ATTACHMENT D-1

CLEAN WATER ACT SECTION 404(B)(1) EVALUATION

EVALUATION OF SECTION 404(B)(1) GUIDELINES
(SHORT FORM)

PROPOSED PROJECT: Gulf Intracoastal Waterway: Brazos River Floodgates and Colorado River Locks Systems Feasibility Study, Brazoria and Matagorda Counties, Texas

	Yes	No*
1. Review of Compliance (230.10(a)-(d))		
A review of the proposed project indicates that:		
a. The placement represents the least environmentally damaging practicable alternative and, if in a special aquatic site, the activity associated with the placement must have direct access or proximity to, or be located in the aquatic ecosystem, to fulfill its basic purpose (if no, see section 2 and information gathered for EA alternative).	**X**	
b. The activity does not appear to:		
1) Violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act;	**X**	
2) Jeopardize the existence of Federally-listed endangered or threatened species or their habitat; and	**X**	
3) Violate requirements of any Federally-designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies).	**X**	
c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, an economic values (if no, see values, Section 2)	**X**	
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see Section 5)	**X**	

Note: See Reference #1, Draft Report, Chapter 5, Sections 5.3.2 (Water Resources), 5.3.3 (Water Quality), 5.4.3 (Threatened and Endangered Species), 5.5 (Aquatic Resources), and 5.7 (Essential Fish Habitat) for description of impacts to respective resources.

	Not Applicable	Not Significant	Significant*
2. Technical Evaluation Factors (Subparts C-F) (where a 'Significant' category is checked, add explanation below.)			
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)			
1) Substrate impacts		**10.0 X**	
2) Suspended particulates/turbidity impacts		**X**	
3) Water column impacts		**X**	
4) Alteration of current patterns and water circulation		**X**	
5) Alteration of normal water fluctuation/hydroperiod		**X**	
6) Alteration of salinity gradients		**X**	
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
1) Effect on threatened/endangered species and their habitat		**X**	

2) Effect on the aquatic food web		**X**	
3) Effect on other wildlife (mammals, birds, reptiles and amphibians)		**X**	
	Not Applicable	**Not Significant**	**Significant***
2. Technical Evaluation Factors (Subparts C-F) (where a 'Significant' category is checked, add explanation below.)			
c. Special Aquatic Sites (Subpart E)			
1) Sanctuaries and refuges		**X**	
2) Wetlands Wetland impacts would occur at each facility, including an estimated 3.7 acres of high marsh and 2.3 acres of intertidal marsh at Brazos River Floodgates (BRFG) and 0.7 acre of intertidal marsh at Colorado River Locks (CRL). The USACE will provide mitigation for the impacted wetland habitats. Mitigation needs were calculated using Habitat Evaluation Procedures (HEP) methodology. The Recommended Plan is the Least Environmentally Damaging Practicable Alternative (LEDPA) that meets the goals and objectives of the study. At the BRFG, the LEDPA would result in the loss of 3.70 Average Annual Habitat Units (AAHUs) for high marsh and 1.84 AAHUs for intertidal marsh. The LEDPA would result in the loss of 0.59 AAHUs for intertidal marsh at the CRL. Using the HEP methodology, it was determined that the USACE would create 6.02 acres of wetland habitat at the BRFG site (3.78 acres of high marsh and 2.24 acres of intertidal marsh) and 0.74 acre of wetland habitat (intertidal marsh) at the CRL site to mitigate for the wetland losses described above. This mitigation would produce 6.13 AAHUs to offset the 6.12 AAHUs that would be lost as a result of the LEDPA.		**X**	
3) Mud flats	**X**		
4) Vegetated shallows	**X**		
5) Coral reefs	**X**		
6) Riffle and pool complexes	**X**		
d. Human Use Characteristics (Subpart F)			
1) Effects on municipal and private water supplies	**X**		
2) Recreational and Commercial fisheries impacts		**X**	
3) Effects on water-related recreation		**X**	
4) Aesthetic impacts		**X**	
5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves	**X**		

Note: See Reference #1, Draft Report, Chapter 5, Section 5.3.2 (Water Resources), 5.3.3 (Water Quality), 5.4.2 (Land Resources [Protected/Managed] and Recreation Areas, 5.4.3 (Threatened and Endangered Species), 5.5 (Aquatic Resources), 5.6 (Commercial and Recreational Fisheries), and 5.7 (Essential Fish Habitat) for description of impacts to respective resources.

	Yes
3. Evaluation of Dredged or Fill Material (Subpart G)	
a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material (check only those appropriate)	
1) Physical characteristics	*X*
2) Hydrography in relation to known or anticipated sources of contaminants	**X**
3) Results from previous testing of the material or similar material in the vicinity of the project	**X**
4) Known, significant sources of persistent pesticides from land runoff or percolation	
5) Spill records for petroleum products or designated (Section 311 of Clean Water Act) hazardous substances	
6) Other public records of significant introduction of contaminants from industries, municipalities or other sources	**X**
7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	

Note: See Reference #1, Draft Report, Chapter 5, Section 5.14 (Hazardous, Toxic, and Radioactive Wastes). Also see References #3.

List appropriate references:

1) U.S. Army Corps of Engineers (USACE). 2018. Draft Report, Gulf Intracoastal Waterway: Brazos River Floodgates and Colorado River Locks Feasibility Study. February 2018.
2) USACE. 2018. Engineering Appendix A of Draft Report, Gulf Intracoastal Waterway: Brazos River Floodgates and Colorado River Locks Feasibility Study. February 2018.
3) USACE. 2017. Hazardous Toxic Radioactive Waste (HTRW) Survey for Gulf Intracoastal Waterway Brazos River Floodgates & Colorado River Lock Feasibility Study. October 2017.
4) U.S. Environmental Protection Agency (EPA). 2016. Detailed Facility Reports for Central WWTF and Matagorda WD & WSC WWTP. Enforcement and Compliance History Online (ECHO). August 2016.

	Yes	**No**
b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredged or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and placement sites and not likely to degrade the placement sites, or the material meets the testing exclusion criteria.		**X**

Note: Sediment deposits around the BRFG may contain Hazardous, Toxic, or Radioactive Waste (HTRW) from upstream chemical and petroleum manufacturing and processing facilities including Superfund sites. The EPA has characterized the GIWW in the vicinity of the study area as having high sediment contaminants. High flooding in the area in 2017 may have caused contaminated surface soil from upstream petroleum refineries, chemical plants and plastic manufacturing facilities to erode into the river, depositing in the sediments. At a minimum, sediment samples to characterize the contaminants present will be required, as the LEDPA results in disturbance of the riverbed. Potential contaminants from upstream operations include, but are not limited to, polychlorinated biphenyls [PCBs], heavy metals such as lead, nickel, mercury, zinc, cadmium, chromium, and arsenic, and organic compounds that include known carcinogens.

Sediment deposits near the CRL may also contain HTRW material. EPA records of water quality testing near the CRL indicate fairly high metal, microbiology, and pesticide results. While there are not currently many industrial

facilities visible upstream, there are several industrial wastewater discharge points that have had known past releases of hazardous materials.

	Yes
4. Placement Site Delineation (230.11(f))	
a. The following factors as appropriate, have been considered in evaluating the placement site:	**N/A**
1) Depth of water at placement site	
2) Current velocity, direction, and variability at placement site	
3) Degree of turbulence	
4) Water column stratification	
5) Discharge vessel speed and direction	
6) Rate of discharge	
7) Fill material characteristics (constituents, amount, and type of material, settling velocities)	
8) Number of discharges per unit of time	
9) Other factors affecting rates and patterns of mixing (specify)	

Note: See Reference #1, Draft Report, Chapter 5, Section 5.1. Materials that would be dredged during construction would be deposited into existing upland dredged material placement areas (DMPAs). Future maintenance materials dredged would also be placed primarily in upland DMPAs, although existing ocean dredged material disposal sites (ODMDS) may be used for maintenance dredging in the Freeport Channel since that is the current mode of disposal there. The USACE Galveston District is currently working on updating the dredged material management plan (DMMP) for the GIWW from High Island to the Brazos River, which includes the Freeport Channel, to allow disposal of future additional maintenance material at ODMDS.

List appropriate references:

1) U.S. Army Corps of Engineers (USACE). 2018. Draft Report, Gulf Intracoastal Waterway: Brazos River Floodgates and Colorado River Locks Feasibility Study. February 2018.

	Yes	No
b. An evaluation of the appropriate factors in 4a above indicates that the placement site and/or size of mixing zone are acceptable.	**N/A**	

	Yes	No
5. Actions to Minimize Adverse Effects (Subpart H)		
All appropriate and practicable steps have been taken, through application of recommendations of 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.	**X**	

List actions taken:

1) Best management practices (BMPs) would be used to reduce suspended solids from land runoff, including installation of silt fences. Similarly, turbidity screens or silt collection curtains around construction equipment would reduce the amount of sediment entrained in the water.

	Yes	No*
6. Factual Determination (230.11)		
A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:		
a. Physical substrate at the placement site (review Sections 2a. 3, 4, and 5 above)	**X**	
b. Water circulation, fluctuation and salinity (review Sections 2a. 3, 4, and 5)	**X**	
c. Suspended particulates/turbidity (review Sections 2a. 3, 4, and 5)	**X**	
d. Contaminant availability (review Sections 2a. 3, and 4)		**X**
e. Aquatic ecosystem structure and function (review Sections 2b and c, 3, and 5)	**X**	
f. Placement site (review Sections 2, 4, and 5)	**X**	
g. Cumulative impacts on the aquatic ecosystem	**X**	
h. Secondary impacts on the aquatic ecosystem	X	

Note: The USACE will collect sediment samples to characterize potential contaminants present at the BRFG and CRL. Depending on the sediment sample results, there may be additional efforts for disposal, treatment, or additional health and safety requirements during construction.

7. Evaluation Responsibility
a. This evaluation was prepared by: Position:

8. Findings	Yes
a. The proposed placement site for discharge of or fill material complies with the Section 404(b)(1) Guidelines.	**X**
b. The proposed placement site for discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines with the inclusion of the following conditions:	

List of conditions:

c. The proposed placement site for discharge of dredged or fill material does not comply with the Section 404(b)(1) Guidelines for the following reason(s):	
1) There is a less damaging practicable alternative	
2) The proposed discharge will result in significant degradation of the aquatic ecosystem	
3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem	

_____ Date	_____

NOTES:

* A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) Guidelines.

Negative responses to three or more of the compliance criteria at the preliminary stage indicate that the proposed projects may not be evaluated using this "short form" procedure. Care should be used in assessing pertinent portions of the technical information of items 2a-e before completing the final review of compliance.

Negative response to one of the compliance criteria at the final stage indicates that the proposed project does not comply with the Guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form" evaluation process is inappropriate.

ATTACHMENT D-2

BIOLOGICAL ASSESSMENT

DRAFT

BIOLOGICAL ASSESSMENT

GULF INTRACOASTAL WATERWAY
BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS SYSTEMS FEASIBILITY STUDY

US Army Corps of Engineers ®

Texas Department of Transportation ®

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition or Meaning
BA	Biological Assessment
BMP	best management practice
BO	Biological Opinion
BRFG	Brazos River Floodgates
CFR	Code of Federal Regulations
CRL	Colorado River Locks
CWS	Canadian Wildlife Service
DMPA	Dredged Material Placement Area
ESA	Endangered Species Act
FR/EIS	Feasibility Report and Environmental Impact Statement
H&H	hydrology and hydraulics
GIWW	Gulf Intracoastal Waterway
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
ODMDS	ocean dredged material disposal sites
SONAR	Sound Navigation and Ranging
TXNDD	Texas Natural Diversity Database
TxDOT	Texas Department of Transportation
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WBNP	Wood Buffalo National Park
WMA	Wildlife Management Area

11.0 INTRODUCTION

The United States Army Corps of Engineers (USACE), in cooperation with the Texas Department of Transportation (TxDOT) Maritime Division, is conducting the *Gulf Intracoastal Waterway (GIWW), Brazos River Floodgates and Colorado River Locks Systems Feasibility Study* to determine the feasibility of modifying the Brazos River Floodgates (BRFG) and Colorado River Locks (CRL) to reduce navigation impacts and costly waterborne traffic delays that are a result of aging infrastructure and inadequate channel dimensions. As part of the Feasibility Study, the USACE has prepared an integrated Feasibility Report and Environmental Impact Statement (FR/EIS) in compliance with the National Environmental Policy Act (NEPA), USACE regulation ER-200-2, 33 Code of Federal Regulations (CFR) 230, the Flood Control Act of 1970 – Section 216, and other Federal, state, and local environmental policies and procedures.

This Biological Assessment (BA) was prepared to fulfill the USACE's requirements under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, and to provide information to assist the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) in reviewing the project's effects on federally listed threatened and endangered species, species proposed or candidates for listing, and designated critical habitat. The project is not expected to adversely affect any listed species; therefore, consultation with the USFWS and NMFS is expected to be informal, and no Biological Opinion (BO) is expected to be required for the project.

11.1 Background Information

The GIWW is a 1,300-mile-long, shallow-draft, man-made protected waterway that connects ports along the Gulf of Mexico from St. Marks, Florida, to Brownsville, Texas. The authorized channel dimensions are 125 feet wide and 12 feet deep. The GIWW is an essential component of the transportation network of Texas and the nation, reducing congestion on highway and rail systems, thereby decreasing maintenance costs and extending the life of these transportation systems. Compared to truck or rail transport, the use of barges to transport goods produces fewer air emissions, is more fuel-efficient, and provides a safer mode of transportation. The GIWW is also used by the commercial fishing industry and for recreational activities such as fishing, skiing, sightseeing, and traveling long distances in the protected waterway (TxDOT 2016).

The BRFG and CRL are two lock-type structures on the GIWW located about 40 miles apart on the upper to mid-Texas coast, in Brazoria and Matagorda Counties, respectively (**Figure 1**). They were initially installed in the early 1940s to prevent heavy sediment loads in the Brazos and Colorado Rivers from entering the GIWW. The structures are over 60 years old and were installed at a time when most tug boats pulled barges behind them, rather than using the modern pushing method. At each facility, the gate openings are 75 feet wide, which is much narrower than the 125-foot-wide GIWW navigation channel. Although regulations restrict the width of tows to 55 feet, oversize tow permits are routinely granted for tows as wide as 108 feet, particularly along the upper Texas coast (TxDOT 2016). To move these wider tows through the BRFG and CRL, vessel operators must park the tows, break the barges apart, move them through the locks in smaller sets or individually, and reconnect the tows on the other side. This process, known as "tripping," is inefficient and causes delays that result in substantial costs to the towing industry each year (TxDOT 2013). In addition to the narrow gates, high flows in the Brazos and Colorado Rivers make

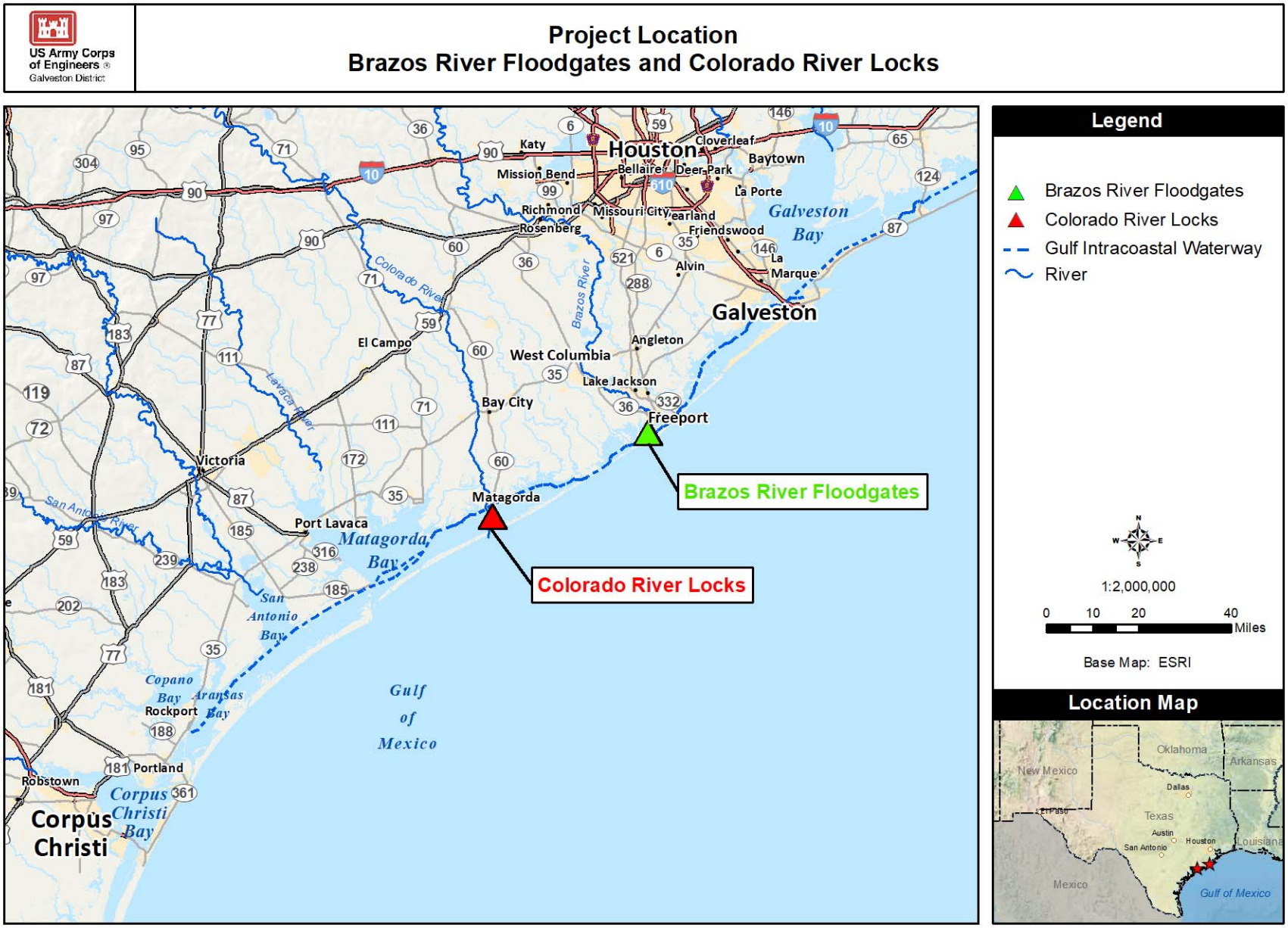

Figure 7 Project Location

navigation through the BRFG and CRL structures more difficult and result in temporary navigation restrictions and/or closures imposed by the USACE and United States (U.S.) Coast Guard. These restrictions and closures result in additional delays and economic impact to the towing industry.

11.2 Structure of this BA

Section 2.0 of this BA provides a description of existing conditions in the study areas, Section 3.0 provides a summary of alternatives considered, the Recommended Plan, and the anticipated impacts of the Recommended Plan. Threatened and endangered species of potential occurrence in Brazoria and Matagorda Counties are described in Section 4.0, as well as designated critical habitat. Finally, Section 5.0 discusses the potential effects of the Recommended Plan on threatened and endangered species and provides the recommended determinations of effect.

12.0 ENVIRONMENTAL BASELINE

12.1 Location

As described above, the BRFG and CRL are located about 40 miles apart on the upper to mid-Texas coast, in Brazoria and Matagorda Counties, respectively (**Figure 1**). For each facility, existing environmental conditions were evaluated within a study area that encompasses the maximum disturbance area for the reasonable alternatives. The BRFG study area encompasses roughly 600 acres and extends 1 mile east and west of the Brazos River crossing and up to 0.5 mile north and south of the river crossing (**Figure 2**). The CRL study area encompasses roughly 400 acres and extends 1 mile east and west of the Colorado River crossing and up to 0.25 mile north and south of the river crossing (**Figure 3**). Under the reasonable alternatives, all direct construction activities would occur within these study areas. In addition, nearby resources were identified and evaluated on a case-by-case basis depending on their potential to be indirectly affected by modifications to the BRFG and/or CRL facilities (e.g., salinity and sedimentation changes).

12.2 Land Use/Land Cover

Based on aerial photograph review and field reconnaissance, the BRFG and CRL study areas are largely undeveloped, with open water, emergent marsh, and upland shrub/woods being the major land cover types in both study areas (**Figures 2 and 3**). Some livestock grazing occurs within these areas. Commercial navigation is a major land use in both study areas, represented by the GIWW, BRFG and CRL facilities and access roads, and existing dredged material placement areas (DMPAs) along the GIWW. Developed areas in the BRFG study area include Texas Boat and Barge, Inc., which is a barge storage, cleaning, maintenance, and repair facility located adjacent to the east floodgate. Nearby, the Department of Energy's Bryan Mound Strategic Petroleum Reserve, which is one of two Federal strategic petroleum reserve sites in Texas, is located about 1 mile north of the east floodgate (**Figure 2**). At the CRL facility, residential areas lie just outside the study area to the northeast in the town of Matagorda and to the south along the east bank of the original Colorado River channel (**Figure 3**). The area surrounding the study areas is also relatively undeveloped, although the City of Freeport lies northeast of the BRFG facility, and the town of Matagorda lies northeast of the CRL facility. Much of the undeveloped areas contain coastal bays and marshes, with upland coastal prairie and some cropland occurring further inland.

