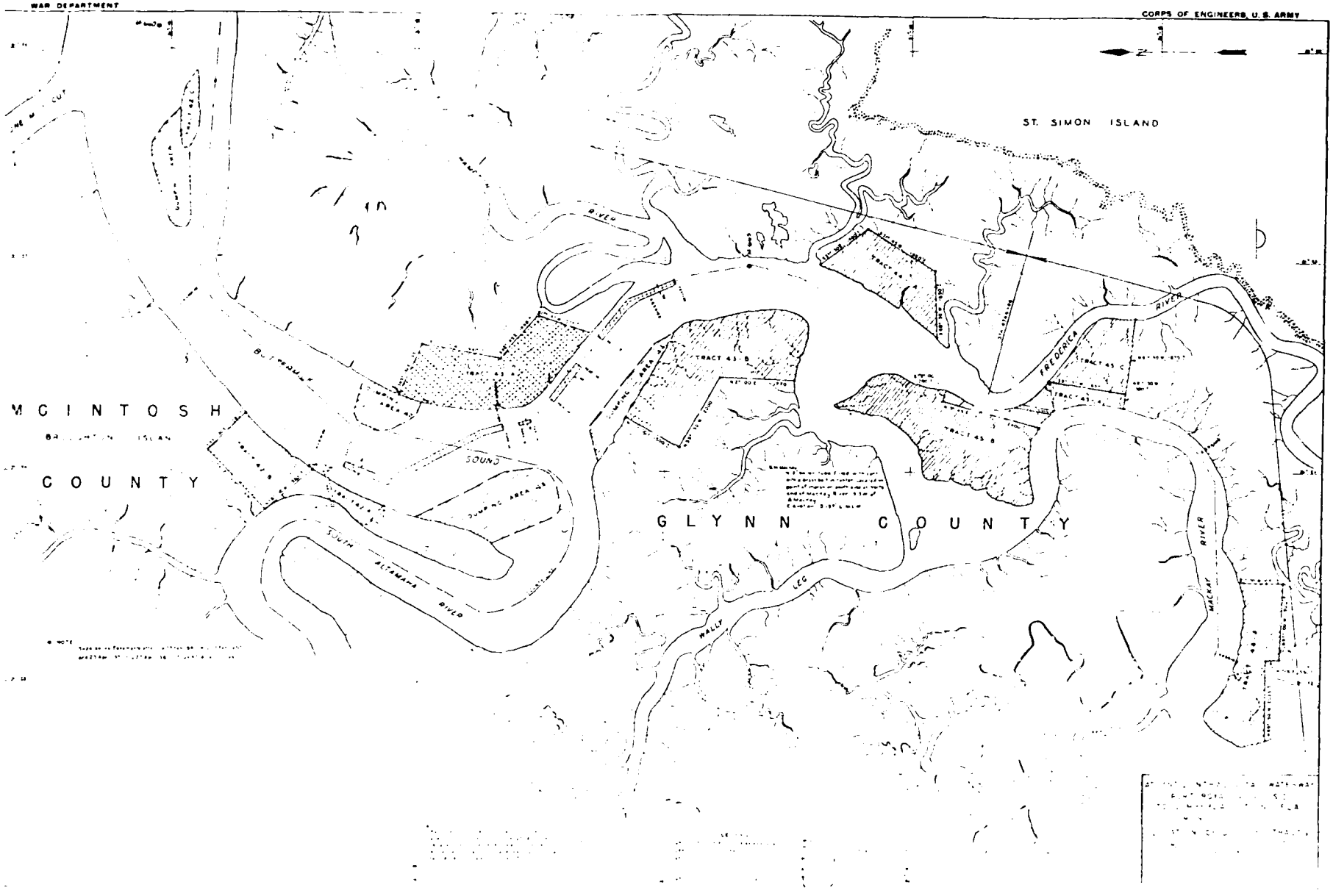

WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
Waldburg Creek
WALDBURG ISLAND
ST. CATHERINES ISLAND
LIBERTY COUNTY
CREEK
JOHNSON
NORTH NEWPORT RIVER
Vandyke Creek
RIVER
MOLLCLARK
SOUTH NEWPORT RIVER
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S C
TO CUMBERLAND SOUND, FLA
LOCATION OF DISPOSAL TRACTS

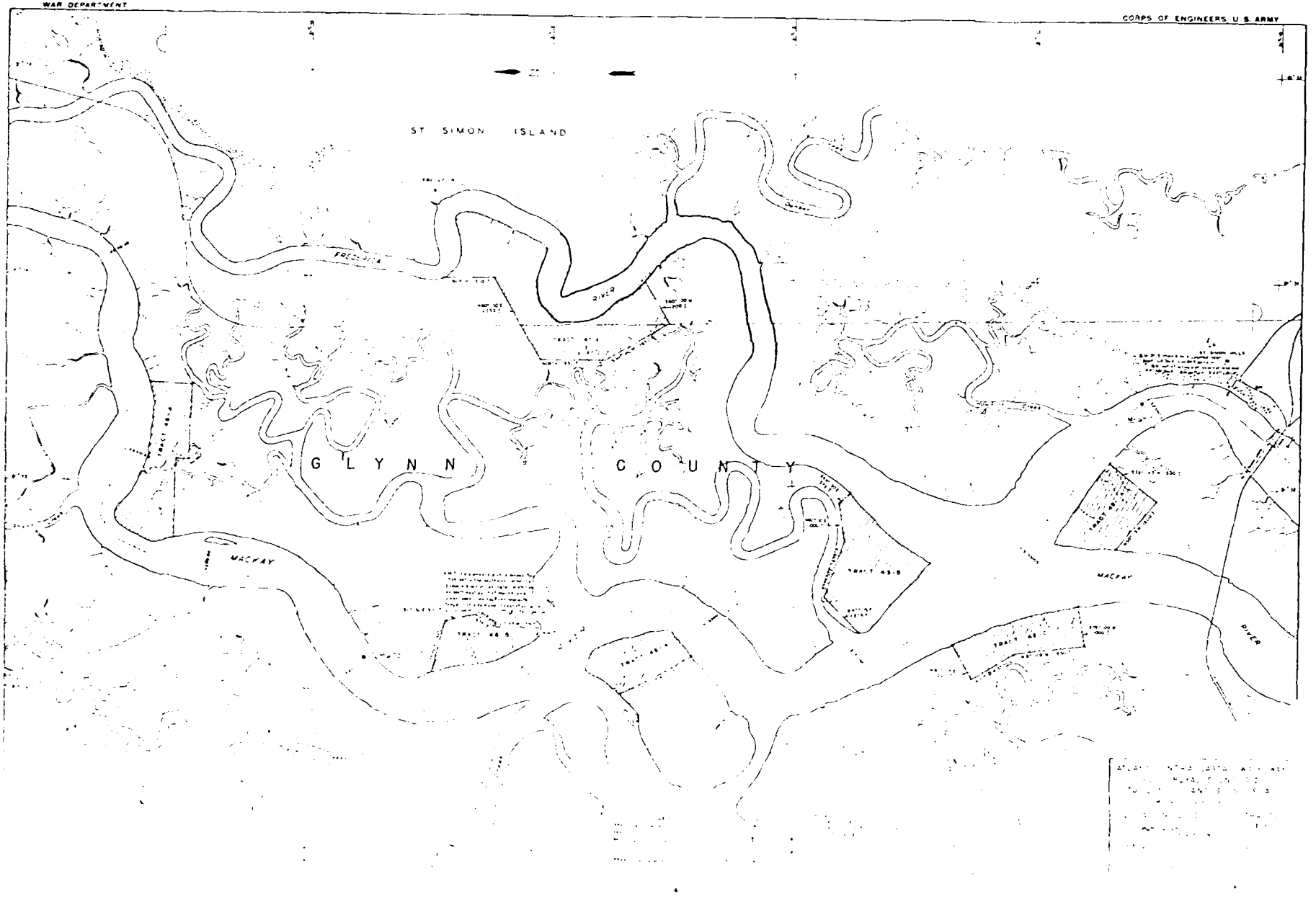
FIGURE 9


WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
LITTLE SAPELO ISLAND
MUD
RIVER
FRONT
RIVER
SAPELO
RIVER
CREIGHTON
ISLAND
CREIGHTON ISLAND
OLD TEAKETTLE CREEK
M C I N T O S H C O U N T Y
SOUTH
SAPELO
RIVER
VALONIA
ATLANTIC INTRACOASTAL WATERWAY
PORT ROYAL SOUND, S C
TO CUMBERLAND SOUND, FLA
LOCATION OF DISPOSAL TRACTS
LEGEND

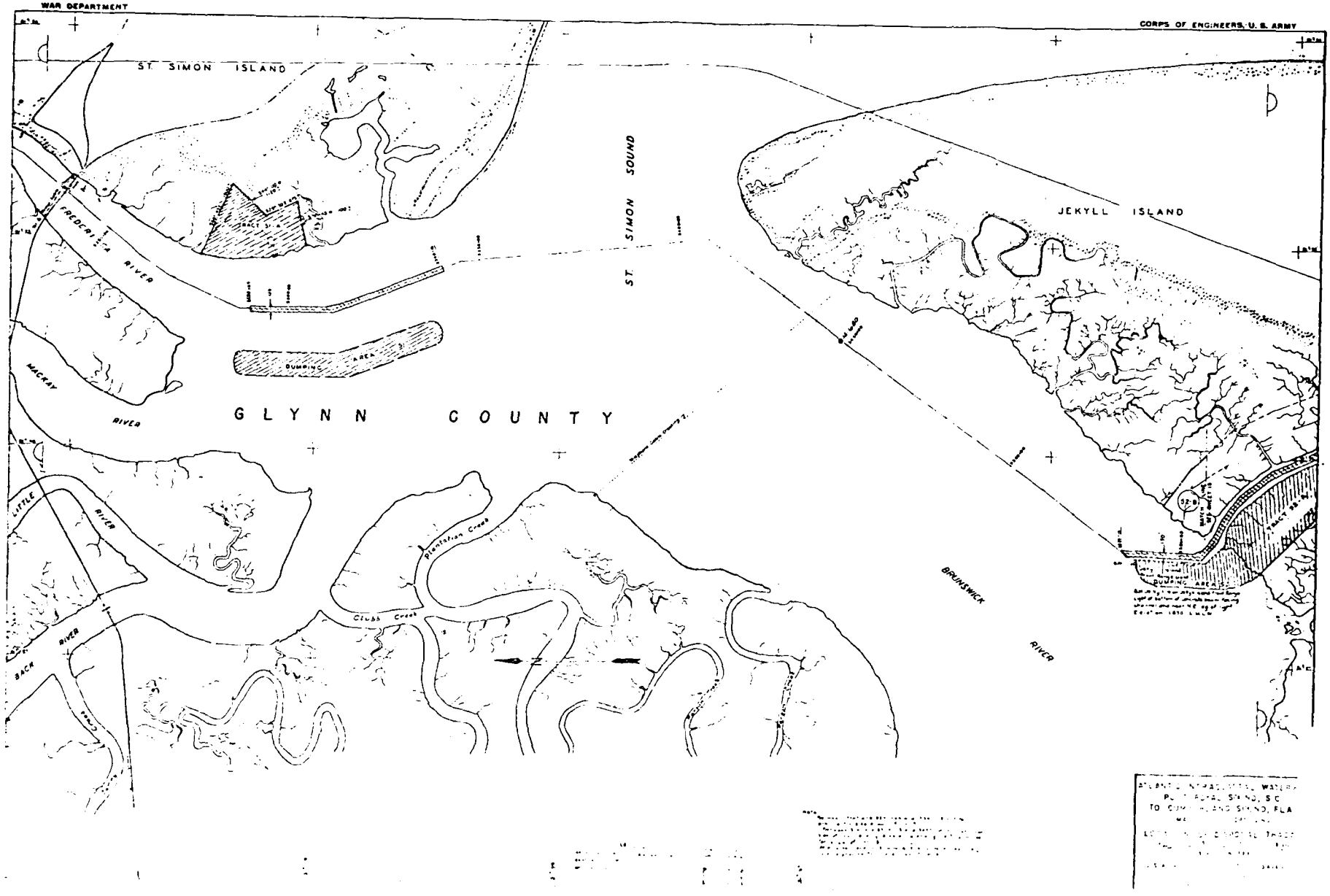

WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
DUPLIN
RIVER
SAPELO ISLAND
LITTLE SAPELO ISLAND
SOUND
DOBOY
COMMODORE ISLAND
DUMPING AREA 28
RIVER
DOBOY ISLAND
BACK
RIVER
SOUTH
TRACT 28-C
MCINTOSH COUNTY
TRACT 28-D
TRACT 28-B
TRACT 30-A
RIVER
ROCKEDUNDY
DARIEN
NORTH
RIVER
ATLANTIC INTRACOASTAL WATERWAY
TO CUMBERLAND CANAL, FLA.
LOCATION OF BORINGS


WAR DEPARTMENT
CORPS OF ENGINEERS, U. S. ARMY
WOLF ISLAND
SOUTH RIVER
SOUND
ALTAMAHA
MUD RIVER
LITTLE
LITTLE ST. SIMON ISLAND
M C I N T O S H C O U N T Y
ROCKDEDUNDY ISLAND
ROCKEDUNDY RIVER
RIVER
G L Y N N
C O U N T Y
HAMPTON RIVER
TRACT 30
TRACT 31
TRACT 32
TRACT 33
TRACT 34
TRACT 35
TRACT 36
TRACT 37
TRACT 38
TRACT 39
TRACT 40
TRACT 41
TRACT 42
TRACT 43
TRACT 44
TRACT 45
TRACT 46
TRACT 47
TRACT 48
TRACT 49
TRACT

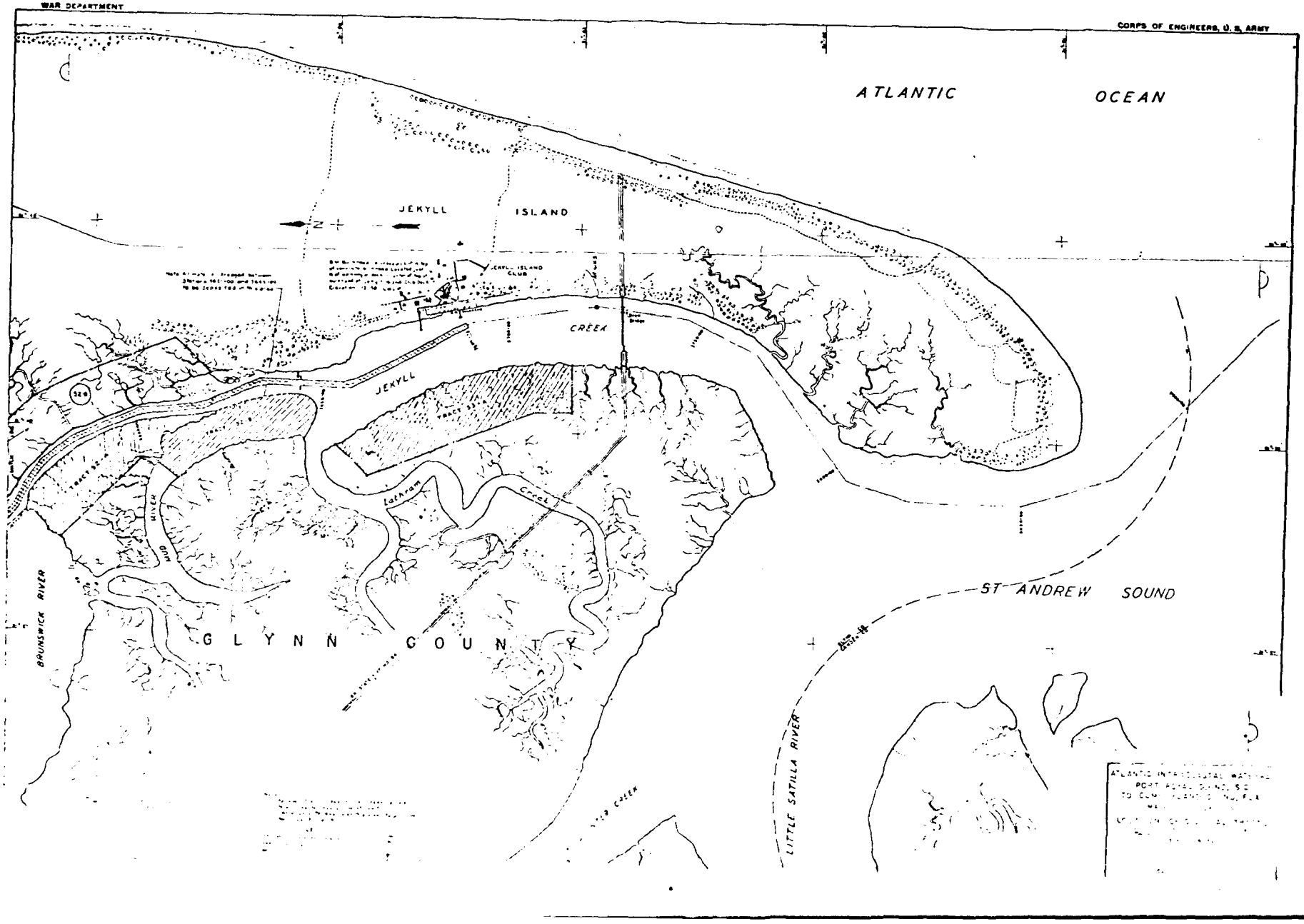

WAR DEPARTMENT
CORPS OF ENGINEERS, U.S. ARMY
ST. SIMON ISLAND
MCINTOSH
COUNTY
GLYNN
COUNTY
SOUND
SOUTH ALTAMAHA RIVER
FREDERICA
RIVER
MACKAY
RIVER
MALLY
LEG



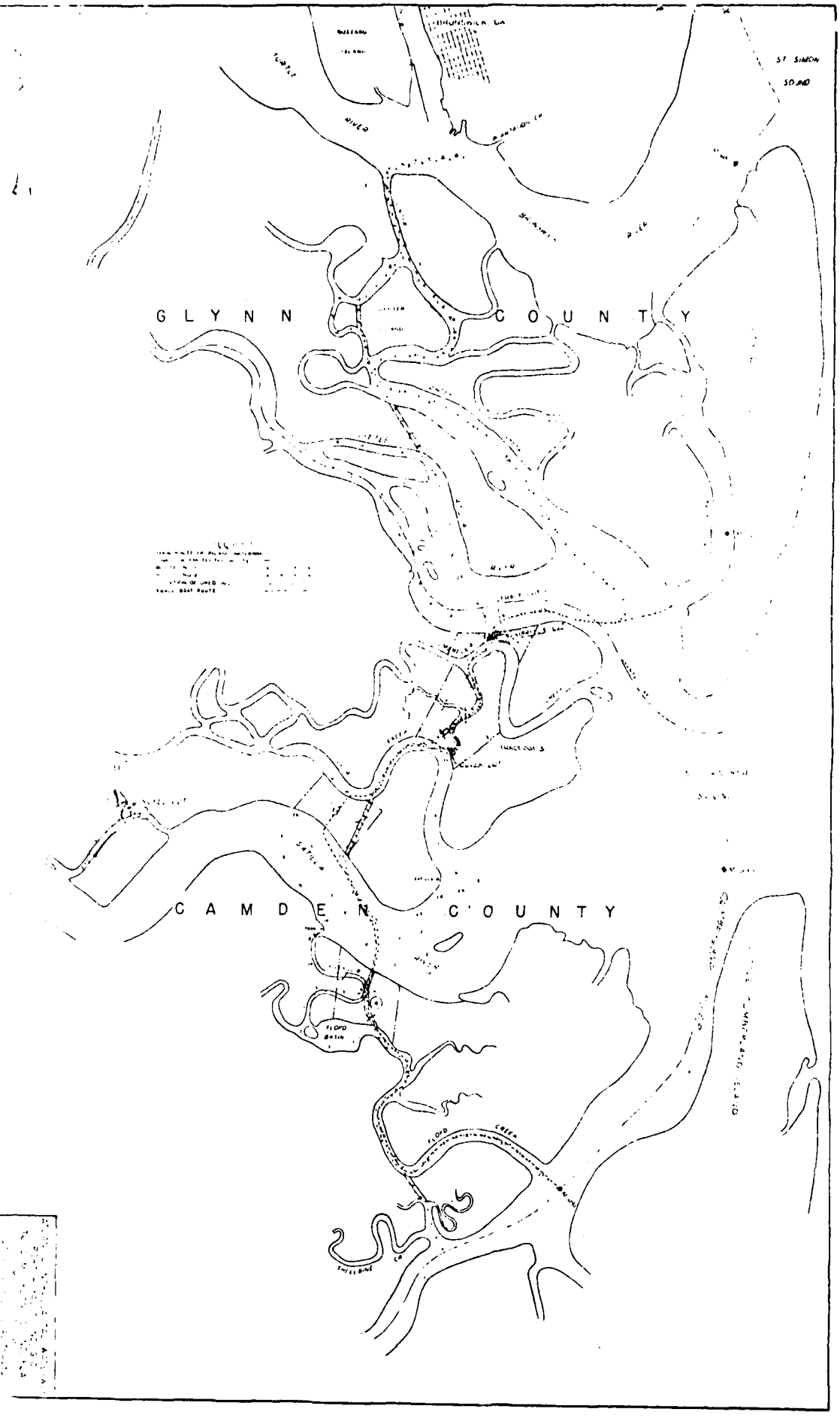
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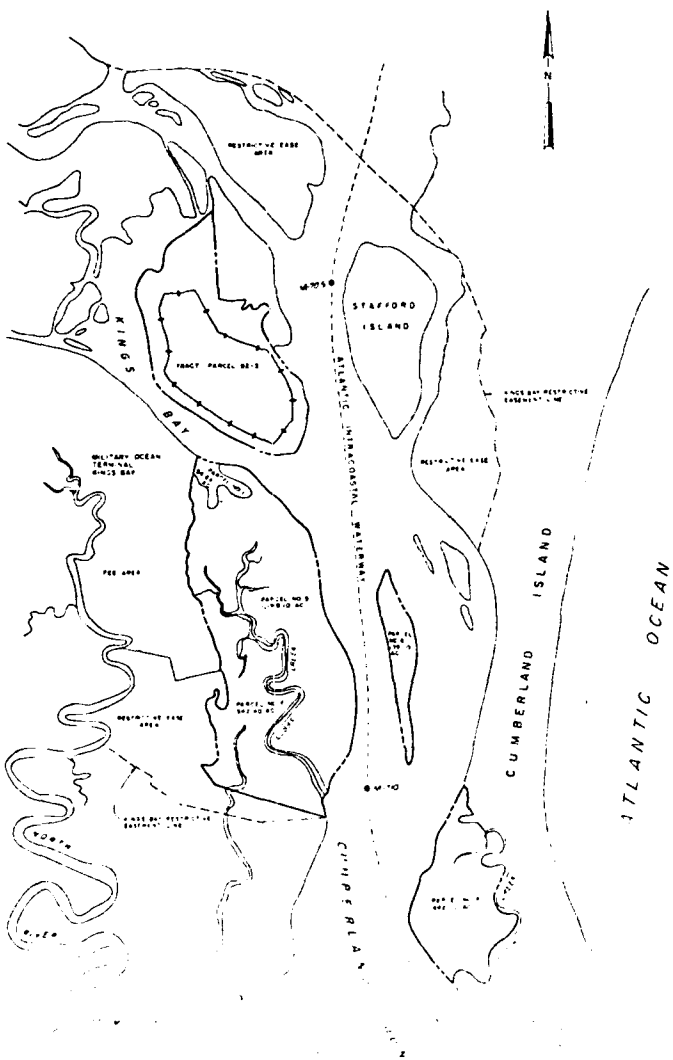


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CORPS OF ENGINEERS



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Real estate maps (same scale as photography) were then superimposed over the color infrared photos and vegetative mapping for all disposal tracts prepared.

Savannah District biologists then conducted field surveys of the three South Carolina sites to verify the accuracy of the mapping. Additionally, all disposal mounds were planimetered to determine the amount of wetland vegetation that has been altered by disposal activities. For the Georgia disposal sites, Savannah District biologists and personnel from the Coastal Protection Section, Coastal Resources Division, Georgia Department of Natural Resources (DNR) conducted field surveys of all major disposal sites. The DNR then prepared vegetation maps of these areas and determined the amount of acres affected within the disposal easement. A report was then prepared and submitted by DNR to the District including their recommendation for future disposal activities.

It should be noted that the DNR data takes into account only those disposal areas that are used on a regular basis. Some disposal areas under easement received only a small amount of dredged material during the construction or early maintenance phases, some disposal areas have never been used and the easements have expired on some sites that were used in the past. If all sites that have ever been under easement for purposes of maintaining the AIWW are taken into consideration, only 1,756 acres out of 10,635 acres or 16.5 percent of the wetlands have been affected.

Although wetlands have been lost from AIWW maintenance activities, other valuable types of habitat have been created in many instances. Mudflats, islands and hammocks have been created along the waterway. Appendix I provides a detailed description of the disposal tracts as well as a discussion of what impacts have occurred from dredged material disposal.

Three disposal tracts (Tract Nos. 1, 2, and 3) are located along the South Carolina portion of the AIWW. Tracts 3 and 2 are used for the maintenance of Ramshorn Creek and Walls Cut respectively. Prior to their use as disposal sites, these areas were almost totally vegetated with salt marsh cordgrass (Spartina alternifiora). Disposal of both construction and maintenance material has affected about 19 percent of the salt marsh in Tract No. 3 or about 52 acres. Approximately 10 percent or 6 acres in Tract No. 2 have been impacted. Tract No. 1 which is a 480 acre site used for maintenance of Fields Cut has been severly impacted by disposal of dredged material. However, much of the impacts in Tract No. 1 are associated with the maintenance of Savannah Harbor since Tract No. 1 also serves as part of Disposal Area 14 used for harbor disposal. AIWW construction and maintenance material is mostly confined to the eastern edge of this tract, and it is estimated that AIWW dredging has affected about 145 acres or 30 percent of this tract. In summary, of the 817 acres of wetland that once existed in Tracts 1, 2 and 3, approximately 203 acres or about 25 percent have been impacted.

In regard to the Georgia sites, the information developed by the Georgia DNR indicates that about 1,548 acres out of 4,636 acres have been impacted by AIWW dredged material disposal. This amounts to 33.4 percent. Table 7 shows the amount of acreage impacted at each site.

TABLE 7

DISPOSAL OF DREDGED MATERIAL BY EASEMENT AND ACRES AFFECTED
IN GEORGIA ATLANTIC INTRACOASTAL WATERWAY
(Georgia Department of Natural Resources)

Affected Easement No.	Acres	% Affected	Amt Affected In Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
1A1	37.8	100	38.7	15.9	most of general area	extensive
2A	45.0	100	45.0	5.3	most of general area	sparse
2B, 3A	155.4	100	155.4	30.64	32.6	
5A	128.7	63.5	81.7	15.6	24.2	5.7
7A	52.4	59	30.9	1.9	10.2	
8A[1]	46.6	36.9	17.2	.75		
9A	133.5	60.5	80.7	4.5	10.0	1.2
11K	24.7	58.5	14.4	1.1	1.5	
11L	39.6	15.1	6.0			
12A[2]	67.9	31.2	21.2	7.2	5.2	2.5
15A	109.0	39.5	43.1	.75	6.5	
15B	66.0	37.4	25.0			
16A	131.0	11.7	15.4	.35		
17A	244.7	9.9	24.1			
19A	97.8	26.2	25.7	.25		

1. Includes 10.99 acres of the easement dedicated in conveyances and highway R.O.W.

2. Includes 10.2 acres of easement dedicated to highway R.O.W.

TABLE 7 (continued)

Affected Easement No.	Acres	% Affected	Amt Affected In Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
23A	71.9	18.4	13.2			
24A	128.6	7.4	9.5	2.6		
25A	104.2	40.9	42.6	7.0		
25C	133.8	41.5	55.5	4.0	7.5	
25E	43.1	73.3	31.6	2.7	1.5	.4
28	OVER BOARD DUMPING AREA					
29A	158.3	12.1	19.2	2.2	7.0	.75
29D	65.9					
29C	92.6	57.8	53.5	2.2		
29B	120.0	30.0	35.9			
30A	230.1	38.7	88.9	1.1	21.2	
32A	228.9	25.5	58.3			
34A	80.9	35.7	28.9	11.5		
36A	260.4	23.0	60.1	26.2		
42C	14.5				1.6	
42B	65.0	27.2	17.7	.25	* 9.0	* .75
42	OVER BOARD DUMPING AREA					
43	OVER BOARD DUMPING AREA					

TABLE 7 (continued)

Affected Easement No.	Acres	% Affected	Amt Affected In Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
43B	176.4	4.2	7.5	1.1		
44A	76.4	29.7	22.7	5.0	1.1	
52	OVER BOARD DUMPING AREA					
52A	115.7	91.1	105.4	all general area		
52B	95.0	100	.4	all general area		
53A	180.4	59.4	107.1	all general area		
Cut 1	140.0	3.9	5.5			
Cut 3	673.0	9.7	65.5			

* Both within Tract 42

Total Number of Easements: 37

(not including over-board dump sites)

Total Acres: 4636.7 acres
Total Area Affected: 15481.1 acres 33.4 percent
Total Area Within Easement Which is Forested: 150.45 acres 3.2 percent
Total Area Outside Easements Which is Affected: 130.1 acres plus 9.0 ac. in Tract 42A
Total Area Outside Easements Which is Forested: 10.5 acres plus .75 ac. in Tract 42A

ALTERNATIVES

With the exception of one diked area on the Wilmington River, and several open water disposal sites in Doboy and Buttermilk Sounds, most of the material dredged from Savannah District's portion of the Atlantic Intracoastal Waterway (AIWW) is deposited in undiked disposal areas adjacent to the waterway. These disposal tracts were acquired when the 12-foot channel was constructed (completed in 1941). Prior to disposal in these tracts, they were almost totally vegetated with wetland plant species dominated by salt marsh cordgrass (Spartina alterniflora) in saline areas and giant cordgrass (Spartina cynosuroides) in brackish areas. Where disposal has occurred, these plant species have been replaced by other plants. Species replacing these dominant wetland plants depend on the amount and type of dredged material discharged into the disposal tracts. Where a thin layer of silt is discharged, the Spartina spp. may remain or tall Spartina spp. may be replaced by a medium or short form. Where continued disposal occurs and the elevation is raised above where Spartina spp. grows, high marsh species such as Juncus roemerianus and Salicornia virginica are found. At elevations above where these species are found, plants such as Borrichia frutescens, Iva frutescens, and Baccharis halimifolia replace the dominant wetland plants. In the highest portions of the disposal mounds especially where dredged material was placed many years ago, hammocks have developed characterized by mature tree stands consisting of such species as oak, pine, black cherry, and hackberry.

As discussed in the previous section and appendix I on the effects of maintenance dredging, undiked disposal has encroached on the wetlands and if continued, will further encroach on adjacent wetlands to some extent. However, this gradual encroachment on wetlands may be environmentally acceptable when compared to diking in the disposal tracts or destroying upland wildlife habitat. For instance, Walls Cut (South Carolina) has only a small siltation problem and dredging is performed only about every 15 years. Consequently, only about 6 acres of wetlands have been impacted by dredged material disposal since completion of the 12-foot channel in 1941. If a diked area were constructed at this site today, between 10 and 22 acres would be required depending on how high the dikes could be built.

The primary purpose of this study is to develop a 50-year maintenance scheme for the AIWW. However, an equally important purpose of the study is to evaluate our existing dredging and disposal operations and make recommendations for improving them from both an environmentally and technically. Various alternatives were evaluated, including construction of diked areas in existing disposal tracts, construction of an upland diked area, open water disposal, open water disposal for purposes of marsh creation, reuse of the material for construction purposes, beach nourishment, discontinuing the use of active disposal tracts by concentrating the dredged material in a central disposal easement, and continued undiked disposal on existing deposits.

It should be noted that ocean disposal was not considered as a viable alternative. The channels that make up the waterway are almost all very narrow and shallow precluding the use of hopper dredges. Even if a small hopper dredge could be located, hopper dredges are most efficient when working in sand. The material removed from almost every section of the AIWW in the

Savannah District is mud and silt. Silt takes up more room than sand since it can bulk up to twice its original volume when disturbed compared to sandy material which expands to about 120 percent of its original volume. The same circumstances would hold true if dump scows were used. While use of hopper dredges or dump scows is excellent in easily accessible areas where the material has a high sand content, it is not considered technically nor economically feasible for the AIWW within Savannah District.

In addition to the technical problems associated with AIWW maintenance, numerous ocean disposal sites would have to be established. To reduce travel distance and time, new ocean disposal sites would have to be located offshore from Ossabaw Sound, St. Catherine Sound, Sapelo Sound, Doboy Sound, Altamaha Sound, and possibly St. Andrew Sound. Establishment of such ocean dumping sites would require extremely detailed and expensive environmental studies.

Since the dredged material from Savannah District's portion of the AIWW is mostly mud and silt, this also precludes its use for construction or beach nourishment purposes. In the few locations where good sand is encountered, it is not economically feasible to pump small amounts of dredged material long distances. The costs would far exceed any benefits derived.

In regard to open water discharge either for disposal purposes or marsh creation, the State of Georgia does not support this type of disposal in most instances. The State of Georgia has over 350,000 acres of tidal salt marsh. The State does not favor disposing of dredged material in open water for purposes of marsh creation since open water bottom habitat is a very significant part of the estuarine ecosystem. Although marsh substrate can be created with dredged material, bottom habitat is lost.

Appendix 2 contains a detailed discussion of our evaluation of alternatives. In those cases where continued undiked disposal is recommended, we tried to improve on our disposal operations to minimize impacts to adjacent wetlands. The Coastal Resources Division of the Coastal Protection Section of the Georgia Department of Natural Resources Division (Brunswick) provided invaluable assistance by providing suggested outfall locations to reduce adverse impacts to the adjacent wetlands as well as mature hammocks.

The following discussion is a synopsis of appendix 2. Appendix 2 should be consulted for support data including diked area requirements, dike costs, pumping costs, and maps showing suggested discharge pipe locations. Each section of the waterway requiring dredging is discussed individually.

The AIWW extends within Savannah District from mile 552 (Port Royal Sound, South Carolina) to mile 713 (Cumberland Sound at the Georgia-Florida border). For the first 16 miles, naturally deep channels are encountered. No dredging has been necessary and no disposal areas are located along this part of the waterway.

Ramshorn Creek. (mile 568 - 569.25).

Ramshorn Creek has a very low shoaling rate and only about 110,000 cubic yards would have to be dredged over the next 50 years. Since the maintenance

requirement is small, this area would be dredged only 3 - 5 times, the material is mostly sand which would tend to settle quickly, continued undiked disposal in Tract No. 3 (See sheet 3 in appendix 3) is recommended. The material could be mostly confined to the larger mounds in the northern end of the disposal tract. Although unconfined disposal could be used at this location with very little impacts on adjacent wetlands, the State of South Carolina objects to undiked disposal in wetland areas. Unconfined disposal of dredged material is not in agreement with the provisions of their Coastal Zone Management Program. Consequently, a dike should be constructed within Tract No. 3 around the large deposit in the northern end of the tract to minimize disturbance to unimpacted wetland areas.

Walls Cut. (mile 572 - 572.5).

Like Ramshorn Creek, Walls Cut has only a minor shoaling problem as only about 55,000 cubic yards of dredged material would be removed in the next 50 years. Consequently, the material could be discharged onto the existing deposits in Tract No. 2 (sheet 4 in appendix 3) with very little impacts to the wetlands remaining in the disposal easement. However, in accordance with the requirements of the South Carolina Coastal Zone Management Act, this site should not be used for unconfined disposal. However, from an economic and environmental standpoint, a diked area should not be constructed within the easement. The use of Tract No. 2 should be discontinued as the material can be easily pumped to Tract No. 1 which is a large area next to Fields Cut that will be diked.

Fields Cut. (mile 573.5 - 575.5).

Almost 3.5 million cubic yards of dredged material will be removed from Fields Cut over the next 50 years. Tract No. 1 is the designated disposal site for Fields Cut. In order to comply with South Carolina's request concerning diked disposal, the State of Georgia will be constructing dikes around Disposal Area No. 14 used for Savannah Harbor (see sheet 4 in appendix 3). Tract No. 1 is in the same easement as Disposal Area 14 and a portion of Tract 1 will be included within the dikes for Disposal Area 14. Material from Fields Cut, as well as Walls Cut, will be deposited in this area.

Elba-McQueens Cut. (mile 576.5 - 578).

Approximately 1.5 million cubic yards will be removed from Elba-McQueens Cut over the next 50 years. In the past, the dredged material has been discharged into Tract 1-A-1 which is an undiked 38.7 acre site next to Elba Cut (see sheet 4 in appendix 3). All of this tract, as well as some wetlands outside the easement have been impacted by dredged material disposal. However, most of this is attributable to Savannah Harbor maintenance dredging. By placing the discharge line in the center of the easement, the dredged material can be almost totally confined to the area that has already been impacted. This site will be monitored through field inspection and aerial photography and if significant encroachment on adjacent wetlands becomes obvious, then the use of Tract 1-A-1 should be stopped. The dredged material could then be pumped easily to Disposal Area 14 for Savannah Harbor.

St. Augustine Creek. (mile 578 - 579).

Maintenance of the 12-foot channel for the next 50 years in St. Augustine Creek will necessitate the dredging of 2.7 million cubic yards. In the past, the dredged material has been put in undiked Tract 2-A (45 acres) and diked area 2B-3A (see sheet 5 in appendix 3). All of Tract 2-A has been impacted, as well as 2B-3A. Consequently, the use of these sites should be continued. Tract 2-A can be used with little encroachment on adjacent wetlands since it is bounded on two sides by an old railroad bed and roadway. The dikes on 2B-3A should be raised to the maximum extent possible and used for St. Augustine Creek, as well as the upper Wilmington River. If 2B-3A reaches its capacity or dredged material begins to enter the channel from Tract 2-A, then the material should be pumped to Disposal Area 14 for Savannah Harbor. Another possible alternative would be open water discharge into the South Channel of Savannah River to establish a substrate for marsh creation. However, the State of Georgia would have to approve this action. Construction of a diked upland area for St. Augustine Creek is not feasible because of existing and planned residential and industrial development.

Upper Wilmington River. (mile 579 - 581.5).

The upper Wilmington River represents one of our worst siltation areas, although maintenance requirements have reduced significantly since the early 1970's. It is estimated that about nine million cubic yards of dredged material will be removed during the course of this maintenance plan. In the past, the dredged sediments have been placed in diked area 2B-3A (155.4 acres) and undiked Tract 5-A (128.7 acres). On several dredging occasions many years ago, Tract 5-B (37.4 acres) received small amounts of material. Tract 2B-3A should continue to be used and the dikes raised to the maximum extent possible. Tract 5-A (see sheet 5 in appendix 3) should also be used but as prescribed by the Georgia DNR. No disposal should occur in that part of Tract 5-A north of the U.S. Highway 80 crossing. Since 5-B is impacted to only a small extent, it should not be used. Like the St. Augustine Creek area, both existing and planned development prevent the establishment of any diked upland area. In view of the large diked area that would be required, dike construction within Tract 5-A would destroy the remaining wetlands within this easement as well as additional wetlands outside the tract. Continued undiked disposal on Tract 5-A will result in further encroachment in the wetlands in the eastern portion of the tract because of the large amounts of dredged material involved. However, this will be a gradual impact, and these wetlands will remain productive for many years compared to instant destruction if diked. Because of its close proximity to a major highway, Tract 5-A offers the potential for an excellent recreation area when it is no longer available for disposal purposes.

Lower Wilmington River. (mile 581.5 - 586).

Although siltation is not as much of a problem in the lower Wilmington River, it still represents a major shoaling area as estimates indicate maintenance of the 12-foot channel will require the dredging of 3.5 million cubic yards. Past disposal operations have used Tracts 7-A, 8-A, and 9-A (see sheet 5 in appendix 3). An upland diked area could be easily constructed on nearby Whitemarsh Island. However, this area contains extremely valuable

wildlife habitat including many large live oaks. This site is scheduled for development since it offers both water and marsh front property. Continued undiked disposal in Tracts 7-A and 9-A is the recommended disposal alternative. Disposal should be executed in a manner to avoid the mature hammock in the southern portion of the Tract 7-A. The dredged material should be placed on the large impacted area in the northern portion of Tract 9-A. Although Tract 8-A has been used in the past, its use should be avoided if possible because of possible detrimental impacts to Grays Creek and its adjacent marshes. Tract 9-B has not been used for maintenance but does contain some small deposits from construction work. Tract 9-B, as well as Tract 10-C which has never been used, should not be disposed on.

Hell Gate. (mile 601 - 602.5).

Hell Gate is also a major shoaling area and predictions indicate that about 10 million cubic yards of material will be dredged during the next 50 years. The dredged material from Hell Gate was placed in undiked Tracts 15-A (109 acres) and 15-B (66.6 acres). For the last several dredging cycles, the material has been discharged to the north and south of Raccoon Key in open water (see sheet 8 of appendix 3). In view of the size of the diked area required for Hell Gate (between 285 - 963 acres), a diked area should not be constructed because of the large loss of wildlife habitat. Continued undiked disposal in Tracts 15-A and 15-B is the recommended alternative. Disposal in 15-A should be concentrated in the center of the large disposal mound in the western portion while the large sand flat in 15-B should be used. These sites should be closely monitored. If the dredged material begins to significantly encroach on the adjacent wetlands or the tidal creek in 15-A, then open water disposal should be used either in the same locations as in the past or perhaps moved to a site suitable for creating marsh substrate. This would have to be approved by the State of Georgia.

Although Hell Gate is a major shoaling area, realignment of the channel might significantly reduce shoaling. Hell Gate has a high shoaling rate due to insufficient velocities to scour the channel. Funds should be provided to study possible channel reorientation.

Florida Passage. (mile 605.5 - 608.5).

The Florida Passage does not experience heavy siltation but will still require dredging during the next 50 years (1.2 million cubic yards). All dredged material from this section of the waterway has been put in undiked tract 16-A (131 acres). (See sheet 9 in appendix 3.) Only 15 acres divided into two deposits on the northern and southern end of this tract have been impacted by disposal activities. Continued undiked disposal is without question the recommended alternative. A diked area would require between 51 and 146 acres which would disrupt much more habitat than continued undiked discharge.

Bear River. (mile 608.5 - 618).

Bear River has an extremely low shoaling rate, and only approximately 165,000 cubic yards will be dredged from this reach of the AIWW during the next 50 years. This maintenance will probably occur every 10 - 15 years. Dredged

material from Bear River is discharged into undiked Tract 17-A (see sheet 9 in appendix 3), and about 24 acres of the 244.7 acre tract have been impacted by dredged material. The affected area would have been much less had the material been concentrated in a central location instead of spread out in 5 different areas. Continued undiked disposal in Tract 17-A is the recommended alternative. The discharge should be concentrated on the large mounds in the northern and southern portions of the tract.

Johnson Creek. (mile 623.5 - 629).

Johnson Creek experiences spot shoaling that will require the dredging of about 360,000 cubic yards during the term of this maintenance plan. Four undiked disposal tracts are located along Johnson Creek (see sheet 11 in appendix 3). Tract 19-A (97.8 acres) and Tract 20-A (71.9 acres) have received the maintenance material while Tracts 21-A (34.6 acres) and "C" (60 acres) show only slight evidence of ever being used. The small mounds in these tracts are probably from construction of the 12-foot channel. Between 23 and 57 acres would be required to construct a diked area for Johnson Creek. Tract 20-A has one disposal mound consisting of about 13 acres, however, Tract 19-A contains a 24-acre impacted area in its northern portion. A diked area could be constructed around this deposit with little encroachment to adjacent wetlands provided the dikes could be raised to 26 feet. The cost would be approximately $402,000. In view of the small projected maintenance requirements of Johnson Creek, and the disruption to wetlands in the area from the construction activities associated with dike building, the expenditure of this money is not justifiable. Undiked disposal on the existing mound in Tracts 19-A and 20-A can be continued with little encroachment on adjacent wetlands. Tracts 21-A and "C" should not be used.

Creighton Narrows. (mile 640.5 - 643).

Creighton Narrows has one of the heaviest maintenance requirements of any section of the waterway. Past disposal practices have significantly impacted the wetlands in the disposal easements, and Creighton Narrows presents a problem relative to the best method of disposal. About 5.7 million cubic yards of dredged material will be dredged from this area over the next 50 years. Additionally Tract 25-C (See sheet 14 in appendix 3) is scheduled to receive about 500,000 cubic yards of material from the proposed Bellville Navigation Project during the same period. In the past, dredged material from Creighton Narrows has been deposited in undiked Tracts 24-A (128.6 acres), 25-A (104.2 acres), 25-C (133.8 acres), and 25-E (43.13 acres). A diked area would require a minimum of 189 acres (provided 26' dike could be constructed). As shown by the above tract sizes, any dike construction in existing easements would totally destroy most of wetlands within the tracts if two large diked areas were built. Open water disposal in Mud River for purposes of creating a mudflat or substrate for marsh growth is also a possible alternative. In view of the extensive oysterbeds in the area, any disposal would have to be performed during the off-season for shellfish. It is doubtful that the state of Georgia would support this disposal alternative.

The following disposal alternative is suggested for Creighton Narrows. Tract 24-A has received only minor impacts from dredged material and should not

be used. Tract 25-A should not be used either because of the extensive oysterbeds in Eagle Creek which lies just to the east of the easement. All dredged material should be concentrated in Tract 25-E, which has been heavily impacted, and Tract 25-C. A monitoring program (which will cover all portions of the AIWW) including field inspection and aerial photography should observe the impacts occurring in these tracts.

If significant encroachment on adjacent wetlands and tidal creeks becomes obvious, then a study should be initiated to determine the feasibility of establishing an upland diked area on Creighton Island or open water disposal in Mud River.

Doboy Sound. (mile 648 - 650).

Doboy Sound also experiences rather heavy shoaling as approximately 6.25 million cubic yards will be dredged during the next 50 years if the 12' channel is maintained. In the past, all of the dredged material has been discharged into an open water site on the northern side of Commodore Island (see sheet 15 of appendix 3). Tract 28-A is close to the dredging site, however, it has not been used. Between 246 and 801 acres would be required if a diked area were constructed. Whether an upland or wetland site was chosen, the environmental impacts associated with construction of such an area would be far more adverse than using this open water site. The material should be disposed of at this location avoiding the creek separating Commodore Island from Doboy Sound.

North River and Rockdedundy River Crossings. (mile 651.7 - 652.7).

While these areas do not have significant shoaling problems, some shoaling does occur at the mouths of these rivers (see sheet 15 in appendix 3). Estimates indicate that about 430,000 cubic yards of material will be removed from here over the next 50 years. Undiked Tracts 29-A (158.3 acres), 29-B (120 acres), 29-C (92.6 acres) and 29-D (6.59 acres) are located along this segment of the waterway. If a diked area were constructed for this area from 43 - 121 acres would be required with dikes ranging from 10 - 26'. Tract 29-A remains mostly unaffected as only 12.1 percent of the easement has been impacted by dredged material. The deposits in Tract 29-B are concentrated in one area and total about 40 acres. A diked area could be constructed around the existing deposits however, it would also take in some additional marsh. The cost would amount to about $588,000 if the dikes could eventually be raised to 26'. The deposits in Tract 29-C are also concentrated in about a 53 acre area. Tract 30-A (see sheet 16 in appendix 3) is also available. Existing deposits consist of about 90 acres in the northern portion of this 230.1 acre tract. Tract 29-D has not been used for maintenance. In summary, a diked area could be constructed in either Tract 29-B, 29-C or 30-A. However, because of the projected low maintenance requirements, it is felt that undiked disposal can be continued without significant encroachment into the adjacent marshes. Preferably, Tract 29-A should not be used. The material should be placed on the existing deposits in either Tract 29-B or 30-A. Although Tract 29-C has been extensively used for South River maintenance (see below), it has not been used for the last several dredging cycles as the material has been put in 30-A. Tract 29-D should definitely not be used.

South River. (mile 652.8 - 653).

Shoaling also occurs at the mouth of South River just before the AIWW enters Little Mud River. It will be necessary to dredge about 1.8 million cubic yards from this site during the term of this maintenance plan. The material has been normally placed in Tract 29-C (see sheet 16 in appendix 3), however, Tract 30-A has been used for the last several dredging cycles. Unconfined disposal in Tract 30-A into the existing deposit in the northern portion of the tract should be continued. However, 90 acres of this 230.1 acre tract have already been impacted by dredged material. The monitoring program for the AIWW (field inspection, aerial photography) should maintain close observation of this site. If the dredged material begins to encroach to a large extent on adjacent unimpacted areas, then a study should be made on the feasibility of constructing a diked area around the existing deposits in the northern portion of 30-A. This diked area should be built to accommodate material from the North and Rockdedundy River Crossings also which would eliminate the need to use Tract 29-B.

Little Mud River (mile 650 - 655.5).

(See sheet 16 in appendix 3.) Little Mud River has an extremely heavy shoaling rate, and the disposal of the dredged material presents a difficult problem. It is estimated that 15 million cubic yards of dredged material will be removed from Little Mud River during the next 50 years. Dredged material has been discharged into undiked Tract 32-A (228.9 acres), and only 58 acres have been impacted by dredged material. However, more wetlands would have been impacted by past disposal activities if much of the material had not been placed in Tract 30-B (Corps no longer holds easements). None of the alternatives evaluated provided a means of disposal that would not have significant adverse impacts. A diked area, whether in existing disposal tracts or upland, would impact between 379 - 1,273 acres of habitat. If an upland site were selected, the pumping distance would be over 6 miles. The material from Little Mud River is entirely mud and silt and cannot be used for construction or beach nourishment purposes. Establishment of an open water site would impact a large area of bottom habitat in Altamaha Sound. Continued undiked disposal in Tract 32-A will result in gradual encroachment on the wetlands remaining in the tract.

Although continued undiked disposal in 32-A will impact additional wetland areas in the easement area, this adverse effect is not as detrimental as construction of a diked area for this portion of the waterway. If 26' dikes could be built to minimize the size of the site, all of Tract 30-A (230.1 acres) and all of Tract 32-A would be diked to provide a sufficient capacity for the next 50 years. All wetlands within the confines of the dikes would be immediately removed from tidal inundation and productivity. Undiked disposal will result in a gradual encroachment on the wetlands allowing most of the marsh to remain productive for many years. There is also the possibility that not all of the marsh would be destroyed. This is evidenced in many of the tracts along the waterway where large quantities of maintenance material (e.g. mud, silt) have been deposited over the last 40 years, yet much of the wetlands in the easement remain unimpacted.

Based on the above determinations, continued undiked disposal on the existing deposits in Tract 32-A is recommended. However, this site should be

closely monitored. If significant encroachment on the adjacent wetlands, especially those outside of the easement becomes apparent, then a study should be initiated to determine either the possibility of constructing a diked area in Tracts 30-A and 32-A or an open water site in Altamaha Sound with the idea of creating substrate suitable for marsh creation. If diking is to be employed, then the possibility of partially diking these areas and expanding the dikes as needed should be investigated. This would allow some of the wetlands to remain in a productive state.

Altamaha Sound (mile 655.5 - 660).

Altamaha Sound has several shoaling areas scattered throughout the length of the sound. It is anticipated that about six million cubic yards of material will be dredged from the sound over the next 50 years. In the past, most of the sediments have been deposited in undiked Tracts 34-A and 36-A. (See sheet 16 in appendix 3.) Two open water sites (No. 32 and 34) are located in the sound; however, the Georgia DNR has requested that they not be used. Establishment of a diked area would require between 164 and 528 acres depending on dike height. Pumping costs to an upland area would increase significantly since St. Simons Island is 2.8 miles away and Broughton Island about 5.2 miles. In lieu of impacting this much upland habitat or wetland area, undiked disposal in Tract 34-A and 36-A is recommended. The discharge should be confined to the western end of Tract 34-A and the large deposits on the eastern and western ends of Tract 36-A. Considering the amount of dredged material that has been placed in these two sites, the impacts have been centralized and confined into relatively small areas. Most of the marsh remains productive and unimpacted from dredged material disposal.

Buttermilk Sound. (mile 660 - 665.5).

Buttermilk Sound is also a heavy shoaling area with most of the problem occurring between miles 662 - 663. About 10 million cubic yards of dredged material will be removed over the next 50 years if the 12' channel is maintained. Several undiked tracts and open water disposal areas have been used for disposal (See sheet 17 in appendix 3). Tract 42-C (14.5 acres) has not been impacted since material from the upper (northern) portion of the sound has been discharged into an open water site adjacent to this easement. Tract 42-B (65 acres) contains one disposal mound in its southern portion comprising about 65 acres. Tract 43-B (176.6 acres) contains one small 8 acre deposit adjacent to Buttermilk Sound. Tract 44-A (76.4 acres) contains five disposal mounds, and the dredged material has impacted about 23 acres. However, most of the material in Tract 44-A is attributable to construction activities and not maintenance. Tract 45-B (167.6 acres) was used on one occasion for construction of a land cut. As noted, the amount of area in these tracts that has been affected by disposal operations is extremely small when considering the amount of material (about 4 million cubic yards) that has been dredged from Buttermilk Sound. This is predominantly due to the fact that much of these sediments were deposited in open water sites 43 and 44. Of particular interest in Buttermilk Sound, is open water site No. 42 which is a experimental site as part of the Corps of of Engineers Dredged Material Research Program. The Georgia Department of Natural Resources and the U.S. Army Corps of Engineers Waterways Experiment

Station conducted experiments at the site to grow marsh plant species on dredged material substrate.

Undiked disposal and open water disposal have and will continue to have far less adverse impacts than diked disposal. A diked area would require 513 - 1,742 acres of either upland or wetland habitat.

A diked area should not be constructed because of the significant adverse impacts associated with the establishment of such a large area. Material from the northern part of the sound should continue to be discharged adjacent to Tract 42-C avoiding the marsh island. Material from the middle of the sound should continue to be placed on the large sand deposit in the southern portion of Tract 42-B, as well as open water sites 43 and 44. The Corps and DNR should investigate a marsh growth site in the Old Channel of the South Altamaha River just past the mouth of the river. Material dredged from the southern portion of the sound should be pumped back to these areas also. Tracts 43-B, 44-A and 45-B should not be used.

Jekyll Creek. (mile 612 - 686.5).

Jekyll Creek is the last shoaling area on the AIWW. Jekyll Creek presents the worst maintenance problem on Savannah District's portion of the AIWW. Over 14 million cubic yards of dredged material have been removed from Jekyll Creek since the completion of the 12' channel. If the 12' channel were maintained over the next 50 years, approximately 67.5 million cubic yards of mud and silt would be removed.

In regard to a 50-year maintenance scheme for Jekyll Creek, evaluating different disposal alternatives is not sufficient in view of the large amount of material involved. The source of the shoaling must be addressed and the shoaling rates reduced if this portion of the waterway is to be maintained.

Several different proposals have been suggested for reducing shoaling in Jekyll Creek. In 1972, the U.S. Army Corps of Engineers Waterways Experiment Station at Vicksburg, Mississippi, conducted hydraulic model investigations to reduce shoaling in Brunswick Harbor and Jekyll Creek, Georgia. Their findings are found in Technical Report H-72-5, "Plans for Reduction of Shoaling in Brunsiwck Harbor and Jekyll Creek, Georgia." The report determined that a 4,900 foot training wall should be constructed on the west side of and parallel to Jekyll Creek, extending from south of the mouth of Lathram River to the approximate midpoint between the mouth of Lathram River and the Jekyll Island Bridge crossing. A 2,950 foot training wall would be constructed on the east side of Jekyll Creek from opposite the mouth of Jekyll Creek Marina docks. Additionally, a 2,300 foot V-shaped training wall would be built across the mouth of Mud River with the V pointing southward. This plan provided an overall decrease in shoaling of 29.3 percent.

The Hydraulics and Hydrology Branch of Engineering Division in the Savannah District also examined the problem. Drawings dated before the construction of the Jekyll Island Causeway showed the area of Jekyll Creek between Lathram River and St. Simon Sound with a channel deeper than the required AIWW project depth.

The road to Jekyll has obviously reduced the amount of water flowing through Lathram River and Jekyll Creek. This reduction in flow causes material to settle out at a faster rate. Their proposed solution consists of dredging a cutoff channel as shown in figure 37 in appendix 2. The road would then be bridged over the channel and a dam constructed over the cut flowing east and parallel to the road. This would direct all flow into the Lathram River.

Before any solution to the shoaling in Jekyll Creek can be implemented, funds should be provided to conduct studies on Jekyll Creek to determine the appropriate course of action. Until studies can be completed to reduce shoaling in Jekyll Creek, a maintenance disposal scheme cannot be developed. However, recommended temporary disposal methods are discussed below.

An extremely large diked area (1553 - 5450) acres) would be required for Jekyll Creek. Until the above shoaling studies can be undertaken, disposal should continue into undiked areas Tract 52-A, 52-B, and 53-A. (See sheets 19 and 20 in appendix 3.) Open water disposal site No. 52 should not be used. In addition to studies to reduce shoaling in Jekyll Creek, studies should be conducted to determine some means of confining the dredged material in these areas. Aerial photographs indicate that much of the material pumped into these areas is returning to the waterway.

Umbrella Creek.

The alternate route around St. Andrews Sound has one small area that experiences only occasional shoaling. Umbrella Creek (see figure 1 of the main report) provides passage from the Little Satilla River to Dover Creek in the alternate route. It is estimated that about 273,000 cubic yards of dredged material will be removed over the next 50 years if the 7' channel is maintained. The Georgia Department of Natural Resources has requested that this alternate route not be maintained on a regular basis. However, the Corps of Engineers is required to maintain authorized projects. Additionally, the alternate route has experienced only minor shoaling. If Umbrella Creek requires dredging, the material could be discharged onto existing deposits in Tract Cut 3 (see figure 41 in appendix 2) with very little encroachment on adjacent wetlands. However, prior to any dredging in the alternate route, the Georgia Department of Natural Resources should be consulted.

SUMMARY.

As with any dredging project, maintenance of the Atlantic Intracoastal Waterway over the next 50 years will have adverse impacts. However, the recommended maintenance plan for the waterway attempts to identify not only the best disposal alternatives based on technical and economic reasons but also on environmental concerns.

Nineteen shoaling areas were identified along Savannah District's portion of the AIWW and the area on the alternate route around St. Andrews Sound that will require maintenance over the next 50 years. If the authorized 12' depth is maintained, approximately 3 million cubic yards of dredged material will be removed annually and deposited in disposal areas adjacent to the waterway. The adverse impacts associated with this dredging and disposal will be primarily

concentrated in a few major shoaling areas. Due to the low maintenance requirements of many of the shoaling areas, dredging and disposal will occur at these locations only 3 - 5 times over the next 50 years.

Three shoaling areas (Ramshorn Creek, Walls Cut, Fields Cut) were identified in the 24 mile section of the AIWW within the State of South Carolina. With the exception of Tract No. 1 at Fields Cut, maintenance has not significantly impacted the wetlands in the established disposal easements. However, in order to comply with the requirements of the State of South Carolina's approved Coastal Zone Management Program, undiked disposal will be stopped. A diked area will be constructed around the existing deposits in Tract No. 3 at Ramshorn Creek. The use of Tract No. 2 at Walls Cut will be stopped, and the dredged material pumped to Tract No. 1 at Fields Cut. Tract No. 1 is part of the same easement for Disposal Area 14 used for the maintenance of Savannah Harbor. The South Carolina Coastal Council has recently approved a proposed dike alignment which will completely enclose Disposal Area 14. A portion of Tract No. 1 will be included within this dike. Dredged material from Walls Cut and Fields Cut will be discharged into this diked area. The recommeded disposal plan for the three shoaling areas within South Carolina will allow continued maintenance of the waterway in a manner consistent with their Coastal Zone Management Program.

Sixteen shoaling areas on the main route of Georgia's portion of the AIWW (137 miles) and one area on the alternate route around St. Andrews Sound were identified. About 97 percent of the dredged material removed on an annual basis will come from these areas. Most of these areas will require dredging only occasionally because of extremely low shoaling rates. Jekyll Creek is by far the worst problem area on the waterway as it will account for over 45 percent of the material removed annually. Past disposal activities have significantly impacted the wetlands in the disposal tracts designated for Jekyll Creek. Additionally, the current method of disposal results in large quantities of the extremely silty material leaving the confines of the disposal easement and reentering the waterway as well as impacting wetlands outside of the easement. Two different studies should be initiated as soon as possible. The first study should identify some means of stopping dredged material from reentering the waterway. The second study should address the long-term problem of reducing the maintenance requirements of Jekyll Creek. Increasing the velocity in Jekyll Creek and construction of training walls should be evaluated.

Four other shoaling areas account for almost 31 percent of the shoaling material. Upper Wilmington River (6 percent); Hell Gate (7.5 percent); Little Mud River (10.3 percent); and Buttermilk Sound (7.2 percent).

The dredged material from the Upper Wilmington River will be concentrated as much as possible in diked area 2B-3A. However, because of the high shoaling rate, undiked disposal in Tract 5-A will also be used. While much of this material can be concentrated on the existing deposits in Tract 5-A, gradual encroachment on the wetlands remaining in the easement will occur over the next 50 years.

No feasible alternative that would significantly reduce adverse disposal impacts could be identified for the Upper Wilmington River.

The dredged material from Hell Gate will continue to be discharged in undiked Tracts 15-A and 15-B. Although much of the material is silt, sand is also encountered. Sand tends to settle rapidly on existing deposits which accounts for the relatively small area of impact when the amount of disposal that has occurred is considered. This area should be monitored carefully. If significant encroachment on the remaining wetlands becomes apparent, then the possibility of establishing an open water site should be investigated. A study should also be initiated to assess the possibility of channel realignment to reduce the shoaling rate at Hell Gate.

Maintenance material from Little Mud River will continue to be discharged into undiked Tract 32-A. This site should also be closely monitored to observe the extent further disposal encroaches on adjacent marshland. If use of this tract begins to significantly impact wetlands, especially those outside of the easement, then the feasibility of constructing a diked area in Tract 32-A and adjacent Tract 30-A or establishing an open water site in Altamaha Sound should be investigated.

Past disposal in Buttermilk Sound has had only minor impacts on the wetlands in disposal easements because of the use of four open water sites. The continued use of the open water site next to Tract 42-C, as well as open water sites No. 43 and 44, and Tract 42-B, is recommended. A potential open water site just south of the South Altamaha River offers an excellent possibility to discharge material to create substrate for marsh growth. This possibility will be investigated by Savannah District in conjunction with the Georgia DNR.

The remaining 21 percent of the dredged material to be removed from the AIWW on a yearly basis is divided among the other 11 shoaling areas. Table 8 shows the current method of disposal and the recommended alternative for these areas as well as the other dredging sites along the waterway. As shown in this table and the alternative discussion section, many of the recommendations suggest not using some of the designated disposal tracts. This is an attempt to concentrate the impacts of dredged material disposal. Although the use of some of these tracts is not recommended, the Corps of Engineers should still retain the easements for these areas. A change in the authorized project dimensions or a national emergency could necessitate the use of these tracts.

In addition to concentrating the discharges onto existing deposits in the most impacted areas, some best management practices have been implemented into the District's maintenance procedures. Prior to each dredging cycle, the District coordinates its proposed disposal plan with the Coastal Protection Section of the Georgia DNR for their recommendations. The recommended discharge points are then clearly marked making it easier for the contractor and Government inspectors to place the material in the right location. This will prevent recurrence of past incidents where contractors have impacted new areas of marsh by discharging at unspecified discharge points.

Savannah District will also implement an improved monitoring plan for the AIWW disposal areas. Depending on the frequency of dredging, active disposal

sites should be inspected by District biologists after every two dredging cycles. Aerial photography of these sites should be made every 5 years and compared to past photography to identify problem areas.

TABLE 8

RECOMMENDED DISPOSAL ALTERNATIVES

Waterway Section	Current Method of Disposal	Recommended Plan
Ramshorn Creek	undiked disposal - Tract 3	Construction of diked area in Tract 3.
Walls Cut	undiked disposal - Tract 2	Discontine use of Tract 2. Use Tract 1 which will be diked.
Fields Cut	Disposal into partially diked Tract 1	Dike Tract 1
Elba-Mcqueens Cut	Undiked disposal in Tract 1-A-1	Continued undiked disposal in Tract 1-A-1. If future inspections show significant degradation of adjacent wetlands to east, discontinue use and pump to Tract 1.
St. Augustine Creek	Undiked disposal in Tracts 2-A, 2B-3A	Continued undiked disposal in Tract 2-A use of 2B-3A. When 2B-3A reaches capacity and 2-A can no longer be used, deposit material in diked Tract 1 or South Channel for purposes of marsh creation.
Upper Wilmington River	Diked Tract 2B-3A undiked Tract 5-A and 5-B	Don't use Tract 5-B or portion of 5-A north of U.S. Highway 80. Continued use of Tract 2B-3A and undiked Tract 5-A (south of U.S. Highway 80).
Lower Wilmington River	Undiked Tracts 7-A 8-A, 9-A, 9-B and 10-C.	Continued undiked disposal in Tract 7-A and 9-A. Close monitoring. If significant encroachment on adjacent marsh and

TABLE 8 (continued)

		finger streams occurs, large diked area in 9-A or two smaller areas in 7-A and 9-A should be constructed. Tracts 8-A, 9-B and 10-C should not be used.
Hell Gate	Open water disposal north and south side of Raccoon Key.	Undiked disposal in Tracts 15-A and 15-B. Monitor, if adjacent marsh is significantly impacted, use open water disposal to create substrate for possible marsh growth. Conduct channel realignment study to reduce shoaling
Florida Passage	Undiked disposal in Trace 16-A	Continued undiked disposal on existing deposits in Tract 16-A.
Bear River	Undiked disposal in Tract 17-A	Continued undiked disposal on two largest mounds in Tract 17-A. Do not use three smaller impacted areas.
Johnson Creek	Undiked disposal in Tracts 19-A, 20-A, 21-A and "C"	Continued undiked disposal on existing deposits in Tract 19-A and 20-A. Tracts 21-A and "C" should not be used.
Creighton Narrows	Undiked diposal Tracts 24-A, 25-A, 25-C, 25-E and 26-A.	Don't use Tracts 24-A, 25-A and 26-A. Continued undiked disposal in Tracts 25-C and 25-E. Conduct study to determine feasibility of establishing diked area on Creighton Island.
Doboy Sound	Open water disposal next to Commodore Island.	Continued open water next to Commodore

TABLE 8 (continued)

		Island avoiding creek mouth between Doboy Island and Commodore Island.
North River. Rockdedundy Crossing	Undiked disposal - Tracts 29-A, 29-B, 29-C, 29-D, 30-A	Continued undiked disposal in Tracts 29-B or 30-A Preferably, Tract 29-C should not be used. Tract 29-D should definitely not be used.
South River	Undiked disposal Tracts 29-C, or 30-A	Preferably, Tract 29-C should not be used. Continued undiked discharge in Tract 30-A. Closely monitor Tract 30-A. If significant encroachment on adjacent wetlands occurs, initiate study to determine feasibility of constructing diked area in Tracts 30-A.
Little Mud River	Undiked disposal Tract 32-A	Continued undiked disposal in Tract 32-A monitoring. If significant encroachment on adjacent wetlands occurs, especially those outside of easement, investigate feasibility of constructing diked area in Tracts 30-A and 32-A, or open water site in Altamaha Sound.
Altamaha Sound	Undiked disposal Tracts 34-A and 36-A	Continued undiked disposal in existing deposits in western portion of 34-A and large deposits on eastern and western end of Tract 36-A.

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Appendix I

Environmental Impacts of Dredged Material Disposal Along the Atlantic Intracoastal Waterway

ENVIRONMENTAL IMPACTS OF DREDGED MATERIAL DISPOSAL ALONG THE ATLANTIC INTRACOASTAL WATERWAY

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36	Tract 34-A, Open Water Site No. 34	I-117
37	Tract 36-A	I-120
38	Tract 42-C, adjacent open water site	I-124
39	Tract 42-B	I-129
40	Open Water Site No. 43	I-132
41	Tract 43-A	I-135
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43	Tract 44-A	I-140
44	Tracts 45-B, 45-C	I-141
45	Tract 46-A	I-142
46	Tracts 48-A, 48-B	I-143
47	Tracts 49-B	I-144
48	Tracts 49-A, 49-C	I-145

Plates

Number	Title	Page
49	Tract 47-A	I-146
50	Tract 51-A, Open Water Site No. 51	I-150
51	Open Water Site No. 52, Tract 52-A	I-154
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Number	Title	Page
1	Plant Species Found on Disposal Easement of Georgia's Intracoastal Waterways 1980	I-10
2	Disposal of Dredged Material by Easement and Acres Affected in Georgia Atlantic Intracoastal Waterway	I-14

GENERAL DISCUSSION

As shown in table 4, in the main report, over 54 million cubic yards of dredged material have been removed from the AIWW between FY 42 and 80 during maintenance dredging operations. With the exception of several locations, most of the material has been deposited in undiked marsh areas adjacent to the waterway.

This type of disposal involves placing the discharge line on a previously formed mound. The heavier material (sand) settles on and around the mound while the finer particles (silts and clays) filter through the marsh. The fines either are eventually trapped in the marsh or filter out to enter finger streams or creeks down slope of the mound. Some of the material probably also reenters the dredging area.

During its maintenance dredging coordination procedures, Savannah District has received numerous comments that this type of dredged material disposal should be stopped and alternatives implemented because of the damage occurring to the salt marsh. As more material is pumped onto the mounds, the mounds gradually increase, and the elevation of the substrate becomes such that it can no longer support the predominant wetland plant along the AIWW, salt marsh cordgrass (Spartina alterniflora).

Although there is no doubt that some wetland vegetation has been altered along the AIWW as a result of disposal operations, Savannah District has maintained that this method of disposal is not as environmentally damaging as many parties have asserted, and in some cases, a net positive benefit is realized. It was this District's opinion that some of the suggested alternatives (e.g. diking in wetland areas) would be more environmentally destructive than the current method of disposal.

A thorough analysis of the changes in the salt marsh that have resulted from maintenance dredging was undertaken. Color infrared photography was obtained to cover the AIWW and all disposal areas adjacent to the waterway. Real estate maps (same scale as photography) were then superimposed over the color infrared photos and vegetative mapping for all disposal tracts prepared. Savannah District biologists then conducted field surveys of the three South Carolina sites to verify the accuracy of the mapping. Additionally, all disposal mounds were planimetered to determine the amount of wetland vegetation that has been altered by disposal activities. For the Georgia disposal sites, Savannah District biologists and personnel from the Coastal Protection Section, Coastal Resources Division, Georgia Department of Natural Resources (DNR) conducted field surveys of all major disposal sites. The DNR then prepared vegetation maps of these areas and determined the amount of acres affected within the disposal easement. A report was then prepared and submitted by DNR to the District including their recommendations for future disposal activities.

SOUTH CAROLINA DISPOSAL SITES.

Port Royal Sound to Ramshorn Creek. (mile 552 - 568).

The first 16 miles of the AIWW (within Savannah District's portion) traverses Skull Creek from Port Royal Sound to Calibogue Sound, thence Cooper

River to Ramshorn Creek. This section of the waterway affords sheltered, naturally deep waters to traffic. No dredging has been required since establishment of the 12-foot channel, and no disposal areas have been acquired for this reach of the AIWW.

Ramshorn Creek. (mile 567 - 569.25).

Ramshorn Creek (South Carolina) connects Cooper River to New River and is the northernmost section of the waterway within Savannah District that requires maintenance. Although it constitutes a 1.25 mile section of the AIWW, the shoaling area is predominantly confined to a 1/2-mile section (mile 568 - 568.5) near its confluence with Cooper River. Since completion of the 12-foot channel in 1941, Ramshorn Creek has required dredging on only three occasions (quantities in cubic yards):

	Credited	Gross
FY 1944	214,629	308,958*
FY 1966	38,175	54,175
FY 1980	22,892	33,888*
Totals	276,696	397,021

* Estimated

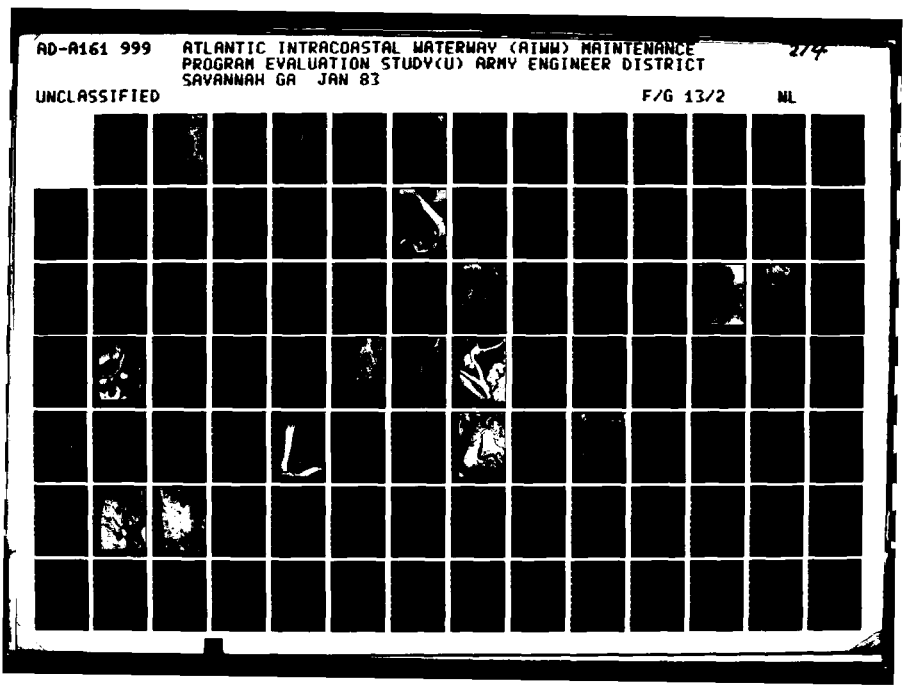
All material that has been removed from Ramshorn Creek has been deposited in a 278-acre disposal area (Tract No. 3) shown on plate 1. This undiked site is located on the east side of Ramshorn Creek and is owned by the State of South Carolina who granted the Corps a spoil-disposal perpetual easement on March 27, 1939. As evidenced by past maintenance operations, the material deposited into Tract No. 3 has been mostly sand and some silt. Five distinct mounds are visible along the eastern bank of Ramshorn Creek in Tract No. 3 where over 397,000 yards of material have been deposited. In view of the fact that this is relatively a small amount of material, and the fact that a considerable amount of marsh has been converted to a different type of habitat, and the fact that the deposits are mostly sand, most of the marsh loss is attributable to deposition of new work material from the construction of the 12' channel. This statement is also based on the size of some of the trees on the larger hammocks.

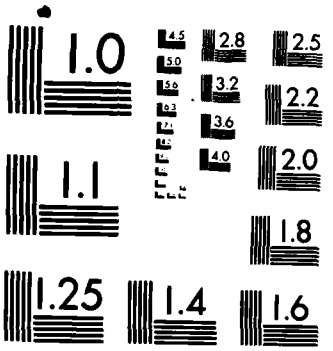
The undisturbed disposal tract was almost entirely a Spartina alterniflora salt marsh. Disposal activities, especially construction of the 12' channel in 1941 have resulted in the formation of five mounds of dredged material along the fringe of the area.

Trees and shrubs dominating the higher positions of mounds included cedar, (Juniperus virginiana) wax myrtle (Myrica cerifera) palmetto (Sabal palmetto), yaupon (Ilex vomitoria) and a few live oaks (Quercus virginiana). The high marsh zone and adjacent salt panne are predominantly vegetated with marsh elder (Iva frutescens), fimbristylis (Fimbristylis castanea), sea ox-eye (Borrichia frutescens), salicornia, (Salicornia spp.) saltwort (Batis maritima) and salt grass (Distichlis spicata). Extensive sand flats are located around and between the high mounds.

AD-A161 999 ATLANTIC INTRACOASTAL WATERWAY (AIWW) MAINTENANCE PROGRAM EVALUATION STUDY(U) ARMY ENGINEER DISTRICT SAVANNAH GA JAN 83 2/4

UNCLASSIFIED F/G 13/2 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



PLATE I

Tract No. 3 Description

Tract Size - 278 acres	
Acres Converted to Trees and Shrubs	12.9
Acres Converted to High Marsh	21.7
Acres Converted to Salt Panne	17.3
Total Acres Converted	51.9
Percent of Tract Converted	18.7%

Walls Cut. (mile 572 - 572.5)

New River (mile 569.25 - 572) has not required dredging, and Walls Cut (South Carolina) which connects New River to Wrights River is the next section of the waterway where maintenance has been necessary. Most of the shoaling in the 1/2 mile long cut occurs at the mouth of an unnamed creek located midway in the cut. Since 1941 Walls Cut has been dredged on four occasions:

	Credited	Gross
FY 1944	44,790	64,475*
FY 1943	25,418	36,589*
FY 1964	64,996	90,198
FY 1980 Totals	15,846	23,652*
Totals	151,050	214,914

* Estimated

All material removed from *Walls Cut* has been discharged into a 58.6 acre site shown on plate 2. The area is undiked and is situated on the western tip of Turtle Island adjacent to the waterway. Material encountered in Walls Creek is mostly sand. Tract No. 2 is owned by the State of South Carolina who granted the Corps a spoil disposal perpetual easement.

Although over 214,000 cubic yards have been deposited in Tract No. 2 from the maintenance, only a small amount of marsh has been disturbed. Prior to use, this tract was a Spartina alterniflora marsh and most of it still is. About 6 acres have been altered from dredged material disposal as shown below. Disturbed areas are vegetated with shrubs and grasses similar to those found at Ramshorn Creek.

Tract No. 2 Description

Tract Size - 58.6 acres	
Acres Converted to Trees and Shrubs	0.2
Acres Converted to High Marsh	4.3
Acres Converted to Barren Sand	1.2
Total Acres Converted	5.7
Percent of Tract Converted	9.7%

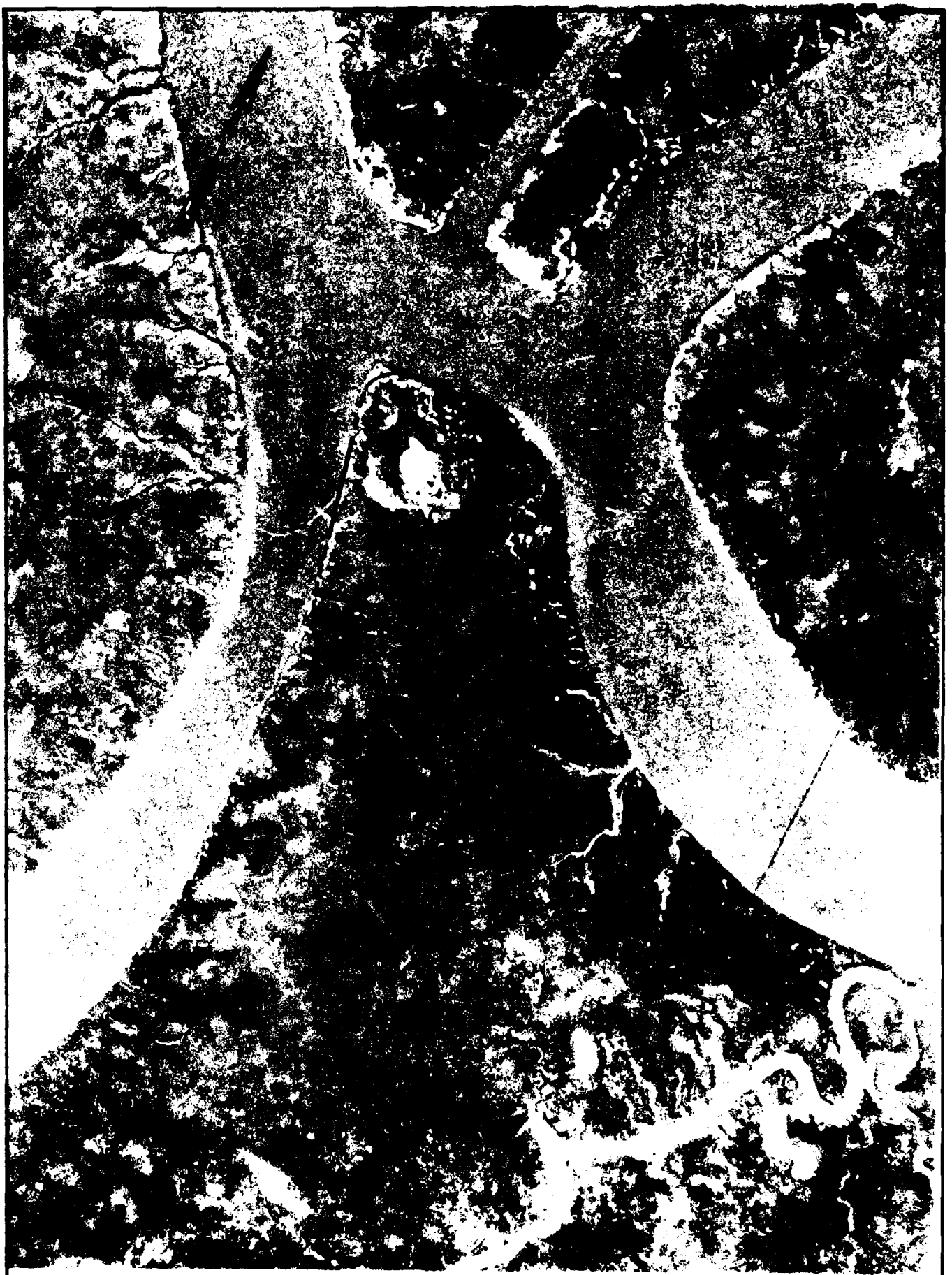


PLATE 2

Fields Cut. (mile 573.5 - 575.75)

Fields Cut (South Carolina) connects Savannah Harbor, Georgia to Wrights River (mile 572.5 - 573.5) which has not needed maintenance. The major shoaling occurs in the northern half of the waterway (mile 574.5 - 573.5).

Past maintenance has been performed as shown below:

	Credited	Gross
FY 1942	52,644	75,781*
FY 1943	228,568	329,024*
FY 1944	245,622	353,573*
FY 1945	200,344	288,395*
FY 1948	58,194	83,770*
FY 1960	44,613	78,173
FY 1964	201,649	234,031
FY 1968	21,266	30,042
FY 1972	31,360	32,360
FY 1974	36,276	49,590
FY 1977	29,206	41,716
Total	1,149,742	1,596,455

* Estimated

All of the material from Fields Cut (mostly sand) has been discharged into Tract No. 1 (Plate 3). Tract No. 1 is a 480-acre site which is diked on the western side of Fields Cut. This site is owned by the State of South Carolina which granted the Corps a spoil disposal perpetual easement on March 27, 1939.

Tract No. 1 is a partially diked site that has received large quantities of dredged material. However, it is difficult to quantify how much vegetation has been altered by AIWW maintenance dredging since Tract No. 1 also serves as part of Disposal Area No. 14 which is used in the maintenance of Savannah Harbor. As a result of AIWW maintenance work, approximately 1.6 million cubic yards of material have been pumped into Tract No. 1. Most of the shoaling has occurred in the northern half of the waterway with most of this at the confluence of Fields Cut and Wrights River. This fact is evidenced by the presence of a large sand deposit on the northern tip of the disposal tract. Extending down from the disposal mound is a rather wide band of big cordgrass Spartina cynosuroides and a narrow growth of salt marsh cordgrass Spartina alterniflora. Upland vegetation on Tract No. 1 created by the dredged material consists mainly of wax myrtle with some chinaberry (Melia azedarach) and popcorn (Sapium sebiferum) trees.

