

Appendix B - Resources at Risk in the Preapproved Areas for Surface Washing Agents

Source Information

This report was prepared in January 2013. The information included in this report is for the preapproval of the use of surface washing agents within the Upper Houston Ship Channel (including Barbour's Cut), Bayport Ship Channel, Freeport, Texas City Ship Channel and Galveston Channel. The ESI shorelines and species information for the preapproved areas was compiled from the latest data collected by Texas General Land Office and Texas Parks and Wildlife to ensure the most up-to-date information was available for this project.

Geographic Region Covered

The area covered by this report includes the Upper Houston Ship Channel (including Barbour's Cut), Bayport Ship Channel, Texas City Ship Channel, Galveston Channel, and Freeport. (see Appendixes A.1- A.3)

Shoreline Resources at Risk

The shorelines along the northwestern portion of Galveston Bay are predominantly composed of sheltered man-made structures, steep scarps in clay, and riprap. Areas near the mouth of Goose Creek are composed of sheltered scarps in clay. Shorelines along the northern and southern shores of the Upper San Jacinto Bay and Scott Bay consist mostly of exposed riprap structures with pockets of exposed seawalls and other concrete structures. There are also some areas of sheltered scarps and small portions of salt- or brackish-water marshes. The shoreline of Alexander Island is composed of mostly fine-grained sand beach with areas of scarps and steep slopes. The most sensitive shoreline habitat in the area exists in Santa Anna Bayou, which contains areas of salt- and brackish-water marshes. The shorelines along the remainder of the Houston Shipping Channel including Burnet Bay, Old River, and Buffalo Bayou are composed mainly of exposed seawalls, fine grained sand beaches, mixed sand and gravel beaches, sheltered scarps, exposed riprap structures, and sheltered man-made structures.

The shorelines along Bayport Ship Channel are primary sheltered tidal flats. There are some sheltered manmade structures on the southwestern shores. The entrance to the channel has exposed walls and other solid structures along the northern side and scarps and steep slopes in clay on the southern side.

The shorelines along Texas City Ship Channel are primarily sheltered tidal flats along the southern/western shore and sheltered solid manmade structures along the northern/eastern shore. The northern most jetties, at the mouth of the ship channel, are comprised of exposed tidal flats. The northeastern shoreline, at the entrance to the channel, has some salt and brackish marshes. There are three gravel or shell beaches on the northwestern side of the channel and also an area with salt and brackish marshes. The ship channel has five areas of sheltered riprap.

The shorelines along the Galveston Channel are primarily exposed walls and other structures with sheltered manmade structures throughout. There are some exposed tidal flats on the northwestern side of the channel along with some fine grained sand beaches on the southeastern shores of Pelican Island. The south side of Pelican Island also has some sheltered tidal flats and some coarse sand and shell beaches. The North side of Pelican Island has “low” priority protection areas but they do not fall within the areas preapproved for SWA use.

The shorelines in Freeport channel are primarily sheltered riprap structures and sheltered manmade structures. There are some sheltered tidal flats spread throughout the shorelines. Just north of Brazos Harbor on the western shoreline there is a small area with scarps and steep slopes. The entrance to the channel also has some exposed tidal flats. The entire channel is considered a “low” priority protection area.

For the purpose of this operations plan, although it is not intended that SWAs will be applied to shorelines or other surfaces that are not vessels or hard structures, consideration of the environment (tides, currents, wind, storm systems, lighting, etc.) is critical in order to evaluate possible adverse impacts of SWAs for recovery operations. For example, overspray of SWAs or flushing of the treated oil/SWA mixture resulting in the unintended impacts of SWAs outside the oiled area could pose additional toxic effects to intertidal communities and sensitive lower intertidal habitats. In addition to determining the use, application and prevention strategy for SWAs, all responders involved in the SWA application process shall use good judgment, to include halting operations as appropriate if it appears that current strategies pose a threat to the safety of others and the environment. And finally, as a reminder, where it is deemed necessary for the use of SWAs on shorelines to achieve a higher degree of cleanliness or cleanliness at a higher rate, both within and outside of the identified preapproved locations in this operations plan, RRT concurrence shall be obtained.