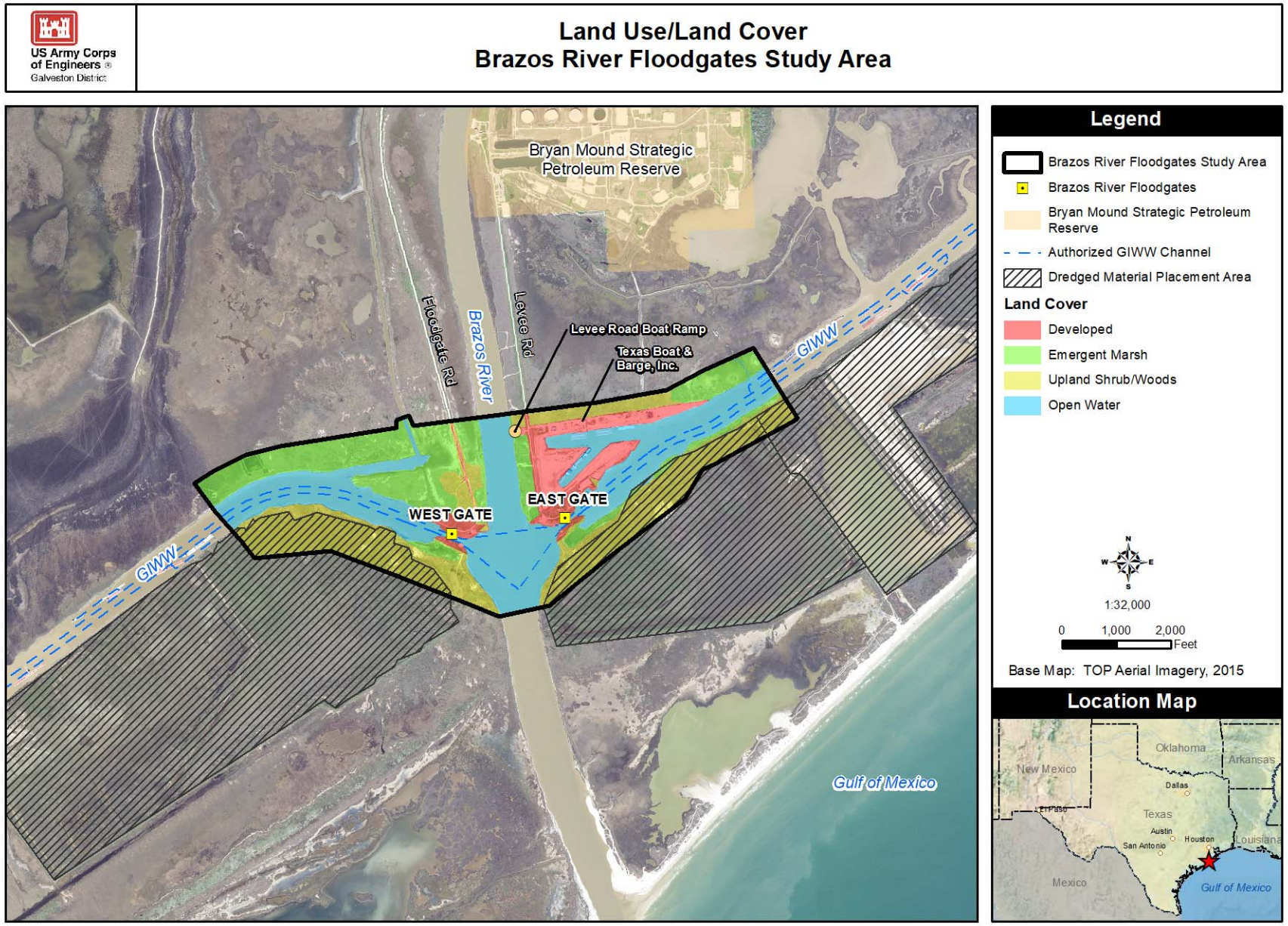

Figure 8 BRFG Study Area and Land Use/Land Cover

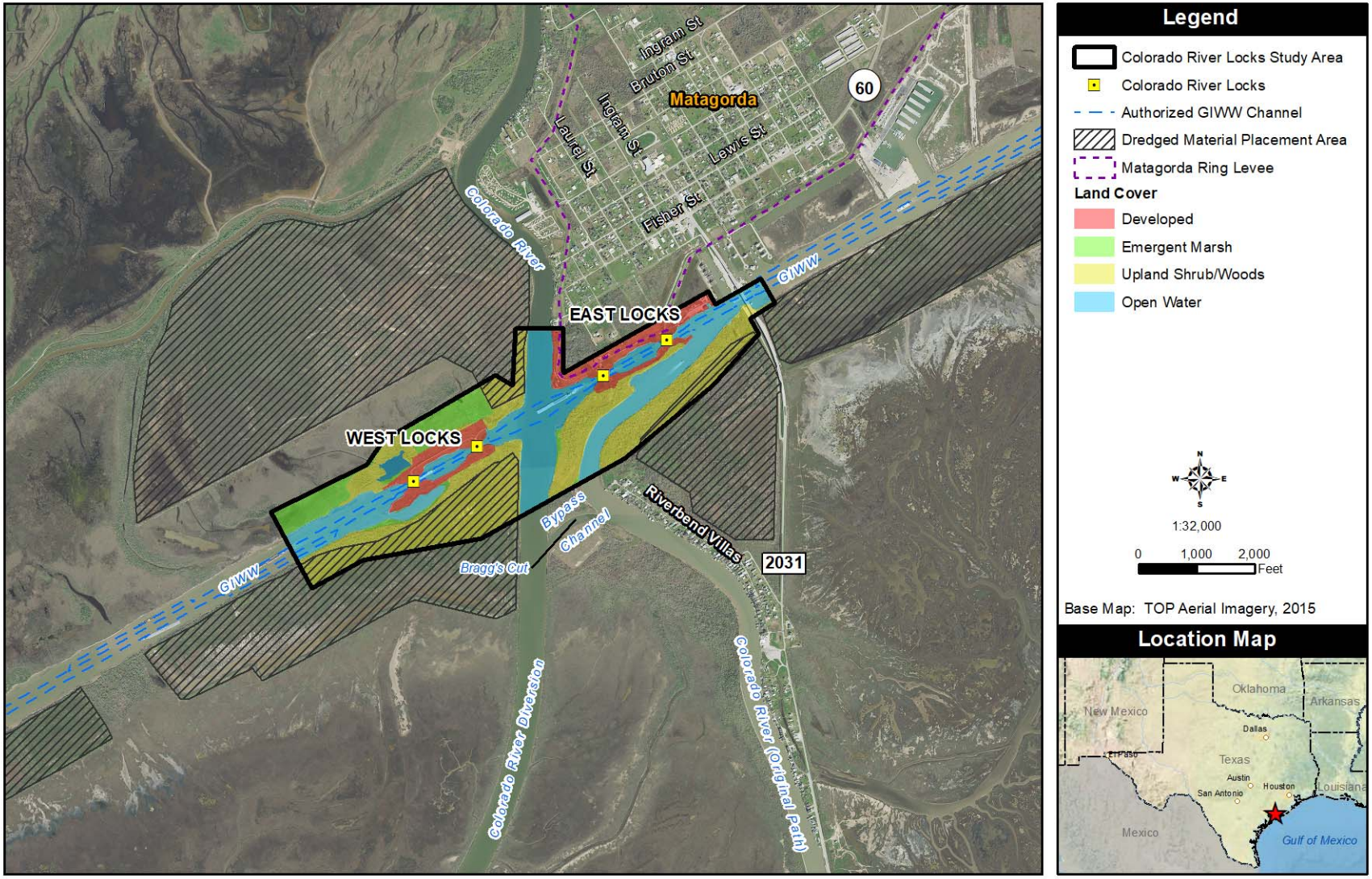

Figure 9 CRL Study Area and Land Use/Land Cover

12.3 Nearby Wildlife Refuges and Management Areas

National wildlife refuges (NWR) and state wildlife management areas (WMA) occur in the vicinity of the study areas. Near the BRFG, Justin Hurst WMA is located less than 1 mile north and San Bernard NWR is located approximately 3 miles west of the BRFG study area (**Figure 4**). Near the CRL is Mad Island WMA, which is located about 1.5 miles west of the CRL study area (**Figure 5**).

12.4 Vegetation and Wildlife Habitats

The BRFG and CRL study areas are in the Mid-Coast Barrier Islands and Coastal Marshes portion of the Western Gulf Coastal Plain ecoregion, which stretches from Galveston Bay in the north to Corpus Christi Bay in the south (Griffith et al. 2007). This ecoregion is characterized as having salt marsh on the back side of barrier islands, with fresh or brackish marshes near river deltas. The region contains a matrix of wetland and upland habitats that support a variety of wildlife species.

Based on aerial photography review and field reconnaissance, six general vegetation communities/habitat types were observed within the BRFG and CRL study areas (**Figures 6 and 7**). **Table 1** lists the habitat types and the approximate percentage of each study area that contains the habitat. Descriptions of the habitat types follow the table.

Table 23 Estimated Habitat Types in the BRFG and CRL Study Areas

Habitat Type	Percentage of BRFG Study Area	Percentage of CRL Study Area
Open Water	36	35
Intertidal Marsh	2	1
High Marsh	21	8
Tidal Flat	0.5	0
Upland Shrub/Woods	30	43
Developed	11	13

Open Water

Open water is a major habitat type in both study areas and is present in the GIWW and Brazos and Colorado Rivers. The open water areas provide habitat for fish, shrimp, crabs, bottlenose dolphins (*Tursiops truncatus*), and other estuarine species. Most of the open water habitat experiences regular disturbances by barge tows and other vessels traveling through the GIWW, as well as periodic maintenance dredging.

High Marsh

High marsh habitat is the dominant wetland habitat in the study areas, occurring at low elevations but only infrequently inundated by very high tides. Common plant species observed in this habitat include turtleweed (*Batis maritima*), saltgrass (*Distichlis spicata*), saltworts (*Salicornia* spp.), Gulf cordgrass (*Spartina spartinae*), marshhay cordgrass (*S. patens*), sea-oxeye daisy (*Borrichia frutescens*), seepweed (*Suaeda linearis*), and marsh-elder (*Iva frutescens*). Scattered threesquare (*Schoenoplectus pungens*), wolfberry (*Lycium carolinianum*), saltcedar (*Tamarix ramosissima*), smooth cordgrass (*Spartina alterniflora*), and common reed (*Phragmites australis*) were also observed.