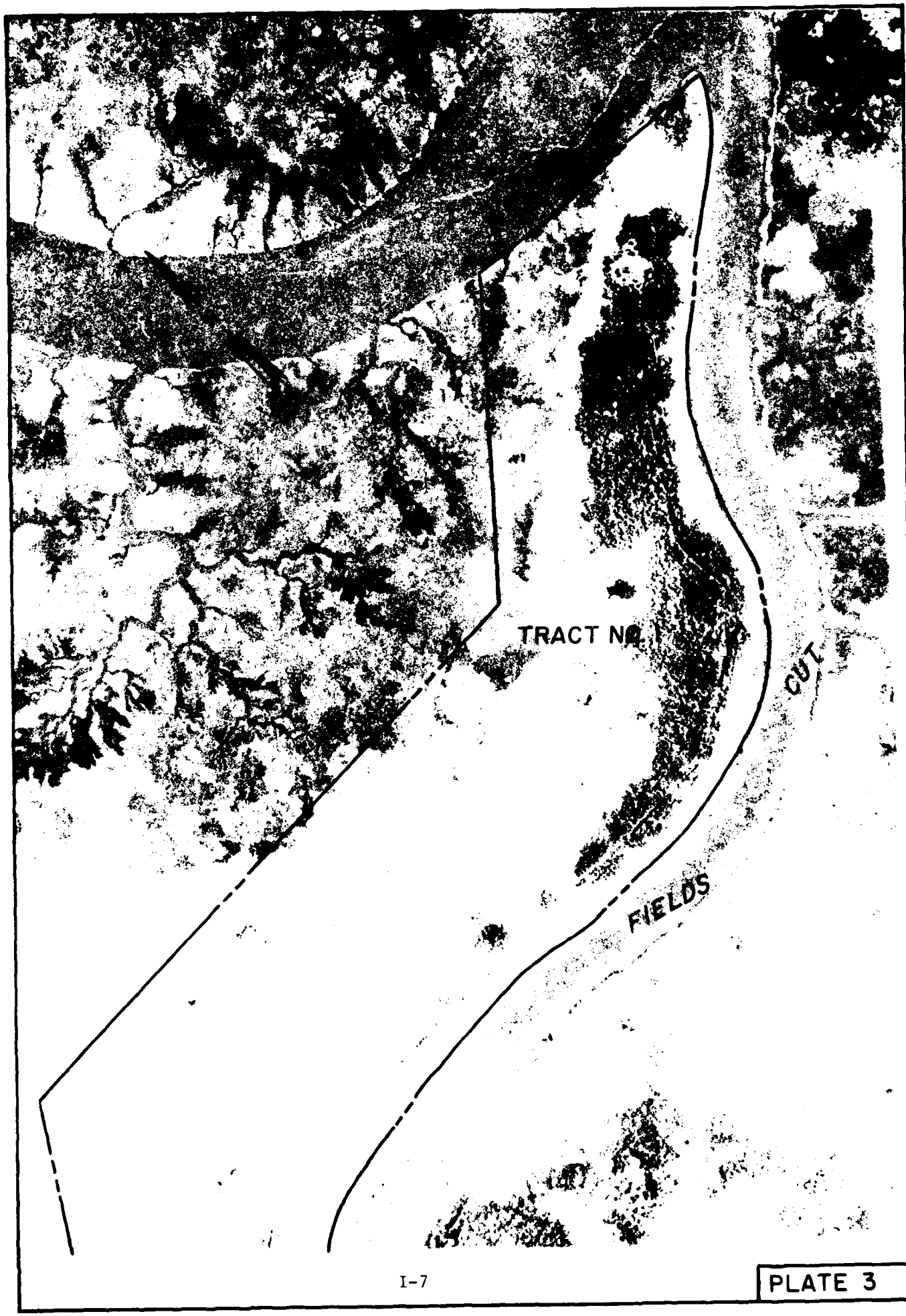


PLATE 3

Tract No. 1 Description	
Tract Size - 480 acres	
Acres Converted to Trees and Shrubs	105.5
Acres Converted to High Marsh	362.9
Acres Converted to Open High Sand	11.6
Total Acres Converted	480
Percent Converted	100%

AIWW DISPOSAL AREAS - GEORGIA

Corps of Engineers biologists inspected all disposal easements within the State of Georgia as well as conducted analyses of infrared photography of each site. Savannah District was assisted by personnel from the Coastal Resources Division of the Georgia Department of Natural Resources. Personnel from the Department of Natural Resources (DNR) determined the extent to which each disposal area has been affected and prepared the vegetation maps used in the discussions of AIWW disposal areas within the State of Georgia. Some of the conclusions reached by the DNR are as follows:

"With the expection of the heavy maintenance areas at 3 of the 9 nodal points, there has been relatively little impact to the estuarine system. It is our considered judgement that no additional areas should be diked along the AIWW in Georgia since this stops completely the tidal inundation and twice daily flushing of these tide lands. The only exception should be that certain toxic chemicals are best confined or retained behind dikes.

Many of the disposal sites created in the last decade or two have been occupied by species of plants and animals which are not native to the southeastern United States. The most notable non-native species is the popcorn tree which occurs from Savannah south to McIntosh County. Its niche is filled in the southern region by the tree called tamarisk or salt cedar. The popcorn tree, nevertheless, is invading northward. Other opportunistic species like the fire ant and raccoons are found in great abundance throughout. The common upland/shrub border species include wax myrtle, the silverling or groundsel bush and the high tide bush. The most common cross section from the water through the marsh to the upland was a Spartina species (either smooth or rough cordgrass), then sea ox-eye, high tide bush and the silverling as one proceeds higher in elevation through the shrub border toward the upland. One successful and opportunistic species, the nine banded armadillo, was not found on any of the waterway spoil easement sites.

There are many beautiful islands and hammocks which have been created over the last 50 to 60 years of intensive hydraulic dredging which have been spared of any recent dredge spoil. Our aim has been not to stop using these areas but to minimize the impact with the aim of a future Waterways National Park. This

concept could continue to serve the disposal requirements of the waterway and provide scenic and primitive camping areas reached by boat.

An estimated 33.4 percent (refer to table 2) of the easements (excluding the overboard dumping sites) are affected to some degree by dredged spoil. In many cases dredge spoil has been deposited outside of the designated easement boundaries. The most notable instances in which this has occurred include: easements No. 1-A-1, 2B-3A, 5A, 7A, 9A, 15A, 25C, 25E, 29A, 30A, 42C, 42B, 44A, 52A, 52B, and 53A.

The total affected area by dredge spoil outside the boundaries of the assessed easements totals approximately 140 acres. This figure does not include the extensively affected areas of marsh along the Jekyll River easements nor the affected open water areas adjacent to overboard spoil sites. Every effort should be made to contain all dredge spoil within the designated easement boundaries. The suggested pipe outfall locations have been identified for each easement. These alignments will ensure that future spoil will be deposited within the boundaries.

The spoil easements exhibit a very definite pattern of use. Some spoil deposits not being used for a number of years, have matured and stabilized and today support forest canopies. Other spoil sites have been in continual use thus prohibiting the long term establishment of vegatative species. Additionally, some easements have had a variety of pipe outfall locations which have greatly enlarged the impact areas."

The DNR prepared detailed vegetation maps for all areas that are used for maintenance disposal. Maps were not prepared for areas that were used for waterway construction purposes only, have never been used or for which the Corps no longer holds the easement. Table 1 prepared by the DNR shows the plant species found on the Georgia Disposal sites, and a discussion of individual sites follows. Table 2 is a summary of the impacts that have occurred at each site from the disposal of maintenance material.

Elba Cut - McQueens Cut (mile 576.5 - 578)

As of March 1943, the part of the AIWW through the westerly end of the South Channel of the Savannah River was abandoned in favor of a more direct route through two new marsh cuts. Elba Cut was dredged between Bird Island and Elba Island, and McQueens Cut was excavated through McQueens Island. The work was performed during FY 43 and required the removal of about 1.4 million cubic yards. Since its completion in 1943, most of the shoaling has occurred in Elba

TABLE 1

PLANT SPECIES FOUND ON DISPOSAL EASEMENTS
OF GEORGIA'S INTRACOASTAL WATERWAY - 1980

Trees	
Acer rubrum	red maple
Bumelia lanuginosa	buckthorn
Bumelia tenax	tough buckthorn
Celtis laevigata	sugar hackberry
Diospyros virginiana	persimmon
Juniperus salicicola	eastern red cedar
Magnolia grandiflora	southern magnolia
Melia azedarach	chinaberry
Nyssa ogeche	ogeechee tupelo
Nyssa sylvatica	black gum
Persea borbonia	red bay
Pinus elliottii	slash pine
Pinus serotina	Pond pine
Pinus taeda	loblolly pine
Platanus occidentalis	sycamore
Prunus caroliniana	laurel cherry
Prunus serotina	black cherry
Quercus falcata var. pagodaefolia	southern swamp red oak
Quercus laurifolia	laurel oak
Quercus nigra	water oak
Quercus virginiana	live oak
Rhus copallina	winged sumac
Rhus glabra	smooth sumac
Sabal palmetto	palmetto
Salix caroliniana	willow
Salix nigra	black willow
Sapium sebiferum	popcorn tree
Tamarix gallica	tamarisk
Taxodium distichum	cypress
Zanthoxylum clava-herculis	toothache tree

Shrubs/Vines	
Ampelopsis arborea	pepper vine
Atriplex patula	salt bush
Baccharis angustifolia	false willow, silvering
Baccharis halimifolia	sea myrtle, groundsel, silvering
Borrichia frutescens	sea ox-eye
Cephalanthus occidentalis	button bush
Foresteria awminata	florida privet
Ilex cassine	dahoon
Ilex opaca	American holly
Ilex vomitoria	cassena, yaupon
Iva frutescens	marsh elder
Myrica cerifera	way myrtle
Opuntia compressa	prickley pear

TABLE 1 (continued)

Shrubs/Vines (continued)	
Rubus betulifolius	blackberry
Rubus trivialis	dewberry
Sambucus canadensis	eldeberry
Serenoa repens	palmetto
Yucca aloifolia	spanish bayonet
Forbs	
Acnida cannabina	water hemp
Amaranthus cannabinus	water hemp
Ambrosia artemisiifolia	rag weed
Aster subulatus	aster
Aster tenuifolius	marsh aster
Batis maritima	saltwort
Boltonia asteroides	aster
Cassia fasiculata	patridge pea
Chenopodium album	lambs quarters
Chenopodium ambrosioides	mexican tea
Erigeron bonariensis	horseweed
Erigeron canadensis	horseweed
Eupatorium capillifolium	dog fennel
Eupatorium serotinum	dog fennel
Gnaphalium obtusifolium	rabbit tobacco
Heterotheca subaxillaris	goldenrod
Hibiscus moscheutos	rose mallow
Hydrocotyle umbellata	pennywort
Hymenocallis occidentalis	spider lily
Lechea patula	pinweed
Limonium nashii	sea lavender
Mikania scandens	climbing hempweed
Muscadinia rotundifolia	muscadine grapes
Parthenocissus quinquefolia	virginia creeper
Peltandra virginica	arrow arum
Phytolacca americana	pokeberry
Pluchea camphorata	marsh fleabane
Pluchea purpurascens	salt-marsh fleabane
Polygonum hydropiperoides	mild water-pepper
Polygonum punctatum	knotweed
Polygonum sagittatum	arrow leaved tearthumb
Rhus toxicodendron	poison ivy
Rumex verticellatus	water dock
Salicornia bigelovii	glasswort
Salicornia europea	samphire
Salicornia virginica	woody glasswort
Sesbania exaltata	sesbania
Sesuvium maritimum	sea purslane
Smilax bona-nox	catbriar
Solanum nigrum	nightshade

TABLE 1 (continued)

Forbs (continued)	
Solanum sisymbriifolium	spiny nightshade
Solidago sempervirens	seaside goldenrod
Solidago teniufolia	goldenrod
Sonchus asper	sow thistle
Strophostyles umbellata	wild bean
Suaeda linearis	sea blite
Verbena scabra	verbena
Vitus aestivalis	possum grape
Grasses	
Andropogon scoparius	little bluestem
Andropogon virginicus	virginia broomsedge
Arundo donax L.	giant weed
Cenchrus tribuloides	giant sand spur
Cladium jamaicensis	saw grass
Cyperus virens	sedge
Distichlis spicata	seashore salt grass
Echinochloa walteri	wild millet
Elymus virginicus	wild rye grass
Fimbristylis castanea	marsh fimbristylis
Juncus roemerianus	marsh rush
Panicum aciculare	panicgrass
Panicum amarulum	bitter panicgrass
Panicum virgatum	switchgrass
Paspalum ciliatifolium	
Paspalum dissectum	knotgrass
Paspalum notatum var. saurae	bahia grass
Paspalum vaginatum	creeping paspalum
Petrea chloris	finger grass
Ruppia maritima	widgeon grass
Sagittaria falcata	lance-leaved sagittaria
Sagittaria graminea	grass-leaved sagittaria
Sagittaria subulata	sublate sagittaria
Scirpus americanus	three square
Scirpus cyperinus	wool grass
Scirpus olneyi	bulrush
Scirpus robustus	saltmarsh bulrush
Scirpus validus	great bulrush
Setaria geniculata	knotroot
Setaria glauca	foxtail
Setaria magna	giant millet
Spartina alterniflora	smooth cordgrass
Spartina bakerii	bunch cordgrass
Spartina cynosuroides	big cordgrass
Spartina patens	salt meadow cordgrass
Sporobolus virginicus	virginia dropseed
Tillandsia usneoides	spanish moss
Triglochin striata	arrow grass

TABLE 1 (continued)

Grasses (continued)	
Typha domingensis	cattail
Typha latifolia	cattail
Zizaniopsis miliacea	southern wildrice

TABLE 2

DISPOSAL OF DREDGED MATERIAL BY EASEMENT AND ACRES AFFECTED
IN GEORGIA ATLANTIC INTRACOASTAL WATERWAY
(Georgia Department of Natural Resources)

Affected Easement No.	Acres	% Affected	Amt Affected In Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
1A1	37.8	100	38.7	15.9	most of general area	extensive
2A	45.0	100	45.0	5.3	most of general area	sparse
2B, 3A	155.4	100	155.4	30.64	32.6	
5A	128.7	63.5	81.7	15.6	24.2	5.7
7A	52.4	59	30.9	1.9	10.2	
8A[1]	46.6	36.9	17.2	.75		
9A	133.5	60.5	80.7	4.5	10.0	1.2
11K	24.7	58.5	14.4	1.1	1.5	
11L	39.6	15.1	6.0			
12A[2]	67.9	31.2	21.2	7.2	5.2	2.5
15A	109.0	39.5	43.1	.75	6.5	
15B	66.0	37.4	25.0			
16A	131.0	11.7	15.4	.35		
17A	244.7	9.9	24.1			
19A	97.8	26.2	25.7	.25		

1. Includes 10.99 acres of the easement dedicated in conveyances and highway R.O.W.

2. Includes 10.2 acres of easement dedicated to highway R.O.W.

TABLE 2 (continued)

Affected Easement No.	Acres	% Affected	Amt Affected In Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
20A	71.9	18.4	13.2			
24A	128.6	7.4	9.5	2.6		
25A	104.2	40.9	42.6	7.0		
25C	133.8	41.5	55.5	4.0	7.5	
25E	43.1	73.3	31.6	2.7	1.5	.4
28	OVER BOARD DUMPING AREA					
29A	158.3	12.1	19.2	2.2	7.0	.75
29D	65.9					
29C	92.6	57.8	53.5	2.2		
29B	120.0	30.0	35.9			
30A	230.1	38.7	88.9	1.1	21.2	
32A	228.9	25.5	58.3			
34A	80.9	35.7	28.9	11.5		
36A	260.4	23.0	60.1	26.2		
42C	14.5				1.6	
42B	65.0	27.2	17.7	.25	* 9.0	* .75
42	OVER BOARD DUMPING AREA					
43	OVER BOARD DUMPING AREA					

TABLE 2 (continued)

Affected Easement No.	Acres	% Affected	Amt Affected in Acres	Amt Forested In Acres	Amt Affected Outside Easement in Acres	Amt Forested Outside Easement in Acres
43B	176.4	4.2	7.5	1.1		
44A	76.4	29.7	22.7	5.0	1.1	
52	OVER BOARD DUMPING AREA					
52A	115.7	91.1	105.4	all general area		
52B	95.0	100	.4	all general area		
53A	180.4	59.4	107.1	all general area		
Cut 1	140.0	3.9	5.5			
Cut 3	673.0	9.7	65.5			

* Both within Tract 42

Total Number of Easements: 37

(not including over-board dump sites)

Total Acres: 4636.7 acres
Total Area Affected: 15481.1 acres 33.4 percent
Total Area Within Easement Which is Forested: 150.45 acres 3.2 percent
Total Area Outside Easements Which is Affected: 130.1 acres plus 9.0 ac. in Tract 42A
Total Area Outside Easements Which is Forested: 10.5 acres plus .75 ac. in Tract 42A

Cut into the South Channel (576.5 - 577). The maintenance history is as follows:

	Location	Credited	Gross	Disposal Area
FY 1947	McQueens Cut	121,977	175,586*	Tract A
FY 1948	Elba Cut	109,877	158,168*	Tract 1-A-1
FY 1949	McQueens Cut	145,845	209,944*	Tract A
FY 1953	Elba Cut	191,514	268,968	Tract 1-A-1
FY 1963	Elba & McQueens	177,646	226,972	Tract 1-A-1, Tract A
FY 1970	Elba Cut	16,118	28,475	Tract 1-A-1
FY 1974	Elba Cut	89,892	133,304	Tract 1-A-1
FY 1980	Elba & McQueens	38,789	57,408*	Tract 1-A-1
Total		891,658	1,258,825	

* Estimated

As indicated by the quantities above for maintenance, most of the material deposited in Tract 1-A-1 and Tract A resulted from the initial construction of Elba Cut and McQueens Cut. The use of Tract A was allowed by a special use permit from the National Park Service. The undiked site totalled 185 acres and was divided into two sections when McQueens Cut was dredged. The last maintenance in McQueens Cut was performed in FY 1963. On 30 April 1973, the special use permit was terminated and Tract A is no longer an AIWW disposal area.

As shown in the f gure 1 and plate 4 most of Tract 1-A-1 has changed from wetland to upland habitat although some wetland (Spartina cynosuroides) remains in the eastern section.

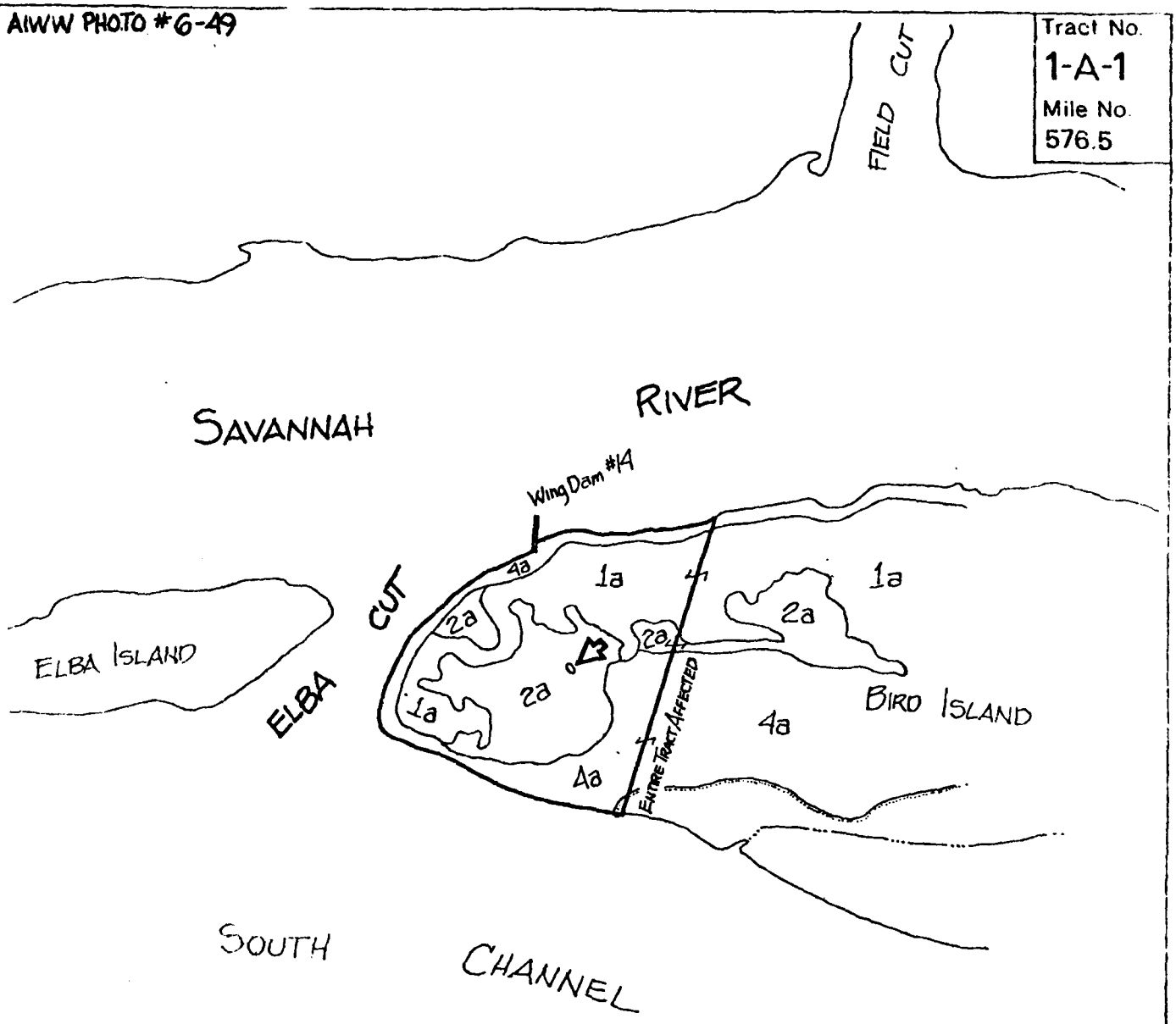
As indicated by the DNR, dredged material is present outside the easement. Although a small portion of this is attributable to AIWW dredging, the forested area bordering Savannah Harbor is a result of harbor maintenance. All of the easement has been affected by disposal activities.

South Channel

Prior to construction of Elba and McQueens Cuts, Tract 1-A (shown on plate 5) was acquired for the maintenance of the South Channel. In view of the new route, Tract 1-A has not been required for maintenance. It was acquired by the Georgia Intracoastal Waterway Commission and the Corps obtained a spoil disposal perpetual easement on February 17, 1940. It should be noted that the Commission is now defunct, and all disposal areas owned by the State of Georgia are now administered by the Georgia Department of Natural Resources. Although the Corps of Engineers still has disposal rights to Tract 1-A, there are no plans to use

AIWW PHOTO #6-49

Tract No.
1-A-1
Mile No.
576.5



Tract No.	Description & Management Practice:
1-A-1 Acreage 38.7	Disposal should continue to be toward the east and center of easement avoiding the main channel of the Savannah River, Elba Cut and South Channel. Preferred pipe outfalls marked with an arrow.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 1

TOTAL SIZE IN ACRES	38.7 1-A-1
PERCENTAGE OF EASEMENT AFFECTED	100.00%
AMOUNT OF EASEMENT AFFECTED IN ACRES	38.7
AMOUNT OF EASEMENT FORESTED IN ACRES	15.9
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	MOST ALL OF SURROUNDING AREA
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	EXTENSIVE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sapium sebiferum* POPCORN TREE (Many 20' to 25' high) The predominant tree on the island.
   Rhus glabra SMOOTH SUMAC
   Prunus caroliniana CAROLINA LAUREL CHERRY with tent caterpillar nest.
2. *Baccharis halimifolia* GROUNDSEL OR SILVERLING, predominant upper marsh and fringing shrub.
   Ilex vomitoria YAUPON
   Myrica cerifera WAX MYRTLE
   Rubus betulifolius BLACKBERRY-large bramble occupying site,
   Rubus trivialis DEWBERRY
3. *Solidago tenuifolia* GOLDENROD
4. *Spartina alterniflora* SMOOTH CORDGRASS, fringing marsh particularly in south channel.
   Spartina cynosuroides ROUGH CORDGRASS, fringing marsh also with great deal of stubble.

ANIMALS-Fire ants very abundant, tree scratches of bob cat, snapper turtle, cedar wax wing, square back and fiddler crabs.

Savannah River at Elba Cut, some question as to whether site was once occupied by man.



PLATE 4



PLATE 5

the 204.9 acre site since it is not located on the AIWW's current route. The road traversing the eastern portion provides vehicular access to Elba Island and was constructed by Southern Energy Company.

St. Augustine Creek. (mile 578 - 579).

The lower 1-mile portion of St. Augustine Creek serves to connect McQueens Cut with the Wilmington River. Most maintenance is necessary in the northern portion (mile 578 - 578.5). Past maintenance has been required as follows:

	Credited	Gross	Disposal Area
FY 1944	134,140	193,095*	Tract 2B-3A, Tract 2-A
FY 1945	61,134	88,002*	Tract 2B-3A, Tract 2-A
FY 1946	50,346	72,473*	Tract 2B-3A, Tract 2-A
FY 1948	51,701	74,424*	Tract 2B-3A, Tract 2-A
FY 1949	105,799	152,298*	Tract 2B-3A, Tract 2-A
FY 1963	82,134	146,947	Tract 2B-3A, Tract 2-A
FY 1965	89,565	143,796	Tract 2B-3A, Tract 2-A
FY 1967	73,443	124,460	Tract 2B-3A
FY 1968	65,127	86,905	Tract 2B-3A
FY 1970	70,979	116,503	Tract 2B-3A
FY 1972	44,383	62,406	Tract 2B-3A
Total	828,751	1,261,309	

* Estimated

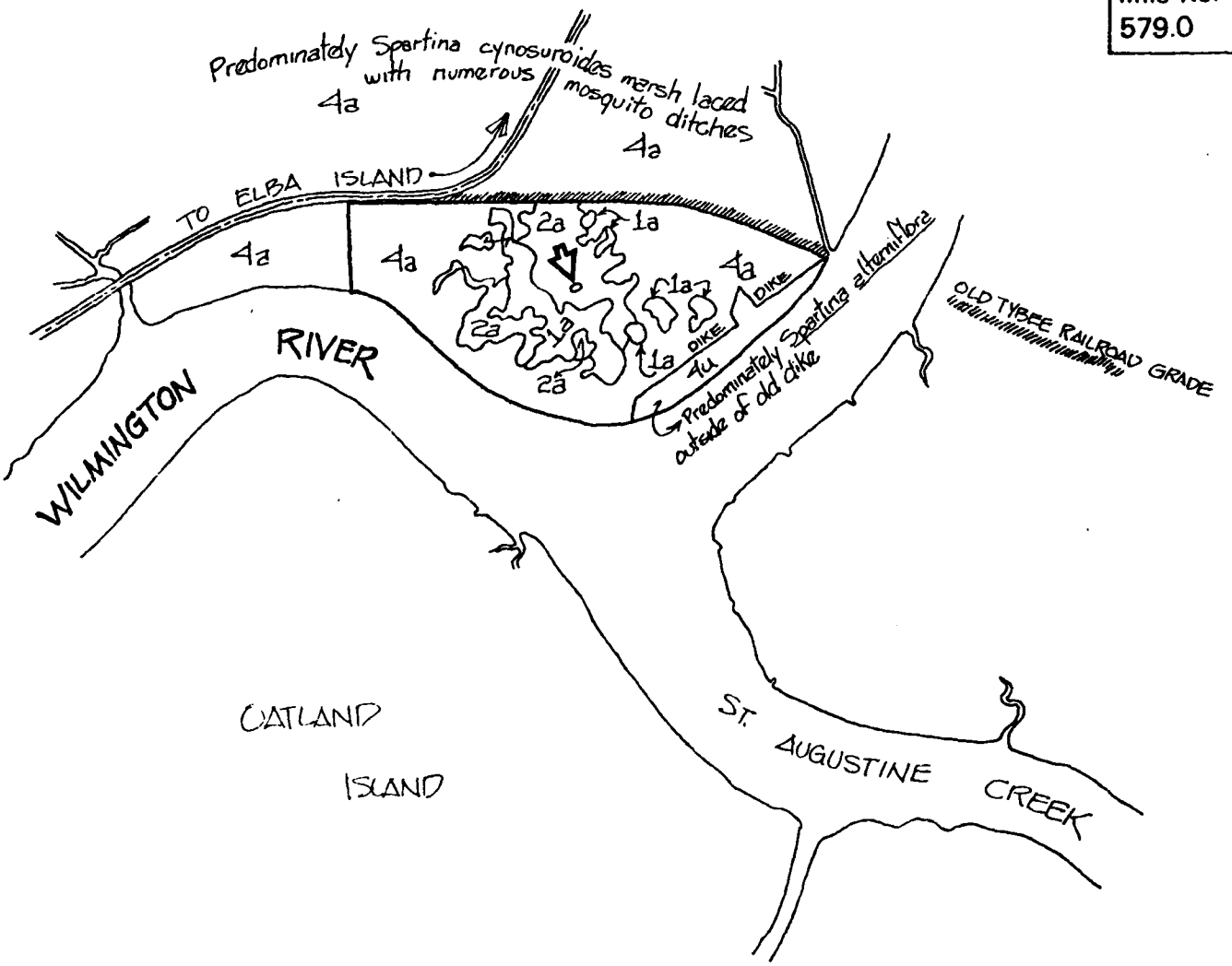
Almost all of the material from St. Augustine Creek has been deposited in Tract 2B-3A on Oatland Island which borders St. Augustine Creek and Wilmington River. However, it was noted that some of the material dredged from the southern portion of St. Augustine Creek was probably deposited in Tract 2-A in some of the earlier years. Tract 2B-3A is the only diked disposal area on the AIWW. Although material removed from St. Augustine Creek has been pumped into 2B-3A, most of the impacts have resulted from the heavy maintenance requirements of the upper Wilmington River. As shown in figures 2 and 3 and plate 6, 100 percent of Tract 2-A and 2B-3A have been impacted by dredged material disposal.

Wilmington River (mile 579 - 586).

The AIWW traverses the Wilmington River for approximately 7 miles to its confluence with Skidaway River. All maintenance has been confined to the first 5 miles (miles 579 - 584). No dredging has been necessary since FY 1982. Maintenance was performed as follows:

AIWW PHOTO # 9-66

Tract No.
2 A
Mile No.
579.0



Tract No.	Description & Management Practice:
2 A Acreage 45.0	This easement should be used more as it is bounded on two sides by a dike and railroad bed. Suggest that if dumping distances are suitable that it be used at every opportunity.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 2

TOTAL SIZE IN ACRES	45.0 2A
PERCENTAGE OF EASEMENT AFFECTED	100.00%
AMOUNT OF EASEMENT AFFECTED IN ACRES	45.0
AMOUNT OF EASEMENT FORESTED IN ACRES	5.3
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	MOST ALL OF SURROUNDING AREA
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	SPARSE

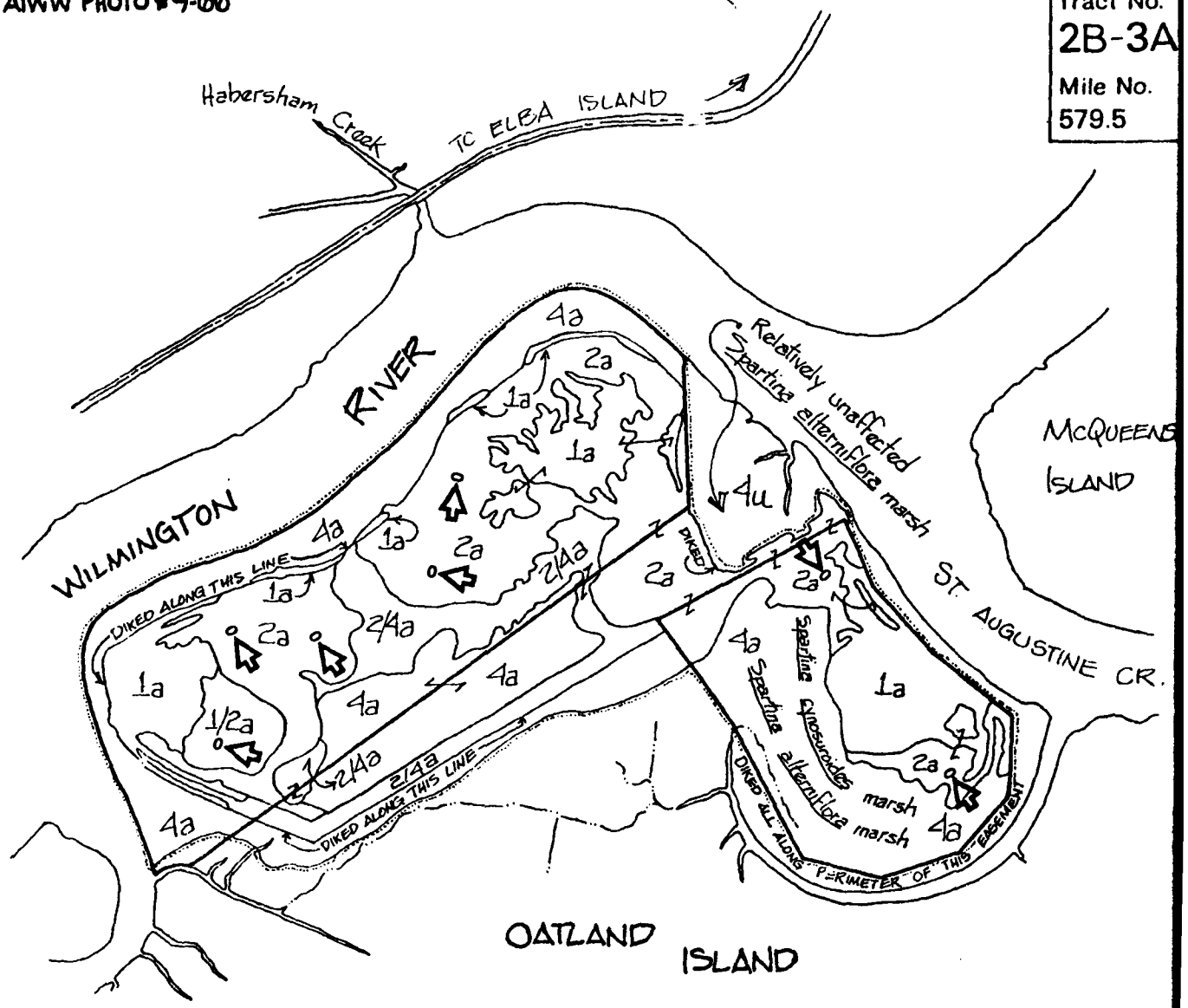
KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sapium sebiferum* — POPCORN TREE
2. *Myrica cerifera* — WAX MYRTLE
3. *Solidago sempervirens* — SEASIDE GOLDENROD
4. *Spartina cynosuroides* — ROUGH CORDGRASS site is predominately made up with this one grass

   Spartina alterniflora — SMOOTH CORDGRASS

AIWW PHOTO #9-66

Tract No.
2B-3A
Mile No.
579.5



Tract No.	Description & Management Practice:
2B-3A Acreage 155.4	Diked disposal area, heavy clay soil, monotonous vegetative cover made up primarily of silverling, rough cordgrass and popcorn tree. Placement recommended inside the diked in area. Note that dikes in some cases do not match easement.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 3

TOTAL SIZE IN ACRES	155.4 2B-3A
PERCENTAGE OF EASEMENT AFFECTED	100.00%
AMOUNT OF EASEMENT AFFECTED IN ACRES	155.4
AMOUNT OF EASEMENT FORESTED IN ACRES	30.6
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	32.6
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sapium sebiferum* — POPCORN TREE

2. *Baccharis halimifolia* — SILVERLING OR GROUNDSEL
Ilex opaca — AMERICAN HOLLY
Rubus betulifolius — RASBERRY
Rubus trivialis — DEWBERRY
Myrica cerifera — WAX MYRTLE
Iva frutescens — HIGH TIDE BUSH

3. *Solidago tenuifolia* — NARROW LEAVED GOLDENROD (in outfall hole)
Phytolacca americana — POKEWEED

4. *Spartina alterniflora* — SMOOTH CORDGRASS (lower, next to river, outside dike)
Spartina cynosuroides — ROUGH CORDGRASS (predominate marsh flora)
Typha angustifolia — Narrow-leaved CAT-TAIL
Arundo donax L. — GIANT REED (on northern corner)

Green Camelion, Marsh Rabbit and Raccoon

The predominate vegetation is Silverling together with Popcorn Tree and Rough Cordgrass which create a very monotonous condition. This site is the best argument on the AIWW to discontinue diking.



PLATE 6

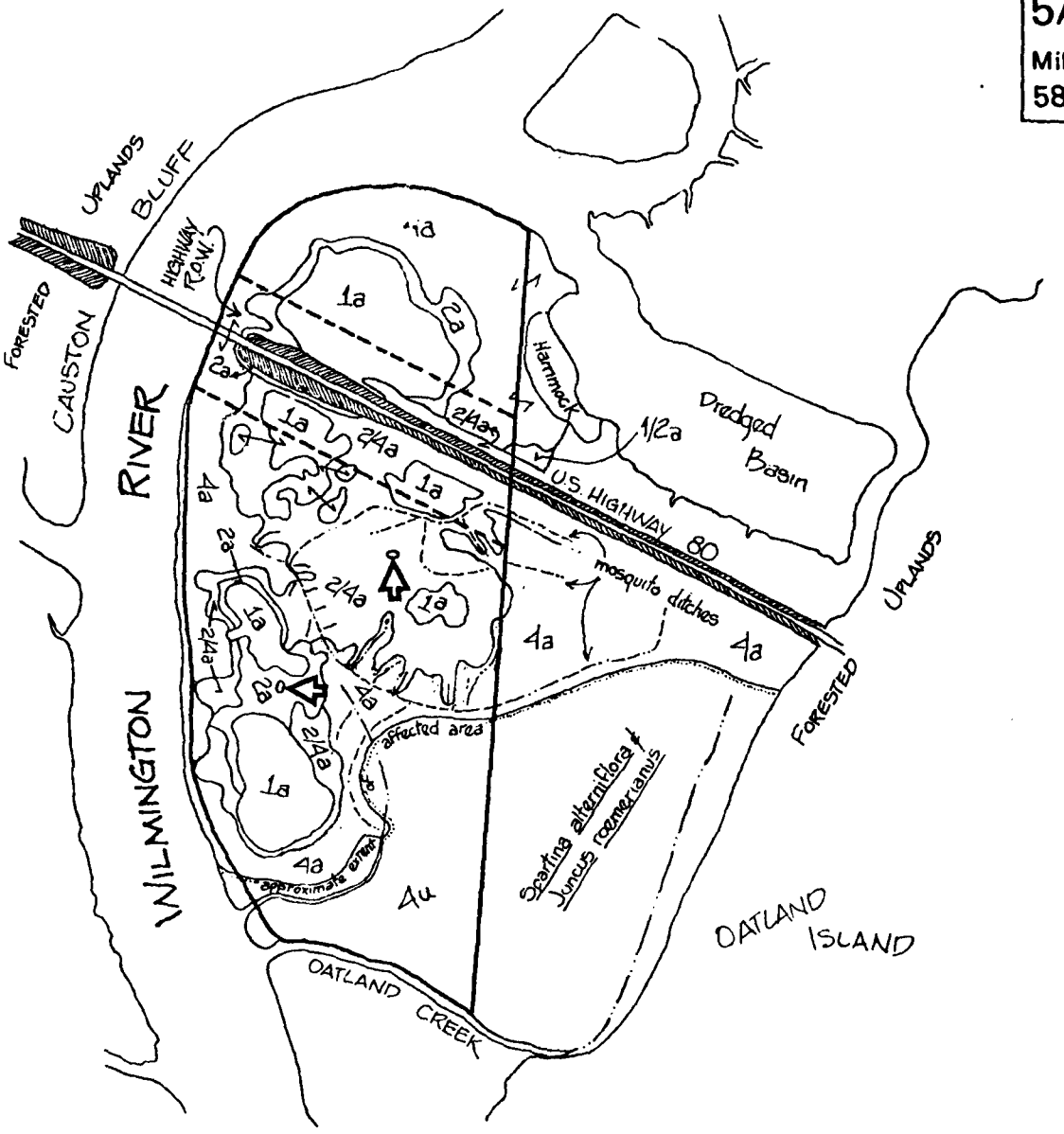
FY	Credited	Gross	Disposal Area
1942	433,784	624,432*	Tract 2B-3A, tract 5-A
1943	673,043	968,845*	Tract 2B-3A, Tract 5-A, Tract 7-A, Tract 9-A, Tract 9-B
1944	1,377,603	1,983,060*	Tract 2B-3A, Tract 5-A, Tract 5-B, Tract 7-A, Tract 9-A, Tract 9-B
1945	425,162	612,021*	Tract 2B-3A, Tract 5-A, Tract 9-A, Tract 9-B
1946	307,771	443,036*	Tract 2B-3A, Tract 5-A
1947	121,964	175,567*	Tract 5-A, Tract 5-B, Tract 7-A, Tract 9-A, Tract 9-B
1948	985,875	1,419,167*	Tract 2-A, Tract 2B-3A, Tract 5-A, Tract 5-B, Tract 7-A, Tract 9-A, Tract 9-B
1949	1,647,620	2,371,749*	Tract 2B-3A
1950	69,651	100,262*	Tract 2B-3A
1951	1,036,560	1,295,904	Tract 2A, Tract 2B-3A, Tract 5-A, Tract 5-B, Tract 7-A, Tract 8-A, Tract 9-A
1953	592,594	824,511	Tract 2B-3A, Tract 5-A
1960	478,961	784,593	Tract 2A, Tract 2B-3A, Tract 5-A
1963	443,993	712,517	Tract 2A, Tract 2B-3A, Tract 5-A Tract 5-B, Tract 7-A, Tract 8-A, Tract 9-A
1965	345,883	571,163	Tract 2-A, Tract 2B-3A, Tract 5-A Tract 5-B, Tract 7-A
1967	85,516	133,880	Tract 2B-3A
1968	66,461	86,170	Tract 9-A
1970	69,107	111,339	Tract 2B-3A
1972	275,447	298,589	Tract 2B-3A, Tract 8-A
1978	41,154	60,908 *	Tract 9-A
Total	9,478,149	13,567,713	

* Estimated

As stated earlier, all material dredged from the upper Wilmington River has been placed in diked area 2B-3A with the exception of small amounts in Tract 2-A. Tract 5-A (figure 4 and plate 7) has received most of the dredged material from the middle portion of the Wilmington River. The Georgia DNR, indicates that about 63.5 percent of this tract has been impacted. Stands of smooth cordgrass (Spartina alterniflora) remain unaffected in the southeastern portion of the tract. Tract 5-B (Plate 7) shows only slight use from waterway construction and maintenance activities many years ago. It has not been used for many years and would not normally be disposed on. Tract 7-A (figure 5 and plate 8) has been used rather extensively. As 59 percent of the tract is impacted, much of the impacts at this site can be attributed to construction of the AIWW as evidenced by several large hammocks that have developed on disposal

AIWW PHOTO #9-68

Tract No
5A
Mile No.
581.0



Tract No.	Description & Management Practice:
5A Acreage 128.7	Easement bisected by U.S. Highway 80. The small hammock on the north side of 80 and adjoining the dredged basin is used as a Chatham County park and boatramp. Where possible dredged material should be confined to the south side of the highway. Pipe outfall locations are indicated by the X.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE

TOTAL SIZE IN ACRES	128.7 5A
PERCENTAGE OF EASEMENT AFFECTED	63.5%
AMOUNT OF EASEMENT AFFECTED IN ACRES	81.7
AMOUNT OF EASEMENT FORESTED IN ACRES	15.6
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	24.2
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	5.7

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Pinus elliottii* SLASH PINE
2. *Myrica cerifera* WAX MYRTLE
3.
4. *Spartina cynosuroides* ROUGH CORDGRASS

Island almost completely dominated with Wax Myrtle and Rough Cordgrass. Upland area made up of Slash Pine. Outfall locations avoid Highway 80 and mosquito ditches and natural creeks.

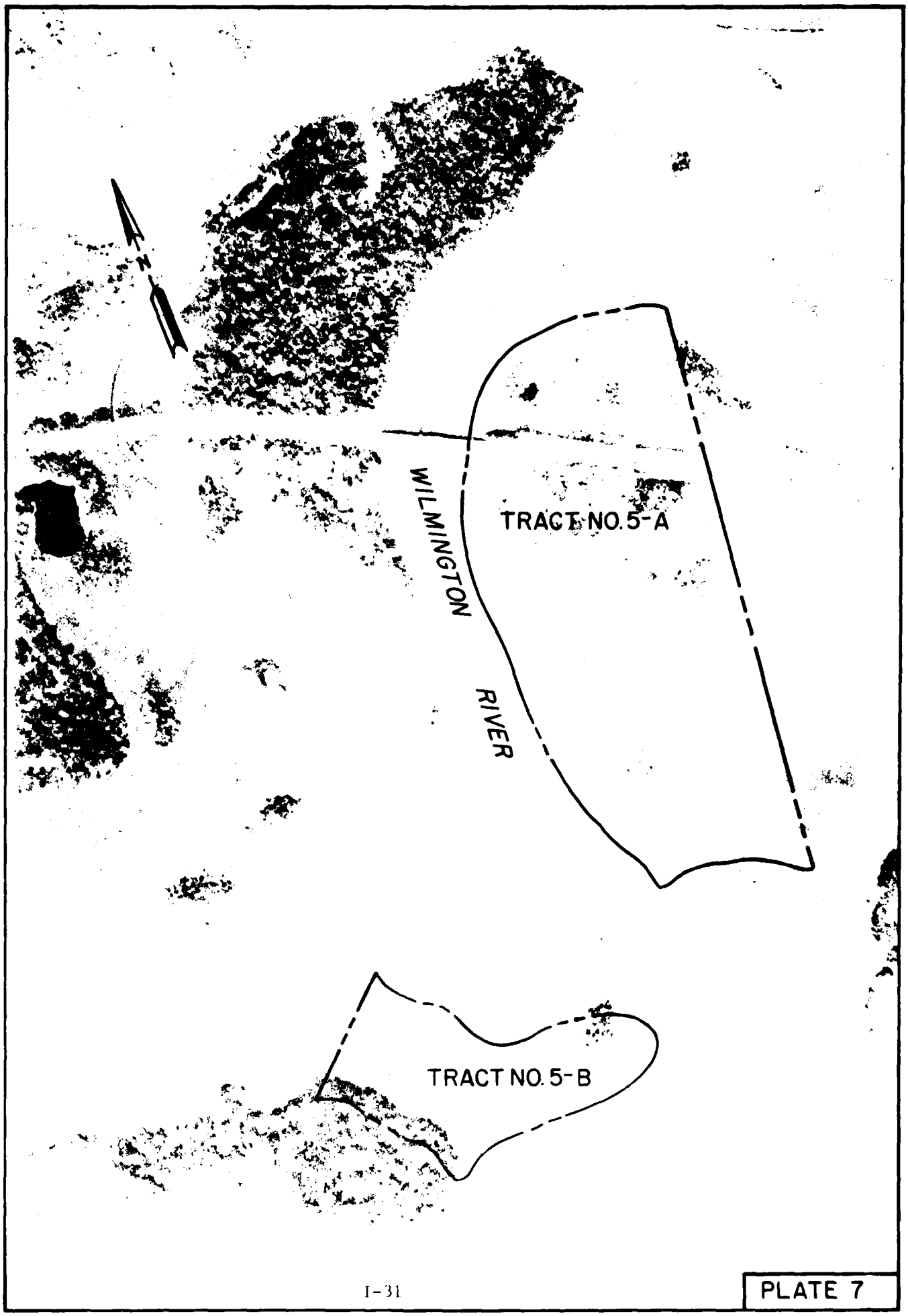
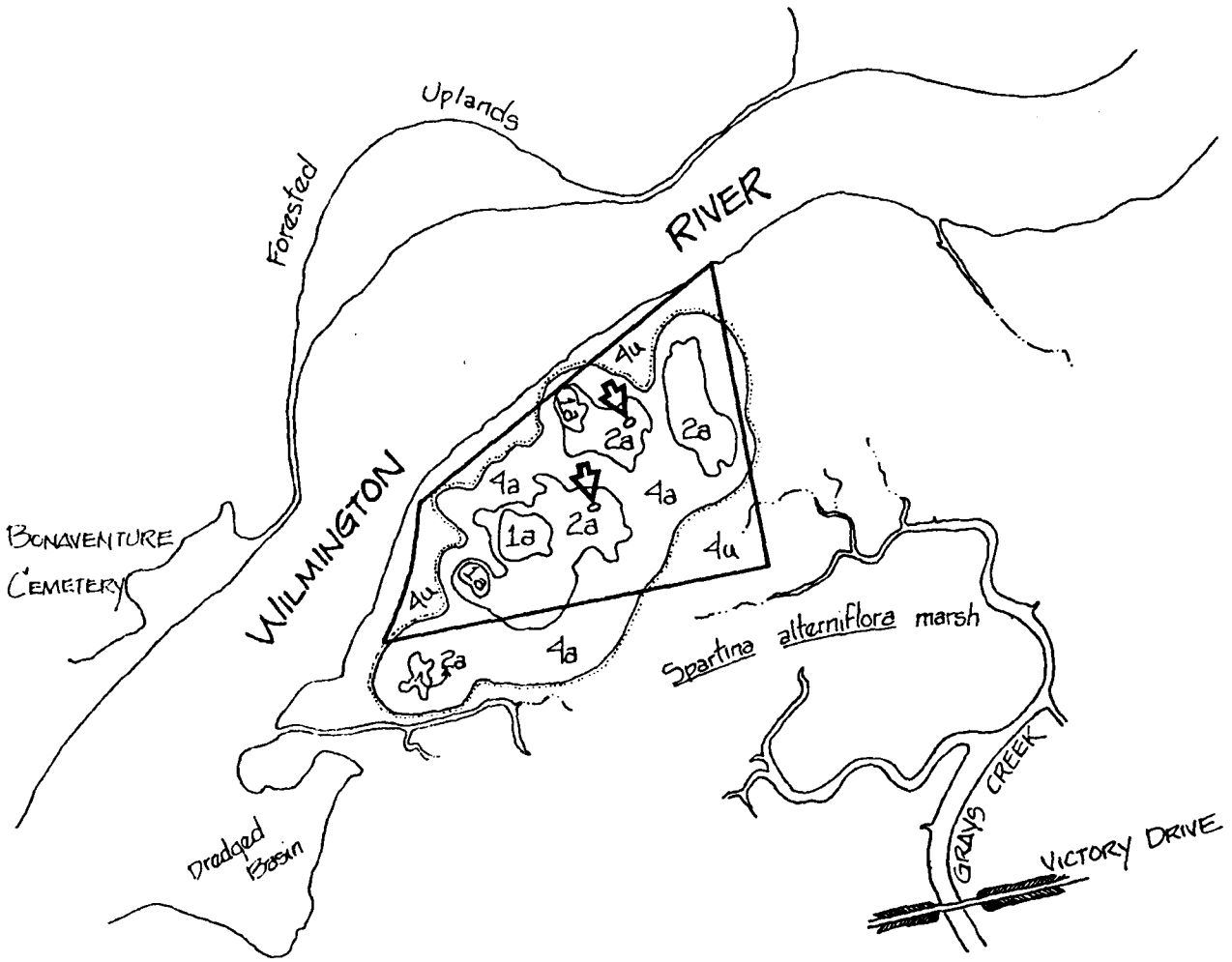


PLATE 7

AIWW PHOTO #9-70

Tract No.
7A
Mile No.
582.5



Tract No. 7A Acreage 52.4	Description & Management Practice: Outfall location avoids mature hammocks on this southern portion of 7A

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 5

TOTAL SIZE IN ACRES	52.4 7A
PERCENTAGE OF EASEMENT AFFECTED	59.0%
AMOUNT OF EASEMENT AFFECTED IN ACRES	30.9
AMOUNT OF EASEMENT FORESTED IN ACRES	1.9
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	10.2
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sabal palmetto* — CABBAGE PALMETTO
   Pinus taeda — PINE (probably slash or loblolly pine)
   Juniperus virginiana — CEDAR
   Magnolia grandiflora — MAGNOLIA
   Quercus nigra — WATER OAK
2. *Myrica cerifera* — WAX MYRTLE
   Borrichia frutescens — SEA OX-EYE
   Baccharis halimifolia — SILVERLING OR GROUNDSEL
3. *Phytolacca americana* — POKE BERRY
4. *Spartina alterniflora* — SMOOTH CORDGRASS
   Spartina cynosuroides — ROUGH CORDGRASS

Tillandsia usneoides — Spanish Moss abundant. This is not present on disposal sites up the waterway to the north toward the Savannah River.

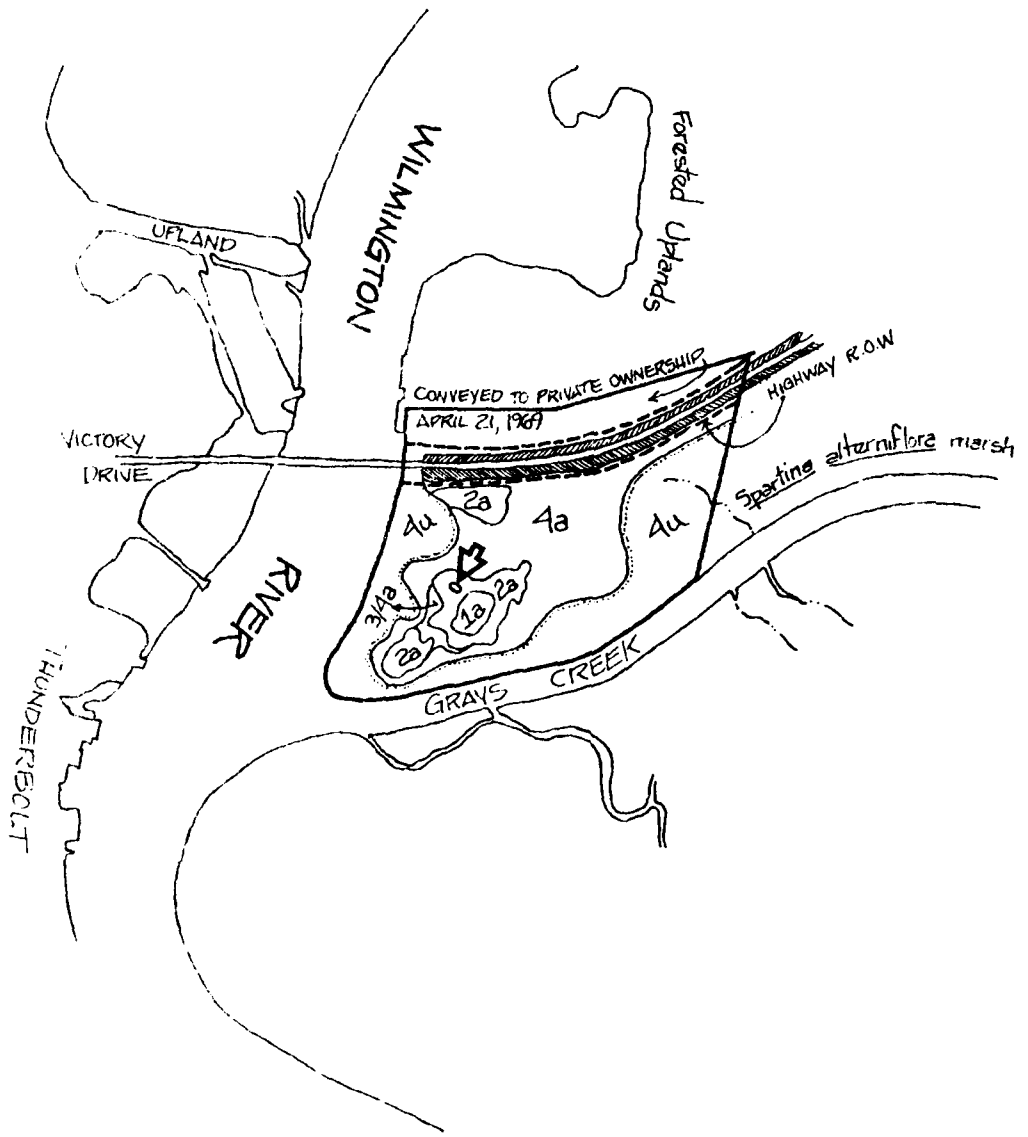
Previous disposal between this hammock and one to south, pipe outfall pits still persist .

ANIMALS- Rice Rabbits and Racoons are very abundant

Clapper Rail

AIWW PHOTO #9-72

Tract No.
8A
Mile No.
583.0



Tract No.	Description & Management Practice:
8A Acreage 46.6	Preferred outfall site on north side of hammock but sufficently far away from deep Spartina marsh and Highway right-of-way. This location avoids spoiling in Gray Creek and productive streamside marshes.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE

TOTAL SIZE IN ACRES	46.6*	8A
PERCENTAGE OF EASEMENT AFFECTED	36.9%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	17.2	
AMOUNT OF EASEMENT FORESTED IN ACRES	.75	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

* INCLUDES 10.9 ACRES OF THE EASEMENT DEDICATED IN CONVEYANCES AND HIGHWAY R.O.W.

1.	*Pinus elliottii*	SLASH PINE
	Sapium sebiferum	POPCORN TREE
2.	*Baccharis halimifolia*	SILVERLING OR GROUNDSEL
	Iva frustescens	HIGH TIDE BUSH
	Myrica cerifera	WAX MYRTLE
3.		
4.	*Spartina cynosuroides*	ROUGH CORDGRASS

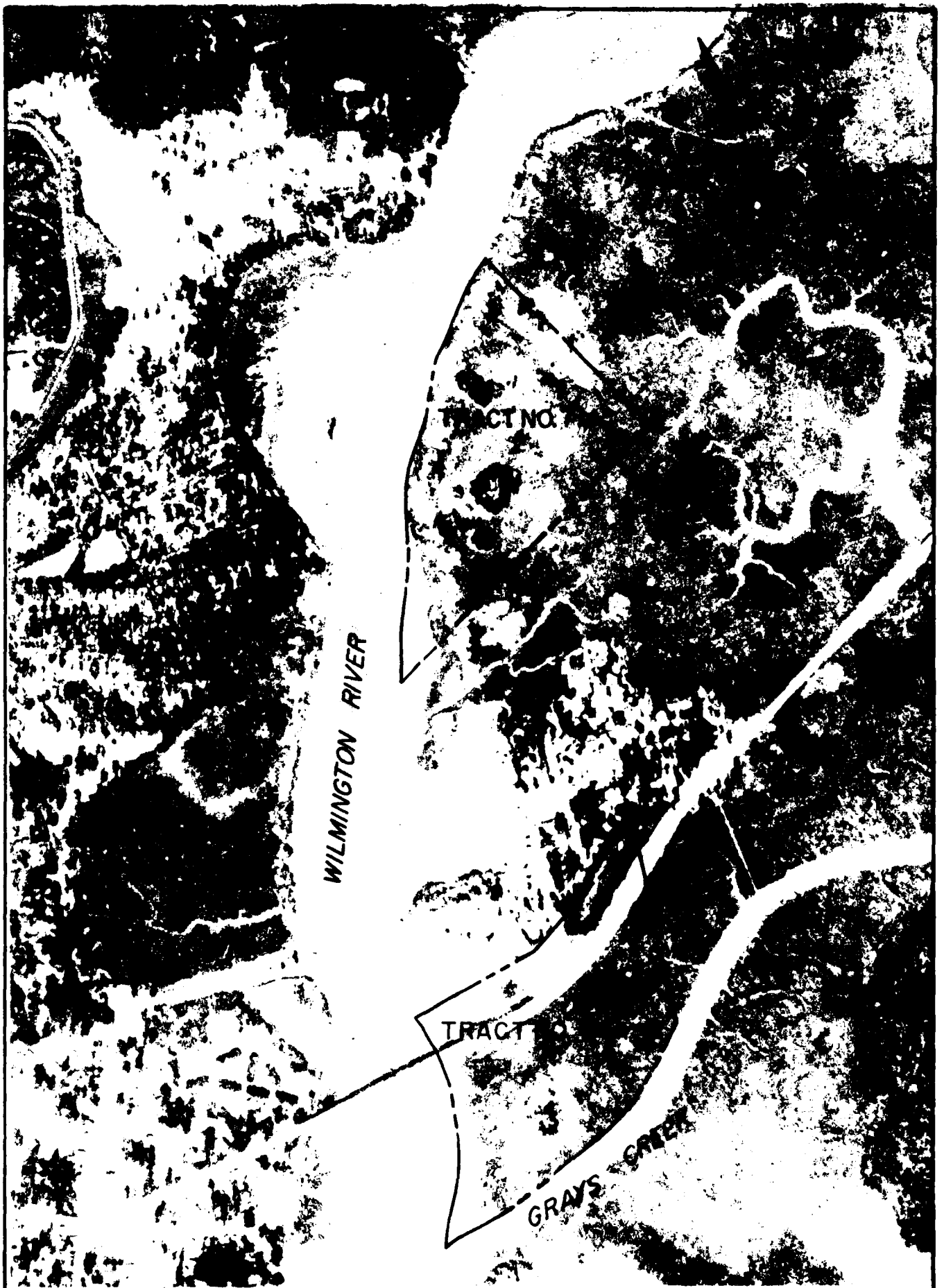


PLATE 8

mounds. These hammocks are characterized by rather large pine (Pinus taeda), cedar (Juniperus virginiana) magnolia (Magnolia grandiflora) and water oak (Quercus nigra).

Dredged material from the lower Wilmington River is usually deposited in Tract 9-A (figure 7 and plate 9). Over 10 percent of this area has been affected to some extent. In addition to Corps activities, Latex Construction Company has used this area to maintain their boat basin. They constructed a dike around 26 acres in the northeast corner of the Tract 8-A (figure 6 and plate 8). Tract 9-B (plate 9) and Tract 10-C (plate 10) are also available for disposal. Tract 8-A was last used in 1972. Most of the tract remains a productive Spartina alterniflora marsh. Four small disposal mounds are visible in Tract 9-B, and only 10 acres of this 126 acres tract have been impacted. This disposal is a result of construction of the 12' channel and early maintenance in the 1940's. In Tract 10-C, (57.6 acres) has never been used.

Skidaway River. (mile 586 - 591).

This 5-mile (mile 586 - 591) portion of the AIWW extends from Wilmington River to the Skidaway Narrows. It has required maintenance on two occasions in the early years after the 12-foot channel was completed:

	Credited	Gross	Disposal Area
FY 1942	165,457	238,175*	Tract 11-K, Tract 11-L
FY 1943	49,450	71,183*	Tract 11-K, Tract 11-L
Totals	214,907	309,358*	

* Estimated

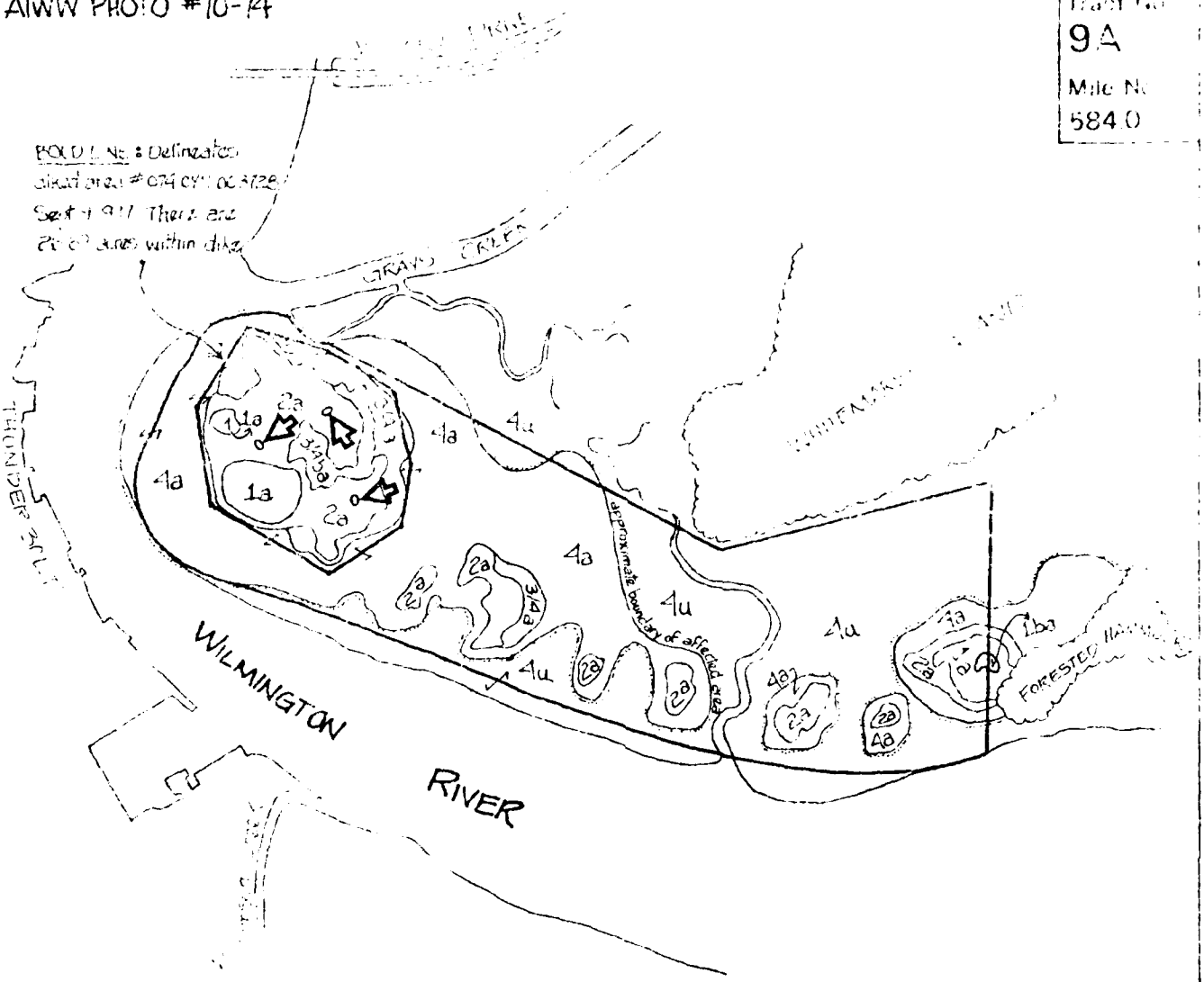
As shown above, all maintenance material has been deposited in Tract 11-K and Tract 11-L (figure 8 and plate 11) resulting in about 60 percent of the tract being affected by dredge material. The fact that these deposits are from early maintenenace of the waterway is evidenced by the hammock in Tract 11-K vegetated with rather large red cedar (Juniperus salicicola), black cherry (Prunus serotina), red bay (Persea borbonia), slash pine (Pinus elliottii) and live oak (Querus virginiana). Tract 11-H (plate 11) is a small 19.5 acre site just downstream from Tracts 11-K and 11-L. One small disposal mound is located in this site as a result of construction dredging.

Skidaway Narrows (mile 581 - 594.5).

For the next .5 mile, the AIWW enters a confined section known as the Skidaway Narrows until the confluence with the Burnside River. Like Skidaway

AIWW PHOTO #10-74

Tract No.
9A
Mile No.
584.0



Tract No.	Description & Management Practice:
9A Acreage 1335	Disposal easement across Wilmington River from Thunderbolt Marina (Latex) The westernmost 20 acres of the site was diked in 1978 by the Marina and are greatly impacted. Dewatering and compaction of the dike-in area would prolong the useful life of the site. Pipe outfall within the dike should continue to be the high point.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Scale 0,000 0 500' 1000' 2000' north

FIGURE 7

TOTAL SIZE IN ACRES	133.5
PERCENTAGE OF EASEMENT AFFECTED	60.5%
AMOUNT OF EASEMENT AFFECTED IN ACRES	80.7
AMOUNT OF EASEMENT FORESTED IN ACRES	4.5
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	10.0
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	1.2

9A

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sabal palmetto* — CABBAGE PALMETTO
   Salix caroliniana — SWAMP WILLOW
   Platanus occidentalis — SYCAMORE
   Sapium sebiferum — POPCORN TREE 40 to 50' high

2. *Baccharis halimifolia* — GROUNDSEL or SILVERLING
   Iva frutescens — HIGH TIDE BUSH

3. *Pluchea camphorata* — MARSH FLEABANE
   Sesbania exaltata — SESBANIA
   Eupatorium capillifolium — DOG-FENNEL
   Solidago sempervirens — SEASIDE GOLDENROD
   Ambrosia artemisiifolia — RAGWEED
   Heterotheca subaxillaris
   Chenopodium ambrosioides — MEXICAN-TEA
   Aster tenuifolius — ASTER

4. *Juncus roemerianus* — NEEDLE RUSH, 6' high

ANIMALS-Many Racoons and Rabbits

The above list was prior to 1979 Latex dredge disposal. Following that all the species were smoothered or died back. A field of large mud cracks are inside the dike, soft, thixotrophic muds lie underneath. All Myrtle and upland species killed back by spoiling within the dike. In the summer of 1980, new sprouts from the Myrtle, Palm, Willow and Groundsel Tree were coming back.

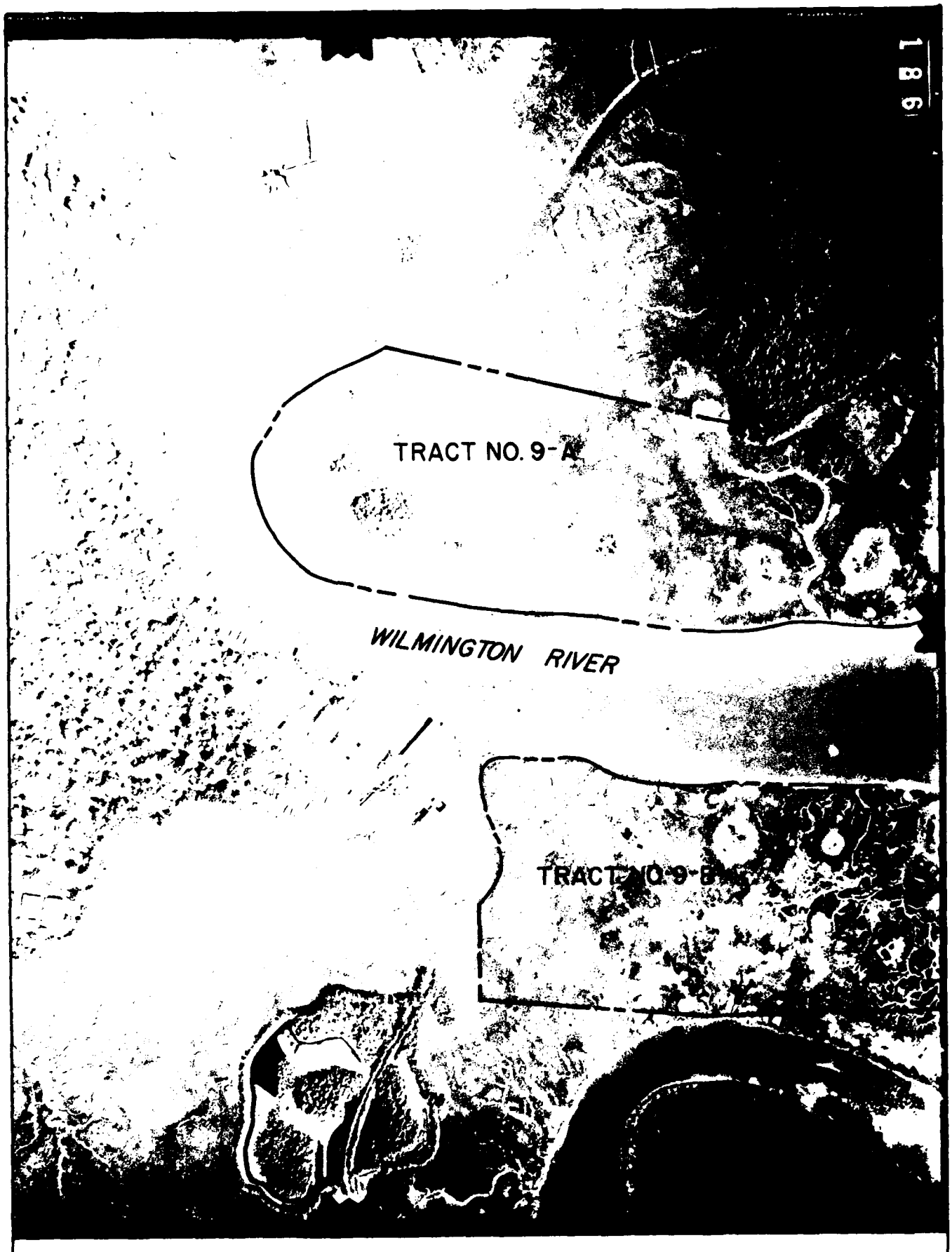


PLATE 9

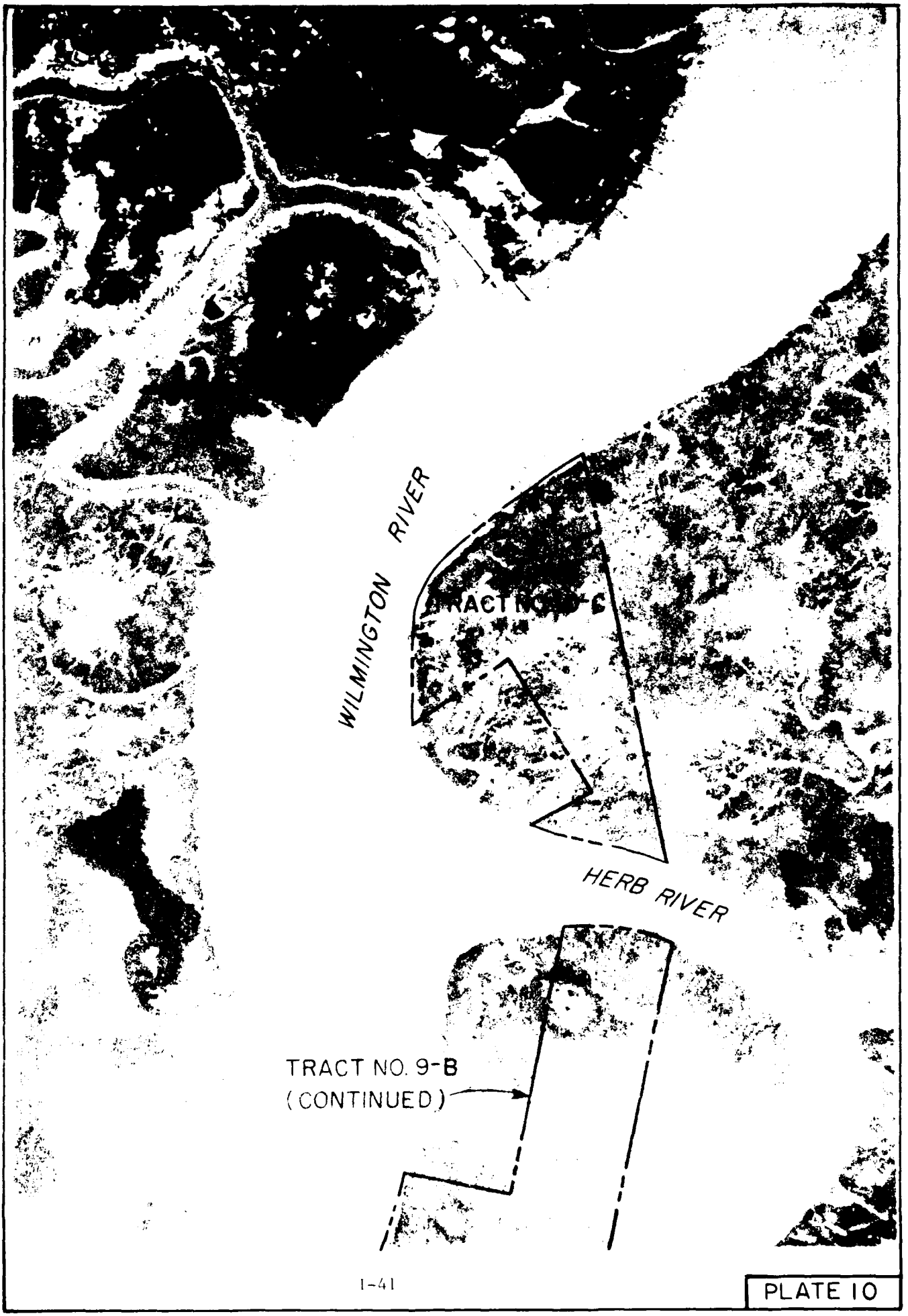
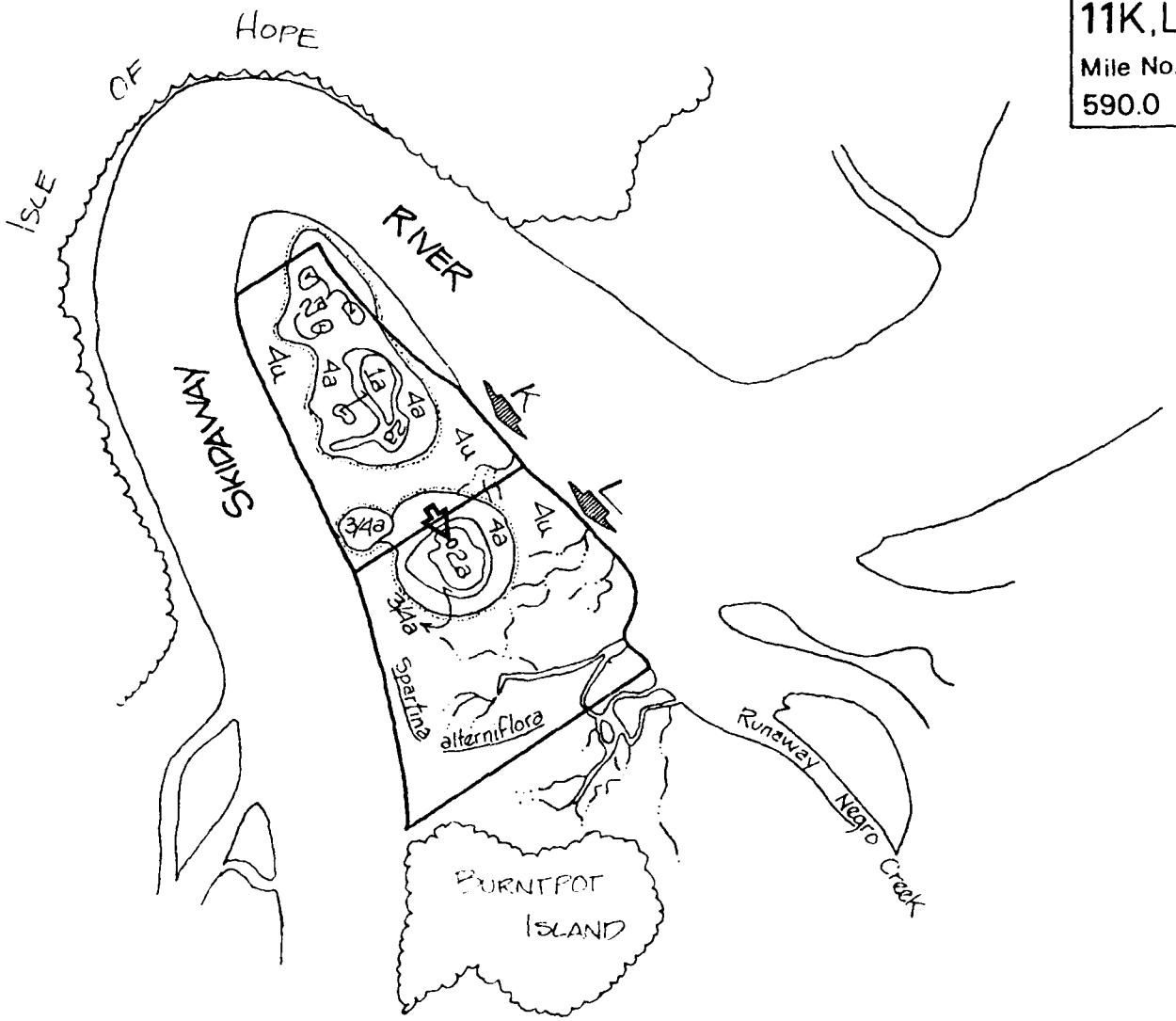


PLATE 10

AIWW PHOTO # 12-8E

Tract No.
11K,L
Mile No.
590.0



Tract No.	Description & Management Practice:
11K,L Acreage K24.7, L39.6	Disposal site across from Isle of Hope Marina and north of Burntpot Island. 11K has mature island. The mature upland trees on this site should not be disturbed. Outfall locations should be on the boundary between K & L and on L with caution for the Spartina alterniflora marsh and creek system next to Burntpot.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 8

TOTAL SIZE IN ACRES	K: 24.7	L: 39.6
PERCENTAGE OF EASEMENT AFFECTED	58.5%	15.1%
AMOUNT OF EASEMENT AFFECTED IN ACRES	14.4	6.0
AMOUNT OF EASEMENT FORESTED IN ACRES	1.1	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	1.5	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sabal palmetto* — CABBAGE PALMETTO
   Junpiperus virginiana — RED CEDAR
   Prunus serotina — BLACK CHERRY
   Persea borbonia — RED BAY
   Pinus elliottii — SLASH PINE
   Quercus virginiana — LIVE OAK
2. *Baccharis halimifolia* — GROUNDSEL OR SILVERLING
   Iva frutescens — HIGH TIDE BUSH
3. *Limonium nashii* — SEA LAVENDER
   Salicornia virginica — WOODY GLASSWORT
4. *Spartina alterniflora* — SMOOTH CORDGRASS



PLATE II

River, it has not required maintenance since the early years after completion of the 12-foot channel.

	Credited	Gross	Disposal Area
FY 1944	29,990	43,171*	Tract 12-A
FY 1945	17,487	25,173*	Tract 12-A
Total	47,477	68,344*	

* Estimated

In addition to the above dredging, a land cut was made through Tract 11-E in FY 74 to straighten the channel. Some of the unsuitable material was pumped into Tract 12-A (figure 9 and plate 13) while the usable material was discharged on the west bank of Skidaway Narrows for purposes of public boat ramp construction.

Three other disposal tracts are located along Skidaway Narrows and two show slight evidence of having been used in the past. The material deposited in them is probably resultant from the construction of the 12-foot channel or possibly from the early maintenance shown above. Tract 11-B (plate 12), Tract 13-A (plate 14), and Tract 14-A (plate 14) are all undiked. Tract 14-A has never been used.

Burnside River to Hell Gate. (mile 594.5 - 601).

The next .5 miles of AIWW have not required dredging in view of natural depths in the Burnside River, and Vernon River. Only one disposal site is located in this section. Tract 14-B (32.8 acres) shown on plate 14 is an undiked disposal island in the Burnside River owned by the State of Georgia. The site is not currently being used since no dredging is contemplated in this area.

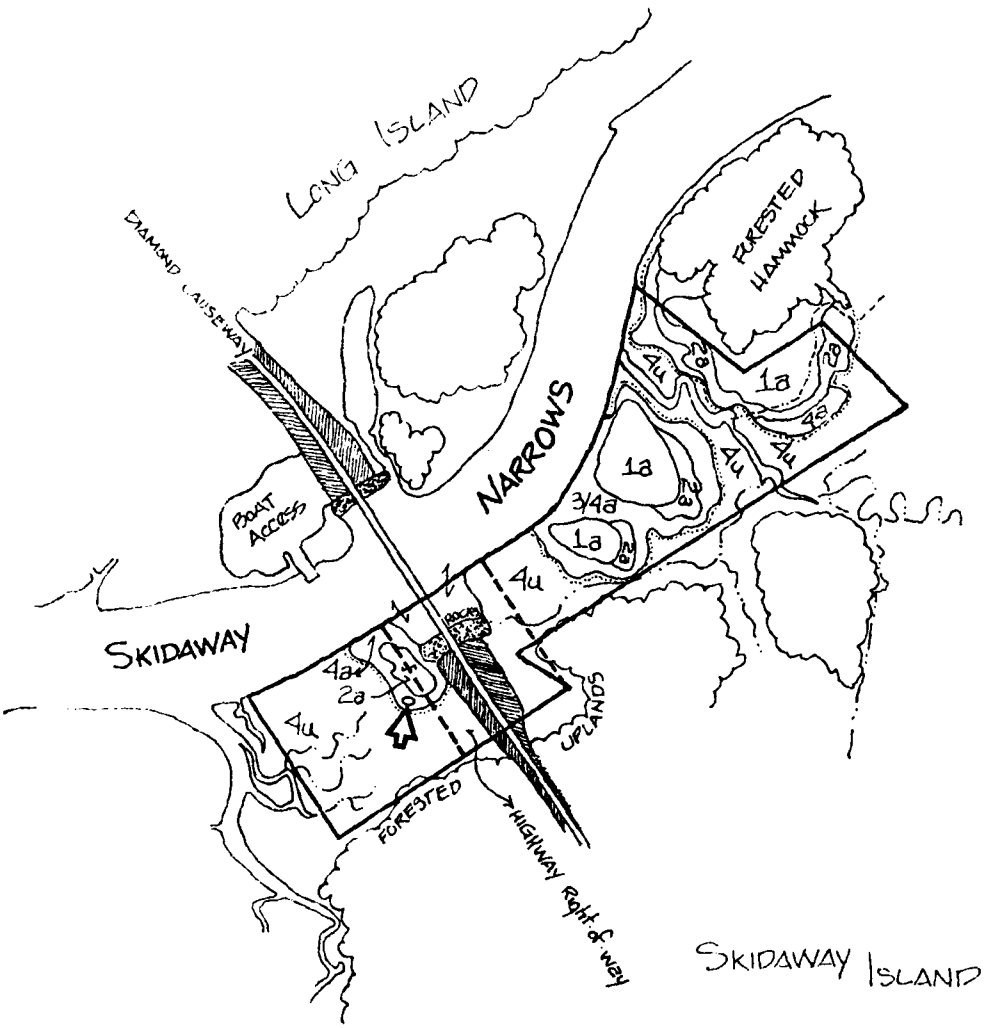
Hell Gate. (mile 601 - 602.5).

Hell Gate is a narrow passage in between Little Don Island and Raccoon Key. It is subject to heavy siltation between mile 601.25 - 602.25 as evidenced by the maintenance record.