Delineation of Shoreline Types by ESI Type and Linear Miles for the Upper Houston Ship Channel (including Barbour's Cut), Bayport Ship Channel, Freeport, Texas City Ship Channel and Galveston Channel

<u>ESI Type</u>		<u>Miles</u>	<u>%of Total</u>
8C	Sheltered Scarps	73.7	32.34
6B	Exposed Riprap Structures	32.2	14.13
1	Exposed Walls and Other Solid Structures	23.27	10.21
8A	Sheltered Solid Manmade Structures	32.55	14.28
10A	Salt and Brackish Water Marshes	11.02	4.84
2A	Scarps and Steep Slopes in Clay	6.32	2.77
3B	Scarps and Steep Slopes in Sand	4.7	2.06
8B	Sheltered Riprap Structures	11.32	4.97
10C	Freshwater Swamps	4.4	1.93
3A	Fine-grained Sand Beaches	3	1.31
5	Mixed Sand and Gravel or Shell Beaches	2.7	1.18
7	Exposed Tidal Flats	6.59	2.89
9	Sheltered Tidal Flats	14.92	6.54
2B	Wave-cut Clay Platforms	0.5	0.22
6A	Gravel or Shell Beaches	0.4	0.18
10B	Freshwater Marshes	0.3	0.15
TOTAL		227.89	100

Biological Resources at Risk

Birds

Threatened/Endangered Birds

The federally endangered least tern (~18 birds) may be present and nesting from April through September in and around the entrance to Black Duck Bay near Baytown. Least terns may be found on the shoreline or hunting for fish in waters near these areas.

Other Birds

Trinity Bay and Galveston Bay have a variety of different birds nesting and feeding all year round. Alexander Island serves as habitat and breeding grounds for a variety of birds including: black-crowned night heron (nesting Apr-Aug), cattle egret (nesting Apr-Jul), great blue heron (nesting Feb-Jun), great egret (nesting Mar-Jul), little blue heron (nesting Apr-Jul), more correct name is now neotropic cormorant (nesting Jan-Jul), roseate spoonbill (nesting Apr-Aug), snowy egret (nesting Apr-Jul), tri-colored heron

(nesting Apr-Aug), white ibis (nesting Feb-Jun). All of these species may potentially be nesting on the island and young fledging birds may be present in nests. The American white pelican may also be present on and around Alexander Island during certain times of the year (typically late fall through early spring). American coots and pied-billed grebes can be found in Scott Bay, directly north of Alexander Island. Pied-billed grebes may be nesting on the northwestern shoreline of Scott Bay during the months of March through August. In Santa Anna Bayou, roseate spoonbill may be present and nesting in the wetlands during April through August.

The Texas City Ship Channel and the Galveston Channel are highly industrial waterways. Within them, habitat and breeding can be found for a variety of birds, wading birds (nesting Apr-Sep), rails (nesting Apr-Sep), terns (nesting Apr-Sep), black skimmers (nesting Apr-Sep), Neotropic cormorant (nesting Jan-Jul). Diamondback terrapin habitat in Dickinson Bay and in Galveston Bay between Miller Point and Dollar Point (nesting Feb-Aug). Pelican Island is habitat for several other birds. On the northwestern shores royal tern (nesting Feb- Aug), black-crowned night heron (nesting Apr-Aug), sandwich tern (nesting Feb-Aug), laughing gull (nesting Feb-Aug), gull billed tern (nesting Feb-Aug), tri-colored heron (nesting Apr-Aug), great blue heron (nesting Feb-Jun), snowy egret (nesting Apr- Jul), cattle egret (nesting Apr- Jul), great egret (nesting Mar-Jul), roseate spoonbill (nesting Apr-Sep), reddish egret (nesting Apr-Aug), white ibis (nesting Feb-Jun), and white faced ibis (nesting Feb-Aug).

The Freeport channel including Brazos Harbor in a highly industrial waterway with minimal bird known habitat. Birds known to habitat in the Freeport area are the Wilson's plover (nesting Apr-Jun), mottled duck (nesting Jan-Aug), and black skimmer (nesting Apr-Sep).

Use of SWAs should have no significant direct effects on birds beyond those normally associated with use of flushing techniques on shorelines. Normal procedures are to contain and recover any floating oil that is released. Use of SWAs that disperse the treated oil into the water column could increase the exposure of water-column resources in areas of restricted water flow, which could result in acute toxic effects to fish in these areas and a reduction in prey species for diving birds.