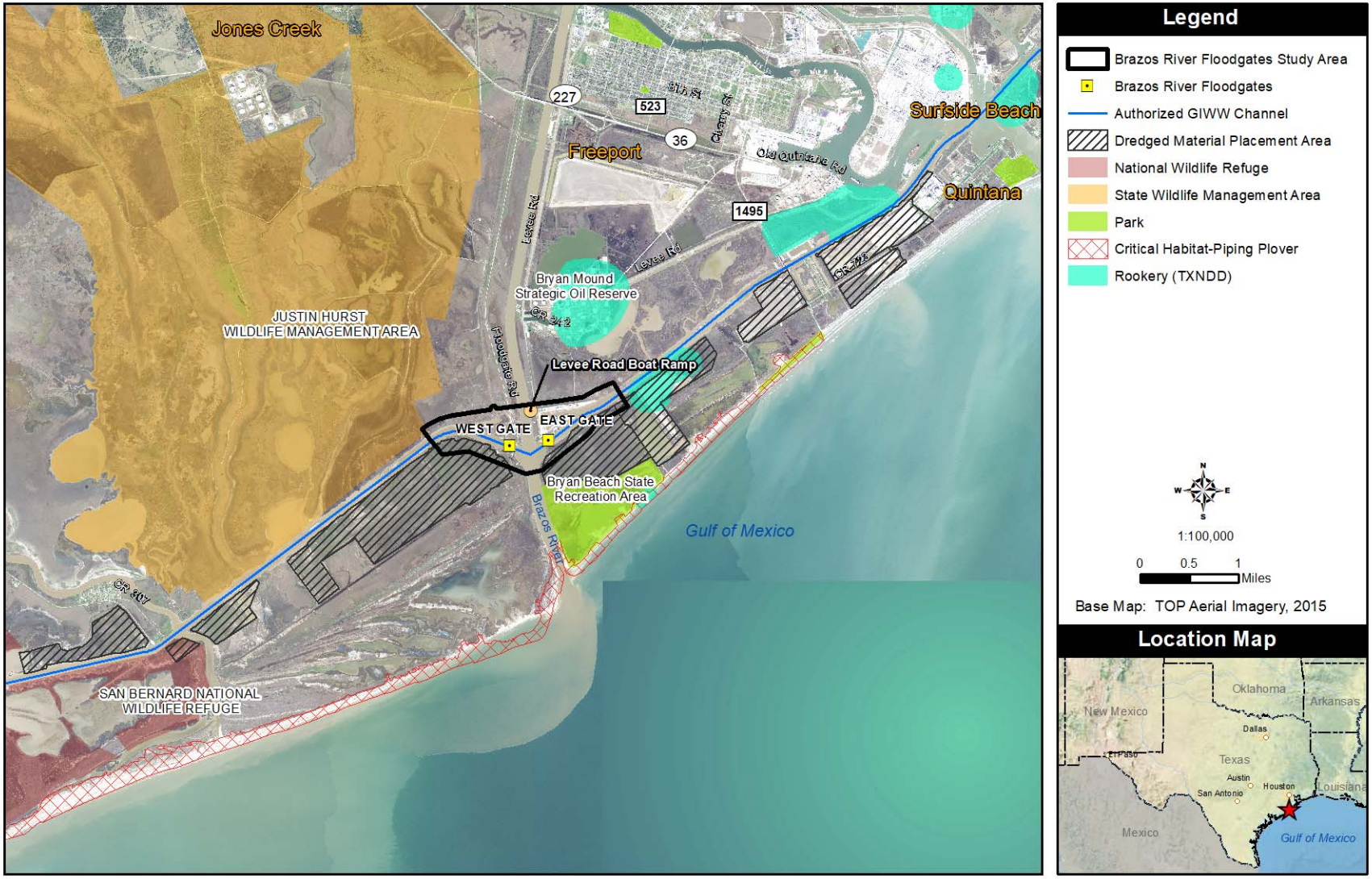

Figure 10 Wildlife Refuges and Management Areas Near the BRFG Study Area

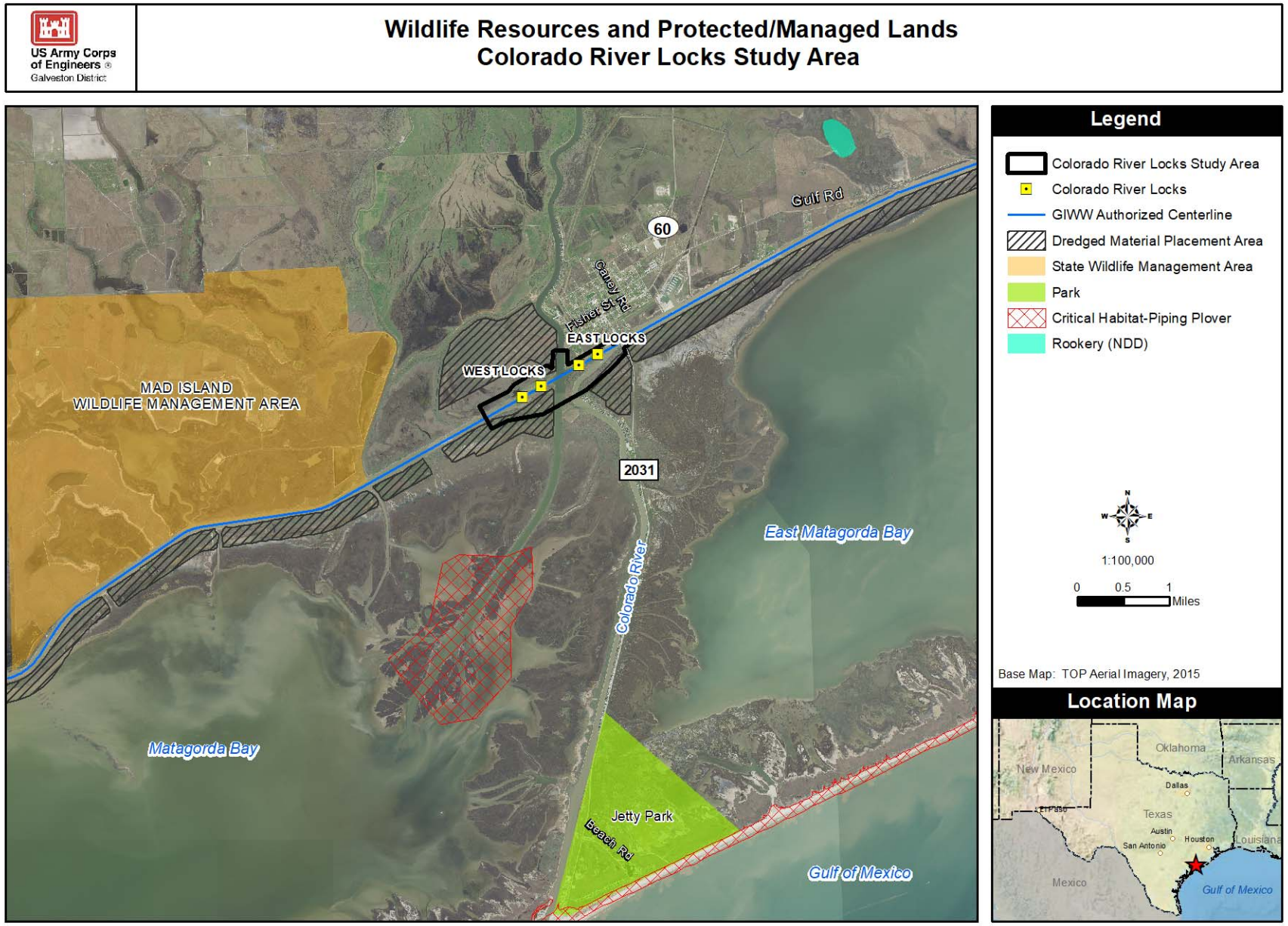

Figure 11 Wildlife Refuges and Management Areas Near the CRL Study Area

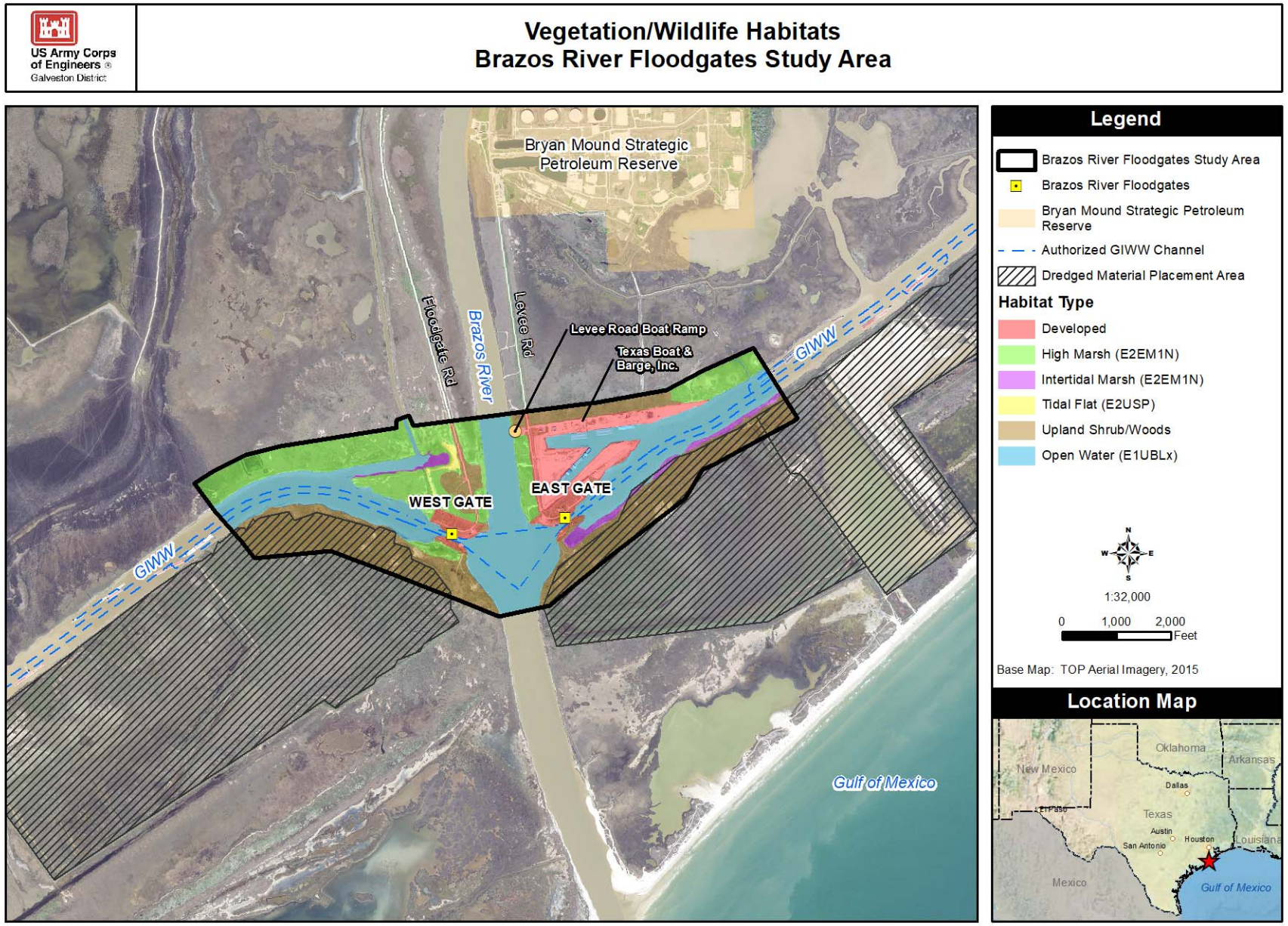

Figure 12 Vegetation/Wildlife Habitats in BRFG Study Area

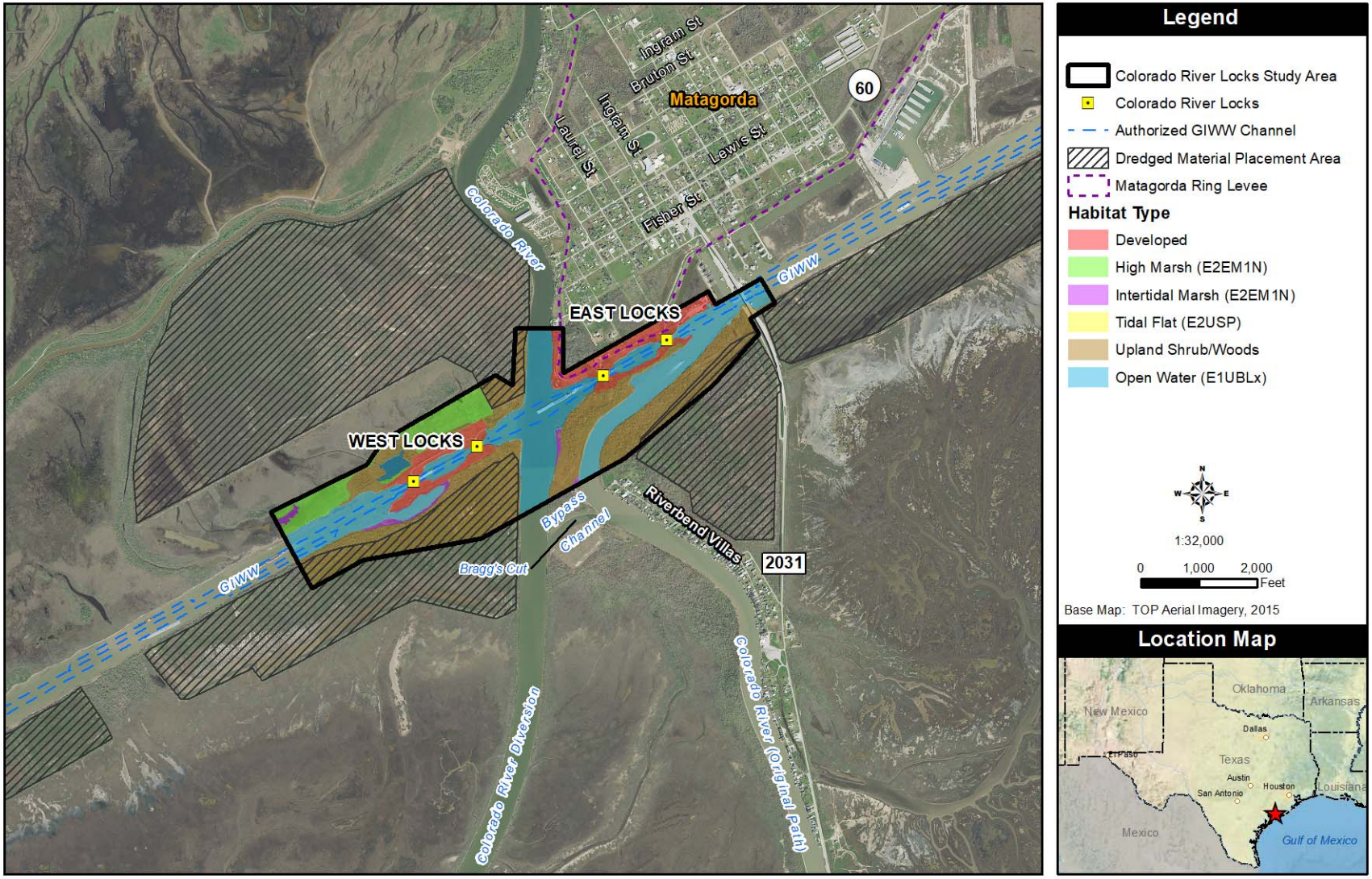

Figure 13 Vegetation/Wildlife Habitats in CRL Study Area

Intertidal Marsh

Within both study areas, there are relatively small patches of intertidal marsh, which are wetland areas that occur at elevations between the low and high tides (intertidal zone). These areas are dominated by smooth cordgrass (*Spartina alterniflora*), with species common to the high marsh habitat present along the edges.

Tidal Flat

One small area of unvegetated tidal flat is in the BRFG study area. This habitat is adjacent to an intertidal marsh and contained less than 5 percent plant cover (turtleweed, smooth cordgrass, saltwort, and saltgrass). Algal mats covered an estimated 50 percent of the flat during a February 2017 field investigation. The area also showed evidence of disturbance from cattle.

Upland Shrub/Woods

Higher elevations in the study areas, such as portions of the river banks and in DMPAs, support upland shrub/woods vegetation. Common plant species observed in this habitat include American elm (*Ulmus americana*), sugar hackberry (*Celtis laevigata*), honey mesquite (*Prosopis glandulosa*), Hercules'-club (*Zanthoxylum clava-herculis*), osage orange (*Melia azedarach*), roughleaf dogwood (*Cornus drummondii*), retama (*Parkinsonia aculeata*), elbowbush (*Forestiera angustifolia*), eastern baccharis (*Baccharis halimifolia*), saltcedar, Louisiana vetch (*Vicia ludoviciana*), rosettegrass (*Dichanthelium* sp.), catchweed (*Galium* sp.), crow-poison (*Nothoscordum bivalve*), hairyfruit chervil (*Chaerophyllum tainturieri*), giant ragweed (*Ambrosia trifida*), mustang grape (*Vitis mustangensis*), poison ivy (*Toxicodendron radicans*), southern dewberry (*Rubus trivialis*), Virginia creeper (*Parthenocissus quinquefolia*), and peppervine (*Ampelopsis arborea*).

Developed

Developed areas in the study areas include the floodgate and lock facilities and Texas Boat & Barge, Inc. (BRFG study area).

13.0 SUMMARY OF ALTERNATIVES CONSIDERED AND RECOMMENDED PLAN

13.1 Summary of Alternatives Considered and Recommended Plan Identification

Early on in alternatives development, the USACE and TxDOT identified a number of alternatives that involved various measures to improve navigation through the BRFG and CRL facilities. Through multiple screening efforts, the USACE and TxDOT narrowed the reasonable alternatives to the No Action Alternative and five Action Alternatives at the BRFG facility, and the No Action Alternative and three Action Alternatives at the CRL facility. In an effort to minimize environmental impacts, the disturbance areas associated with the reasonable alternatives are located in and adjacent to the existing GIWW, BRFG, and CRL facilities. The USACE and TxDOT further evaluated these alternatives through hydrology and hydraulics (H&H) modeling, economic analysis, and environmental analysis to identify a Recommended Plan. **Table 2** lists the alternatives, provides a general overview of each alternative, and provides an estimated area that would be affected by the alternative.

Table 24 Summary of BRFG and CRL Alternatives Considered

Alternative	Alternative Overview	Estimated Acreage Affected	Recommended Plan?
BRFG Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing floodgates, guide walls, and other infrastructure; no major changes to overall footprint, orientation, operations, or bathymetry; H&H and salinity modeling and analysis assume conditions would be the same as existing.	0[1]	No
3a	Gate Relocation on Existing Alignment – Move floodgates farther from Brazos River along existing GIWW alignment; widen chamber wall opening from 75 feet to 125 feet wide.	83	No
3a.1	**Open Channel West/East Gate Relocation – Similar to Alternative 3a but only includes a new east floodgate; removes west floodgate, leaving an open channel on the west side of the river.**	**79**	**Yes[2]**
9a	Open Channel – Remove floodgates and excavate an open channel north of the existing GIWW alignment to straighten this section of the GIWW.	75	No
9b/c	New Alignment/Gates with Control Structures – Excavate new channel north of existing GIWW alignment and construct 125-foot-wide floodgates on the new channel. Alt. 9c includes a flow control structure at existing west gate location, while Alt. 9b does not.	87	No
CRL Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing locks, guide walls, and other infrastructure as needed; no major changes to overall footprint, guide wall orientation, gate operations, or bathymetry; H&H and salinity modeling/analysis assume conditions would be the same as existing.	0[1]	No
3b	Open Channel – Remove existing locks, creating an open channel through the intersection at the GIWW.	71	No
4b.1	**Removal of Riverside Gates – Remove riverside gates, converting the locks to floodgates.**	**71**	**Yes[2]**

[1] BRFG Alternative 2a and CRL Alternative 2a would rehabilitate the existing facilities within the existing footprints.
[2] The Recommended Plan is BRFG Alternative 3a.1 and CRL Alternative 4b.1.

The Recommended Plan includes implementing Alternative 3a.1 (Open Channel West/East Gate Relocation) at the BRFG facility and Alternative 4b.1 (Removal of Riverside Gates) at the CRL facility. At the BRFG facility, the Recommended Plan would remove the existing 75-foot-wide east and west floodgates, construct new 125-foot-wide floodgates on the east side of the Brazos River, and construct new wing walls and guide walls for the east floodgates. The new east floodgates would be on the existing GIWW alignment and set back from the Brazos River compared to the existing floodgates to provide a longer approach channel. They would require installation of about 1,140 feet of steel sheet pile that will be installed by pile driving. The Recommended Plan would include an open channel west of the river; therefore, no new floodgates would be constructed west of the river. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on the east side of the river. On the west side of the river, the bypass channel may serve as the permanent open channel, depending on final design of the Recommended Plan.

At the CRL, the Recommended Plan would remove the existing riverside (inner) gates east and west of the Colorado River and rehabilitate the existing GIWW-side (outer) 75-foot-wide gates. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on both sides of the river.

Under the Recommended Plan (and all other alternatives considered), materials that would be dredged during construction would be deposited into existing upland dredged material placement areas (DMPAs). Future maintenance materials dredged would also be placed primarily in upland DMPAs, although existing ocean dredged material disposal sites (ODMDS) may be used for maintenance dredging in the Freeport Channel since that is the current mode of disposal there.

13.2 Potential Effects of the Recommended Plan

Potential effects of the Recommended Plan on threatened and endangered species are expected to be relatively minor, localized, and temporary. The general setting of the study areas would not change and the study areas would continue to be exposed to environmental factors that will affect the area, including hurricanes, climate change and projected sea level rises, local subsidence, and periodic disposal of dredged material from maintenance dredging. These effects are expected to be similar to the baseline conditions and to future without project conditions. Anticipated changes to threatened and endangered species habitat under the Recommended Plan are discussed in the following paragraphs.

Water quality impacts include increases in turbidity and suspended sediment in the GIWW, Brazos River, and Colorado River. During construction, water-based activities would increase turbidity in the GIWW, Brazos River, and Colorado River. Land-based construction activities adjacent to the GIWW would cause runoff from exposed earth, which would result in localized, temporary increases in suspended sediment in adjacent water. The increase in turbidity is temporary, and local water quality is expected to return to existing conditions after construction activities are completed. Best management practices (BMPs) would be used to reduce suspended solids from land runoff, including installation of silt fences. Similarly, turbidity screens or silt collection curtains around construction equipment would reduce the amount of sediment entrained in the water. Following construction, periodic disturbance of sediments and suspension of sediments in the water column would occur as a result of maintenance dredging operations, barge traffic, and flooding at levels similar to the existing conditions.

Construction activities have the potential to create ***short-term noise level increases*** that would be similar to increases during maintenance dredging currently occurring in the study areas. At the BRFG, noise levels would be affected by pile driving of sheet pile or other structures for the proposed new guide walls. No blasting or Sound Navigation and Ranging (SONAR) is anticipated during construction, and any noise level increases would be temporary during construction.

Soils and waterbottoms would be impacted by construction activities, including dredging and grading. Projected increases in velocities in the Colorado River channel and in the GIWW during floods may lead to soils being eroded at a faster rate than under existing conditions. Soils that remain in place in both study areas would be subject to inundation and conversion to waterbottoms due to erosion and the combined effects of sea level rise and subsidence. Soils removed for the Recommended Plan would be placed in

existing DMPAs and ODMDS, which would alter the soil structure and bottom habitats at those areas. At the BRFG, increased sedimentation would occur in the GIWW (both east and west of the BRFG), the Brazos River basin, and Freeport Channel, requiring maintenance dredging to prevent or reduce the shoaling that would occur under natural sedimentation deposition processes. At the CRL, sedimentation trends are expected to be similar to existing conditions and maintenance dredging would continue.

In general, during high flows in the Brazos and Colorado Rivers, ***salinities in the study areas*** would decrease due to higher influx of freshwater. Salinities would gradually increase as river levels and freshwater inflow decrease to normal flows and low flows. Hydraulic modeling was conducted and predicted that salinities in the BRFG study area would change by a decrease of up to 6 percent and an increase of as much as 16 percent. As the area experiences large fluctuations in salinities under existing conditions, no significant impacts to habitat are expected due to salinity changes. Hydraulic modeling was conducted and predicted that salinities in the CRL study area would be similar to the existing conditions; no significant changes to habitat are expected due to salinity changes.

The anticipated impact areas associated with the Recommended Plan at each facility are shown in relation to ***vegetation/wildlife habitats*** on **Figures 8 and 9**, and the acreages of vegetation/wildlife habitats that are present within the anticipated impact areas are provided in **Table 3**. At the BRFG, the Recommended Plan would impact an estimated 79 acres of land, primarily due to excavation of a temporary bypass channel to maintain navigation through the area during construction. The impacted areas are dominated by upland shrub/woods and open water; however, approximately 6.0 acres of wetlands would be removed during construction. Impacted wetland habitats in the temporary bypass channel would be restored and/or mitigated, resulting in no net loss of wetlands.

Table 25 Impacts to Vegetation and Wildlife Habitats (acres)

Habitat Type	BRFG Recommended Plan (Alternative 3a.1)	CRL Recommended Plan (Alternative 4b.1)
Open Water	21.4	45.2
Intertidal Marsh	2.3	0.7
High Marsh	3.7	0
Tidal Flat	0	0
Upland Shrub/Woods	45.1	14.7
Developed	6.1	10.8
Total	**78.6**	**71.4**

At the CRL, the Recommended Plan would impact an estimated 71 acres of land, primarily due to excavation of a temporary bypass channel to maintain navigation through the area during construction (**Table 3**). The impacted areas are mainly open water, upland shrub/woods, and developed land; however, approximately 0.7 acre of wetlands would be removed during construction. Impacted wetland habitats in the temporary bypass channel would be restored and/or mitigated, resulting in no net loss of wetlands.

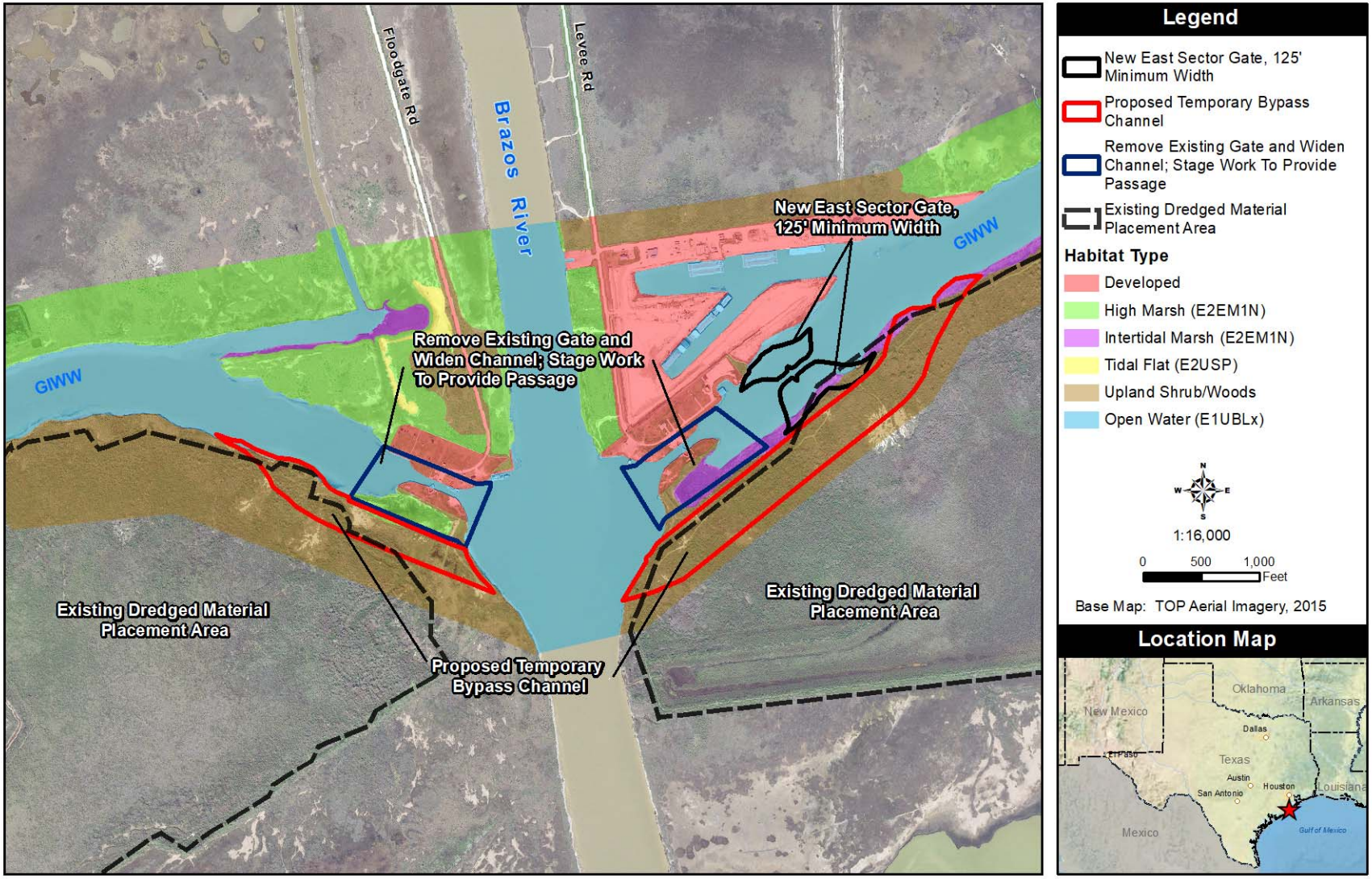

Figure 14 Vegetation/Wildlife Habitats Affected by BRFG Alternative 3a.1 (Recommended Plan)

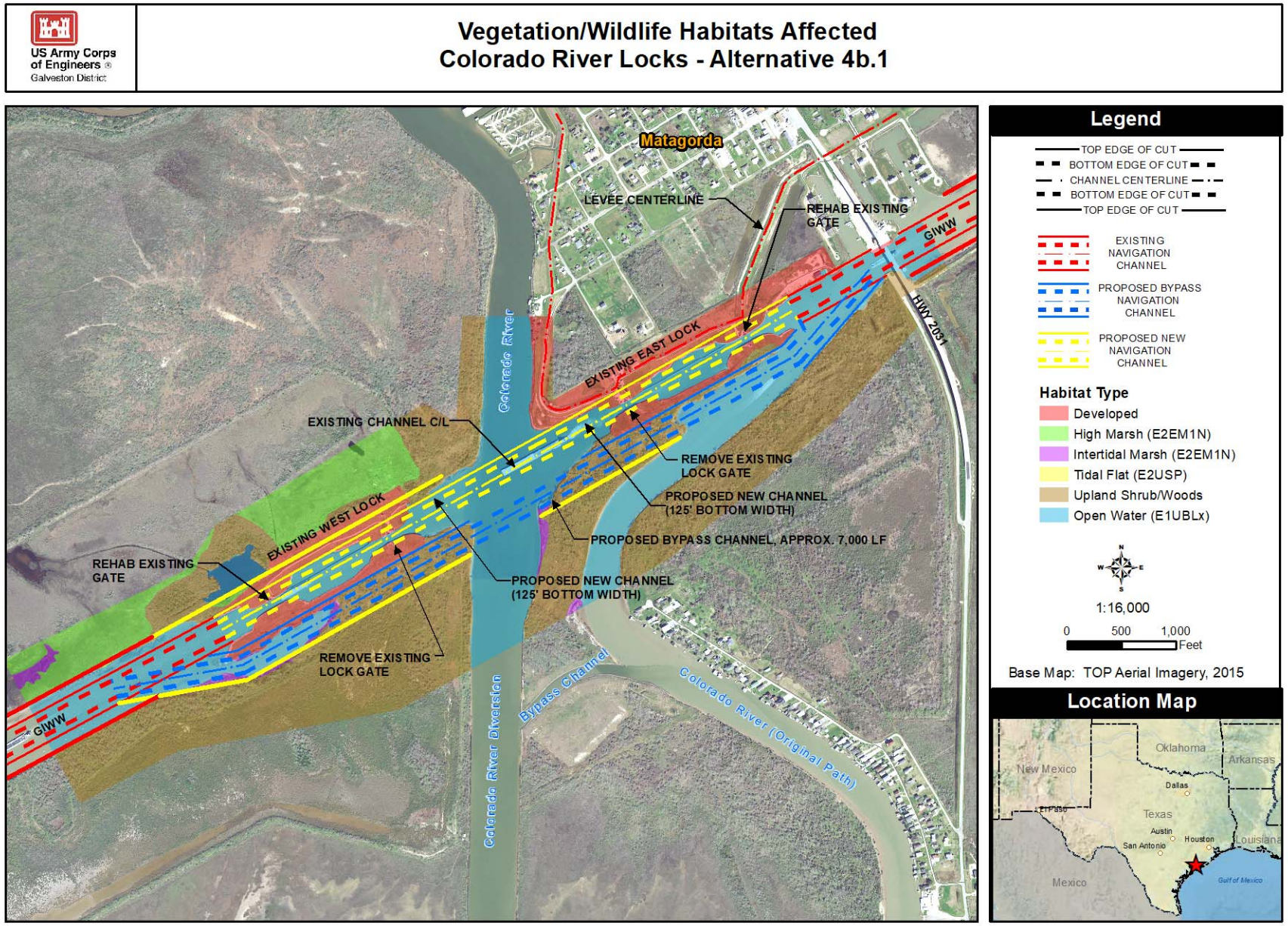

Figure 15 Vegetation/Wildlife Habitats Affected by CRL Alternative 4b.1 (Recommended Plan)

14.0 STATUS OF THE SPECIES AND CRITICAL HABITAT

Based on a review of the USFWS' species lists for threatened, endangered, and candidate species in Brazoria and Matagorda Counties (USFWS 2017a, b, c) and the NMFS' species list for threatened, endangered, and candidate species in Texas (NMFS 2017), there are 18 threatened or endangered species and four candidates for federal listing that could occur in these counties (**Table 4**). The USFWS also listed the occurrence of designated critical habitat for the piping plover (*Charadrius melodus*) along the coastline of Brazoria and Matagorda Counties. A discussion of each listed species and candidate for federal listing in provided in the sections following **Table 4**.