FY	Credited	Gross	Disposal Area
1943	180,931	260,450*	Tract 15-A, Tract 15-B
1944	62,756	90,337*	Tract 15-A, Tract 15-B

AIWW PHOTO #12-85.

Tract No
12A
Mile No.
592.5



Tract No.	Description & Management Practice:
12A Acreage 67.9	Skidaway Narrows is one of the many nodal points behind a barrier island. Along the AIWW the incoming tides from the opposing sounds on the north (Wassaw) and the south (Ossabaw) meet . Tidal velocties are reduced and siltation occurs. Disposal sites should be limited to the south of the Diamond Causeway just off the R/W in the shrub border.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 9

TOTAL SIZE IN ACRES	67.9*
PERCENTAGE OF EASEMENT AFFECTED	31.2%
AMOUNT OF EASEMENT AFFECTED IN ACRES	21.2
AMOUNT OF EASEMENT FORESTED IN ACRES	7.2
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	5.2
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	2.5

12A

* INCLUDES 10.2 ACRES OF EASEMENT DEDICATED TO HIGHWAY R.O.W.

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1.	*Sabal palmetto*	CABBAGE PALMETTO
	Prunus serotina	BLACK CHERRY
	Pinus elliottii	SLASH PINE
	Pinus taeda	LOBLOLLY (Predominates)
	Quercus virginiana	LIVE OAK
	Quercus laurifolia	LAUREL OAK
	Tamarix gallica	SALTCEDAR
2.	*Baccharis halimifolia*	SILVERLING OR GROUNDSEL
	Myrica cerifera	WAX MYRTLE
	Iva frutescens	HIGH TIDE BUSH
	Borrichia frutescens	SEA OX-EYE
3.	*Solidago*	sp. and other composites as understory
	Salicornia bigelovii	GLASSWORT
	Solidago sempervirens	SEASIDE GOLDENROD
4.	*Spartina alterniflora*	SMOOTH CORDGRASS

Some sandy loam over a hard pan clay. The several upland islands and hammocks are the result of the orginial improvements and dredging to the Narrows in 1905. Succession since then has created some upland. A portion of the State Park occupies these dredge sites.



PLATE 12

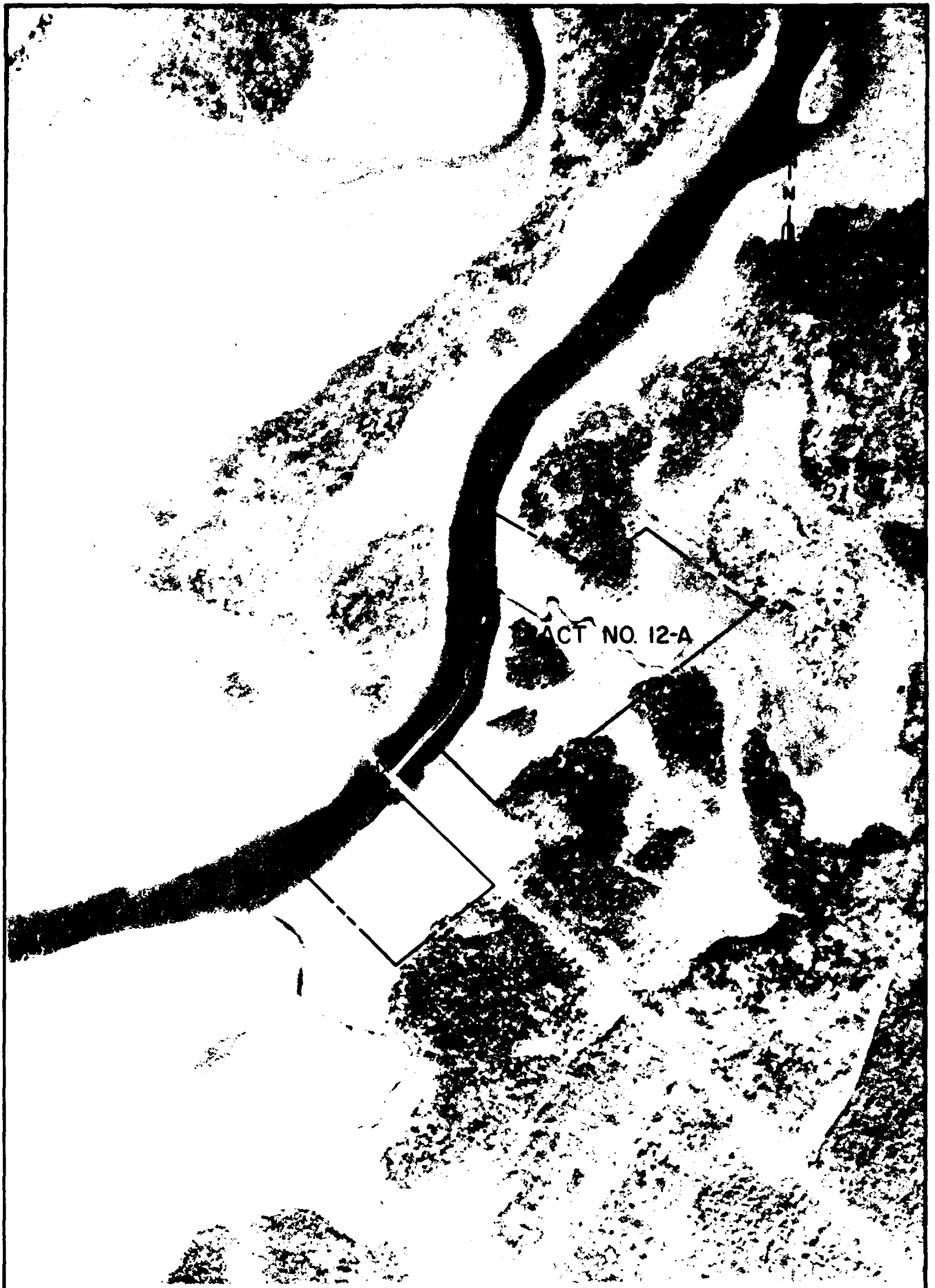


PLATE 13



PLATE 14

1945	72,563	104,454*	Tract 15-A, Tract 15-B
1946	137,598	198,072*	Tract 15-A, Tract 15-B
1948	87,348	125,737*	Tract 15-A, Tract 15-B
1949	223,691	322,003*	Tract 15-A, Tract 15-B
1953	279,751	345,861	Tract 15-A, Tract 15-B
1960	194,625	252,583	Tract 15-A, Tract 15-B
1963	195,828	276,726	Tract 15-A, Tract 15-B
1964	72,863	95,094	Tract 15-A, Tract 15-B
1965	104,355	203,793	Tract 15-A, Tract 15-B
1966	97,017	134,273	Tract 15-A, Tract 15-B
1968	149,149	193,461	Tract 15-A, Tract 15-B
1970	82,086	123,035	Tract 15-A, Tract 15-B
1972	148,781	186,488	Tract 15-B
1974	206,241	224,592	Tract 15-A
1976	102,055	132,648	Overboard-north and south sides of Raccoon Key
1977	65,464	75,613	Overboard-north and south
1978	102,173	151,216*	sides of Raccoon Key
1980	82,073	121,468*	sides of Raccoon Key
Total	2,587,886	3,562,291	Tract 15-A

* Estimated

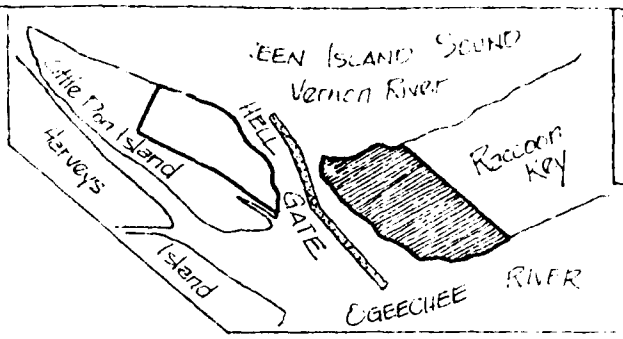
Up until FY 76, all material dredged from Hell Gate was deposited in Tracts 15-A or 15-B shown on plates 15 and 16 and figures 10 and 11 respectively. Both are undiked disposal sites. The use of Tract 15-B (66.6 acres) was stopped after FY 72 as it was utilized by the Skidaway Institute for study of undiked vs. diked disposal techniques. Tract 15-A (109 acres) was used during the FY 74 operation. However, several agencies expressed concern over the damage occurring to some finger streams within 15-A. In response to this concern, the Corps decided to use the alternative of open water discharge for the last four dredging occasions. The material was deposited in open water on the north and south sides of Raccoon Key.

Hell Gate to Florida Passage (mile 602.5 - 605.5) has not required maintenance, and no disposal sites are located along this reach.

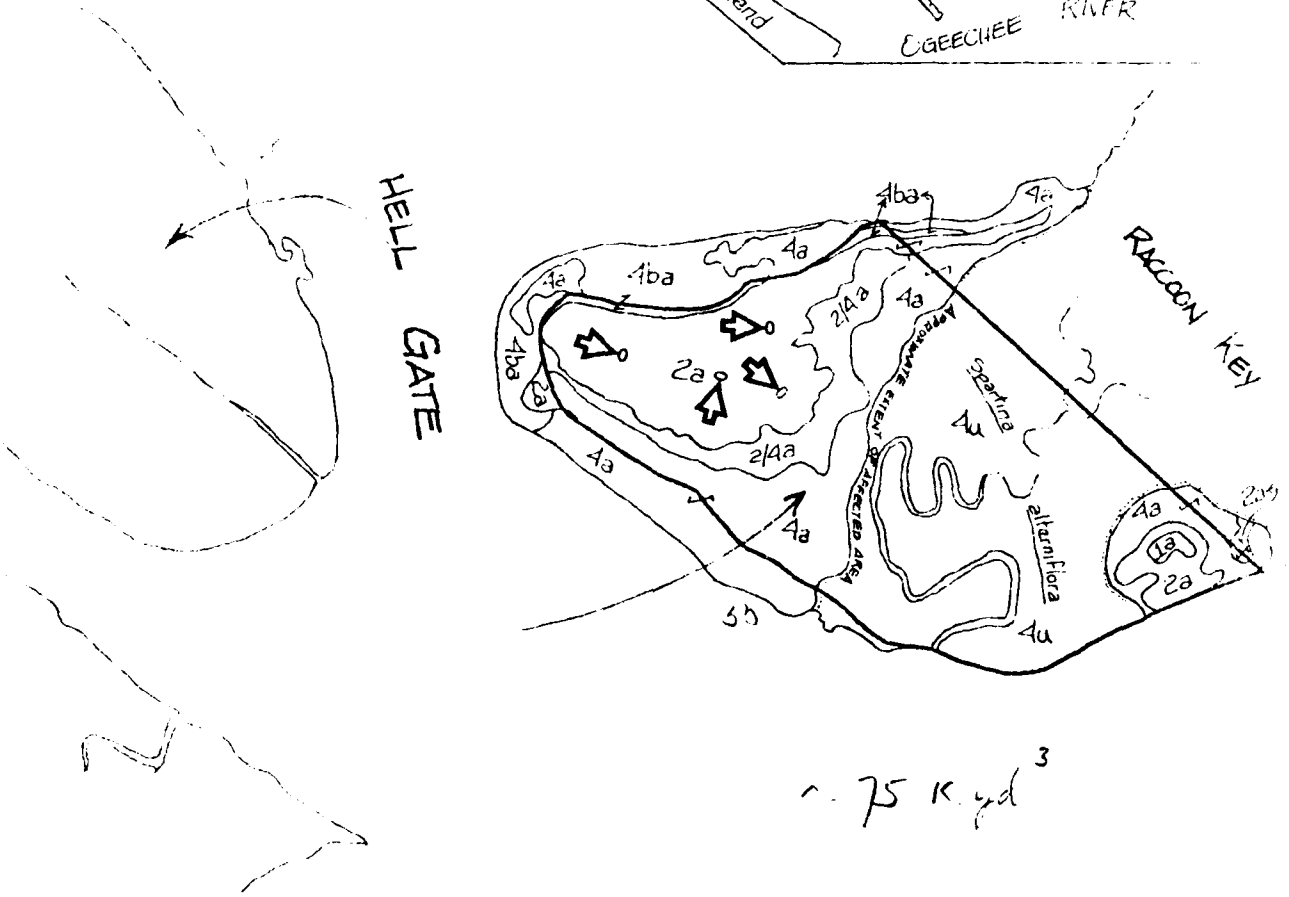
Florida Passage (mile 605.5 - 608.5).

This 3-mile section connects the Ogeechee River crossing of the AIWW to Bear River. Almost all of the shoaling is confined to the last mile of the passage (mile 607.5 - 608.5). Maintenance since 1941 has been required on five occasions:

AIWW PHOTO #15-10



Tract No.
15A
Mile No.
601.0



~ 75 K yd^3

Tract No.	Description & Management Practice:
15A Acreage 109.0	Raccoon Key at Hell Gate channel warrants a current speed and direction study to determine if Channel could be oriented in a more favorable position (i.e. less maintenance dredging) Outfall sites are shown by arrows and circles.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GEORGIA DNR / COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1 10,000 E 0 500' 1000' 2000'

FIGURE 10

TOTAL SIZE IN ACRES	109.0	15A
PERCENTAGE OF EASEMENT AFFECTED	39.5%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	43.1	
AMOUNT OF EASEMENT FORESTED IN ACRES	.75	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	65	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1.	*Sabal palmetto*	CABBAGE PALMETTO
	Juniperus virginiana	RED CEDAR (2-3 in number)
2.	*Baccharis halimifolia*	SILVERLING (predominant vegetative cover)
	Borrichia frutescens	SEA OX-EYE (an understory)
	Ilex vomitoria	YAUPON
	Yucca aloifolia	SPANISH BAYONET
3.	*Salicornia virginica*	WOODY GLASSWORT
	Suaeda linearis	SEA BLITE
	Chenopodium album	PIGWEED
	Erigeron bonariensis	HORSEWEED
4.	*Paspalum vaginatum*	SEASIDE PASPALUM
	Distichlis spicata	SALTGRASS
	Elymus virginicus	WILD RYE GRASS
	Setaria magna	GIANT FOX TAIL GRASS

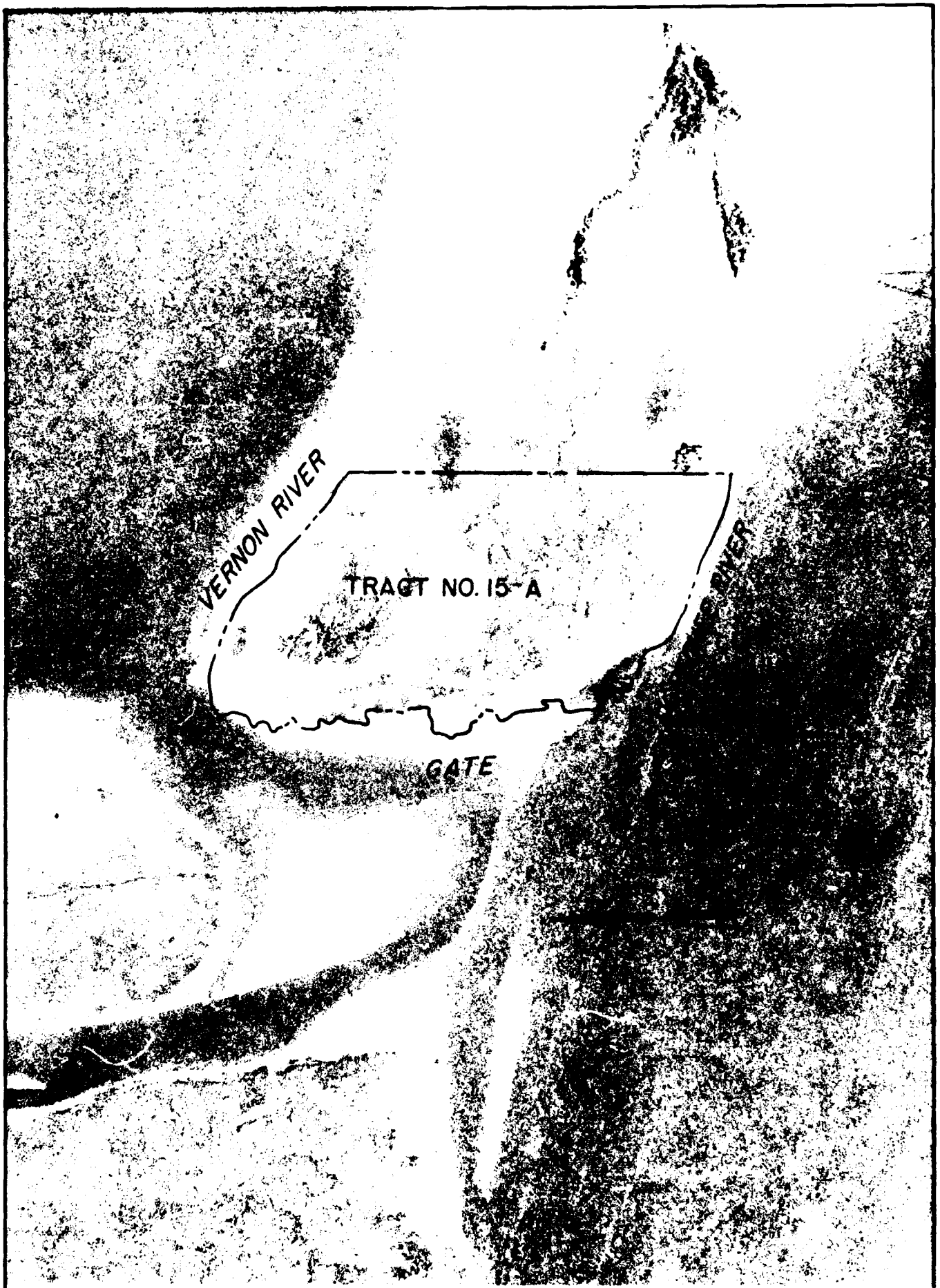
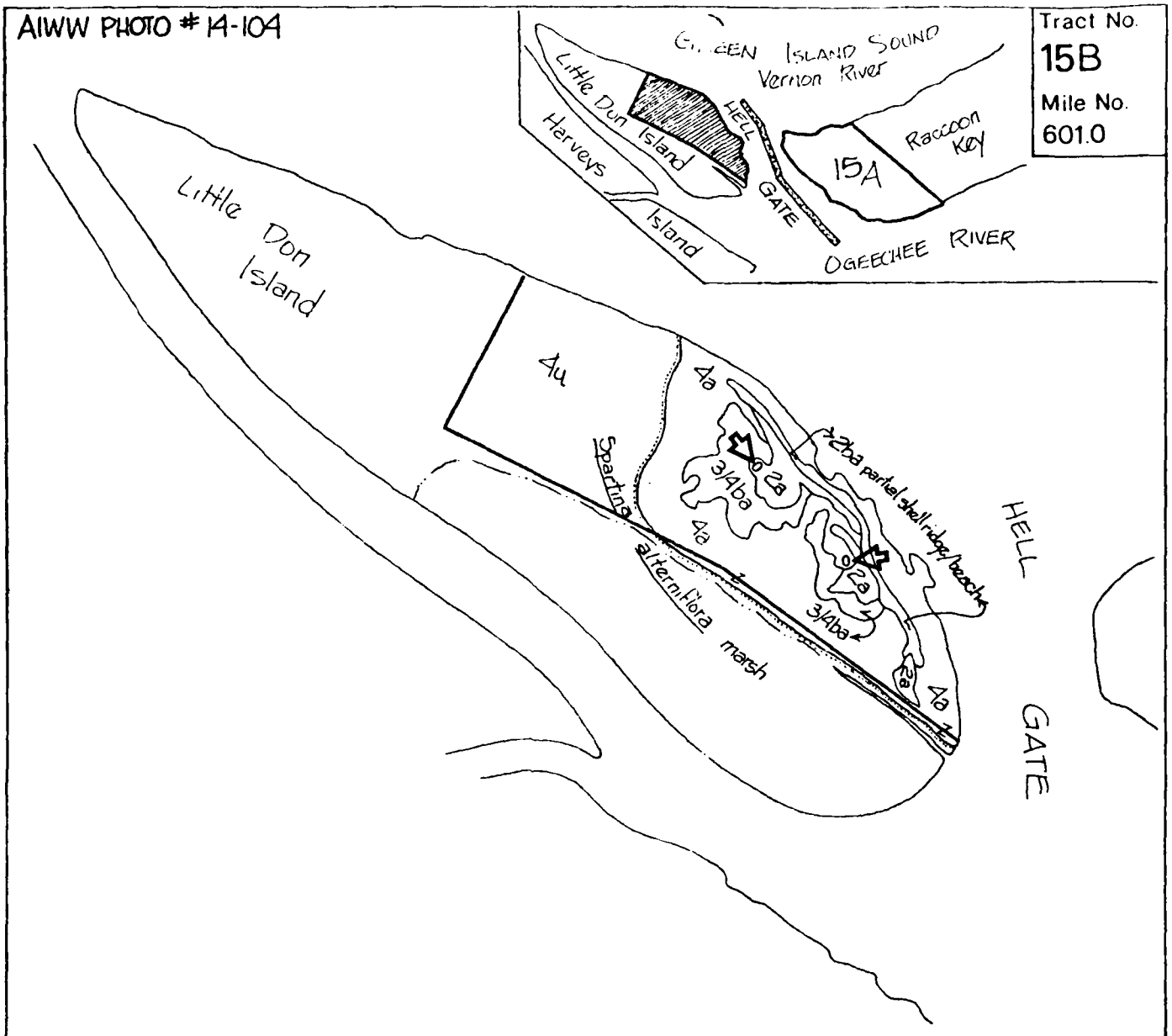


PLATE 15

AIWW PHOTO # 14-104



Tract No.	Description & Management Practice:
15B Acreage 66.6	Little Don Island has large sand flat. It is recommended that this be used for next dredging cycles.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

FIGURE 11

TOTAL SIZE IN ACRES	66.6 15B
PERCENTAGE OF EASEMENT AFFECTED	37.4%
AMOUNT OF EASEMENT AFFECTED IN ACRES	25.0
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1. TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Juniperus virginia* — RED CEDAR (few scattered cedars)
2. *Borrichia frutescens* — SEA OX-EYE (good field of growth)
   Iva frutescens — HIGH TIDE BUSH
3.
4. *Spartina alterniflora* — SMOOTH CORDGRASS



PLATE 16

	Credited	Gross
FY 1943	66,139	95,207*
FY 1963	93,115	127,214
FY 1966	13,217	23,545
FY 1974	63,741	93,971
FY 1977	17,585	23,625
Totals	253,797	363,562

* Estimated

All material removed from the Florida Passage has been discharged into a 131-acre undiked site designated as Tract 16-A shown on plate 17 and figure 12. Only 12 percent of this tract has been impacted due to the low maintenance requirements and the fact that the material is mud and silt.

Bear River (mile 608.5 - 618).

Although Bear River constitutes a 9 1/2-mile portion of the AIWW, shoaling problems are limited to several small sections between mile 610 - 612 with the worst around mile 612. Past maintenance has been needed on only four occasions:

	Credited	Gross
FY 1943	83,659	120,337*
FY 1963	59,375	98,288
FY 1966	35,097	53,134
FY 1977	34,198	45,008
Totals	212,329	316,767

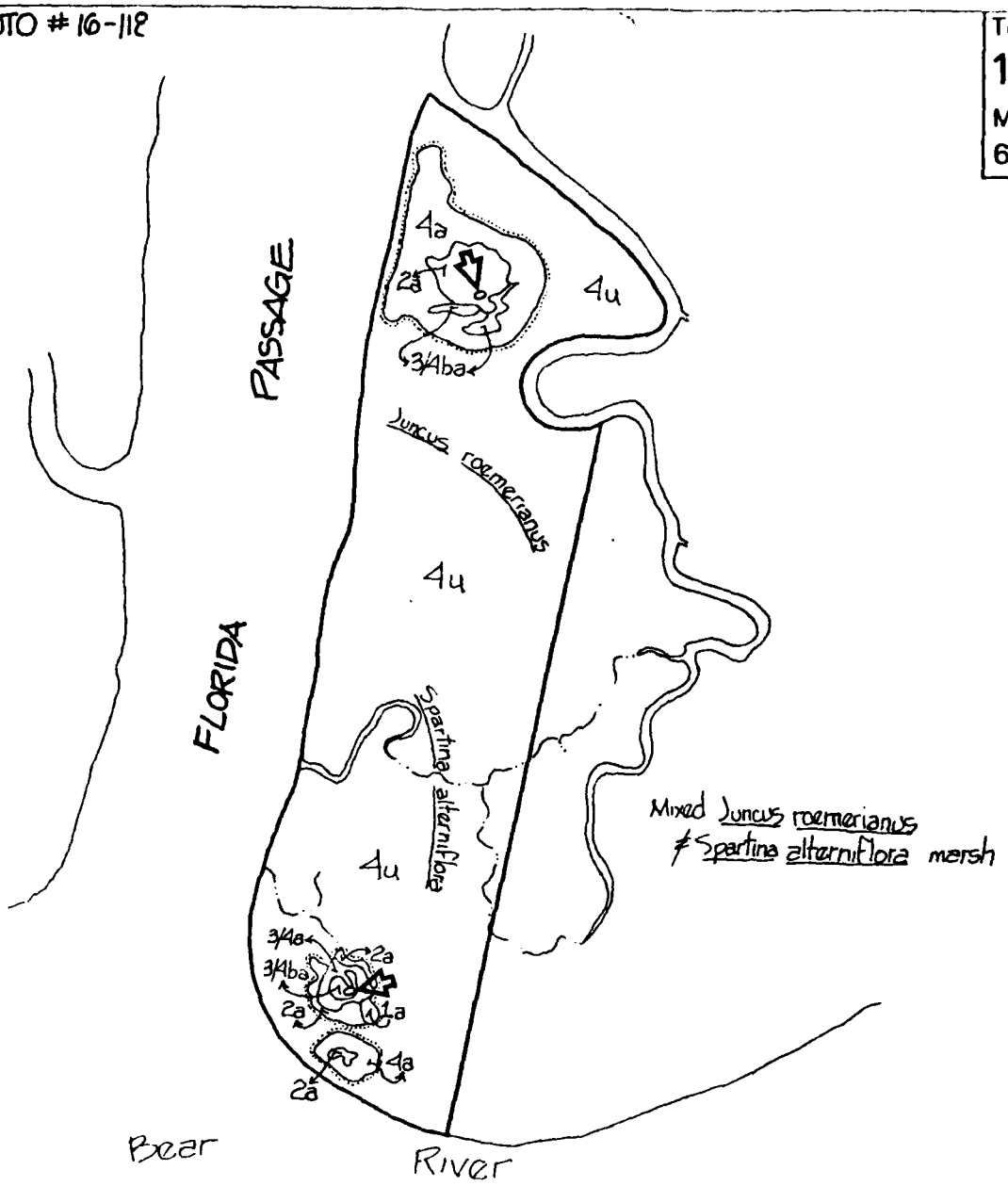
* Estimated

All material that has been excavated from Bear River has been deposited in a 244.7-acre undiked site designated as Tract 17-A shown on plate 18 and figure 13. Although almost the same amount of material has been deposited in Tract 17-A as in Tract 16-A for the Florida Passage, 26 acres of wetlands have been impacted in 17-A compared to 15 acres in 16-A. This results from the discharge pipe not being placed on existing deposits. When this site was inspected, the sand flats were being heavily used for nesting by diamondback terrapins (Malaclemys terrapin).

From Bear River, the AIWW crosses St. Catherines Sound to the mouth of North Newport River (mile 618 - 620). No dredging has been required, and no disposal areas are in this section.

AIWW PHOTO # 16-118

Tract No.
16A
Mile No.
608.0



Tract No.	Description & Management Practice:
16A Acreage 131.0	Two distinct ends-a north hammock and a southern one. Southern one is mostly barren with shrub border and a few trees clustered on one side. Northern site predominately shrubs and saplings. Preferred out fall locations are indicated. Large creek on back side of site should be avoided.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 12

TOTAL SIZE IN ACRES	131.0 16A
PERCENTAGE OF EASEMENT AFFECTED	11.7%
AMOUNT OF EASEMENT AFFECTED IN ACRES	154
AMOUNT OF EASEMENT FORESTED IN ACRES	35
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES MIXED CLASSES ARE ALSO USED

SOUTH END SITE

1. *Sabal palmetto* CABBAGE PALMETTO
Juniperus virginicus RED CEDAR (a few)
Salix caroliniana SWAMP WILLOW (a single tree)

2. *Borrichia frutescens* SEA OX-EYE
Myrica cerifera WAX MYRTLE
Iva frutescens HIGH TIDE BUSH
Baccharis angustifolia FALSE WILLOW
Ampelopsis arborea PEPPER VINE

3. *Eupatorium capillifolium* DOG-FENNEL
Eupatorium compositifolium DOG FENNEL
Solidago sempervirens SEASIDE GOLDENROD

4. *Spartina cynosuroides* ROUGH CORDGRASS
Spartina alterniflora SMOOTH CORDGRASS
Typha angustifolia NARROW-LEAVED CAT-TAIL (on fringe)
Andropogon virginicus BROOM SEDGE

NORTH END SITE

1. *Sabal palmetto* CABBAGE PALMETTO (few)
Juniperus virginicus RED CEDAR
Prunus serotina BLACK CHERRY

2. *Yucca gloriosa* YUCCA OR SPANISH BAYONET (a few)
Iva frutescens HIGH TIDE BUSH
Baccharis halimifolia SILVERLING
Myrica cerifera WAX MYRTLE (Predominant)
Borrichia frutescens SEA OX-EYE (not abundant
Ampelopsis arborea PEPPERVINE

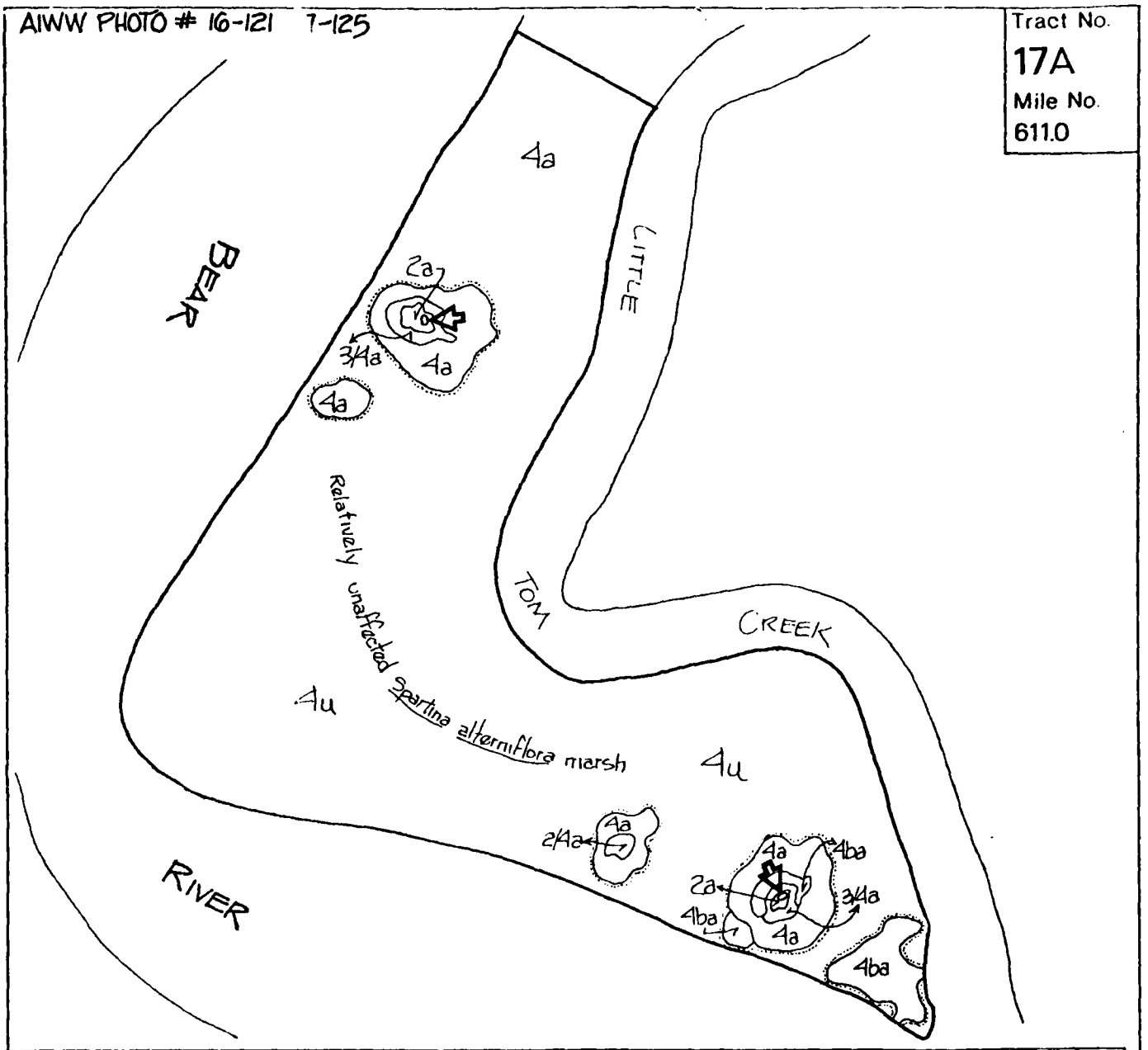
3. *Eupatorium capillifolium* DOG-FENNEL
Eupatorium compositifolium DOG-FENNEL

4. *Typha angustifolia* NARROW-LEAVED CAT-TAIL (in depression)

Just South of Bear Island site dominated by Wax Myrtle with no real good plant zonation.



PLATE 17



Tract No.	Description & Management Practice:
17A Acreage 244.7	Spoil sites are predominately sand flats with few grasses and Sea Ox-Eye in center of each. Spartina alterniflora marsh in center and along Little Tom Creek should remain unspoiled for the next 10 dredging cycles. Outfall sites are shown

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 13

TOTAL SIZE IN ACRES	244.7
PERCENTAGE OF EASEMENT AFFECTED	9.9%
AMOUNT OF EASEMENT AFFECTED IN ACRES	24.1
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

17A

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. No Trees present on both sites.

2. *Borrichia frutescens* SEA OX-EYE
Baccharis halimifolia SILVERLING OR GROUNDSEL BUSH

3. *Eupatorium capillifolium* DOG-FENNEL

4. *Spartina alterniflora* SMOOTH/CORDGRASS
Juncus roemerianus NEEDLERUSH
Fimbristylis castanea SALTMARSH SEDGE



PLATE 18

North Newport River. (mile 620 -623.5).

The North Newport River connects St. Catherines Sound to Johnson Creek. No significant shoaling problems have developed in this portion of the waterway. However, maintenance was required on one occasion in FY 64. A total of 53,195 cubic yards (67,110 gross) was removed near the mouth of Waldburg Creek. The material was discharged into one of two undiked sites, Tract 805 E-2 (77.4 acres) shown on plate 19. Tract 805 E-1 (103.6 acres) shown on plate 20 was never used. The Corps had only 10-year easements on these sites and the right to dispose on them was terminated on March 30, 1974.

Johnson Creek. (mile 623.5 - 629).

Johnson Creek connects the North Newport River with the South Newport River near its mouth in Sapelo Sound. Although significant shoaling has not been a problem, spot shoaling does occur along a 1.5 mile section (mile 624 - 625.5). Dredging has been necessary on only two occasions.

	Credited	Gross
FY 1943	455,634	655,885*
FY 1974	91,751	141,537
Total	547,385	797,422

* Estimated

Most of the material has been deposited in undiked Tracts 19-A (97.8 acres) and 20-A (71.9 acres) which are located near the northern end of the creek. Two other disposal tracts show slight evidence of having been used in the past. Tracts 21-A (34.6 acres) and Tract "C" (60 acres) are both undiked and are located just upstream of the first two disposal tracts. Tract 19-A is shown in figure 14 and plate 20, Tract 20-A in figure 15 and plate 21, Tract 21-A on plate 21, and "C" on plate 22. About (26 acres 26.2 percent of the tract) in 19-A have been impacted by dredged material disposal and 13 acres (18.4 percent) in Tract 20-A. The affected area would probably be greater, however, the discharge of dredged material was concentracted in a central location.

The AIWW traverses Sapelo Sound to Front River between miles 629 and 639.25. This 10-mile section of the waterway contains naturally deep water. Consequently, no dredging has been required, and no disposal areas are located along this stretch.

Front River. mile (639.25 - 640.5.

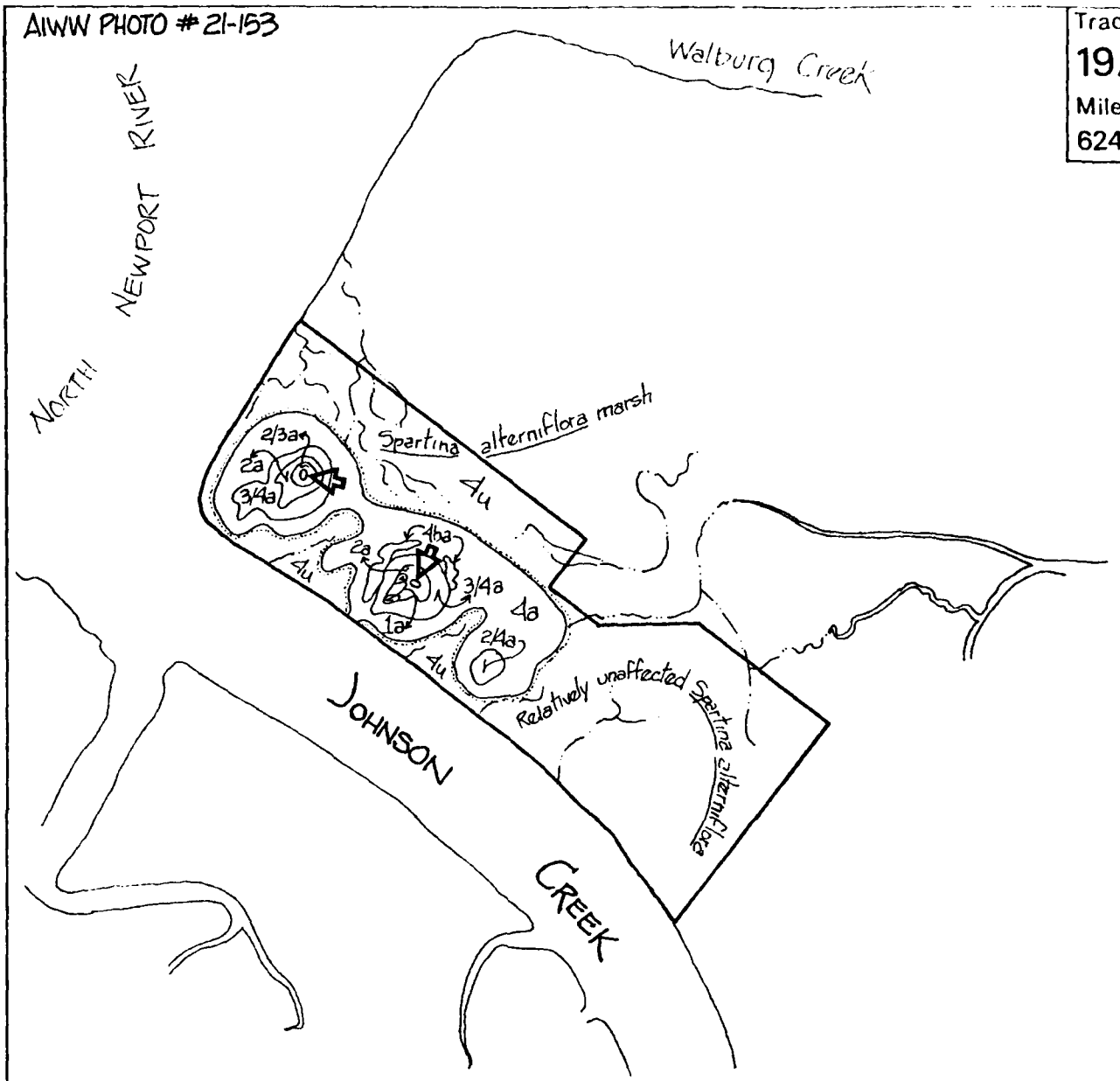
Front River serves to connect Sapelo Sound with Creighton Narrows. Other than a small amount of shoaling after completion of the 12-foot channel, siltation has not been a problem as shown below:



PLATE 19



PLATE 20



Tract No.	Description & Management Practice:
19A Acreage 97.8	Few scattered trees of Red Cedar and Live Oaks with small perimeter of shrubs and sand flat. The relatively unaffected area occupied by Spartina alterniflora should be avoided and preserved.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 14

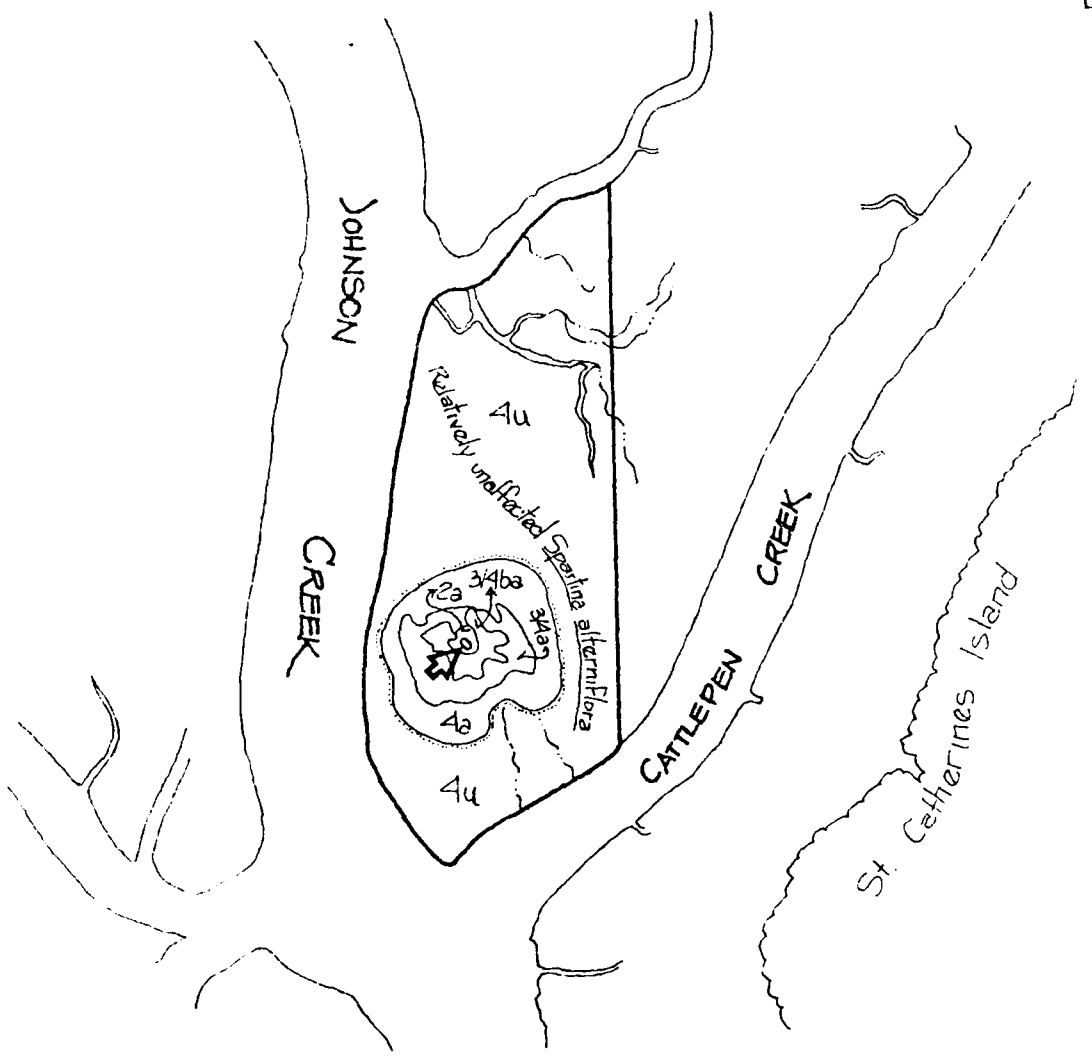
TOTAL SIZE IN ACRES	97.8	19A
PERCENTAGE OF EASEMENT AFFECTED	26.2%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	25.7	
AMOUNT OF EASEMENT FORESTED IN ACRES	.25	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Juniperus virginicus* — RED CEDAR
   Quercus virginiana — LIVE OAK
2. *Baccaharis halimifolia* — SILVERLING OR GROUNDSEL
   Borrichia frutescens — SEA OX-EYE
3. *Salicornia virginica* — WOODY GLASSWORT
   Salicornia europaea — EUROPEAN GLASSWORT
4. *Spartina alterniflora* — SMOOTH CORDGRASS

AIWW PHOTO # 21-155

Tract No
20A
Mile No
6250



Tract No	Description & Management Practice:
20A Acreage 719	Disposal site without trees. Small shrub border and large sand flat. Continued use of center and middle of flat recommended.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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FIGURE 5

TOTAL SIZE IN ACRES	71.9
PERCENTAGE OF EASEMENT AFFECTED	18.4%
AMOUNT OF EASEMENT AFFECTED IN ACRES	13.2
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

20A

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. No trees

2. *Baccharis halimifolia* SILVERLING OR GROUNDSEL
Borrichia frutescens SEA OX-EYE

3. *Salicornia virginica* WOODY GLASSWORT
Salicornia europaea EUROPEAN GLASSWORT

4. *Spartina alterniflora* SMOOTH CORDGRASS



PLATE 21



PLATE 22

	Credited	Gross
FY 1943	40,044	57,643*
FY 1944	17,015	24,493*
Totals	57,059	82,136

* Estimated

The maintenance material was deposited in Tract 24-A which is a 128.6 acre site shown on figure 16 and plate 23. The fact that dredged material has not been deposited on the mounds for almost 30 years accounts for the mature trees found on the small hammocks created by the dredged material.

Creighton Narrows (mile 640.5 - 643)

This portion of the AIWW is a narrow passage between Front River and Old Teakettle Creek. It has been subject to rather extensive shoaling throughout most of its course as indicated by the maintenance record.

FY	Credited	Gross	Disposal Area
1942	51,540	74,192*	Tracts 25-A, 25-C
1943	319,737	460,261*	Tracts 24-A, 25-C
1944	333,980	480,764*	Tracts 25-A, 25-C, 25-E
1946	78,496	112,995*	Tract 24-A
1949	436,224	627,944*	Tracts 24-A, 25-A, 25-C
1963	114,715	164,708	Tracts 25-C, 25-E
1967	79,372	138,653	Tract 25-C
1971	109,040	183,100	Tracts 24-A, 25-C
1974	298,891	393,097	Tracts 24-A, 25-C
1977	169,885	216,135	Tracts 25-C, 25-E
1978	55,131	81,594*	Tracts 25-C, 25-E
Totals	2,047,021	2,933,443	

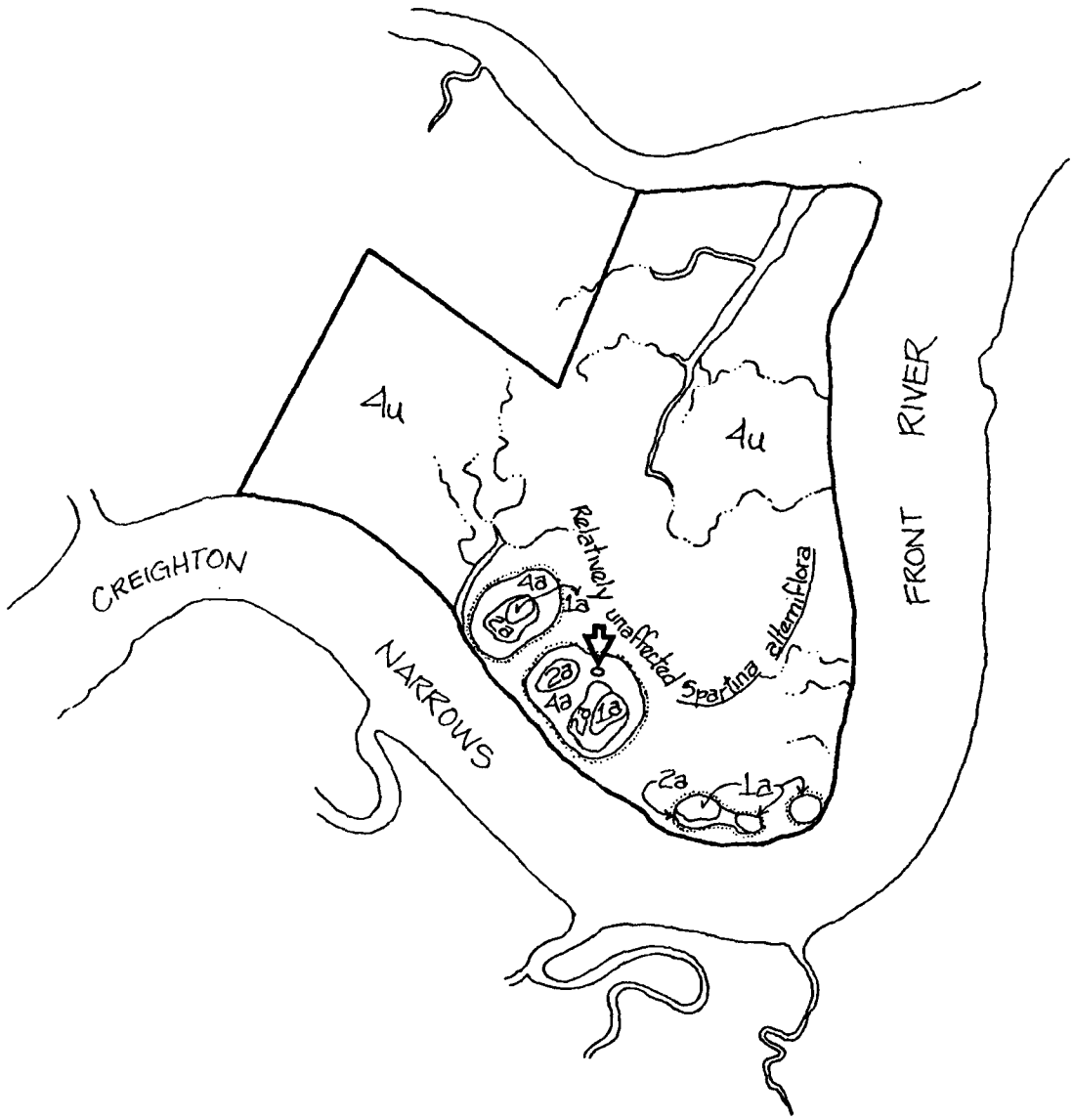
* Estimated

In those years where dredging has been required in the upper (northern) end of the waterway, Tract 24-A (128.6 acres) has been used. Tract 25-A (104.6 acres) has not been used recently but dredged material deposits in the area are probably resultant from the original dredging of the 12-foot channel and early maintenance done in the 1940's.

The remaining two disposal areas for Creighton Narrows are designated 25-C (133.8 acres) and 25-E (43.13 acres). Tracts 25-C and 25-E have received the

AIWW PHOTO #24-18E

Tract No.
24A
Mile No.
641.0



Tract No.	Description & Management Practice:
24A Acreage 128.6	This has some ballast rock islands from the sailing and timber days of the last century. Disposal recommended away from ballast islands and AIWW. Northern and Central portion of the easement is "deep" Spartina marsh.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 16

TOTAL SIZE IN ACRES	128.6
PERCENTAGE OF EASEMENT AFFECTED	74%
AMOUNT OF EASEMENT AFFECTED IN ACRES	95
AMOUNT OF EASEMENT FORESTED IN ACRES	26
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

24A

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Magnolia grandiflora* — SOUTHERN MAGNOLIA
Celtis laevigata — SUGAR HACKBERRY
Sabal plametto — CABBAGE PALMETTO (mature)
Pinus elliottii — SLASH PINE
Juniperus virginiana — RED CEDAR (60 to 80 years old)
Quercus virginiana — LIVE OAK
Bumelia tenax — TOUGH BUCKTHORN

2. *Myrica cerifera* — WAX MYRTLE
Baccharis halimifoli — SILVERLING OR GROUNDSEL
Iva frutescens — HIGH TIDE BUSH
Borrichia frutescens — SEA OX-EYE (predominant fringe)
Ilex vomatoria — YAUPON
Ilex cassine — DAHOON
Fosetiera porulosa — FLORIDA PRIVET
Yucca aliofolia — SPANISH BAYONET
Serenoa repens — PALMETTO

3. *Muscadine grapes*

4. *Spartina alterniflora* — SMOOTH CORDGRASS
Spartina patens — SALT HAY
Fimbristylis castanea — SALT MARSH SEDGE
Distichilis spicata — SALT GRASS

Mature tree species of Cedar, Yaupon and Hackberry (no pine or oak) are favored growing on top of ballast rock. Ballast base has four or five feet of sand, some limestone and chert.

Animals include; Garden spider, Redwing Blackbirds, common egrets, great Blue Herons, Painted bunting. Also some hog signs. This series of hammocks has great diversity due to proximity of Creighton Island and the antiquity of the ballast piles.

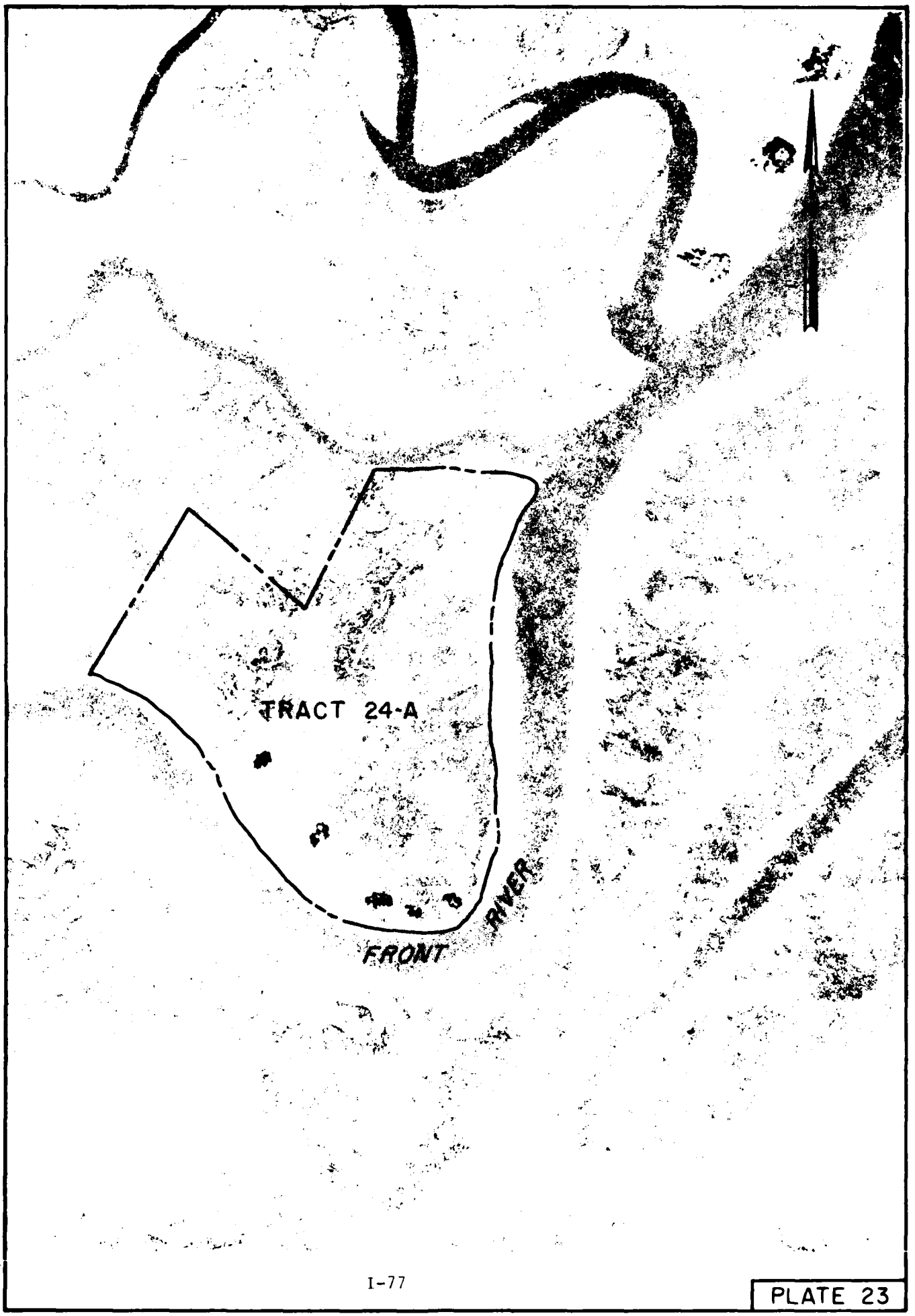


PLATE 23

most use by far. Tracts 25-A, 25-C, and 25-E are shown on figures 17 - 19, and respectively and plate 24.

Old Teakettle Creek. (mile 643 - 648).

This 5-mile section of the AIWW runs from Creighton Narrows to Doboy Sound. It has been maintenance-free with the exception of one dredging operation in FY 43. This job involved the removal of 112,840 cubic yards (162,433 estimated gross) with subsequent deposition in Tract 26-A and Tract 27-B. Although it has not been used for maintenance dredging, Tract 27-A is an additonal 80.2-acre undiked area located along Old Teakettle Creek. Tract 26-A is shown on plate 25 and Tracts 27-A and 27-B on plate 26.

Doboy Sound. (mile 648 - 650).

The AIWW crosses Doboy Sound for about 2 miles; however, the shoaling has been restricted to a small part at mile 649.5. Maintenance has been necessary on eight occasions since completion of the 12 foot channel in 1941:

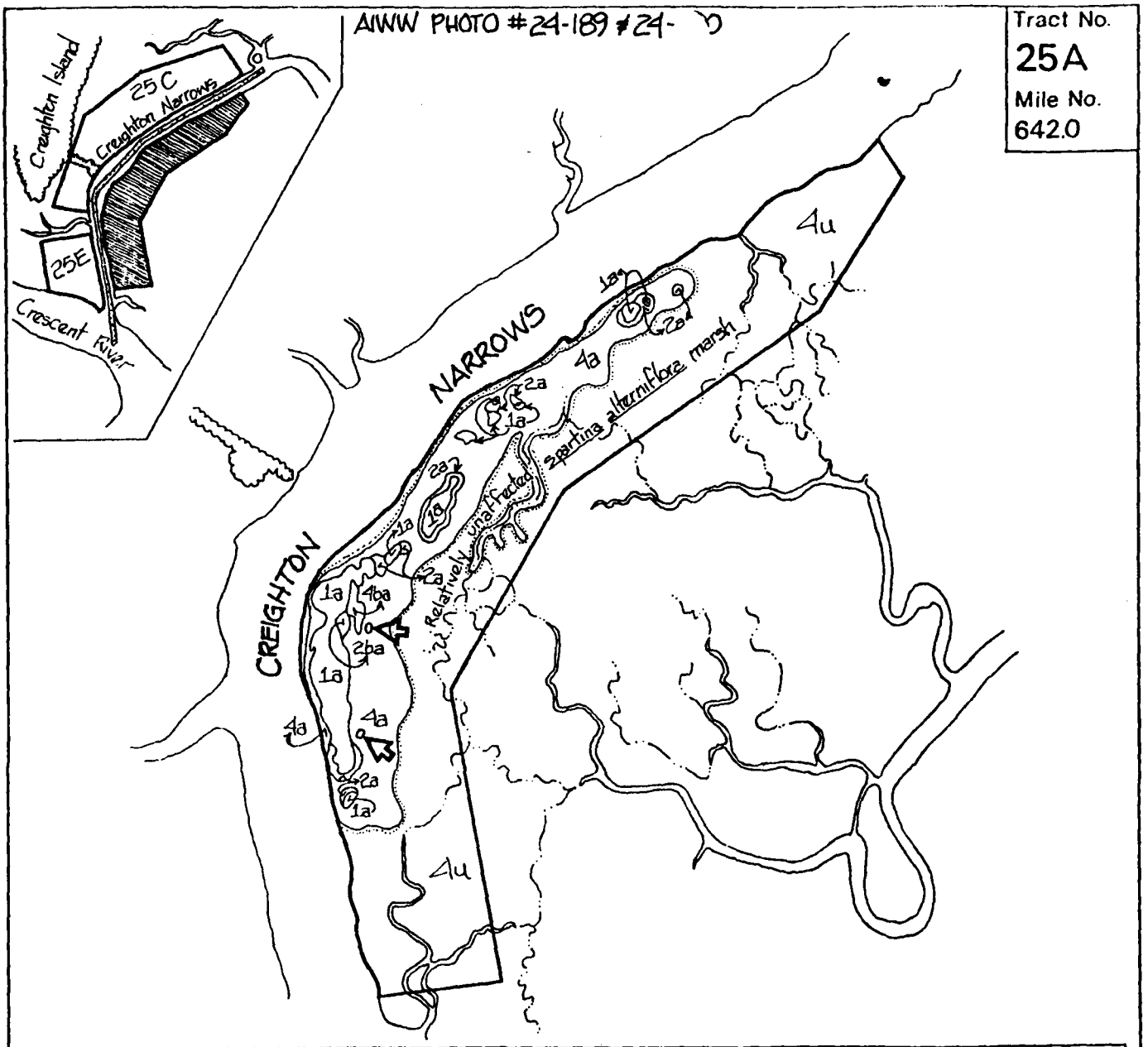
FY	Credited	Gross
1943	110,259	158,718*
1946	75,363	108,485*
1949	240,850	346,704*
1963	16,077	21,533
1967	12,183	17,323
1970	24,524	48,880
1974	24,528	82,516
1977	12,698	14,136
1978	24,633	36,457
Total	541,115	834,752

All maintenance material removed from Doboy Sound has been discharged into open water on the north side of Commodore Island (Dump Area 28). Tract 28-A (155.6 acres) is an available undiked disposal area on the north side of the sound, however, it has not been used.

For the next 3.5 miles (miles 650 - 653.7) to Little Mud River the route of the AIWW is crossed by five different rivers, and shoaling has occurred at some of these crossings.

North River Crossing. (mile 651.7 - 652.2)

Shoaling occurs in the North River Crossing between North River and Darien River. Maintenance has been necessary on the following occasions:



Tract No.	Description & Management Practice:
25A Acreage 104.2	Series of low cedar hammocks, some of which are quite mature. With heavy siltation at this nodal point and with Cedar Point navigation project it is recommended that this site be monitored more carefully than any other except Jekyll River.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

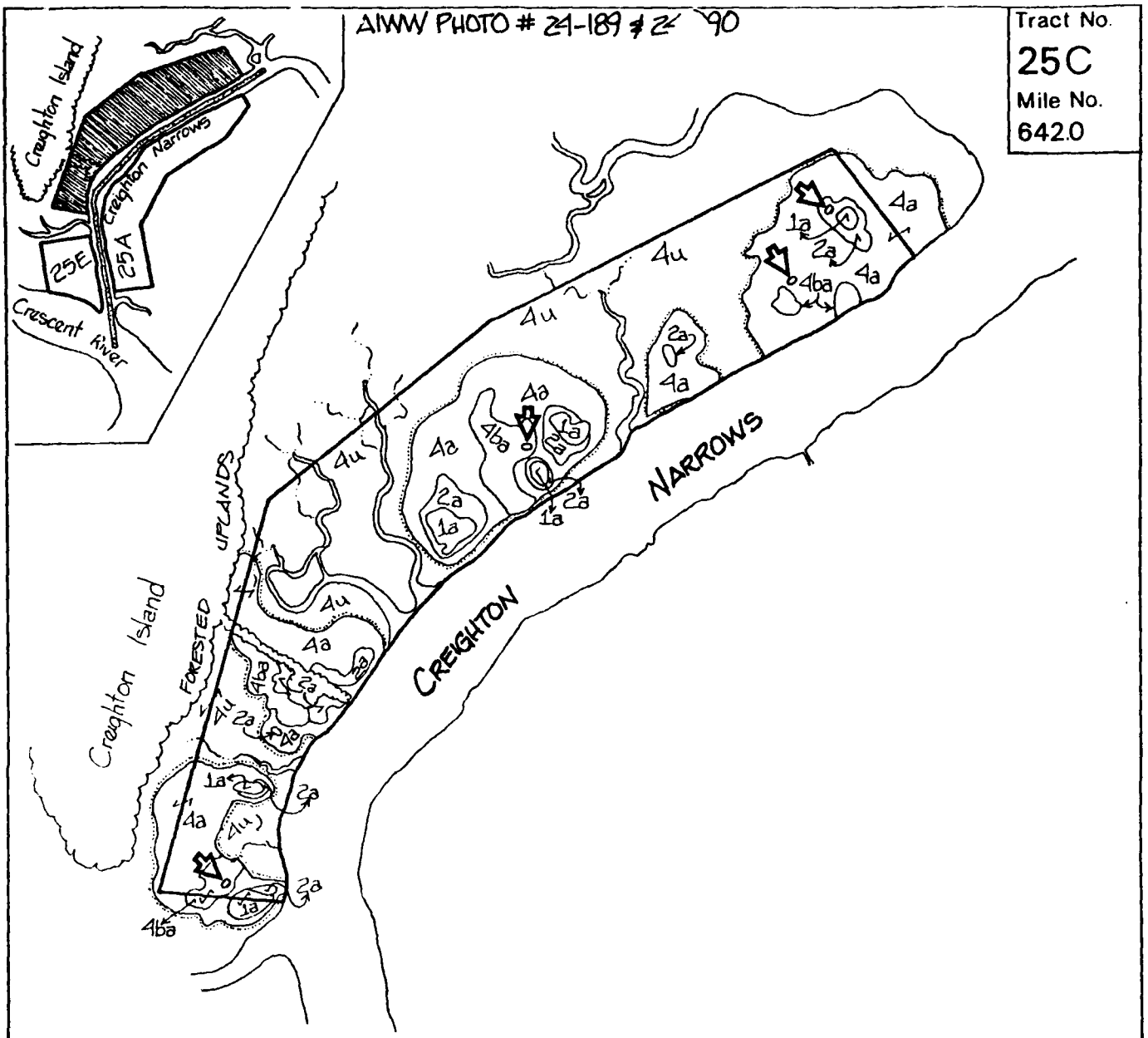
north

FIGURE 17

TOTAL SIZE IN ACRES	104.2 25A
PERCENTAGE OF EASEMENT AFFECTED	40.9%
AMOUNT OF EASEMENT AFFECTED IN ACRES	42.6
AMOUNT OF EASEMENT FORESTED IN ACRES	7.0
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1. TREES (FORESTED) b BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1.	*Sabal palmetto*	CABBAGE PALM
	Juniperus virginiana	CEDAR (50 to 80 years old)
	Celtis laevigata	SUGAR HACKBERRY
	Quercus virginiana	LIVE OAK (1 small one 2'-3')
2.	*Yucca aloifolia*	SPANISH BAYONET
	Ilex vomitoria	YAUPON
	Borrichia frutescens	SEA OX-EYE
3.	*Salicornia virginicus*	WOODY GLASSWORT
4.	*Spartina alterniflora*	SMOOTH CORDGRASS
	Spartina patens	SALT MARSH HAY



Tract No.	Description & Management Practice:
25C Acreage 133.8	Recommended sites shown above will preserve the diversity and maturity of the existing hammocks which have mature forests. Caution should be exercised in the southernmost outfall location to avoid the small creek and easement boundary.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

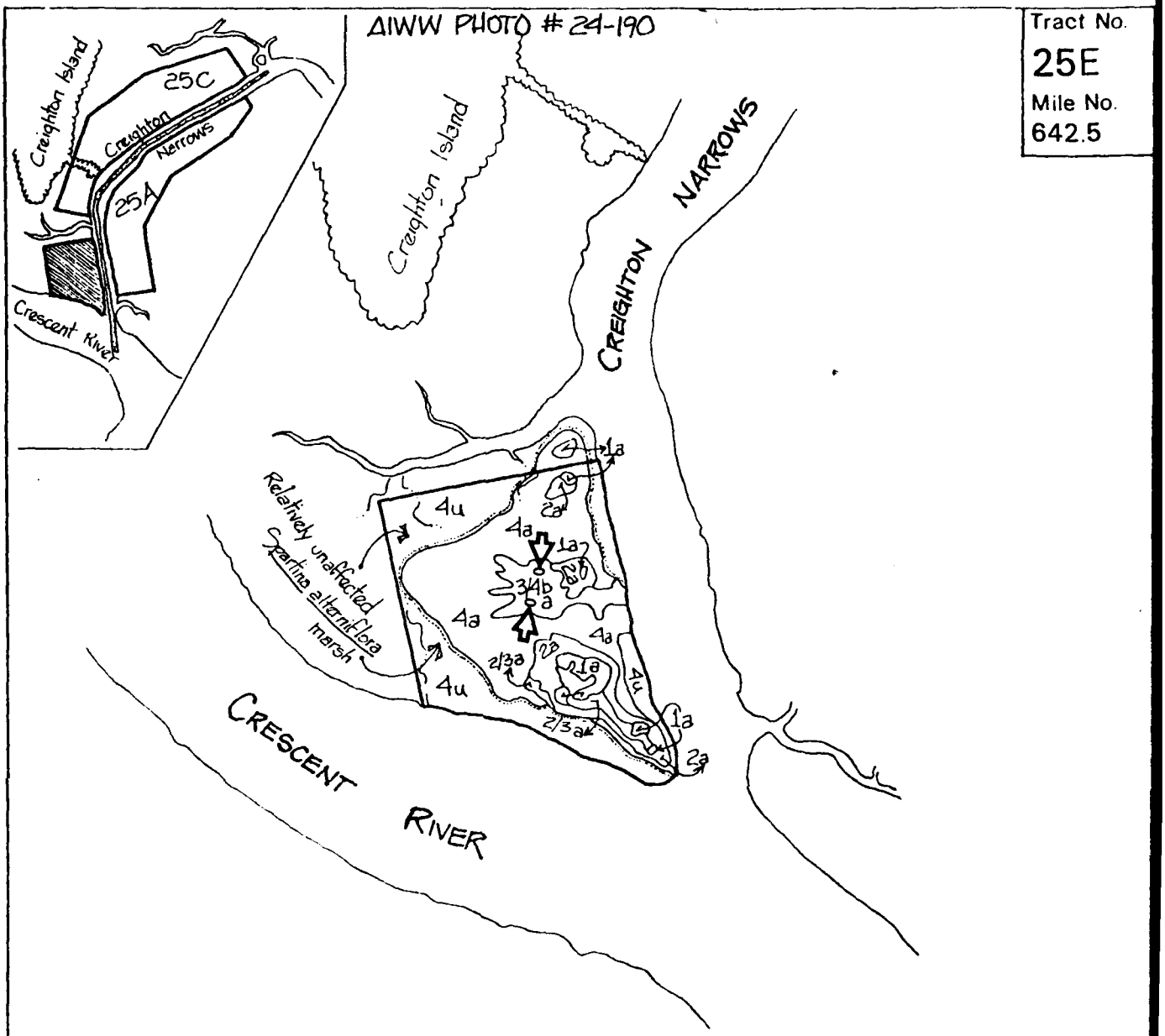
north

FIGURE 18

TOTAL SIZE IN ACRES	133.8	25C
PERCENTAGE OF EASEMENT AFFECTED	41.5%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	55.5	
AMOUNT OF EASEMENT FORESTED IN ACRES	4.0	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	7.5	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Sabal palmetto* — CABBAGE PALMETTO
   Juniperus virginiana — RED CEDAR
   Pinus taeda — LOBLOLLY PINE
   Magnolia grandiflora — MAGNOLIA
   Persea borbonia — RED BAY
   Quercus virginiana — LIVE OAK
   Quercus laurifolia — LAUREL OAK
2. *Barrichia frutescens* — SEA OX-EYE
   Borrichia halimifolia — SILVERLING OR GROUNDSEL
   Ilex vomitoria — YAUPON
   Myrica cerifera — WAX MYRTLE
3.
4. *Fimbristylis castanea* — SALTMARSH SEDGE
   Distichlis spicata — SALTGRASS



Tract No.	Description & Management Practice:
25E Acreage 43.13	Caution should be exercised on the very southern tip as NOS has installed 5 tidal bench marks on the island near AIWW marker # 156. The number of the westernmost bench mark is 4975E. Preferred spoil location shown above.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 19

TOTAL SIZE IN ACRES	43.13 25E
PERCENTAGE OF EASEMENT AFFECTED	73.3%
AMOUNT OF EASEMENT AFFECTED IN ACRES	31.6
AMOUNT OF EASEMENT FORESTED IN ACRES	27
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	1.5
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	.4

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1.	*Juniperus virginicus*	RED CEDAR
	Quercus falcata var. pogodifolia	SOUTHERN SWAMP RED OAK (two 30' high)
	Quercus nigra	WATER OAK
	Quercus virginiana	LIVE OAK (6' to 8')
	Quercus laurifolia	LAUREL OAK
	Bumelia lanuginosa	BUCKTHORN
2.	*Borrichia frutescens*	SEA OX-EYE
	Iva frutescens	HIGH TIDE BUSH
	Baccharis halimifolia	SILVERLING OF GROUNDSEL
	Myrica cerifera	WAX MYRTLE
	Yucca aloifolia	SPANISH BAYONET
	Opuntia compressa	PRICKLEY PEAR
3.	*Helianthemum rosemarynefolium*	
	Solidago sempervirens	SEASIDE GOLDENROD
	Eupatorium	
	Salicornia virginica	WOODY GLASSWORT
	Strophostyles umbelata	WILD BEAN
4.	*Spartina alterniflora*	SMOOTH CORDGRASS
	Andropogon glomeratus	BROOMSEDGE
	Distichlis spicata	SALT GRASS
	Paspalum ciliatifolium	
	Paspalum notatum var. saurae	BAHIA GRASS
	Petrea chloris	FINGER GRASS

Solitary wasps, site has small pea-size gravel. In other portions of site heavy clays have been deposited.

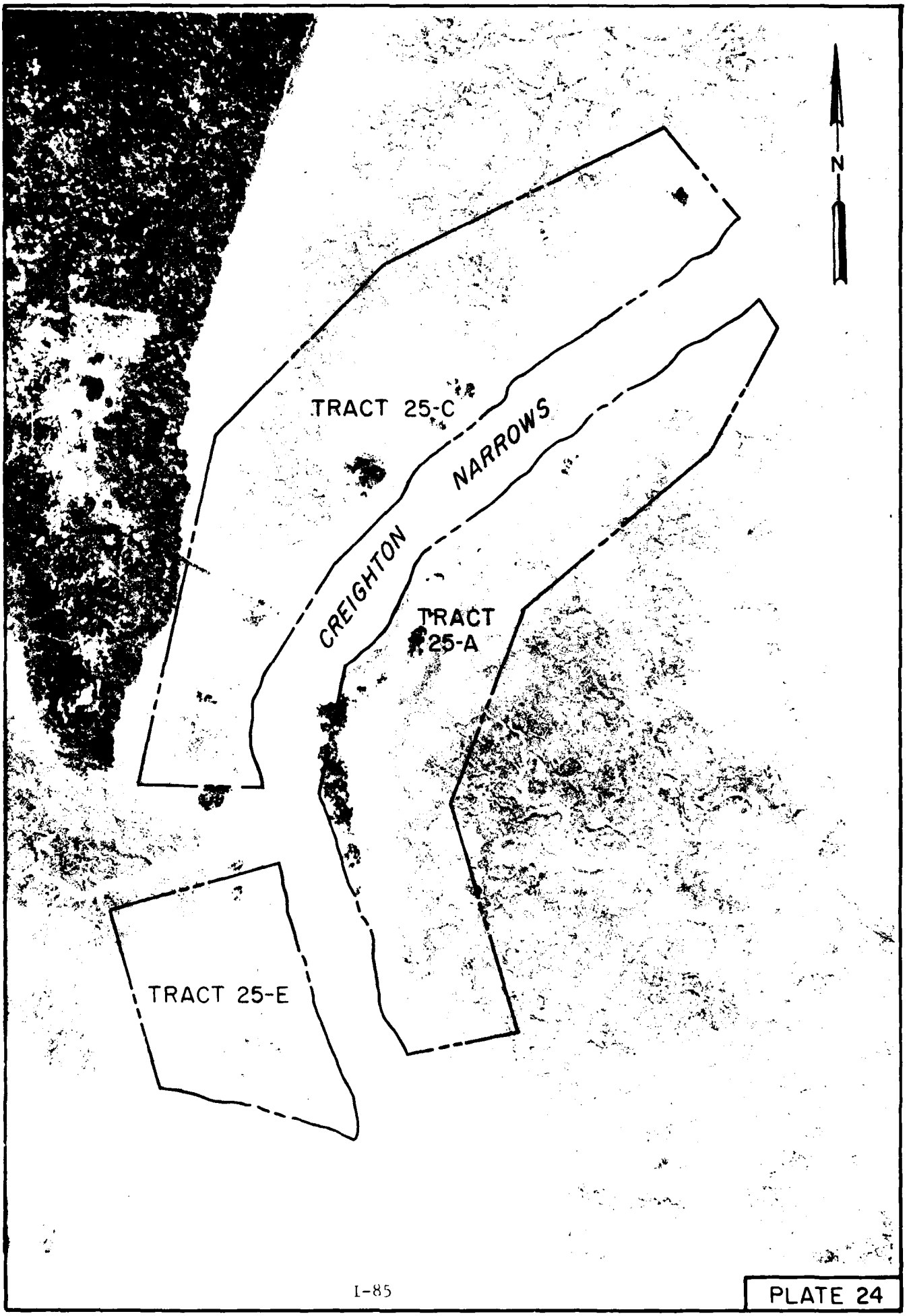


PLATE 24

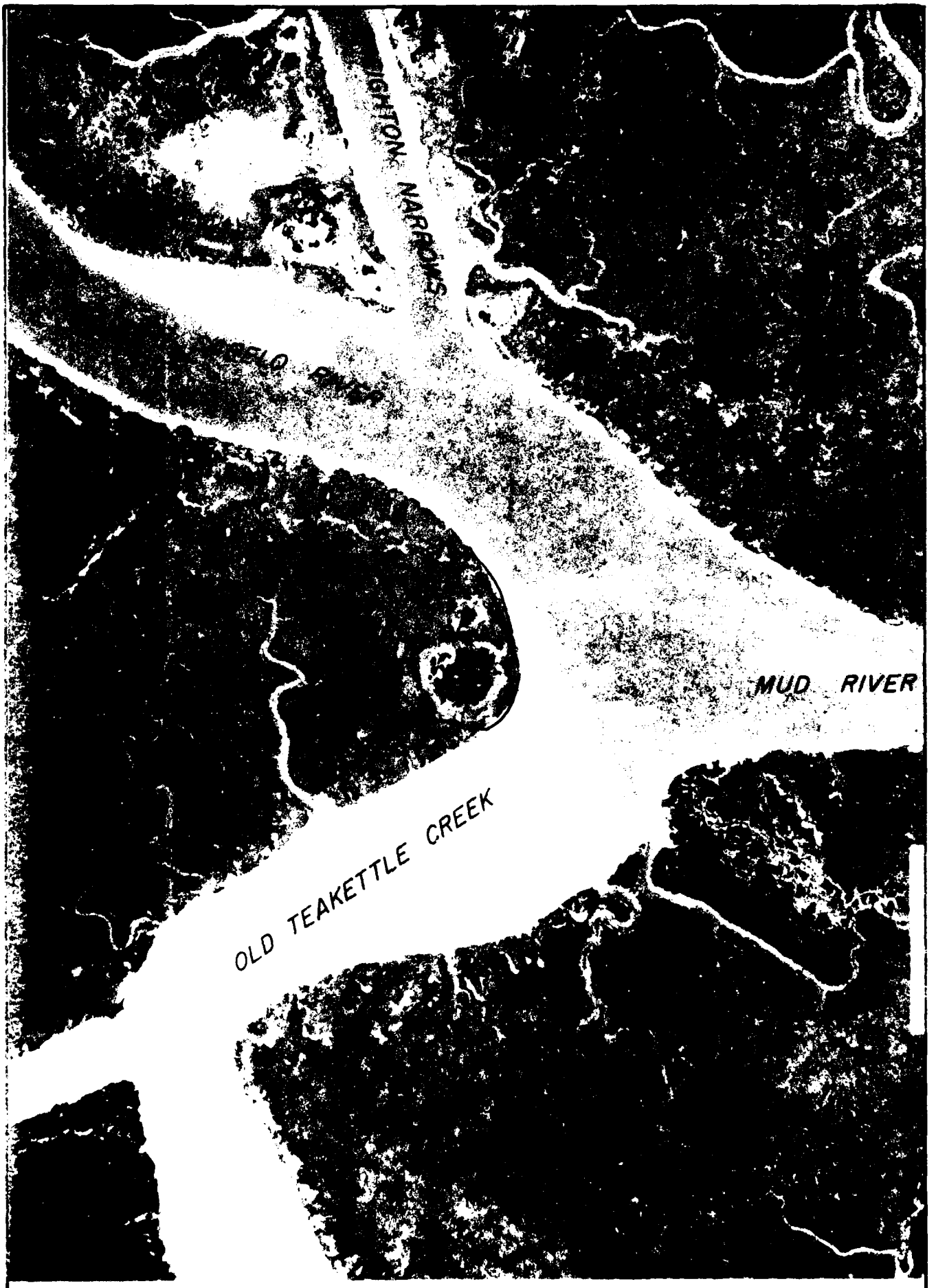
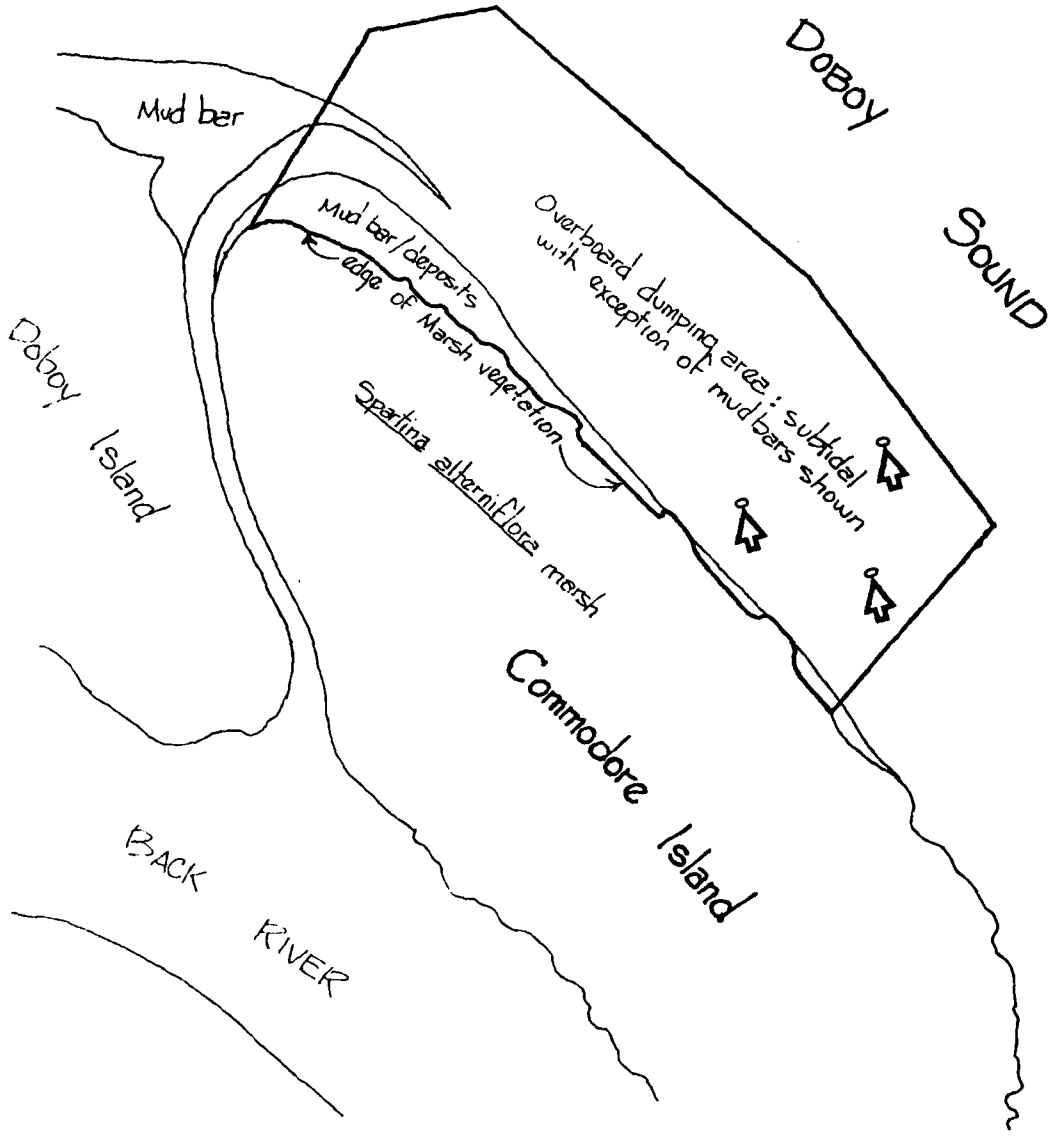


PLATE 25

PLATE 26

AIWW PHOTO #26-2

Tract No. Dumping Area 28 Mile No. 649.5



Tract No. Dumping Area 28 Acreage Open Water	Description & Management Practice: Overboard site. Disposal should avoid mouth of creek in sound seperating Doboy Island from Commodore Island.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 20

TOTAL SIZE IN ACRES	APPROX. 103.0 #28
PERCENTAGE OF EASEMENT AFFECTED	OVERBOARD DUMPING
AMOUNT OF EASEMENT AFFECTED IN ACRES	OPEN WATER, MUD FLATS
AMOUNT OF EASEMENT FORESTED IN ACRES	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

Overboard disposal site-Underwater biota not sampled.