Fish and Invertebrates

Fish potentially present in Galveston Bay, Trinity Bay, and East Matagorda Bay are: Atlantic croaker, gulf menhaden, hardhead catfish, red drum, sand seatrout, sheepshead, southern flounder, spotted seatrout, and stripped mullet. Further north into the shipping channel, common fish present may include: gulf menhaden, red drum, and southern flounder. Tabbs Bay may serve as nursery grounds for Atlantic croaker with larvae and juveniles present during April through October. Southern flounder may also be present within Tabbs Bay. Several species of fish may potentially be present in Goose Creek including red drum, sand seatrout, and spotted seatrout. The spotted seatrout may be spawning at and juvenile sand seatrout may be present within Goose Creek throughout the year. It should be noted that waters in San Jacinto Bay and Scott Bay are considered

fish nursery areas. East Matagorda Bay may also include Florida pompano, gulf menhaden, and hardhead catfish.

Several invertebrates are common along the Galveston Bay, Trinity Bay, and East Matagorda Bay including blue crabs, brown shrimp, white shrimp, and American oysters. Blue crabs may be spawning during April through July with larvae and juveniles present from May through August in Tabbs Bay, Goose Creek, Lower San Jacinto Bay, Santa Anna Bayou, and Black Duck Bay.

Use of SWAs that result in most of the oil being dispersed into the water column could result in acute toxicity to fish and shellfish, particularly the larval and juvenile life stages. Product that lift and float the oil might have a slightly increased risk to fish and shellfish compared to normal flushing techniques because of the added toxicity of the SWA product. However, at the recommended application rate (1 gallon per 100 square feet) dilution to non-toxic levels is expected to be rapid.

Marine Mammals

Bottlenose dolphin may be present throughout the year within Galveston Bay, Trinity Bay, and East Matagorda Bay. Any effects of spilled oil on dolphins are likely to be temporary (eye, nose, skin irritation). Use of SWAs is not likely to cause any significant additional impacts.

Human-Use Resources

Commercial ship traffic moves through Houston Ship Channel. Water intakes are numerous along the ship channel. Use of SWAs that lift and disperse could increase the amount oil that mixes into the water column, which would increase the risk of oil entering water intakes. Only lift and float products should be used where there is a risk to water intakes, and oil containment and recovery efforts should be closely monitored.

Appendix B.1



LEGEND

ENVIRONMENTAL SENSITIVITY INDEX

- MANGROVE MARSH (10D)
- FRESHWATER SWAMPS (10C)
- FRESHWATER MARSHES (10B)
- SALT AND BRACKISH MARSHES (10A)
- SHELTERED TIDAL FLATS (9)
- SHELTERED ROCKY/KARST SHORES (8D)
- SHELTERED SCARPS (8C)
- SHELTERED RIPRAP STRUCTURES (8B)
- SHELTERED SOLID MAN-MADE STRUCTURES (8A)
- EXPOSED TIDAL FLATS (7)
- EXPOSED RIPRAP STRUCTURES (6B)
- GRAVEL OR SHELL BEACHES (6A)
- MIXED SAND AND GRAVEL OR SHELL BEACHES (5)
- COARSE-GRAINED SAND BEACHES (4)
- SCARPS AND STEEP SLOPES IN SAND (3B)
- FINE-GRAINED SAND BEACHES (3A)
- WAVE-CUT CLAY PLATFORMS (2B)
- SCARPS AND STEEP SLOPES IN CLAY (2A)
- EXPOSED WALLS AND OTHER SOLID STRUCTURES (1)

HYDROGRAPHY

- MARSH, WETLAND
- TIDAL, MUD OR SAND FLATS
- BEACH, BAR
- INTERMITTENT WATER BODY
- DUNES
- SUBMERGED AQUATIC VEGETATION
- MANGROVES
- OYSTERS