Table 26 Potential for Threatened and Endangered Species to Occur in Study Areas

Listed Species		Listing Status	Jurisdiction	Potential to Occur in Study Areas?
Common Name	**Scientific Name**			
Birds				
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	USFWS	Yes
Piping plover	*Charadrius melodus*	Threatened	USFWS	Yes
Red knot	*Calidris canutus rufa*	Threatened	USFWS	Yes
Whooping crane	*Grus americana*	Endangered	USFWS	Yes
Mammals				
West Indian manatee	*Trichechus manatus*	Threatened	USFWS	Yes
Fin whale	*Balaenoptera physalus*	Endangered	NMFS	No
Humpback whale	*Megaptera novaeangliae*	Endangered	NMFS	No
Sei whale	*Balaenoptera borealis*	Endangered	NMFS	No
Sperm whale	*Physeter macrocephalus*	Endangered	NMFS	No
Reptiles				
Green sea turtle	*Chelonia mydas*	Threatened	NMFS	Yes
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	USFWS; NMFS	Yes
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	USFWS; NMFS	Yes
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	USFWS; NMFS	No
Loggerhead sea turtle	*Caretta caretta*	Threatened	USFWS; NMFS	Yes
Mollusks				
Golden Orb	*Quadrula aurea*	Candidate	USFWS	No
Smooth pimpleback	*Quadrula houstonensis*	Candidate	USFWS	No
Texas fawnsfoot	*Truncilla macrodon*	Candidate	USFWS	No
Texas pimpleback	*Quadrula petrina*	Candidate	USFWS	No
Corals				
Boulder star coral	*Orbicella franksi*	Threatened	NMFS	No
Elkhorn coral	*Acropora palmata*	Threatened	NMFS	No
Lobed star coral	*Orbicella annularis*	Threatened	NMFS	No
Mountainous star coral	*Orbicella faveolata*	Threatened	NMFS	No

Sources: NMFS 2017; USFWS 2017a, b, c

14.1 Terrestrial Species

14.1.1 Northern Aplomado Falcon

The northern aplomado falcon (*Falco femoralis septentrionalis*) is a medium-sized raptor with a weight of approximately 6 to 14 ounces, a body length of 14 to 18 inches, and a wingspan of 2.5 to 3 feet. Males and females have a similar appearance of rust-colored underparts, a gray back, a long-banded tail, and black markings on the top of the head, around the eyes, and extending down its face. The falcon was listed as endangered on February 25, 1986 (51 FR 6690) and was formerly distributed across the southwestern U.S. and northern Central America (Peregrine Fund 2017, USFWS 2007). Landscape alterations and pesticide use may have led to its extirpation throughout much of its range in the U.S.; currently it is limited to reintroduced populations in the central portion of southeastern New Mexico and south Texas. Captive-bred northern aplomado falcons have been released at select locations often referred to as "hack sites" with a goal of restoring the species to its historical range in the U.S. (USFWS 2014a). Some of these hack sites are located in south Texas at Brownsville and Matagorda Island, and in the Chihuahuan Desert region of west Texas (USFWS 2014a). No critical habitat is designated for this species.

Northern aplomado falcons are permanent residents in south Texas occurring in savannas, open woodlands, grassy plains, coastal prairies, and desert grasslands. In the Gulf Coast region of Texas and Mexico, the species occupies coastal prairie habitat, coastal savannahs, marshes, and tidal flats with few trees, mesquite, yucca and cactus, or other tall succulent shrubs. In northern Mexico, southeastern Arizona, New Mexico, and west Texas, the species has a strong association with Chihuahuan desert grasslands with scattered tall yuccas (USFWS 2014a). In the southwestern U.S., the northern aplomado falcon uses old nests of ravens and other raptors. Nests can be found in Spanish dagger (*Yucca treculeana*), mesquite (*Prosopis* spp.), and manmade structures like power poles. Nests built in Spanish dagger are typically 6 to 10 feet off the ground and average 1 to 3 feet in diameter. Nesting/breeding activities occur between February 1 and August 31; however, this species is territorial and pairs may stay near and defend their nest or nest site throughout the year. Their diet consists primarily of birds, but also includes insects, small snakes, lizards, and rodents (Keddy-Hector 2000).

The nearest population of northern aplomado falcons, which contains approximately 14 territorial pairs, exists on Matagorda Island and adjacent San Jose Island, located 32 miles southwest of the CRL study area. Individual sightings of the species have been recorded within 5 miles of the BRFG and CRL study areas (**Figures 10 and 11**), at San Bernard NWR and Mad Island WMA (eBird 2017). The study areas contain open habitats that could be used by aplomado falcons, but no nesting falcons are expected based on the current known nesting range.

14.1.2 Piping Plover

The piping plover is a small, pale sand-colored shorebird with a weight of 1.5 to 2.5 ounces, a body length of 7 inches, and a wingspan of 15 inches (Palmer 1967, Elliot-Smith and Haig 2004). Plumage differs in breeding and wintering seasons by the presence of a single black breast band, often incomplete, and a black bar across the forehead in the breeding season. The bill color may also turn from orange to black. The piping plover is a migratory species with a breeding distribution within the Great Lakes region and Atlantic coast

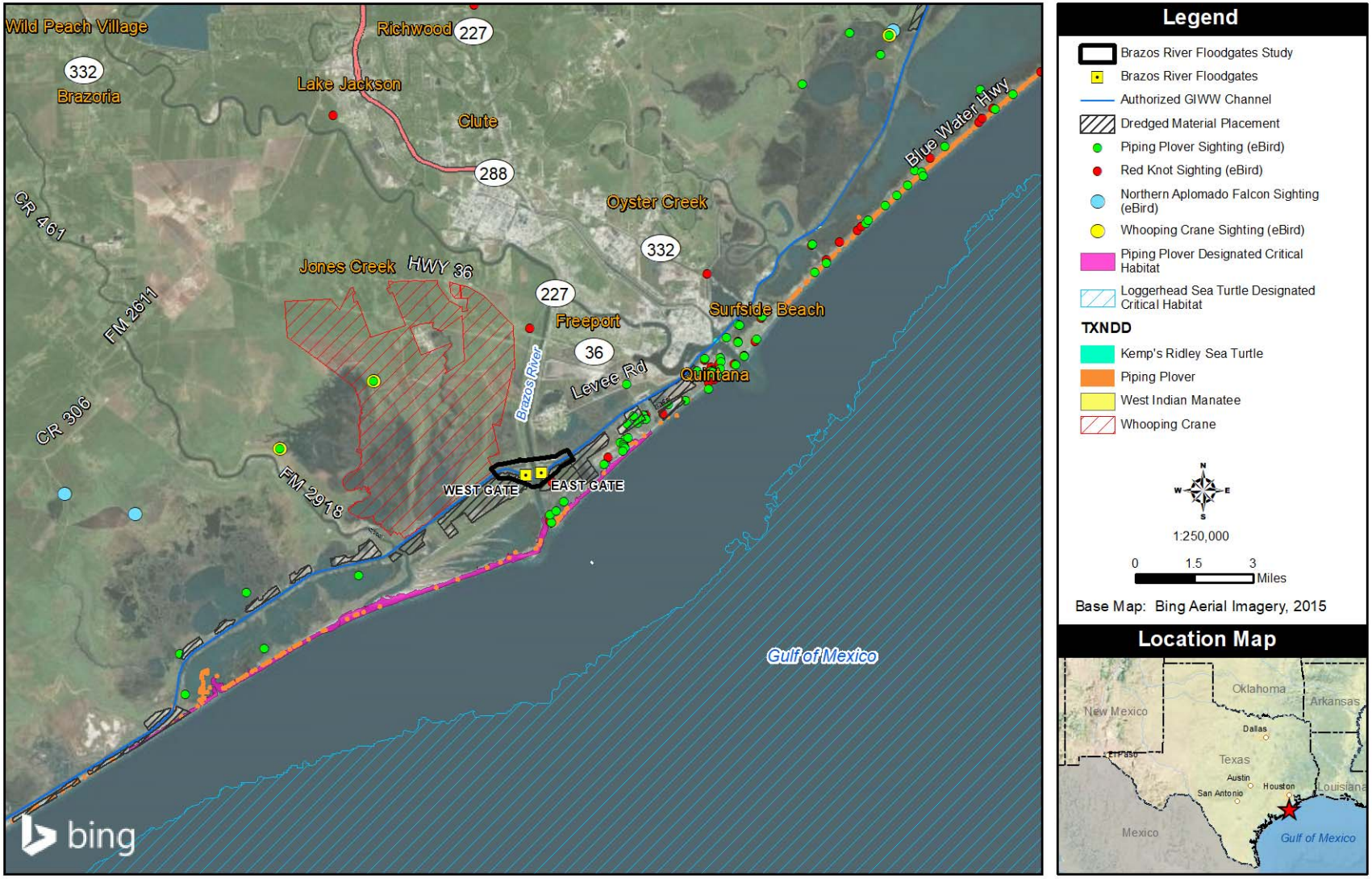

Figure 16 Occurrences and Designated Critical Habitat in the Vicinity of the BRFG Study Area

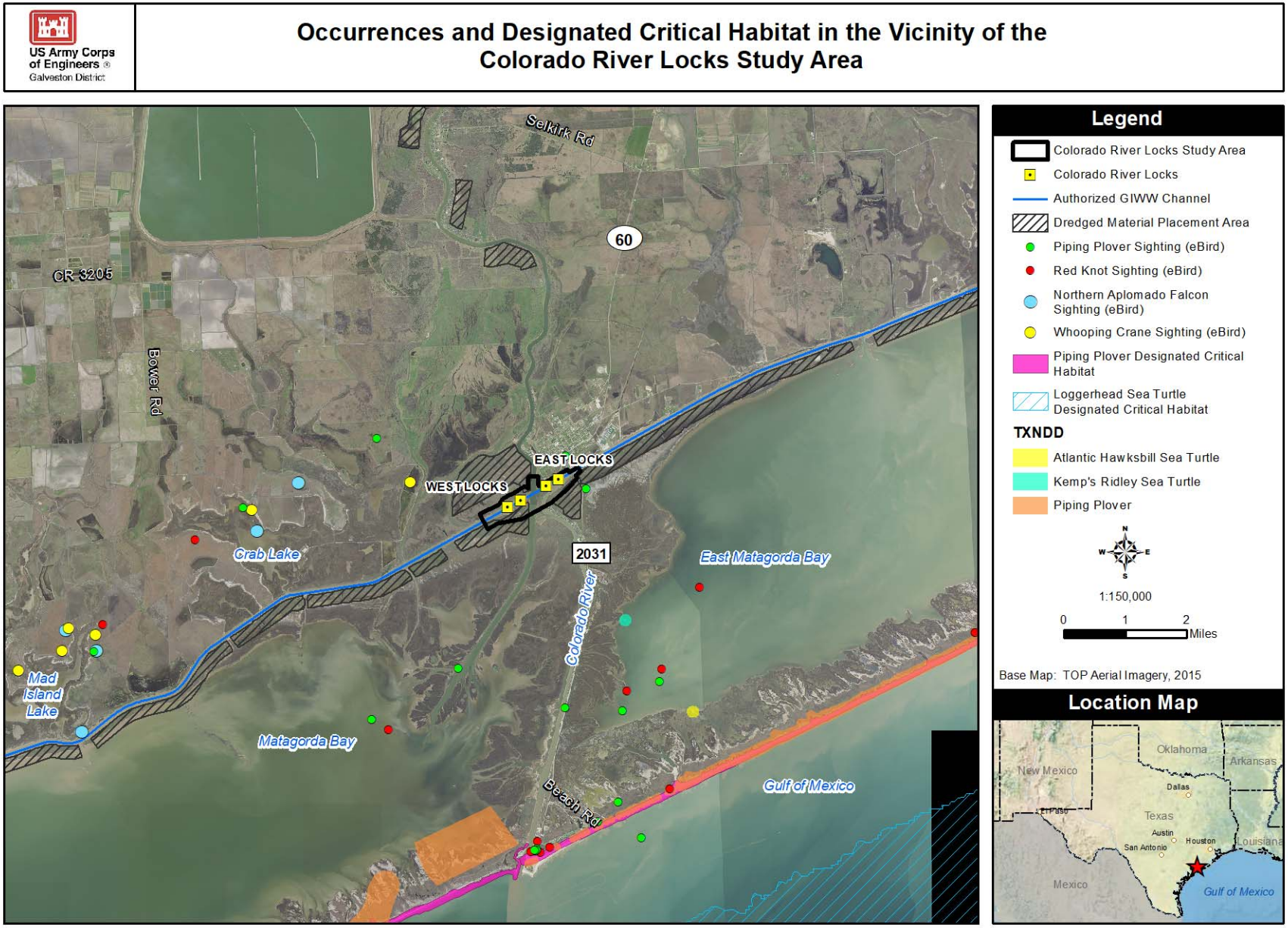

Figure 17 Occurrences and Designated Critical Habitat in the Vicinity of the CRL Study Area

and along central North America from Alberta, Canada to Colorado and Oklahoma (USFWS 2012). The non-breeding or wintering distribution occurs mainly coastal from North Carolina to Florida and the Gulf Coast states including Texas (USFWS 2012).

The piping plover was listed as threatened in Texas wintering grounds on January 10, 1986 (USFWS 1985). The primary threats to the species occur in the breeding areas of this species, where it is listed as federally endangered. Population declines were historically due to hunting and are currently due to habitat alteration at nesting grounds, nest depredation, and nest disturbance on beach habitat. Wintering habitats on the Texas Gulf Coast are threatened by industrial activities, urban development, and maintenance activities for commercial waterways, with the potential for pollution from spills of petrochemicals or other hazardous materials also being a concern (Campbell 1995). Human activity on beaches can also disturb wintering piping plovers and degrade habitat conditions (Campbell 1995, USFWS 2003a). The Texas wintering population census indicates a fluctuating to increasing trend in populations from 1,904 plovers in 1991 to 2,145 plovers in 2011 (Haig et al. 2005, USFWS 2012). Fluctuations may be due to localized effects of weather conditions; changes in roosting, foraging, or nesting habitats; or variance in survey efforts among observers.

Piping plovers nest on wide, gravelly beaches with little vegetation in alkali lakes and wetlands, inland lakes, reservoirs, and major rivers in the northern Atlantic coast, Great Lakes region, and around waterbodies of the Great Plains and Canada. Wintering habitat includes beaches, tidal sand flats, mud flats, algal mats, washover passes, and small dunes, where they feed primarily on small invertebrates (Campbell 2003). The migration and wintering period may last as long as 10 months (mid-July through mid-May) (USFWS 2012). Migration to breeding grounds may occur from mid-February through mid-May, with peak migrations in March (USFWS 2012). The piping plover exhibits intra- and inter-annual wintering site fidelity (Drake et al. 2001, Noel and Chandler 2008, Stucker et al. 2010), and the mean-average home-range size for piping plovers in south Texas is 4.9 square miles with a core area of 1.1 square miles. They may move 2 miles between sites within a season (Drake et al. 2001). Piping plovers can also be seen foraging along sandy, wet areas along waterways and wetlands beaches. Wintering piping plovers forage on invertebrates located on top of the sand or just below the surface along wrack lines (organic material including seaweed, seashells, driftwood, and other materials deposited on beaches by tidal action). Specific prey items may include polychaete marine worms, crustaceans, fly larvae, beetles, and bivalve mollusks (USFWS 2012).

Critical habitat for the wintering population of piping plovers was designated in July 2001, and is currently divided into 141 units totaling over 250,000 acres across eight states (USFWS 2001a, 2008, 2009a). Eighteen (18) of these units are located along the Texas coastline and comprise roughly 139,000 acres. Designated critical habitat for the piping plover is present along the Gulf beach near both study areas, as well as in the Colorado River delta in West Matagorda Bay (USFWS 2017a, b, c) (**Figures 10 and 11**). Piping plovers have been recorded near both study areas (**Figures 10 and 11**; eBird 2017, Texas Natural Diversity Database [TXNDD] 2017).

14.1.3 Red Knot

The red knot (*Calidris canutus rufa*) is a medium to large shorebird with a weight of 5 ounces, a body length of 9 to 10 inches, and a wingspan of 20 to 22 inches. During the breeding season, it has a rust-colored face, chest, and undersides, and dark brown wings. In winter, it has a gray head, chest, and upperparts and a white belly. It has long greenish legs and a pointed black bill. Males and females look similar, and juveniles resemble nonbreeding adults. The red knot was listed as threatened on December 11, 2014 (79 FR 73706). The greatest threat to the red knot population is habitat loss in the U.S., followed by reduction of preferred prey items in nesting areas and along migration routes (USFWS 2014b). The red knot breeds in tundra habitat of the central Canadian arctic, between May and mid-July, and winters along the U.S. coastline from North Carolina to Texas and south to Tierra del Fuego in South America between July and May; however, non-breeding red knots are known to remain in Texas year-round. Wintering habitat includes tidal flats, beaches, and oyster reefs, where they feed primarily on small invertebrates, particularly clams (Newstead 2012, Newstead et al. 2013, USFWS 2011a).

Long-term systematic population surveys are lacking for this species, but current estimates suggest Texas wintering populations may range between 50 and 2,000, with numbers increasing from survey counts in the early 1990s to recent counts in 2012 (USFWS 2014b). The increase in numbers does not necessarily reflect an increase in the population, but may be due to an increase or variation in survey effort. Although rigorous population estimates are lacking, preliminary trends indicate prolonged decline followed by stabilization of small populations (USFWS 2014b).

Based upon similar habitat preferences between the red knots and piping plovers, the same potential habitat areas mapped for the piping plover were assumed to be potential habitat for the red knot. Red knots have been observed in the vicinity of both study areas (**Figures 10 and 11**; eBird 2017).

14.1.4 Whooping Crane

The whooping crane (*Grus americana*) occurs only in North America and is North America's tallest bird, with males approaching 5 feet when standing erect. The whooping crane adult plumage is snowy white except for black primaries, black or grayish alula (specialized feathers attached to the upper leading end of the wing), sparse black bristly feathers on the carmine crown and malar region (side of the head from the bill to the angle of the jaw), and a dark gray-black wedge-shaped patch on the nape (Canadian Wildlife Service [CWS] and USFWS 2007). The whooping crane was listed as endangered on March 11, 1967 (32 FR 4001) and whooping crane critical habitat was designated in August 17, 1978. The main threat to whooping cranes in the wild is the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas Coast. Collisions with power lines and fences are known hazards to wild whooping cranes. Historic population declines resulted from habitat destruction, shooting, and displacement by activities of man.

Whooping cranes currently exist in the wild at 3 locations and in captivity at 12 sites. There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park (WBNP) and adjacent areas in the Northwest Territories and Alberta provinces of Canada, and winters mainly in and adjacent to Aransas NWR along the central Texas coast in Aransas,

Calhoun, and Refugio Counties. This population size was estimated at 431 whooping cranes during the winter of 2016-2017 (USFWS 2017e). The cranes migrate during spring and fall through an approximately 200-mile-wide corridor between Aransas NWR and WBNP. The migration corridor basically follows a straight line through the Great Plains, with the cranes traveling through Alberta, Saskatchewan, extreme eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas (CWS and USFWS 2007). Whooping cranes migrate primarily during daylight hours, relying heavily on tailwinds and thermal currents to aid their flight. They normally migrate at altitudes between 1,000 and 6,000 feet (Kuyt 1992) and typically fly from 200 to 400 miles per day and land at night (USFWS 2009b). Approximately 12 to 15 stopovers are made during migration (Kuyt 1992). The birds begin to arrive at their wintering grounds in mid-October, with most birds arriving from late October through mid-November (CWS and USFWS 2007). Spring migration generally begins in late March, with some birds remaining on the wintering grounds into early May.