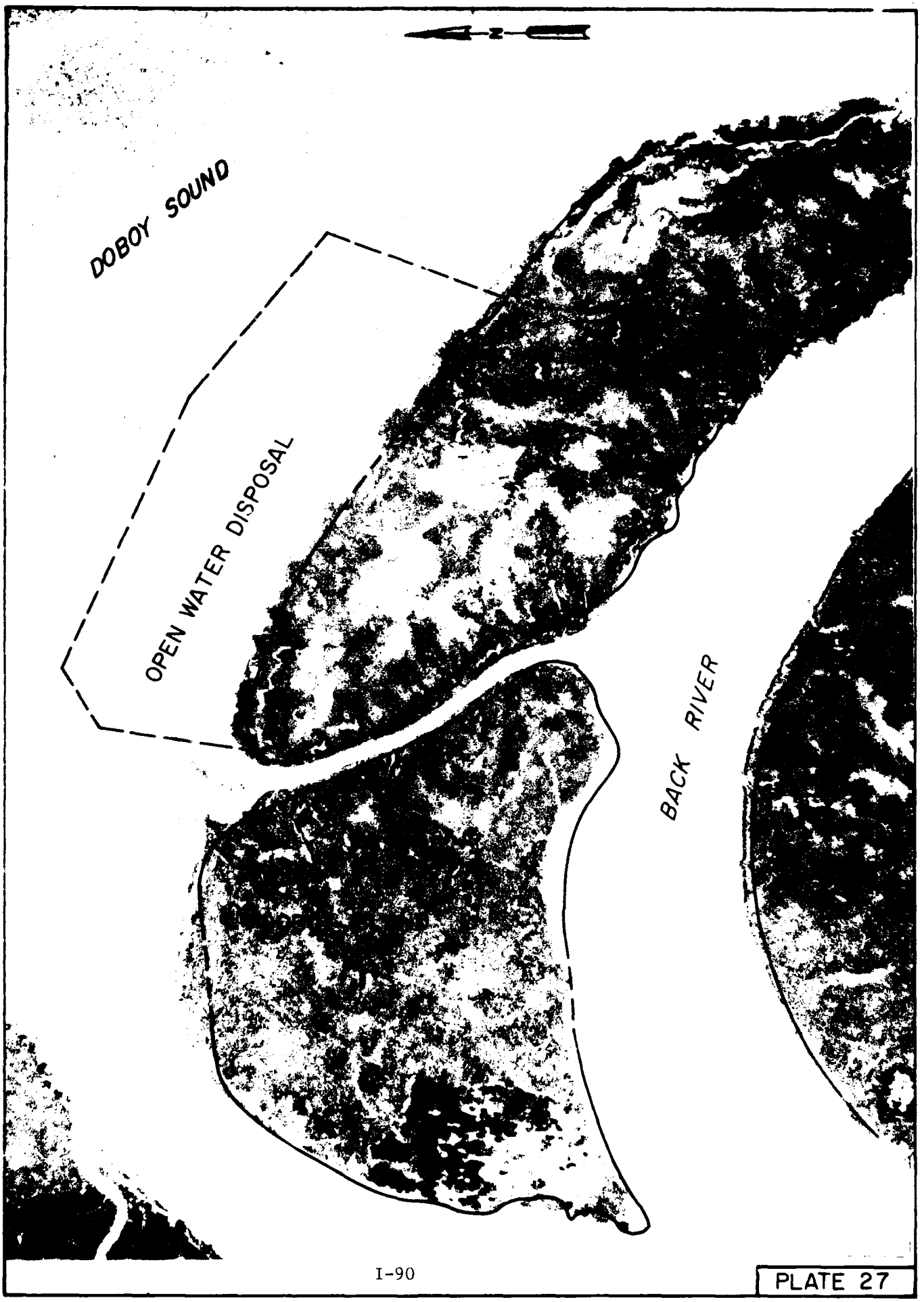


PLATE 27

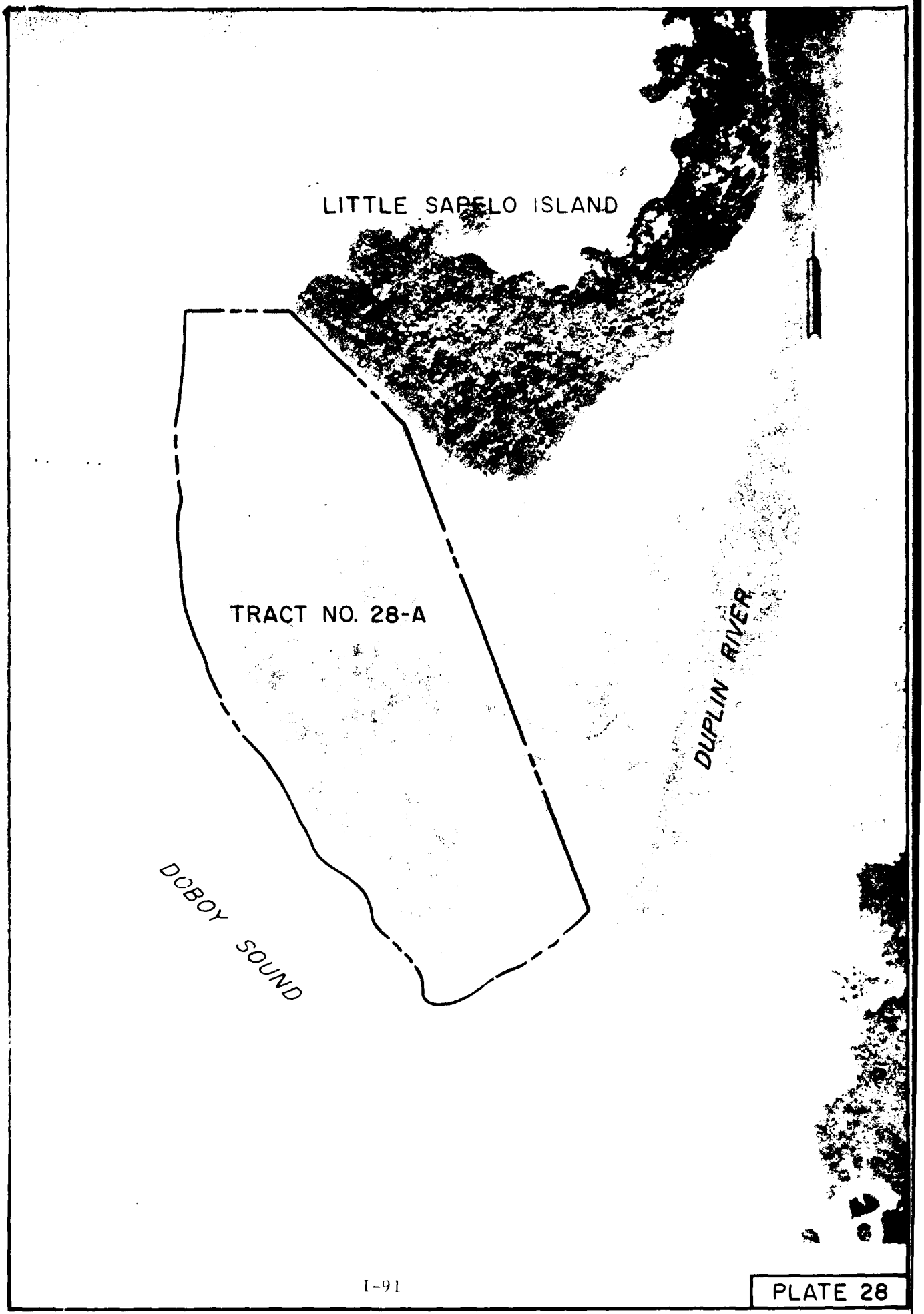


PLATE 28

FY	Credited	Gross
1965	22,641	32,991
1970	42,538	65,658
1973	43,206	55,294
1977	37,659	50,539
1980	45,341	67,105
Totals	191,345	271,587

All material from the North River Crossing has been deposited in the undiked site designated Tract 29-B (120 acres). Two other tracts are also located in the vicinity of North River: Tract 29-A and Tract 29-D. The sites contain 158.3 acres and 65.9 acres respectively and are both undiked. Tract 29-D has never been used. Tract 29-A shows evidence of some use; however, this material probably was deposited during the dredging of the 12-foot channel. About 36 acres or 30 percent of Tract 29-B have been impacted by dredging in North River crossing as well as from the Rockdedundy River crossing discussed below. Tracts 29-A, 29-B, and 29-D are shown on plate 29 and figures 21, 22, and 23 respectively.

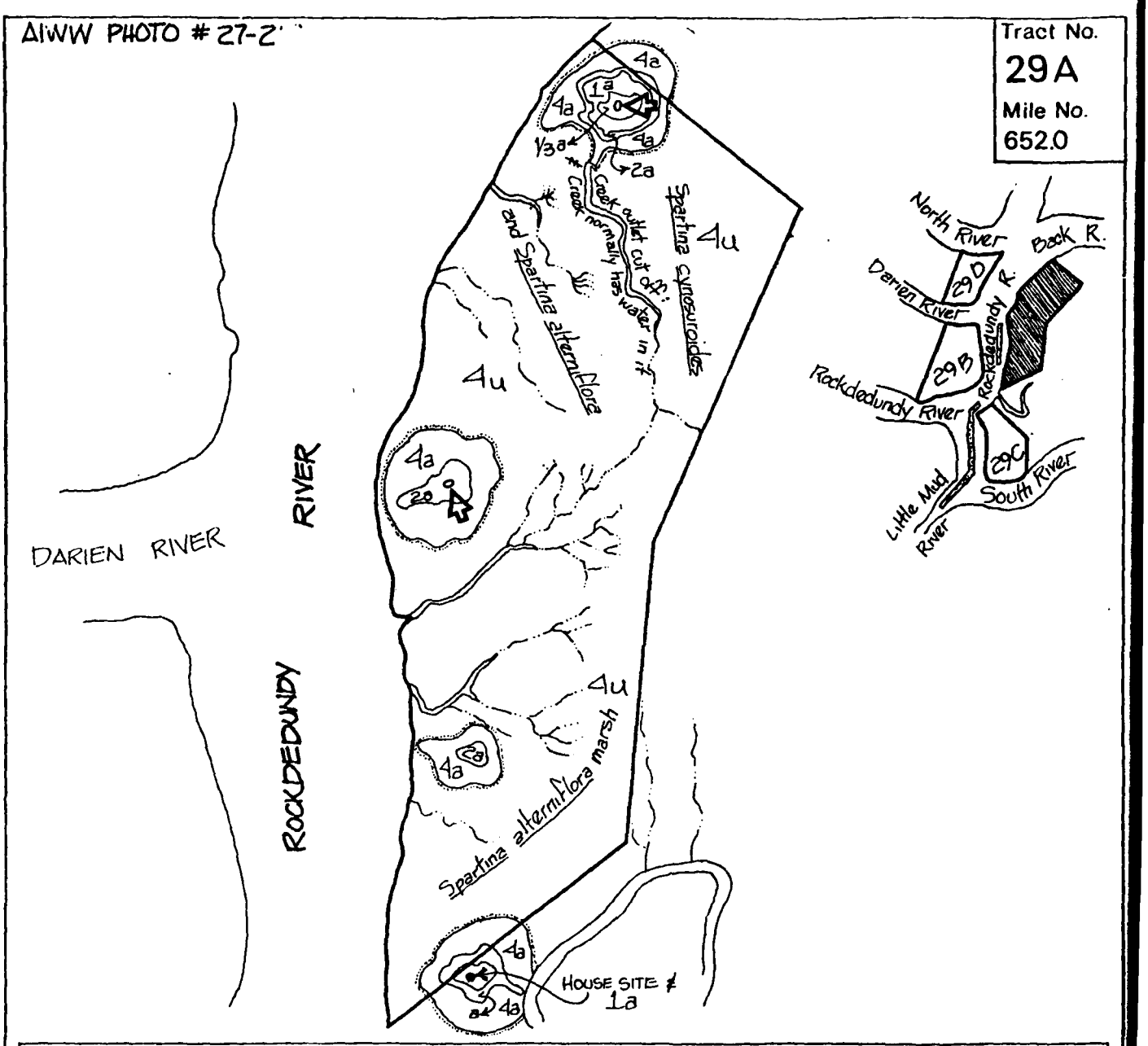
Rockdedundy River. (mile 652.2 - 652.7).

The portion of the AIWW that includes Rockdedundy is very small, and the shoaling that has occurred in the past has been at the mouth of the Rockdedundy.

FY	Credited	Gross
1942	143,517	296,593*
1943	120,958	174,119*
1944	136,251	196,133*
1945	101,000	145,390*
1946	25,681	36,968*
1947	15,784	22,721*
1949	143,260	206,223*
1980	14,495	21,453*
Total	700,586	1,009,600*

* Estimated

Past dredging operations have utilized Tract 29-B which was discussed in the previous section and Tract 30-A. It is discussed under the South River Section.



Tract No.	Description & Management Practice:
29A Acreage 158.3	Preferred outfall in the center or middle of both northern upland areas. No distinct or valuable upland habitat at these sites. Creeks to south of each upland should be avoided. House site should be avoided all together.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 21

TOTAL SIZE IN ACRES	158.3	29A
PERCENTAGE OF EASEMENT AFFECTED	12.1%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	19.2	
AMOUNT OF EASEMENT FORESTED IN ACRES	2.2	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	7.0	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	.75	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Juniperus virginiana* RED CEDAR (even age)
   Persea borbonia RED BAY
   Bumelia lanuginosa BUCKTHORN

2. *Baccharis angustifolia* FALSE WILLOW
   Myrica cerifera WAX MYRTLE
   Iva frutescens HIGH TIDE BUSH
   Opuntia compressa PRICKLY PEAR

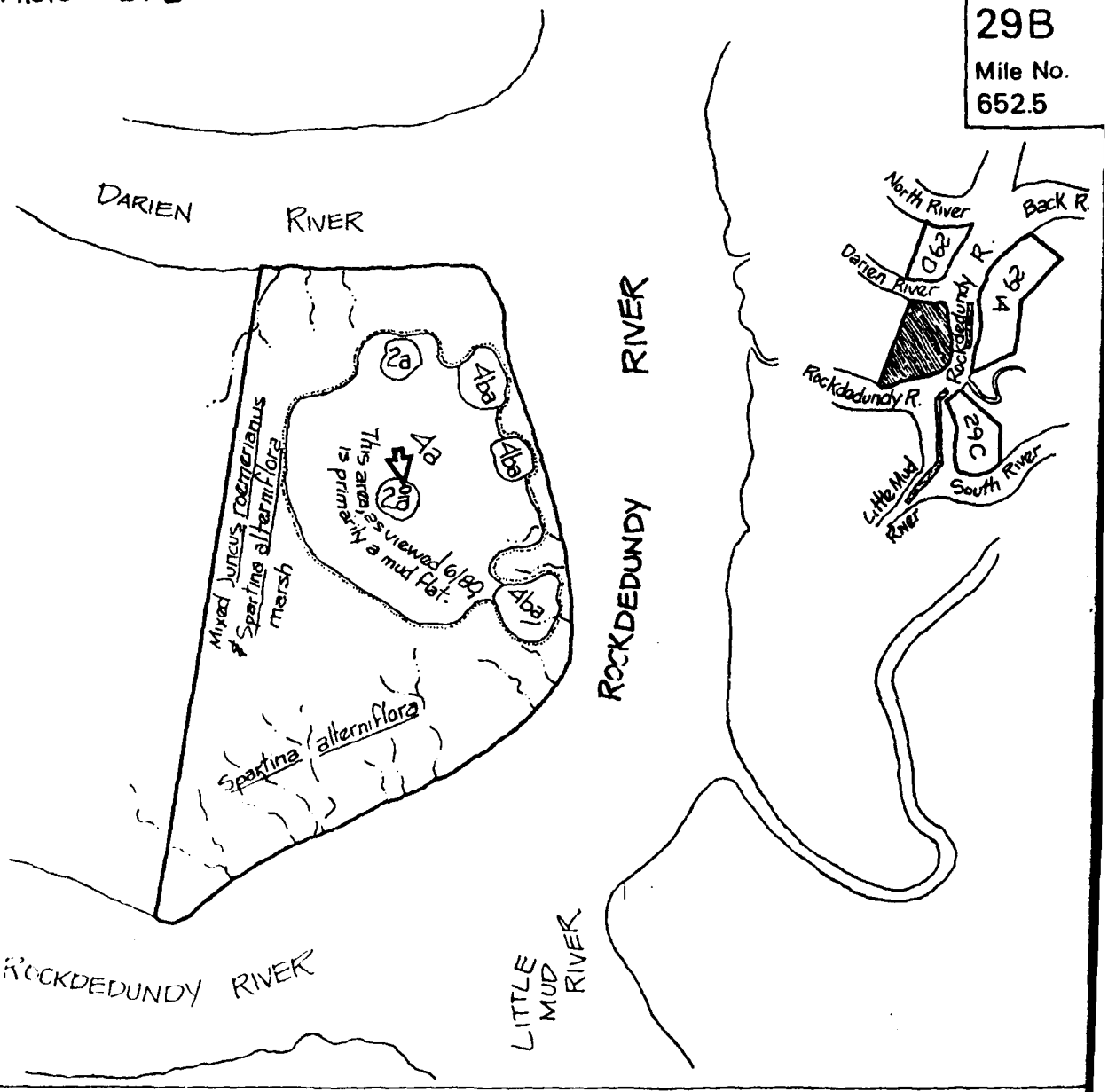
3. *Heterotheca subaxillaris* GOLDENROD
   Smilax bona-nox CATBRIER
   Salicornia virginica WOODY GLASSWORT

4. *Spartina alterniflora* SMOOTH CORDGRASS (vigorous stream side growth)
   Juncus roemerianus NEEDLE RUSH
   Fimbristylis castanea SALTMARSH SEDGE
   Andropogon glomeratus BROOMSEDGE
   Panicum aciculare PANIC GRASS
   Cenchrus tribuloides GIANT SAND SPUR

Deer lichen Caldonia sp. also present, browsed by rabbits(?) Spanish Moss also present, no animal tracks or signs other than racoons. Marsh wren Red wing black birds, solitary wasps, and a great abundance of yellow flies and mosquitoes.

AIWW PHOTO #27-2

Tract No.
29B
Mile No.
652.5



Tract No.	Description & Management Practice:
29B Acreage 120.0	Use of disposal sites along and adjacent to AIWW should be discontinued. This destroys productive stream side marsh. There is photographic evidence taken by helicopter during dredging which shows a significant portion of dredge material is returned directly to the waterway. Outfall is located further to west.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 22

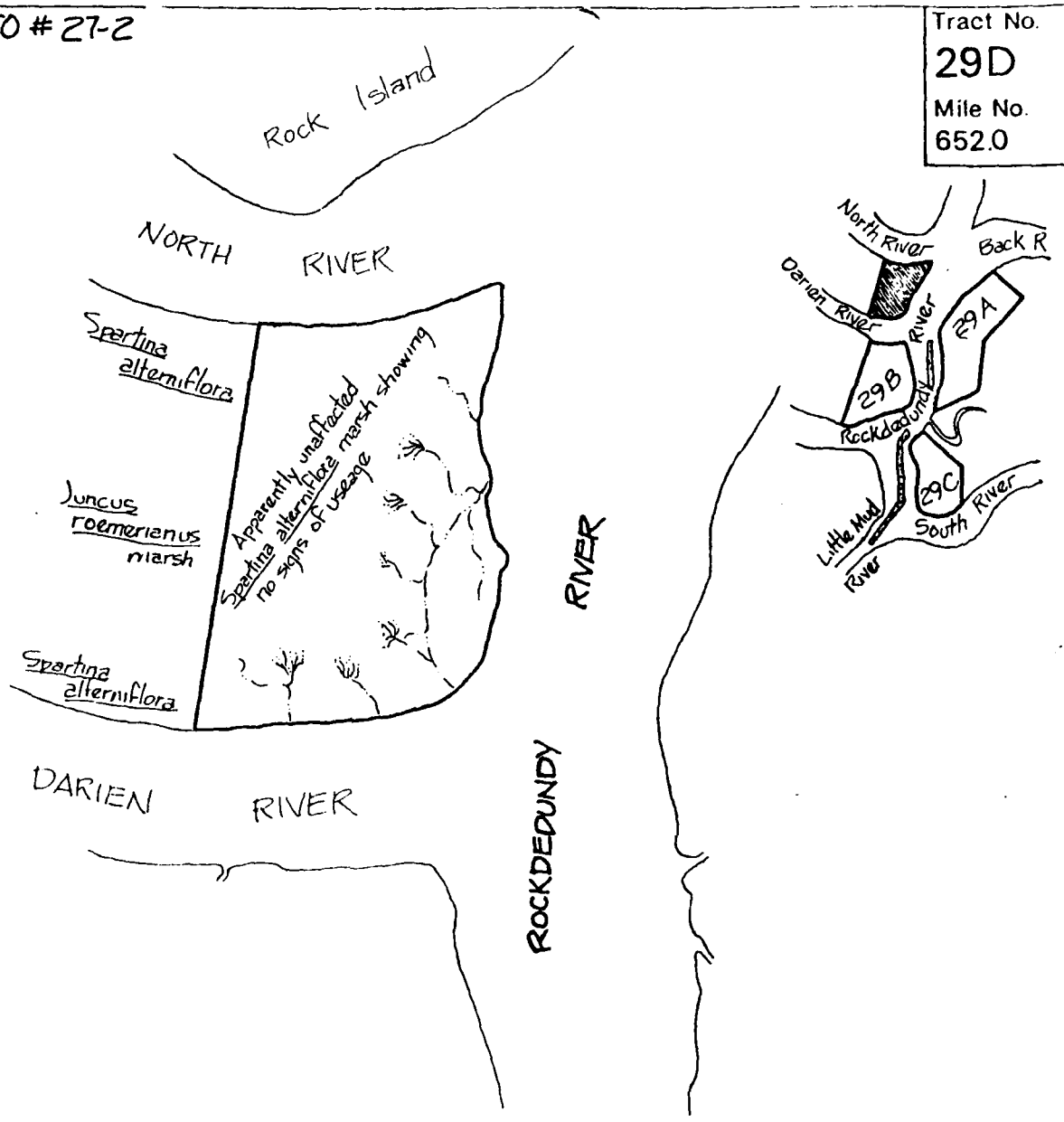
TOTAL SIZE IN ACRES	120.0	29B
PERCENTAGE OF EASEMENT AFFECTED	30.0%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	35.9	
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

Helicopter inspection only, recent usage, mostly barren sand and mud. Fringes of Spartina and Juncus.

AIWW PHOTO # 27-2

Tract No.
29D
Mile No.
652.0



Tract No.	Description & Management Practice:
29D Acreage 65.9	This site should be used sparingly and held in reserve. Last disposal was in 1968.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500', 1000', 2000')

north

FIGURE 23

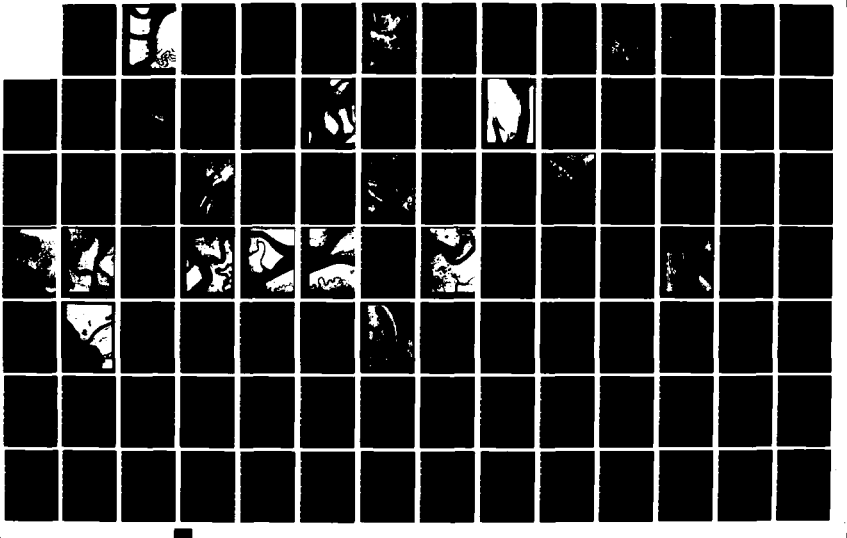
TOTAL SIZE IN ACRES	659	29D
PERCENTAGE OF EASEMENT AFFECTED	NONE	
AMOUNT OF EASEMENT AFFECTED IN ACRES	NONE	
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

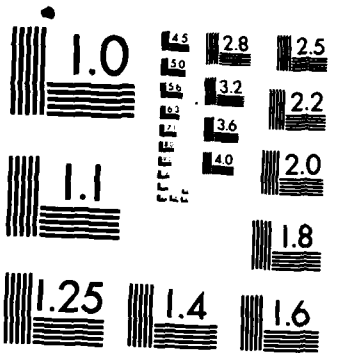
KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

Site predominated by Spartina alterniflora, almost exclusively.

AD-A161 999 ATLANTIC INTRACOASTAL WATERWAY (AIWW) MAINTENANCE PROGRAM EVALUATION STUDY(U) ARMY ENGINEER DISTRICT SAVANNAH GA JAN 83 3/4

UNCLASSIFIED F/G 13/2 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



PLATE 29

South River Crossing. (mile 652.7 - 653.5)

Although the South River comprises only a small portion of the waterway, significant shoaling has been a problem especially at the mouth of the South River. Dredging has been needed as follows :

FY	Credited	Gross	Disposal Area
1952	93,182	134,135*	Tracts 29-C, 30-A
1956	54,182	88,327	Tracts 29-C, 30-A
1963	49,461	67,428	Tracts 29-C, 30-A
1965	44,679	85,096	Tracts 29-C, 30-A
1967	65,431	81,215	Tracts 29-C, 30-A
1968	30,259	41,780	Tracts 30-A, 30-B
1969	21,393	40,652	Tracts 29-C, 30-A
1970	58,730	72,831	Tracts 29-C, 30-A
1971	50,073	61,193	Tract 30-A
1972	55,215	71,466	Tract 30-A
1973	58,251	73,113	Tract 30-A
1974	56,806	64,991	Tract 30-A
1976	67,334	94,070	Tract 30-A
1977	62,112	76,630	Tract 30-A
1978	43,974	65,082*	Tract 30-A
1980	53,300	78,899*	Tract 30-A
Totals	864,382	1,196,873	

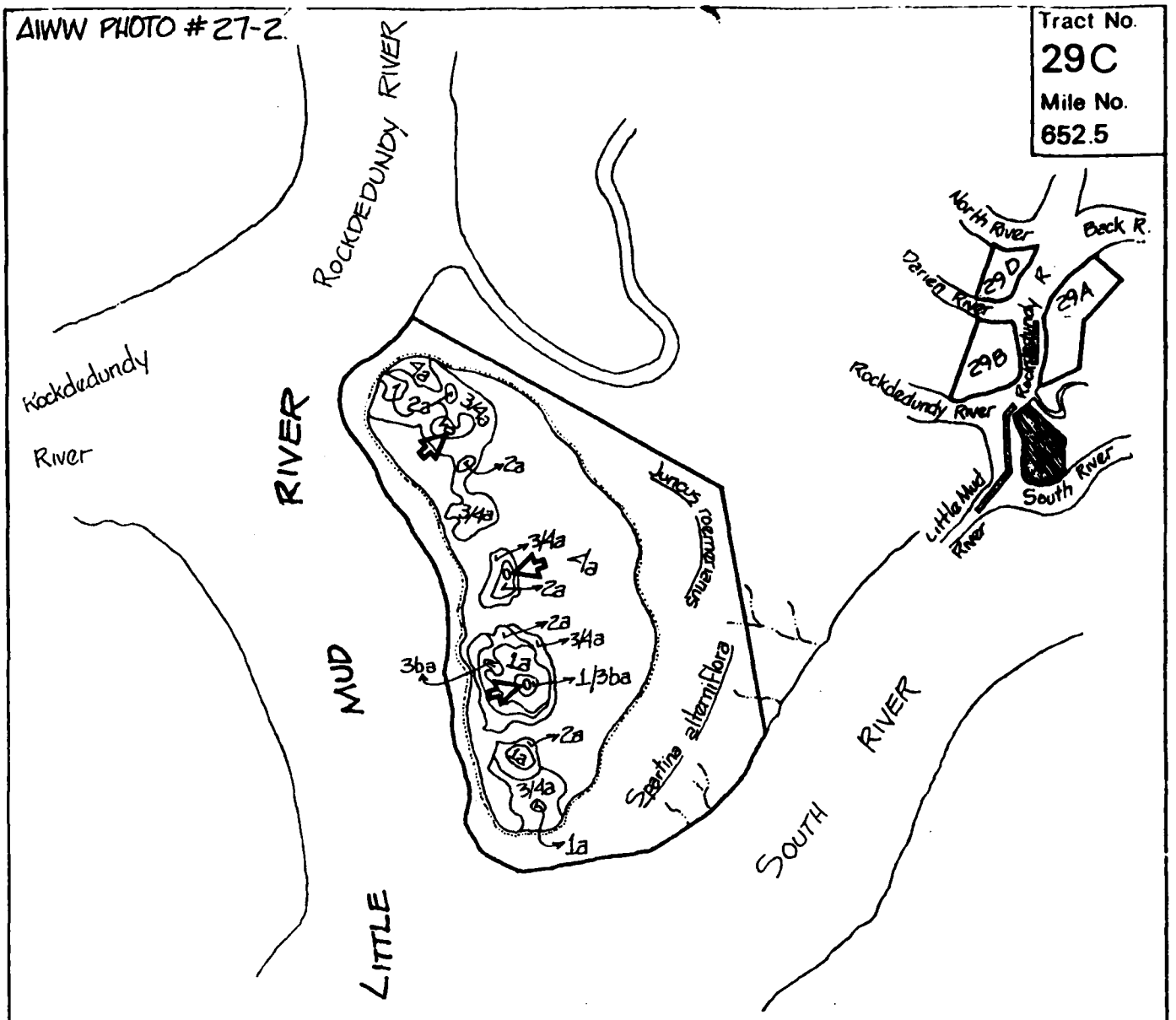
* Estimated

The South River has been maintained with undiked Tracts 29-C (92.6 acres) and Tract 30-A (230.1 acres). Tract 30-A remains an active disposal area while 29-C has not been used since FY 1970. These areas are both owned by the State of Georgia. Tract 30-B is no longer a disposal site since the easement was terminated on July 9, 1973. As shown in figure 24 and plate 30, Tract 29-C has been heavily impacted from disposal of dredged material as about 56 acres or 58 percent have been impacted as has Tract 30-A (89 acres or 39 percent). Tract 30-A is shown in figure 25 and plate 31.

Little Mud River (mile 653.5 - 655.5).

This 2-mile section of the water extends from the mouth of South River to the Altamaha Sound. As evidenced by the maintenance history, shoaling has been extensive.

FY	Credited	Gross	Disposal Area
1944	71,638	103,123*	Tracts 30-B, 32-B
1949	174,445	251,116*	Tracts 30-B, 32-A
1963	61,844	99,494	Tracts 30-B, 32-A
1965	62,440	121,973	Tracts 30-B, 32-A



Tract No.	Description & Management Practice:
29C Acreage 92.6	Disposal shown above. Also possibility of spoiling behind northern and eastern end of islands (staying away from creek) to consolidate areas.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 24

TOTAL SIZE IN ACRES	92.6	29C
PERCENTAGE OF EASEMENT AFFECTED	57.8%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	53.5	
AMOUNT OF EASEMENT FORESTED IN ACRES	2.2	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Juniperus virginicus* — RED CEDAR

2. *Iva frutescens* — HIGH TIDE BUSH (on marsh side)
Borrichia frutescens — SEA OX-EYE

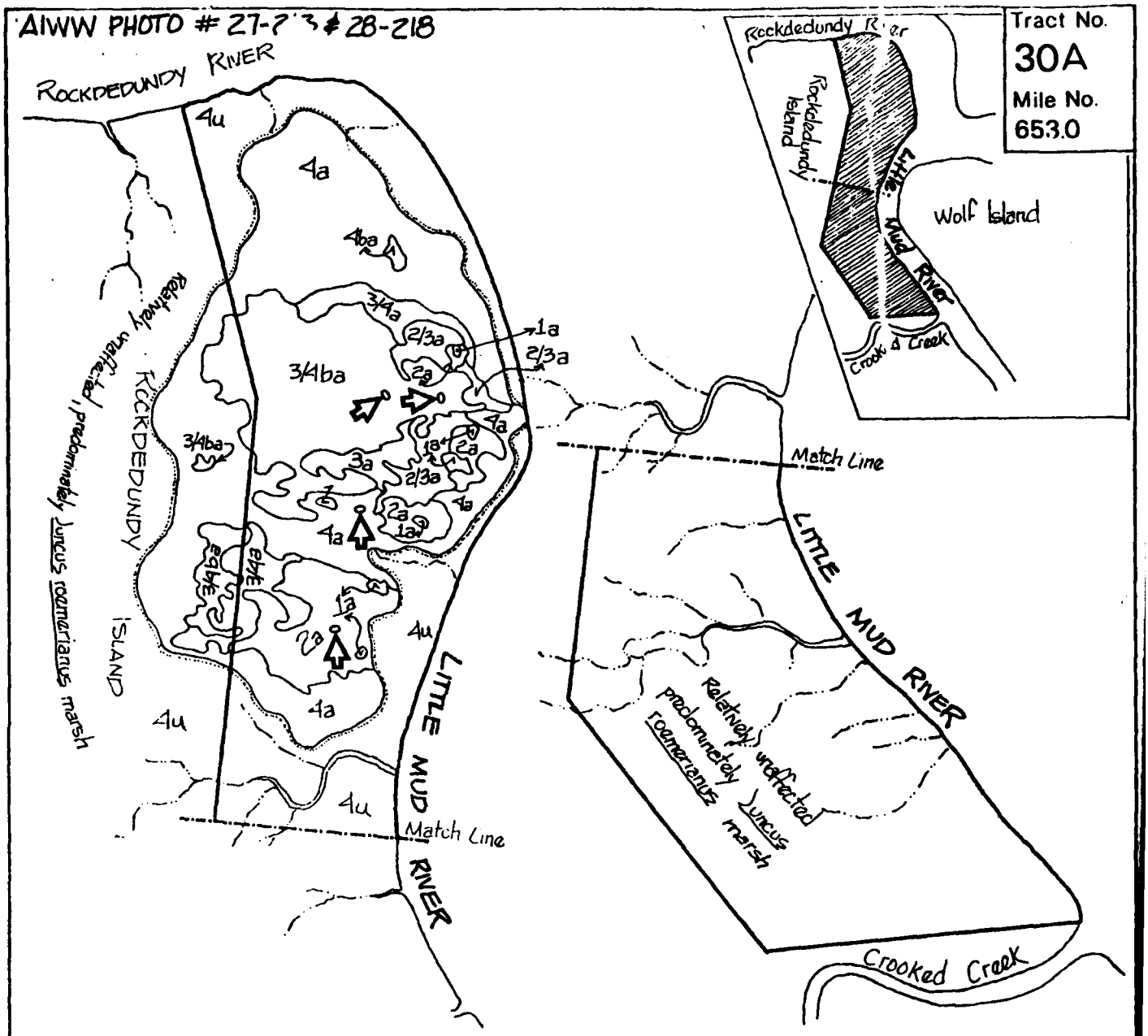
3. *Hydrocotyle bonariensis* — PENNYWORT

4. *Spartina cynosuroides* — ROUGH CORDGRASS
Juncus roemerianus — NEEDLE GRASS (in patches on backside)
Scirpus robustus — SALT MARSH BULRUSH
Fimbristylis castanea — SALT MARSH SEDGE

Opposite and past AIWW Marker 185 has witness post and bench mark of NOS tidal bench mark.



PLATE 30



Tract No.	Description & Management Practice:
30A Acreage 230.1	Heavily impacted site with large area (designated 3/4 ba) with clay soil and mud cracks, these conditions make mosquito breeding possible. Continued dumping on this particular area would help alleviate the mosquito problem by elevating the low areas and filling the cracks.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 25

TOTAL SIZE IN ACRES	230.1 30A
PERCENTAGE OF EASEMENT AFFECTED	38.7%
AMOUNT OF EASEMENT AFFECTED IN ACRES	88.9
AMOUNT OF EASEMENT FORESTED IN ACRES	11
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	21.2 ADDITIONAL AREA AFFECTED TO A LESSER DEGREE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Tamarisk gallica* SALT CEDAR
   Salix nigra BLACK WILLOW

2. *Iva frutescens* HIGH TIDE BUSH
   Borrichia frutescens SEA OX-EYE
   Baccharis halimifolia SILVERLING OR GROUNDSEL
   Baccharis angustifolia FALSE WILLOW
   Myrica cerifera WAX MYRTLE

3. *Sesuvium maritimum* SEA PURSLANE
   Chenopodium album LAMBS QUARTERS
   Amaranthus cannabinus WATER HEMP
   Batis maritima SALTWORT
   Salicornia virginica WOODY GLASSWORT
   Daubentonia punicea RATTLEBOX
   Rumex verticillatus SWAMP DOCK
   Phytolacca americana POKEBERRY
   Boltonia asteroides ASTER
   Solidago sempervirens SEASIDE GOLDENROD
   Eupatorium serotinum DOG FENNEL
   Erigeron bonariensis HORSEWEED
   Sonchus asper SOW THISTLE

4. *Cyperus virens* SEDGE
   Scirpus robustus SALTMARSH BULRUSH

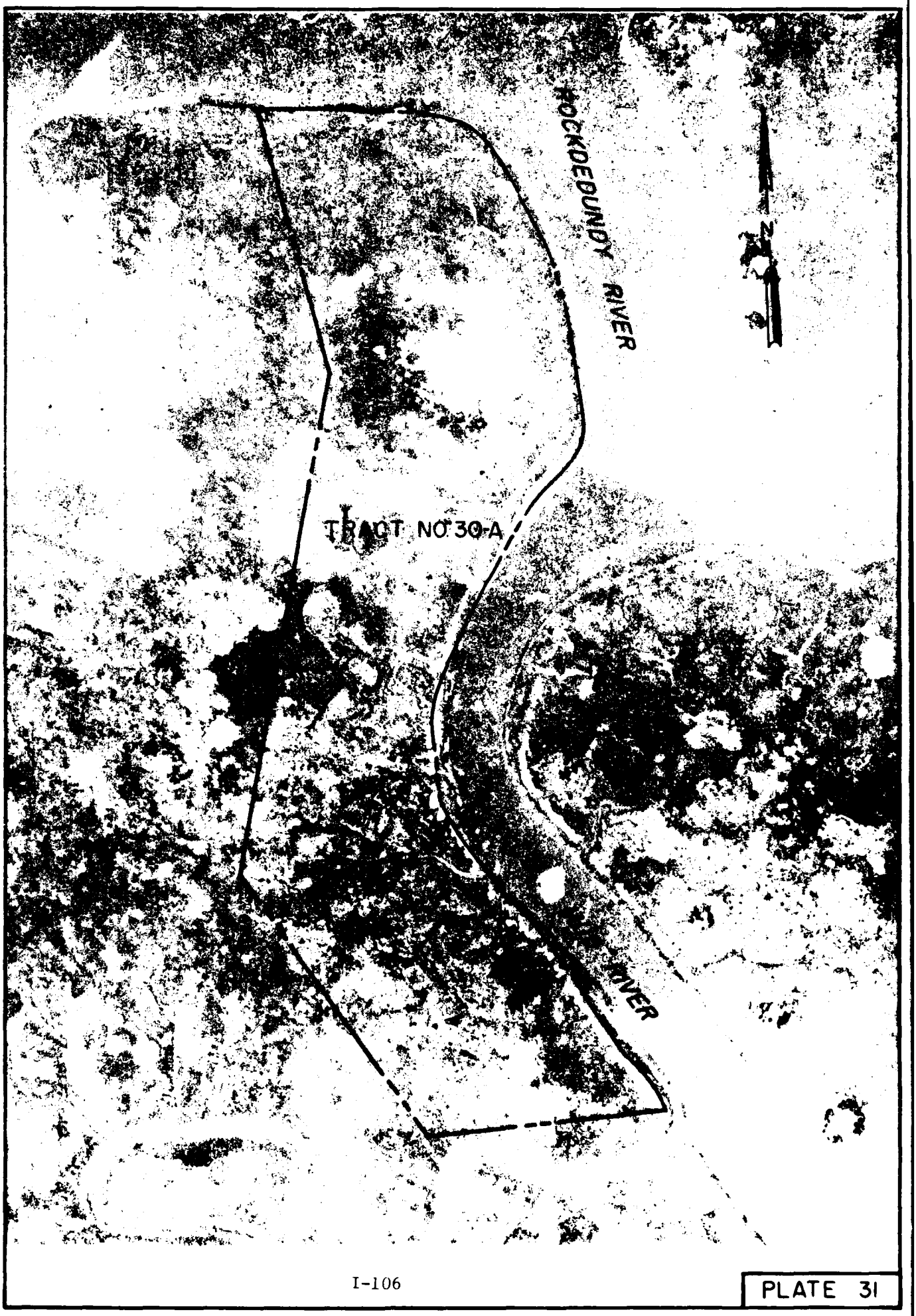


PLATE 31



PLATE 32

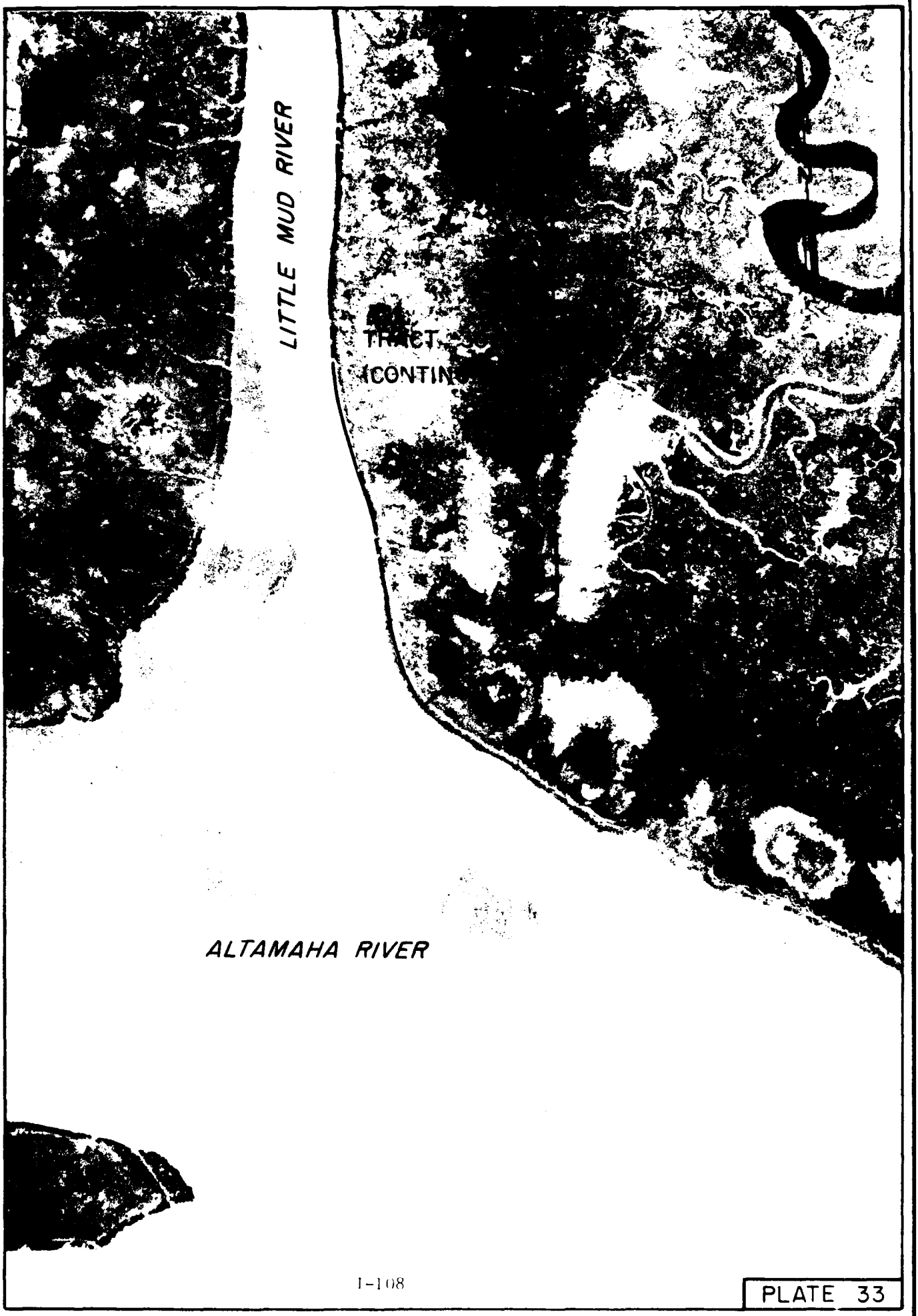


PLATE 33

1967	120,379	205,114	Tracts 30-B, 32-A
1968	197,077	271,076	Tracts 30-B, 32-A
1970	124,333	202,326	Tracts 29-C, 32-A
1971	151,338	226,548	Tract 32-A
1973	185,659	229,731	Tract 32-A
1974	129,814	182,321	Tract 32-A, Dump Area 32
1976	215,558	296,955	Tract 32-A
1977	148,300	191,767	Tract 32-A
1978	247,305	366,601	Tract 32-A
1980	186,670	276,272	Tract 32-A
Total	1,642,825	2,381,542	

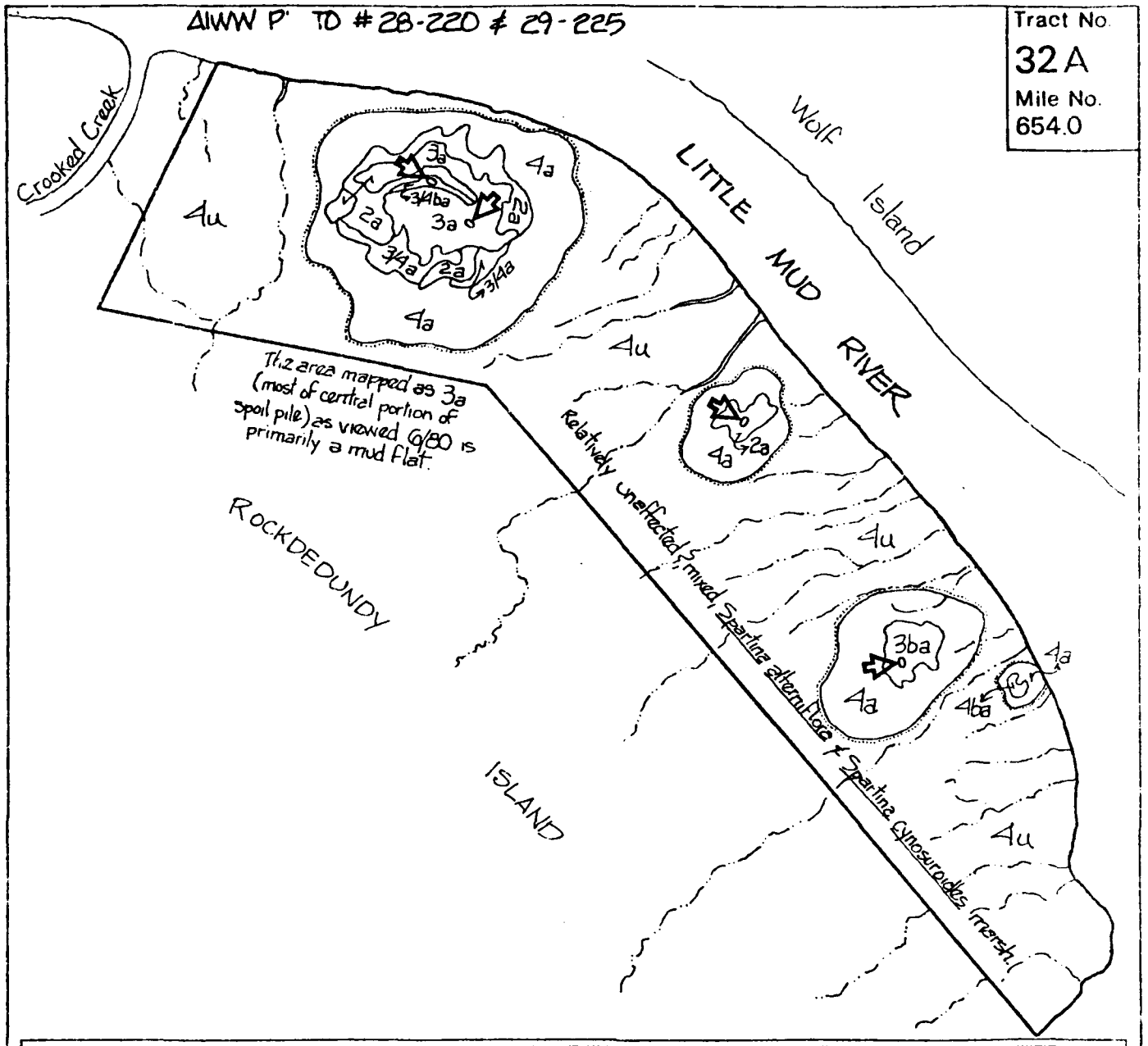
* Estimated

As discussed in the previous section, Tract 29-C has not been used since FY 70 and Tract 30-B was terminated on July 9, 1973. Tract 32-A (228.9 acres) remains an active disposal area for Little Mud River. On one occasion in FY 74, Dump Area 32 in the Altamaha Sound was used to dispose of material from lower Little Mud River. Material deposited in disposal sites along Little Mud River has been almost entirely mud and silt. About 58 acres of Tract 32-A (figure 26 plate 34) has been affected by maintenance activities.

Altamaha Sound. (mile 655.5 - 660).

For the next 4.5 miles, (mile 655.5 - 660) the AIWW crosses Altamaha Sound to the northern end of Buttermilk Sound. Spot shoaling occurs in three sections: mile 655.5 - 656.5, mile 658 - 659, and mile 659.5 - 660. The maintenance history is shown below:

FY	Credited	Gross	Disposal Area
1942	77,988	112,264*	Tract 36-A
1943	87,606	126,109*	Tract 34-A
1944	149,519	215,233*	Tract 36-A
1946	126,807	182,539*	Tract 36-A
1949	141,537	203,743	Tract 36-A
1960	16,908	26,907	Tract 36-A
1963	165,251	230,761	Tracts 30-B, 31-A, 32-A, 36-A
1965	17,455	31,142	Tract 34-A
1967	52,622	103,646	Tract 36-A
1969	84,308	144,633	Tracts 31-A, 36-A
1971	73,392	106,190	Tracts 34-A, 36-A
1972	71,872	90,833	Tract 36-A
1974	59,632	79,445	Tract 36-A
1977	80,428	93,326	Tract 36-A



Tract No.	Description & Management Practice:
32A Acreage 228.9	Protection of finger-like creeks running perpendicular to Little Mud River and stream side marsh to be protected. As in 29B preferred disposal shown to the middle of previously impacted areas. Deltaic outwash from previous dredge spoil operations can be seen in Mud River.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000'

FIGURE 26

TOTAL SIZE IN ACRES	228.9	32A
PERCENTAGE OF EASEMENT AFFECTED	25.5%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	58.3	
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. NO TREES

2. *Baccharis halimifolia* SILVERLING OR GROUNDSEL

3. *Eupatorium capillifolium* DOG FENNEL
Pluchea camphorata MARSH FLEABANE

4. *Juncus roemerianus* NEEDLE RUSH
Spartina cynosuroides ROUGH CORDGRASS
Spartina alterniflora SMOOTH CORDGRASS

1978	135,321	200,276	Tract 36-A
Total	1,346,637	1,947,047	

* Estimated

Tract 31-A (80.9 acres) and 31-B (125 acres) are located on the southern end of Wolf Island. They are undiked and administered by the State of Georgia. While Tract 31-B has not been used for maintenance, Tract 31-A was used in FY 63 and FY 69. Tract 34-A (80.9 acres) and Tract 36-A (260.4 acres) have been heavily used for the dredging in Altamaha Sound. Although not utilized, two open water areas are available and are designated as Dump Area 32 and Dump Area 34. Although a good deal of silt is encountered in Altamaha Sound, pockets of sand are also present in the shoaling areas other than that adjacent to Little Mud River.

Tracts 31-A and 31-B (plate 35) are not normally used. Approximately 29 acres or 36 percent of Tract 34-A (figure 27, plate 36) has been affected by dredged material disposal. The mature hammock on the western end Tract 34-A is a good example of the successional pattern of the older deposits in this section of the waterway. Prior to the disposal, this Tract was almost entirely a Spartina cynosuroides marsh. Spartina cynosuroides has replaced Spartina alterniflora as the dominant wetland plant because of the freshwater influence of the Altamaha River. Typical upland tree species that grow in the dredged material include persimmon (Diospyras virginiana), sugar hackberry (Celtis laevigata), red cedar (Juniperus salicicola), wild black cherry (Prunus serotina), southern magnolia (Magnolia grandiflora), water oak (Quercus nigra), salt cedar (Tamarix gallica), hercules club (Zanthoxylum clava-herculis), willow (Salix caroliniana), and tough buckthorn (Bumelia tenax).

About 60 acres or 23 percent of Tract 36-A has been impacted. Tract 36-A (figure 28, plate 37) is the only case of encroachment upon an AIWW disposal area in Savannah District as a squatter has constructed a house on the western end.

Buttermilk Sound. (mile 660 - 665.5)

Buttermilk Sound (mile 660 - 665.5) serves to connect Altamaha Sound with Mackay River. It is a relatively narrow sound and siltation has been extensive. Almost all of the shoaling is confined to mile 662 - 665 with the major problem occurring between 662 - 663.

FY	Credited	Gross	Disposal Area
1942	43,602	62,765*	Tract 43-A
1943	231,705	333,539*	Dump Area next to 42-C
			Dump Areas 42 & 44, Tract 43-A
1944	275,937	397,211*	Dump Area next to 42-C
			Dump Area 42, Tract 43-A
1945	222,571	320,391*	Dump Areas 42 & 44, Tract 43-A

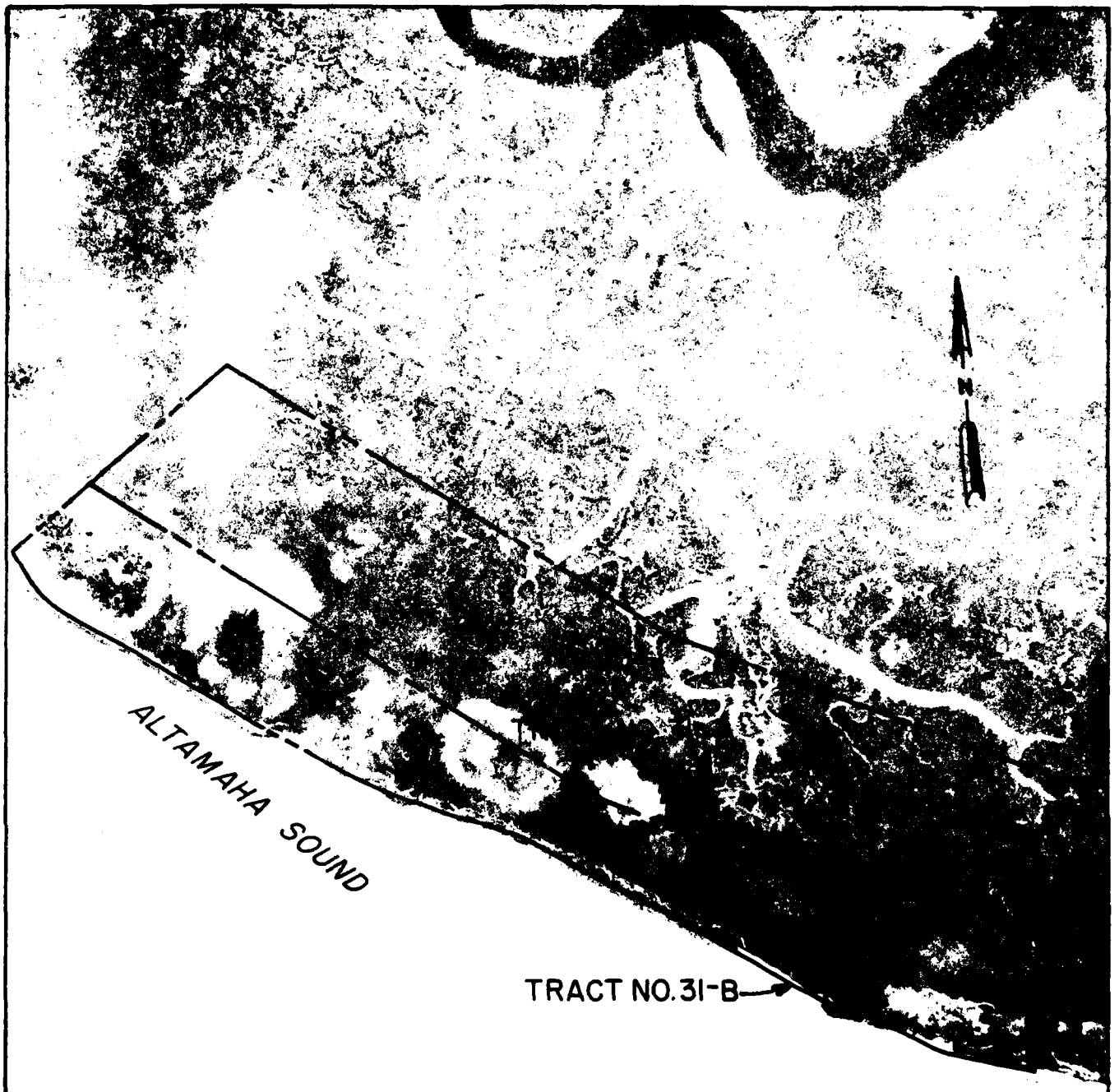
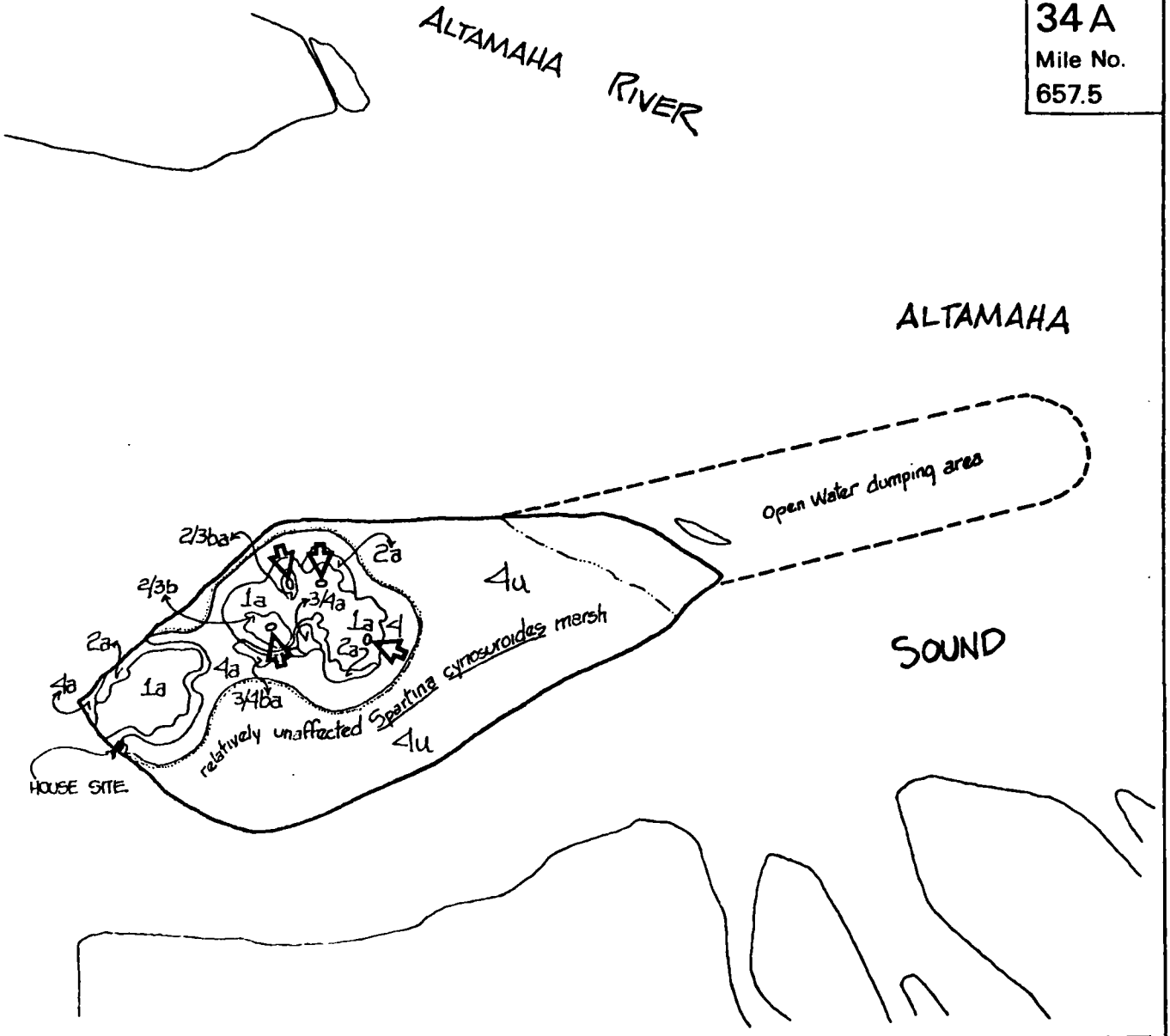


PLATE 35

AIWW PHOTO # 32-E

Tract No.
34 A
Mile No.
657.5



Tract No.	Description & Management Practice:
34 A Acreage 80.9	Extremely complex vegetative cover. The older, mature site on the western end is forested and has a house (now burned). Eastern portion of site was spoiled on last dredging cycle. A large field of dog fennel, dead willows and Hercules Club has grown up. This latter site should be used rather than the open water site.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 27

TOTAL SIZE IN ACRES	80.9 34A
PERCENTAGE OF EASEMENT AFFECTED	35.7%
AMOUNT OF EASEMENT AFFECTED IN ACRES	28.9
AMOUNT OF EASEMENT FORESTED IN ACRES	11.5
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

NOTE: Adjacent dumping area approximates 36.0 acres

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Diospyrus virginiana* PERSIMMON
Celtis laevigata SUGAR HACKBERRY
Juniperus virginiana RED CEDAR
Prunus serotina BLACK CHERRY
Prunus caroliniana CHERRY LAUREL
Magnolia grandiflora SOUTHERN MAGNOLIA
Quercus nigra WATER OAK
Tamarix gallica SALT CEDAR
Zanthoxylum clava-herculis HERCULES CLUB
Salix caroliniana WILLOW
Bumelia tenax TOUGH BUCKTHORN

2. *Myrica cerifera* WAX MYRTLE
Ilex vomatoria YAUPON
Sambucus canadensis ELDERBERRY
Rubus trivialis DEWBERRY

3. *Heterotheca subaxillaris*
Eupatorium capillifolium DOG FENNEL
Solidago sempervirens SEASIDE GOLDENROD
Mikania scandens CLIMBING HEMPWEED
Pluchea purpurascens MARSH FLEABANE
Ampelopsis arborea PEPPER VINE
Smilax bona-nox CAT BRIAR
Phytolacca americana POKEBERRY
Parthenocissus quinquefolia VIRGINIA CREEPER
Rhus toxicodendron POISON IVY
Vitus aestivalis POSSUM GRAPE
Erigeron canadensis HORSEWEED
Chenopodium ambrosioides MEXICAN TEA
Erigeron bonariensis HORSEWEED
Pluchea camphorata MARSH FLEABANE
Gnaphalium obtusifolium RABBIT TOBACCO
Verbena scabra VERBENA

4. *Andropogon sp.* BROOMSEDGE
Scirpus robustus BULRUSH
Scirpus cyperinus BULRUSH
Typha latifolia CAT TAIL
Spartina cynosuroides ROUGH CORDGRASS

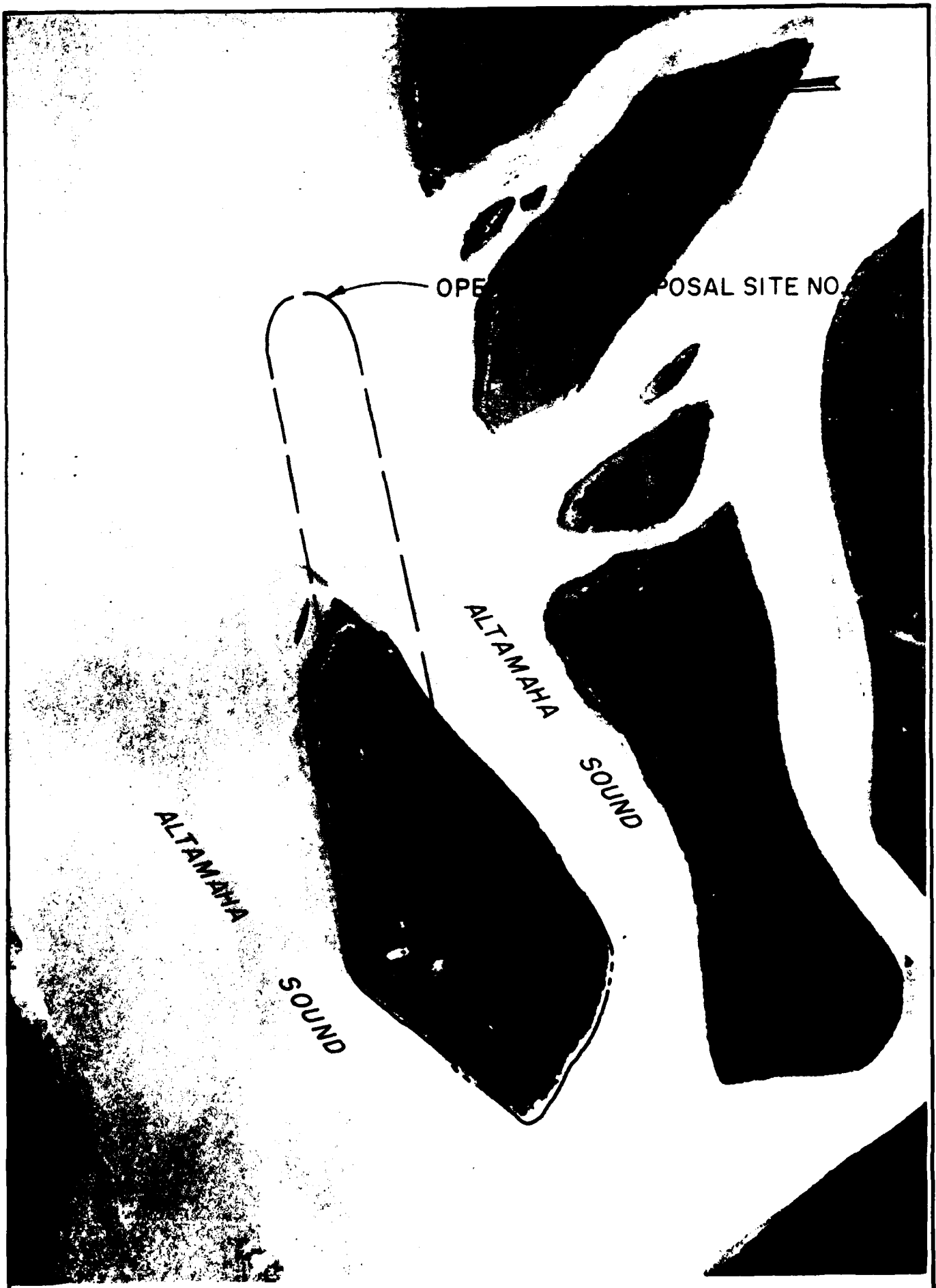
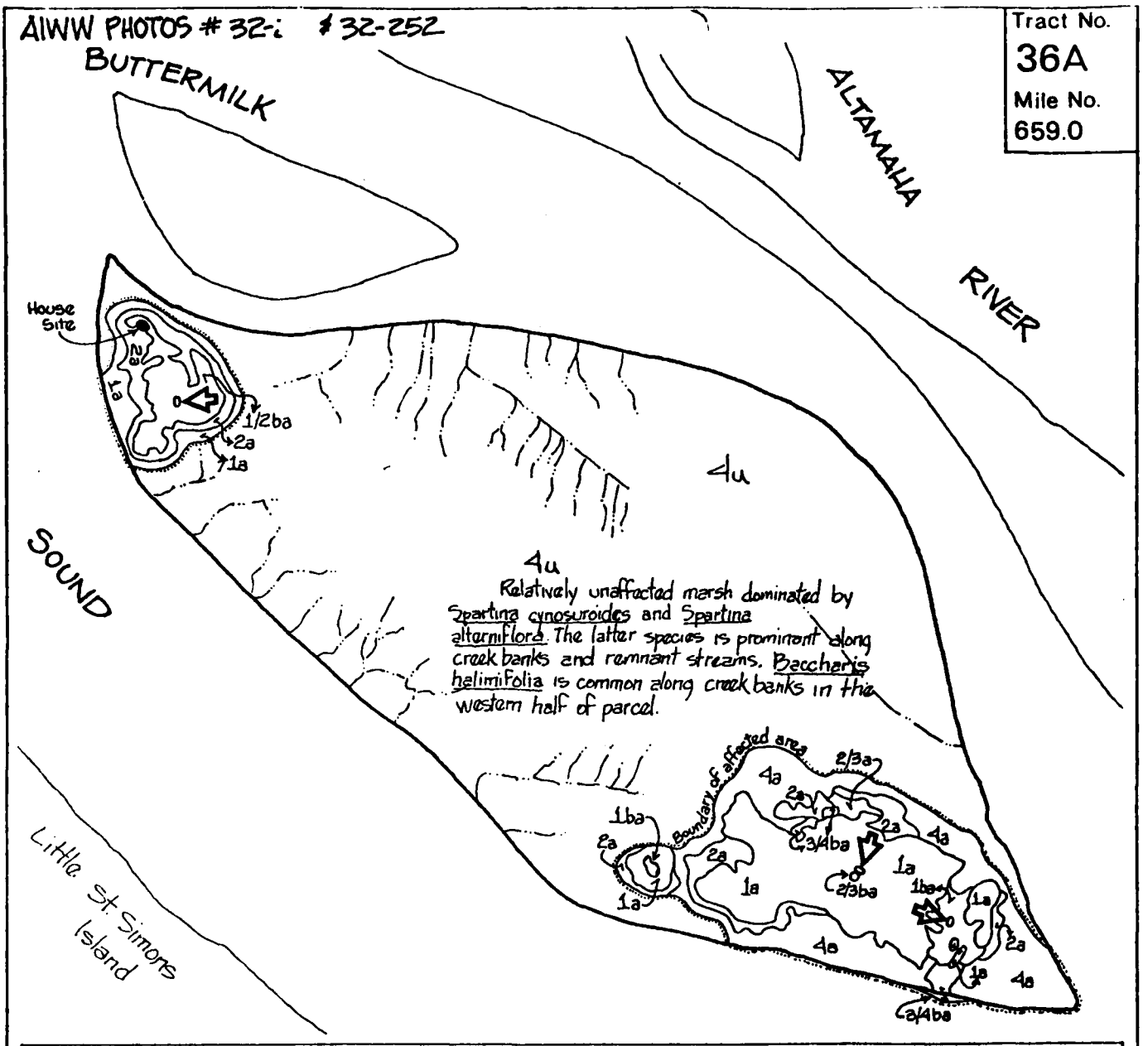


PLATE 36



Tract No.	Description & Management Practice:
36A Acreage 260.4	It is recommended that both sites continue to be used. Island has squatters who graze goats and cows. Disposal on the island is to be preferred to nearby overboard spoiling.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

FIGURE 28

TOTAL SIZE IN ACRES	260.4 36A
PERCENTAGE OF EASEMENT AFFECTED	23.0%
AMOUNT OF EASEMENT AFFECTED IN ACRES	60.1
AMOUNT OF EASEMENT FORESTED IN ACRES	26.2
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Magnolia grandiflora* SOUTHERN MAGNOLIA
Prunus caroliniana LAUREL CHERRY
Prunus serotina BLACK CHERRY
Persea borbonia RED BAY
Sabal palmetto CABBAGE PALMETTO
Melia azederach CHINA-BERRY
Tamarix gallica SALT CEDAR
Taxodium distichum CYPRESS
Juniperus virginiana RED CEDAR
Celtis laevigata SUGAR HACKBERRY
Acer rubrum REDMAPLE

2. *Ilex vomitoria* YAUPON
Opuntia stricta SHRUBBY PRICKLEY-PEAR
Zanthoxylum clava-herculis HERCULES CLUB
Cephalanthus occidentalis BUTTON BUSH
Baccharis halimifolia SILVERLING OR GROUNDSEL
Ampelopsis arborea PEPPERVINE
Iva frutescens HIGH TIDE BUSH

3. *Pluchea camphorata* MARSH FLEABANE
Cassia obtusifolia SICKLE POD
Solanum sisymbriifolium SPINY NIGHTSHADE

4. *Spartina cynosuroides* BIG CORDGRASS
Spartina alterniflora SMOOTH CORDGRASS

This site occupied by goats, goat houses and pens on the eastern end, and by a house, and dock on the western end. This site was provided for by the State of Georgia under the Georgia Intracoastal Waterway Commission (Act no. 385, 1939) Title searches in McIntosh County Courthouse indicate present squatter has license from a second party who has a quit claim deed. Legal action by State recommended course.



PLATE 37

1946	200,163	288,135*	Dump Areas 42 & 44, Tract 43-A
1947	29,984	43,162*	Tract 43-A
1952	178,165	184,156	Tract 43-A, Dump Areas 43 & 44
1953	294,537	461,232	Tracts 42-B, 43-A, Dump Areas 42 & 43
1956	98,681	169,192	Tract 43-A, Dump Areas 43 & 44
1960	192,328	307,910	Tract 42-B,43-A,43-B, Dump Area 42 & 43
1963	250,666	360,202	Dump Area next to Tract 42-C, Tract 42-B 43 A, Dump Area 42
1964	57,022	145,222	Tract 42-B, Dump Areas 42,43,&44
1965	82,336	106,509	Tract 42-B, Dump Area 42
1967	75,943	161,110	Tract 43-A, Dump Area 42
1969	142,723	194,710	Tract 42-B, Dump Area 43
1971	112,369	179,343	Dump Areas 42 & 43
1972	12,428	23,132	Dump Area 42
1974	127,934	177,885	Dump Areas, 42,43 & 44
1977	45,038	56,413	Tract 42-B
1978	241,605	357,575	
Totals	2,915,737	4,029,790	Tract 42-B, open water sites 42 & 43

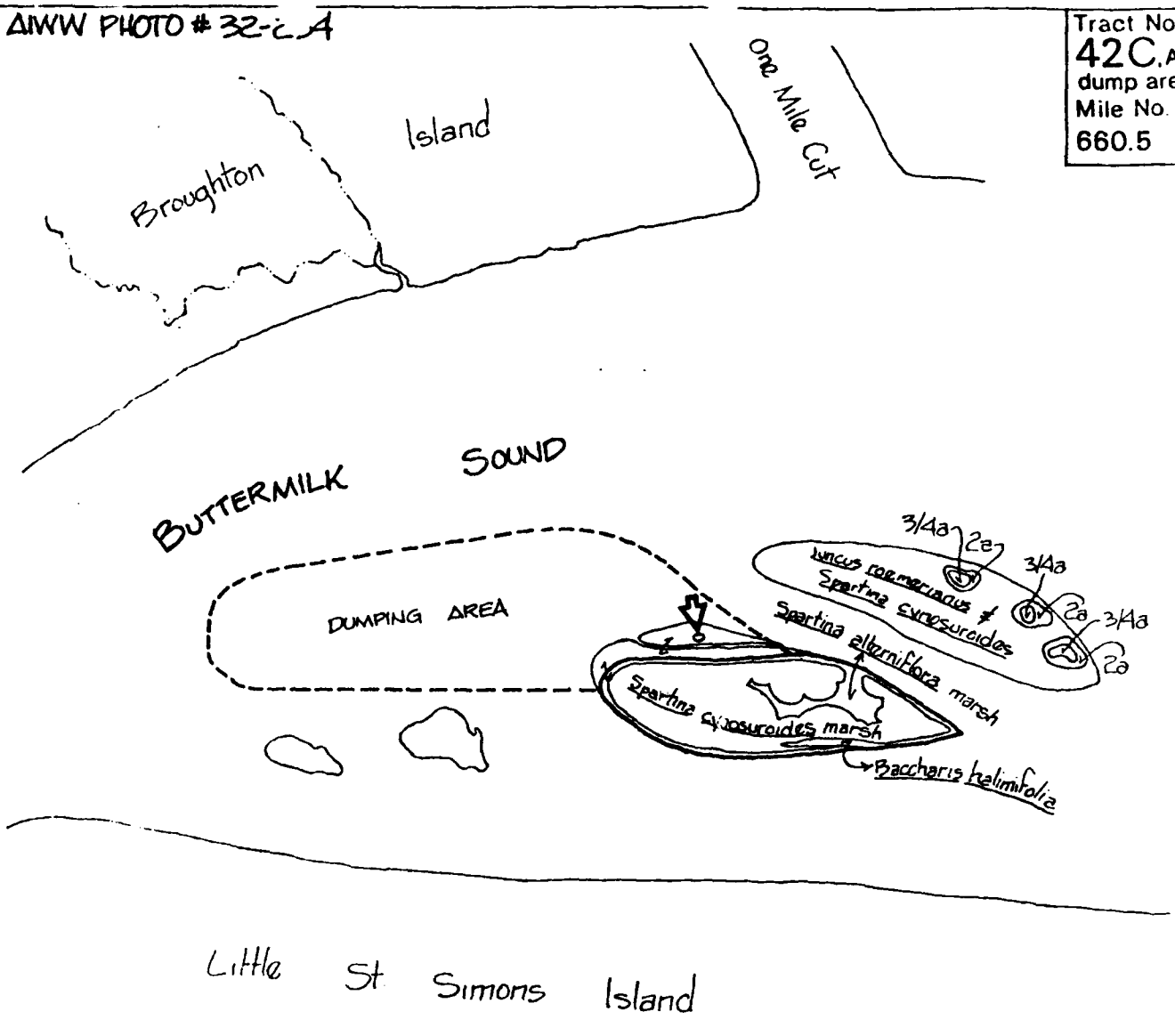
* Estimated

Tract 42-C (14.5 acres) shown on figure 29 and plate 38 has never been used, however, the adjacent open water site has received dredged material on several occasions. Tract 43-A (plate 41) is no longer a disposal site since the easement was terminated on 17 June 1972. Open water Disposal Area No. 42 (figure 30, plate 41) is an experimental marsh development site. The Georgia Department of Natural Resources in conjunction with the U.S. Army Corps of Engineers Waterways Experiment Station conducted research relative to marsh establishment as part of the Corps of Engineers Dredged Material Research Program.

Tract 42-B (figure 31, plate 39) has been used on numerous occasions, as has open water Disposal Area No. 43 (figure 32, plate 40). Tract 43-B and adjacent open water Disposal Area No. 44 (figure 33, plate 42) have been only

AIWW PHOTO # 32-c-A

Tract No. 42C, Adj. dump area Mile No. 660.5



Tract No. 42C, Adj dump area Acreage 14.5	Description & Management Practice: Preferred disposal site on the northern edge of the Spartina marsh. This can be accomplished without smothering that new growth which fringes the island.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date. July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 29

TOTAL SIZE IN ACRES	145	42C # adj. dumping
PERCENTAGE OF EASEMENT AFFECTED	NONE	
AMOUNT OF EASEMENT AFFECTED IN ACRES	NONE	
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	16 ON ADJACENT MARSH ISLAND	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

NOTE: Dumping Area approximates 42 acres in size.

Adjacent marsh island approximates 16 acres in size.

1. NO TREES

2. *Baccharis halimifolia* SILVERLING OF GROUNDSEL
Iva frutescens HIGH TIDE BUSH

3.