PRIORITY PROTECTION AREAS

- HIGH MEDIUM
- MEDIUM PRIORITY
- LOW PRIORITY

BIOLOGICAL RESOURCES

- DIVING BIRDS
- GULLS/TERNS
- PASSERINE BIRDS
- PELAGIC BIRDS
- RAPTORS
- SHOREBIRDS
- WADING BIRDS
- WATERFOWL
- FISH
- DOLPHINS
- SMALL MAMMALS
- UPLAND/WETLAND PLANTS
- SUBMERGED AQUATIC VEGETATION
- ALLIGATOR
- TURTLES
- OTHER REPTILES/AMPHIBIANS
- BIVALVES
- CRABS
- GASTROPODS
- SHRIMP
- SQUID
- THREATENED/ENDANGERED SPECIES

POLITICAL BOUNDARIES

- COUNTY BOUNDARY
- MUNICIPAL BOUNDARY

TRANSPORTATION

- DIVIDED HIGHWAY
- STATE/FEDERAL HIGHWAY
- CITY STREET/COUNTY ROAD
- AIRPORT
- RAILROAD
- SHIP CHANNEL/GULF INTRACOASTAL WATERWAY
- SHIPPING SAFETY FAIRWAY

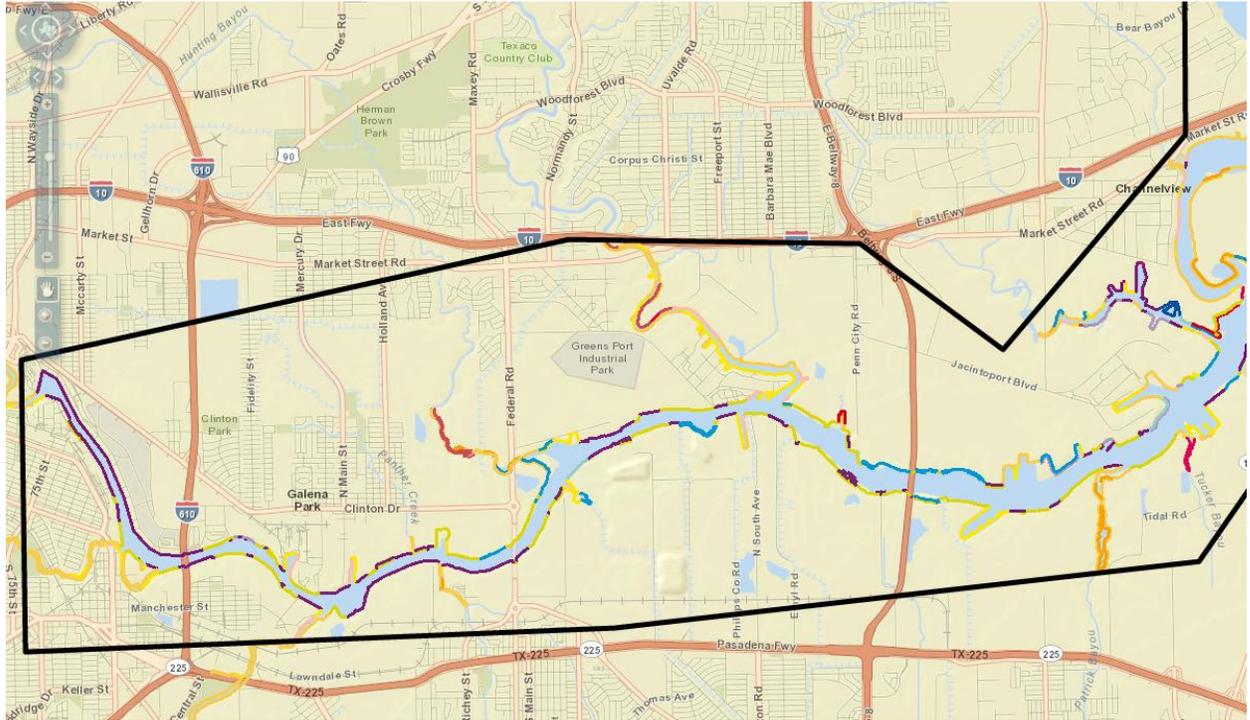
HUMAN USE FEATURES

- AQUACULTURE SITE
- BEACH ACCESS POINT
- BOAT RAMP
- COAST GUARD STATION
- HELIPORT
- LIGHTHOUSE
- MARINA
- WATER INTAKE POINT