Whooping cranes use a variety of habitats during migration, including croplands for feeding and wetlands for roosting (Howe 1987, 1989; Lingle 1987; Lingle et al. 1991). According to Austin and Richert (2001), the migrant whooping cranes observed at feeding sites have primarily been recorded in upland cropfields, including row crop stubble, small grain stubble, and green crops such as winter wheat (*Triticum aestivum*) and alfalfa (*Medicago sativa*). Whooping cranes have also been observed feeding in palustrine wetlands, seasonally flooded habitats, permanent water, pastures, and meadows (Austin and Richert 2001).

Austin and Richert (2001) report that migrant whooping cranes roost predominantly in palustrine or riverine wetland systems, with these types of wetlands accounting for 91.5% of roost sites recorded. Most palustrine roost sites were adjacent to cropland or grassland; less than 8% of palustrine roost sites were reported as occurring adjacent to woodland (Austin and Richert 2001). When using riverine habitat, whooping cranes roost on submerged sandbars in wide, unobstructed channels ranging from 249 to 1,500 feet wide (Armbruster 1990). Austin and Richert (2001) report that remaining roost sites were mostly lacustrine wetlands (7.8% of occurrences) or flooded cropland (2.8% of occurrences). Studies of whooping cranes in migration indicate that they prefer to roost in wetlands that are less than 10 acres in size, have good horizontal visibility, have water depth of 12 inches or less, and generally occur adjacent (or within 0.62 mile) of cropland feeding areas (Howe 1987, 1989; CWS and USFWS 2007; USFWS 2009b). Studies cited by CWS and USFWS (2007) suggest landscapes characterized as “wetland mosaics” provide the most suitable stopover habitat.

Whooping cranes also overwinter on the Texas coast, mostly in the area surrounding the Aransas NWR located about 30 miles southwest of the CRL study area. They utilize salt marshes and tidal flats on the mainland and barrier islands. Salt marsh habitat is present in both study areas, and whooping cranes have been recorded within 5 miles of both study areas at Justin Hurst WMA, San Bernard NWR, and Mad Island WMA (**Figures 10 and 11**; TXNDD 2017, eBird 2017).

14.2 Marine and Aquatic Species

14.2.1 West Indian Manatee

West Indian manatees (*Trichechus manatus)* have large, seal-shaped bodies with paired flippers and a round, paddled-shaped tail (USFWS 2015b). This species is found in marine, estuarine, and freshwater environments and feeds opportunistically on a wide variety of plants, including submerged, floating, and emergent vegetation. In coastal areas, seagrasses appear to be a staple of their diet, with preferences for water hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), and smooth cordgrass (USFWS 2001b, Whitaker 1996).

The West Indian manatee is a migratory marine mammal of Florida, the Greater Antilles, Central America, and South America (USFWS 2003b, 2017d). Texas is the extreme western edge of this species' distribution (USFWS 2003b). Based on a 2011 survey, West Indian manatees numbered over 4,800 individuals (USFWS 2015b), and in 2015 the southeastern U.S. population was estimated at 6,350 (USFWS 2016). Occurrences in Texas are occasional to rare and thus this species is unlikely to occur in the study areas (USFWS 2003b; Texas Marine Mammal Stranding Network 2016).

The Texas Marine Mammal Standing Network has recovered fewer than 10 manatees along the Texas coast since 1980 (Houston Chronicle 2012). One historical manatee record is in the GIWW near Oyster Creek just north of Freeport. Historical records from Texas waters also include Cow Bayou, Sabine Lake, Copano Bay, the Bolivar Peninsula, and the mouth of the Rio Grande (Natural Science Research Laboratory 2017). In October 2012, live manatee sightings were recorded near Galveston and near Corpus Christi (Houston Chronicle 2012). The TXNDD includes one observation of a West Indian manatee in the GIWW near Surfside Beach (**Figures 10**); this observation was made in 2011 (TXNDD 2017). A West Indian manatee could occur in the GIWW or rivers in the study areas; however, the likelihood of their occurrence is considered low due to their rare occurrence in Texas.

14.2.2 Whales

NMFS identifies four endangered whale species of potential occurrence in the Gulf of Mexico – the fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter macrocephalus*). These whale species are generally restricted to deeper offshore waters; therefore, it is unlikely that any of these four species would venture into the study areas (NMFS 2017); therefore, this project would have *no effect* on the fin whale, humpback whale, sei whale, or sperm whale, and they are not considered further in the analysis.

14.2.3 Sea Turtles

There are five sea turtles listed by USWFS as having the potential to occur in the counties associated with the study areas (USFWS 2017c). These five species include the green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), the Kemp's ridley sea turtle (*Lepidochelys kempii*), the leatherback sea turtle (*Dermochelys coriacea*), and the loggerhead sea turtle (*Caretta caretta*). All but the Kemp's ridley sea turtle have global distributions either in the tropics, subtropics or temperate waters. The

Kemp's ridley sea turtle distribution is limited to the Gulf of Mexico, though juveniles may be found along the U.S. Atlantic coast (NMFS et al. 2011, National Park Service [NPS] 2016). In Texas, these species can be found along South Texas inshore and near-shore coastal waters, although leatherback sea turtles are less common in coastal waters than the other species (Landry n.d.). The loggerhead sea turtles are known to occur in the inshore Texas waters in relative abundance (Landry n.d.). Green sea turtles are known to frequent Texas coastal waters (Coyne 1994). Juveniles, males, and non-breeding females may occur all along the inshore and near-shore coastal waters. During adult non-nesting and juvenile stages, these species occur in pelagic, coral reefs, or near-shore coastal areas for foraging and breeding.

Sea turtle nesting occurs on coastal beaches. Primary nesting areas for all species are located outside of Texas. However, Kemp's ridley sea turtles regularly nest along the Texas coast, and occasional green sea turtle and loggerhead sea turtle nests have been recorded, as well (Turtle Island Restoration Network 2017). In 2017, 353 Kemp's ridley sea turtle nests were confirmed along the Texas coast, including three nests at Surfside Beach, one nest at Quintana Beach, and seven nests along the Matagorda Peninsula. In addition, one loggerhead sea turtle nest was confirmed at Surfside Beach in 2017 (Turtle Island Restoration Network 2017). These species exhibit site fidelity, returning to the same nesting area annually and across generations. Although there are slight temporal differences in the specific nesting dates for each species, most nesting occurs during the summer months (March – November) with peak activities from May to July.

In 2014, NMFS designated 38 occupied marine areas within the range of the Northwest Atlantic Ocean Distinct Population Segment of loggerhead sea turtles as critical habitat (NMFS 2014). These areas contain one or a combination of habitat types: nearshore reproductive habitat, winter area, breeding areas, constricted migratory corridors, and/or *Sargassum* habitat. Critical habitat is mapped in the Gulf of Mexico offshore from Brazoria and Matagorda Counties, but is not located within the study areas (**Figures 10 and 11**). No critical habitat has been designated for the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, or leatherback sea turtle in the vicinity of the study areas. The TXNDD includes records of Kemp's ridley and hawksbill sea turtles occurring in the study area vicinities (**Figures 10 and 11**).

14.3 Mollusks

There are four mussel species that are candidates for federal listing and have the potential to occur in Brazoria and Matagorda Counties. The golden orb (*Quadrula aurea*) is a filter feeder and is found in firm mud, sand, and gravel substrate in flowing waters in medium-sized rivers (USFWS 2015a). This species historically occurred in the Nueces-Frio and Guadalupe-San Antonio River systems, and is now know from nine locations in four rivers (USFWS 2015a). Extant populations have been recorded in Lake Corpus Christi and in the Guadalupe, San Marcos, and San Antonio Rivers.

The smooth pimpleback (*Quadrula houstonensis*) is a filter feeder and is found in mud, sand, and fine gravel substrate in medium-to-large rivers and some reservoirs. This species is native to the Brazos and Colorado River basins of central Texas, and has also been reported from other drainages, including the Trinity River and rivers outside of Texas. As of 2015, the smooth pimpleback has been nearly extirpated from the Colorado River basin and a few small populations persist in the Brazos River basin (USFWS

2015a). Extant populations in the lower Brazos River have been recorded in Austin, Waller, and Fort Bend Counties.

The Texas fawnsfoot (*Truncilla macrodon*) is a filter feeder and, based on a recently discovered population in the Brazos River, this species is assumed to occur in rivers with soft, sandy sediment and moderate water flow (USFWS 2011b). However, little information is available about the species' habitat preferences because the species was not found alive for many years. This species historically occurred throughout the Colorado and Brazos river basins but, as of 2015, was known from only five locations (USFWS 2015a). The farthest downstream collection of Texas fawnsfoot in the Brazos River in recent years was in Austin and Waller Counties (USFWS 2011b).

The Texas pimpleback (*Quadrula petrina*) is a filter feeder and is found in moderately sized rivers, usually in mud, sand, gravel, and cobble, and occasionally in gravel-filled cracks in bedrock slab bottoms. This species is endemic to the Colorado and Guadalupe-San Antonio river basins of central Texas. The species has declined range wide and extant populations are known from only four streams: San Saba River, Concho River, Guadalupe River, and San Marcos River (USFWS 2011b). These populations are disjunct, small and isolated.

These four mussel species are freshwater species that are not expected to occur in the tidal and brackish waters of the Brazos River, Colorado River, or other waters in or near the study areas due to salinity fluctuations, and have not been recorded in the study areas. This project would have *no effect* on the golden orb, smooth pimpleback, Texas fawnsfoot, or Texas pimpleback, and they are not considered further in the analysis.

14.4 Corals

NMFS identifies four species of threatened corals, the boulder star coral (*Orbicella franksi*), elkhorn coral (*Acropora palmata*), lobed star coral (*Orbicella annularis*), and mountainous star coral (*Orbicella faveolata*), that have the potential to occur in the Gulf of Mexico (NMFS 2017). These species occur offshore in the Gulf of Mexico and are not located within the study areas; therefore, this project would result in *no effect* to these species and they are not considered further in the analysis.

15.0 EFFECTS OF THE RECOMMENDED PLAN

The ESA prohibits "take" of any federally listed species [16 United States Code (USC) §1538(a))], where take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC §1532(19)). The ESA requires that federal agencies ensure that any activity that an agency funds, authorizes, or carries out does not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat (16 USC §1536). The USFWS and NMFS have legislative authority under the ESA to list and monitor the status of wildlife species whose populations are considered to be imperiled (16 USC §1533). Species listed as "endangered" or "threatened" by the USFWS and NMFS (henceforth, "listed species") are provided full protection. This protection not only prohibits the direct take of a protected species, but also includes a prohibition of indirect take, such as destruction of designated critical habitat. Federal listings for protected

animals and plants are provided in separate chapters of the CFR: 50 CFR 17.11 for animals and 50 CFR 17.12 for plants. The federal process also includes identifying "candidates" for listing under the ESA. While on the candidate list, species are not provided any federal protection but may be protected by state law. ESA implementing regulations (50 CFR 402) require federal agencies to complete a BA to determine whether a proposed project may affect a listed species.

In addition to direct and indirect effects, a BA also considers cumulative effects, which include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area, which is defined as the area that will be affected by a proposed activity or project. Future federal actions that are unrelated to the proposed action are not considered because they would require separate consultation pursuant to Section 7 of the ESA (USFWS and NMFS 1998).

For listed species, one of three possible determinations of effect is made (USFWS and NMFS 1998):

- *No effect*—the proposed action will have no adverse or beneficial effects on the species or critical habitat.

- *May affect, but is not likely to adversely affect*—the proposed action may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or beneficial.

- *May affect, is likely to adversely affect*—adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent activities, and the effect is not discountable or insignificant.

The Recommended Plan was evaluated and the anticipated effects of the action determined in accordance with the ESA. The following sections discuss the anticipated direct and indirect effects of the Recommended Plan on each species that has the potential to occur in the study area.

15.1 Northern Aplomado Falcon

Open habitats in the study areas are limited to coastal marshes that could be used by foraging aplomado falcons, but are not their preferred habitats. No nesting sites have been documented in the study areas, and no nesting falcons are expected based on the current known nesting range and lack of suitable nesting habitat. While there is potential for the northern aplomado falcon to occur in the study areas, no nesting habitat or preferred habitat for this species is present and the species is no more likely to occur in the study areas than in other similar habitats in the region. Therefore, the Recommended Plan is expected to have *no effect* on northern aplomado falcons.

15.2 Piping Plover, Red Knot, and Piping Plover Designated Critical Habitat

Given shared habitat preferences of beaches, tidal flats, algal mats, washover passes, small dunes, and herbaceous wetlands, the piping plover and red knot are discussed together. Both species return to the same general wintering grounds each year (Drake et al. 2001; Noel and Chandler 2008; Stucker et al. 2010; Buchanan et al. 2012). These wintering habitats provide foraging, roosting, and sheltering for piping plovers

and red knots. Although no substantial habitat is located within the study areas, designated critical habitat for the piping plover is present along the Gulf beach near both study areas, as well as in the Colorado River delta in West Matagorda Bay. The Recommended Plan could affect sediment budget to these areas; however, this change is not expected to modify the critical habitat or adversely affect the species. Direct effects of habitat loss on the piping plover and red knot from the project are not anticipated.

Construction activities will temporarily elevate noise and human disturbance levels; however, this is not expected to contribute to any permanent noise disturbances for these species. Construction noise may cause these species to temporarily avoid adjacent habitats; however, there are no preferred habitats immediately adjacent to the proposed work areas.

Overall, activities associated with the Recommended Plan could have some minor but discountable effect on these species; therefore, the project *may affect, but is not likely to adversely affect* piping plovers and red knots. As stated above, the project is not expected to modify the designated critical habitat for piping plovers.

15.3 Whooping Crane

The study areas contain foraging habitats of the whooping crane, including shoreline wetlands. No nesting sites occur in Texas and the anticipated impact to salt marshes (foraging habitats) in the study areas is considered low compared to the availability of salt marshes in the region. Most whooping crane wintering occurs well south of the study areas; therefore, direct effects of the project on the whooping crane due to habitat loss are not anticipated.

Construction activities will create temporary, short-term increases in noise levels. However, whooping cranes prefer to forage away from human disturbance and would, therefore, not be likely to occur in the study areas during typical operations and maintenance of the existing facilities, nor are they expected to be present during construction activities or maintenance dredging activities. Overall, the project is expected to have *no effect* on whooping cranes.

15.4 West Indian Manatee

A West Indian manatee could occur in the GIWW or rivers in the study areas; however, the likelihood of their occurrence is considered low due to their rare occurrence in Texas. Increased noise levels during construction could disturb manatees, but they appear relatively unresponsive to human noise (NoiseQuest 2016) and do not startle readily. This, coupled with the fact that occurrence of a West Indian manatee would be rare and temporary, indicates that noises from the project are not expected to affect this species.

Marine traffic during water-based construction activities could result in a higher incidence of collision with marine species. West Indian manatees are vulnerable to collisions with boats in narrow waterways and shallow water areas. In addition, although boat channels may provide deeper waters for manatees to avoid or escape oncoming boats, manatees do not always move out of the way of approaching boats (USFWS 1999). However, as the occurrence of the West Indian manatee in the study areas is unlikely, collisions are not expected. Therefore, the project is expected to have *no effect* on the West Indian manatee.

15.5 Sea Turtles

The five sea turtle species are distributed worldwide in tropical, subtropical, and colder waters and are found in coastal and off-shore habitats. Leatherback sea turtles are uncommon in Texas coastal waters and are not expected to occur in the study areas. No habitat loss for the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle is expected to occur due to the project.

During construction, sea turtles may be impacted by changes to water quality, noise levels, and marine traffic. Increased turbidity during construction activities may cause sediments around seagrasses to become unconsolidated and suspended, reducing available food for sea turtles (NMFS/USFWS 1991; USFWS 1999). However, sediment plumes during construction activities would be localized and temporary, and thus not expected to affect foraging activities or food availability.

Although NMFS has not yet established acoustic thresholds for effects on sea turtles, studies have analyzed acoustic and explosive effects on sea turtles (Finneran and Jenkins 2012). Potential sea turtle behavioral changes can include a startle response, avoiding the sound source, increased swimming speed, increased surfacing time, and decreased foraging. While construction activities have the potential to create short-term noise level increases, these would be similar to increases during maintenance dredging currently occurring in the study areas. An exception is the potential for driving sheet pile for the new guide walls at the BRFG facility. This would be accomplished with the incorporation of BMPs such as construction timing, monitoring, or attenuation to address underwater noise, if needed. Construction methods and BMPs to reduce potential for impact will be addressed during further design of the project. Impacts to sea turtles associated with construction noise are expected to by minor and temporary.

While sea turtles may be present in the study areas during construction, they are highly mobile and are expected to move away from the active construction area and avoid collisions with vessels. Avoidance of the construction area is not expected to result in impacts on these species because the disturbance will be short-term and localized.

Dredging activities would include dredging of the temporary bypass channels during construction and maintenance dredging during operations. It is anticipated that hopper dredges would not be used for this project, thereby avoiding the potential of killing sea turtles (NMFS 2003). Overall, activities in the GIWW and river channels could have some minor effect on sea turtles; therefore, the project *may affect, but is not likely to adversely affect* green sea turtles, hawksbill sea turtles, Kemp's ridley sea turtles, and loggerhead sea turtles. The project is expected to have *no effect* on leatherback sea turtles because they are uncommon in Texas coastal waters and are not likely to occur in the study areas.

15.6 Interdependent and Interrelated Actions

An interdependent action has no independent utility apart from the proposed action that is subject to consultation. No interdependent actions have been identified; therefore, no interdependent effects to any of the listed species would occur.

Interrelated actions are those that are part of the larger action and dependent on the larger action for their justification. Interrelated actions include operation and maintenance dredging within the study areas. Potential impacts of such dredging are included in the discussions above.

15.7 Cumulative Effects

Cumulative effects under the ESA [50 CFR § 402.02] are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the study areas. Future federal actions that are unrelated to the proposed action are not considered in this section, as they require separate consultation pursuant to Section 7 of the ESA.

Because future activities with a federal nexus are not included in the cumulative effects analysis in a BA, planned activities with the most potential to affect federally listed species in the vicinities of the BRFG and CRL are not addressed here. Examples of such activities could include, but are not limited to, further expansion of national wildlife refuge lands, additional placement areas, or deepening and widening of existing channels. Many of the future projects will likely require a federal authorization (e.g., a permit under Section 404 of the Clean Water Act), in which case they will be subject to future ESA consultation.

No future non-federal actions that have the potential to affect the subject species have been identified in the study areas.

16.0 SUMMARY OF RECOMMENDED DETERMINATION OF EFFECTS

The proposed Recommended Plan is anticipated to have *no effect* on 16 of the 22 federally listed threatened or endangered species, or candidate species, and is anticipated to have a *may affect, but not likely to adversely affect* determination for the remaining six species (**Table 5**). The project will not modify designated critical habitat for any listed species.