4. *Spartina alterniflora* SMOOTH CORDGRASS
Spartina cynosuroides ROUGH CORDGRASS
Juncus roemerianus NEEDLE RUSH

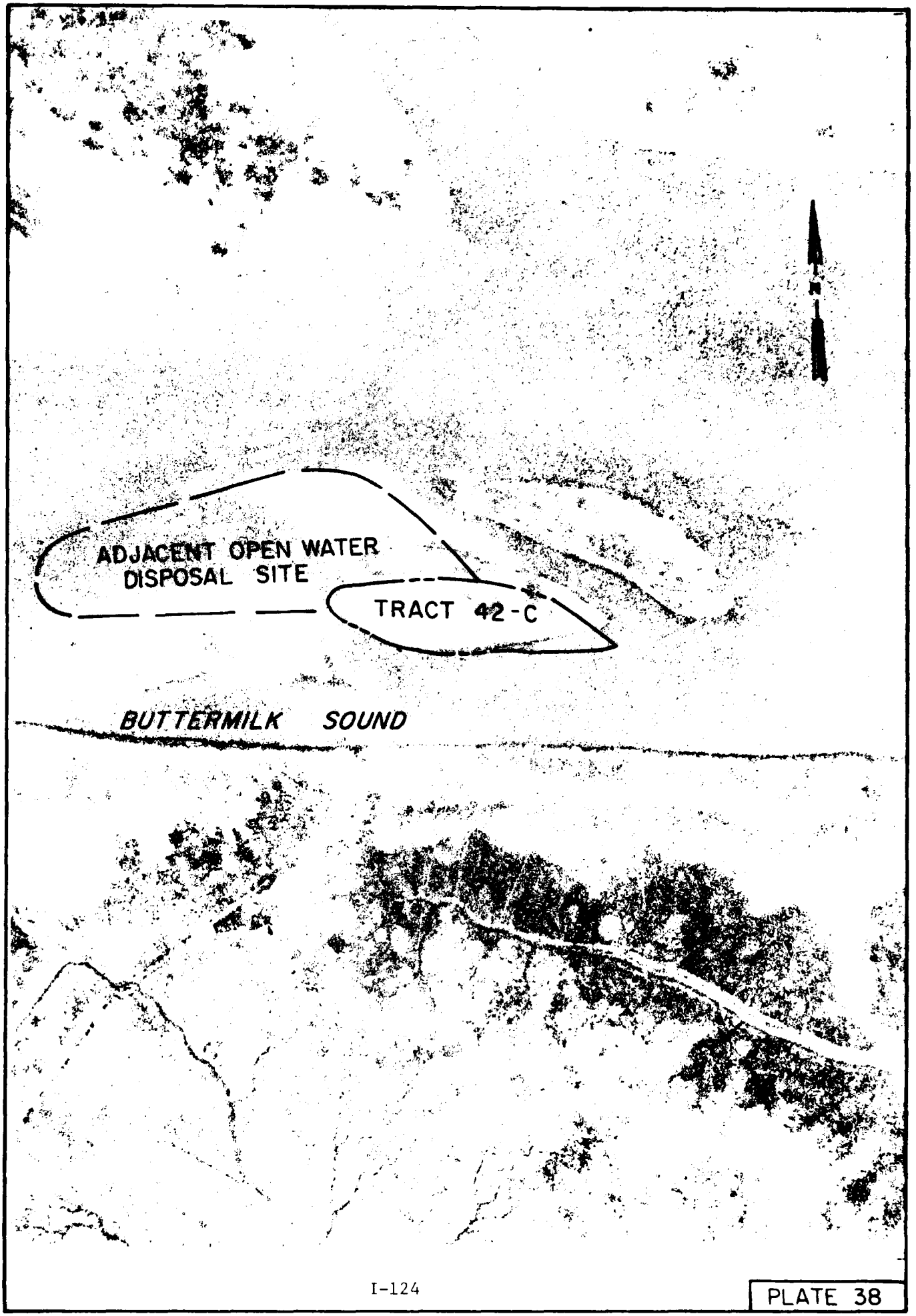
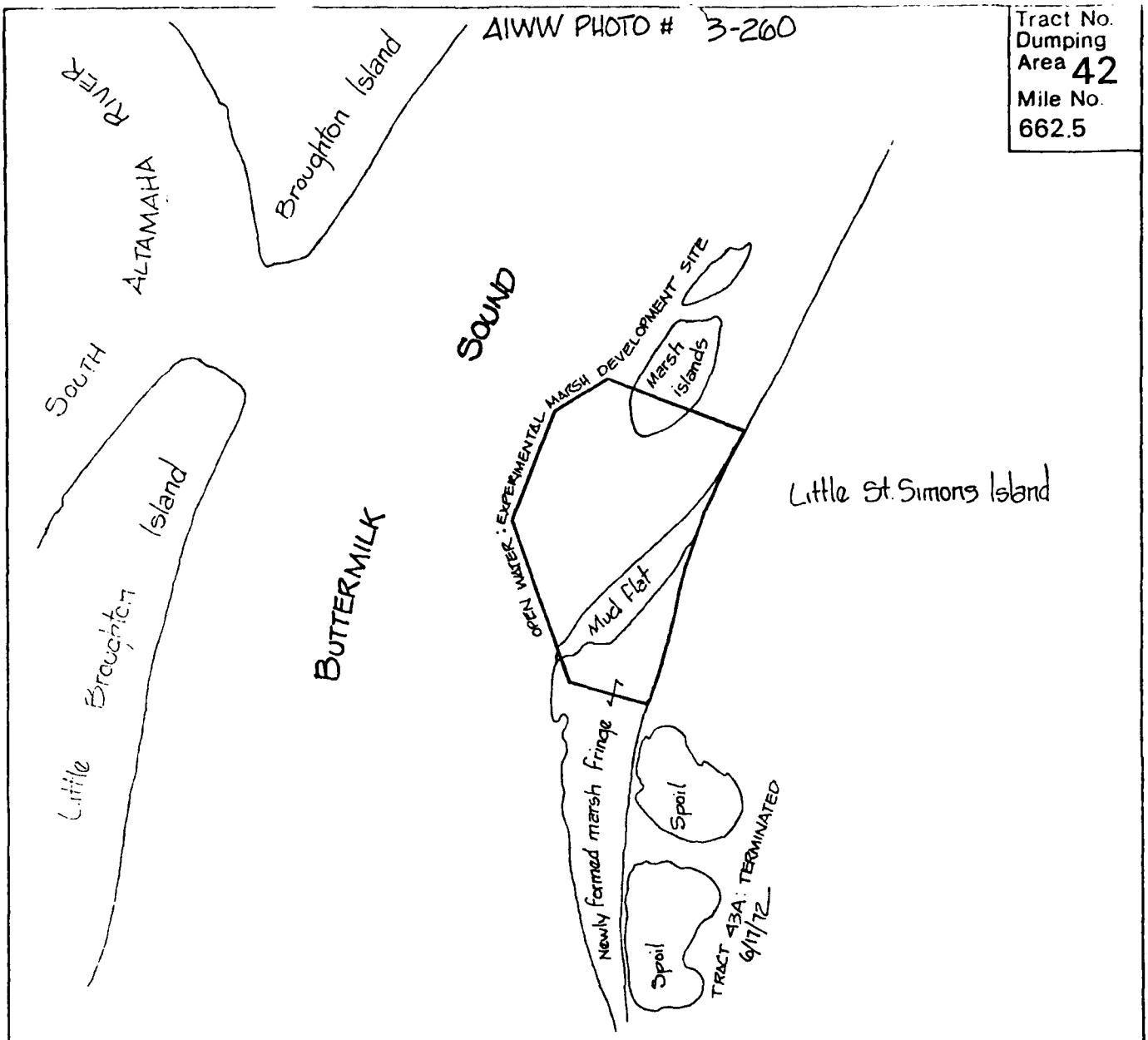

ADJACENT OPEN WATER
DISPOSAL SITE
TRACT 42-C
BUTTERMILK SOUND

PLATE 38



Tract No. Dumping Area 42 Acreage H_2O/Marsh	Description & Management Practice:
	Disposal should be very limited and only in conjunction with previous experimental work that Corps and State have carried out.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 30

TOTAL SIZE IN ACRES	APPROX. 340 #42
PERCENTAGE OF EASEMENT AFFECTED	OVERBOARD DUMPING
AMOUNT OF EASEMENT AFFECTED IN ACRES	OPEN WATER, MUD FLATS
AMOUNT OF EASEMENT FORESTED IN ACRES	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1.

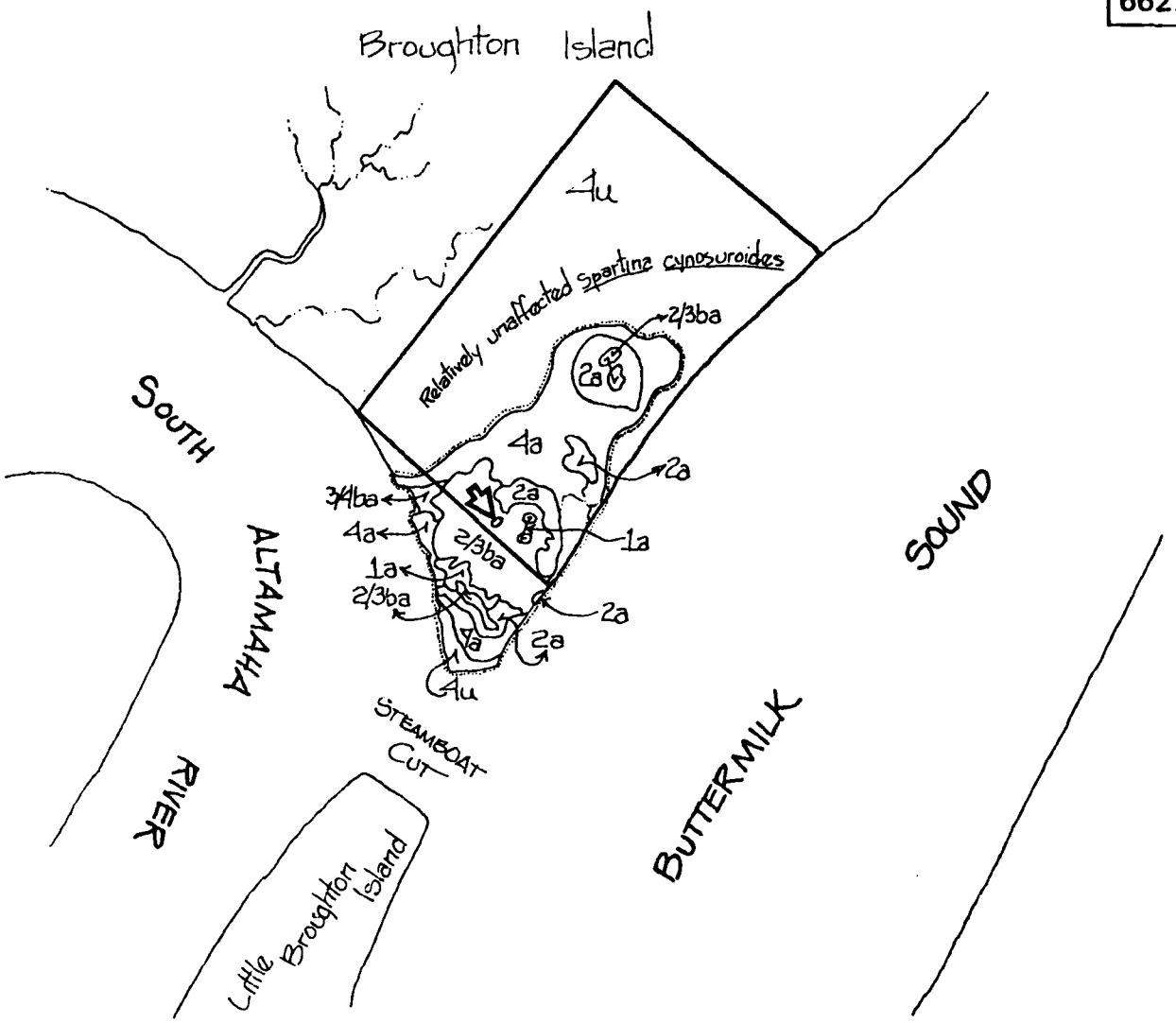
2.

3.

4. *Spartina alterniflora* SMOOTH CORDGRASS
Spartina cynosuroides ROUGH CORDGRASS

AIWW PHOTO # 33-c-9

Tract No.
42B
Mile No.
662.0



Tract No.	Description & Management Practice:
42B Acreage 65.0	Much of the maintenance dredging in this area of the AIWW is the result of removing the last meander of the Altamaha River and making Steamboat Cut. Some consideration should be given to hydraulic studies which would restore a small loop in place of the cut.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 31

TOTAL SIZE IN ACRES	65.0 42B
PERCENTAGE OF EASEMENT AFFECTED	27.2%
AMOUNT OF EASEMENT AFFECTED IN ACRES	17.7
AMOUNT OF EASEMENT FORESTED IN ACRES	.25
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	9.0*
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	.75*

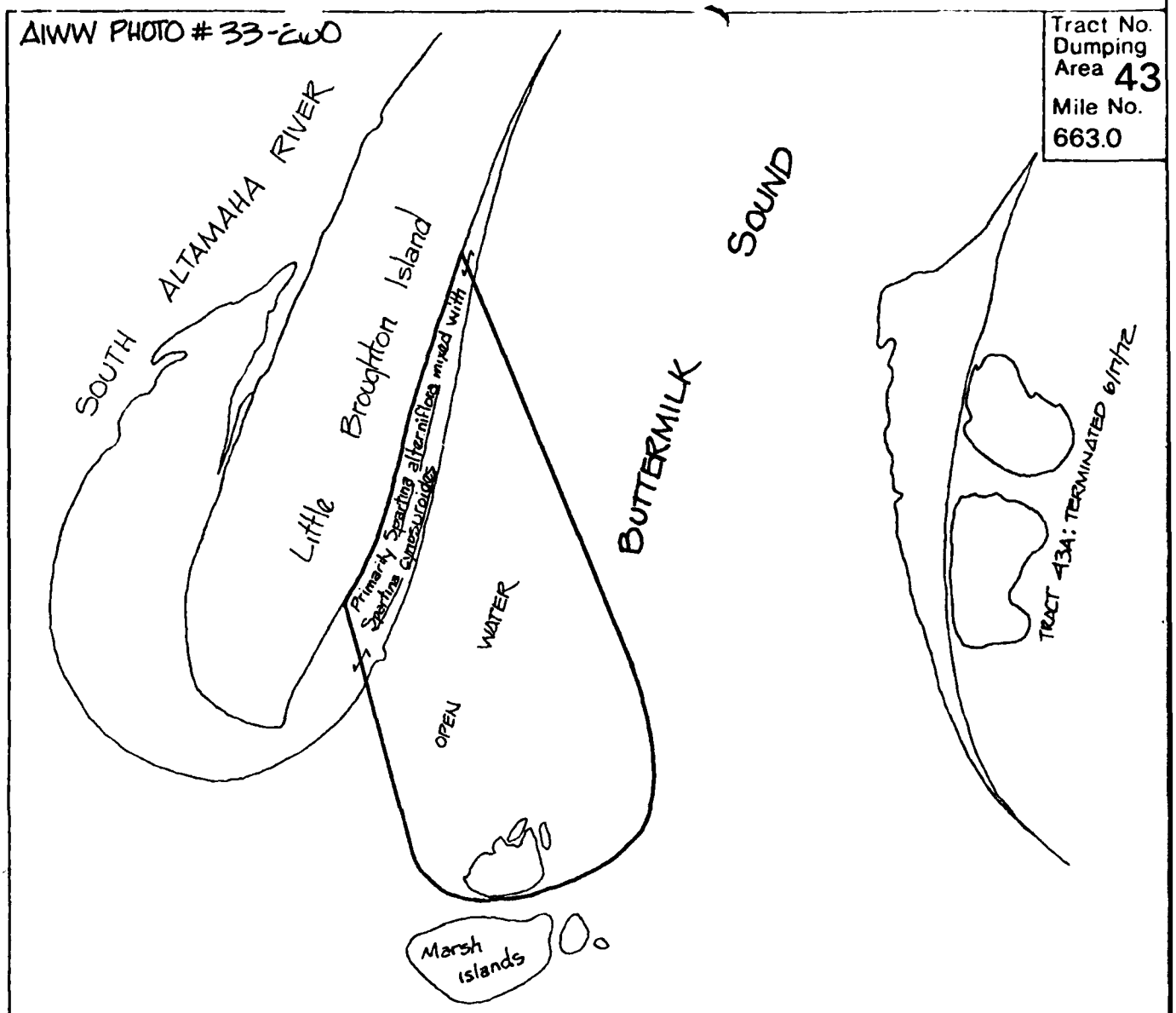
KEY: 1. TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

* BOTH OF THESE FIGURES ARE FOR AFFECTED AREAS WITHIN THE ADJACENT EASEMENT 42A

1.	*Juniperus virginicus*	RED CEDAR
	Pinus elliotii	SLASH PINE
	Persea borbonia	RED BAY
	Prunus serotina	BLACK CHERRY
	Melia azederach	CHINA BERRY
	Nyssa ogeechee	OGEECHEE TUPELO
	Nyssa sylvatica	BLACK GUM
	Salix caroliniana	WILLOW
	Rhus copallina	WINGED SUMAC
2.	*Myrica cerifera*	WAX MYRTLE
	Ilex vomitoria	YAUPON
	Sambucus canadensis	ELDERBERRY
	Baccharis halimifolia	SILVERLING OR GROUNDSEL
	Iva frutescens	HIGH TIDE BUSH
	Amplelopsis arborea	PEPPERVINE
	Rubus trivialis	DEWBERRY
3.	*Peltandra virginia*	ARROW ARUM
	Amaranthus cannabinus	WATER HEMP
	Eupatorium serotinum	DOG FENNEL
	Polygonum punctatum	KNOTWEED
	Lechea patula	PINWEED
	Rumex verticillatus	SWAMP DOCK
4.	*Spartina cynosuroides*	ROUGH CORDGRASS
	Panicum virgatum	PANIC GRASS
	Typha angustifolia	CAT-TAIL



PLATE 39



Tract No. Dumping Area 43 Acreage Open Water	Description & Management Practice:
	Recommend hydraulic studies to restore portion of Altamaha Channel to its former course and condition and thus reduce maintenance dredging.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 32

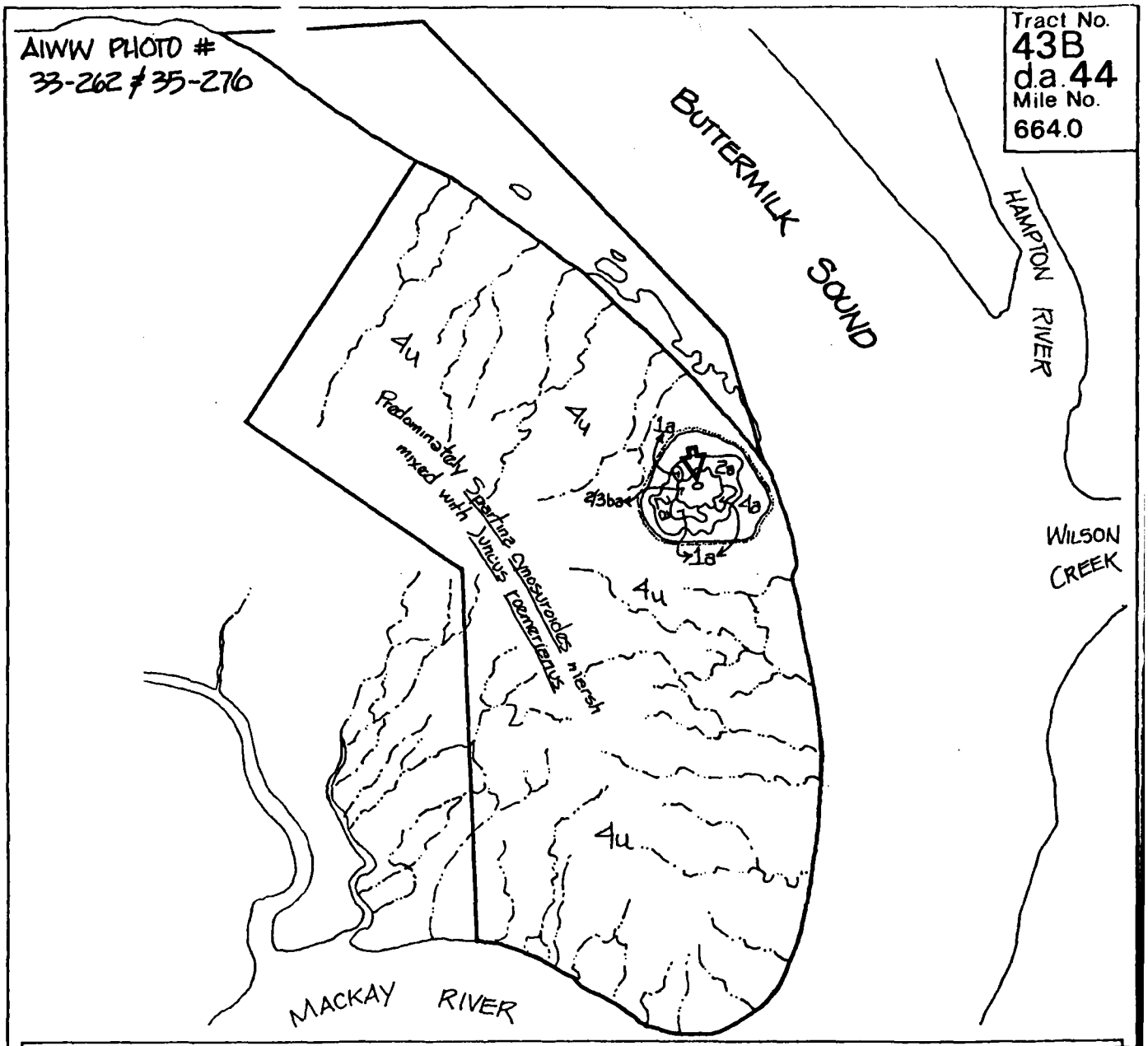
TOTAL SIZE IN ACRES	APPROX. 810 ±43
PERCENTAGE OF EASEMENT AFFECTED	OVERBOARD DUMPING
AMOUNT OF EASEMENT AFFECTED IN ACRES	OPEN WATER, MUD FLATS
AMOUNT OF EASEMENT FORESTED IN ACRES	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

Primarily an overboard site with fringe of Spartina cynosuroides, some alterniflora and Pletandra.



PLATE 40



Tract No. 43B d.a.44 Acreage 176.4	Description & Management Practice: Preferred pipe outfall should be in the center of existing site.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 33

TOTAL SIZE IN ACRES	176.4	43B1 adj. dumping
PERCENTAGE OF EASEMENT AFFECTED	4.2%	
AMOUNT OF EASEMENT AFFECTED IN ACRES	7.5	
AMOUNT C.' EASEMENT FORESTED IN ACRES	1.1	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

NOTE: Dumping Area approximates 34 acres in size

1. *Juniperus virginiana* — RED CEDAR
2.
3.
4. *Spartina cynosuroides* — ROUGH CORDGRASS
   Spartina alterniflora — SMOOTH CORDGRASS
   Juncus roemerianus — NEEDLE RUSH



PLATE 41



PLATE 42

used sparingly. Tract 44-A (figure 34, plate 43) has not been used for maintenance but did receive dredged mateiral from construction of the 12' channel. Tract 45-B (plate 44) and Tract 45-C (plate 44) are located at the confluence of Buttermilk Sound, Frederica River and Mackay River. Tract 45-C has not been used while Tract 45-B contains a mature hammock resulting from dredged material from land cut construction.

Mackay River. (mile 665.5 - 674)

With the exception of two dredge cycles in the 1940's Mackay River has been self-maintaining.

	Credit	Gross	Disposal Area
FY 1945	25,963	37,374*	Tract 41-A
FY 1946	59,789	86,066*	Tract 49-A

There are eight disposal tracts along Mackay River of which six have never been used. Tract 46-A (plate 45) shows only a few small mounds from the dredging operation in 1945. Tracts 48-B (plate 46), 48-A (plate 46) 49-B (plate 47) and 49-C (plate 48) have never been used. Tract 49-A (plate 48) contains several small mounds from deposits put there in 1946.

Frederica River. (mile 674 - 675.5)

For most of its length, the Frederica River serves as one of the alternate routes, however, the last 2.5 miles constitute the main route of the AIWW. No dredging has been required since 1941 in this section of the waterway. Savannah District has recently completed a feasibility report recommending that Mackay River be designated the main route and the Frederica River be changed to the alternate route. This action is being taken to accommodate improvements of the Torras Causeway. Tract 47-A (plate 49) and Tract 49-A are designated disposal areas for Frederica River. The deposits in Tract 47-A are from construction dredging.

St. Simon Sound. (mile 676.5-682).

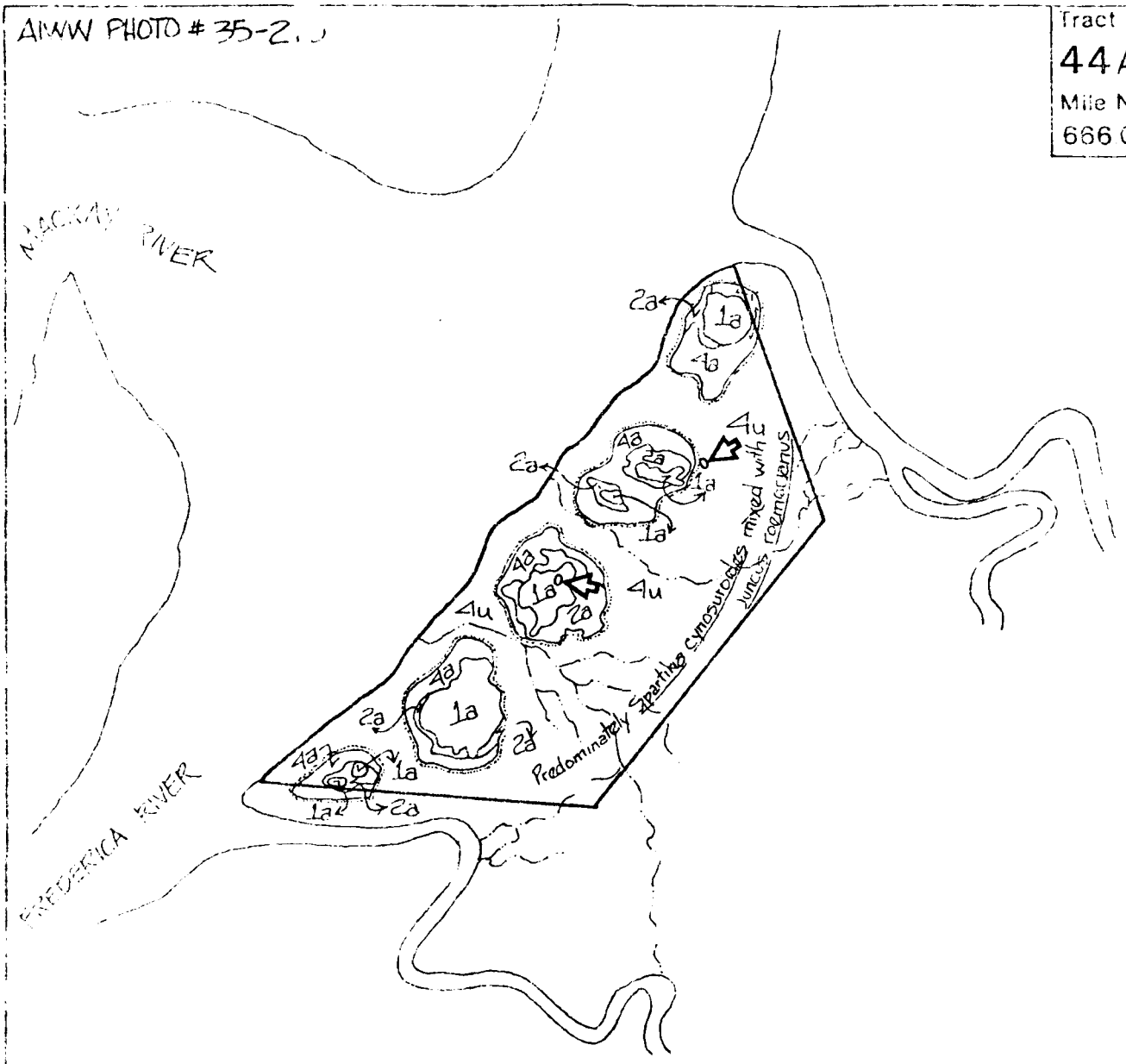
The AIWW extends for 5.5 miles through St. Simons Sound to Jekyll Creek. Shoaling has been limited to a 1-mile section located between mile 677 and 678. Maintenance has been light.

FY	Credited	Gross	Disposal Area
1943	12,750	104,724*	Dump Area 51
1963	101,698	127,178	Dump Area 51
1969	46,893	81,878	Dump Area 51
Total	221,341	313,780	

*Estimated

AIWW PHOTO # 35-2.3

Tract No.
44A
Mile No.
666.0



Tract No	Description & Management Practice:
44A Acreage 76.4	Series of 5 small cedar hammocks. Recommend that 1 or 2 be selected for disposal and the remainder be left undisturbed for next 10 dredging cycles.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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FIGURE 34

TOTAL SIZE IN ACRES	76.4
PERCENTAGE OF EASEMENT AFFECTED	29.7%
AMOUNT OF EASEMENT AFFECTED IN ACRES	22.7
AMOUNT OF EASEMENT FORESTED IN ACRES	5.0
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	1.1
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

44A

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Juniperus virginicus* RED CEDAR
2. *Myrica cerifera* WAX MYRTLE
3.
4. *Juncus roemerianus* NEEDLE RUSH
Zizaniopsis miliacea SOUTHERN WILD RICE
Typha domingensis CAT-TAIL
Spartina alterniflora SMOOTH CORDGRASS
Spartina cynosuroides ROUGH CORDGRASS



PLATE 43

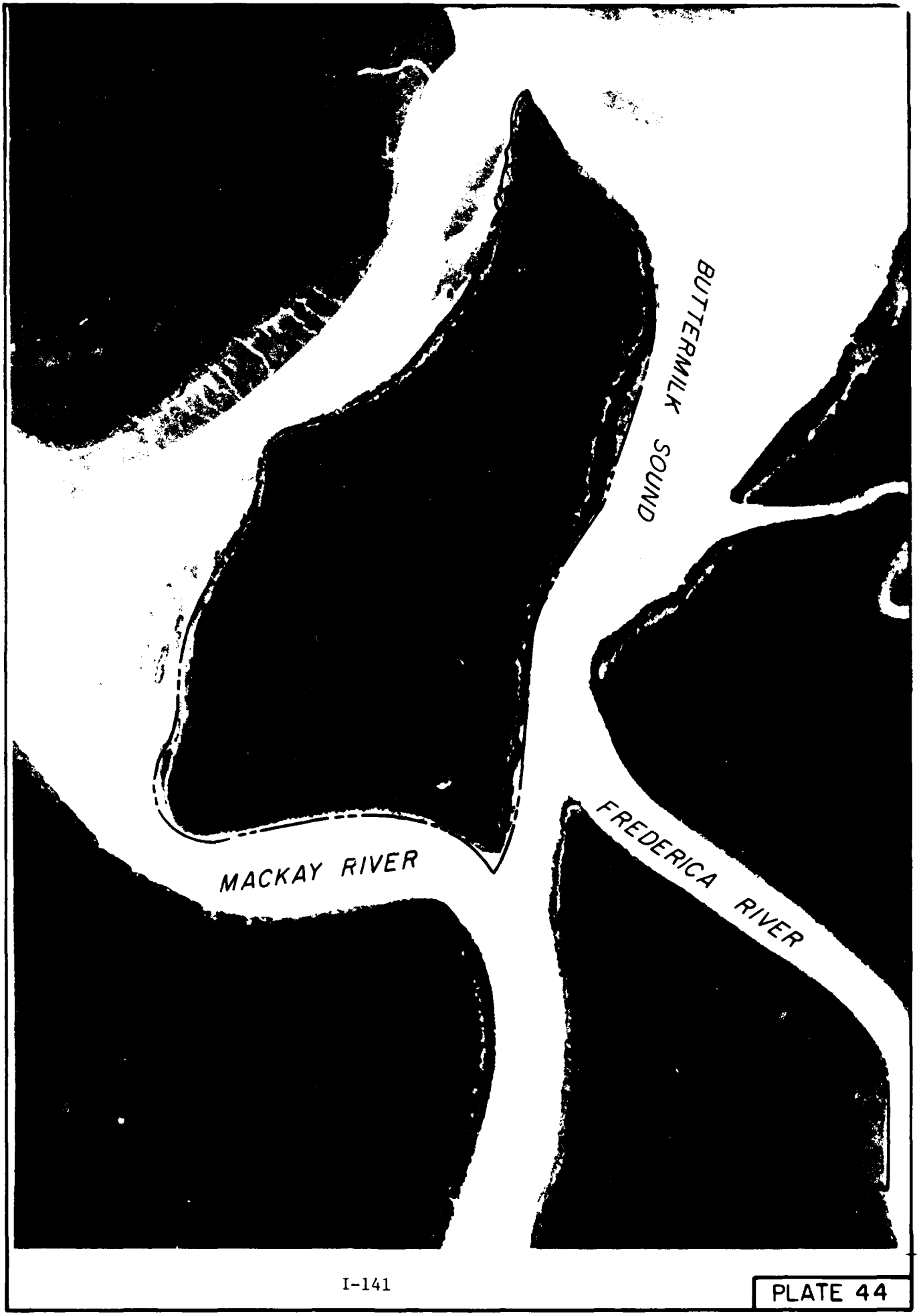


PLATE 44

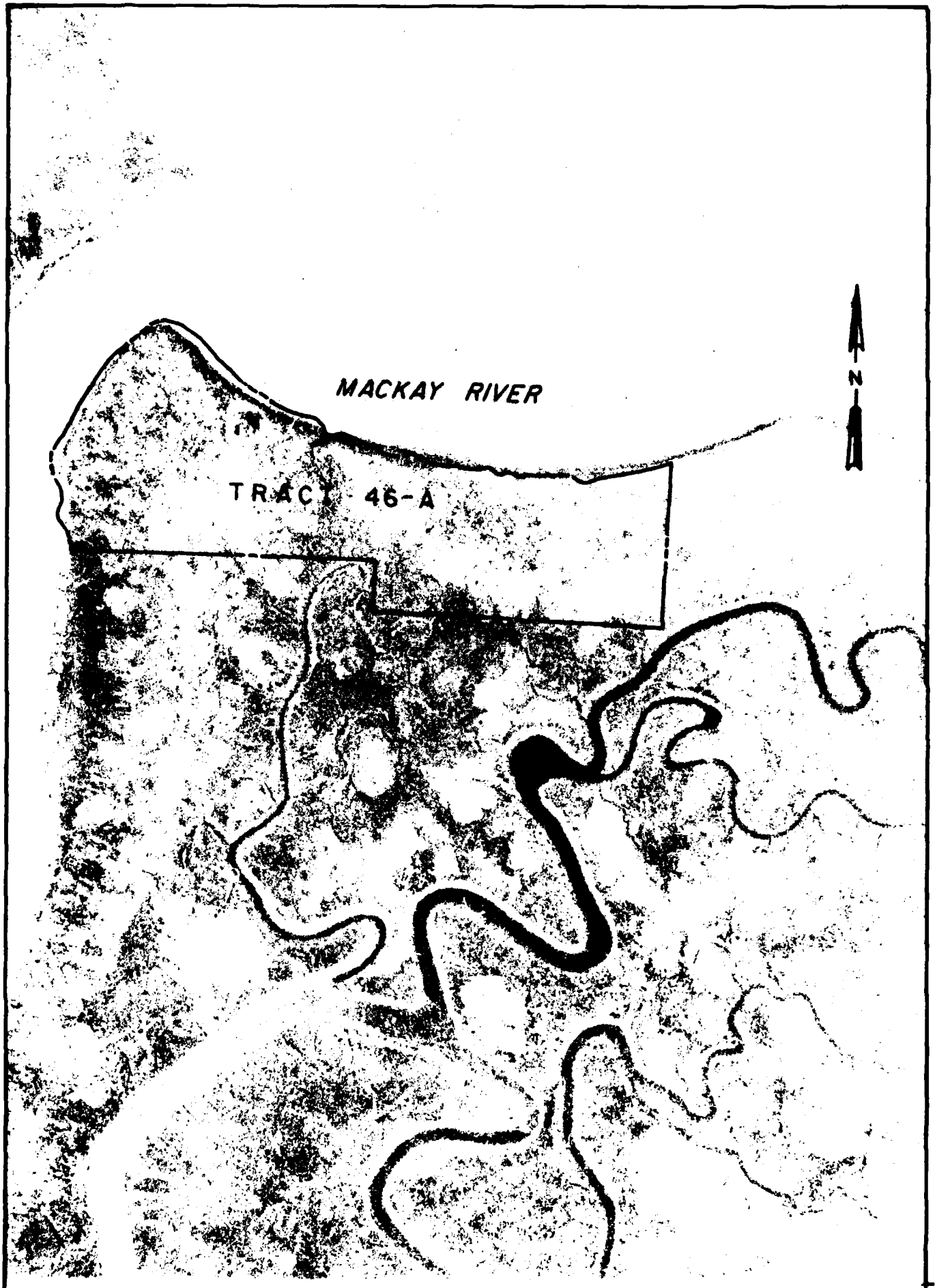


PLATE 45



PLATE 46

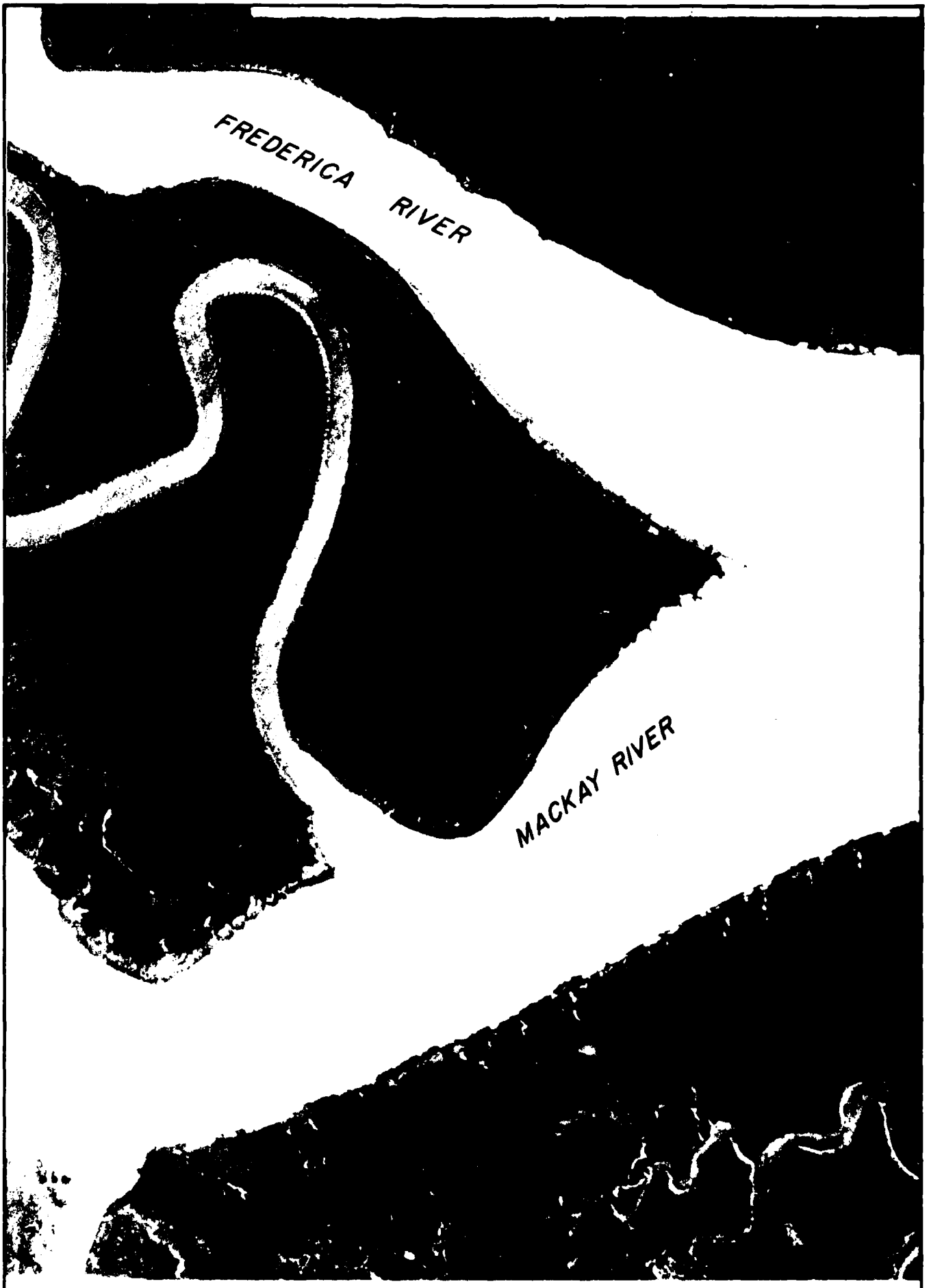


PLATE 47

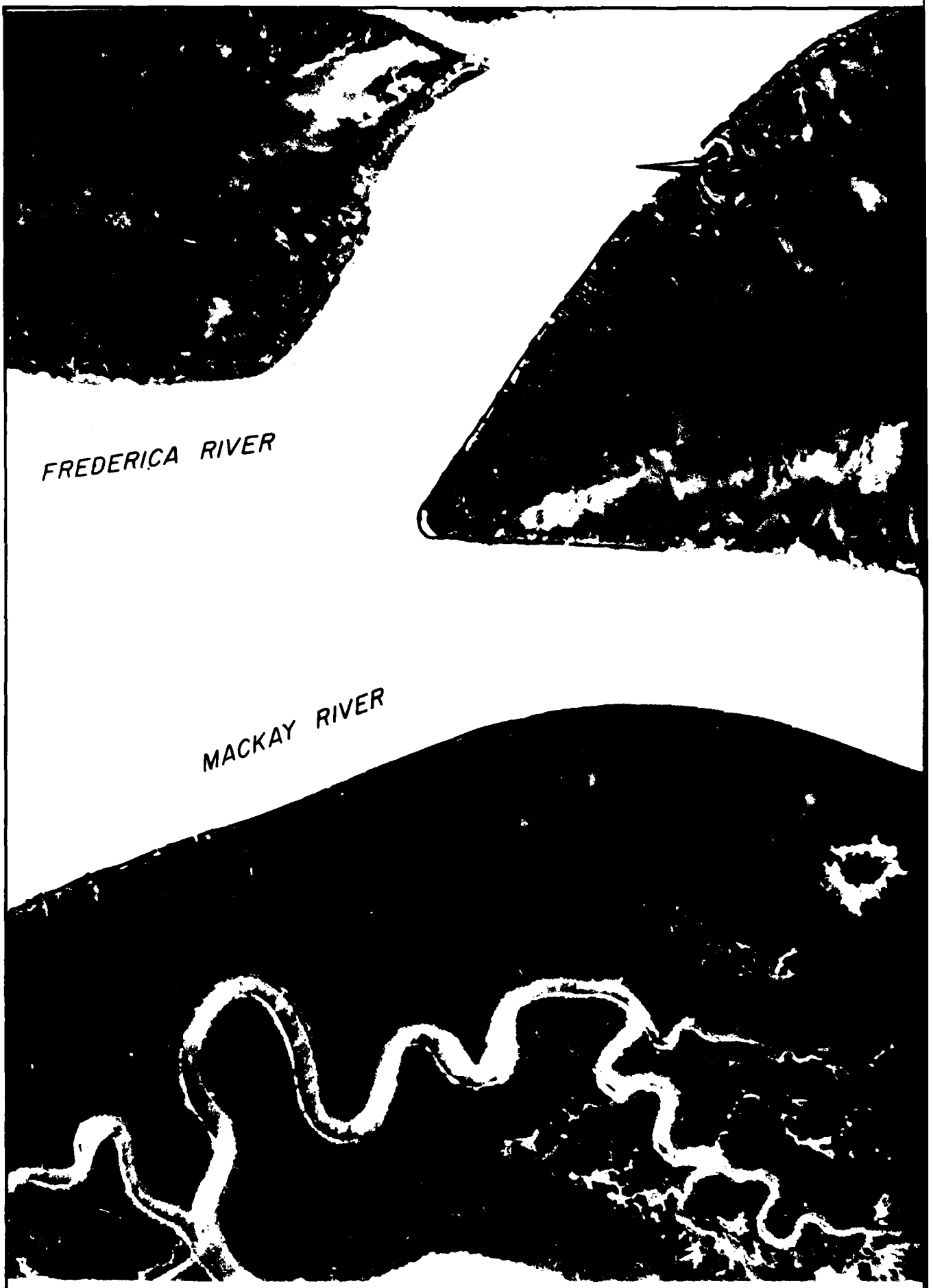


PLATE 48



PLATE 49

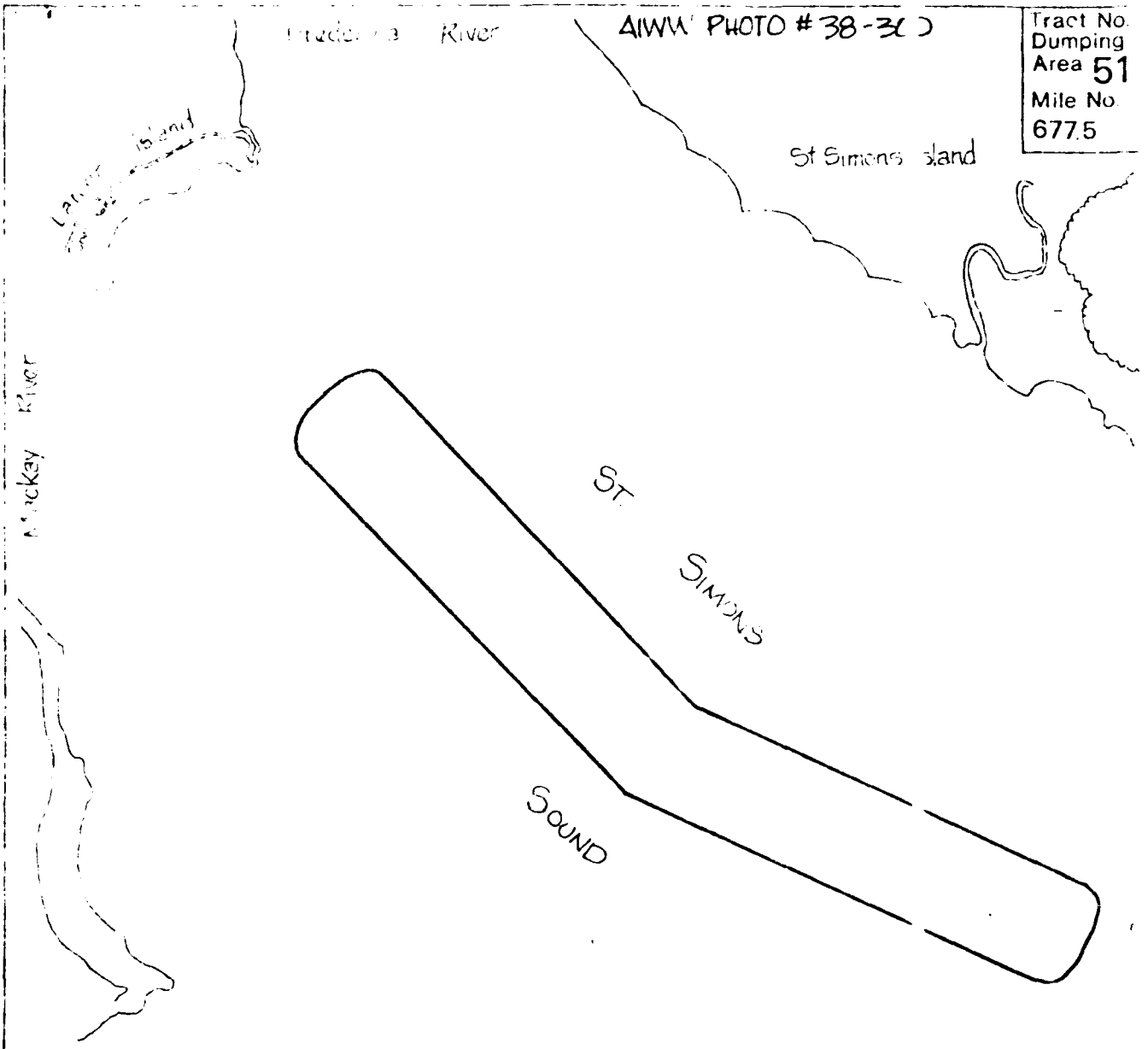
Tract 51-A (67.6 acres) shown on plate 50 is an undiked site that has not been used. All material has been deposited at an overboard site near the middle of St. Simon Sound. This site is designated open water site No. 51 and is shown on figure 35 and plate 50.

Jekyll Creek. (mile 682 - 686.25)

Jekyll Creek extends from St. Simon Sound to St. Andrew Sound. Jekyll Creek requires more maintenance than any other section of the water as heavy shoaling occurs just outside its entrance (mile 681.5) to the Jekyll Island Bridge (mile 685).

FY	Credited	Gross	Disposal Area
1942	81,618	117,489*	Dump Area 52, Tracts 52-A, 53-A
1943	739,134	1,063,983*	Dump Area 52, Tracts 52-A, 53-A
1944	286,398	412,270*	Dump Area 52, Tracts 52-A, 53-A
1945	281,806	405,660*	Dump Area 52, Tracts 52-A, 53-A
1946	270,555	389,464*	Dump Area 52, Tract 52-A
1947	688,934	991,720*	Dump Area 52, Tract 52-A
1948	549,250	790,645*	Tract 53-A
1949	549,251	790,645*	Dump Area 52, Tracts 52-A, 53-A
1952	814,354	876,361	Tracts 52-B, 53-A
1953	286,241	393,356	Dump Area 52, Tracts 52-B, 53-A
1956	437,916	702,187	Dump Area 52, Tracts 52-A, 53-A
1960	574,101	845,122	Dump Area 52, Tracts 52-A, 52-B
1963	483,504	729,092	Dump Area 52, Tracts 52-A, 53-A
1964	353,012	618,938	Dump Area 52, Tracts 52-A, 53-A
1965	332,638	605,768	Dump Area 52, Tracts 52-A, 53-A
1967	355,812	536,295	Dump Area 52, Tracts 52-A, 53-A
1969	395,233	636,738	Dump Area 52, Tracts 52-A, 53-A
1971	440,835	660,938	Dump Area 52, Tracts 52-A, 52-B, 53-A
1972	390,049	510,060	Dump Area 52, Tracts 52-A, 52-B, 53-A
1974	438,382	518,985	Dump Area 52, Tracts 52-A, 52-B, 53-A
1976	264,535	337,084	Tract 52-B, Tract 53-A
1977	473,020	587,638	Dump Area 52, Tracts 52-A, 53-A
1978	576,758	853,602	Tract 52-A, Tract 52-B, 53-A
Total	10,063,336	14,373,590	

* Estimated



Tract No. Dumping Area 51 Acreage Open Water	Description & Management Practice: Since GA DOT has requested Federal Authorities to change IWW from Frederica River to Mackay, this overboard site should be eliminated. The Mackay at this point is naturally deep.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000'

FIGURE 35

TOTAL SIZE IN ACRES	APPROX. 78.0 #51
PERCENTAGE OF EASEMENT AFFECTED	OVERBOARD DUMPING
AMOUNT OF EASEMENT AFFECTED IN ACRES	OPEN WATER, MUD FLATS
AMOUNT OF EASEMENT FORESTED IN ACRES	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

SITE UNDERWATER



PLATE 50

Open water Disposal Area No. 52 is shown on figure 36 and plate 51. Tracts 52-A (figure 37, plates 51 and 52), 52-B (figure 38, plate 52) and 53-A (figure 39, plate 53) have received most of the dredged material from Jekyll Creek. In view of the large volumes of silt and mud that have been disposed of in these tracts, 91 percent of Tract 52-A, 100 percent of Tract 52-B and 59 percent of Tract 53-A have been impacted. Although all of Tract 52-B has been impacted to some extent, much of the tract remains a Spartina alterniflora marsh.

Jekyll Creek to Cumberland River. (mile 686.3 - 690.5).

This portion extends through deep water in St. Andrews Sound and consequently has not required dredging. No disposal areas are located in this section of the AIWW.

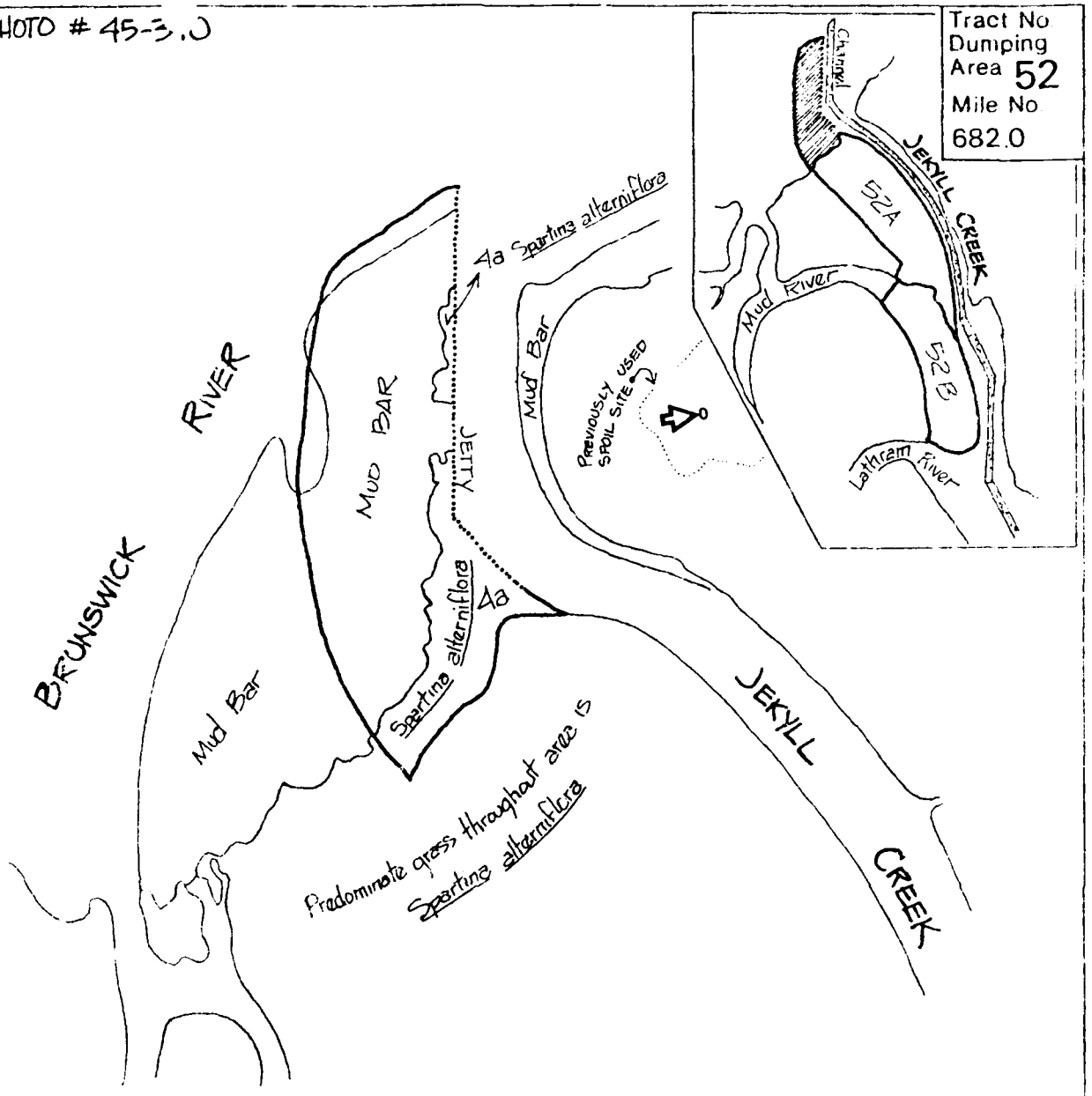
Cumberland River to Cumberland Sound. (690.5 - 713).

The last 22.5 miles of the AIWW traverses deep water through Cumberland River and Cumberland Sound. Very little maintenance has been required as shown below:

FY	Location	Credited	Gross
1942	mile 706	72,461	104,308*
1965	mile 706	30,917	45,451
1965	mile 704	51,331	76,527
Total		154,709	226,281

All material removed from the vicinity of mile 706 has been deposited in Tract Parcel B2-3 while that dredged from mile 704 was discharged overboard in open water. Tract Parcel B2-3 (885.2 acres) is a diked disposal area located at Kings Bay. It is no longer used in the maintenance of the AIWW as it was transferred to the Department of the Army, Military Ocean Terminal Kings Bay on February 22, 1974 for use in maintaining that facility. Four other disposal tracts are also located in Cumberland Sound which were transferred to the Department of the Army. Parcel No. 1 (54.64 acres), Parcel No. 5 (1199.1 acres), Parcel No. 6 (139 acres) and Parcel No. 7 (542.4 acres) were all transferred to Kings Bay. However, the Corps has reserved a perpetual spoil disposal use permit over Parcels 5, 6 and 7. Parcel No. 4 (492 acres) is not used since it is on Cumberland Island which has been designated a National Seashore. Although some of the tracts show rather extensive use, this is attributable to dredging at Kings Bay Terminal and entrance channel and not the AIWW. These areas are shown on sheet 23 in appendix 3.

AIWW PHOTO # 45-3.0



Tract No. Dumping Area 52 Acreage Open Water	Description & Management Practice: Because of the oysters and other intertidal life that has developed west of the jetty on the mud bar, it is recommended that dredge spoil be placed east of Jekyll Creek on the site previously used.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 36

TOTAL SIZE IN ACRES	APPROX. 510 #52
PERCENTAGE OF EASEMENT AFFECTED	OVERBOARD DUMPING, JETTY
AMOUNT OF EASEMENT AFFECTED IN ACRES	MUD FLATS, SPARTINA MARSH
AMOUNT OF EASEMENT FORESTED IN ACRES	
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	LARGE EXTENT, adj MUD FLAT
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

INTERTIDAL MUD BAR AND OYSTER FLAT

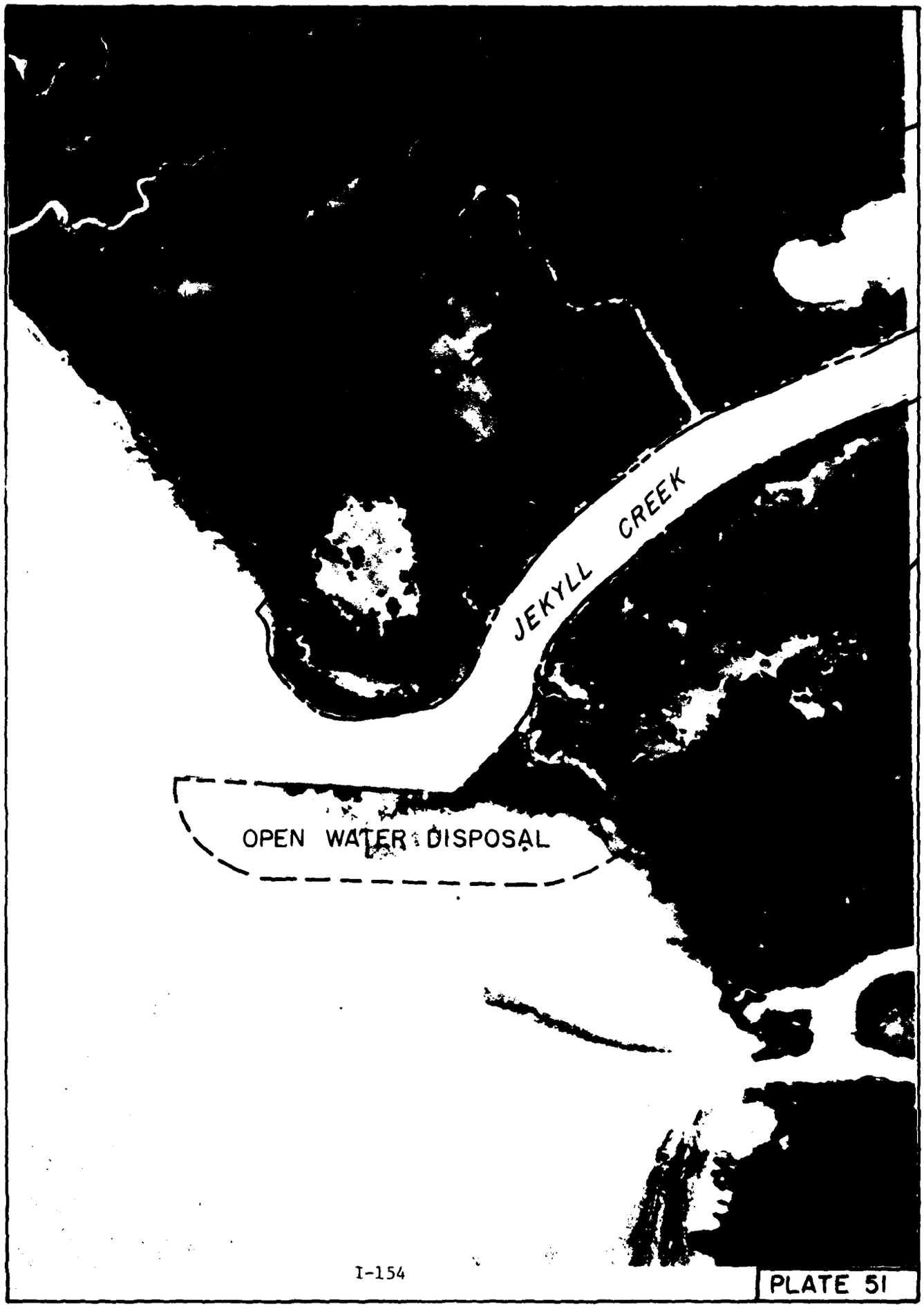
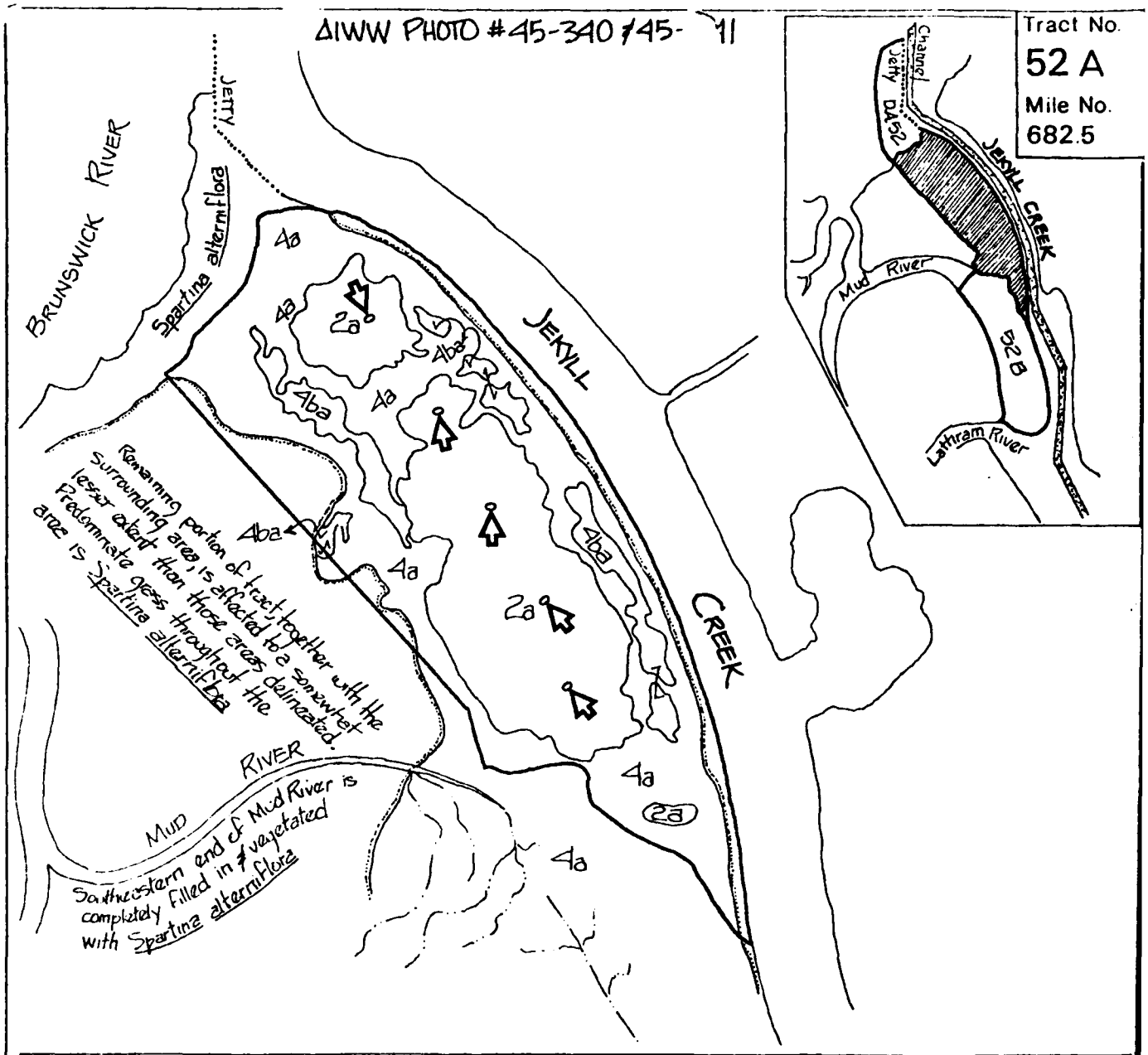


PLATE 51



Tract No.	Description & Management Practice:
52 A Acreage 115.7	Recommend multiple pipe outfalls along the back of the existing area which makes up the rib or backbone of the site. As is well recognized by the study team and previous studies, the maintenance of Jekyll Creek remains the most difficult.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 37

TOTAL SIZE IN ACRES	115.7 52A
PERCENTAGE OF EASEMENT AFFECTED	91.1%
AMOUNT OF EASEMENT AFFECTED IN ACRES	105.4
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	MOST ALL OF SURROUNDING AREA
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

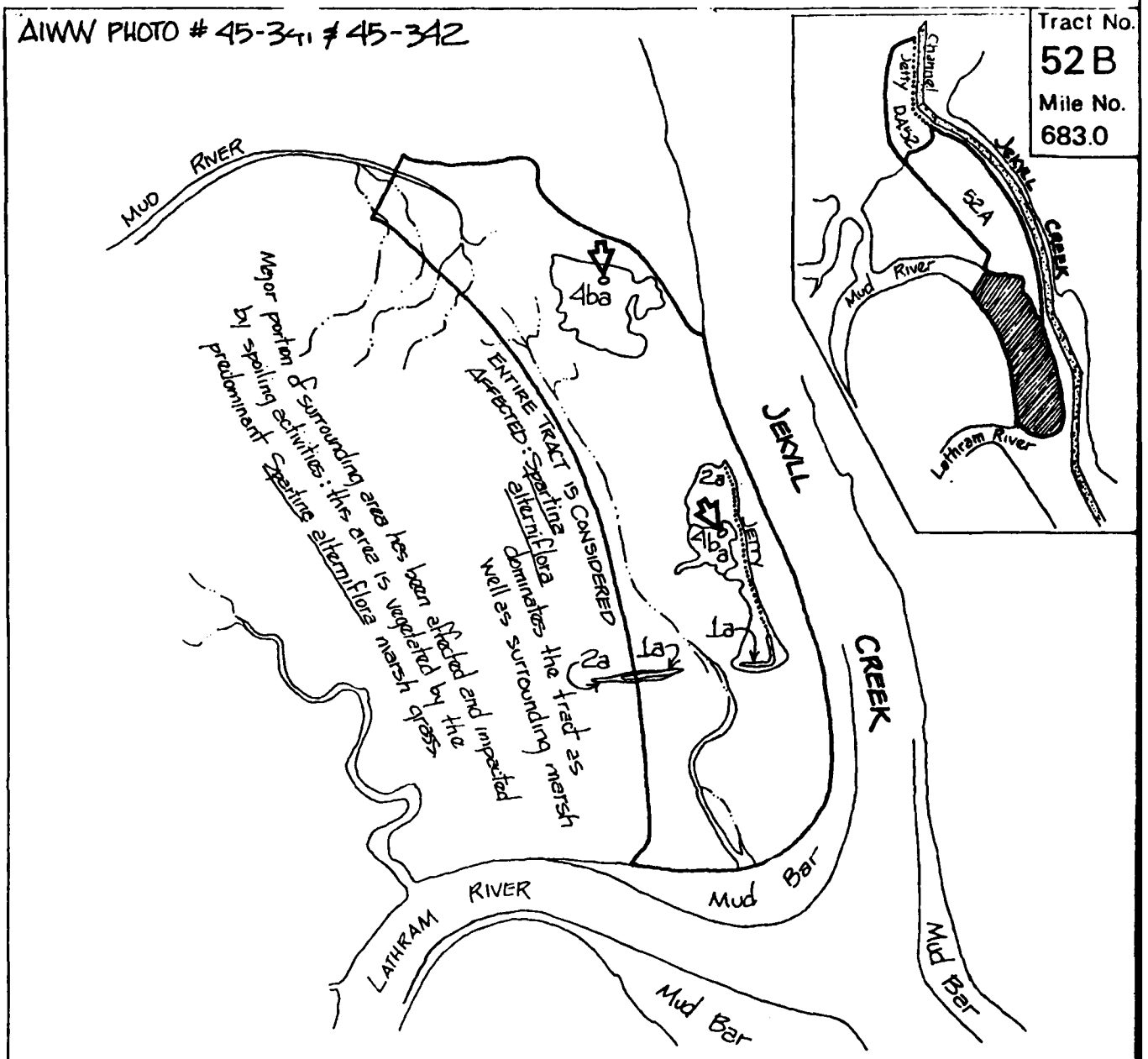
KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Tamarix gallica* TAMARISK (scattered)

2. *Borrichia frutescens* SEA OX-EYE
Myrica cerifera WAX MYRTLE
Baccharis halimifolia SILVERLING OR GROUNDSEL (predominates)

3. *Salicornia virginica* WOODY GLASSWORT

4. *Spartina alterniflora* SMOOTH CORDGRASS



Tract No.	Description & Management Practice:
52B Acreage 95.0	Old jetty could be fortified by Coffer Dam to restrain flow of fluid mud back into Jekyll Creek (AIWW).

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 38

TOTAL SIZE IN ACRES	95.0 52B
PERCENTAGE OF EASEMENT AFFECTED	100%
AMOUNT OF EASEMENT AFFECTED IN ACRES	95.0
AMOUNT OF EASEMENT FORESTED IN ACRES	.4 ON OLD JETTY
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	MOST ALL OF SURROUNDING AREA
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

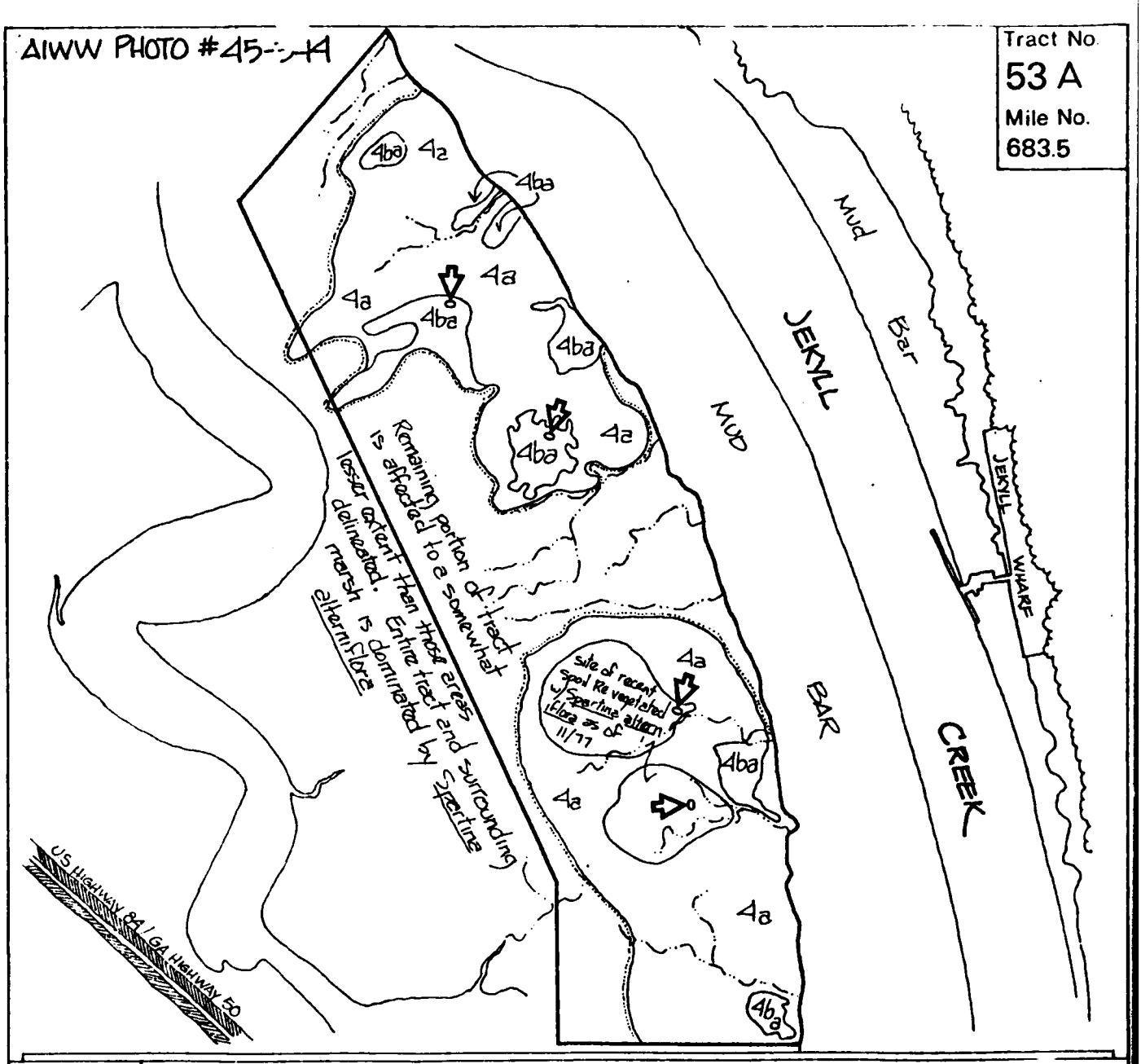
KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. *Quercus virginiana* — LIVE OAK (single one)
   Sabal palmetto — CABBAGE PALMETTO
2. *Baccharis halimifolia* — SILVERLING OR GROUNDSEL
   Borrichia frutescens — SEA OX-EYE
3.
4. *Spartina alterniflora* — SMOOTH CORDGRASS

Large unstable mud flats not able to land and recon the area on foot.
Many mud cracks - potential mosquito breeding sites.



PLATE 52



Tract No.	Description & Management Practice:
53 A Acreage 180.4	Thixotrophic mud which sinks and spreads out loading by dredge disposal leads one to suggest studies to re-open Lathram Creek underneath Jekyll Causeway to more nearly flush out Jekyll Creek.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 39

TOTAL SIZE IN ACRES	180.4 53A
PERCENTAGE OF EASEMENT AFFECTED	59.4%
AMOUNT OF EASEMENT AFFECTED IN ACRES	107.1
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	MOST ALL OF SURROUNDING AREA
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

This site is made up entirely of Spartina alterniflora and large barren areas with mud cracks.



PLATE 53

Dredging in the Alternate Routes

Alternate Route - Doboy Sound to Brunswick Harbor.

An alternate route 7 feet deep at mean low water from Doboy Sound to Brunswick Harbor was incorporated into the project in 1912. The route was via Darien River, Three-mile Cut, Altamaha River, One-Mile Cut, Buttermilk Sound, Mackay River, Back River, Clubbs Creek and Plantation Creek. During the study period, dredging in this alternate route has been required only one time. In FY 44, 59,251 cubic yards (85,292 gross estimated) were removed from Back River and 31,079 cubic yards (44,738 gross estimated) were removed from Plantation Creek. There are no disposal tracts along these waterways, and the material was probably deposited overboard.

Alternate Route - Frederica River.

In 1945, Congress authorized an alternate route through that part of Frederica River not part of the main route. This alternate route had already been improved since it had formerly been a portion of the main route. No maintenance has been required. Three disposal tracts are located along Frederica River. Tract 45-C (59.5 acres) Tract 47-A (167.4 acres) and Tract 49-A are both undiked and owned by the State of Georgia.

Alternate Route - Protected Route Around St. Andrews Sound.

In FY 40, an alternate channel 7 feet deep and 75 feet wide was completed around St. Andrews Sound. The alternate route extends from the main channel of the AIWW in Jekyll Creek through Jekyll Sound, Little Satilla River, Umbrella Cut, Umbrella Creek, and its south branch, through Dover Cut to Dover Creek, thence up Dover Creek and through a narrow neck of land to Satilla River, thence through a land cut south of Todd Creek and through Floyd Creek to the main route of the waterway in Cumberland River. Almost all of the shoaling problems have occurred in Umbrella Cut and Umbrella Creek with some minor siltation in Floyd Creek.

Umbrella Cut and Umbrella Creek.

If the auxiliary route is taken, Umbrella Cut is located at about mile 686.3 where it enters Umbrella Creek. Maintenance had been necessary as shown below:

FY	Credited	Gross	Disposal Area
1947	53,833	77,493*	Tract Cut 3
1948	80,331	115,636*	Tract Cut 3
1949	57,933	83,395*	Tract Cut 3
1964	35,123	63,234	Tract Cut 3
1967	1,959	3,250	Tract Cut 3
1971	25,497	53,934	Tract Cut 3
1972	20,782	28,426	Tract Cut 1, Tract Cut 3
1974	22,537	33,931	Tract Cut 3
1977	3,153	4,990	Tract Cut 3
Total	301,148	464,289	

* Estimated

Both Tract Cut 1 (140 acres) and Tract Cut 3 (673 acres) are undiked and still used for maintaining this section of the waterway. As shown in figures 41 and and 42, over 65 acres of Tract 3 have been affected. While maintenance dredging has contributed to this impact, much of the wetland loss is attributable to early channel and land cut construction.

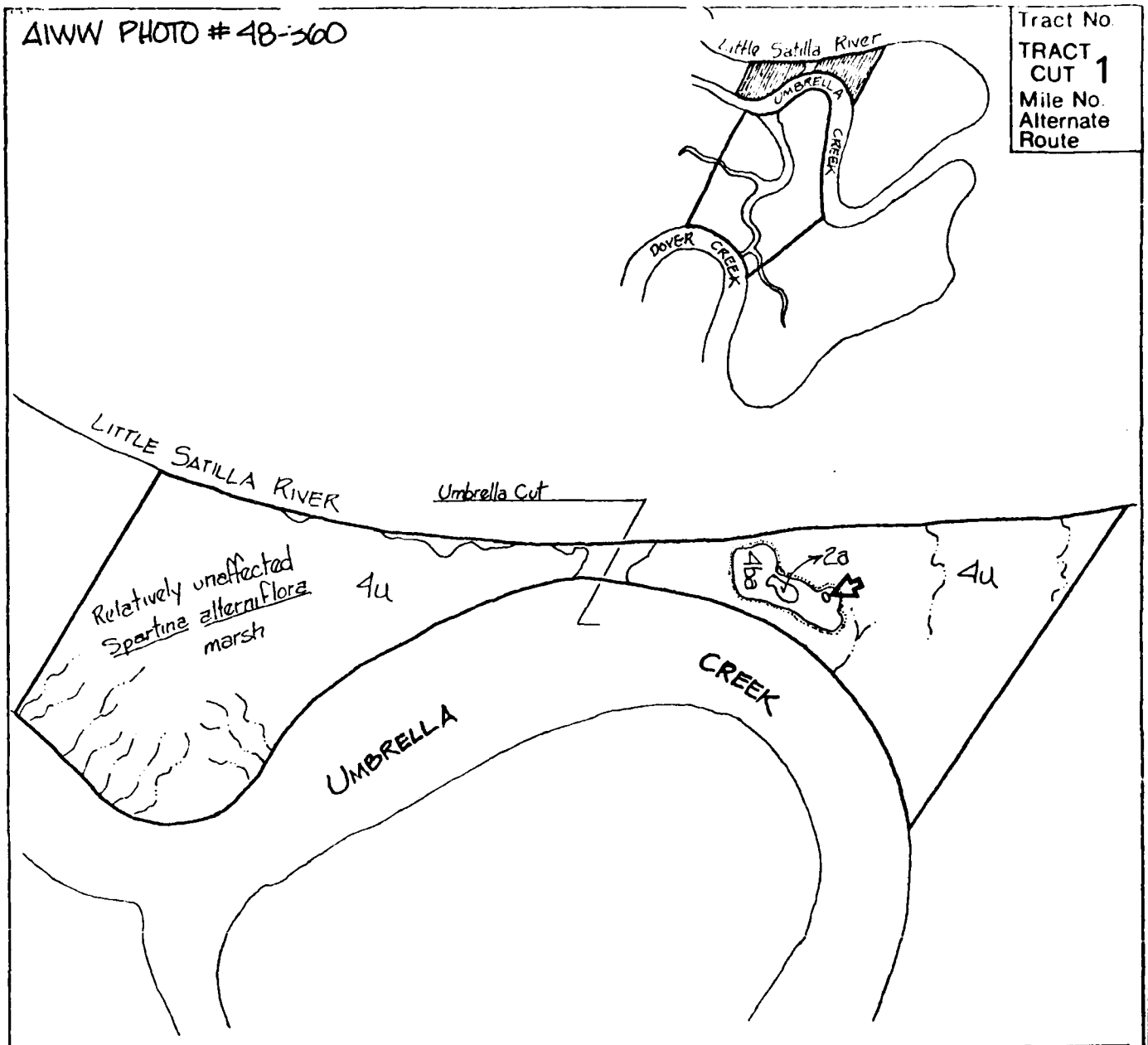
Floyd Creek.

If the alternate route is used, Floyd Creek connects the Satilla (mile 688.3) back to the main part of the waterway in Cumberland River (mile 695). Dredging has been required on only two occasions in a small section just south of Floyd Basin.

FY	Credited	Gross
1974	22,537	33,931
1977	19,476	34,228
Total	42,013	68,159

This dredged material was mostly sand and was discharged in open water adjacent to the west bank of Floyd Creek.

AIWW PHOTO # 48-360



Tract No.	Description & Management Practice:
TRACT CUT 1 Acreage 140.0	Recommend doing no further maintenance on Umbrella Cut and the Alternate Waterway through Camden County. The Alternate has crossed 4 major streams (Little Satilla, Umbrella, Dover and Satilla Rivers) which in turn has caused siltation and stream capture.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

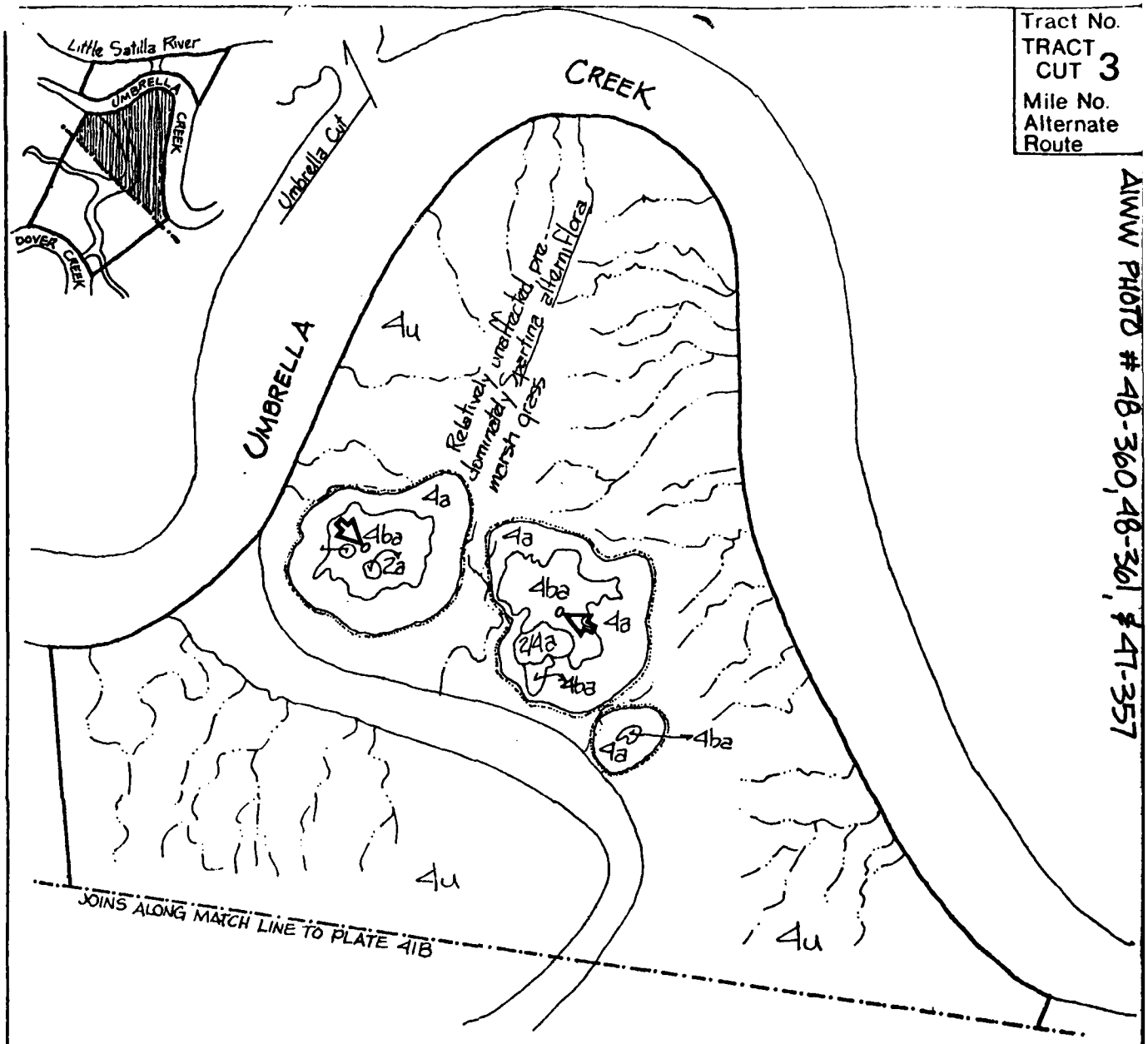
FIGURE 40

TOTAL SIZE IN ACRES	140.0
PERCENTAGE OF EASEMENT AFFECTED	3.9%
AMOUNT OF EASEMENT AFFECTED IN ACRES	5.5
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

TRACT CUT 1

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. NO TREES
2. *Borrichia frutescens* SEA OX-EYE
   Iva frutescens HIGH TIDE BUSH
3.
4. *Spartina alterniflora* SMOOTH CORDGRASS



Tract No.
TRACT CUT 3
Mile No.
Alternate Route

AIWW PHOTO # 48-360, 48-361, & 47-357

Tract No.	Description & Management Practice:
TRACT CUT 3 Acreage 673.0 A+B	Recommend not doing regular maintenance in alternate waterway particularly in this reach and in Umbrella Cut, Dover Cut and Satilla Cut as this interupts the land to sea, west to east drainage of 4 major tidal rivers.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

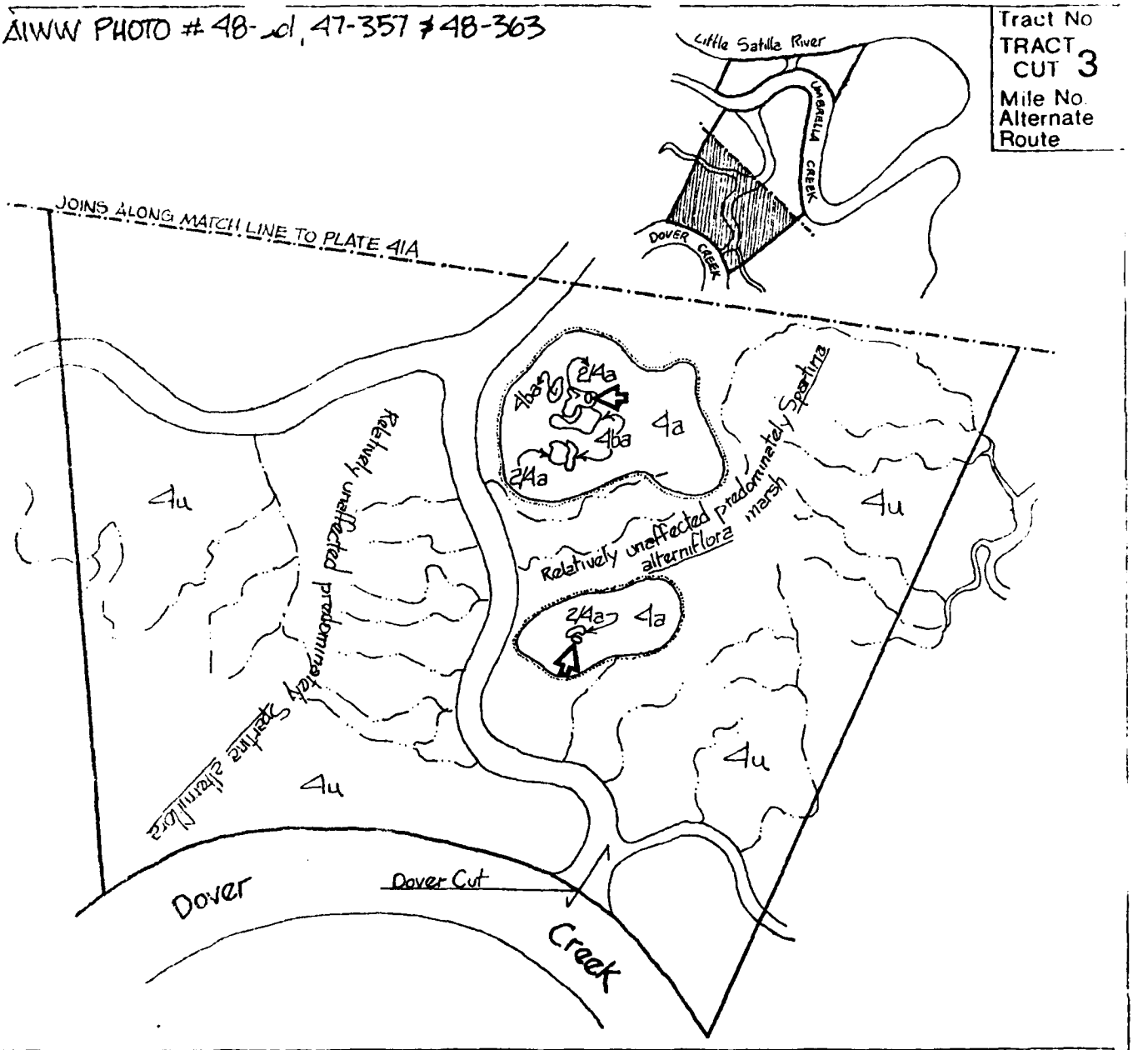
GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE #1

AIWW PHOTO # 48-cl, 47-357 & 48-363

Tract No
TRACT CUT 3
Mile No.
Alternate Route



Tract No.	Description & Management Practice:
TRACT CUT 3 Acreage 673.0 A + B	Refer to comments on Tract Cut No. 1.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 42

TOTAL SIZE IN ACRES	673.0*
PERCENTAGE OF EASEMENT AFFECTED	9.7%
AMOUNT OF EASEMENT AFFECTED IN ACRES	65.5
AMOUNT OF EASEMENT FORESTED IN ACRES	NONE
AMOUNT OF AFFECTED ACRES OUTSIDE EASEMENT	NONE
AMOUNT OF FORESTED ACRES OUTSIDE EASEMENT	NONE

TRACT CUT 3

* FIGURES REPRESENT ENTIRE AREA OF TRACT/EASEMENT

KEY: 1 TREES (FORESTED) b. BARREN
2 SHRUBS/VINES a. AFFECTED
3 FORBS u. UNAFFECTED
4 GRASSES
MIXED CLASSES ARE ALSO USED

1. NO TREES
2. *Borrichia frutescens* SEA OX-EYE
3.
4. *Spartina alterniflora* SMOOTH CORDGRASS

Appendix II

EVALUATION OF DISPOSAL ALTERNATIVES

ATLANTIC INTRACOASTAL WATERWAY
MAINTENANCE EVALUATION STUDY
EVALUATION OF DISPOSAL ALTERNATIVES APPENDIX

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INTRODUCTION

The disposal practice most commonly used along the AIWW is discharge of dredged material into undiked disposal tracts adjacent to the waterway. In a few instances, the material is discharged into open water sites, and in one area, the material is pumped into a diked area. Prior to their use as disposal areas, those tracts were almost entirely wetlands. Distinct disposal mounds are now visible where material has been deposited. Wetland vegetation has been replaced by high marsh and upland species. Based on our assessment of the disposal tracts, most of the areas are still dominated by wetland vegetation, especially Spartina alterniflora. Although undiked disposal along the AIWW has not caused significant alteration of wetlands in most of the sites, the wetlands are still being gradually encroached upon by the disposal activities. Therefore, one of the primary objectives of this study was to evaluate our existing disposal practices and either improve our disposal procedures or implement other alternatives to reduce the adverse impacts to the marsh.