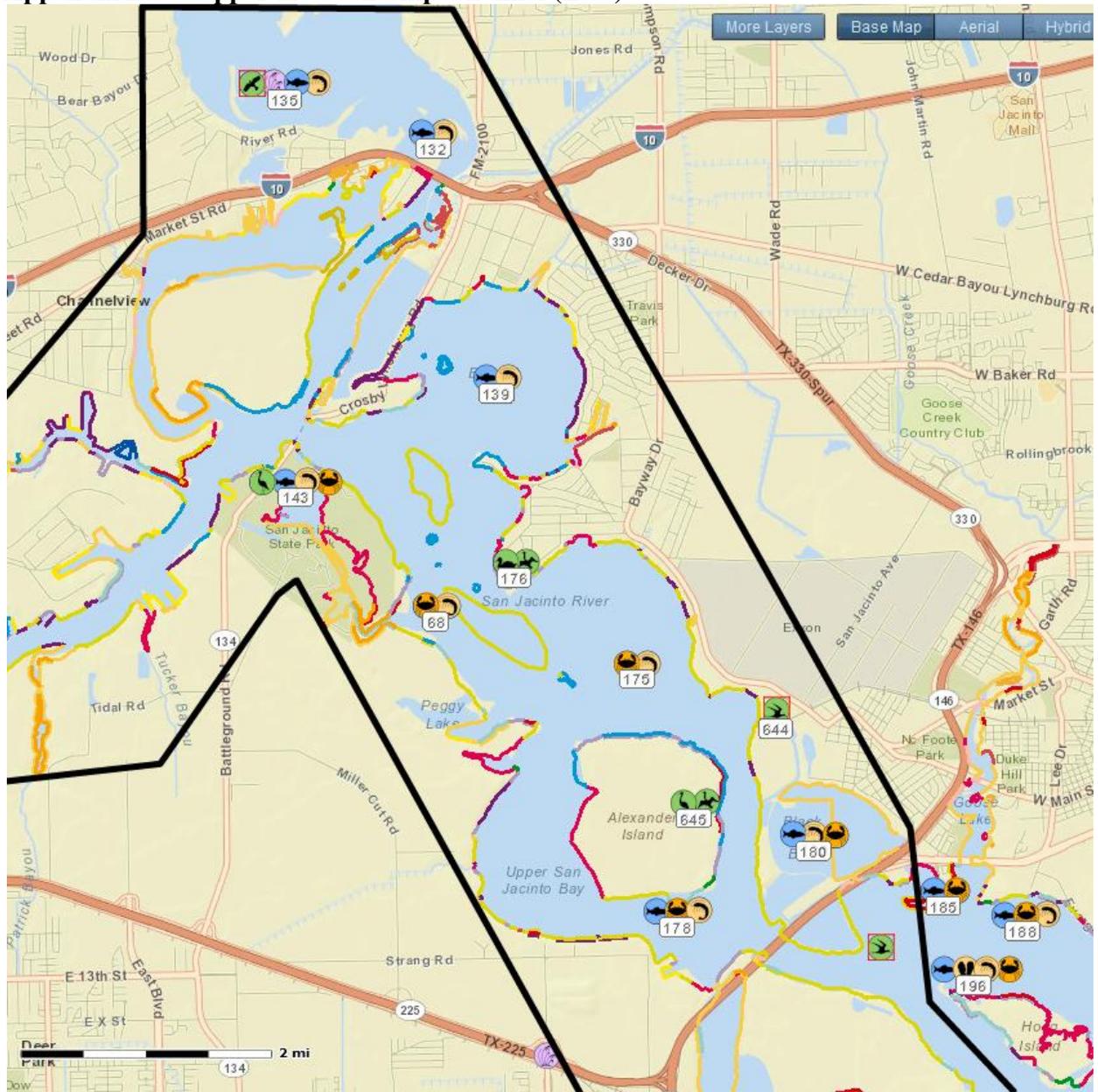
OTHER LAYERS

- ANCHORAGE AREA
- AUDUBON SANCTUARY
- BIRD ROOKERY AREA
- CITY OR COUNTY PARK
- COASTAL PRESERVE
- MUNICIPAL AREA
- NATIONAL WILDLIFE REFUGE
- STATE PARK/WILDLIFE MANAGEMENT AREA
- WASHOVER AREA