Table 27 Anticipated Effects of Project on Threatened and Endangered Species

Listed Species		Listing Status	Jurisdiction	Potential to Occur in Study Areas?	Recommended Plan Effect Determination[1]
Common Name	**Scientific Name**				
Birds					
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	USFWS	Yes	No Effect
Piping plover	*Charadrius melodus*	Threatened	USFWS	Yes	May Affect, Not Likely to Adversely Affect
Red knot	*Calidris canutus rufa*	Threatened	USFWS	Yes	May Affect, Not Likely to Adversely Affect
Whooping crane	*Grus americana*	Endangered	USFWS	Yes	No Effect
Mammals					
West Indian manatee	*Trichechus manatus*	Threatened	USFWS	Yes	No Effect
Fin whale	*Balaenoptera physalus*	Endangered	NMFS	No	No Effect
Humpback whale	*Megaptera novaeangliae*	Endangered	NMFS	No	No Effect
Sei whale	*Balaenoptera borealis*	Endangered	NMFS	No	No Effect
Sperm whale	*Physeter macrocephalus*	Endangered	NMFS	No	No Effect

Table 27 Anticipated Effects of Project on Threatened and Endangered Species

Listed Species		Listing Status	Jurisdiction	Potential to Occur in Study Areas?	Recommended Plan Effect Determination[1]
Common Name	**Scientific Name**				
Reptiles					
Green sea turtle	*Chelonia mydas*	Threatened	NMFS	Yes	May Affect, Not Likely to Adversely Affect
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	USFWS; NMFS	Yes	May Affect, Not Likely to Adversely Affect
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	USFWS; NMFS	Yes	May Affect, Not Likely to Adversely Affect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	USFWS; NMFS	No	No Effect
Loggerhead sea turtle	*Caretta caretta*	Threatened	USFWS; NMFS	Yes	May Affect, Not Likely to Adversely Affect
Mollusks					
Golden Orb	*Quadrula aurea*	Candidate	USFWS	No	No Effect
Smooth pimpleback	*Quadrula houstonensis*	Candidate	USFWS	No	No Effect
Texas fawnsfoot	*Truncilla macrodon*	Candidate	USFWS	No	No Effect
Texas pimpleback	*Quadrula petrina*	Candidate	USFWS	No	No Effect
Corals					
Boulder star coral	*Orbicella franksi*	Threatened	NMFS	No	No Effect
Elkhorn coral	*Acropora palmata*	Threatened	NMFS	No	No Effect
Lobed star coral	*Orbicella annularis*	Threatened	NMFS	No	No Effect
Mountainous star coral	*Orbicella faveolata*	Threatened	NMFS	No	No Effect

[1] The Recommended Plan is BRFG Alternative 3a.1 and CRL Alternative 4b.1.
Sources: NMFS 2017; USFWS 2017a, b, c

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ATTACHMENT D-3

ESSENTIAL FISH HABITAT ASSESSMENT

DRAFT

ESSENTIAL FISH HABITAT ASSESSMENT

GULF INTRACOASTAL WATERWAY
BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS SYSTEMS FEASIBILITY STUDY

BRAZORIA AND MATAGORDA COUNTIES, TEXAS

PREPARED FOR

US Army Corps of Engineers ®
Galveston District

AND

Texas Department of Transportation ®

PREPARED BY

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition or Meaning
BMP	Best management practices
BRFG	Brazos River Floodgates
CFR	Code of Federal Regulations
CRL	Colorado River Locks
DMPA	dredged material placement areas
EFH	Essential Fish Habitat
FR/EIS	Feasibility Report/Environmental Impact Statement

Acronym or Abbreviation	Definition or Meaning
FMP	Fishery management plan
GIWW	Gulf Intracoastal Waterway
GMFMC	Gulf of Mexico Fishery Management Council
HAPC	Habitat Areas of Particular Concern
H&H	hydrology and hydraulics
NCCOS	National centers for Coastal Ocean Science
NEPA	National Environmental Policy Act
NMFS	National Marine Fishery Service
ODMDS	ocean dredged material disposal sites
SONAR	Sound Navigation and Ranging
TxDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers

18.0 INTRODUCTION

The United States Army Corps of Engineers (USACE), in cooperation with the Texas Department of Transportation (TxDOT) Maritime Division, is conducting the *Gulf Intracoastal Waterway (GIWW), Brazos River Floodgates and Colorado River Locks Systems Feasibility Study* to determine the feasibility of modifying the Brazos River Floodgates (BRFG) and Colorado River Locks (CRL) to reduce navigation impacts and costly waterborne traffic delays that are a result of aging infrastructure and inadequate channel dimensions. As part of the Feasibility Study, the USACE has prepared an integrated Feasibility Report and Environmental Impact Statement (FR/EIS) in compliance with the National Environmental Policy Act (NEPA), USACE regulation ER-200-2, 33 Code of Federal Regulations (CFR) 230, the Flood Control Act of 1970 – Section 216, and other Federal, state, and local environmental policies and procedures.

This assessment was prepared to fulfill the USACE's requirements under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), which addresses the authorized responsibilities for the protection of essential fish habitat (EFH) by the National Marine Fisheries Service (NMFS) in association with regional Fishery Management Councils. The Act establishes eight regional Fishery Management Councils responsible for the protection of marine fisheries within their respective jurisdictions. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." This definition extends to habitat specific to an individual species or group of species, whichever is appropriate, within each Fishery Management Plan (FMP). The Act also authorizes the designation of Habitat Areas of Particular Concern (HAPC) for marine fisheries. HAPCs are subsets of EFH that are rare, susceptible to human degradation, ecologically important, or located in an ecologically stressed area. Any Federal agency that proposes an action that potentially affects or disturbs EFH must consult with the Secretary of Commerce and Fishery Management Council authority per the Magnuson-Stevens Act, as amended (2005). Interim final rules were published on December 19, 1997, in the Federal Register (Vol. 62. No. 244) to establish guidelines for the identification and description of EFH in fishery management plans. These guidelines include impacts from fishing and non-fishing activities as well as the identification of actions needed to conserve and enhance EFH. The rule was established to provide protection, conservation, and enhancement of EFH.

Per 50 CFR 600.920(e)(3), all EFH assessments must include the following information:

1. Description of the action;
2. Analysis of the potential adverse effects of the action on EFH and the managed species;
3. Federal agency's conclusions regarding the effects of the action on EFH; and
4. Proposed mitigation, if applicable.

This assessment includes a description of the proposed action (Section 2.0), a review of EFH and managed species in the BRFG and CRL study areas (Section 3.0), and discussion of the anticipated effects of the proposed action on EFH and managed species and proposed mitigation (Section 4.0).

19.0 DESCRIPTION OF THE PROPOSED ACTION

19.1 Background Information

The GIWW is a 1,300-mile-long, shallow-draft, man-made protected waterway that connects ports along the Gulf of Mexico from St. Marks, Florida, to Brownsville, Texas. The authorized channel dimensions are 125 feet wide and 12 feet deep. The GIWW is an essential component of the transportation network of Texas and the nation, reducing congestion on highway and rail systems, thereby decreasing maintenance costs and extending the life of these transportation systems. Compared to truck or rail transport, the use of barges to transport goods produces fewer air emissions, is more fuel-efficient, and provides a safer mode of transportation. The GIWW is also used by the commercial fishing industry and for recreational activities such as fishing, skiing, sightseeing, and traveling long distances in the protected waterway (TxDOT 2016).

The BRFG and CRL are two lock-type structures on the GIWW located about 40 miles apart on the upper to mid-Texas coast, in Brazoria and Matagorda Counties, respectively (**Figure 1**). They were initially installed in the early 1940s to prevent heavy sediment loads in the Brazos and Colorado Rivers from entering the GIWW. The structures are over 60 years old and were installed at a time when most tug boats pulled barges behind them, rather than using the modern pushing method. At each facility, the gate openings are 75 feet wide, which is much narrower than the 125-foot-wide GIWW navigation channel. Although regulations restrict the width of tows to 55 feet, oversize tow permits are routinely granted for tows as wide as 108 feet, particularly along the upper Texas coast (TxDOT 2016). To move these wider tows through the BRFG and CRL, vessel operators must park the tows, break the barges apart, move them through the locks in smaller sets or individually, and reconnect the tows on the other side. This process, known as "tripping," is inefficient and causes delays that result in substantial costs to the towing industry each year (TxDOT 2013). In addition to the narrow gates, high flows in the Brazos and Colorado Rivers make navigation through the BRFG and CRL structures more difficult and result in temporary navigation restrictions and/or closures imposed by the USACE and U.S. Coast Guard. These restrictions and closures result in additional delays and economic impact to the towing industry.

19.2 Project Location

As described above, the BRFG and CRL are located about 40 miles apart on the upper to mid-Texas coast, in Brazoria and Matagorda Counties, respectively (**Figure 1**). For each facility, existing environmental conditions were evaluated within a study area that encompassed the maximum disturbance area for the reasonable alternatives. The BRFG study area encompasses roughly 600 acres and extends 1 mile east and west of the Brazos River crossing and up to 0.5 mile north and south of the river crossing (**Figure 2)**. The CRL study area encompasses roughly 400 acres and extends 1 mile east and west of the Colorado River crossing and up to 0.25 mile north and south of the river crossing (**Figure 3)**. Under the reasonable alternatives, all direct construction activities and impacts to EFH would occur within these study areas. In addition to the study areas, EFH and potential for managed species were evaluated in the surrounding areas to assess potential indirect effects to these resources.

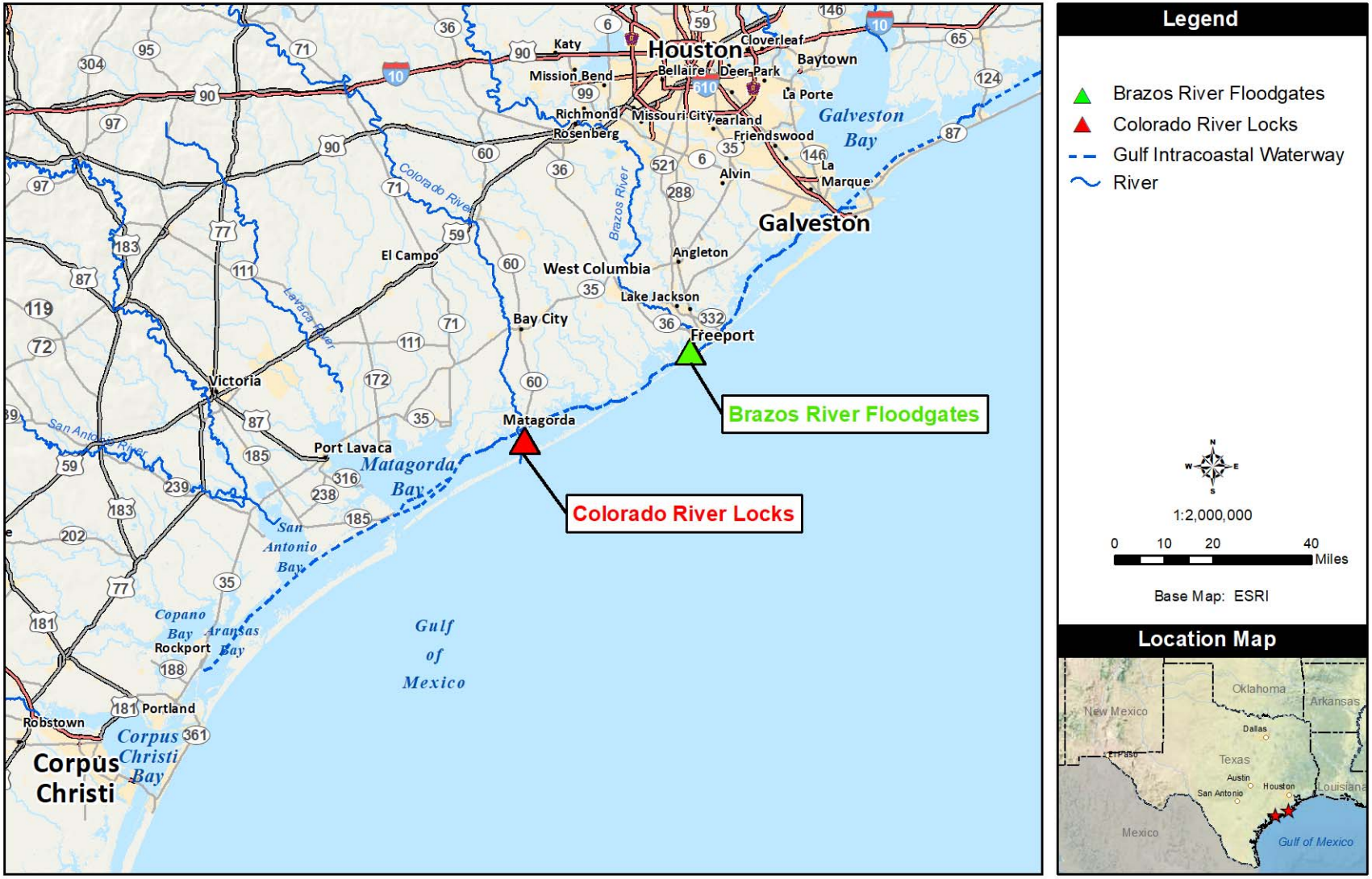

Figure 18 Project Location

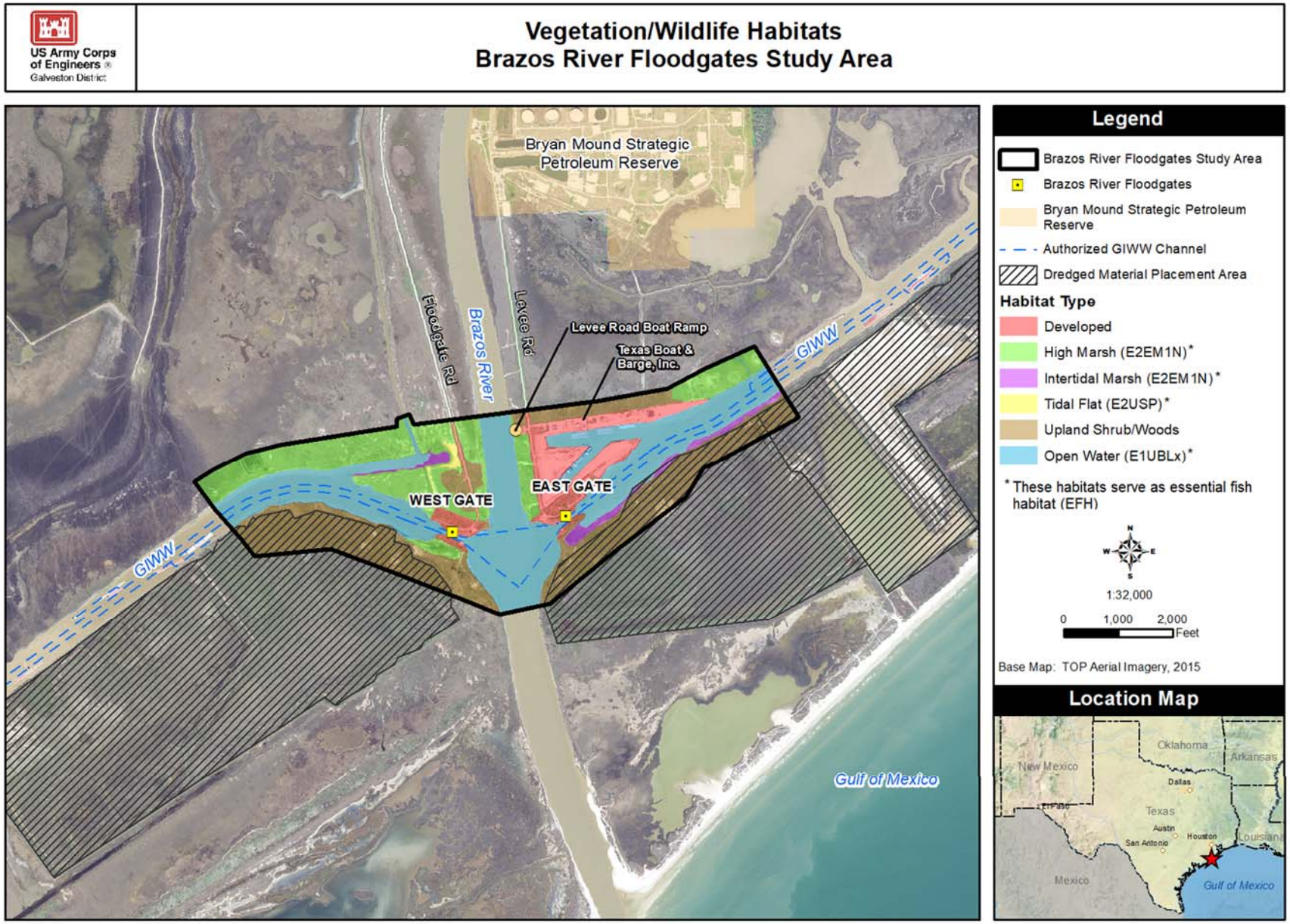

Figure 19 Habitats in BRFG Study Area

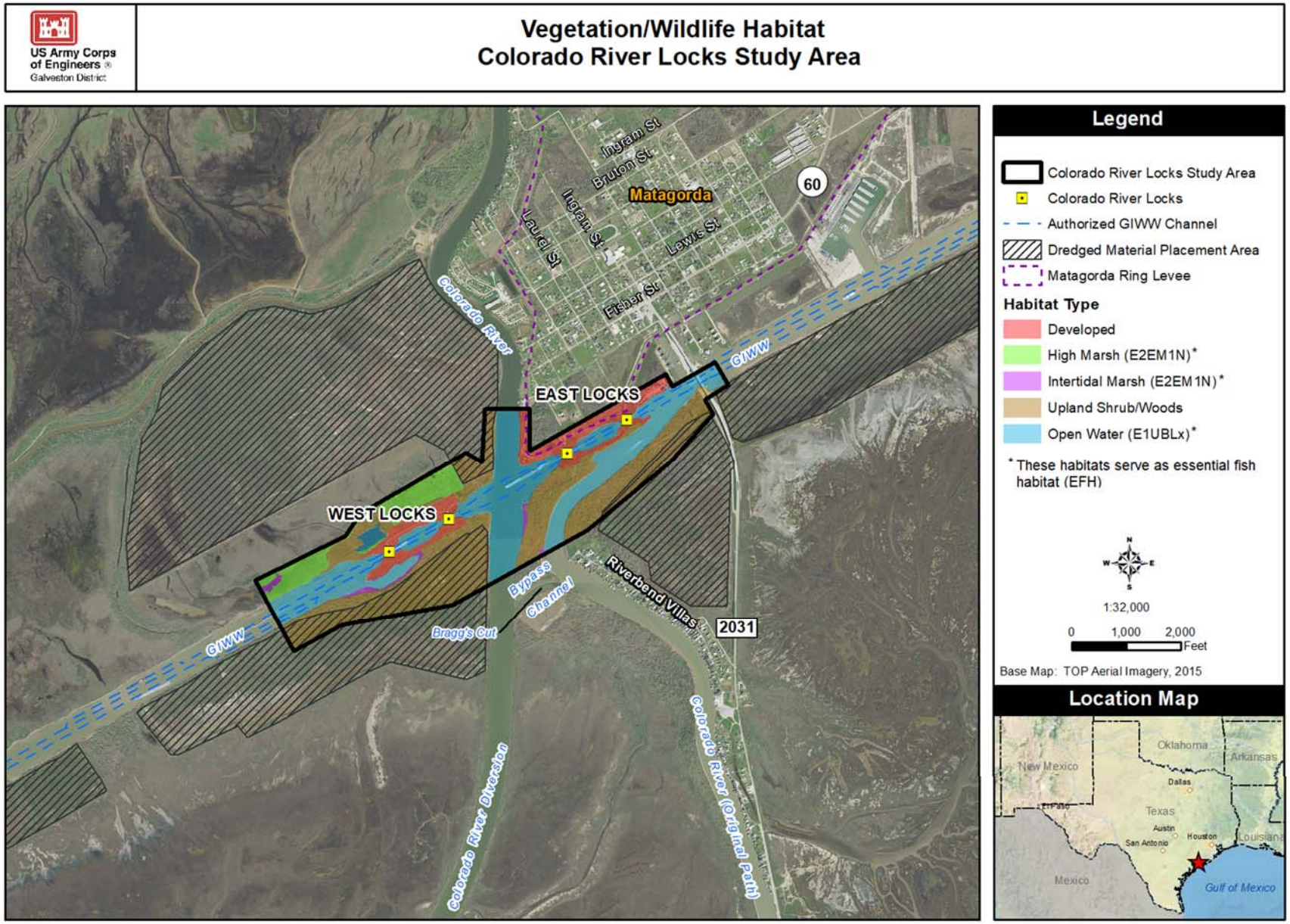

Figure 20 Habitats in CRL Study Area

19.3 Summary of Alternatives Considered

Early on in alternatives development, the USACE and TxDOT identified a number of alternatives that involved various measures to improve navigation through the BRFG and CRL facilities. Through multiple screening efforts, the USACE and TxDOT narrowed the reasonable alternatives to the No Action Alternative and five Action Alternatives at the BRFG facility, and the No Action Alternative and three Action Alternatives at the CRL facility. In an effort to minimize environmental impacts, the disturbance areas associated with the reasonable alternatives are located in and adjacent to the existing GIWW, BRFG, and CRL facilities. The USACE and TxDOT further evaluated these alternatives through hydrology and hydraulics (H&H) modeling, economic analysis, and environmental analysis to identify a Recommended Plan. **Table 1** lists the alternatives, provides a general overview of each alternative, and provides an estimated area that would be affected by the alternative.

Table 28 Summary of BRFG and CRL Alternatives Considered

Alternative	Alternative Overview	Estimated Acreage Affected	Recommended Plan?
BRFG Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing floodgates, guide walls, and other infrastructure; no major changes to overall footprint, orientation, operations, or bathymetry; H&H and salinity modeling and analysis assume conditions would be the same as existing.	0[1]	No
3a	Gate Relocation on Existing Alignment – Move floodgates farther from Brazos River along existing GIWW alignment; widen chamber wall opening from 75 feet to 125 feet wide.	83	No
3a.1	**Open Channel West/East Gate Relocation – Similar to Alternative 3a but only includes a new east floodgate; removes west floodgate, leaving an open channel on the west side of the river.**	**79**	**Yes[2]**
9a	Open Channel – Remove floodgates and excavate an open channel north of the existing GIWW alignment to straighten this section of the GIWW.	75	No
9b/c	New Alignment/Gates with Control Structures – Excavate new channel north of existing GIWW alignment and construct 125-foot-wide floodgates on the new channel. Alt. 9c includes a flow control structure at existing west gate location, while Alt. 9b does not.	87	No
CRL Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing locks, guide walls, and other infrastructure as needed; no major changes to overall footprint, guide wall orientation, gate operations, or bathymetry; H&H and salinity modeling/analysis assume conditions would be the same as existing.	0[1]	No
3b	Open Channel – Remove existing locks, creating an open channel through the intersection at the GIWW.	71	No
4b.1	**Removal of Riverside Gates – Remove riverside gates, converting the locks to floodgates.**	**71**	**Yes[2]**

[1] BRFG Alternative 2a and CRL Alternative 2a would rehabilitate the existing facilities within the existing footprints.
[2] The Recommended Plan is BRFG Alternative 3a.1 and CRL Alternative 4b.1.