The following alternatives were considered for each portion of the waterway requiring maintenance dredging: construction of dikes within existing disposal easements; construction of a new diked area at an upland site; open water disposal; reuse or stockpiling of the material for construction purposes; and continued undiked disposal, and discontinuing the use of some active sites by concentrating the material in one disposal site.

Ocean dumping of AIWW dredged material was not considered in detail for maintaining the waterway. The channels that make up the waterway are almost all very narrow and shallow precluding the use of hopper dredges. Even if a small hopper dredge could be located, hopper dredges are most efficient when working in sand. The material removed from almost every section of the AIWW in Savannah District requiring maintenance is mud and silt. Silt takes up more room than sand since it can bulk up to twice its original volume when disturbed, compared to sandy material which expands to about 120 percent of its original volume. The same circumstances would hold true if dump scows were used. While use of hopper dredges or dump scows is excellent in easily accessible areas where the material has a high sand content, it is not considered technically nor economically feasible for the AIWW within Savannah District.

Table 1 shows the projected average annual maintenance requirements. It should be noted that these estimated quantities of dredged material reflect maintaining the channel to its 12' mlw authorized depth plus 2 feet of allowable overdepth. These average annual quantities are greater than what has historically been removed from the waterway since the AIWW has not been consistently maintained to 12 mlw. However, for study purposes, it was assumed that the AIWW would be maintained at its authorized depth for the next 50 years.

As with the section on Enviroinmental Impacts, this section on alternatives will deal with each section of the waterway that requires dredging. It should be noted that the costs listed for establishing any new upland, diked area includes only the cost of the dikes and not acquisition of the land. The

Table 1

Average Annual Maintenance Dredging Requirements

Location	Avg. Annual Quantity Material to Maintain a 12' Channel	Percentage of Total
1. Ramshorn	2,200	0.07
2. Wall's Cut	1,100	0.02
3. Field's Cut	66,700	2.48
4. Elba McQueen's Cut	30,000	1.01
5. St. Augustine Creek	54,000	1.82
6. Upper Wilmington River	177,000	5.96
7. Lower Wilmington River	69,000	2.33
8. Hell Gate	222,400	7.50
9. Florida Passage	24,400	0.82
10. Bear River	3,300	0.11
11. Johnson Creek	7,200	0.24
12. Creighton Narrows	133,300	4.49
13. Doboy Sound	125,000	4.21
14. Rockdedundy River	8,600	0.29
15. South River Crossing	36,600	1.23
16. Little Mud River	305,600	10.30
17. Altamaha Sound	120,000	4.04
18. Buttermilk Sound	213,900	7.20
19. St. Simons Sound	16,700	0.56
20. Jekyll Sound	1,967,000	45.50
Total	2,967,000	100.00

Umbrella Cut - 5450 cy/yr

disposal area acreage is larger than the storage area since this figure reflects the amount of area that would be covered by the dikes.

Ramshorn Creek.

Ramshorn Creek has required dredging on only three occasions (FY 44, 66, 80) since completion of the 12' channel. A total of about 363,000 cubic yards has been removed and deposited in Tract 3 adjacent to the waterway. (See sheet 3 in appendix 3.) Based on the amount of marsh that has been affected (52 acres), the relatively small amount of dredged material that has been deposited and the size and age of some of the upland vegetation, it can be concluded that most of the loss of marsh occurred during construction of the 12' channel. Another reason so much marsh has been affected by this amount of material is its composition -- sand. Sand, unlike the lighter silts, tends to basically remain where it is deposited. It is estimated that about 110,000 cubic yards will be removed over the next 50 years to maintain the 12' channel.

1. Construction of Diked Area Within Existing Easement or Construction of New Diked Upland Site. As shown in table 2, construction of a diked area would require between 10.4 and 21.8 acres, depending on the dike height selected. The cost to construct the dikes would range from $221,512 - $441,681. The increased cost for the dikes constructed in an upland area is attributable to the cost of clearing and the possibility of having to haul material in to build the dikes. If the diked area were constructed in the existing easement, the annual pumping cost would be $8,776. As shown on sheet 3 in appendix 3, the nearest upland area is on Daufuskie Island. Pumping distance to this site would increase from the current 500' to 3,500' increasing the annual pumping cost to $22,024.

2. Open Water Disposal. There are no large, deep bodies of water within reasonable distance of Ramshorn Creek. The adjacent waterways are rather narrow and shallow and deposition of dredged material would restrict or possibly block flow. There is a mudflat located to the northwest (sheet 3 in appendix 3) where the material could be placed to a suitable elevation to promote marsh growth. However, this could probably serve only one dredging cycle. Although no large bodies of water are available, the material could be discharged into the slack water side of Cooper River to possibly create another mudflat. Mudflats are an important habitat in marine ecosystems for various benthic communities. A third open water possibility would be to pump the dredged material across Calibogue Sound to the mouth of New River on ebb tide. However, the material from Ramshorn Creek contains large quantities of sand which could create shoaling problems. Pumping costs would increase immensely as shown in the beach nourishment discussion below.

3. Reuse or Stockpiling of Material for Construction Purposes. The material from Ramshorn Creek is good sand and could be used for construction purposes. Currently, Daufuskie is a remote island with very little development. It is accessible by boat only. However, recent plans have been announced to develop part of the island. Although the sand could be deposited in a diked area on Daufuskie, the small maintenance requirements of Ramshorn Creek would not make this a cost efficient alternative.

Table 2

RAMSHORN CREEK

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS UPLAND	DISPOSAL AREA ACREAGE
10	17.33	$141,774	-	21.78
14	10.40	170,329	$221,512	14.90
18	7.43	197,090	282,174	12.27
22	5.70	221,225	353,919	10.90
26	4.73	247,596	441,681	10.36

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 3	$8,776	500'	275.0

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Daufuskie Island	$22,024	3,500'

Pumping cost to beach renourishment areas are as follows:

Location	Cost	Distance
Daufuskie Beach	$190,500	13,000'

Present pumping cost would be $7,?60/annually to maintain a 12' channel.

4. Beach Nourishment. Ramshorn Creek is one of the few areas along the AIWW where material suitable for beach nourishment is dredged. The only beaches anywhere near the creek are located on the southern tips of Daufuskie Island and Hilton Head Island. If the pipeline could be laid directly across Daufuskie Island, the distances to these beaches would be 2.75 and 4.1 miles respectively. However, it would be very difficult to lay this much pipeline across marsh, woods and ridges on the island. Therefore, a floating pipeline would have to be laid through New River to the Daufuskie site, and Cooper River to the Hilton Head site. This would increase the pumping distance to 4.3 miles and 7.0 miles respectively and require the installation of booster pumps. The nourishment of these beaches with only about 200,000 cubic yards every 15 - 20 years is not considered to justify this expenditure of over $190,000 to pump the material to these beaches.

5. Continued Undiked Disposal in Tract 3. The material could continue to be discharged into Tract 3 with very little impacts to the adjacent wetlands. This portion of the waterway will probably require dredging only 2 - 4 times during the next 50 years. The material is mostly sand and most of it would remain on the disposal mounds. The material should be discharged onto existing sand flats which will prevent adverse impacts to several hammocks that have formed in the disposal tract.

Summary and Recommendations.

Construction of a diked area at an upland site is not recommended since 10.4 - 21.8 acres of wildlife habitat would be destroyed. Construction of a diked area within Tract 3 is also not recommended since we believe more wetlands (Spartina alterniflora) would be destroyed than with continued undiked disposal. If a diked area is constructed within the tract, then it should be built around the largest disposal mound. Since mudflats are also important estuarine habitat, the large mudflat to the north should not be eliminated for purposes of marsh creation. Pumping the material to New River on ebb tide would increase existing pumping costs over 20 times. Another mudflat could be created in Cooper River, however, this would result in the loss of existing bottom habitat and its associated communities. In view of the infrequent maintenance requirements of Ramshorn Creek, continued undiked disposal in Tract 3 is recommended. The discharge line should be placed so the material will flow onto the sand flats as shown on sheet 3 in appendix 3.

Although continued undiked disposal is the preferred alternative, the State of South Carolina has issued an objection to any undiked disposal in the State's wetlands. The South Carolina Coastal Council has informed the District that this type of disposal is not in agreement with the State's approved Coastal Zone Management Program. The District has not discussed this matter with the Council in detail. Although we feel diking results in greater marsh loss than undiked disposal, dikes will have to be constructed if the State does not waive this requirement; therefore a diked area should be constructed inside the existing easement.

Walls Cut.

Like Ramshorn Creek, Walls Cut has a very slow shoaling rate, and it has required dredging on only four occasions (FYS 42, 43 and 63, 80). About 215,000 cubic yards of material have been placed in Tract 2 from maintenance activities. (See sheet 4 in appendix 3). Only about 6 acres of this tract have been affected. It is estimated that about 55,000 cubic yards of dredged material will be removed over the next 50 years.

1. Diking Portion of Tract 2 or Construction of New Diked Area. As shown in the calculations in table 3, 10.5 - 22.1 acres of Tract 2 would have to be diked to handle the material, at a cost of between $143,073 and $445,717, depending on location and dike height. Approximately six acres of Spartina alterniflora have been altered by previous dredging activities and construction of such a dike would isolate and destroy additional marsh.

2. Open Water Disposal. As shown on sheet 4 in appendix 3 the waterways in the vicinity of Walls Cut are narrow. Although there is some deep water in New River and Wrights River, most of the water is relatively shallow. Deposition of dredged material in deep water, or shallow areas for purposes of marsh and mudflat creation is not recommended in these narrow waterways.

3. Reuse or Stockpiling of the Material. The material dredged from Walls Cut is mostly good sand and suitable for construction purposes. However, there is no place to deposit this material where it can be obtained. Considering the infrequent maintenance requirements, hauling the material to an easily accessible area is not considered economically justifiable.

4. Beach Nourishment. The material is basically sand, and it would be suitable for beach nourishment. However, the closest beaches are located on Daufuskie Island (2.85 miles) and Hilton Head Island (6.3 miles). The costs and effort involved in moving this small amount of material for nourishment purposes is not considered feasible.

5. Continued Undiked Disposal in Tract 2. Walls Cut will probably require maintenance dredging about 3 - 5 times over the next 50 years. The material which is mostly sand could be deposited on the existing mound in Tract 2 with very little further degradation of adjacent wetlands. The sand would tend to settle quickly and not flow into the marsh.

Summary and Recommendations.

Although continued undiked disposal would not significantly degrade the Spartina alterniflora bordering the existing disposal mound in Tract 2, the State of South Carolina has expressed objection to this method of disposal. Construction of a diked area in Tract 2 or on an upland site would be extremely expensive. As shown in table 3, the cost to pump this material to Tract 1 would not be significantly greater than continued use of Tract 2. In accordance with the requests of the South Carolina Coastal Council 1, Tract 1 will be diked in the near future. Consequently, use of Tract 2 whould be discontinued and Tract 1 used for maintenance of Walls Cut.

Table 3

WALLS CUT

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS UPLAND	DISPOSAL AREA ACREAGE
10	17.67	$143,073	-	22.13
14	10.60	172,087	$224,253	15.24
18	7.57	198,908	285,009	12.48
22	5.89	224,727	359,772	11.18
26	4.82	249,797	445,717	10.50

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 2	$8,905	5,000'	58.6
Tract 1	14,964	8,000'	480.0

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Daufuskie Island	$39,253	7,000'

Present pumping cost would be $7,375/annually to maintain a 12' channel.

Fields Cut.

Tract 1 which lies along the western side of Fields Cut has received 1.6 million cubic yards of dredged material from AIWW maintenance activities. All of the 480 acre tract has been altered by dredged material. However, it is difficult to determine how much of this alteration is attributable to the AIWW since Tract 1 is also part of Disposal Area 14 for Savannah Harbor. From the aerial photographs, it appears that material from Fields Cut mostly remains immediately behind the dike which borders the waterway side. The material from Fields Cut is silt and sand with most of the sand being confined to the upper (northern) portion as evidenced by the large sand deposit on the northern end of the tract. Disposal Area 14 will be diked to comply with the request of the South Carolina Coastal Council. This dike will inclose Tract 1 also. (See sheet 4 in appendix 3.) Dredged material from Fields Cut, as well as Walls Cut, should be pumped into this site. In view of the availability of this site, no further alternatives were investigated.

Elba - McQueens Cut.

Elba Cut, which separates Elba Island from Bird Island, was dredged in 1943 after the 12' channel was completed. It has required dredging on six occasions since 1943 (FYS 48, 53, 63, 70, 74 and 80) and a total of about 700,000 cubic yards have been removed and deposited in undiked Tract 1- A-1. McQueens Cut was constructed at the same time (1943) as Elba Cut. Maintenance since 1943 has been required only three times (FY 47, 49, 63) and about 500,000 cubic yards have been removed. All of the material was deposited in the undiked Tract A which was divided into parcels on both sides of the cut. The Corps no longer holds an easement in Tract A. Estimates indicated that the removal of about 1.5 million cubic yards of material will be required to maintain the 12' channel.

1. Dike Portion of Tract 1-A-1 or Construct New Upland Site. As shown in table 4, between 69.4 and 206.3 acres would be required to construct a diked area to provide a 50-year requirement for Elba-McQueens Cut. (See sheet 4 in appendix 3.) Depending on the dike height and where the area was located, the cost would vary from $462,301 to $1,423,693. If the area were located in Tract 1-A-1 (38.7 acres), additional marsh would have to be taken to make the site large enough. If a new area were constructed on Oatland Island, Whitemarsh Island or Causton Bluff, large amounts of land (69 - 206 acres) would have to be acquired. All habitat within the area would be destroyed. All three of these sites are experiencing rapid growth and development. Any disposal area located at those areas would be in close proximity to existing housing subdivisions or property scheduled for development.

2. Open Water Disposal. The dredged material could be easily discharged into the South Channel for purposes of marsh or mudflat creation. The material is mostly fine silt and it may be difficult to confine the sediment into a designated open water site.

3. Reuse of Material or Beach Nourishment. The material is not suitable for these purposes.

Table 4

ELBA-MCQUEENS CUT

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS OATLAND I	DIKE COSTS WHITEMARSH	DIKE COSTS CAUSTON BLF	DISPOSAL AREA ACREAGE
10	191.90	$462,301	-	-	-	206.30
14	115.15	549,443	$850,436	$850,436	850,436	129.79
18	82.25	627,754	992,786	992,786	992,786	97.61
22	63.97	699,759	1,190,228	1,190,228	1,190,229	80.20
26	52.34	767,180	1,423,693	1,423,693	1,423,693	69.39

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 1-A-1	$24,203	400'	38.7
Tract 1	27,507	5,500'	480.0
Tract 1-A	38,401	10,000'	204.9
Tract 2B-3A	39,368	12,500'	155.4
Disposal Area 14	24,821	6,000'	1372.0

Pumping costs to upland disposal areas at the following location area as follows:

Location	Cost	Distance
Oatland Island	$89,677	13,500'
Whitemarsh Island	105,306	13,500'
Causton Bluff	138,021	18,500'

Present pumping cost would be $22,559/annually to maintain a 12' channel.

4. Continued Use of Undiked Tract 1-A-1. (See sheet 4 in appendix 3.) The dredged material can be discharged onto the existing deposits near the center of the tract without significant impacts to the adjacent wetlands (Spartina alterniflora, Spartina cynosuroides) or valuable wildlife habitat as recommended by the Georgia DNR (figure 1). All of Tract 1-A-1, as well as areas outside of the easement, have been affected by dredged material disposal. Although AIWW maintenance has contributed to the impacts, most of the wetland loss is attributable to Savannah Harbor maintenance dredging. This site is no longer used for the harbor, and the amount of material to be removed from Elba-McQueens Cut over the next 50 years will not have significant impacts on adjacent wetlands.

5. Use of Tract 1, 1-A, 2B-3A. Through field inspection and aerial photography, Tract 1-A-1 should be monitored to insure that wetlands to the east of the tract are not being adversely impacted. If significant amounts of the dredged material is flowing into these wetlands, then alternate tracts are available. As shown on table 4, the dredged material could be pumped at little additional cost to Disposal Area 14 (also Tract 1) which will be completely diked. Tract 1-A has been used on a few occasions many years ago and it should not be used. Disposal Area 2B-3A is already totally diked, however, the pumping costs would be greater for this area.

Summary and Recommendations.

Tract 1-A-1 has already been significantly impacted by dredged material and should continue to be used. If future inspections show further degradation of adjacent wetlands, the material should be deposited in Disposal Area 14.

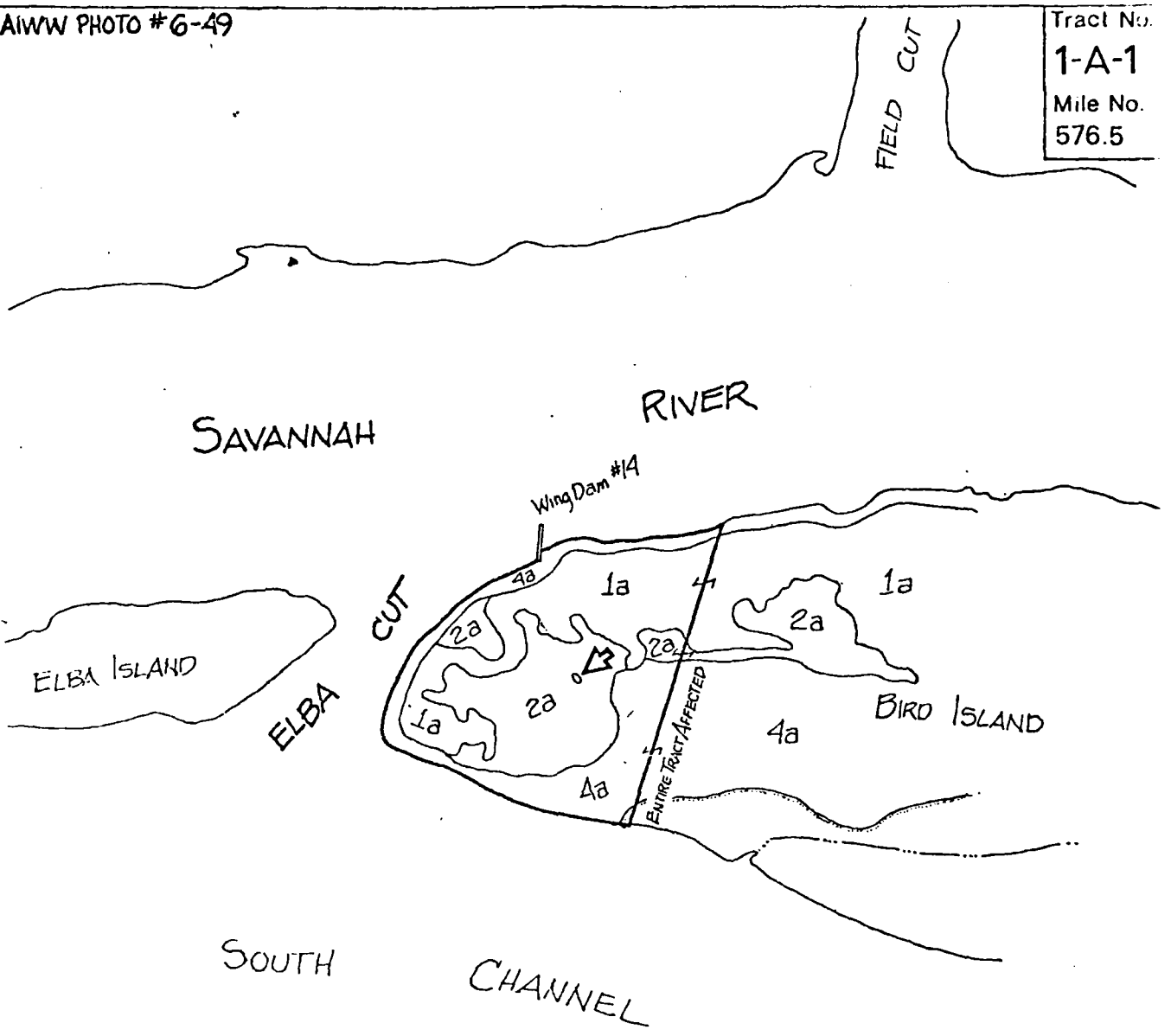
St. Augustine Creek.

St. Augustine Creek which connects McQueens Cut to the Wilmington River has required dredging on 11 occasions since completion of the 12' channel. Approximately 1.26 million cubic yards have been removed from this stretch of the AIWW and deposited in either undiked Tract 2-A or the diked area 2B-3A on Wilmington River. If a 12' channel is maintained, about 2.7 million cubic yards of dredged material will be dredged over the next 50 years.

1. Construction of Diked Area Within Existing Disposal Tracts or Construction of Diked Upland Site. As shown in table 5, 79 - 239 acres would be required to provide an adequate diked area for 50 years. Tract 2B-3A (155.4 acres) is already diked. (See sheet 5 in appendix 3.) If a diked area were constructed in the vicinity of Tract 2-A (45 acres), additional wetlands would be lost. As shown in table 5, $498,571 to $1,542,196 would be required to construct a diked area. As was the case with acquiring an upland area for Elba-McQueens Cut, no suitable areas are available as shown on sheet 5. Any undeveloped land is either scheduled for development or in close proximity to residential areas.

2. Open Water Disposal. Material dredged from St. Augustine Creek could be discharged into open water in South Channel. Due to the large quantity of dredged material, an exposed mudflat would be created where the material is placed in shallow water. There is also the possibility of creating marsh in

AIWW PHOTO #6-49



Tract No.	Description & Management Practice:
1-A-1 Acreage 38.7	Disposal should continue to be toward the east and center of easement avoiding the main channel of the Savannah River, Elba Cut and South Channel. Preferred pipe outfalls marked with an arrow.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500', 1000', 2000')

north

FIGURE 1

Table 5

ST. AUGUSTINE CREEK

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS CAUSTON BLF	DIKE COSTS OATLAND I	DISPOSAL AREA ACREAGE
10	223.50	$498,571	-	-	238,96
14	131.10	585,782	$923,353	$923,353	146,71
18	95.79	676,602	1,084,288	1,084,288	112,33
22	74.50	753,657	1,293,007	1,293,007	91,93
26	60.95	826,053	1,542,196	1,542,196	79,34

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 2A	$51,485	4,000'	45.0
Tract 2B-3A	50,592	2,500'	155.4
Tract 1-A	80,524	9,000'	204.9
Tract 1	96,641	12,500'	

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Causton Bluff	$120,663	9,500'
Oatland Island	76,635	5,000'

Present pumping cost would be $46,128/annually to maintain a 12 ' channel.

this area. Although both mudflats and marsh are valuable estuarine habitat, the bottom habitat and its benthic communities would be lost.

3. Reuse of Material or Beach Nourishment. The material is mud and silt and not suitable.

4. Continued Undiked Disposal in Tract 2-A and Disposal in Tract 2B-3A. As recommended in the DNR plan, (figures 2 and 3) Tract 2-A should continue to be used. The material should be discharged into the center of the tract. An old railroad bed and dike will help to prevent spillage into adjacent marshes. Since Tract 2B-3A is diked it should also be used.

Summary and Recommendations.

Since all of Tract 2-A has been affected by past dredging activities, it should continue to be used as long as possible. Diked area 2B-3A should also be used. When 2B-3A reaches its capacity and can no longer be used, then the material should be pumped to Disposal Area 14 (Tract 1) or discharged into South Channel for purposes of marsh creation.

Wilmington River (Upper)

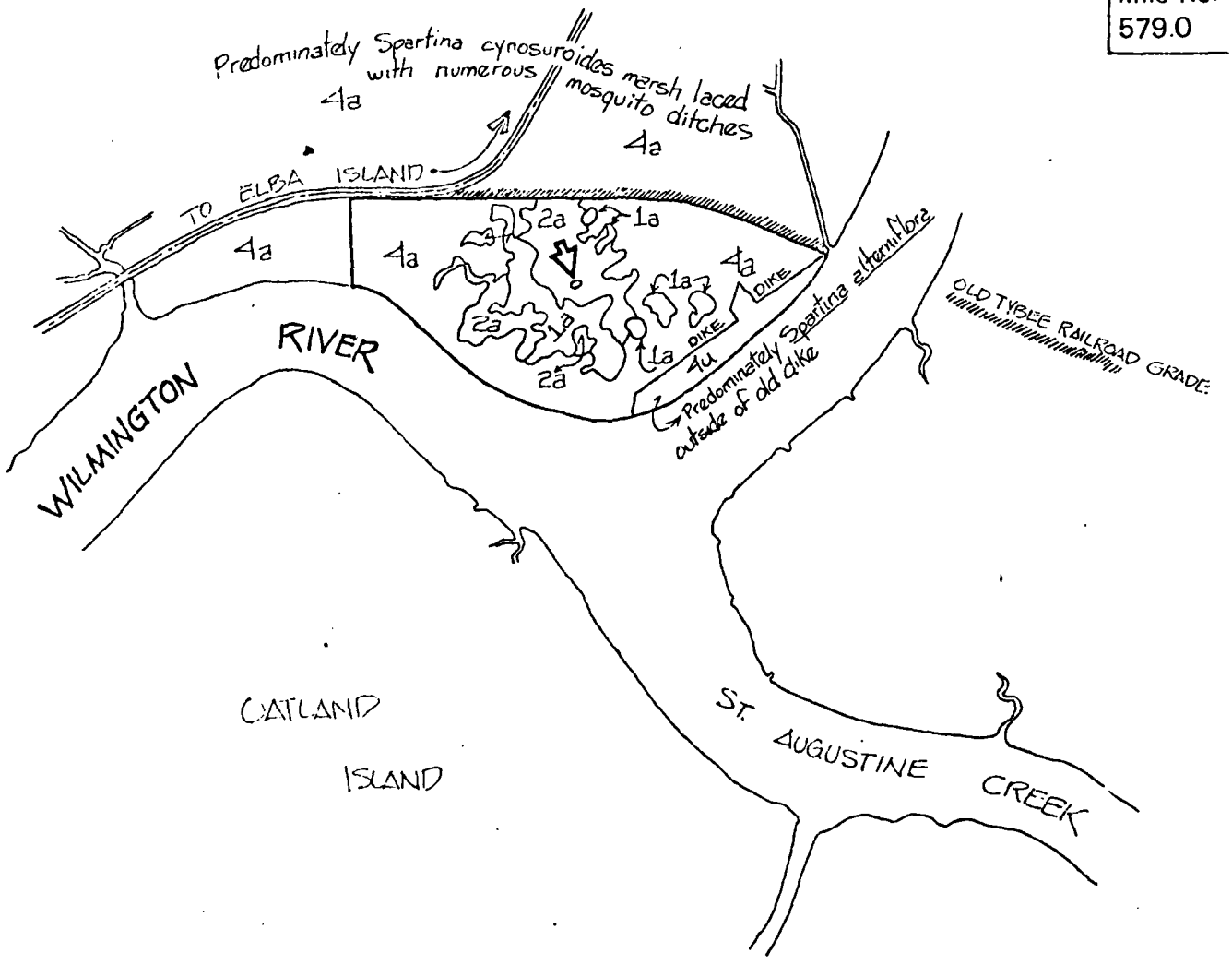
Wilmington River (Upper) at one time ranked with Jekyll Creek as one of our worst shoaling areas on the AIWW. Some 13.5 million cubic yards of material have been dredged from Wilmington River on 18 occasions since completion of the 12' channel. The Wilmington River on the AIWW extends from about miles 579 - 586. The last two miles (584 - 586) do not experience shoaling, and maintenance has not been required. The majority of the shoaling occurs between mile 579 - 582, and in some years dredging is required between 582 - 584, especially in the vicinity of Gray's Creek (mile 583.5). For purposes of discussion, Wilmington River will be divided into Upper (mile 579 - 581.5) and Lower (581.5 - 584).

Upper Wilmington River has experienced the most dredging. A review of contracts issued since 1960 reveals that of the almost 2.7 million cubic yards dredged that from the Wilmington River, about 2.0 million cubic yards has been taken from Upper Wilmington River. The majority of material has been deposited in Tract 2B-3A (diked) and undiked Tract 5-A. Tract 5-B (undiked) was used on several occasions, but only about 2.4 acres of the 37.4 acres in the tract have been altered by dredged material which means that only a small amount has been deposited in Tract 5-B. Currently, the contractor will use Tract 2B-3A for material from St. Augustine Creek and Wilmington River (mile 579 - 580) and Tract 5-A for any dredging between mile 580 - 581.5. To maintain a 12' channel for the next 50 years, about 8.9 million cubic yards of dredged material will be removed.

1. Construction of Diked Disposal Area Within Existing Easements or New Upland Site (see sheet 5 in appendix 3.). Tract 5-B has not been used for many years and only a small portion of this tract has been affected by dredged material. It should not be used. Tract 2B-3A is already diked. Tract 5-A

AIWW PHOTO # 9-66

Tract No
2 A
Mile No.
579.0



Tract No.	Description & Management Practice:
2 A Acreage 45.0	This easement should be used more as it is bounded on two sides by a dike and railroad bed. Suggest that if dumping distances are suitable that it be used at every opportunity.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

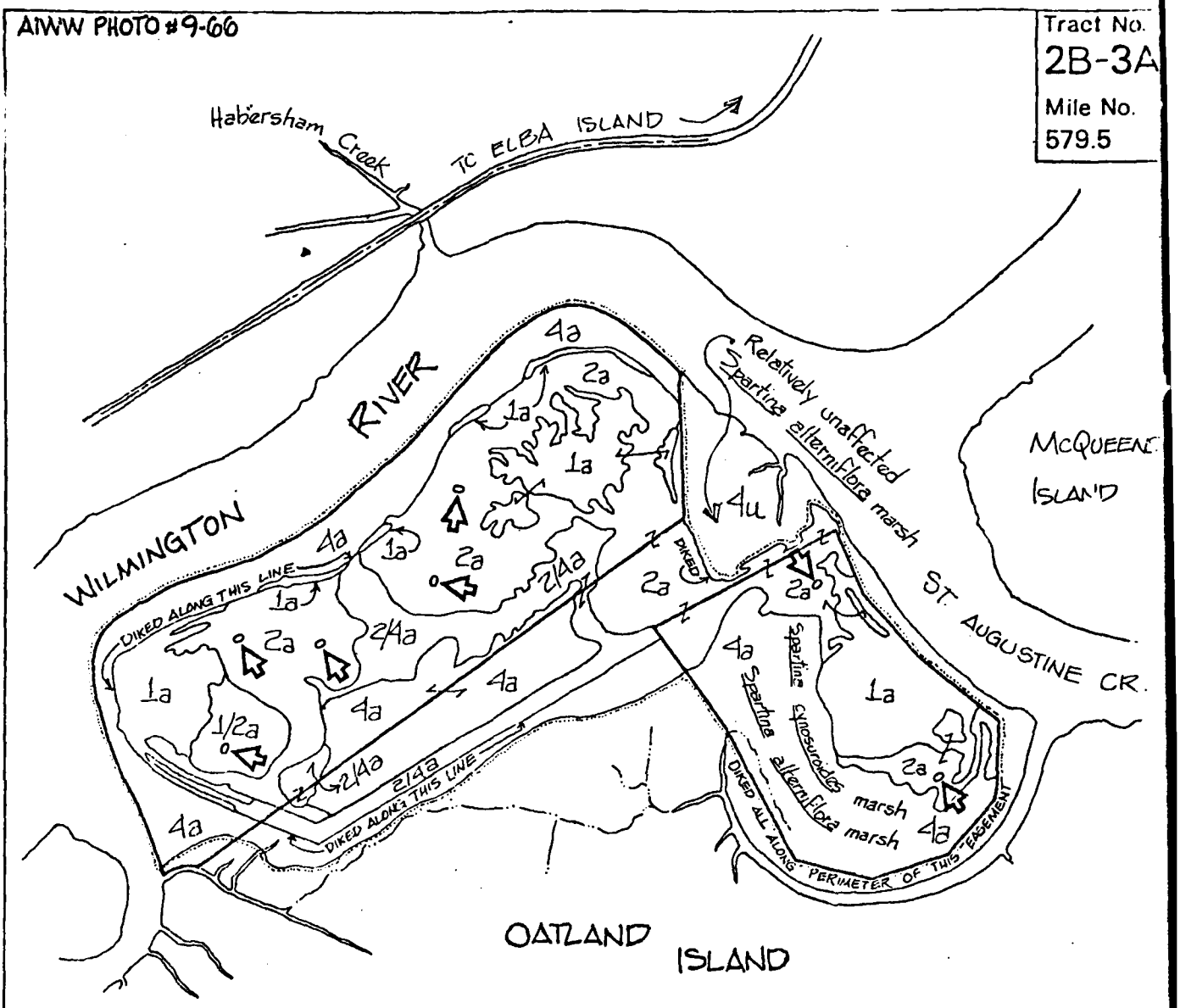
GA DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale 1:10,000 0 500' 1000' 2000'

north

FIGURE 2



Tract No.	Description & Management Practice:
2B-3A Acreage 155.4	Diked disposal area, heavy clay soil, monotonous vegetative cover made up primarily of silverling, rough cordgrass and popcorn tree. Placement recommended inside the diked in area. Note that dikes in some cases do not match easement.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 3

(128.7 acres) has been heavily impacted by dredged material disposal and highway construction as U.S. Highway 80 intersects the tract. About 64 percent of this tract has been impacted by dredged material. Table 6 shows the costs and area requirements for a diked area to handle 50 years of material. About 30 acres of Tract 5-A is on the north side of Highway 80 leaving about 90 acres for a diked area which would not be sufficient. An additional 90 acres could be obtained by extending the easement to Oatland Island. If this area were obtained and diked, an additional 70 acres of wetland plus the remaining unaffected wetlands in Tract 5-A would be lost. This disposal area would be adjacent to a residential area on the island. An undeveloped upland area within reasonable pumping distance is located at Causton Bluff, however, this property was recently purchased by a developer.

2. Open Water. There are no suitable open water sites in the vicinity of Upper Wilmington River to solve the long range 50 year maintenance problem. Two areas shown on sheet 5 could be used on a one time basis for purposes of establishing marsh. This would help reserve some of the capacity of Tracts 2B-3A and 5-A.

3. Reuse of Material, Beach Nourishment. Material from the Upper Wilmington River is mud and silt and unsuitable for these purposes.

4. Use of Disposal Area 13 for Savannah Harbor. The dredged material could be pumped about 2.0 miles to Disposal Area 13 used for maintenance of Savannah Harbor. As shown in table 6, this would almost double pumping costs, and reduce the disposal capacity in Area 13. Maintenance capacity for dredged material from the middle harbor is already reaching a critical stage.

5. Continued Use of Tract 2B-3A and Undiked Tract 5-A. Tract 2B-3A should continue to be used and the dikes raised to the maximum extent possible. Undiked disposal in Tract 5-A will gradually continue to encroach upon the Spartina alterniflora, Spartina cynosuroides and Juncus roemerianus wetlands located to the east of the tract. The portion of Tract 5-A to the north of U.S. Highway 80 should not be used.

Summary and Recommendations.

There are no suitable upland sites for use as a disposal area. Several sites for possible marsh creation are close to the dredging areas, but the discharge of large quantities of mud and silt into this narrow, shallow river is not recommended. Neither Tract 5-B nor the portion of Tract 5-A north of U.S. Highway 80 should be used. Tract 2B-3A should continue to be used to the maximum extent possible. Continued undiked disposal should continue in Tract 5-A in the manner prescribed by the Georgia DNR in figure 4. The dredged material will gradually encroach upon the wetlands to the east of the easement; however, this will occur over a period of many years. If the site were diked, this marsh would be taken out of productivity immediately. Additionally, a diked site this close to residential areas on Oatland Island is not recommended. After the site is no longer available for disposal purposes, it could possibly be developed by the State or county into a large recreation area.

Table 6

UPPER WILMINGTON RIVER

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE AREAS	DIKE COSTS MARSH	DIKE COSTS CAUSTON BLF	DISPOSAL AREA ACREAGE
10	707.00	$883,664	-	734.55
14	424.20	1,047,626	$2,354,279	451.89
18	303.00	1,196,235	2,461,009	355.88
22	235.67	1,326,589	2,743,635	266.20
26	192.82	1,450,360	2,878,980	224.92

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 2B-3A	$136,784	500'	155.4
Tract 5A	148,320	7,500'	128.7
Disposal Area 13	225,657	10,500'	1900.0

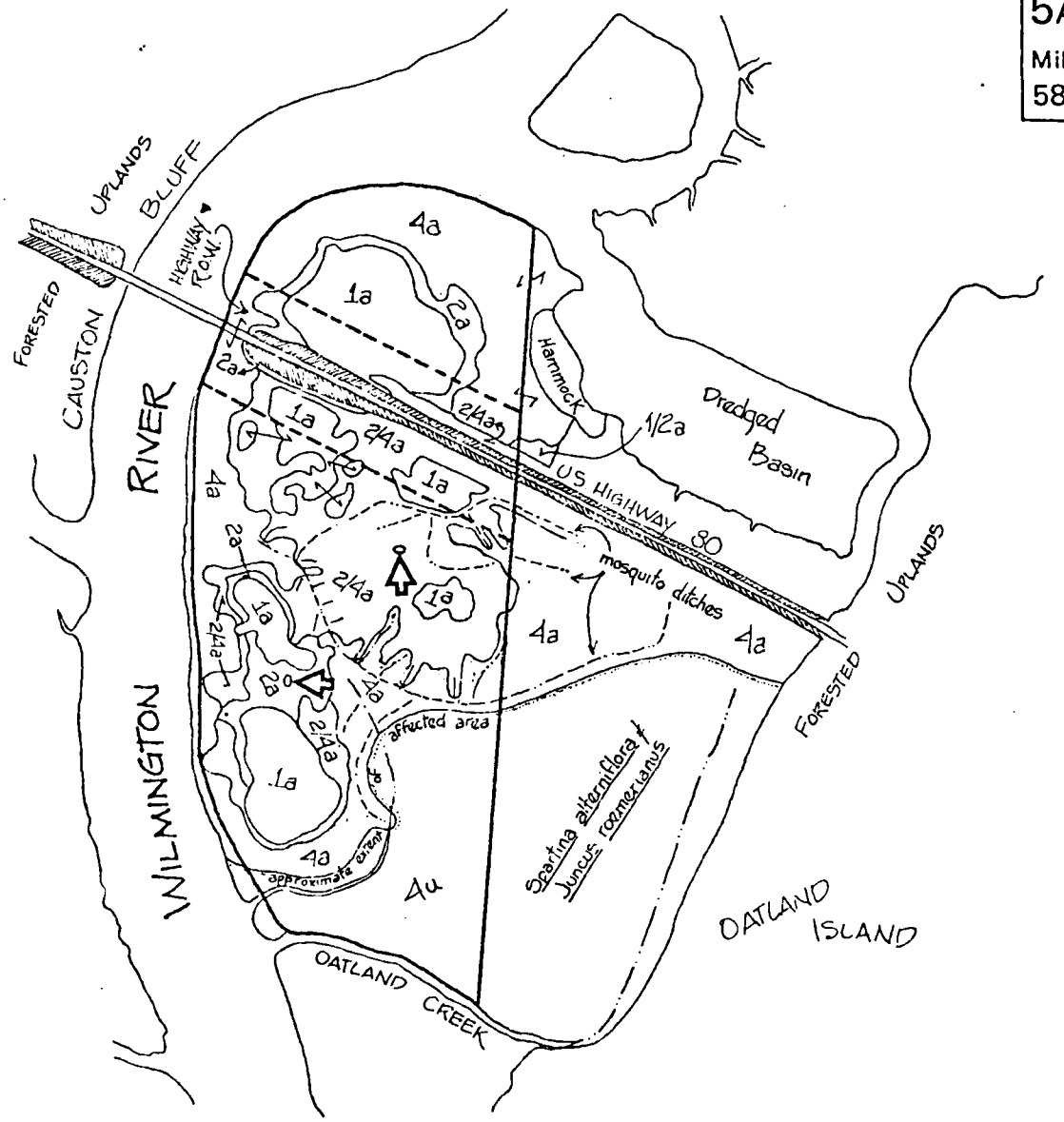
Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Causton Bluff	$64,040	6,000'

Present pumping cost would be $125,632/annually to maintain a 12' channel.

AIWW PHOTO #9-68

Tract No.
5A
Mile No.
581.0



Tract No.	Description & Management Practice:
5A Acreage 128.7	Easement bisected by U.S. Highway 80. The small hammock on the north side of 80 and adjoining the dredged basin is used as a Chatham County park and boatramp. Where possible dredged material should be confined to the south side of the highway. Pipe outfall locations are indicated by the X.

PREFERRED MANAGEMENT PRACTICES FOF DISPOSAL AREAS OF THE GEORGIA PORTION OI THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 4

Wilmington River (Lower)

Wilmington River (Lower) - mile 581.5 - 584. Of the 2.7 million cubic yards of material removed from the Wilmington River since 1960 only 700,000 cubic yards have been removed from the lower part of Wilmington River; mostly from the vicinity of mile 582 and Gray's Creek (mile 583.5). Most of the dredged material has been deposited in undiked Tracts 7-A and 9-A, and a small amount in undiked Tract 8-A. It is estimated that about 3.5 million cubic yards of material will have to be dredged from this section of Wilmington River over the next 50 years.

1. Diking Within Existing Easements or Construction of New Upland Diked Sites. (See sheet 5 in appendix 3). Tracts 7-A (52.4 acres), 8-A (46.6 acres), 9-A (133.5 acres), 9-B (126 acres) and 10-C (57.6 acres) are available for dredged material from the lower Wilmington River. As shown in table 7, only tracts 9-A and 9-B are large enough for a diked area. Tract 9-A contains a small diked area used by Latex Construction Company in maintaining their boat basin. This diked area would not provide enough capacity for AIWW maintenance. A diked area could be constructed within Tract 9-A, however, 18' dikes would be required at a cost of approximately $751,753. The Juncus roemerianus marsh within Tract 9-A as well as the Spartina alterniflora in the southern portion would be lost. Tract 9-B was used for construction material in the 1940's and should not be used since most of this area is undisturbed Spartina alterniflora marsh. Sufficient undeveloped upland is available on Whitemarsh Island for construction of a diked area for lower Wilmington River. Although not developed at this time, it will be in the near future. This area contains excellent wildlife habitat including large stands of large live oaks.

2. Open Water. No suitable areas for open water disposal could be located in this segment of the AIWW.

3. Reuse of Material, Beach Nourishment. Material removed from the lower Wilmington River is mostly mud and silt.

4. Continued Undiked Disposal in Tracts 7-A, 8-A, 9-A, 9-B, and 10-C. Continued undiked disposal in Tract 7-A will result in gradual encroachment on the Spartina alterniflora wetlands to the east of the easement. As the elevation on the existing deposits are raised, the Spartina cynosuroides marsh that has replaced the Spartina alterniflora marsh that once grew in the tract will also be repalced by high marsh species such as Borrichia frutescens and Baccharis halimifolia. Tract 8-A is a small tract located next to Grays Creek. Dredged material is gradually encroaching towards the narrow fringe of marsh separating the tract from Grays Creek. This tract should not be used if at all possible. Continued disposal in Tract 9-A will also result in a gradual encroachment into adjacent wetland sites. However, with proper discharge pipe placement, impacts to the tidal creek and Spartina alterniflora marsh in the southern part of the tract can be avoided. Tract 9-B has not been used since the 1940's and 10-C has never been disposed on. These tracts should not be used.

Table 7

LOWER WILMINGTON RIVER

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS WHITEMARSH	DISPOSAL AREAS ACREAGE
10	242.00	$560,892	-	300.79
14	145.20	665,987	$1,091,564	187.69
18	103.70	751,753	1,229,168	137.03
22	80.67	846,228	1,473,281	113.95
26	66.00	926,925	1,748,103	97.82

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 9A	$54,029	1,500'	133.5
Tract 9B	55,958	4,500'	126.0
Tract 8A	55,380	3,600'	46.6
Tract 7A	85,600	8,000'	52.4
Tract 10-C	86,800	9,500'	57.6

Pumping costs to upland disposal areas at the following location are as follows:

Location	Cost	Distance
Whitemarsh Island	$69,754	4,000'

Present pumping cost would be $48,960/annually to maintain a 12' channel.

5. Summary and Recommendations. Continued undiked disposal in Tracts 7-A and 9-A is recommended as shown in figures 5 and 7. However, these two areas should be closely monitored to determine if dredged material is adversely impacting adjacent wetlands. If dredged material begins to encroach on adjacent marshes and finger streams, then a diked area may be required. A large area could be constructed in 9-A or two smaller areas in 7-A and 9-A. Tracts 8-A, 9-B and 10-C should not be used.

Skidway River.

Skidaway River has required maintenance on only two occasions immediately after completion of the 12' channel (FY 42, 43). The only work done in Skidaway River since FY 43 was some channel modification performed in the vicinity of Isle of Hope in the early 1970's. All of the maintenance material was deposited in undiked Tracts 11-K and 11-L immediatey across from Isle of Hope. If the present trend continues, there will be no maintenance necessary. Consequently, an alternative method of disposal was not investigated. If maintenance becomes necessary, it will be a relatively small amount of material in all likelihood. We recommend that if dredging was required, the material could be discharged into Tracts 11-K and 11-L (figure 8) and confined to the existing mounds.

Skidaway Narrows.

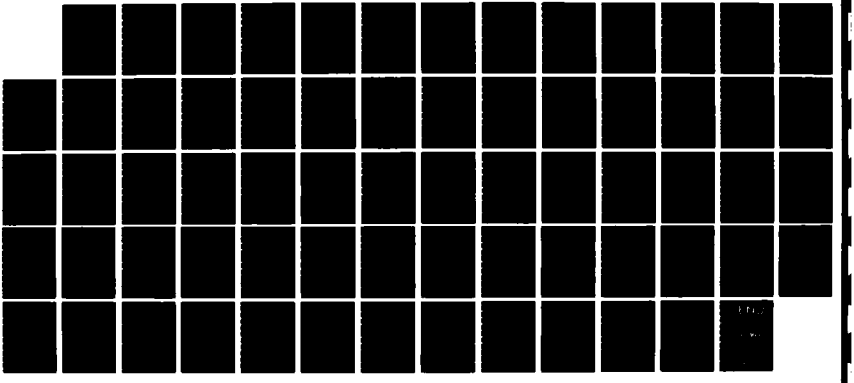
Like Skidaway River, Skidaway Narrows has required maintenance dredging on only two occasions since completion of the 12' channel (FYS 44, 45) in 1941. A land cut was also made in the vicinity of the Skidaway Island Bridge in 1973. Almost all of the maintenance material was deposited in undiked Tract 12-A on the west side of the waterway while the new material from the land cut was deposited on the east side of the waterway to assist the Georgia Department of Natural Resources in constructing public boat ramps and a parking lot. Skidaway Narrows appears to be self maintaining at the present time, and if the present trend continues, maintenance will not be necessary over the next 50 years. If dredging does become necessary, the Georgia DNR has indicated an interest in expanding the parking lot at the boat ramps. The Corps of Engineers would of course give prime consideration to this request, and if the material was determined to be suitable, pump the material to enlarge the parking lot. If the dredged material is determined to be unsuitable, then it is our recommedation that it be discharged into Tract 12- A (figure 9) where it could be confined to existing deposits. No detailed alternative analysis was undertaken for this section of the waterway.

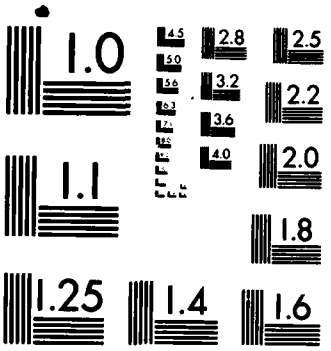
Hell Gate.

The next shoaling area on the AIWW within the Savannah District is Hell Gate, and heavy shoaling has been a problem ever since completion of the 12' channel in 1941. Approximately 3.6 million cubic yards have been removed on 20 occasions to maintain project depths. The dredged material has been deposited into two undiked tracts (15-A and 15-B) adjacent to the waterway, with Tract 15-A receiving more of the material. It is anticipated that maintenance

AD-A161 999 ATLANTIC INTRACOASTAL WATERWAY (AIWW) MAINTENANCE PROGRAM EVALUATION STUDY(U) ARMY ENGINEER DISTRICT SAVANNAH GA JAN 83 4/4

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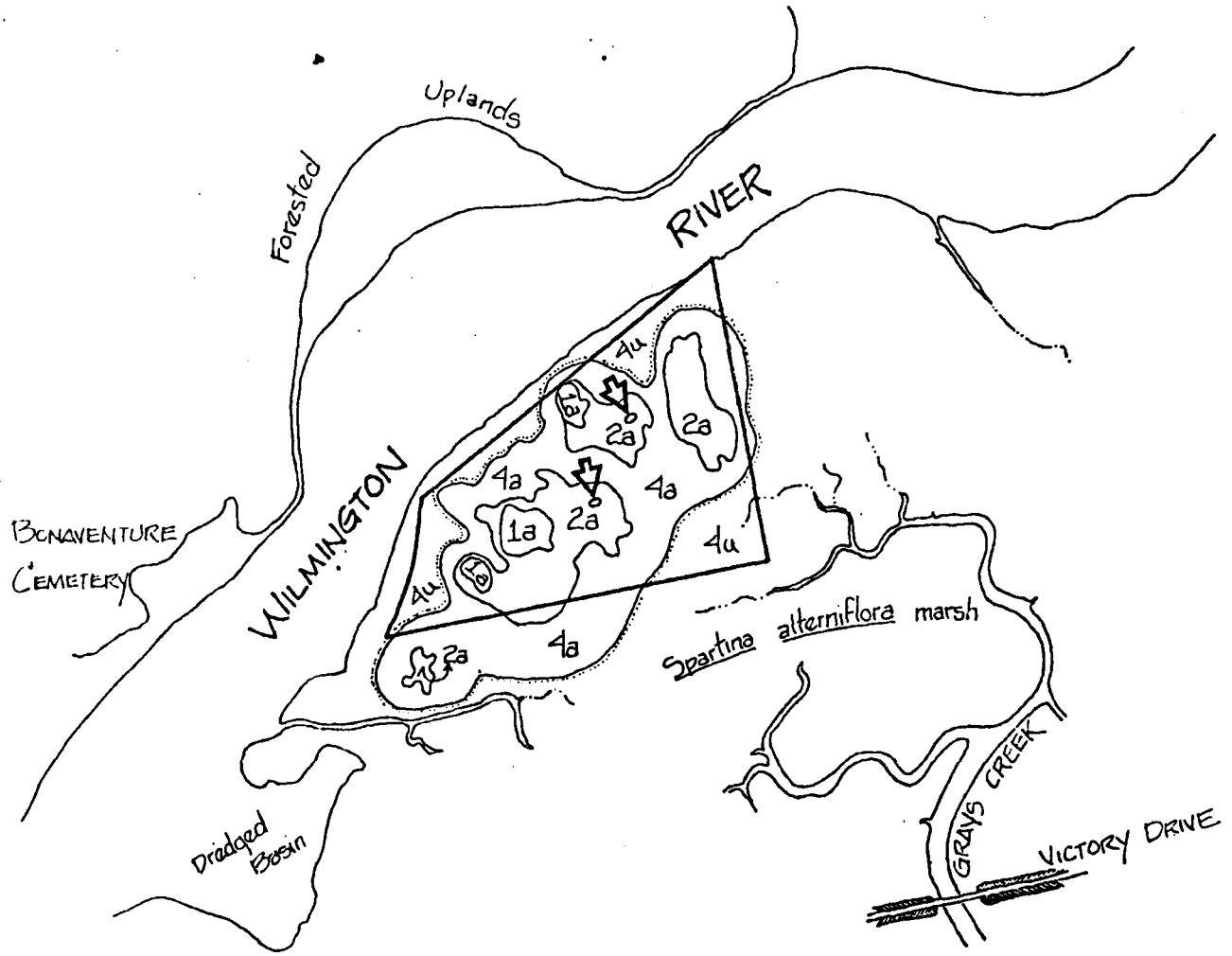




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AIWW PHOTO #9-70

Tract No.
7A
Mile No.
582.5



Tract No.	Description & Management Practice:
7A Acreage 52.4	Outfall location avoids mature hammocks on this southern portion of 7A

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

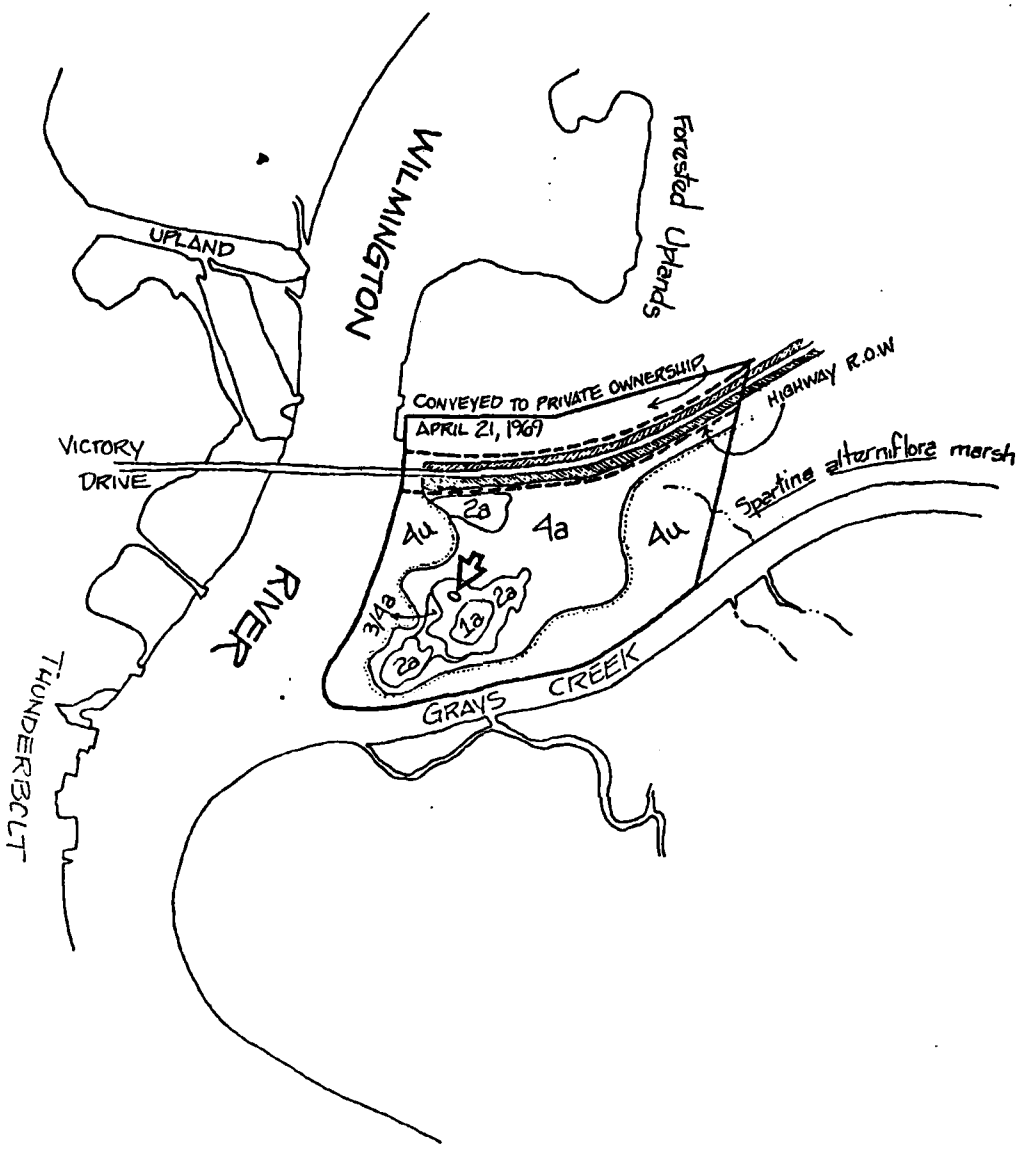
GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 5

AIWW PHOTO #9-72

Tract No.
8A
Mile No.
583.0



Tract No.	Description & Management Practice:
8A Acreage 46.6	Preferred outfall site on north side of hammock but sufficently far away from deep Spartina marsh and Highway right-of-way. This location avoids spoiling in Gray Creek and productive streamside marshes.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

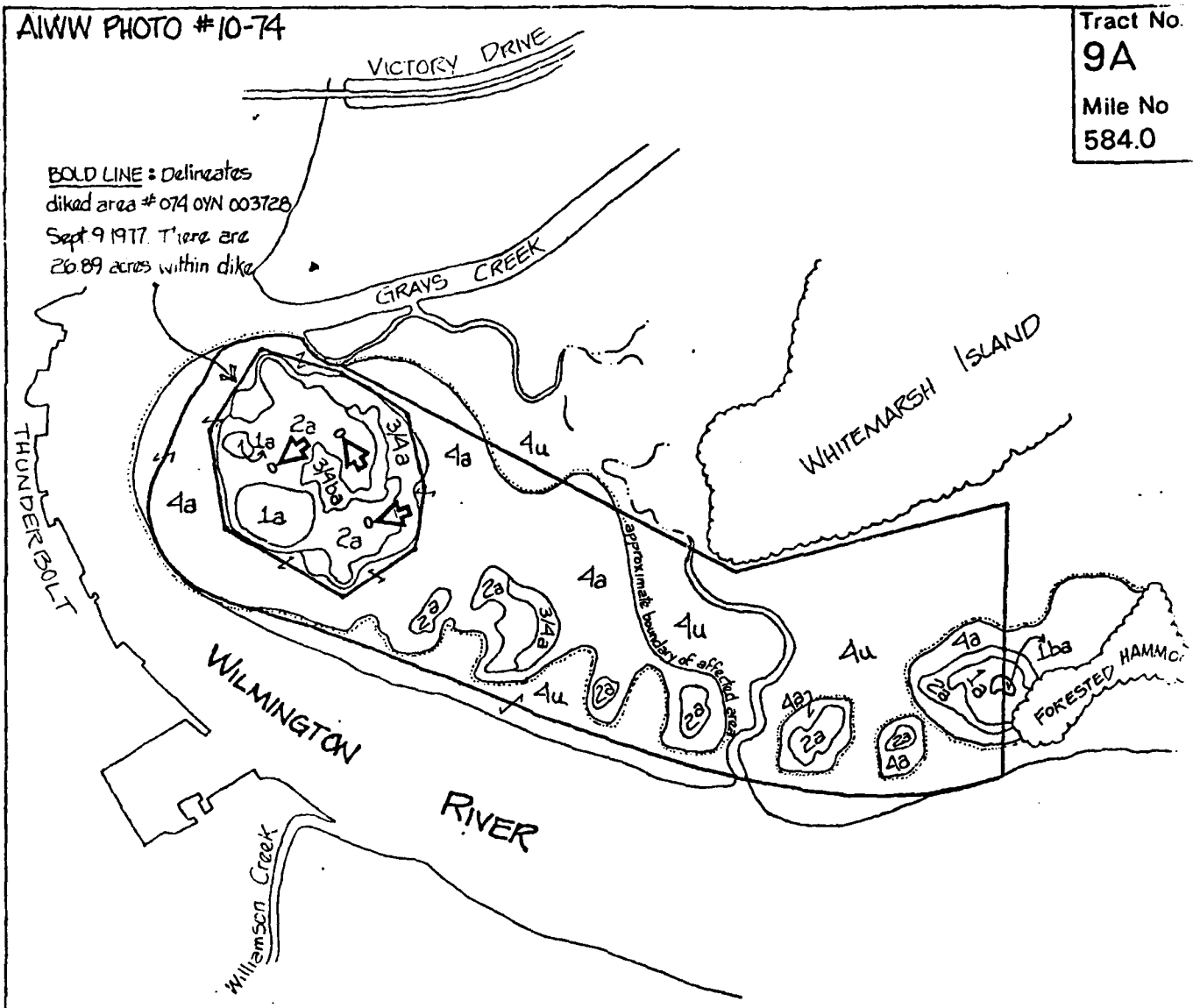
GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 6



Tract No.	Description & Management Practice:
9A Acreage 133.5	Disposal easement across Wilmington River from Thunderbolt Marina (Latex) The westernmost 26 acres of the site was diked in 1978 by the Marina and are greatly impacted. Dewatering and compaction of the dike-in area would prolong the useful life of the site. Pipe outfall within the dike should continue to be the high point.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

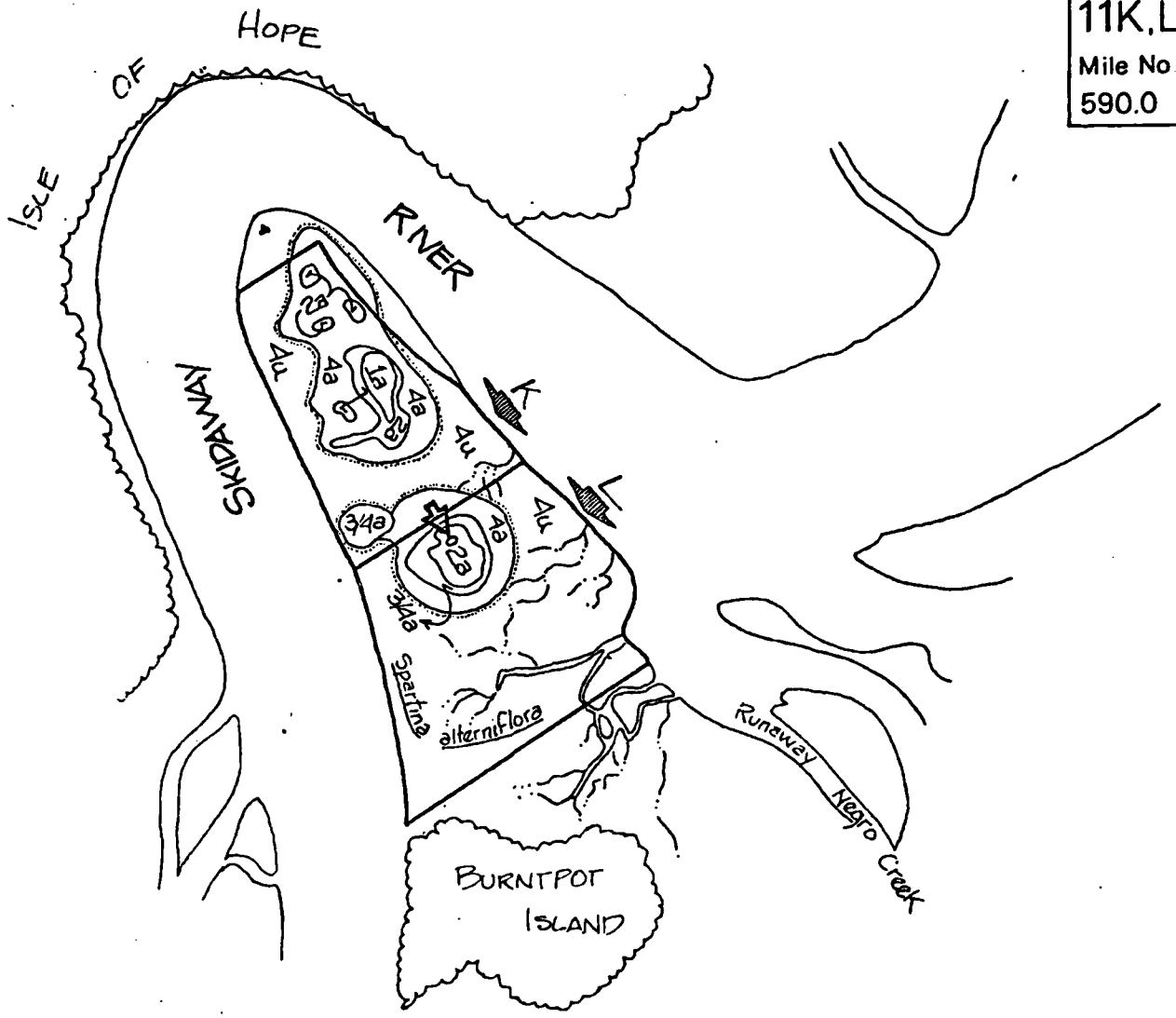
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 7

AIWW PHOTO # 12-85

Tract No.
11K,L
Mile No
590.0



Tract No.	Description & Management Practice:
11K,L Acreage K24.7, L39.6	Disposal site across from Isle of Hope Marina and north of Burntpot Island. 11K has mature island. The mature upland trees on this site should not be disturbed. Outfall locations should be on the boundary between K & L and on L with caution for the Spartina alterniflora marsh and creek system next to Burntpot.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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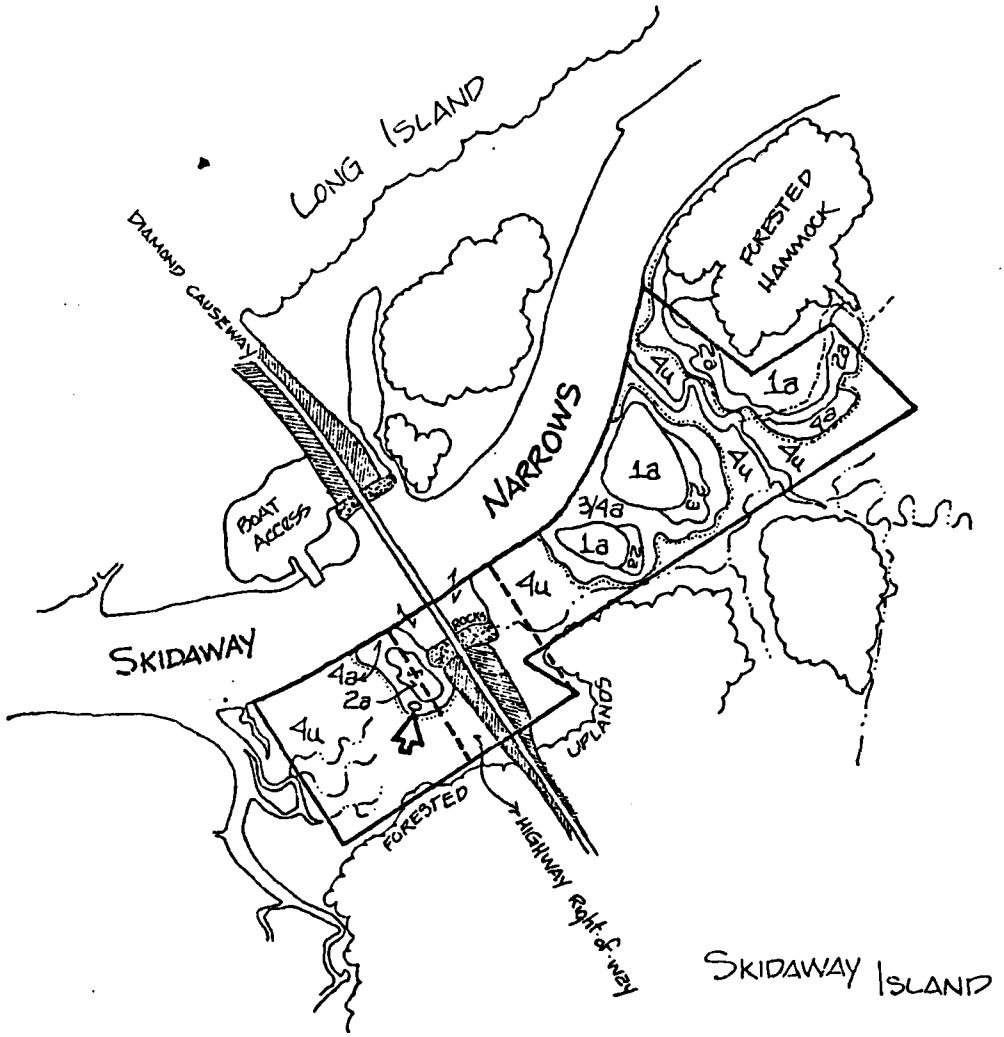
Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 8

AIWW PHOTO #12-89

Tract No.
12A
Mile No.
592.5



Tract No.	Description & Management Practice:
12A Acreage 67.9	Skidaway Narrows is one of the many nodal points behind a barrier island. Along the AIWW the incoming tides from the opposing sounds on the north (Wassaw) and the south (Ossabaw) meet . Tidal velocties are reduced and siltation occurs. Disposal sites should be limited to the south of the Diamond Causeway just off the R/W in the shrub border.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 9

requirements will be about 445,000 cubic yards every 2 years which means that approximately 10 million cubic yards would be dredged over the next 50 years.

1. Diking Within Existing Easement or Construction of New Diked Upland Site. (See sheet 8 in appendix 3). As shown in table 8, a diked area for this section of the waterway would require between 285 and 963 acres depending on the dike height selected. The existing disposal Tracts 15-A (109 acres) and 15-B (66.6 acres) are not large enough for a diked area this large. If either of these easements were expanded to accommodate diked areas, significant amounts of Spartina alterniflora marsh would be lost. The possibility of an upland site was investigated on Ossabaw Island, Wassaw Island, Green Island and the mainland. Table 8 shows the costs to pump to these areas and the dike costs. Ossabaw and Wassaw Islands should not be used since they are State and Federal Refuges respectively. Although diked areas could be established on the mainland or Green Island, between 285 and 963 acres of wildlife habitat would be destroyed.

2. Open Water. Since 1976, material dredged from Hell Gate has been deposited into open water areas on the north and south sides of Raccoon Key. Although open water disposal for purposes of marsh creation has not been used in the past, there are several areas that appear to be suitable.

3. Reuse of Material, Beach Nourishment. Although the dredged material does contain some sandy material, most of it is mud and silt and, therefore, not suitable for these purposes.

4. Undiked Disposal in Tract 15-A and 15-B. The material could be discharged into undiked Tracts 15-A and 15-B as it has on past occasions. Emphasis would be placed on using the large sand flat in 15-B and the exisitng mounds in the northeast portion of 15-A (figures 10 and 11).

5. Reduction of Shoaling Rate. This is one of several locations along the AIWW where channel modification might significantly reduce the shoaling rate and thus maintenance requirements. Hell Gate has such a high shoaling rate because velocities are too slow to keep the channel swept clean. Redireting the channel might offer a solution. Figure 12 shows two possible alternative alignments. Funds should be provided to study this area.

Summary and Recommendations.

In view of the high costs and the fact that a significant amount of wildlife habitat would be destroyed, construction of a diked upland site is not recommended. The State of Georgia does not favor open water discharge whether it is merely for disposal purposes or marsh creation. Their opposition to open water disposal for purposes of marsh creation is based on the fact that the State of Georgia has abundant stands of marsh. Although new marsh habitat can be created with dredged material, the open water bottom along with its associated benthic community is eliminated. Consequently, open water disposal as used on the last several dredging cycles should be stopped and undiked disposal in Tracts 15-A and 15-B used as recommended by the DNR. However, these tracts should be closely monitored to see if the dredged material is encroaching on the wetlands or the tidal creek in the southern portion of 15-A. If adjacent

Table 8

HELL GATE

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS OSSABAW I	DIKE COSTS WASSAW I	DIKE COSTS GREEN I	DIKE COST MAINLAND	DISPOSAL AREA ACREAGE
10	783.33	$1,002,754	-	-	-	-	962.65
14	470.00	1,189,327	$2,441,963	$2,441,963	$2,441,963	$2,440,868	580.95
18	335.71	1,353,689	2,568,047	2,568,047	2,568,047	2,566,952	423.54
22	261.11	1,503,813	2,891,034	2,891,034	2,891,034	2,889,939	338.40
26	213.64	1,644,035	3,324,812	3,324,812	3,324,812	3,323,717	285.10

Pumping costs to tracts presently located along the waterway are as follows:

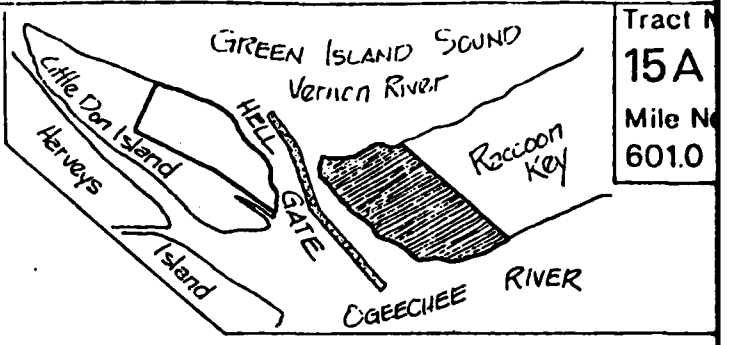
Location	Cost	Distance to Tract	Acreage
Tract 15-A	$172,627	750'	109.0
Tract 15-B	176,256	2,500'	66.6
Overboard	177,293	3,000'	-

Pumping costs to upland disposal areas at the following locations are as follows:

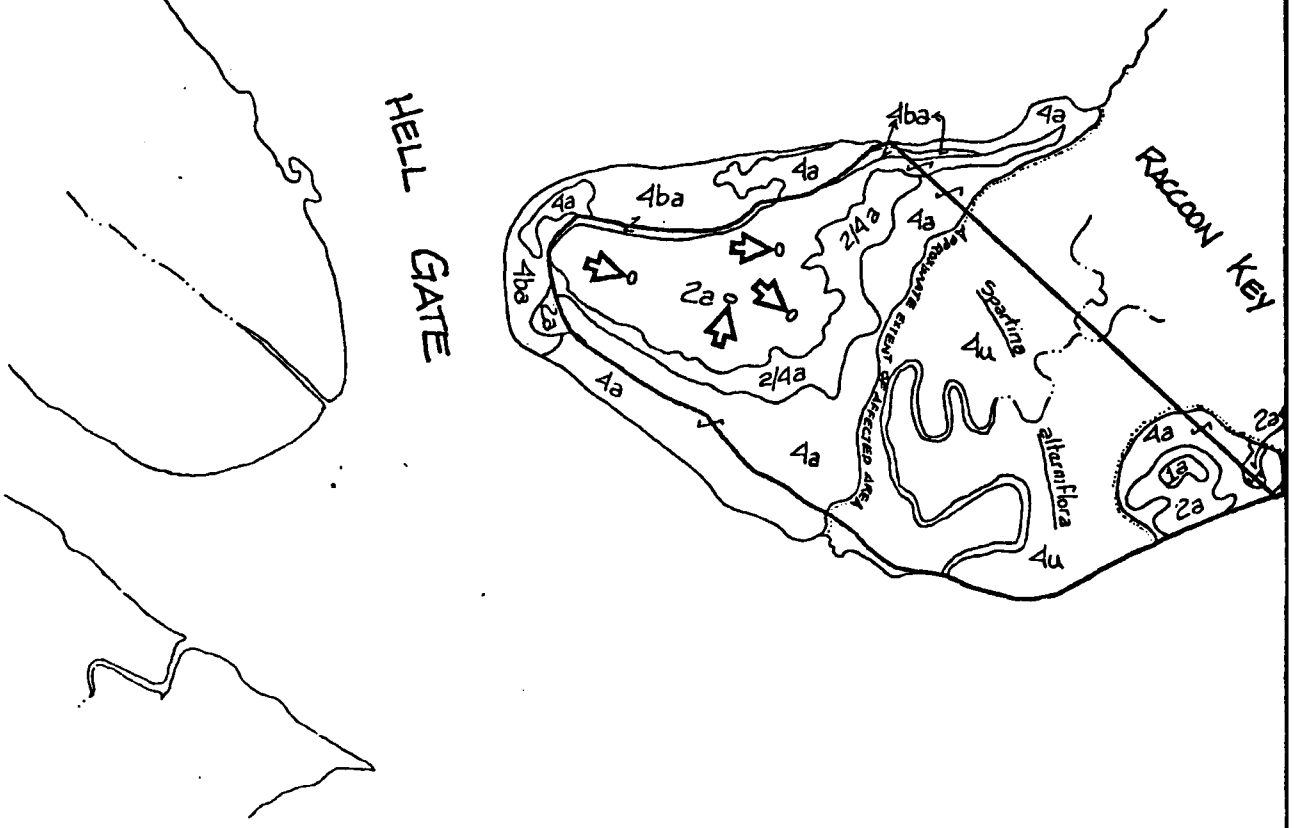
Location	Cost	Distance
Ossabaw Island	$355,147	9,000'
Wassaw Island	847,050	26,000'
Green Island	360,000	11,000'
Mainland Between Belvidere and Cortonham	868,957	27,000'

Present pumping cost would be $157,560/annually to maintain a 12' channel.

AIWW PHOTO #15-107



Tract N
15A
Mile N
601.0



Tract No.	Description & Management Practice:
15A Acreage 109.0	Raccoon Key at Hell Gate channel warrants a current speed and direction study to determine if Channel could be oriented in a more favorable position (i.e. less maintenance dredging) Outfall sites are shown by arrows and circles.