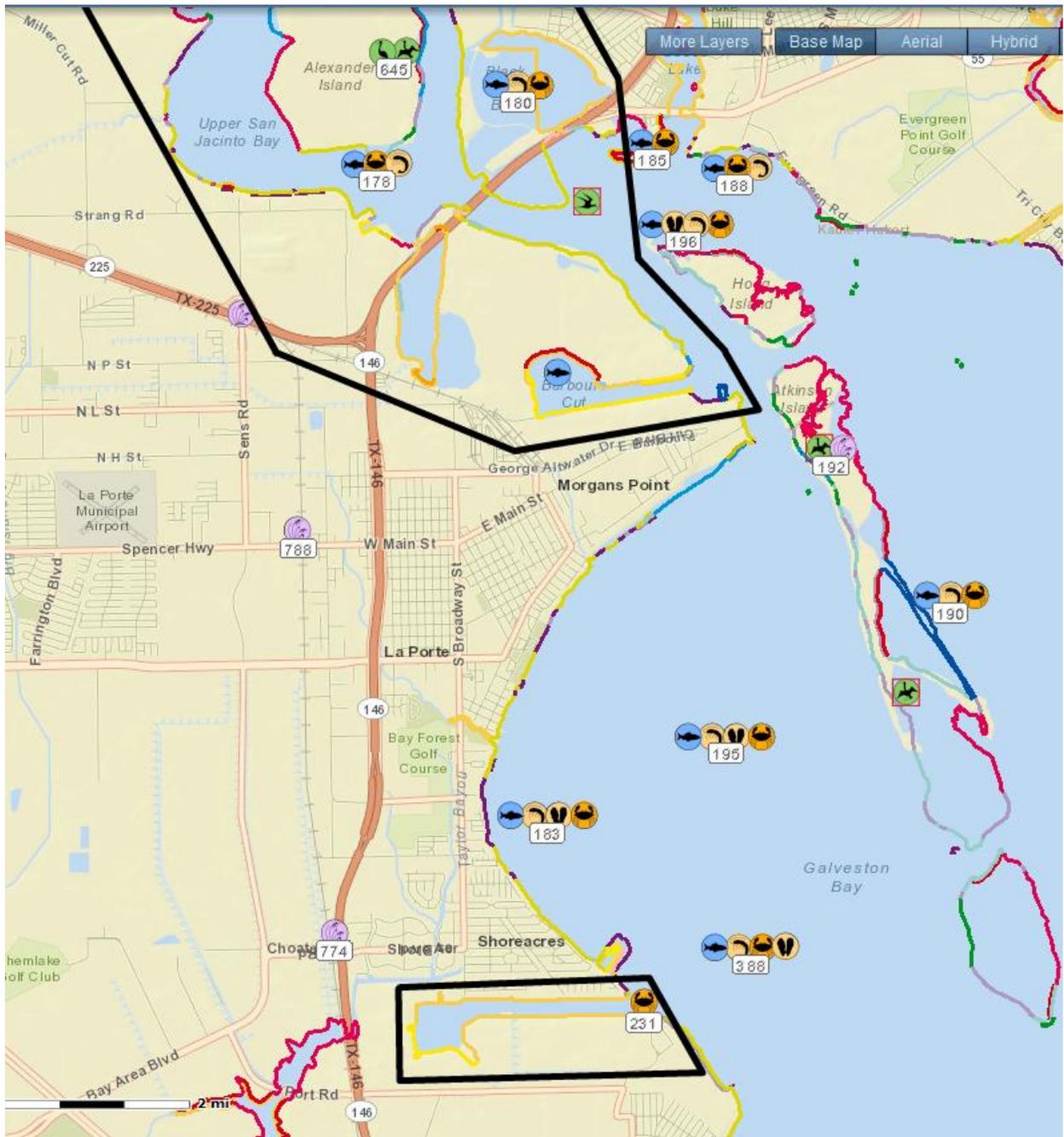
Appendix B.2 - Upper Houston Ship Channel (West)



Appendix B.3 – Upper Houston Ship Channel (East)



Appendix B.3 - Bayport Ship Terminal



Appendix B.4 – Texas City and Galveston Channel