The Recommended Plan includes implementing Alternative 3a.1 (Open Channel West/East Gate Relocation) at the BRFG facility (**Figure 4**) and Alternative 4b.1 (Removal of Riverside Gates) at the CRL facility (**Figure 5**). At the BRFG facility, the Recommended Plan would remove the existing 75-foot-wide east and west floodgates, construct new 125-foot-wide floodgates on the east side of the Brazos River, and construct new wing walls and guide walls for the east floodgates. The new east floodgates would be on the existing GIWW alignment and set back from the Brazos River compared to the existing floodgates to provide a longer approach channel. The Recommended Plan would include an open channel west of the river; therefore, no new floodgates would be constructed west of the river. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on the east side of the river. On the west side of the river, the bypass channel may serve as the permanent open channel, depending on final design of the Recommended Plan.

At the CRL, the Recommended Plan would remove the existing riverside (inner) gates east and west of the Colorado River and rehabilitate the existing GIWW-side (outer) 75-foot-wide gates. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on both sides of the river.

Under the Recommended Plan (and all other alternatives considered), materials that would be dredged during construction and maintenance activities would be deposited into existing DMPAs and ocean dredged material disposal sites (ODMDS).

19.4 Potential Effects of the Recommended Plan

Potential effects of the Recommended Plan on EFH are expected to be relatively minor and localized, and would be mitigated. The general setting of the study areas would not change and the study areas would continue to be exposed to environmental factors that will affect the area, including hurricanes, climate change and projected sea level rises, local subsidence, and periodic disposal of dredged material from maintenance dredging. These effects are expected to be similar to the baseline conditions and to future without project conditions. Anticipated impacts of the Recommended Plan that may affect EFH are discussed in the following paragraphs.

Water quality impacts include increases in turbidity and suspended sediment in the GIWW, Brazos River, and Colorado River. During construction, water-based activities would increase turbidity in the GIWW, Brazos River, and Colorado River. Land-based construction activities adjacent to the GIWW would cause runoff from exposed earth, which would result in localized, temporary increases in suspended sediment in adjacent water. The increase in turbidity is temporary, and local water quality is expected to return to existing conditions after construction activities are completed. Best management practices (BMPs) would be used to reduce suspended solids from land runoff, including installation of silt fences. Similarly, turbidity screens or silt collection curtains around construction equipment would reduce the amount of sediment entrained in the water. Following construction, periodic disturbance of sediments and suspension of sediments in the water column would occur as a result of maintenance dredging operations, barge traffic, and flooding at levels similar to the existing conditions.

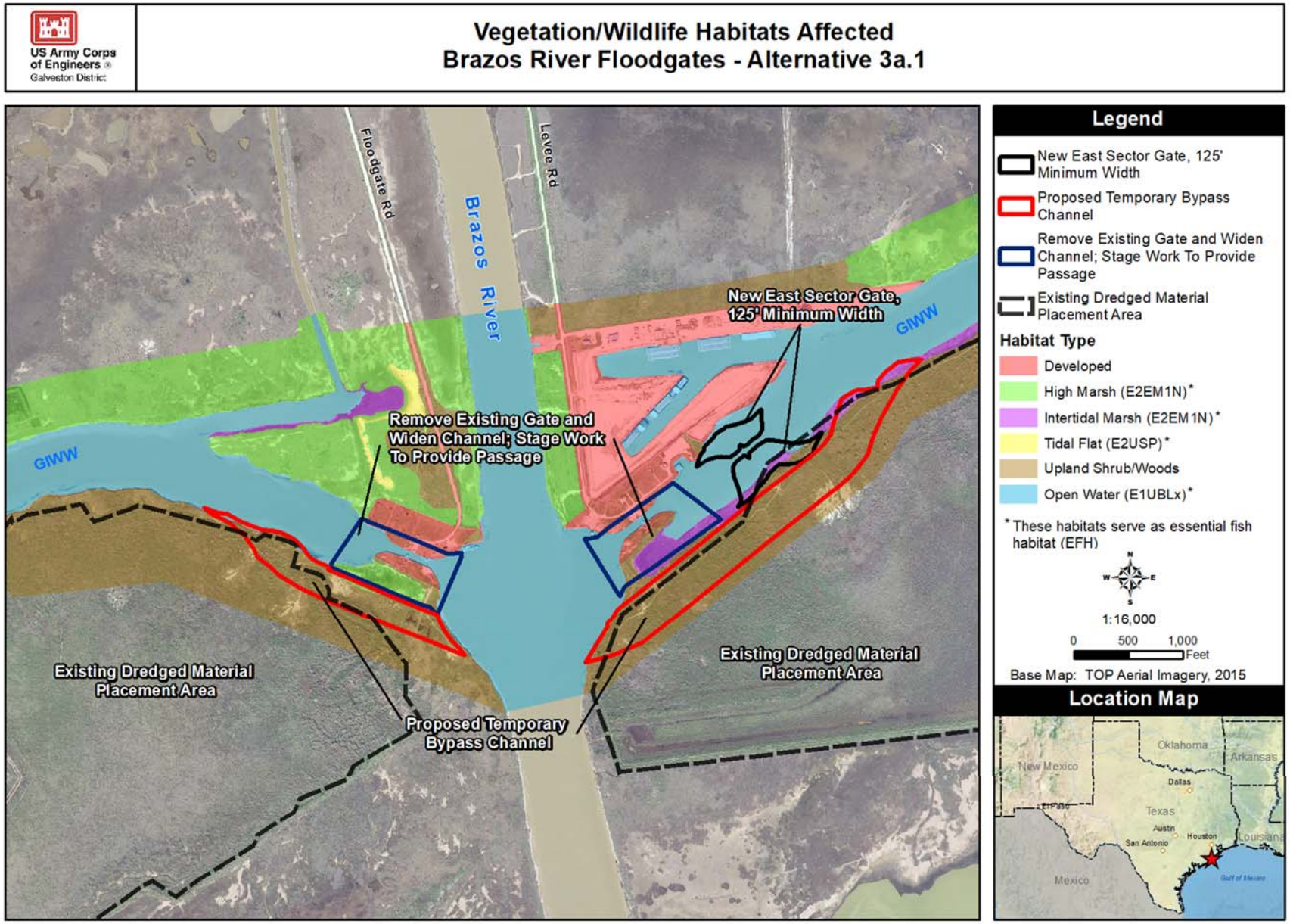

Figure 21 Habitats Affected by BRFG Alternative 3a.1 (Recommended Plan)

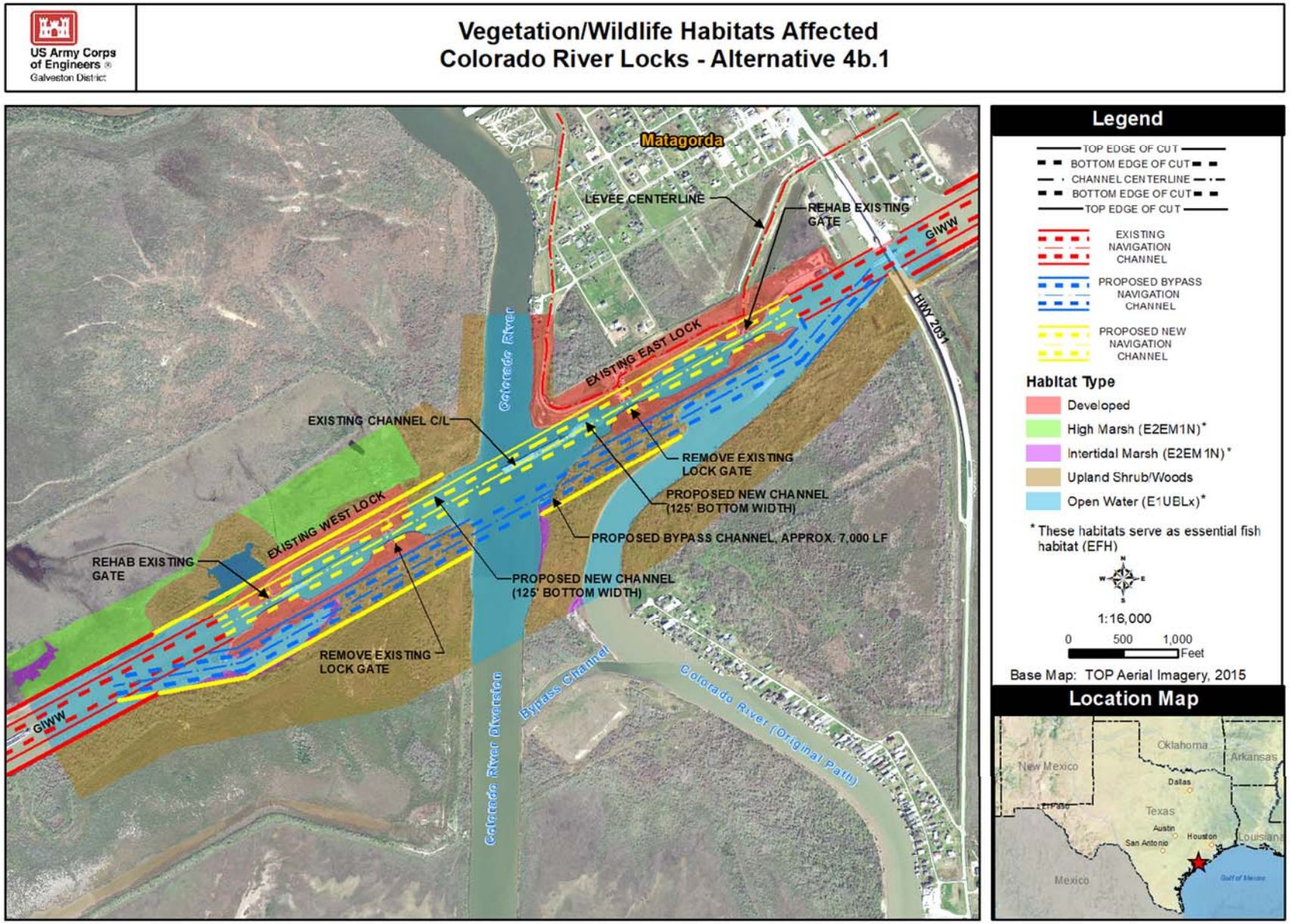

Figure 22 Habitats Affected by CRL Alternative 4b.1 (Recommended Plan)

Construction activities have the potential to create ***short-term noise level increases*** that would be similar to increases during maintenance dredging currently occurring in the study areas. At the BRFG, noise levels would be affected by pile driving of sheet pile or other structures for the proposed new guide walls. No blasting or Sound Navigation and Ranging (SONAR) is anticipated during construction, and any noise level increases would be temporary during construction.

Soils and waterbottoms would be impacted by construction activities, including dredging and grading. Projected increases in velocities in the Colorado River channel and in the GIWW during floods may lead to soils being eroded at a faster rate than under existing conditions. Soils that remain in place in both study areas would be subject to inundation and conversion to waterbottoms due to erosion and the combined effects of sea level rise and subsidence. Soils removed for the Recommended Plan would be placed in existing DMPAs and ODMDS, which would alter the soil structure and bottom habitats at those areas. At the BRFG, increased sedimentation would occur in the GIWW (both east and west of the BRFG), the Brazos River basin, and Freeport Channel, requiring maintenance dredging to prevent or reduce the shoaling that would occur under natural sedimentation deposition processes. At the CRL, sedimentation trends are expected to be similar to existing conditions and maintenance dredging would continue.

In general, during high flows in the Brazos and Colorado Rivers, ***salinities in the study areas*** would decrease due to higher influx of freshwater. Salinities would gradually increase as river levels and freshwater inflow decrease to normal flows and low flows. Hydraulic modeling was conducted and predicted that salinities in the BRFG study area would change by a decrease of up to 6 percent and an increase of as much as 16 percent. As the area experiences large fluctuations in salinities under existing conditions, no significant impacts to habitat are expected due to salinity changes. Hydraulic modeling was conducted and predicted that salinities in the CRL study area would be similar to the existing conditions; no significant changes to habitat are expected due to salinity changes.

The anticipated impact areas associated with the Recommended Plan at each facility are shown in relation to ***vegetation/wildlife habitats*** on **Figures 4 and 5**, and the acreages of vegetation/wildlife habitats that are present within the anticipated impact areas are provided in **Table 2**. At the BRFG, the Recommended Plan would impact an estimated 79 acres of land, primarily due to excavation of a temporary bypass channel to maintain navigation through the area during construction. The impacted areas are dominated by upland shrub/woods and open water; however, approximately 6.0 acres of wetlands would be removed during construction. Impacted wetland habitats in the temporary bypass channel would be restored and/or mitigated, resulting in no net loss of wetlands.

At the CRL, the Recommended Plan would impact an estimated 71 acres of land, primarily due to excavation of a temporary bypass channel to maintain navigation through the area during construction (**Table 2** and **Figure 5**). The impacted areas are mainly open water, upland shrub/woods, and developed land; however, approximately 0.7 acre of wetlands would be removed during construction. Impacted wetland habitats in the temporary bypass channel would be restored and/or mitigated, resulting in no net loss of wetlands.

Table 29 Impacts to Habitats (acres)

Habitat Type	Description of Habitat Type	BRFG Recommended Plan (Alternative 3a.1)	CRL Recommended Plan (Alternative 4b.1)
Open Water*	Open water in the study areas includes the GIWW and the Brazos and Colorado Rivers. These areas provide habitat for fish, shrimp, crabs, bottlenose dolphins (*Tursiops truncatus*), and other estuarine species. Most of the open water habitat experiences regular disturbances by barge tows and other vessels traveling through the GIWW, as well as periodic maintenance dredging.	21.4	45.2
Intertidal Marsh*	Intertidal marsh are wetland areas that occur in the study areas at elevations between the low and high tides (intertidal zone). These areas are dominated by smooth cordgrass (*Spartina alterniflora*), with species common to the high marsh habitat present along the edges.	2.3	0.7
High Marsh*	High marsh habitat occurs in the study areas at low elevation areas that are only infrequently inundated by very high tides. Common plant species observed in this habitat include turtleweed (*Batis maritima*), saltgrass (*Distichlis spicata*), saltworts (*Salicornia* spp.), Gulf cordgrass (*Spartina spartinae*), marshhay cordgrass (*S. patens*), sea-oxeye daisy (*Borrichia frutescens*), seepweed (*Suaeda linearis*), and marsh-elder (*Iva frutescens*). Scattered threesquare (*Schoenoplectus pungens*), wolfberry (*Lycium carolinianum*), saltcedar (*Tamarix ramosissima*), smooth cordgrass (*Spartina alterniflora*), and common reed (*Phragmites australis*) were also observed.	3.7	0
Tidal Flat*	One small area of unvegetated tidal flat is located in the BRFG study area adjacent to an intertidal marsh. This habitat contained less than 5 percent plant cover; species include turtleweed, smooth cordgrass, saltwort, and saltgrass. Algal mats covered an estimated 50 percent of the flat during a February 2017 field investigation. The area also showed evidence of disturbance from cattle.	0	0
Upland Shrub/Woods	Upland shrub/woods vegetation occurs in high elevations in the study areas, such as portions of the river banks and in DMPAs.	45.1	14.7
Developed	Developed areas include the floodgate and lock facilities and a nearby private facility.	6.1	10.8
	Total	**78.6**	**71.4**

* These habitats serve as EFH.

In addition to anticipated wetland losses, open water habitat in the GIWW and river crossings would be affected during construction as described above. Overall, impacts to open water habitats are expected to be temporary.

20.0 ESSENTIAL FISH HABITAT AND MANAGED SPECIES IN THE STUDY AREA

The study area is located within the jurisdiction of the Gulf of Mexico Fishery Management Council (GMFMC). The GMFMC jurisdiction (federal waters) extends from three to 200 miles off the coasts of Louisiana, Mississippi, and Alabama, and nine to 200 miles off Texas and the west coast of Florida. The Council prepared fishery management plans designed to manage fisheries from where state waters end out to the 200-mile limit of the Gulf of Mexico. These waters are knowns as the Exclusive Economic Zone. The GMFMC has identified and described EFH for hundreds of species covered by seven FMPs (NMFS 2010):

- Shrimp FMP
- Red Drum FMP
- Reef Fish FMP
- Stone Crab FMP
- Spiny Lobster FMP
- Coral and Coral Reef FMP
- Coastal Migratory Pelagic FMP

There are also a number of species managed in the Gulf of Mexico under Federally Implemented FMPs, including tuna, swordfish, billfish, large coastal sharks, small coastal sharks, and pelagic sharks (NMFS 2010).

Table 3 provides a list of representative areas in the Gulf of Mexico that are designated as EFH by the GMFMC.

Table 30 Representative Categories of Essential Fish Habitats in the Gulf of Mexico

Estuarine Areas	Marine Areas
Estuarine emergent wetland	Water column
Mangrove wetland	Vegetated bottoms
Submerged aquatic vegetation	Non-vegetated bottoms
Algal flats	Live bottoms
Mud, sand, shell, and rock substrates	Coral reefs
Estuarine water column	Geologic features
	Continental Shelf Features

Source: NMFS 2010

In estuarine environments, EFH is defined as "all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including the sub-tidal vegetation (seagrasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves)" (GMFMC 2004). The estuary habitats (open water, high marsh and intertidal marsh, and tidal flats) in the BRFG and CRL study areas have been

identified as EFH for red drum (*Sciaenops ocellatus*), shrimp, coastal migratory pelagics (3 species), 43 species of reef fish, and several shark species: blacknose shark (*Carcharhinus acronotus*), blacktip shark (*Carcharhinus limbatus*), bonnethead shark (*Sphyrna tiburo*), bull shark (*Carcharhinus leucas*), great hammerhead shark (*Sphyrna mokarran*), lemon shark (*Negaprion brevirostris*), scalloped hammerhead shark (*Sphyrna lewini*), and spinner shark (*Carcharhinus brevipinna*) (NMFS 2010, 2015). EFH for BRFG is shown on **Figure 6**, and EFH for CRL is shown on **Figure 7**. The FMPs for each of these EFH designations for species managed by the GMFMC is discussed in the following paragraphs. Note that no HAPCs are located in the study areas.

Red Drum FMP - EFH for red drum consists of all Gulf of Mexico estuaries; waters and substrates extending from Vermilion Bay, Louisiana, to the eastern edge of Mobile Bay, Alabama, out to depths of 25 fathoms; waters and substrates extending from Crystal River, Florida, to Naples, Florida, between depths of 5 and 10 fathoms; waters and substrates extending from Cape Sable, Florida, to the boundary between the areas covered by the GMFMC and the South Atlantic Fishery Management Council between depths of 5 and 10 fathoms.

Shrimp FMP - EFH for shrimp consists of Gulf of Mexico waters and substrates extending from the US/Mexico border to Fort Walton Beach, Florida, from estuarine waters out to depths of 100 fathoms; waters and substrates extending from Grand Isle, Louisiana, to Pensacola Bay, Florida, between depths of 100 and 325 fathoms; waters and substrates extending from Pensacola Bay, Florida, to the boundary between the areas covered by the GMFMC and the South Atlantic Fishery Management Council out to depths of 35 fathoms, with the exception of waters extending from Crystal River, Florida, to Naples, Florida, between depths of 10 and 25 fathoms and in Florida Bay between depths of 5 and 10 fathoms.

Coastal Migratory Pelagic FMP - EFH for coastal migratory pelagics consists of all Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the GMFMC and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

Reef Fish FMP - EFH for reef fish consists of Gulf of Mexico waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the GMFMC and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

The National Centers for Coastal Ocean Science (NCCOS) Estuarine Living Marine Resources Database (NMFS 2017b) was queried to identify the potential for occurrence for each of the species managed by the FMPs discussed above. These species are listed in **Table 4**, along with the potential for each to occur within the Brazos River and Matagorda Bay estuaries.