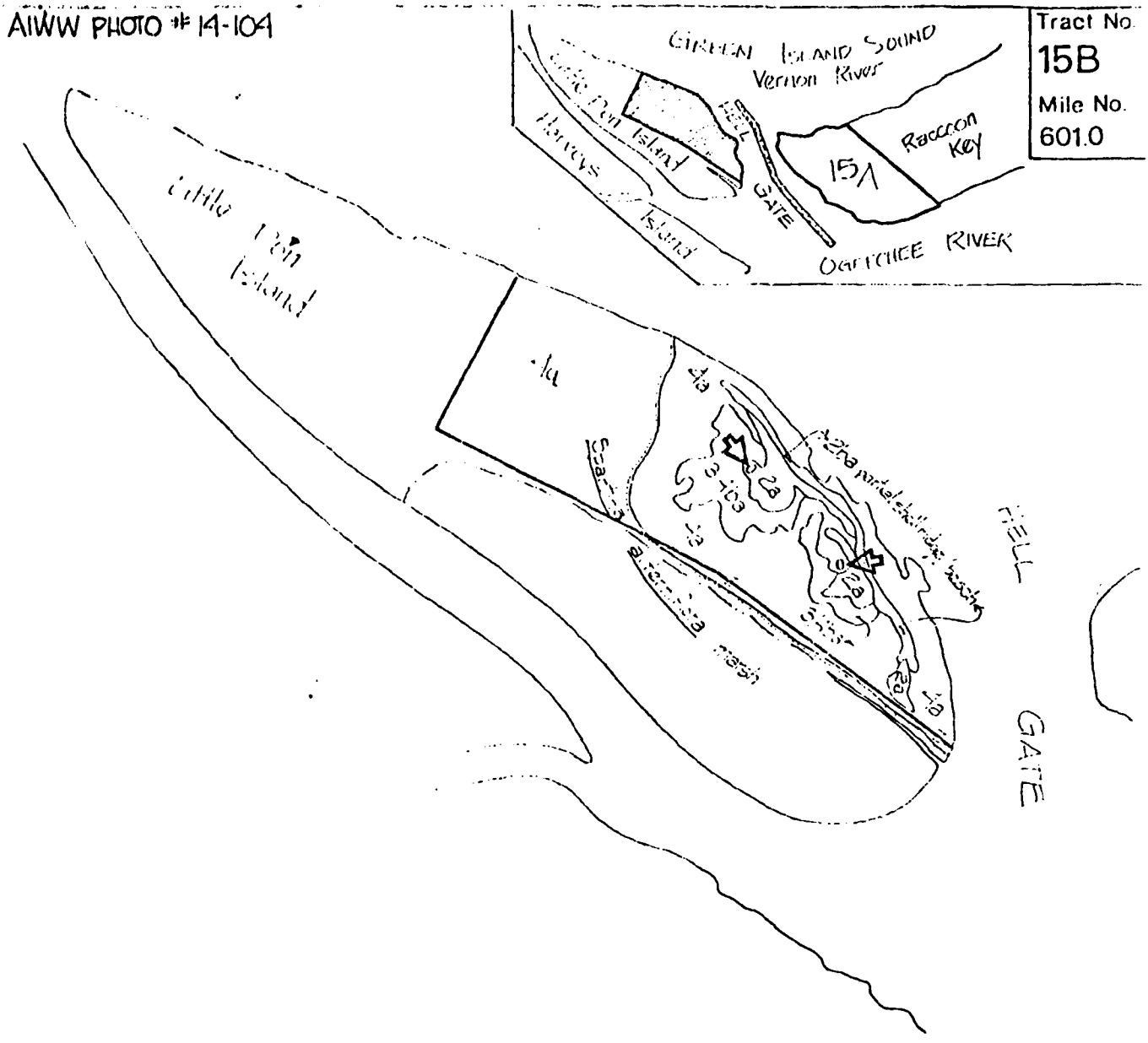
PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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FIGURE 10



Tract No.	Description & Management Practice:
15B Acreage 66.6	Little Don Island has large sand flat. It is recommended that this be used for next dredging cycles.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

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FIGURE 11

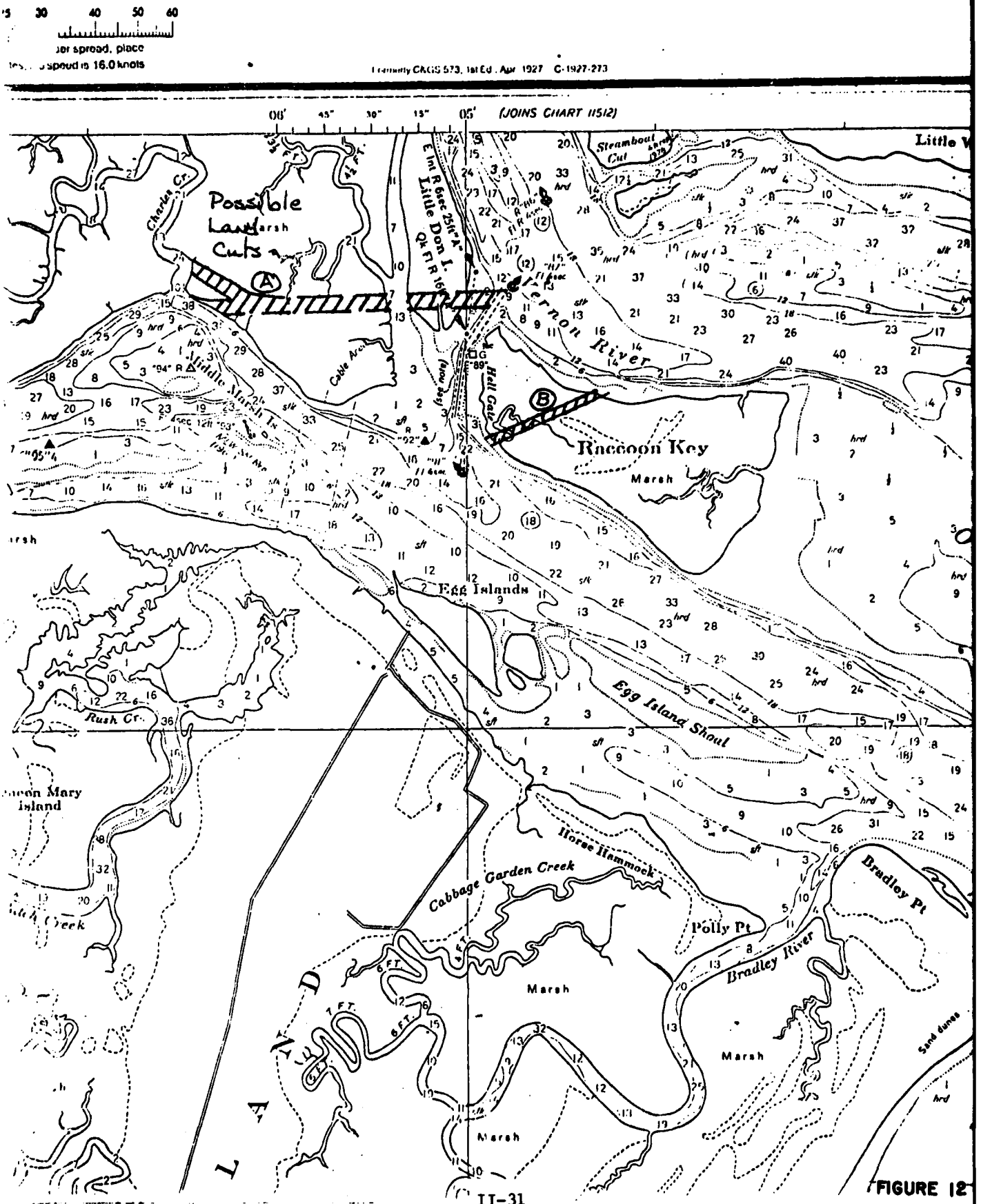

Possible Land Cuts
Charles Cr.
Middle Marsh Is.
Cable Area
Hell Gate
Vernon River
Raccoon Key
Marsh
Egg Islands
Egg Island Shoal
Rush Cr.
Horse Hammock
Cabbage Garden Creek
Polly Pt
Bradley River
Bradley Pt
Marsh
Marsh
Marsh
Sand dunes
Steamboat Cut
(JOINS CHART 11512)

FIGURE 12

marsh is being adversely affected, then the use of these tracts should be stopped and open water disposal used to establish some marsh creation sites. Funds should be provided for a study to evaluate possible channel realignment to reduce shoaling rates.

Florida Passage.

The Florida Passage (mile 605.5 - 608.5) has a very low shoaling rate and has required the removal of about 364,000 cubic yards on five dredging occasions since construction of the 12' channel. If a 12' channel is maintained, about 1.2 million cubic yards will be removed over the next 50 years.

1. Construction of Diked Area Within Tract 16-A or New Diked Upland Area. Only 15 acres out of this 131 acre site have been affected by past dredged material disposal activities because of the small maintenance requirements. The calculations in table 9 show that a diked area for this section of the AIWW would require about 146 acres with a 10' dike. This area could be reduced to as little as a 51 acre site if a 26' dike were built. Considering the future maintenance predictions, construction of a permanent diked area would destroy more marsh than continued undiked techniques. Most of Tract 16-A remains vegetated with lush stands of salt marsh cordgrass (Spartina alterniflora). An upland site could be established on the mainland (1.4 miles), however, such a site would mean the loss of a minimum of 51 acres of wildlife habitat at a cost of $1,182,135 for the dikes, and an increase in the pumping cost from $18,912 to $43,218.

2. Open Water Site. The dredged material could be pumped back to the Ogeechee River for disposal purposes or marsh creation.

3. Reuse of Material or Beach Nourishment. Mud and silt; not suitable.

4. Continued Undiked Disposal. The dredge material could be discharged onto existing mounds in Tract 16-A as recommended by the DNR (figure 13).

Summary and Recommendations.

Based on the extent of impacts in Tract 16-A from past dredging activities, continued use of this tract (undiked) is recommended (see sheet 9, appendix 3). Diking, whether in Tract 16-A or an upland site, would have significantly greater environmental impacts.

Bear River.

Like the Flordia Passage, Bear River (mile 608.5 - 618) has required very little maintenance. About 317,000 cubic yards have been dredged on four occasions since construction of the 12' channel. Estimations are that only 165,000 cubic yards will be removed over the next 50 years.

1. Construction of Diked Area in Tract 17-A or New Upland Diked Site. As shown in table 10, a diked disposal area would require from 14 - 32 acres

Table 9

FLORDIA PASSAGE

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS MAINLAND	DISPOSAL AREA ACREAGE
10	134.00	$386,983	-	146.06
14	80.40	460,357	$680,355	92.65
18	57.43	526,542	809,476	70.25
22	44.67	587,548	981,226	58.27
26	36.55	645,033	1,182,135	50.90

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 16A	18,912	750'	131.0
Overboard	32,325	14,500'	-

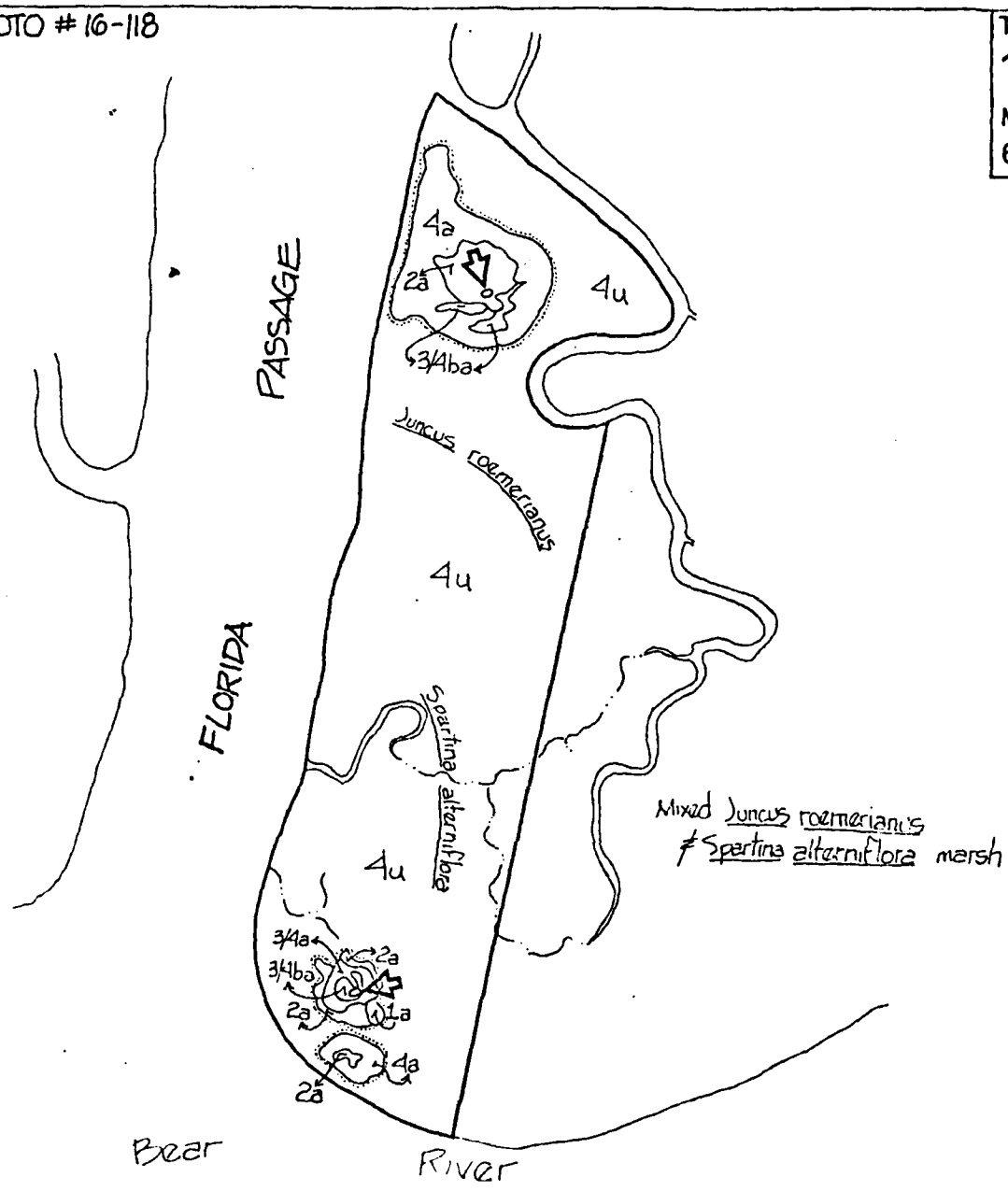
Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Mainland near Belvidere	$43,218	7,000'

Present cost would be $16,968/annually to maintain a 12' channel.

AIWW PHOTO # 16-118

Tract No
16A
Mile No.
608.0



Tract No.	Description & Management Practice:
16A Acreage 131.0	Two distinct ends-a north hammock and a southern one. Southern one is mostly barren with shrub border and a few trees clustered on one side. Northern site predominately shrubs and saplings. Preferred out fall location are indicated. Large creek on back side of site should be avoided.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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FIGURE 13

Table 10

BEAR RIVER

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	MAINLAND	DISPOSAL AREA ACREAGE
10	26.83	$175,386	-	32.33
14	16.10	210,183	$280,375	21.74
18	11.50	242,423	351,700	17.48
22	8.94	272,535	439,360	15.31
26	7.32	302,250	541,649	14.17

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 17-A	$8,791	750'	244.7
Overboard	23,848	20,000'	

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Mainland near Kilkenny Club	$63,933	11,000'

Present pumping cost would be $7,272/annually to maintian a 12' Channel.

depending on the dike height. Although 24 acres of marsh have been impacted in Tract 17-A, the mounds are not concentrated but spread out in five different locations. Construction of a diked area in this Tract would impact additional marshland and construction of a diked area at an upland site would result in the destruction of 14 - 32 acres of wildlife habitat. Annual pumping costs would increase from $8,791 to $63,933.

2. Open Water. The dredged material could be pumped 1.6 miles back to the west end of Bear River for purposes of marsh creation. Annual pumping costs would increase from $8,791 to $23,848.

3. Reuse of Material or Beach Nourishment. Mud and silt, unsuitable.

4. Continued Undiked Disposal in Tract 17-A. The dredged material can be discharged onto existing mounds as recommended by the DNR.

Summary and Recommendations.

In view of the very small maintenance requirements of Bear River, continued disposal on existing undiked mounds in Tract 17-A is recommended. Only the two largest mounds should be used with the three smaller ones avoided. See sheet 9 in appendix 3 and figure 14.

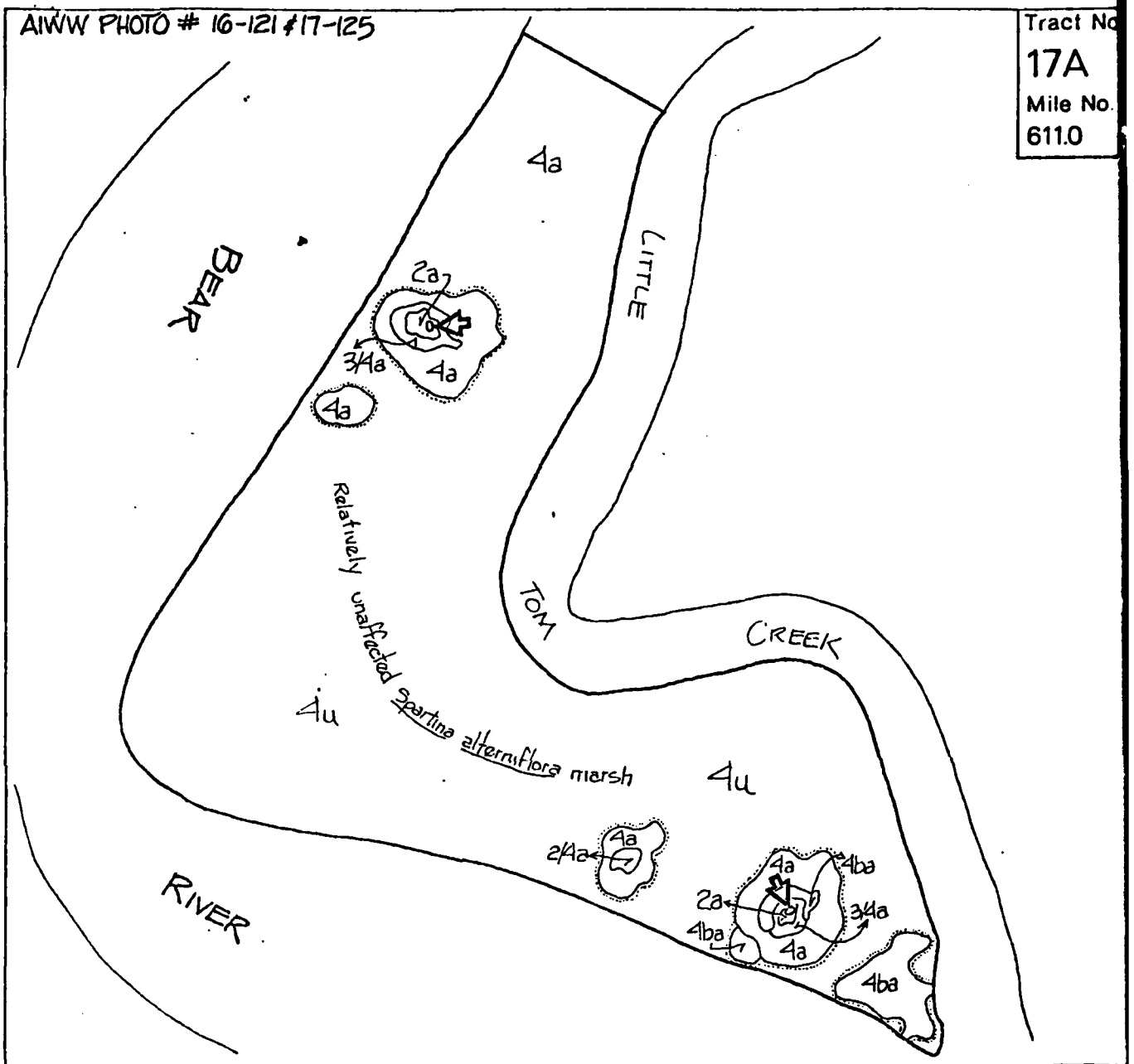
North Newport River.

The North Newport River connects St. Catherines Sound to Johnson Creek (mile 620 - 623.5). No major shoaling has occurred in this section of the waterway. However, maintenance was required in 1966 when about 67,000 cubic yards were removed near the mouth of Waldburg Creek and deposited into Tract 805 E-2. The Corps no longer holds easement rights to this tract. In view of the fact that the North Newport River may not require any further maintenance, no assessment of alternatives was undertaken. If dredging is required, the material should be handled in the same manner as Johnson Creek, below.

Johnson Creek.

Johnson Creek (mile 623.5 - 629) experiences only spot shoaling and it has been dredged on only two occasions. Approximately 797,000 cubic yards were removed. It is estimated that 360,000 cubic yards will be removed over the next 50 years.

1. Construction of Diked Area in Existing Disposal Tracts or Construction of New Dikes Upland Area. (See sheet 11 in appendix 3). As shown in table 11, a diked area would require between 23 - 57 acres with dike heights between 10' - 26'. Tract 19-A (97.8 acres) is large enough to hold this diked area which could be constructed around the 26 acres of dredged material deposits in the northern portion of the tract. Tract 20-A (71.9 acres) is also available, however, only one 13.2-acre deposit is located in the southern portion of the tract. Construction of a diked area in this tract would have much greater impacts on the adjacent unaffected Spartina alterniflora wetlands than use of Tract 19-A. Tract 21-A (34.6 acres) and Tract "C" (60 acres) are also situated along Johnson Creek, however, they show only slight evidence of ever having been



Tract No.	Description & Management Practice:
17A Acreage 244.7	Spoil sites are predominately sand flats with few grasses and Sea Ox-Eye in center of each. Spartina alterniflora marsh in center and along Little Tom Creek should remain unspoiled for the next 10 dredging cycles. Outfall sites are shown

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 14

Table 11

JOHNSON CREEK

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

Pumping costs to tracts presently located along the waterway are as follows:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS ST. CATHERINEST	DIKE COST HARRIS NECK	DISPOSAL AREA ACREAGE
10	49.50	$236,821	-	-	56.92
14	29.70	282,769	$379,931	$378,582	37.25
10	21.2	324,725	472,158	470,906	29.17
22	16.50	364,039	599,428	598,176	24.97
26	13.50	401,655	730,290	724,431	22.53

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 20-A	$8,818	1,000'	91.9
Tract 19-A	9,367	6,200'	97.8
Tract 21-A	9,134	4,000'	34.6
"C"	9,293	5,500'	60.0
Overbd. N. Newport R.	12,622	13,200'	-

Pumping costs to upland disposal areas at the following locations are as follows

Location	Cost	Distance
St. Catherine Isl.	$22,017	3,500'
Harris Neck	238,620	27,000'

Present pumping cost would be $7,296/annually to maintain a 12' channel.

used and should be avoided. A diked upland site could be located on the mainland. However, because of the diking costs ($378,582 - $724,431), the increased pumping costs ($238,620 compared to about $9,000) and the destruction of 23 - 57 acres of wildlife habitat, a diked area should be located in Tract 19-A if one was constructed.

2. Open Water. Material from Johnson Creek is mostly mud and there are no suitable open water sites in the vicinity of Johnson Creek.

3. Reuse of Material, Beach Nourishment. Unsuitable material.

4. Continued Undiked Disposal in Tracts 19-A, 20-A, 21-A and "C". The material can be discharged onto existing deposits in these four undiked areas.

Summary and Recommendations.

Although a diked area could be constructed in Tract 19-A, the costs of constructing dikes and the associated impacts to adjacent wetlands is not warranted in view of the anticipated maintenance requirements. Johnson Creek has been dredged on only one occasion since 1943. Although it is estimated that 360,000 cubic yards of material will be removed from this portion of the waterway over the next 50 years, it may require no dredging. If maintenance is required, then the material should be deposited on the existing mounds in Tract 19-A and 20-A as shown in figures 15 and 16. Tracts 21-A and "C" should not be used.

Front River.

The next section of the AIWW that has required dredging is Front River (mile 639.25 - 640.5). About 82,000 cubic yards was removed during two dredging cycles in FYS 43 and 44. Since it has not required maintenance in 40 years, no alternative analysis was conducted for Front River. If dredging is ever required, the material should be deposited in the same manner as that removed from Creighton Narrows.

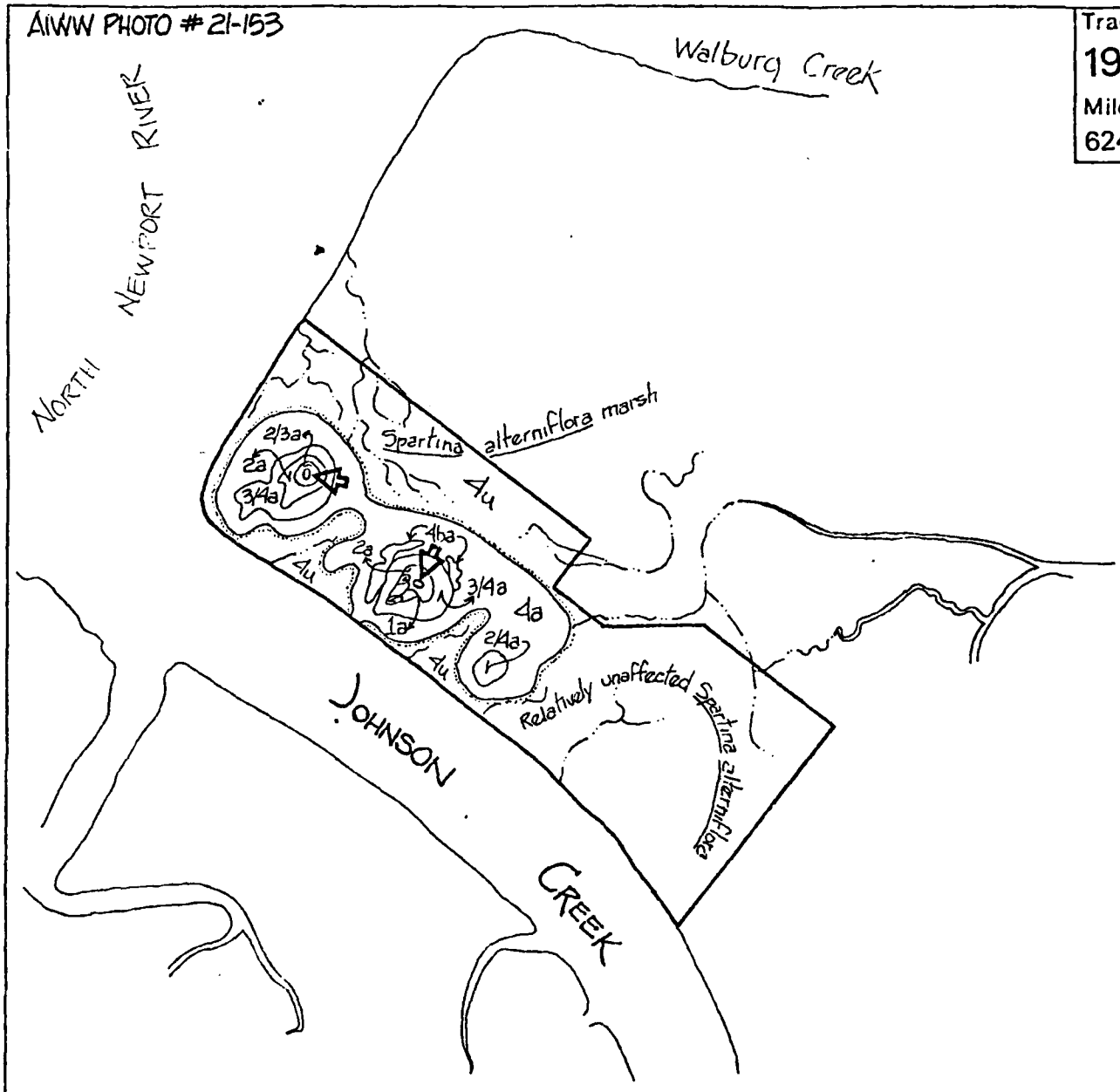
Creighton Narrows.

Creighton Narrows (mile 640.5 - 643) has one of the heaviest maintenance requirements of any section of the waterway. Approximately 2.9 million cubic yards of mud and silt have been dredged and deposited into adjacent undiked disposal tracts. It is projected that about 6.7 million cubic yards of material would be removed over the next 50 years if a 12' channel is maintained.

1. Construction of Diked Area in Existing Disposal Tracts or Construction of New Upland Site. (See sheet 14 in appendix 3). Tracts 24-A (128.6 acres), 25-A (104.2 acres), 25-C (133.8 acres), 25-E (43.13 acres) and 26-A (31 acres) are available for disposal. As shown in table 12, a diked area would require a minimum area of 189 acres provided it was feasible to build an area with 26' high dikes. Construction of a large diked area would require extending the easement to either Tract 24-A, 25-A or 25-C or construct two smaller areas in two of the tracts. As shown on figures 17 - 20, most of the Spartina

AIWW PHOTO # 21-153

Tract No.
19A
Mile No.
624.0



Tract No.	Description & Management Practice:
19A Acreage 97.8	Few scattered trees of Red Cedar and Live Oaks with small perimeter of shrubs and sand flat. The relatively unaffected area occupied by Spartina alterniflora should be avoided and preserved.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

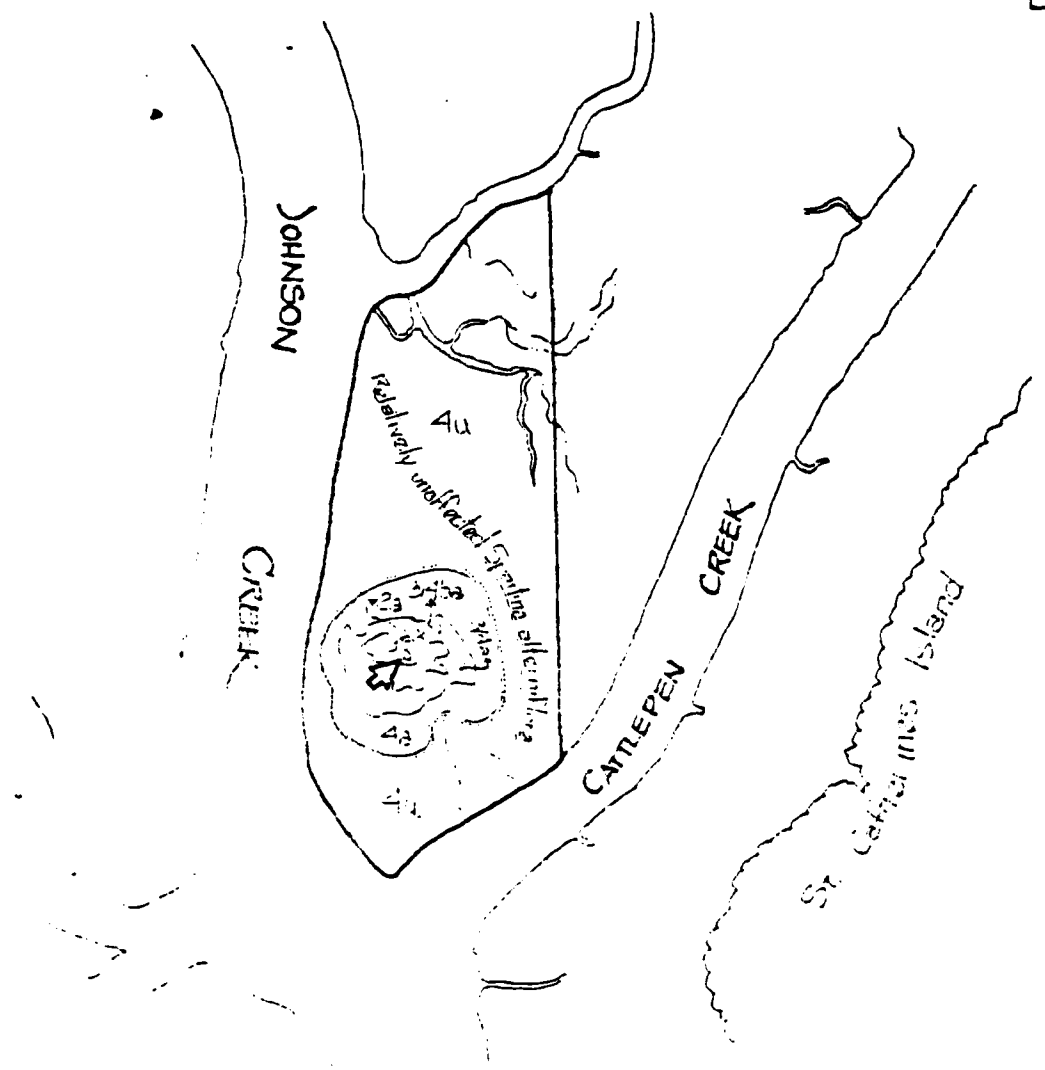
Scale: 1:10,000 (0, 500', 1000', 2000')

north

FIGURE 15

AIWW PHOTO #21-155

Tract N
20A
Mile No
625.0



Tract No	Description & Management Practices
20A Acreage 71.9	Disposal site without trees. Small shrub border and large sand flat. Continued use of center and middle of flat recommended.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

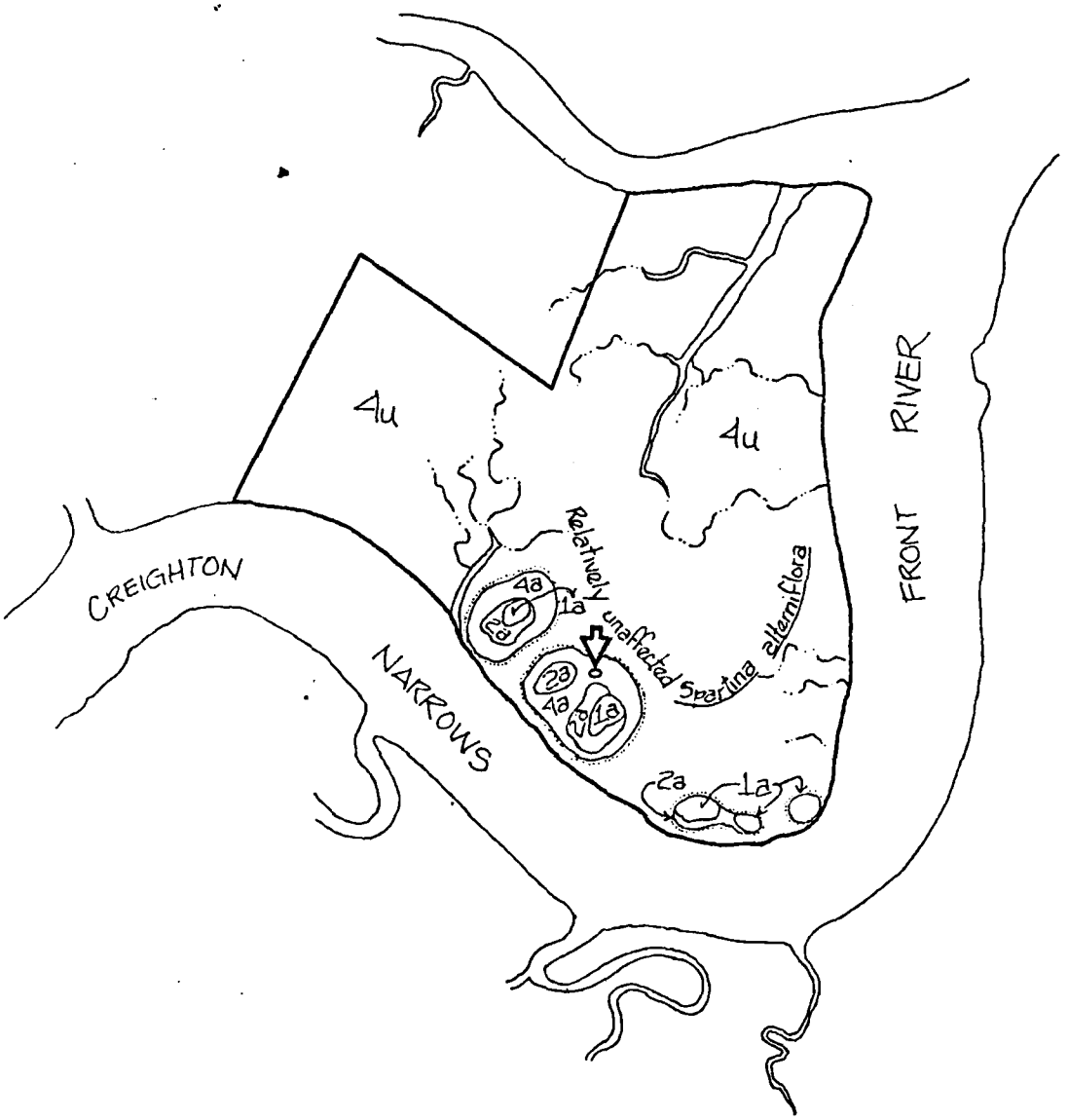
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July, 1980 Scale 1:10,000 0 500' 1000' 2000' north

FIGURE 16

AIWW PHOTO #24-188

Tract No
24A
Mile No.
641.0



Tract No.	Description & Management Practice:
24A Acreage 128.6	This has some ballast rock islands from the sailing and timber days of the last century. Disposal recommended away from ballast islands and AIWW. Northern and Central portion of the easement is "deep" Spartina marsh.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 17

Table 12

CREIGHTON NARROWS

The following dike heights and their associated areas will provide a 50 year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS CREIGHTON I	DISPOSAL AREA ACREAGE
10	587.10	$805,629	-	612.27
14	352.25	955,338	$1,783,856	377.63
18	251.60	1,284,235	1,941,148	278.18
22	195.69	1,210,572	2,230,073	223.62
26	160.10	1,323,812	2,546,069	189.44

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 25-A	$103,425	800'	104.2
Tract 25-C	106,529	3,300'	133.8
Tract 25-E	166,064	8,000'	43.13
Tract 24-A	168,392	9,500'	128.6
Tract 26-A	167,616	9,000'	31.0

Pumping costs to upland disposal areas at the following location are as follows:

Location	Cost	Distance
Creighton Isl.	$144,371	5,000'

Present pumping cost would be $94,598/annually to maintain a 12' channel.

alterniflora marsh remains unaffected in these tracts. Also, the deposits are spread throughout the tracts, and the tracts are traversed by numerous finger streams. Any dike construction would have extreme adverse impacts on the remaining wetlands and small tidal creeks. A upland diked area could be constructed on Creighton Island. However, this would result in the destruction of a significant amount of wildlife habitat, and Creighton Island is especially sensitive from a cultural resource standpoint.

2. Open Water. The dredged material could be discharged into slack water in Mud River in an attempt to establish substrate for possible marsh development. However, this would involve discharging large quantities of mud and silt into a relatively narrow waterway. There are also numerous oysterbeds throughout this section of the waterway.

3. Reuse of the Material, Beach Nourishment. Mud and silt; unsuitable.

4. The material could be discharged onto existing deposits in Tracts 24-A, 25-A, 25-C, 25-E or 26-A.

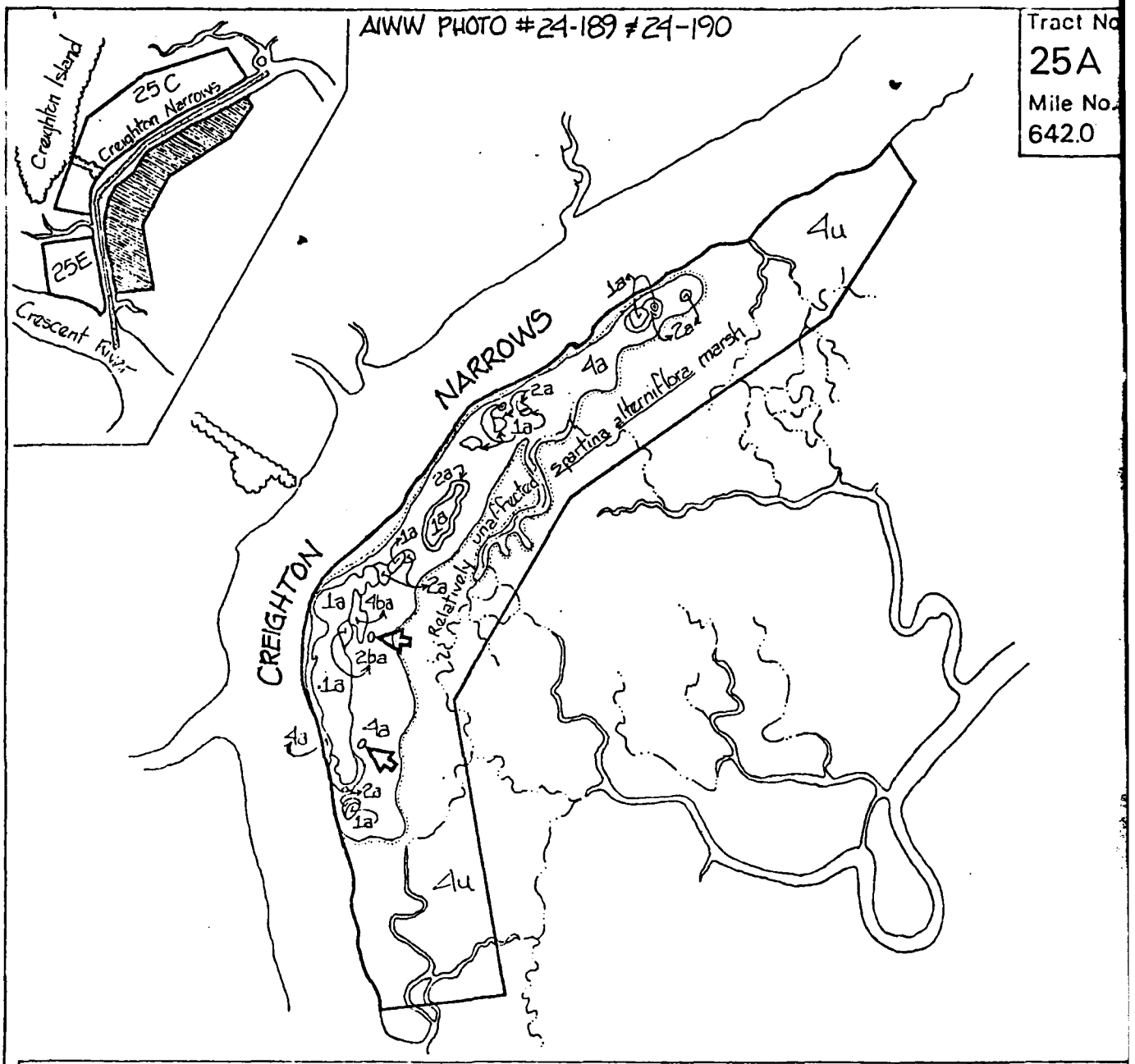
Summary and Recommendations.

Tract 24-A (128.6 acres) has received only small amounts of dredged material. Only about 7 percent of the wetlands have been impacted, and it should not be used. About 41 percent of Tract 25-A has been impacted by dredged material. Extensive oysterbeds are located in Eagle Creek east of the tract. This tract should not be used if at all possible. About 42 percent of Tract 25-C has been altered by dredged material. Undiked disposal of dredged material should be continued as recommended by the DNR (figure 19). Tract 25-E should also be used since it has already been heavily impacted by dredged material disposal (figure 20).

Construction of diked areas within existing easements is not recommended because of destruction of remaining wetlands and tidal creeks. Because of the huge quantities of dredged material expected over the next 50 years, continued undiked disposal of dredged material into undiked Tracts 25-C and 25-E will gradually result in further encroachment upon unaffected wetlands and finger streams. Marsh areas outside of the easements may also be adversely impacted if finger streams are closed off. Consequently, funds should be provided to initiate a study of constructing a diked area on Creighton Island to handle the dredged material. Such a study would examine the biological and cultural resources on Creighton Island as well as examine the technical feasibility and acquisition possibilities of establishing a diked area on the island.

Old Teakettle Creek.

Old Teakettle Creek (mile 643 - 648) has required dredging once since 1943. This stretch of the waterway will probably not require any maintenance over the next 50 years. Should dredging become necessary, Tracts 27-A and 27-B should not be used. The material should be disposed of in the Creighton Narrows disposal areas.



Tract No.	Description & Management Practice:
25A Acreage 104.2	Series of low cedar hammocks, some of which are quite mature. With heavy siltation at this nodal point and with Cedar Point navigation project it is recommended that this site be monitored more carefully than any other except Jekyll River.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

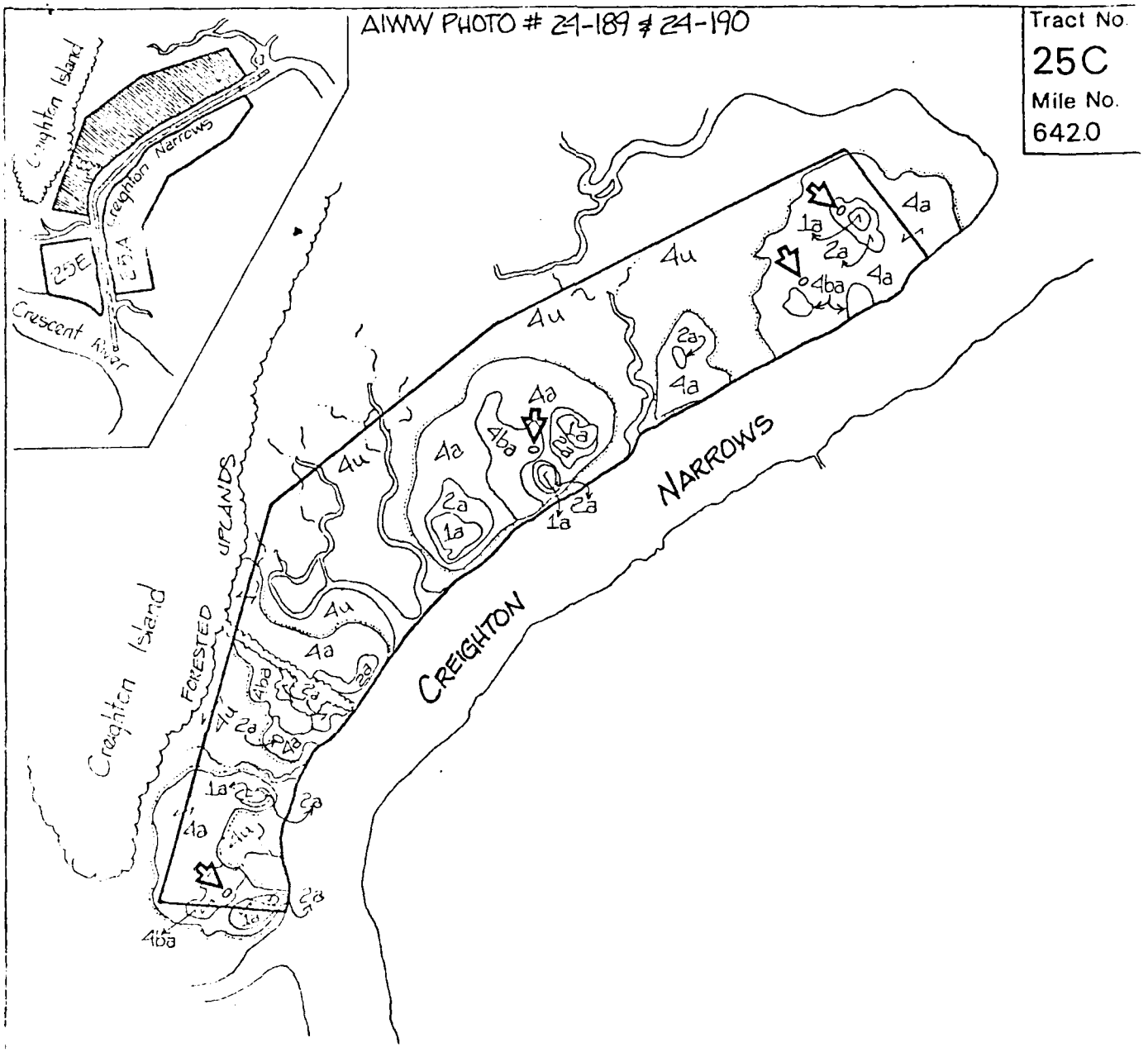
GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500′, 1000′, 2000′)

north

FIGURE 18

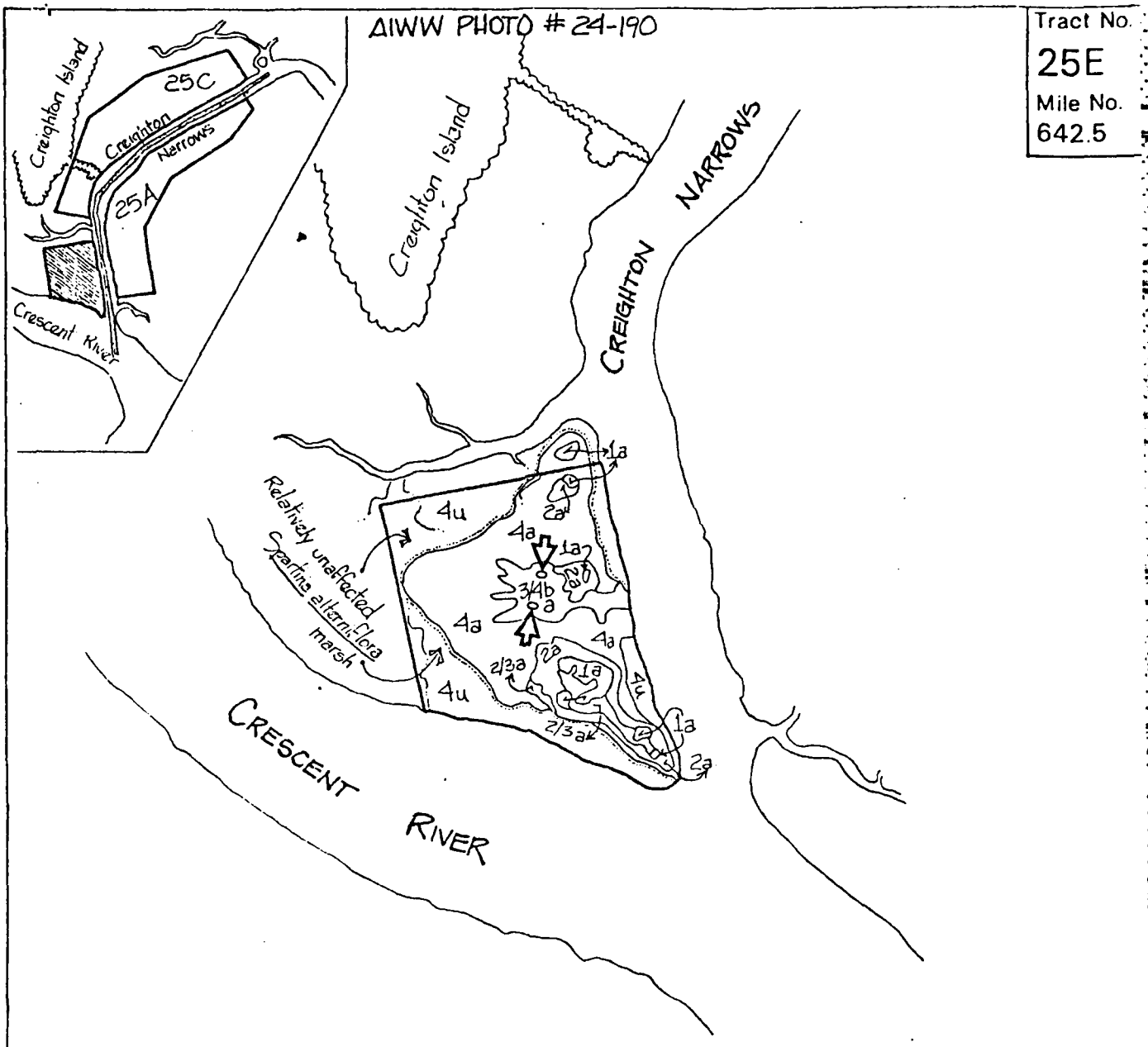


Tract No.	Description & Management Practice:
25C Acreage 133.8	Recommended sites shown above will preserve the diversity and maturity of the existing hammocks which have mature forests. Caution should be exercised in the southernmost outfall location to avoid the small creek and easement boundary.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1 10,000 0 500' 1000' 2000' north **FIGURE 19**



Tract No.	Description & Management Practice:
25E Acreage 43.13	Caution should be exercised on the very southern tip as NOS has installed 5 tidal bench marks on the island near AIWW marker # 156. The number of the westernmost bench mark is 4975E. Preferred spoil location shown above.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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Scale 1:10,000 0 500' 1000' 2000'

north

FIGURE 20

Doboy Sound.

The AIWW crosses Doboy Sound for about 2 miles, (mile 648 - 650), however, the shoaling is restricted to a small part at mile 649.5. About 900,000 cubic yards have been removed since construction of the 12' channel. It will be necessary to dredge about 6,250,000 cubic yards to maintain the channel for the next 50 years. As shown in table 13, establishment of a new diked area would take between 246 - 801 acres depending on the dike height, and costing between 1 - 3 million dollars. This loss of wildlife habitat would result in greater impacts than continued open water disposal of the dredged material (mud and silt) from Doboy Sound. The length of time between dredging cycles allows benthic communities to reestablish their populations at this site. The mudflats at this open water site remain a viable part of the estuarine ecosystem even though it is used as a dredged material disposal site. If a diked area were constructed for Doboy Sound, all habitat within that area would be destroyed. Tract 28-A is also available for disposal. However, this tract has never been disposed in and is located close to the University of Georgia Marine Institute on Sapelo Island. This site should definitely not be used. It is recommended that the material from Doboy Sound continue to be disposed of at the open water site next to Commodore Island avoiding the tidal creek as requested by the Georgia DNR. (See figure 21 and sheet 15 in appendix 3).

North River, Rockdedundy River Crossings.

The next shoaling area along the AIWW occurs at the North River and Rockdedundy River Crossings between miles 651.7 and 652.7. Approximately 205,000 cubic yards have been remvoed from the vicinity of the North River Crossing and almost 1,000,000 cubic yards around the Rockdedundy Crossing. Strangely, nearly all of the material dredged from the Rockdedundy Crossing was removed between 1942 - 1949 and only one maintenance dredging has been required for almost 35 years. It is estimated that about 430,000 cubic yards of material will be removed over the next 50 years from this vicinity.

1. Construction of a Diked Disposal Within Existing Easements or a New Upland Diked Area. (See sheets 15 and 16 in appendix 3). As shown in table 14, a diked area would require about 43 - 121 acres with dike heights ranging between 10 - 26 feet. Tracts 29-A (158.3 acres), 29-B (120 acres), 29-C (92.6 acres) 29-D (65.9 acres) and 30-A (230.1 acres) are all available as sites for diked area construction. As shown in figure 22, very little (12.1 percent) of Tract 29-A has been impacted. All of the impacted areas are not concentrated but spread throughout the tract. Construction of a diked area in this tract would result in significant destruction of unaffected Spartina alterniflora marsh. The deposits in Tract 29-B (figure 23) are concentrated in an area comprising about 40 acres. A diked area could be constructed around the existing deposits with little encroachment upon the adjacent wetlands provided the dikes could eventually be raised to 26'. The deposits in Tract 29-C (figure 24) are also concentrated in 53 acres. Tract 29-D (figure 25) has never been used and a diked area should not be placed here. The deposits in Tract 30-A (figure 26) are essentially concentrated in the northern half of the tract in an area of about 90 acres. Based on the above, diked areas could be constructed in Tracts 29-B, 29-C or 30-A. A diked upland area could be established on the mainland, however, the closest site is almost 5 miles away.

Table 13

DOBOY SOUND

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS MAINLAND	DISPOSAL AREA ACREAGE
10	780.00	$926,373	-	800.81
14	468.00	1,100,095	$2,177,373	497.20
18	334.29	1,253,326	2,322,060	364.85
22	260.00	1,392,515	2,633,404	292.03
26	212.73	1,522,255	3,042,333	246.39

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 28A	$103,904	5,500'	155.6
Commodore Isl.	98,426	2,000'	-
Overboard	156,560	7,000'	-
Light House Creek	158,240	8,000'	-

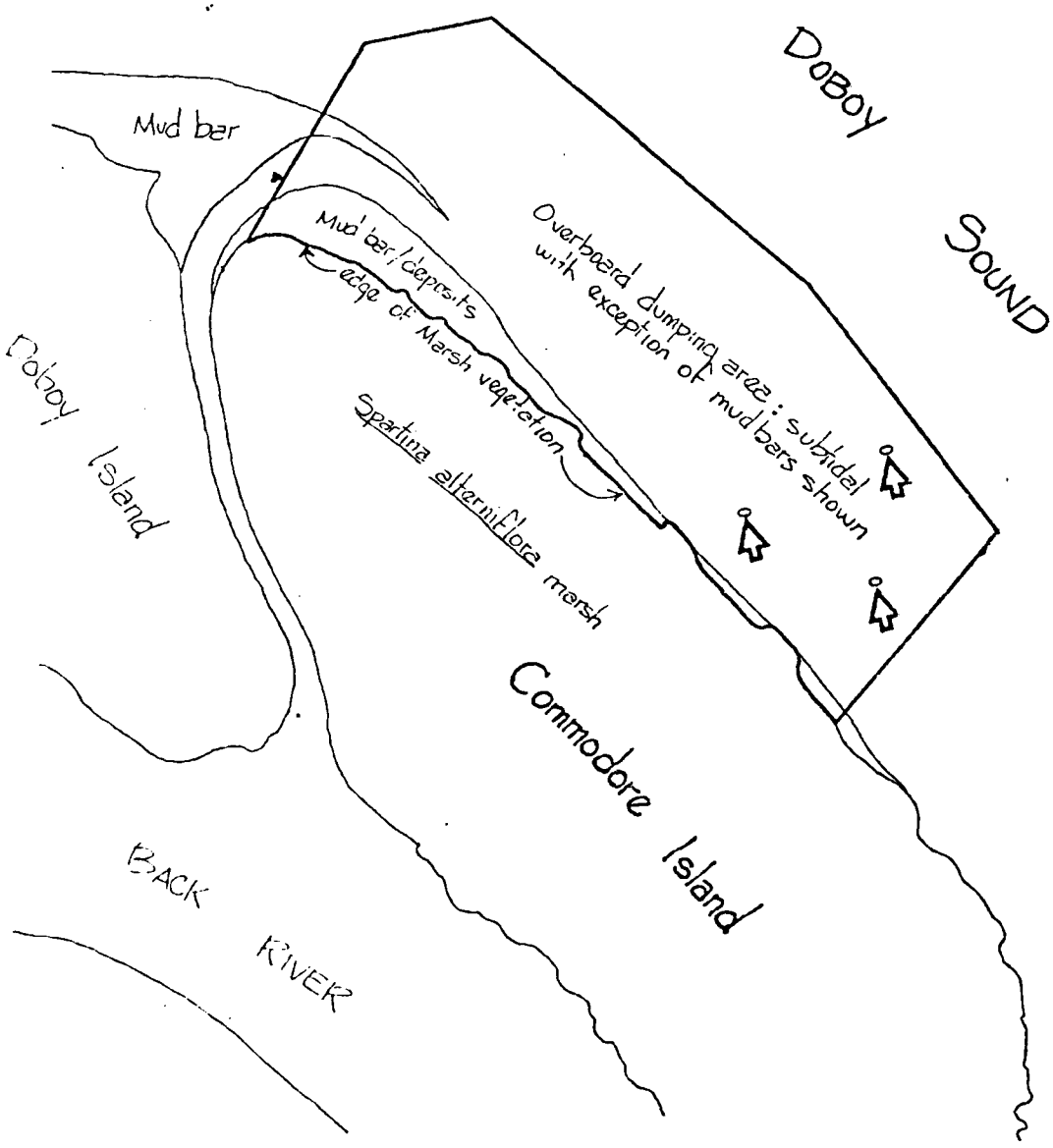
Pumping cost to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Mainland	$71,369	24,000'

Present pumping cost would be $89,208/annually to maintain a 12' channel.

AIWW PHOTO #26-206

Tract No.
Dumping
Area 28
Mile No.
649.5



Tract No. Dumping Area 28 Acreage Open Water	Description & Management Practice: Overboard site. Disposal should avoid mouth of creek in sound seperating Doboy Island from Commodore Island.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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FIGURE 21

Table 14

NORTH RIVER,

ROCKDEDUNDY, RIVER CROSSINGS

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS MAINLAND	DISPOSAL AREA ACREAGE
10	110.33	$351.481	-	121.23
14	60.20	418,428	$604,546	77.29
18	47.29	478,906	726,434	58.99
22	36.78	534,716	885,234	49.15
26	30.09	587,627	1,070,609	43.21

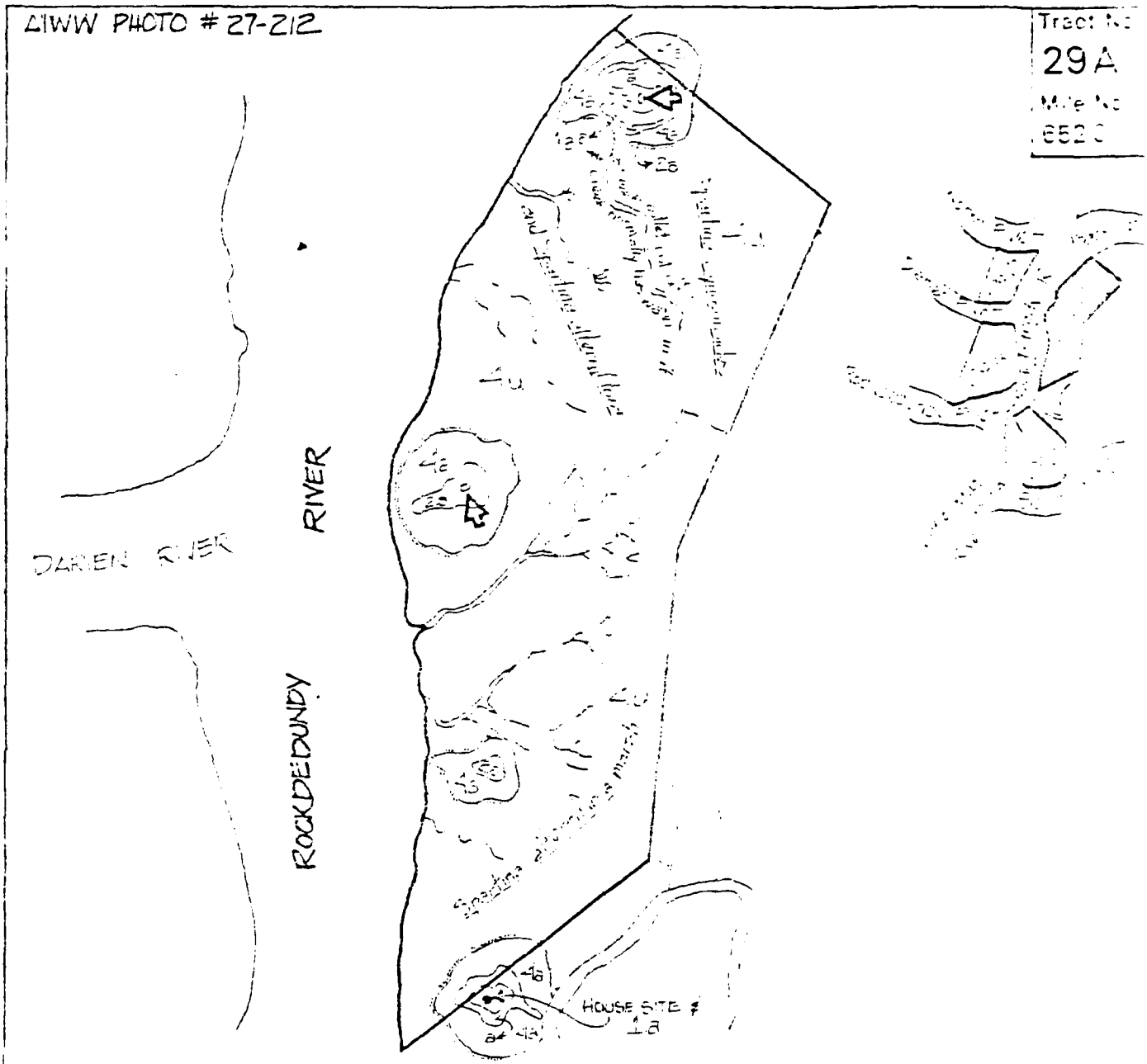
Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 29-A	$8,946	2,000'	158.3
Tract 29-B	8,829	1,000'	120.0
Tract 29-C	9,122	3,500'	92.6
Tract 29-D	9,298	5,000'	65.9
Tract 30-A	9,248	5,000'	230.1
South River	23,843	18,000'	-
Overboard	23,452	16,000'	-

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Mainland	$232,671	24,000'

Present pumping cost would be $7,306/annually to maintain a 12' channel.



Tract No.	Description & Management Practices
29A Acreage 158.3	Preferred outfall in the center or middle of both northern upland areas. No distinct or valuable upland habitat at these sites. Creeks to south of each upland should be avoided. House site should be avoided all together.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

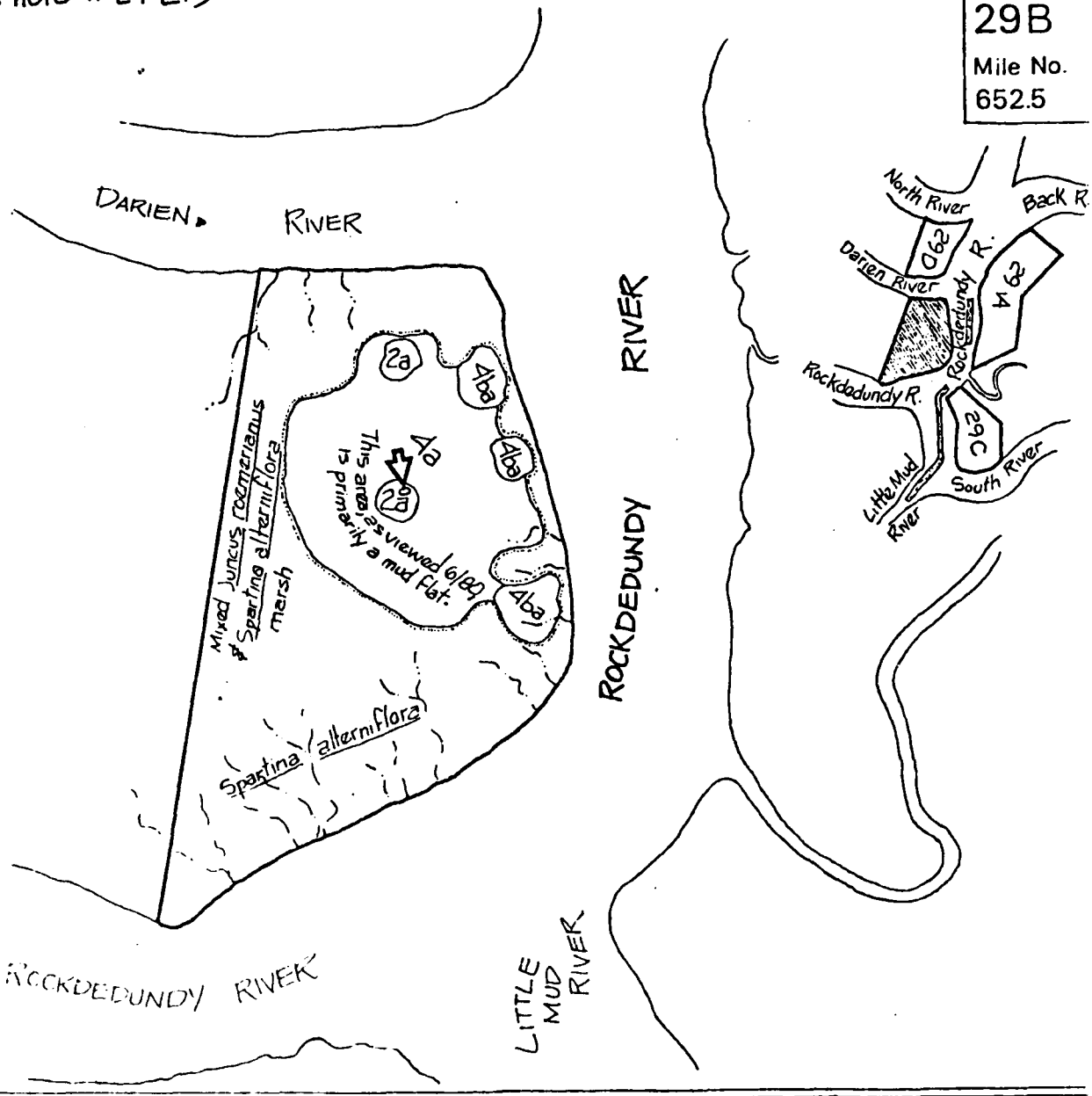
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date July 1980 Scale 1:10,000 0 500' 1000' 2000' north

FIGURE 22

AIWW PHOTO # 27-213

Tract No.
29B
Mile No.
652.5



Tract No.	Description & Management Practice:
29B Acreage 120.0	Use of disposal sites along and adjacent to AIWW should be discontinued. This destroys productive stream side marsh. There is photographic evidence taken by helicopter during dredging which shows a significant portion of dredge material is returned directly to the waterway. Out-fall is located further to west.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

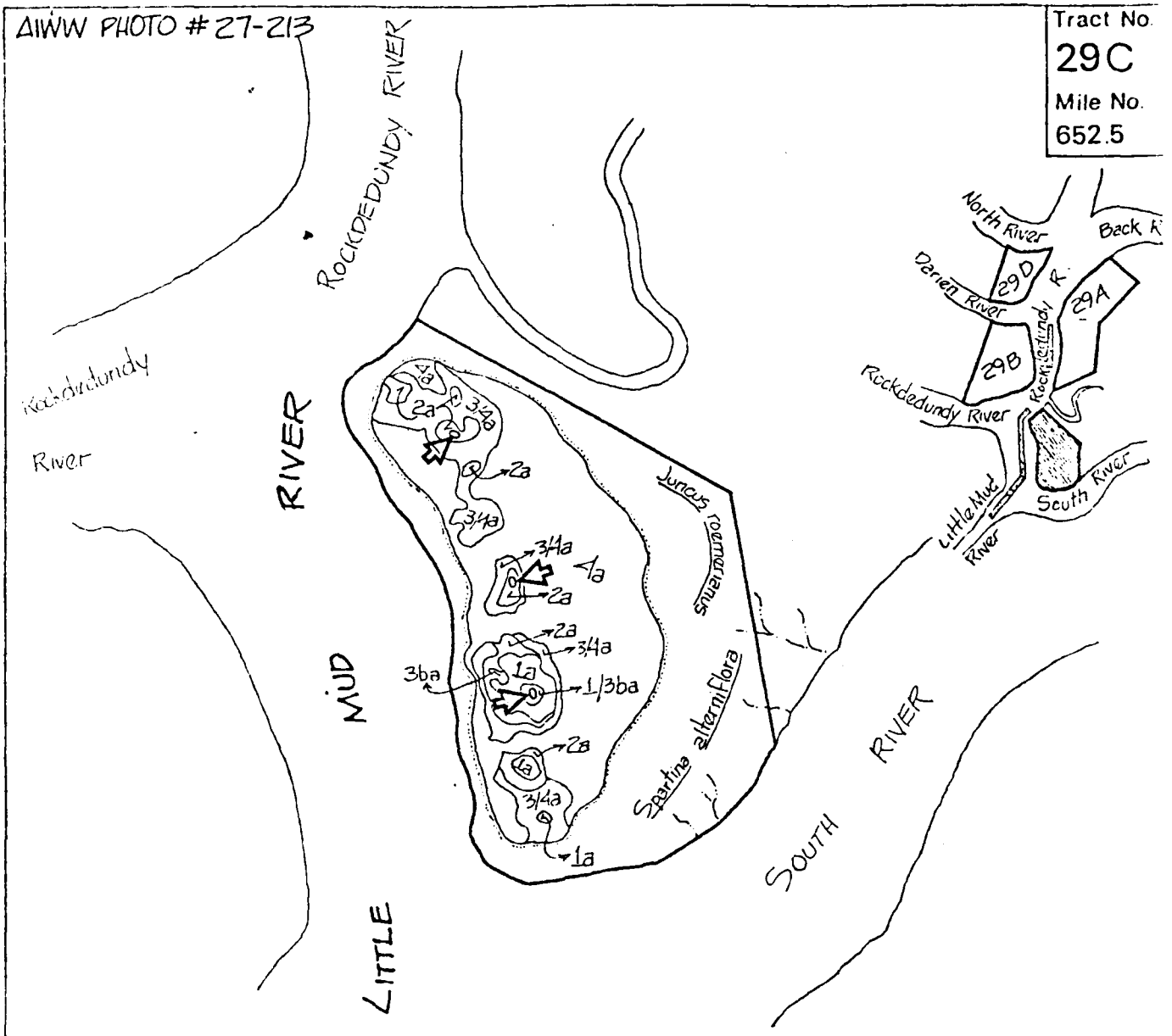
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 23



Tract No.	Description & Management Practice:
29C Acreage 92.6	Disposal shown above. Also possibility of spoiling behind northern and eastern end of islands (staying away from creek) to consolidate areas.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

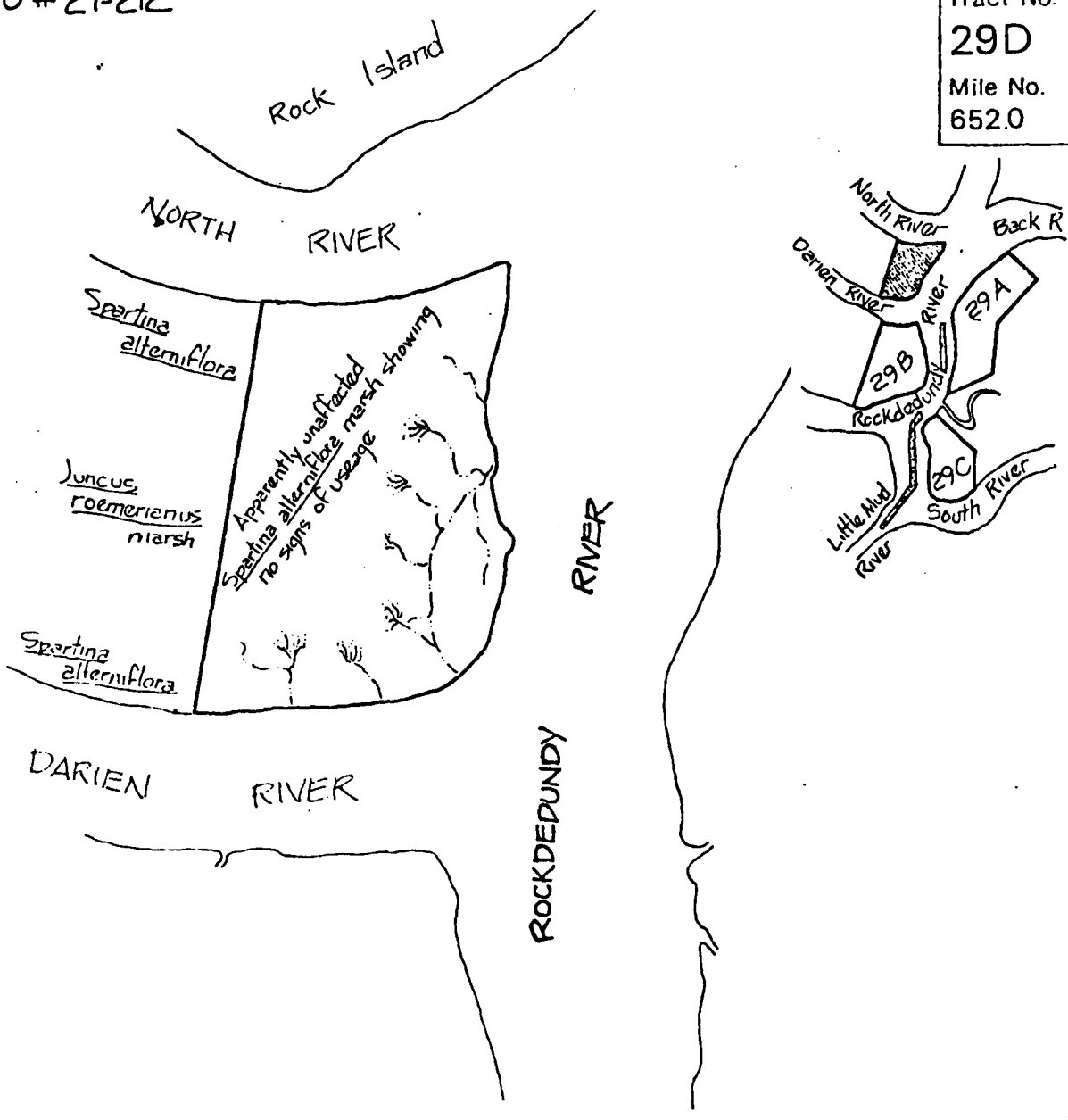
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 24

AIWW PHOTO # 27-212

Tract No.
29D
Mile No.
652.0



Tract No.	Description & Management Practice:
29D Acreage 65.9	This site should be used sparingly and held in reserve. Last disposal was in 1968.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

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Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 25

2. Open Water. The dredged material could be pumped back to open water used for Doboy Sound. Annual pumping costs would increase from about $9,000 to about $523,000.

3. Reuse of Material, Beach Nourishment. The material is almost entirely mud and is not suitable.

4. Continued Undiked Disposal in Existing Disposal Tracts. The material can be discharged onto existing deposits in Tracts 29-A, 29-B, 29-C and 30-A as recommended by the Georgia DNR. Tract 29-D has never been used and obviously should not be in the future.

Summary and Recommendations.

Even though a diked area could easily be constructed, the amount of material to be removed from the North River and Rockededundy River crossings does not warrant the costs asssociated with constructing a diked area. Continued undiked disposal can be used without significant impacts to adjacent wetlands provided Tracts 29-A and 29-D are not used and the material is discharged onto the existing large mounds in either Tract 29-B or 30-A. (figures 22-26).

South River.

Approximately one million cubic yards have been removed to maintain depths in the vicinity of the mouth of South River. Estimates indicate that about 1.8 million cubic yards will be removed over the next 50 years if the 12' channel is maintained to its authorized depth.

1. Construction of Diked Area in Existing Disposal Tracts or New Upland Diked Site. As shown in table 15, between 58 and 170 acres would be required to handle the maintenance material if a diked area were constructed. This area could be constructed around the existing deposits in Tract 29-C which consists of 53 acres or the deposits in Tract 30-A (90 acres). Upland disposal is not feasible because high ground is almost 5 miles away.

2. Open Water Disposal. The material could be discharged back to the open water disposal site in Doboy Sound (2.8 miles) or open water disposal site No. 32 in Altamaha Sound (2.5 miles).

3. Reuse of Material, Beach Nourishment. The material is mud and silt and not suitable for these purposes.

4. Continued Undiked Disposal. Tract 29-C is and Tract 30-A could be used for about the same pumping costs.

Summary and Recommendations.

In accordance with the policies of the DNR, the material should not be deposited in open water. A diked area could be constructed in Tract 29-C; however, preferably the use of this tract should be discontinued. A diked area could also be constructed in Tract 30-A. However, if this site were

Table 15

SOUTH RIVER CROSSING

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS DARIAN	DISPOSAL AREA ACREAGE
10	157.17	$418,764	-	170.20
14	94.30	497,957	$750,469	107.49
18	67.36	569,209	885,644	81.23
22	52.39	635,204	1,069,100	67.14
26	42.86	696,569	1,283,391	58.37

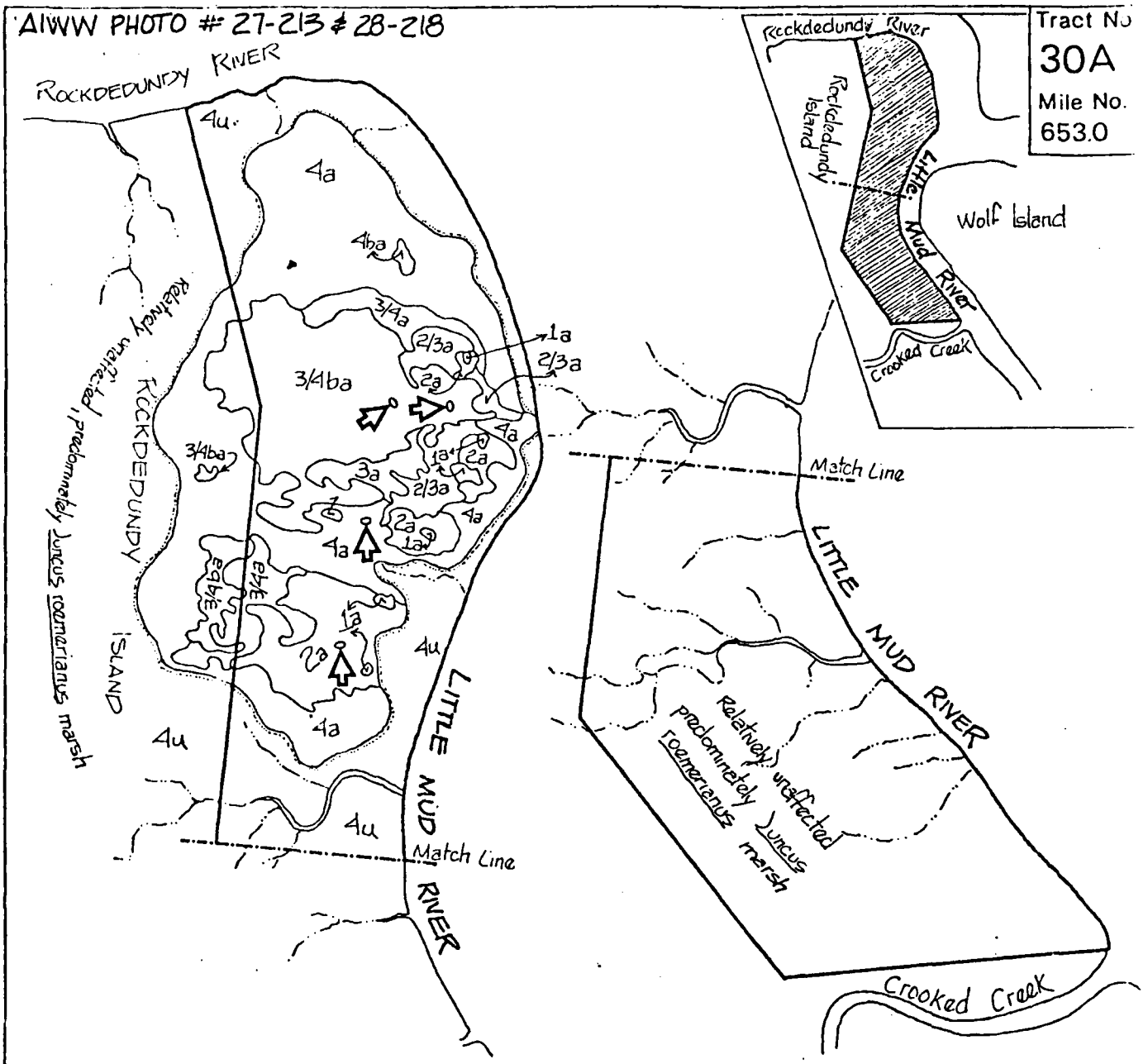
Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 29-C	28,662	2,000'	92.6
Tract 30-A	28,323	1,000'	230.1
Tract 30-B	24,171	3,500'	353.4
Tract 29-A	24,850	5,500'	158.3
Tract 29-B	29,341	4,000'	120.0
Overboard	76,464	14,500'	-
South River	47,261	12,000'	-

Pumping costs to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Darien	$352,332	25,500'

Present pumping cost would be $26,752/annually to maintain a 12' channel.



Tract No.	Description & Management Practice:
30A Acreage 230.1	Heavily impacted site with large area (designated 3/4 ba) with clay soil and mud cracks, these conditions make mosquito breeding possible. Continued dumping on this particular area would help alleviate the mosquito problem by elevating the low areas and filling the cracks.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 26

constructed, it should also be designed to handle the material from the North River and Rockdedundy River. This diked area would encompass approximately 100 acres provided the dikes could eventually be raised to 26'. However the substrate in this wetland area may be too unstable for this dike weight. Consequently, the diked area would have to be constructed over a larger area which would adversely impact the unaffected wetlands in Tract 30-A. Consequently, continued undiked disposal in Tract 30-A is recommended at this time. However, this site should be carefully monitored. If significant encroacnment from future disposal occurs, then a study should be conducted to determine the feasibility of constructing a diked area in Tract 30-A.

Little Mud River.

Little Mud River has one of the highest shoaling rates of any part of the AIWW. Almost 2.6 million cubic yards have been dredged since construction of the 12' channel. It is estimated that over 15 million cubic yards of dredged material will be removed over the next 50 years.

1. Construction of Diked Area in Existing Disposal Tract or New Upland Area. (See sheet 16 in appendix 3.) As shown in table 16, between 379 - 1273 acres would be required to handle the material. Construction of such an area would completely destroy all of the wetlands remaining in Tract 30-A (230.1 acres) as well as a significant amount outside the easement. Construction of an upland site would destroy between 379 - 1273 acres of wildlife habitat and require pumping the dredged material over 6 miles.

2. Open Water Disposal. The material could easily be pumped to open water disposal site No. 32 (1.3 miles) or open water disposal site No. 36 (1.9 miles). Suitable marsh development sites are also located in Altamaha Sound.

3. Reuse of Material, Beach Nourishment. The dredged material is entirely mud and silt.

4. Continued Undiked Disposal. The dredged material could be discharged onto the two large existing deposits in Tract 32-A or the large disposal mound in Tract 30-C.

Summary and Recommendations.

A diked area, whether in existing disposal tracts or upland, would impact between 379 -1,273 acres of habitat. If an upland site were selected, the pumping distance would be over 6 miles. The material from Little Mud River is entirely mud and silt and cannot be used for construction or beach nourishment purposes. Establishment of an open water site would impact a large area of bottom habitat in Altamaha Sound. Continued undiked disposal in Tract 32-A will result in gradual encroachment on the wetlands remaining in the tract.

Although continued undiked disposal in 32-A will impact additional wetland areas in the easement area, this adverse affect is not as detrimental as construction of a diked area for this portion of the waterway. If 26' dikes could be built to minimize the size of the site, all of Tract 30-A (230.1 acres) and all of Tract 32-A would be diked to provide sufficient capacity for

Table 16

LITTLE MUD RIVER

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS DARIAN	DISPOSAL AREA ACREAGE
10	1236.50	$1,167,271	-	1272.71
14	741.90	1,383,009	$3,045,409	779.08
18	529.93	1,574,779	3,137,288	568.26
22	412.17	1,748,789	3,478,468	452.40
26	337.22	1,910,338	3,958,515	379.49

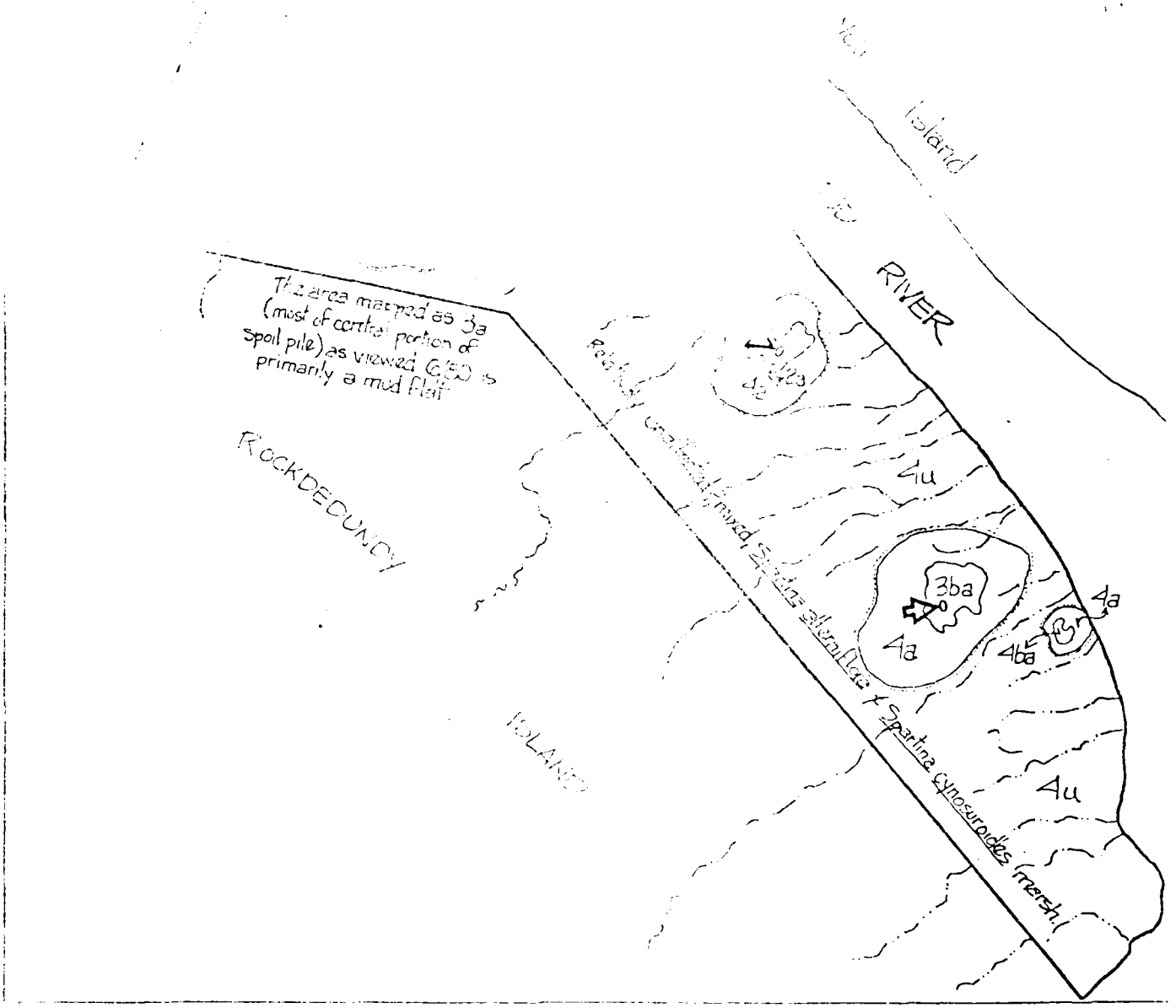
Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 30-B	$239,232	1,500'	353.4
Tract 32-A	243,504	3,000'	228.0
Tract 31-A	380,160	9,000'	80.9
Tract 31-B	383,680	10,000'	125.0
Tract 30-A	381,920	9,500'	230.1
Overboard	388,960	11,500'	-

Pumping costs to upland disposal areas at the following location are as follows:

Location	Cost	Distance
Darien	$2,039,700	33,000'

Present pumping cost would be $223,560/annually to maintain a 12' channel.



Tract No.	Description & Management Practice:
32A Acreage 228.9	Protection of finger-like creeks running perpendicular to Little Mud River and stream side marsh to be protected. As in 29B preferred disposal shown to the middle of previously impacted areas. Deltaic outwash from previous dredge spoil operations can be seen in Mud River.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 5000' 10000' 20000'

FIGURE 27

the next 50 years. All wetlands within the confines of the dikes would be immediately removed from tidal inundation and productivity. Undiked disposal will result in a gradual encroachment on the wetlands allowing most of the marsh to remain productive for many years. There is also the possibility that not all of the marsh would be destroyed. This is evidenced in many of the tracts along the waterway where large quantities of maintenance material (e.g. mud, silt) have been deposited over the last 40 years, yet much of the wetlands in the easement remain unimpacted.

Based on the above determinations, continued undiked disposal on the existing deposits in Tract 32-A is recommended (figure 27). However, this site should be closely monitored. If significant encroachment on the adjacent wetlands, especially those outside of the easement, becomes apparent then a study should be initiated to determine either the possibility of constructing a diked area in Tracts 30-A and 32-A or an open water site in Altamaha Sound with the idea of creating substrate suitable for marsh creation. If diking is to be employed, then the possibility of partially diking these areas and expanding the dikes as needed should be investigated. This would allow some of the wetlands to remain in a productive state.

Altamaha Sound.

Shoaling in the Altamaha Sound (mile 655.5 - 660) occurs between mile 655.5 - 656.5, 658 - 659, and 659.5 - 660. Almost two million cubic yards have been dredged and deposited in undiked disposal Tracts 34-A and 36-A. If the channel is maintained to 12' mlw, about six million cubic yards of dredged material will be removed over the next 50 years.

1. Construction of Diked Area in Existing Tracts or New Upland Sites. (See sheet 16 in appendix 3.) As shown in table 17, between 166 and 528 acres would be required for such an area. Tracts 31-A and 31-B are available for use in Altamaha Sound. However, Tract 31-A has not been used since 1969 and Tract 31-B has never been used. These tracts should be avoided. Tract 34-A contains only 80.9 acres and is not large enough for construction of the site. Tract 36-A (260.4 acres) is large enough; however, only about 60 acres divided between two large disposal mounds have been impacted from past dredging activities. If a diked area were constructed, all marsh within the confined area would be lost. The material could be pumped to an upland site on St. Simons Island (2.8 miles) or Broughton Island (6.2 miles). However, this proposal would destroy a significant amount of wildlife habitat and greatly increase pumping costs.

2. Open Water Disposal. Open water disposal Tracts 32 and 34 are located in Altamaha Sound; however, the DNR has requested that we not use them.

3. Reuse of the Material, Beach Nourishment. The material from Altamaha Sound ranges from silt to sand depending on the dredging location. The nearest upland where the suitable material could be made available is St. Simons Island (2.8 miles). The small amount of good material that could be deposited for reuse would not justify the increased pumping costs.

ALTAMAHA SOUND

The following dike heights and [illegible] associated areas will provide a 30-year capacity at the following [illegible] the following locations:

[illegible]	STORAGE ACRES	[illegible]	[illegible]	DIKE COSTS BROUGHTON I	DISTRICT ACRES
[illegible]	504.33	[illegible]	-	-	527.51
14	302.60	[illegible]	$1,605,090	$1,606,193	323.16
16	216.14	[illegible]	[illegible]	1,765,717	240.67
18	139.13	[illegible]	[illegible]	2,041,953	198.13
20	137.55	[illegible]	[illegible]	2,388,828	164.16

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
[illegible] 34-A	$[illegible],860	4,000'	80.9
[illegible] Overboard	[illegible]	[illegible]	-
24 Overboard	[illegible]	[illegible]	-
Tract 34-A	[illegible]	[illegible]	260.4
Tract 31-A	[illegible]	[illegible]	80.9
[illegible] 31-B	[illegible]	[illegible]	125.0

Pumping costs to upland disposal areas [illegible] following locations are as fol

Location	Cost	Distance
[illegible] Simons Isl.	[illegible]	[illegible]
[illegible] Broughton Isl.	[illegible]	[illegible]

[illegible] pumping cost would be [illegible] to maintain a 12' channel

4. Continued Undiked Disposal. The material can be discharged onto existing deposits in Tract 34-A and 36-A.

Summary and Recommendations.

Based on the diking requirements, continued undiked disposal is the recommended disposal alternative. The dredged material should be placed as recommended by the Georgia DNR (figures 28 and 29).

Buttermilk Sound.

Most of the shoaling in Buttermilk Sound (mile 660 - 665.5) is confined between miles 662 - 665 with the major problem occuring between 662 - 663. Maintenance has required the removal of about four million cubic yards since completion of the 12' channel. The dredged material has been deposited at numerous open water and undiked disposal tracts. If the AIWW is maintained to its authorized depth over the next 50 years, over 10 million cubic yards will be removed.

1. Construction of Diked Area in Existing Disposal Water or New Upland Site. (See sheet 17 in appendix 3.) Since the open water sites have been used for much of the material from Buttermilk Sound, most of the disposal tracts remain unaffected productive wetlands. Tract 42-B (65 acres) contains one disposal mound (18 acres) in its southern portion. Tract 43-B (176.6 acres) contains a small 8 acre deposit next to Buttermilk Sound. Tract 44-A (76.4 acres) has five mounds covering about 23 acres. Much of this impacted area is attributable to construction of the 12' channel and not maintenance. Tract 45-B is located at the southern end of the sound but has not been used for maintenance. The site does not contain deposits from a land cut constructed in the 1940's. As shown in table 18, a diked upland area would require between 513 and 1,742 acres.

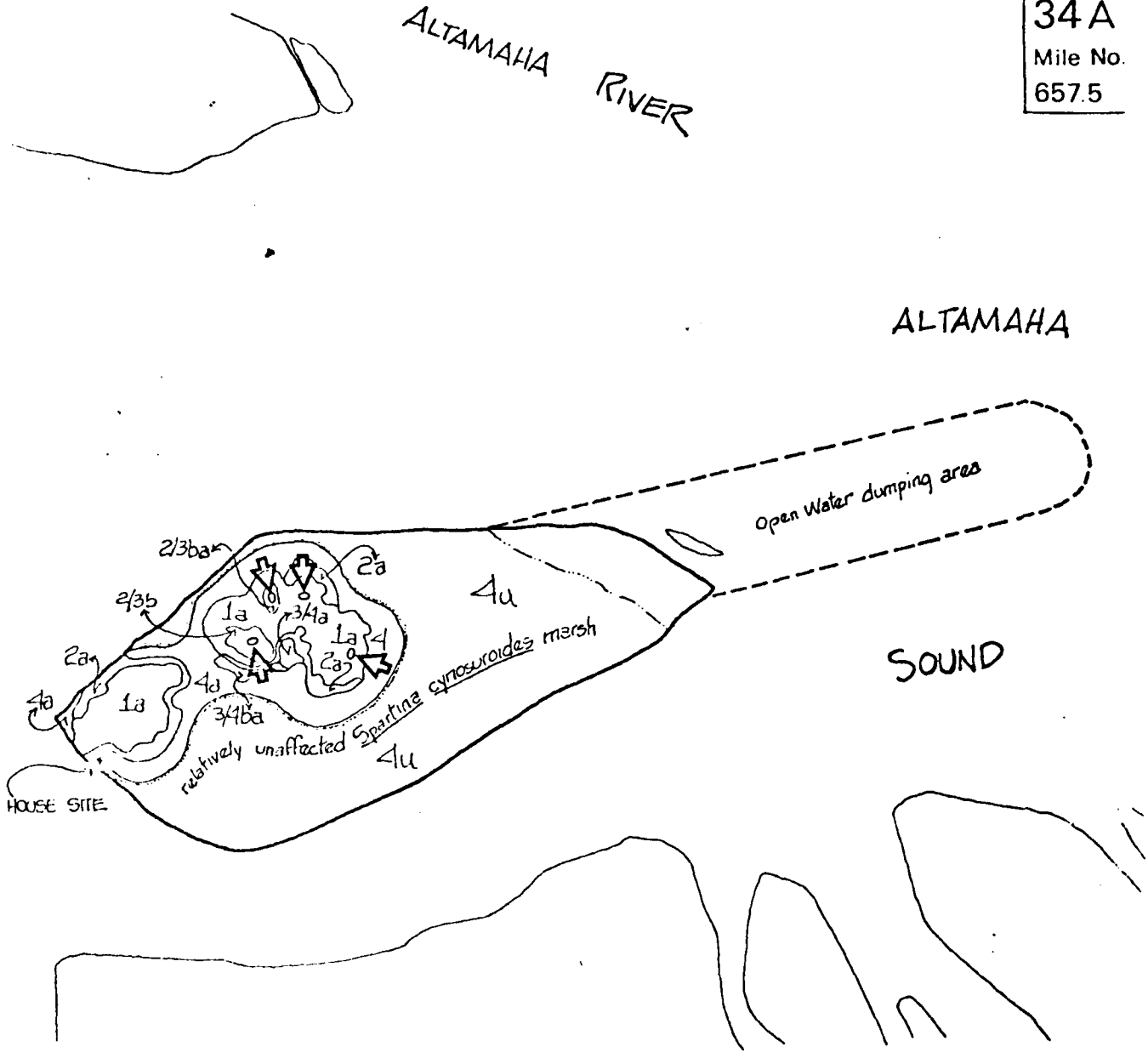
2. Open Water. A portion of the maintenance material has been deposited at open water sites next to Tract 42-C, site No. 42, No. 43 and No. 44. The open water site next to Tract 42-C can be used for maintenance of the upper part of the sound. Substrate has built up next to Tract 42-C and new marsh growth is noticeable. Open water site No. 42 is an experimental marsh development site. It should not be used unless for further experimentation purposes. Substrate also seems to be building in open water sites No. 43 and No. 44. Marsh will probably eventually establish at these locations also. Although not a designated disposal site, a large shallow open water ares is located just past the mouth of the South Altamaha River. This area has excellent potential as a possible marsh development site.

3. Reuse of the Material, Beach Nourishment. Like Altamaha Sound, the sediments in Buttermilk Sound varies from silt to sand. The small amount of useful material that will be removed would be too expensive to pump to an area where it could be used for construction purposes or beach nourishment.

4. Continued Undiked Disposal. Tracts 42-C, 42-B, 43-B, 44-A and 45-B are available for dredged material disposal.

AIWW PHOTO # 32-249

Tract No
34A
Mile No.
657.5



Tract No.	Description & Management Practice:
34A Acreage 80.9	Extremely complex vegetative cover. The older, mature site on the western end is forested and has a house (now burned). Eastern portion of site was spoiled on last dredging cycle. A large field of dog fennel, dead willows and Hercules Club has grown up. This latter site should be used rather than the open water site.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

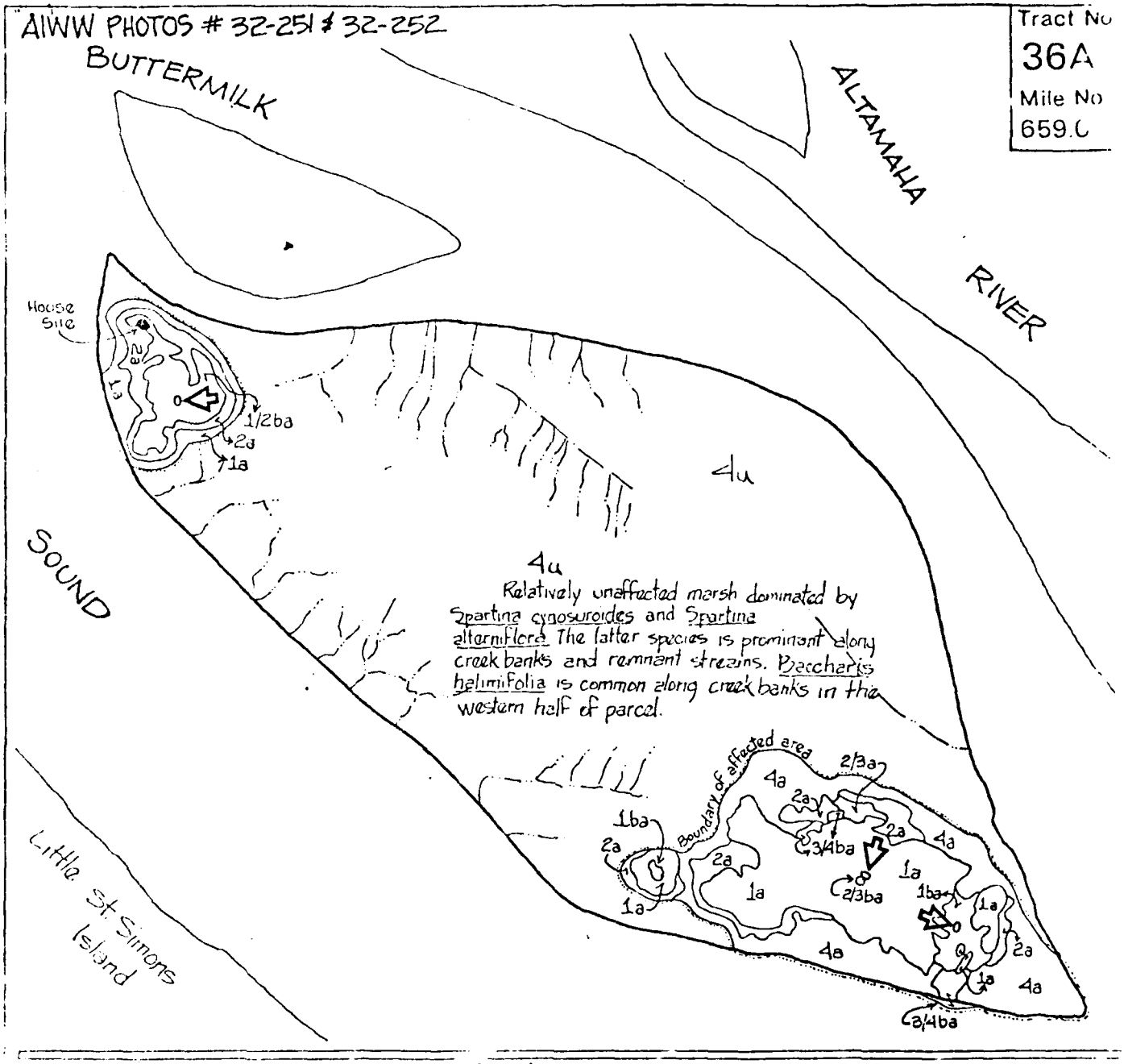
GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 (0, 500', 1000', 2000')

north

FIGURE 28



Tract No.	Description & Management Practice:
36A Acreage 200.4	It is recommended that both sites continue to be used. Island has squatters who graze goats and cows. Disposal on the island is to be preferred to nearby overboard spoiling.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. DNR. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980

Scale: 1:10,000 0 500' 1000' 2000'

FIGURE 29

Table 18

BUTTERMILK SOUND

Present pumping cost would be $163,308/annually to maintain a 12' channel.

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS BROUGHTON I	DISPOSAL AREA ACREAGE
10	1699.67	$1,367,880	-	1742.17
14	1019.80	1,620,288	$3,869,002	1062.82
18	728.43	1,844,232	3,890,605	773.20
22	565.55	2,045,533	4,236,796	612.66
26	463.55	2,236,064	4,772,533	513.18

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract 42-B	$280,206	11,000'	65.0
42 OverPoard	274,130	9,000'	-
43 Overooard	178,188	6,000'	-
Tract 43-B	180,606	7,000'	176.4
44 Overooard	179,397	6,500'	-

Pumping cost to upland disposal areas at the following locations are as follows:

Location	Cost	Distance
Broughton	$355,396	9,000'

Pumping costs to beach nourishment areas are as follows:

Location	Cost	Distance
Sea Island	Cannot be determined. This distance would require eight boosters. We cannot determine pumping costs for distances requiring more than 3 boosters.	62,000'

Summary and Recommendations.

A diked area should not be constructed because of the significant adverse impacts associated with the establishment of such a large area. Material from the northern part of the sound should continue to be discharged adjacent to Tract 42-C (figure 30) avoiding the marsh island. Material from the middle of the sound should continue to be placed on the large sand deposit in the southern portion of Tract 42-B (figure 31), as well as open water sites 43 and 44 (figures 33 and 34). The Corps of Engineers and DNR should investigate a marsh growth site in the large shallow area just past the mouth of the South Altamaha River. Material dredged from the southern portion of the sound should be pumped back to these areas also. Tracts 43-B, 44-A, and 45-B should not be used.

Mackay River (Mile 665.5 - 676)

Mackay River has not required dredging since Fiscal Year 1946. Although eight disposal tracts are located along Mackay River, only two show slight evidence of having ever been used. If dredging were ever required, it would probably be only a minimal amount that could be put in Tract 46-A or 49-A depending where the dredging was required. Currently, the AIWW switches to Frederica River at mile 674 to its confluence with St. Simon Sound (mile 676.5). However, the Corps has recommended that the Mackay River now become the main route to facilitate improvement of the Torras Causeway. This portion of the Mackay River has naturally sufficient depths and no maintenance is anticipated.

St. Simon Sound.

Spot shoaling has occurred in St. Simon Sound between mile 677 and 678. On the three dredging occasions since construction of the 12' channel, the dredged material was discharged into open water site No. 51. No future maintenance is anticipated because of the proposed realignment of the AIWW from Frederica River to Mackay River. The Mackay River approach into St. Simon Sound contains naturally sufficient depths.

Jekyll Creek.

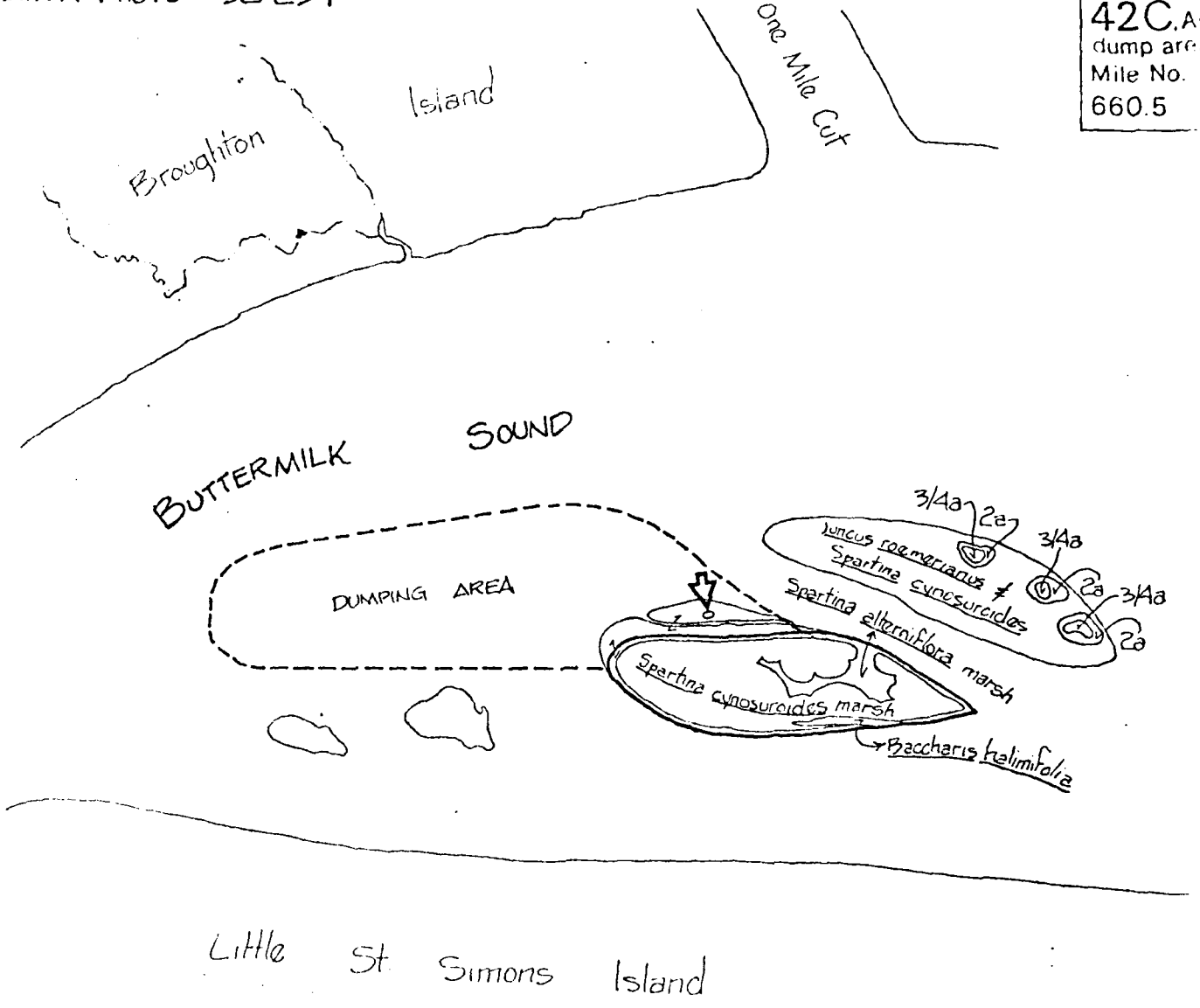
Jekyll Creek presents the worst maintenance problem on Savannah District's portion of the AIWW. (See sheets 19 and 20 in appendix 3.) Over 14 million cubic yards of dredged material have been removed from Jekyll Creek since completion of the 12' channel. If the 12' channel were maintained over the next 50 years, approximately 67.5 million cubic yards of mud and silt would be removed.

Evaluating different disposal alternatives to solve the disposal problems is not sufficient in view of the large amount of material involved. The source of the shoaling must be addressed and the shoaling rates reduced if their portion of the waterway is to be maintained.

Several different proposals have been suggested for reducing shoaling in Jekyll Creek. In 1972, the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi conducted hydraulic model investigations to reduce shoaling in Brunswick Harbor and Jekyll Creek, Georgia. Their findings

AIWW PHOTO # 32-254

Tract No. 42C, A dump are Mile No. 660.5



Tract No.	Description & Management Practice:
42C, Adj dump area Acreage 14.5	Preferred disposal site on the northern edge of the Spartina marsh. This can be accomplished without smothering that new growth which fringes the island.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

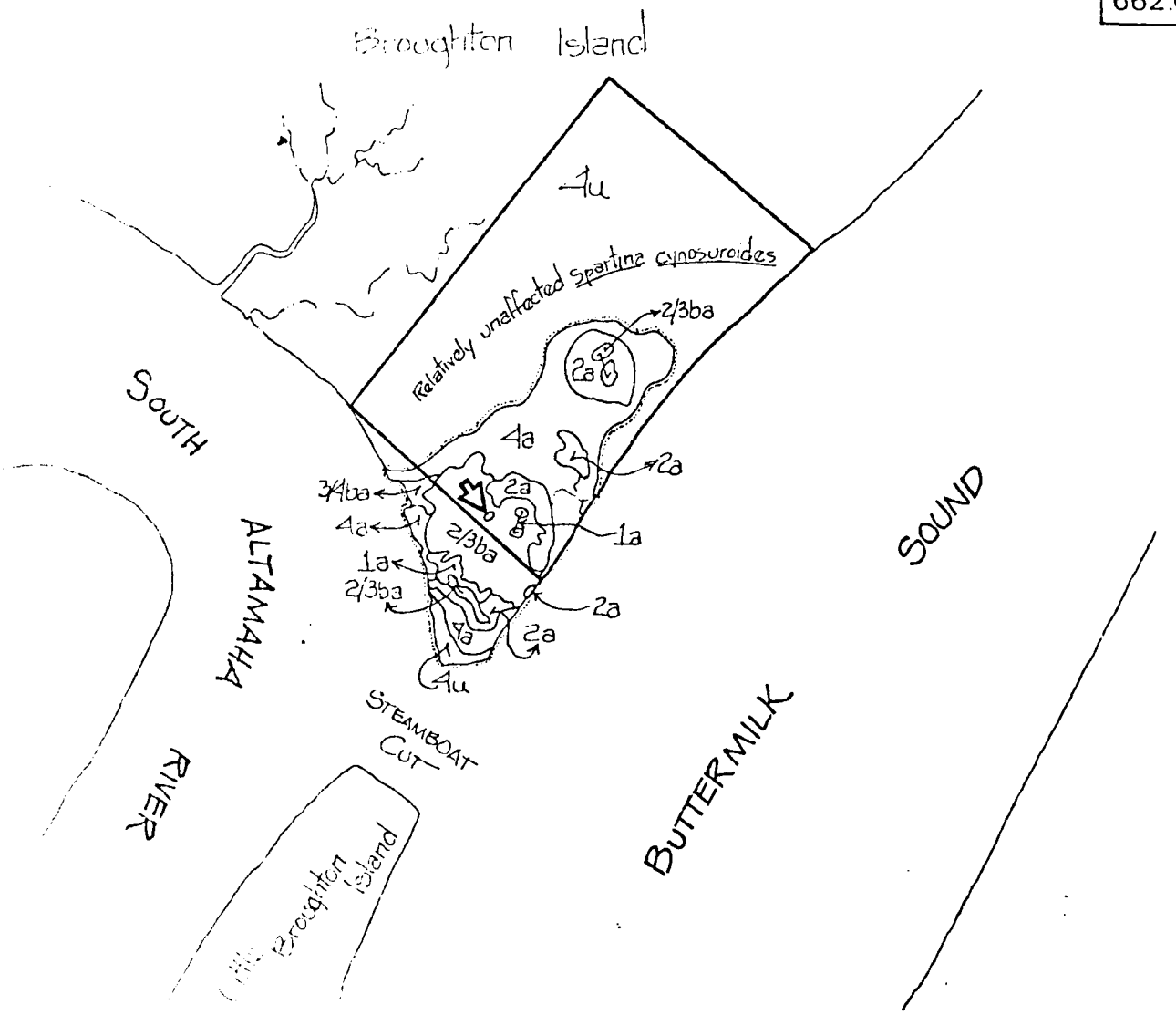
GA. DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 30

AIWW PHOTO # 33-259

Tract No
42B
Mile No
662.0



Description & Management Practice:

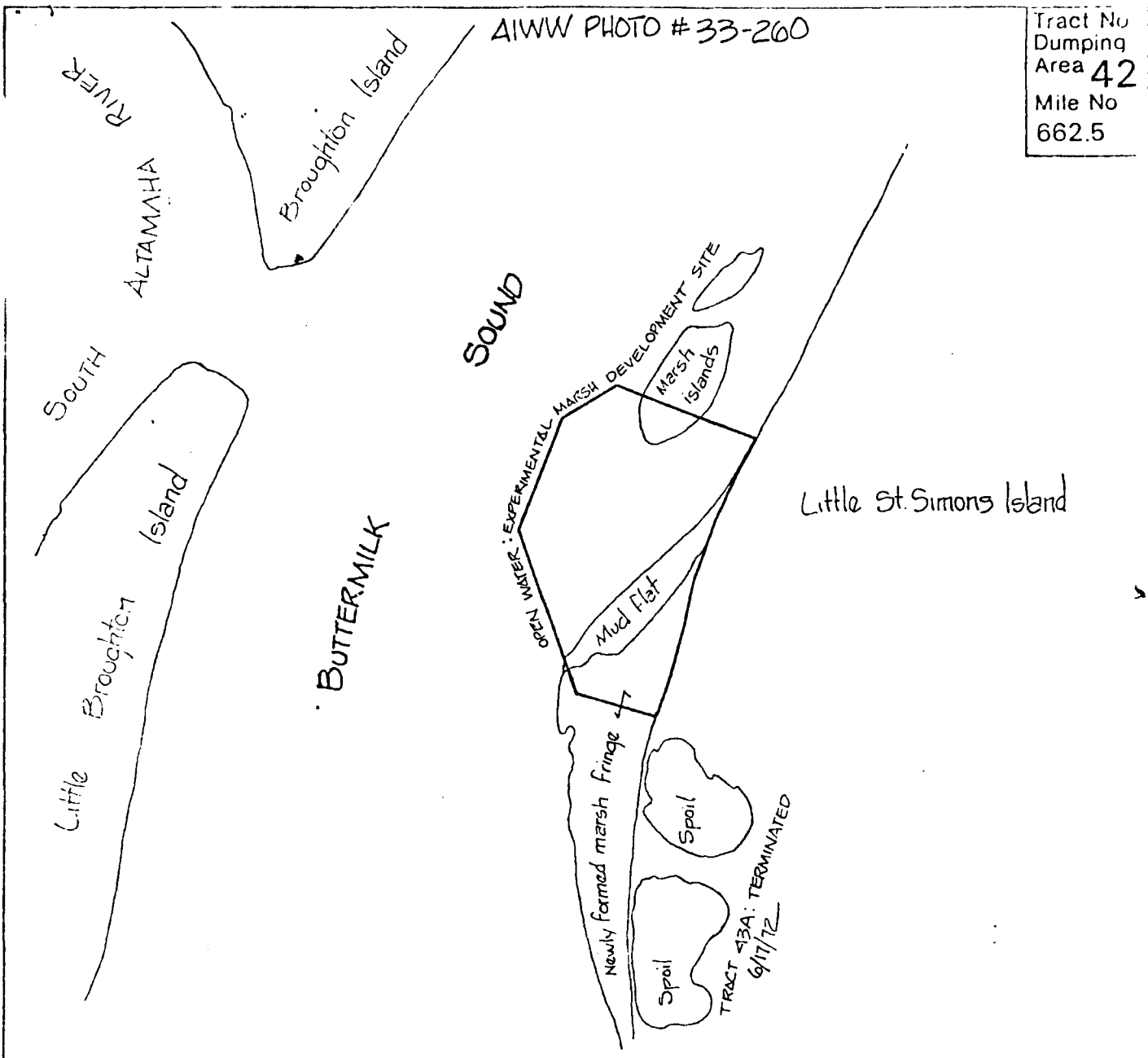
Much of the maintenance dredging in this area of the AIWW is the result of removing the last meander of the Altamaha River and making Steamboat Cut. Some consideration should be given to hydraulic studies which would restore a small loop in place of the cut.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

580 Scale 1:10,000 0 500' 1000' 2000' north

FIGURE 31



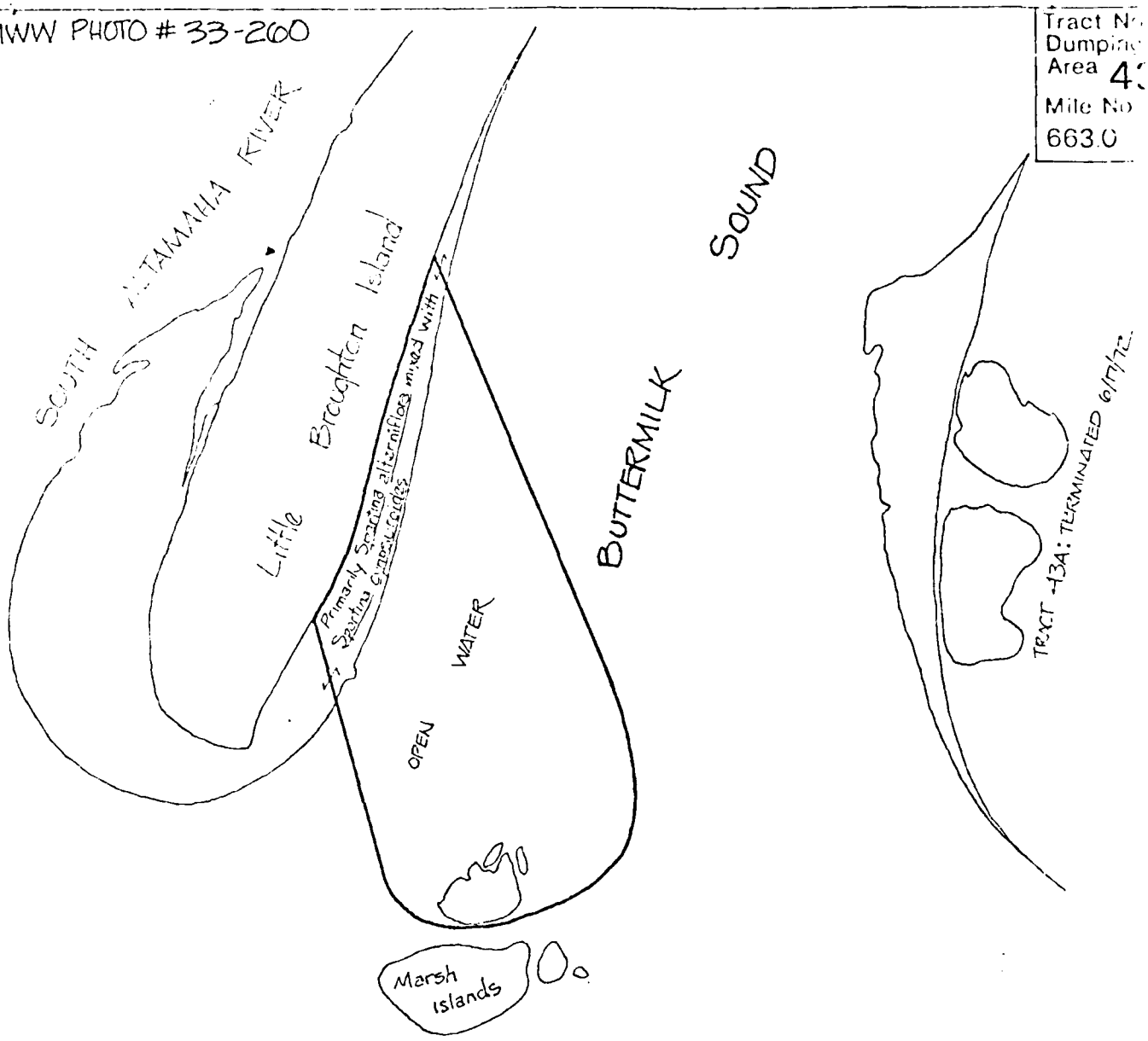
Tract No. Dumping Area 42 Acreage H_2O/Marsh	Description & Management Practice:
	Disposal should be very limited and only in conjunction with previous experimental work that Corps and State have carried out.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA. D.N.R. COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 32

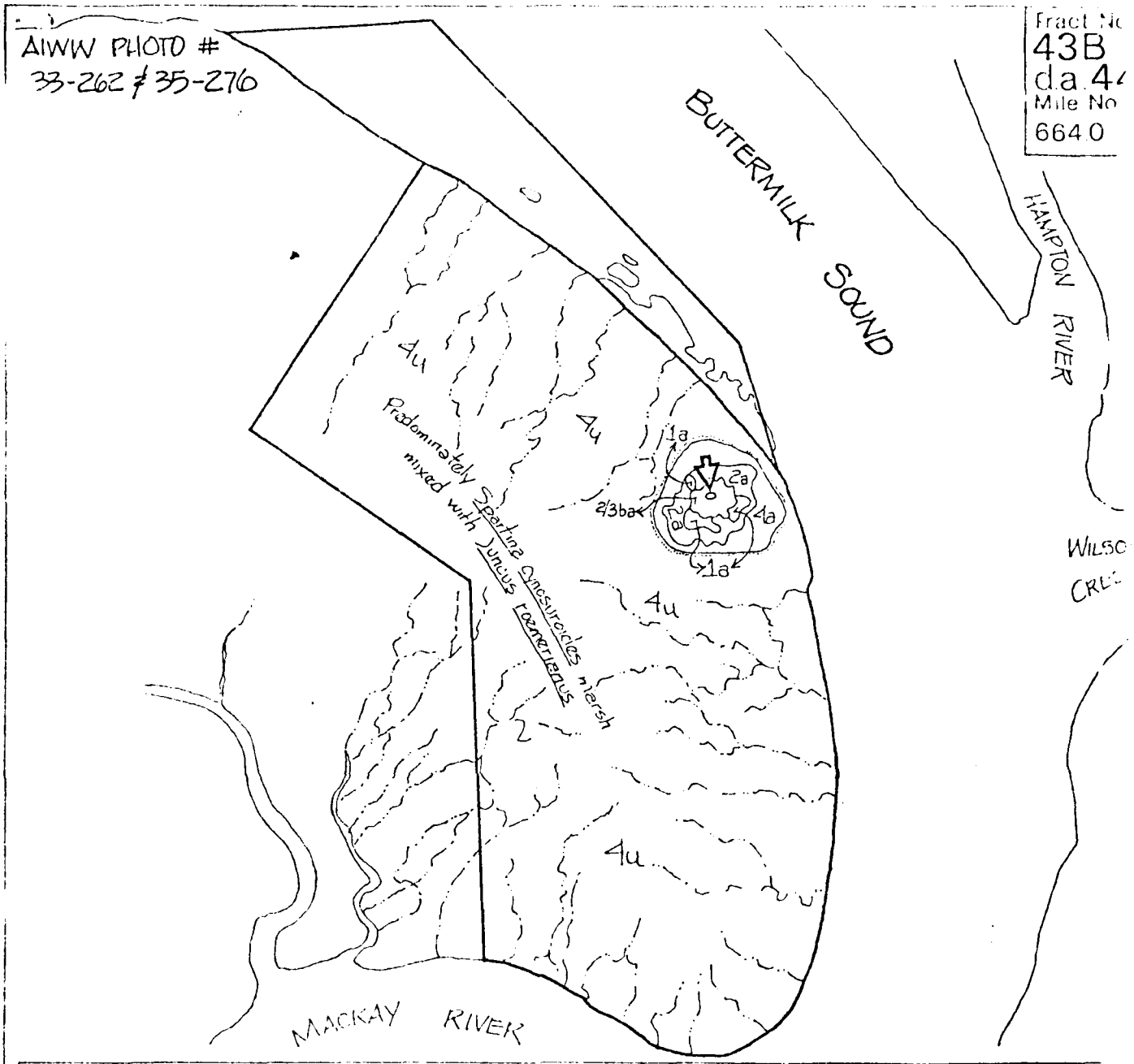


Tract No. Dumping Area 43 Acreage Open Water	Description & Management Practice: Recommend hydraulic studies to restore portion of Altamaha Channel to its former course and condition and thus reduce maintenance dredging.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north **FIGURE 33**



Tract No.	Description & Management Practice:
43B d.a.44 Acreage 176.4	Preferred pipe outfall should be in the center of existing site.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

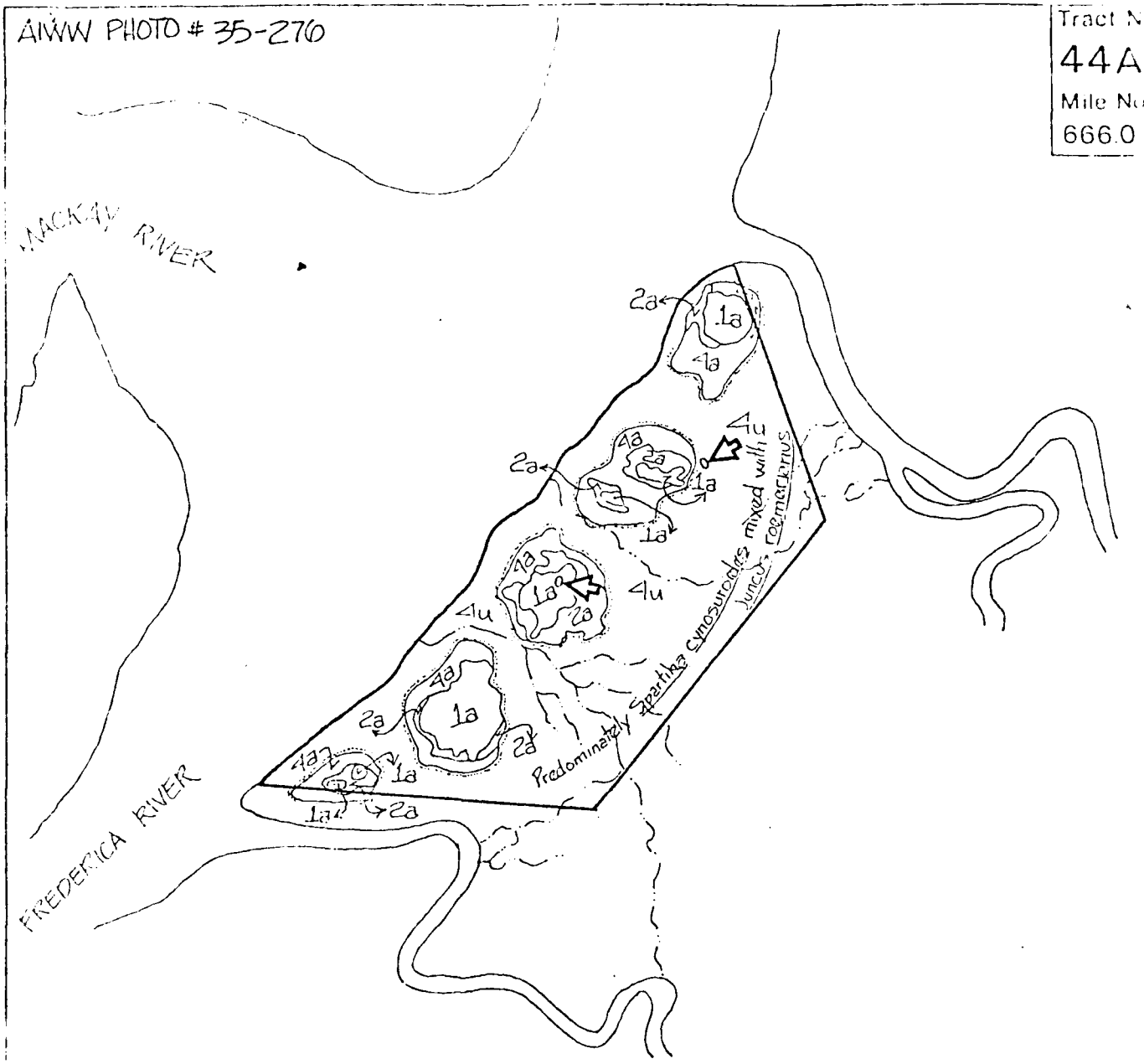
GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 34

AIWW PHOTO # 35-276

Tract No
44A
Mile No
666.0



Tract No.	Description & Management Practice:
44A Acreage 76.4	Series of 5 small cedar hammocks. Recommend that 1 or 2 be selected for disposal and the remainder be left undisturbed for next 10 dredging cycles.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

GA DNR COASTAL RESOURCES DIVISION / COASTAL PROTECTION SECTION

Date: July 1980 Scale: 1:10,000 0 500' 1000' 2000' north

FIGURE 35

are found in Technical Report H-72-5 "Plans for Reduction of Shoaling in Brunswick Harbor and Jekyll Creek Georgia". The report determined that a 4,900 foot training wall should be constructed on the west side of and parallel to Jekyll Creek, extending from just south of the mouth of Lathram River to approximately halfway between the mouth of Lathram River and the Jekyll Island Bridge crossing. A 2,950 foot training wall would be constructed on the east side of Jekyll Creek from opposite the mouth of Lathram River southward to just north of the Jekyll Creek Marina docks. Additionally, a 2,300 foot U-shaped training wall would be built across the mouth of Mud River with the U pointing southward. This plan provided an overall decrease in shoaling of 29.3 percent.

The Hydraulics and Hydrology Branch of Engineering Division in Savannah District also examined the problem. Their proposed solution consists of dredging a cutoff channel as shown in figure 36. Their review of drawings dated before the construction of the Jekyll Island Causeway showed the area of Jekyll Creek between Lathram River and St. Simon Sound with a channel deeper than the required AIWW project depth. The road to Jekyll has obviously reduced the amount of water flowing through Lathram River and Jekyll Creek. This reduction in flow has decreased the velocity and consequently material began to settle out at a faster rate. Their proposed solution consists of dredging a cutoff channel as shown in figure 36. The road would then be bridged over the channel and a dam constructed over the cut flowing east and parallel to the road. This would direct all flow into the Lathram River.

Before any solution to the shoaling in Jekyll Creek can be implemented, funds should be provided to conduct studies on Jekyll Creek to determine the appropriate course of action.

Until studies can be completed to reduce shoaling in Jekyll Creek, a maintenance disposal scheme cannot be developed. However, recommended temporary disposal methods are discussed below.

As shown in table 19, an extremely large diked area (1553 - 5450 acres) would be required. Until the above shoaling studies can be undertaken, disposal should continue into undiked areas of Tract 52-A, 52-B, and 53-A (figures 37 - 40). Open water disposal site No. 52 should not be used. In addition to studies to reduce shoaling in Jekyll Creek, studies should be conducted to determine some means of confining the dredged material in these areas. Aerial photography indicates that much of the material pumped into these areas is returning to the waterway.

Cumberland River to Cumberland Sound.

The last 22.5 miles of the AIWW within Savannah District (mile 690.5 - 713) traverses deep water through Cumberland River and Cumberland Sound. Dredging has been required in the vicinity of mile 704 and 706 in 1974 and mile 706 in 1965. The material dredged from mile 704 was deposited in open water while that dredged from mile 706 was put into Tract Parcel B2-3 which is diked. No dredging is contemplated in this section of the waterway. If dredging were required, the material could be put on existing deposits in Parcels 5, 6 or 7 (See sheet 23 in appendix 3).

Mercator Projection
Scale 1:40,000 at Lat. 30°58'
North American 1927 Datum
SOUNDINGS IN FEET
AT MEAN LOW WATER

LLA RIVER

B

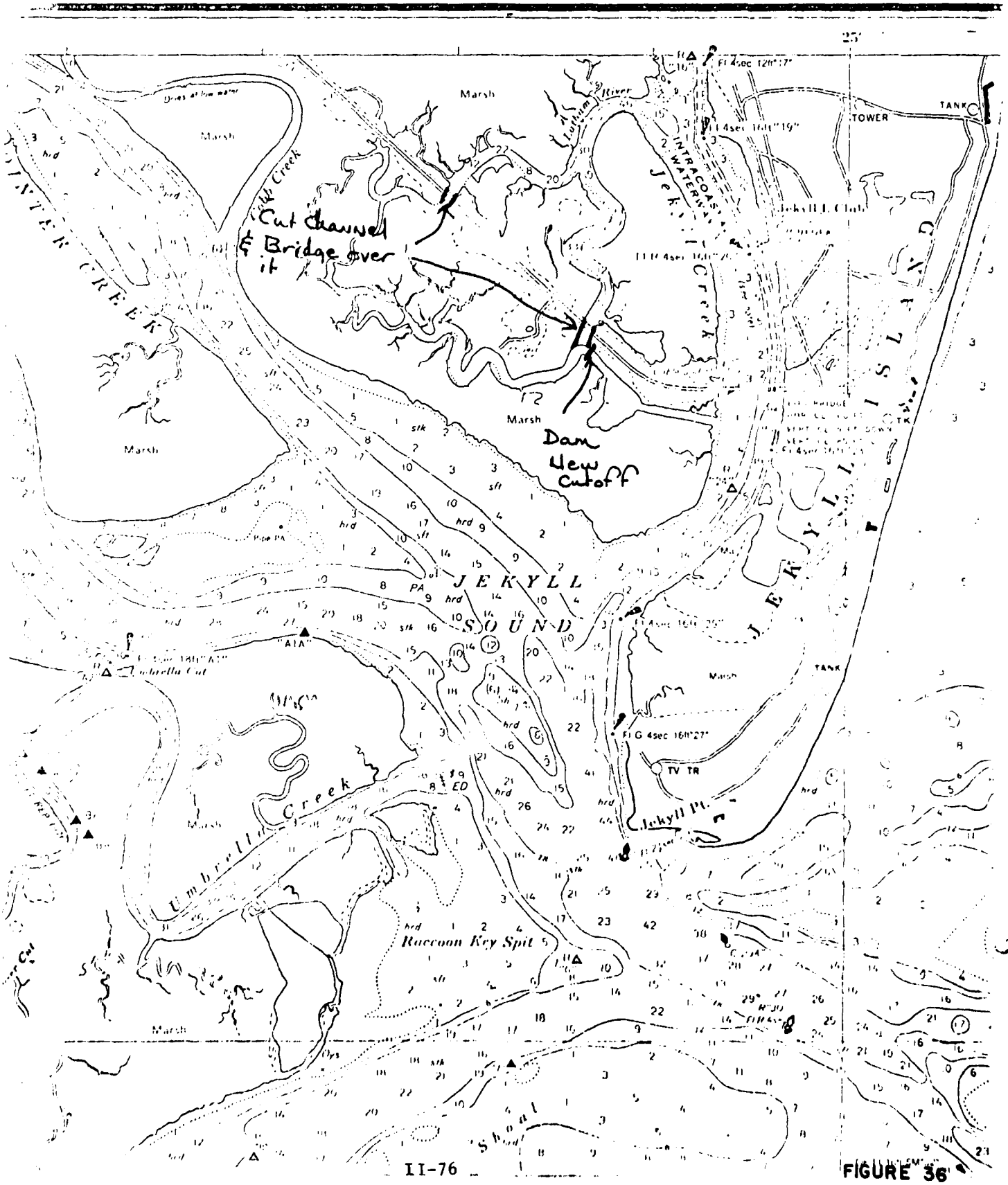


FIGURE 36

Table 19

JEKYLL CREEK

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COSTS MARSH	DIKE COSTS COLONELS I	DIKE COSTS DOVER BLF	DIKE COSTS ANDREWS I	DISPOSAL AREA ACREAGE
10	5374.33	$2,429,264	-	-	-	5450.19
14	322460	2,875,122	$9,693,246	$9,693,246	$3,091,826	3300.71
18	230329	3,270,041	8,902,456	8,902,456	4,154,612	2382.92
22	179144	3,626,690	9,087,147	9,087,147	5,337,347	1874.90
26	1465.72	3,956,395	9,732,119	9,732,119	6,626,379	1552.87

Pumping costs to tracts presently located along the waterway are as follows:

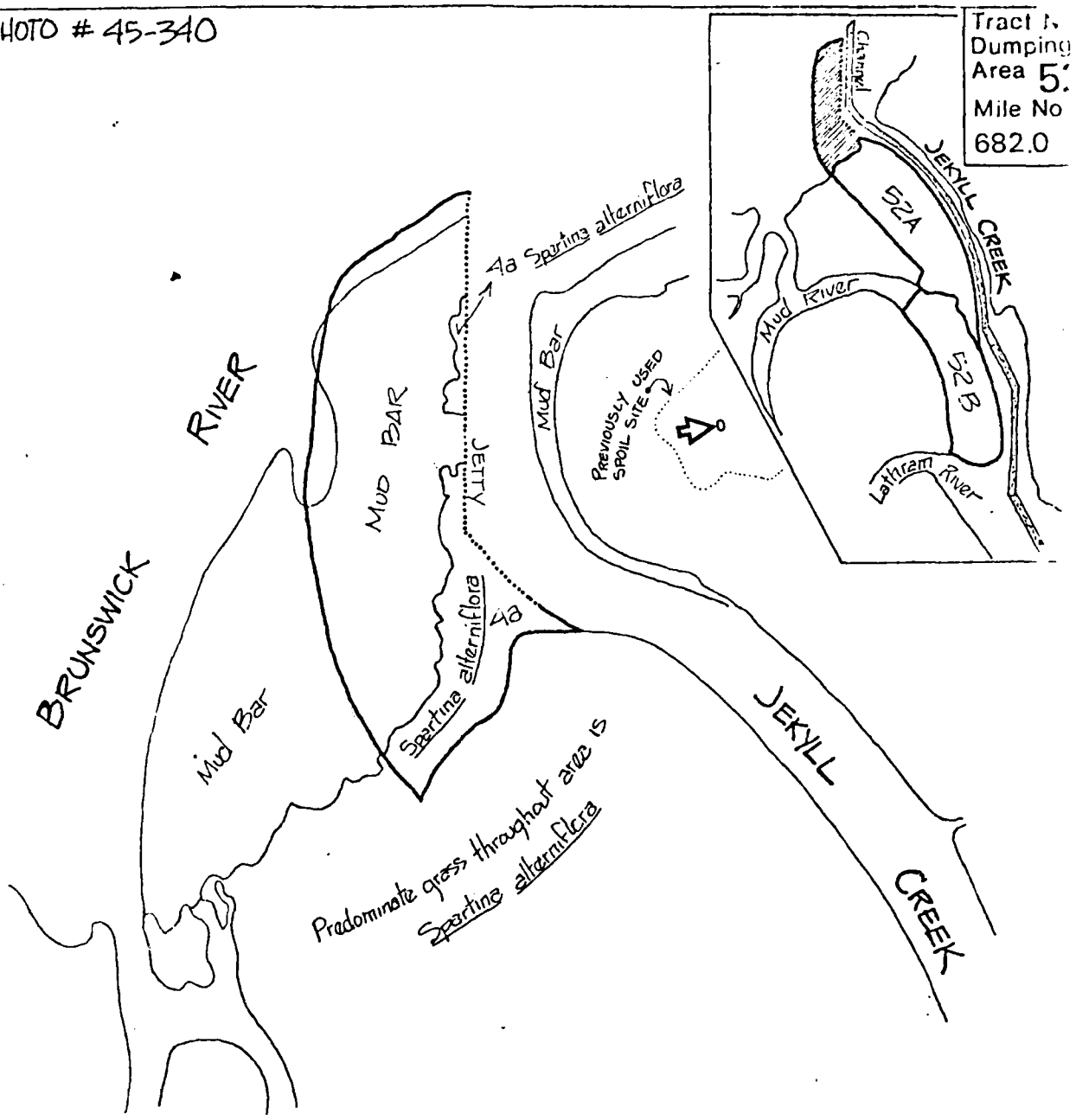
Location	Cost	Distance To Tract	Acreage
Tract 53-A	$1,839,936	12,000'	180.4
Tract 52-B	1,798,496	9,500'	95.0
Tract 52-A	1,848,224	12,000'	115.7
52 Overboard	2,487,552	19,000'	-

Pumping costs to upland disposal areas a the following locations are as follows:

Location	Cost	Distance
Colonels Island	$6,742,939	30,000'
Dover Bluff	6,842,939	30,000'
Andrews Island	6,854,156	36,000'

Present pumping cost would be $993,504/annually to maintain a 12' channel.

AIWW PHOTO # 45-340



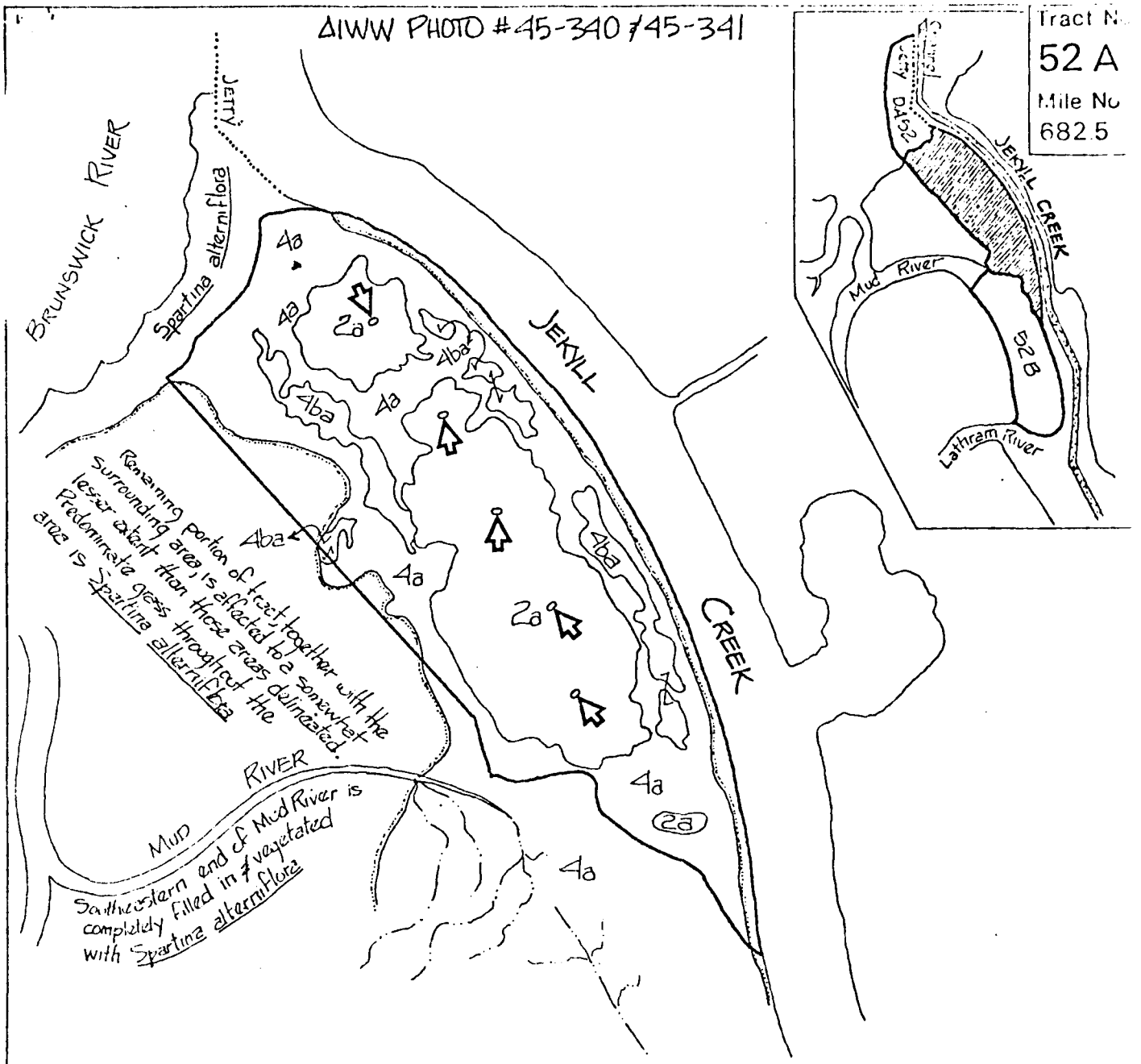
Tract No. Dumping Area 52 Acreage Open Water	Description & Management Practice: Because of the oysters and other intertidal life that has developed west of the jetty on the mud bar, it is recommended that dredge spoil be placed east of Jekyll Creek on the site previously used.

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FIGURE 37



Tract No.	Description & Management Practice:
52 A Acreage 115.7	Recommend multiple pipe outfalls along the back of the existing area which makes up the rib or backbone of the site. As is well recognized by the study team and previous studies, the maintenance of Jekyll Creek remains the most difficult.

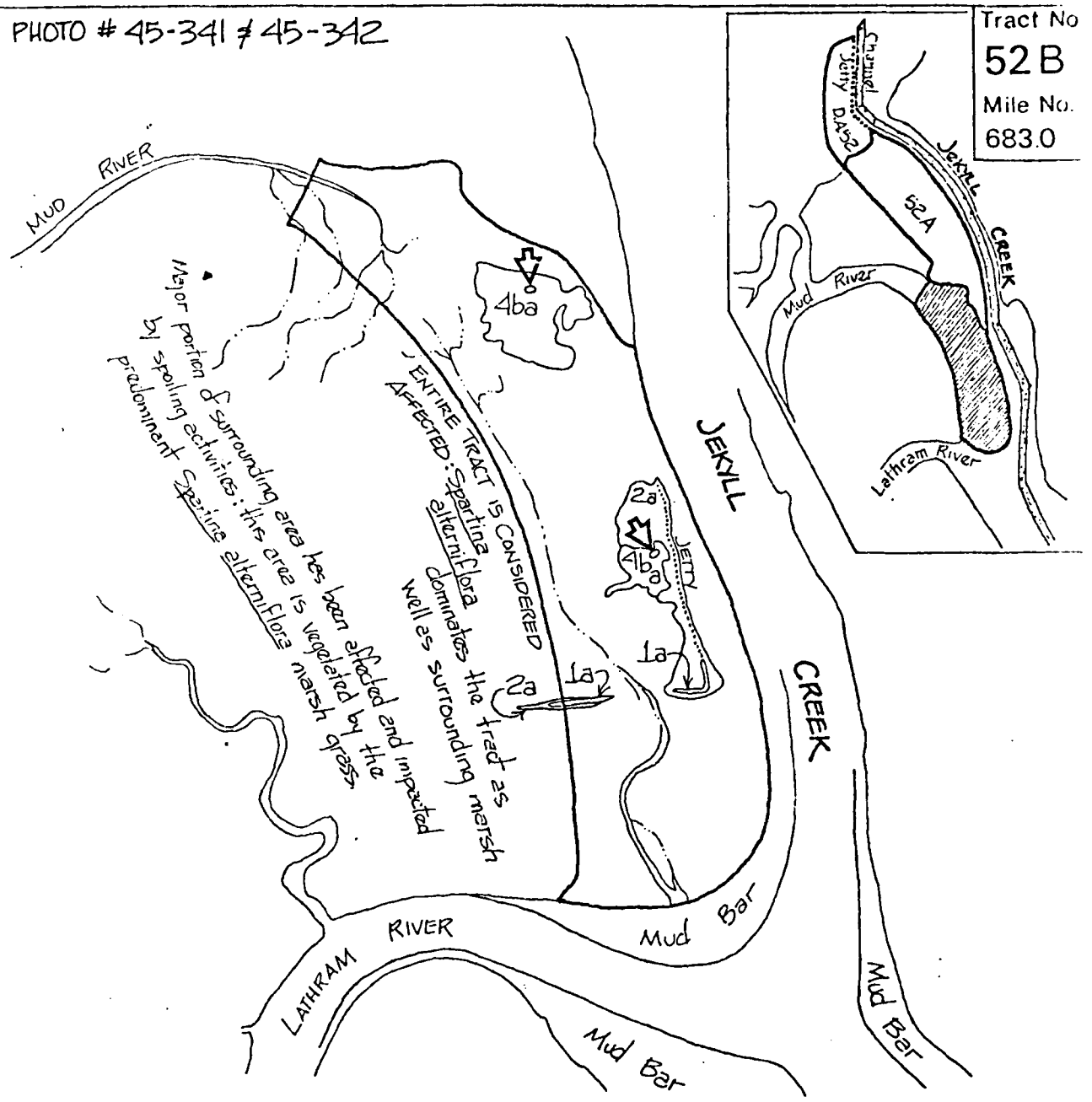
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FIGURE 38

AIWW PHOTO # 45-341 & 45-342



Tract No.	Description & Management Practice:
52B Acreage 95.0	Old jetty could be fortified by Coffer Dam to restrain flow of fluid mud back into Jekyll Creek (AIWW).

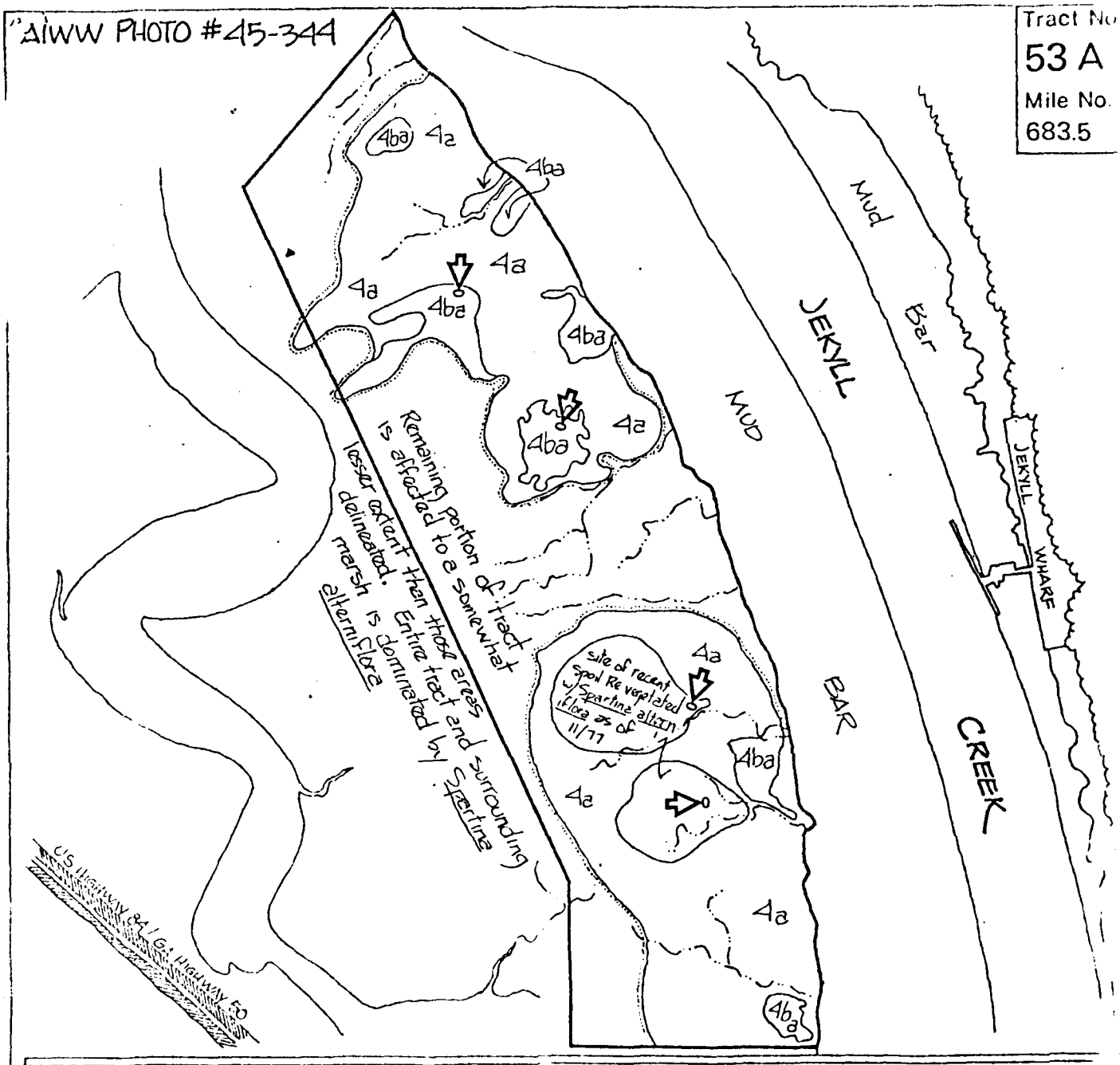
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FIGURE 39

AIWW PHOTO #45-344



Tract No.	Description & Management Practice:
53 A Acreage 180.4	Thixotrophic mud which sinks and spreads out loading by dredge disposal leads one to suggest studies to re-open Lathram Creek underneath Jekyll Causeway to more nearly flush out Jekyll Creek.

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FIGURE 40

Dredging in the Alternate Routes

Alternate Route - Doboy Sound to Brunswick Harbor

An alternate route 7 feet deep at mlw from Doboy Sound to Brunsiwck Harbor was incorporated into the project in 1912. The route was via Darien River, Three-Mile Cut, Altamaha River, One-Mile Cut, Buttermilk Sound, Mackay River, Back River, Clubbs Creek and Plantation Creek. During the study period, dredging in this alternate route has been required only one time. In FY 44, 59,251 cubic yards (85,292 gross estimated) were removed from Back River and 31,079 cubic yards (44,738 gross estimated) were removed from Plantation Creek. There are no disposal tracts along these waterways, and the material was probably deposited overboard. No dredging is contemplated for this alternate section of the waterway.

Alternate Route - Frederica River

In 1945, Congress authorized an alternate route through that part of Frederica River not part of the main route. This alternate route had already been improved since it had formerly been a portion of the main route. No maintenance has been required. Two disposal tracts are located along Frederica River. Tract 45-C (59.5 acres) and Tract 47.A (167.4 acres) are both undiked. No dredging is planned for this alternate route.

Alternate Route - Protected Route Around St. Andrews Sound

In FY 40, an alternate channel 7 feet deep and 75 feet wide was completed around St. Andrews Sound. The alternate route extends from the main channel of the AIWW in Jekyll Creek through Jekyll Sound, Little Satilla River, Umbrella Cut, Umbrella Creek, and its south branch, through Dover Cut to Dover Creek, thence up Dover Creek and through a narrow neck of land to Satilla River, thence through a land cut south of Todd Creek and through Floyd Creek to the main route of the waterway in Cumberland River. Almost all of the shoaling problems have occurred in Umbrella Cut and Umbrella Creek with some minor shoaling in Floyd Creek.

Umbrella Cut and Umbrella Creek

Approximately 464,000 cubic yards of material have been dredged from Umbrella Creek in the vicinity of Umbrella Cut. With the exception of one dredging occasion when the material was put in Tract Cut 1, all of the dredged material has been deposited in Tract Cut 3. It is estimated that approximately 270,000 cubic yards will be removed over the next 50 years.

1. Construction of Diked Area in Existing Tracts or New Diked Upland Area. As shown in table 20, a 15 - 35 acre disposal area would be required to handle the material from Umbrella Creek. Tract Cut 1 has only one 5.5 acre deposit and should not be used. Tract Cut 3 contains five mounds comprising about 65 acres. A diked area could be constructed around the large mound in the western portion of the tract just downstream from Umbrella Cut.

Table 20

UMBRELLA CUT

The following dike heights and their associated areas will provide a 50-year capacity at the following costs for the following locations:

DIKE HT.	STORAGE ACRES	DIKE COST MARSH	DIKE COST DOVER BLUF	DISPOSAL AREA ACREAGE
10	29.35	$183,242	-	35.07
14	17.61	219,479	$294,696	23.47
18	12.58	252,866	368,244	18.74
22	9.78	284,404	459,627	16.43
26	8.0	314,747	564,905	15.1

Pumping costs to tracts presently located along the waterway are as follows:

Location	Cost	Distance To Tract	Acreage
Tract Cut 1	$8,775	600'	140.0
Tract Cut 3	8,839	1,200'	673.0

Pumping costs to upland disposal areas a the following locations are as follows:

Location	Cost	Distance
Dover Bluff	$47,972	78,000'

Present pumping cost would be $7983/annually to maintain a 7' channel.

2. Open Water. The DNR does not support open water disposal practices.

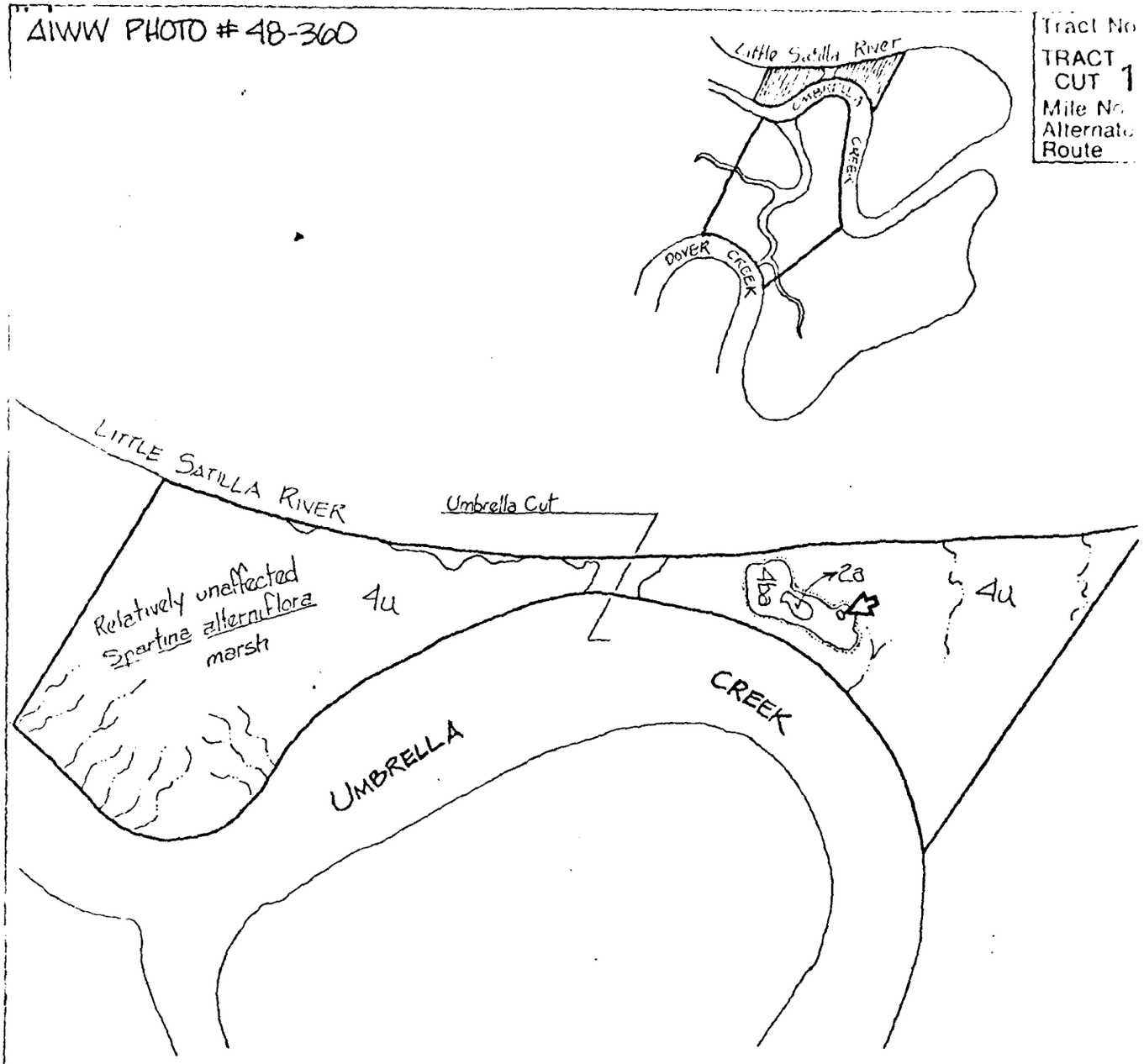
3. Reuse of Material, Beach Nourishment. The sediments are mud and silt.

4. Continued Undiked Disposal. The material should be discharged into undiked Tract Cut 1 or Tract Cut 3.

Summary and Recommendations.

In view of the small maintenance requirements of Umbrella Cut, continued undiked disposal on the two largest mounds in Tract Cut 3 is recommended. Due to budgetary restraints, this alternate route has not been dredged in 5 years. If the necessity for the alternate route becomes apparent and dredging increases significantly, then the possibility of establishing a diked area around existing deposits in Tract Cut 3 should be investigated.

AIWW PHOTO # 48-360



Tract No.	Description & Management Practice:
TRACT CUT 1 Acreage 140.0	Recommend doing no further maintenance on Umbrella Cut and the Alternate Waterway through Camden County. The Alternate has crossed 4 major streams (Little Satilla, Umbrella, Dover and Satilla Rivers) which in turn has caused siltation and stream capture.

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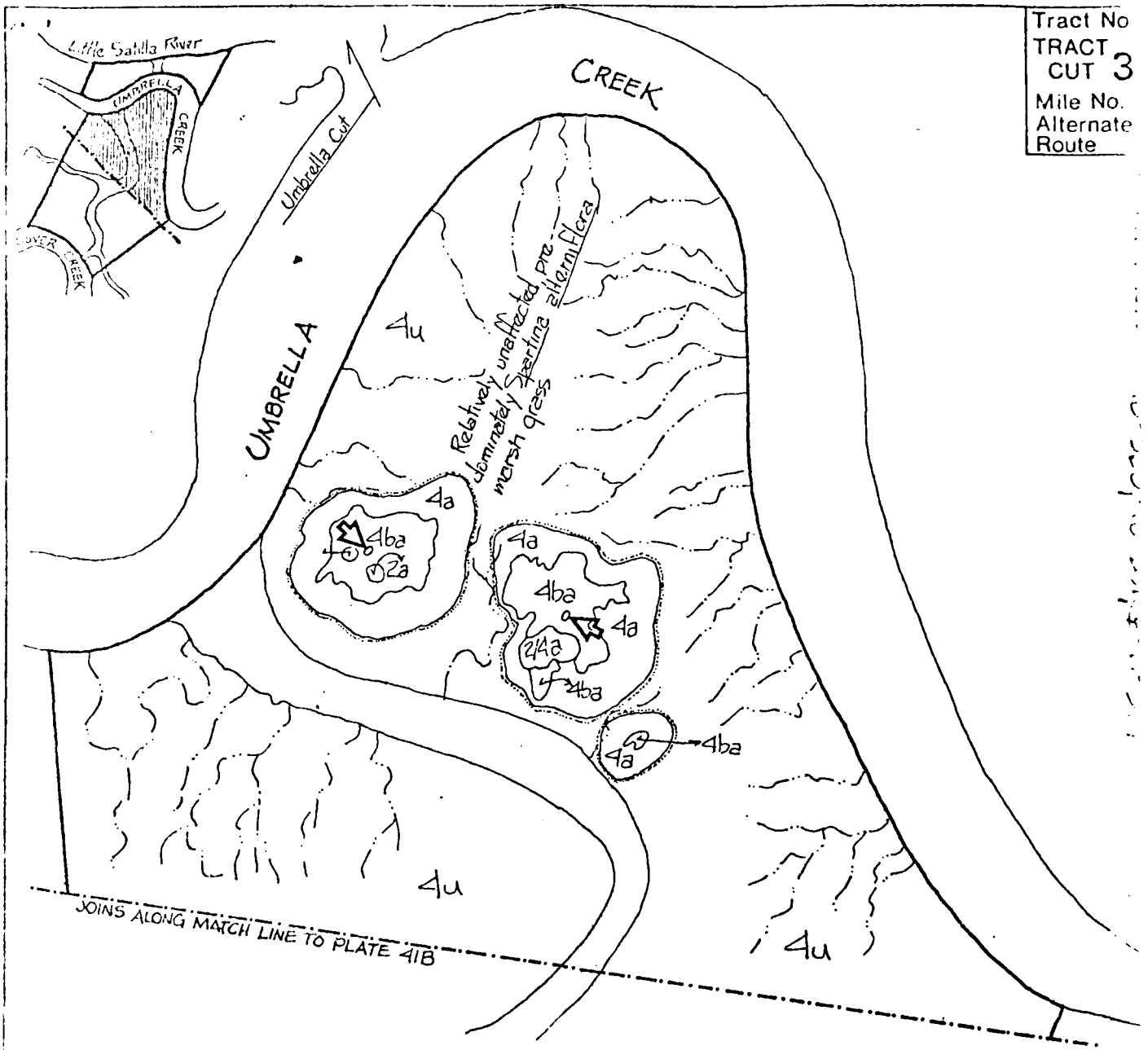
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0 500' 1000' 2000'

I-85

north

FIGURE 41



Tract No.	Description & Management Practice:
TRACT CUT 3 Acreage 73.0 A+B	Recommend not doing regular maintenance in alternate waterway particularly in this reach and in Umbrella Cut, Dover Cut and Satilla Cut as this interupts the land to sea, west to east drainage of 4 major tidal rivers.

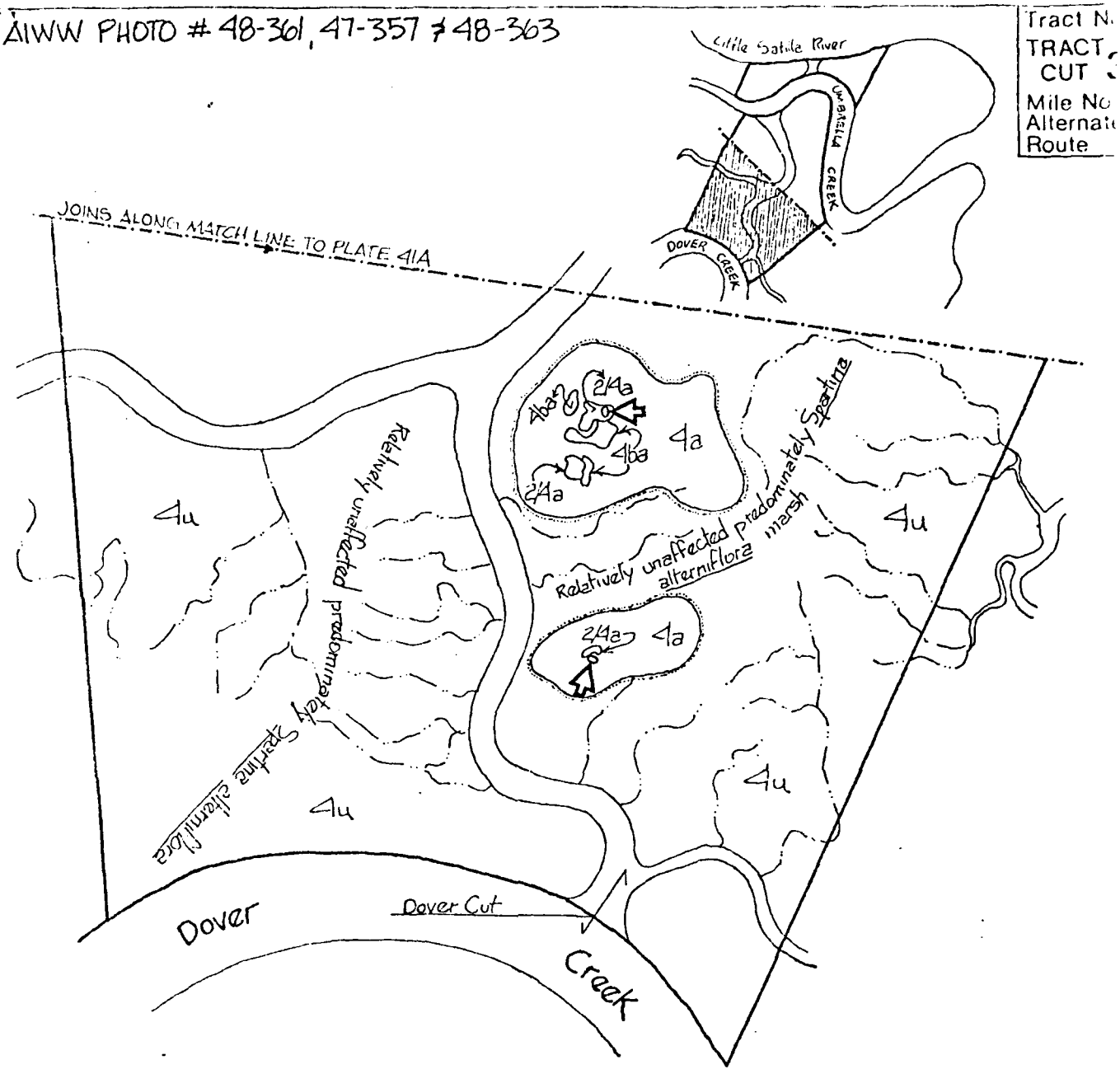
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FIGURE 42

AIWW PHOTO # 48-361, 47-357 & 48-363



Tract No.
TRACT
CUT 3
Acreage
673.0 A+B

Description & Management Practice:

Refer to comments on Tract Cut No. 1.

PREFERRED MANAGEMENT PRACTICES FOR DISPOSAL AREAS OF THE GEORGIA PORTION OF THE ATLANTIC INTRACOASTAL WATERWAY

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Scale: 1:10,000 0 500' 1000' 2000'

north

FIGURE 43

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