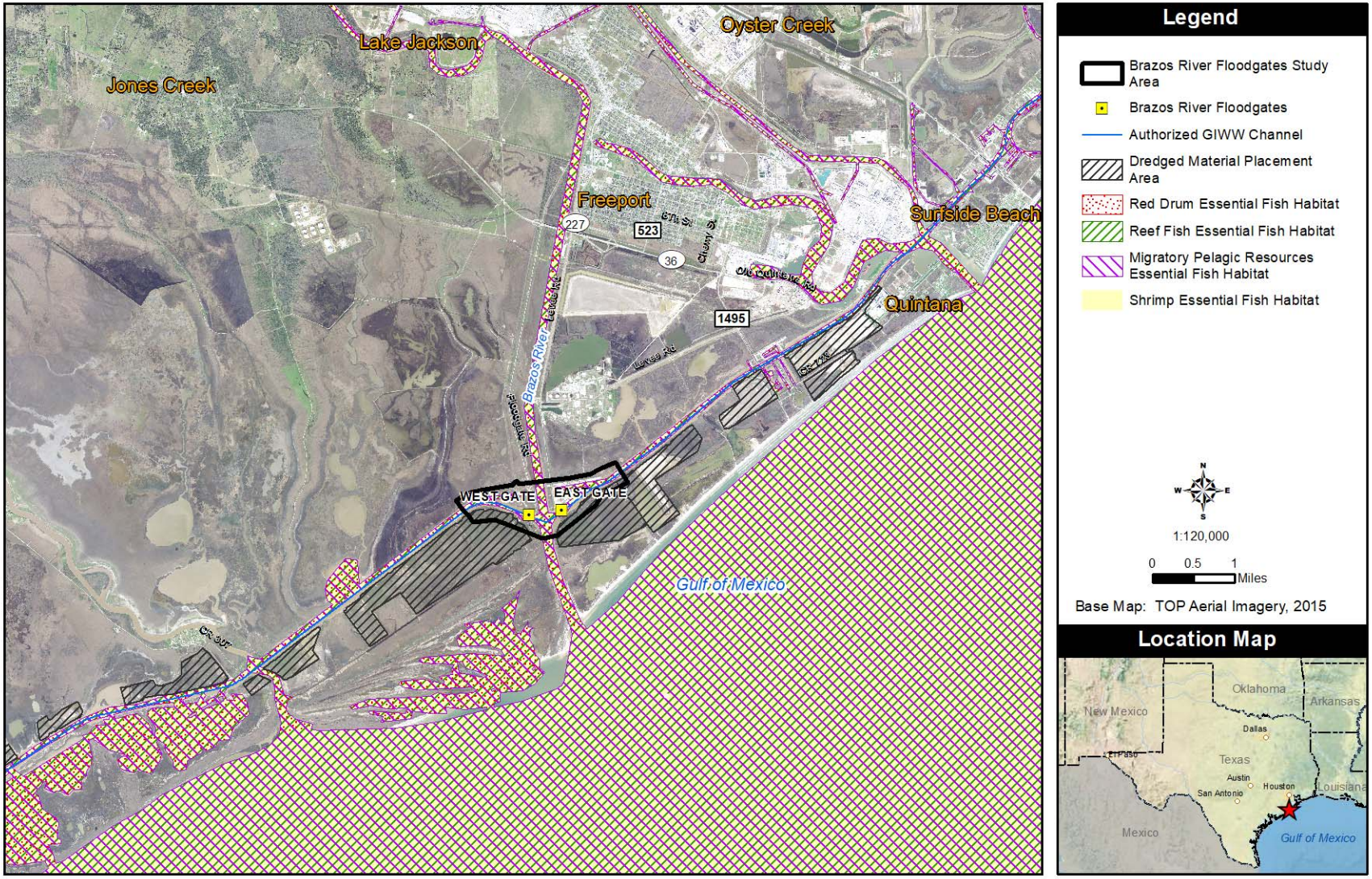

Figure 23 Essential Fish Habitat in the BRFG Study Area

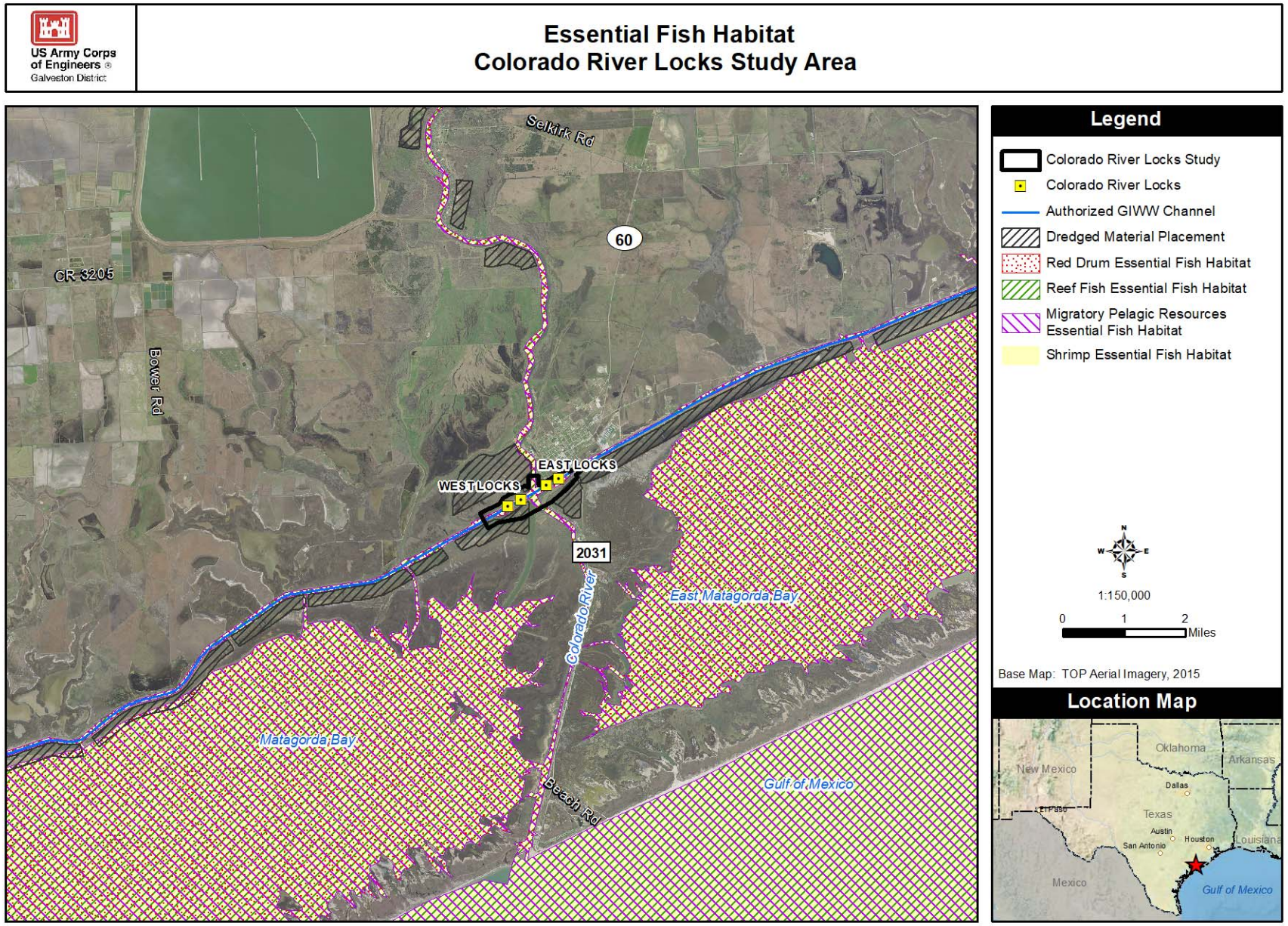

Figure 24 Essential Fish Habitat in the CRL Study Area

Table 31 Potential for EFH Managed Species to Occur in Vicinity of the BRFG and CRL Study Areas

Species	Brazos River Estuary			Matagorda Bay Estuary		
	Eggs/Larvae	Juveniles	Adults	Eggs/Larvae	Juveniles	Adults
Red Drum FMP						
Red drum *Sciaenops ocellatus*	Not present	Common year-round	No data	Rare to common Aug-Nov	Rare to common year-round	Rare to common year-round
Shrimp FMP						
Brown shrimp *Farfantepenaeus aztecus*	Rare to abundant Feb-Apr	Abundant year-round	Rare year-round	Rare Aug-Dec Common to highly abundant Feb-July	Rare to common Aug-Feb Abundant to highly abundant Mar-July	Rare year-round
Pink shrimp *Farfantepenaeus duorarum*	Not present	Rare Dec-May	Not present	Not present	Rare year-round	Common to highly abundant Feb-May
Royal red shrimp *Pleoticus robustus*	No data	No data	No data	No data	No data	No data
White shrimp *Litopenaeus setiferus*	Abundant July-Oct	Abundant to highly abundant year-round	Common May-June	Common to highly abundant March-Nov	Rare to common Dec-Feb Abundant to highly abundant March-Nov	Rare to common year-round
Coastal Migratory Pelagic FMP						
Cobia *Rachycentron canadum*	No data	No data	No data	No data	No data	No data
King mackerel *Scomberomorus cavalla*	No data	No data	No data	No data	No data	No data
Spanish mackerel *Scomberomorus maculatus*	Not present	Rare July-Oct, Dec-May	Rare June-Nov	Not present	Rare Dec-Oct	Rare to common June-Nov
Reef Fish FMP[1]						
Gray snapper *Lutjanus griseus*	Not present	Not present	Not present	Not present	Rare May-Nov	Rare year-round
Sharks[2]						
Bull shark *Carcharhinus leucas*	Not present	No data	Rare year-round	Not present	Rare to common year-round	Rare year-round

Source: GCFMC 2004, NMFS 2010, 2017a, 2017b

[1] No occurrence data available for other reef fish species.

[2] No occurrence data available for other shark species.

21.0 EFFECTS OF PROPOSED ACTION ON EFH AND MANAGED SPECIES

As defined by the Magnuson-Stevens Act (50 CFR 600.810), "adverse effect" includes any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

21.1 Effects on EFH

Construction of the Recommended Plan at the BRFG (Alternative 3a.1) will affect approximately 6.0 acres of wetlands and 21.4 acres of open water, while construction of the Recommended Plan at the CRL (Alternative 4b.1) will affect approximately 0.7 acre of wetlands and 45.2 acres of open water (**Table 2**). The USACE has worked with NMFS and other resource agencies to evaluate the wetland habitats and develop a mitigation plan for offsetting anticipated wetland losses resulting from the Recommended Plan. To ensure that the mitigation plan would adequately compensate for wetland losses over the 50-year analysis period, the USACE compared average annual benefits of potential mitigation projects, in terms of Average Annual Habitat Units (AAHU), to the AAHUs under the Future Without Project condition. The identified mitigation plan entails creating 6.02 acre of tidal marsh habitats at the BRFG site and 0.74 acre of tidal marsh at the CRL site.

Open water impacts will be temporary during construction and will be minimized by the use of BMPs. Water column turbidity will increase during and immediately after construction activities, and displacement of water column food sources for finfish are expected; however, recovery is expected to be rapid after construction activities are complete. If any stormwater runoff occurs it would result in localized, temporary increases in suspended sediment in adjacent water. The increase in turbidity is temporary and local, and water quality is expected to return to existing conditions after dredging and construction activities are completed.

21.2 Effects on Managed Species

At the BRFG, construction activities (including construction of the open channel and new sector gate) would take approximately two years; demolition of the river side gates and rehabilitation of the GIWW-side gates at the CRL would take approximately 15 months. It is assumed that once construction has commenced, work would occur throughout the year, to the extent practicable. Due to the length of construction, there is the potential to impact a variety of EFH managed species that occur in the vicinities of the study areas throughout the year. Similarly, it is assumed that maintenance dredging activities may occur at any time throughout the year and, therefore, may impact a variety of EFH managed species. However, the study areas are already partially developed with navigation-related structures and do not provide high-quality EFH. Additionally, marine water column and marine non-vegetated bottoms occur in abundance in the surrounding areas and are, therefore, not a unique resource.

During maintenance dredging activities, mobile species are expected to move away from the equipment; therefore, impacts would be considered short-term and not dissimilar to the existing conditions or future without project conditions. Dredging activities would result in temporary loss of benthic organisms, which are prey species for many fish species, but the benthic organisms are expected to rapidly recolonize the area when construction activities are complete. It is expected that the EFH species that are present in the area can rapidly recover after maintenance dredging occurs.

Four shrimp species have the potential to occur in the study areas, and the eggs/larvae and juveniles of brown shrimp (*Farfantepenaeus aztecus*) and white shrimp (*Litopenaeus setiferus*) are considered to be common to abundance in the vicinities of the study areas. After hatching, larvae enter estuaries and remain

there throughout the juvenile stage. Estuarine habitat serves as a nursery area for shrimp, offering a suitable substrate, an abundant food supply, and protection from predators. Sub-adult shrimp consume organic matter, including marsh grasses and microorganisms, found in estuarine sediments. It is expected that juvenile shrimp would avoid areas of disturbance; however, these species would be impacted by temporary substrate disturbances and loss of prey. Therefore, the project would have an adverse effect on shrimp, although the effect would be relatively localized and temporary.

Red drum is an important commercial and recreational gamefish found in coastal waters throughout the Gulf of Mexico. Juveniles occupy estuarine environments until maturation, and are considered to be rare to common in the vicinities of the study areas throughout the year (**Table 4**). Red drum are predatory in all life stages, and sub-adults primarily consume small marine invertebrates, including mysids and copepods. It is expected that juvenile red drum would avoid areas of disturbance; however, this species would be impacted by temporary substrate disturbances and loss of prey. Therefore, the project would have an adverse effect on red drum, although the effect would be relatively localized and temporary

Based on the rarity of ***coastal migratory pelagics***, ***reef fish***, and ***sharks*** in the vicinities of the study areas (**Table 4**), and considered in conjunction with the relatively minor impacts of the project, no effects to these species are anticipated.

21.3 Conclusion

The Recommended Plan would have ***adverse effects*** on EFH for shrimp and red drum because of substrate disturbances and loss of prey during construction and maintenance dredging. Construction is expected to last 2 years at the BRFG and 15 months at the CRL. The adverse effects are expected to be localized in nature, short-term in duration, and overall relatively minor; the Recommended Plan will not result in permanent adverse effects to EFH after mitigation has been implemented.

No effect on coastal migratory pelagics, reef fish, or sharks are anticipated.

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ATTACHMENT D-4

COASTAL CONSISTENCY DETERMINATION

DRAFT

TEXAS COASTAL MANAGEMENT PROGRAM CONSISTENCY DETERMINATION

GULF INTRACOASTAL WATERWAY BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS SYSTEMS FEASIBILITY STUDY

US Army Corps of Engineers ®

Texas Department of Transportation ®

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Appendices

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List of Acronyms

Acronym or Abbreviation	Definition or Meaning
BRFG	Brazos River Floodgates
CNRA	coastal natural resource area
CRL	Colorado River Locks
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GIWW	Gulf Intracoastal Waterway
GLO	General Land Office
HTRW	Hazardous, Toxic, and Radioactive Waste
NMFS	National Marine Fisheries Service
PCB	polychlorinated biphenyls

Acronym or Abbreviation	Definition or Meaning
RRC	Railroad Commission
SLB	School Land Board
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCMP	Texas Coastal Management Program
TPWD	Texas Parks and Wildlife Department
THC	Texas Historical Commission
TxDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

23.0 INTRODUCTION

The United States Army Corps of Engineers (USACE), in cooperation with the Texas Department of Transportation (TxDOT) Maritime Division, is conducting the *Gulf Intracoastal Waterway (GIWW), Brazos River Floodgates and Colorado River Locks Systems Feasibility Study* to determine the feasibility of modifying the Brazos River Floodgates (BRFG) and Colorado River Locks (CRL) to reduce navigation impacts and costly waterborne traffic delays that are a result of aging infrastructure and inadequate channel dimensions. As part of the Feasibility Study, the USACE has prepared an integrated Feasibility Report and Environmental Impact Statement (FR/EIS) in compliance with the National Environmental Policy Act (NEPA), USACE regulation ER-200-2, 33 Code of Federal Regulations (CFR) 230, the Flood Control Act of 1970 – Section 216, and other Federal, state, and local environmental policies and procedures.

This report addresses consistency with the Texas Coastal Management Program (TCMP). Section 307 of the Coastal Zone Management Act of 1972, 16 U.S.C. 1456 et. seq., requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs."

23.1 Background Information

The GIWW is a 1,300-mile-long, shallow-draft, man-made protected waterway that connects ports along the Gulf of Mexico from St. Marks, Florida, to Brownsville, Texas. The authorized channel dimensions are 125 feet wide and 12 feet deep. The GIWW is an essential component of the transportation network of Texas and the nation, reducing congestion on highway and rail systems, thereby decreasing maintenance costs and extending the life of these transportation systems. Compared to truck or rail transport, the use of barges to transport goods produces fewer air emissions, is more fuel-efficient, and provides a safer mode of transportation. The GIWW is also used by the commercial fishing industry and for recreational activities such as fishing, skiing, sightseeing, and traveling long distances in the protected waterway.

The BRFG and CRL are two lock-type structures on the GIWW located about 40 miles apart on the upper to mid-Texas coast, in Brazoria and Matagorda Counties, respectively (**Figure 1**). They were initially installed in the early 1940s to prevent heavy sediment loads in the Brazos and Colorado Rivers from entering the GIWW. The structures are over 60 years old and were installed at a time when most tug boats pulled barges behind them, rather than using the modern pushing method. At each facility, the gate openings are 75 feet wide, which is much narrower than the 125-foot-wide GIWW navigation channel. Although regulations restrict the width of tows to 55 feet, oversize tow permits are routinely granted for tows as wide as 108 feet, particularly along the upper Texas coast (TxDOT 2016). To move these wider tows through the BRFG and CRL, vessel operators must park the tows, break the barges apart, move them through the locks in smaller sets or individually, and reconnect the tows on the other side. This process, known as "tripping," is inefficient and causes delays that result in substantial costs to the towing industry each year. In addition to narrow gates, high flows in the rivers make navigation through the BRFG and CRL structures more difficult and result in temporary navigation restrictions and/or closures imposed by the USACE and U.S. Coast Guard, which result in additional delays and economic impact to the towing industry.

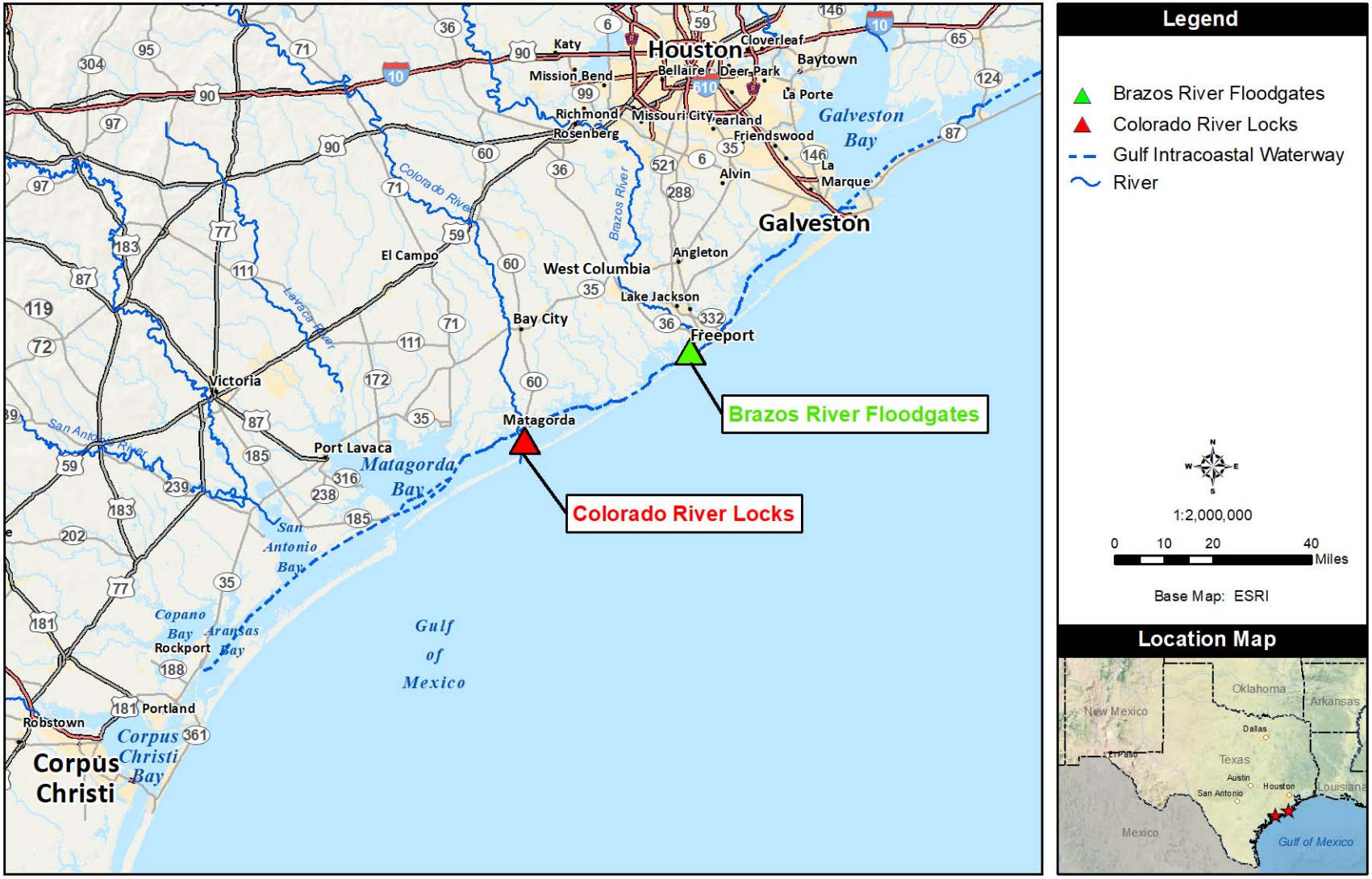

Figure 25 Project Location

23.2 Summary of Alternatives Considered and Recommended Plan Identification

Early on in alternatives development, the USACE and TxDOT identified a number of alternatives that involved various measures to improve navigation through the BRFG and CRL facilities. Through multiple screening efforts, the USACE and TxDOT narrowed the reasonable alternatives to the No Action Alternative and five Action Alternatives at the BRFG facility, and the No Action Alternative and three Action Alternatives at the CRL facility. In an effort to minimize environmental impacts, the disturbance areas associated with the reasonable alternatives are located in and adjacent to the existing GIWW, BRFG, and CRL facilities. The USACE and TxDOT further evaluated these alternatives through hydrology and hydraulics (H&H) modeling, economic analysis, and environmental analysis to identify a Recommended Plan. **Table 1** lists the alternatives, provides a general overview of each alternative, and provides an estimated area that would be affected by the alternative.

Table 32 Summary of BRFG and CRL Alternatives Considered

Alternative	Alternative Overview	Estimated Acreage Affected	Recommended Plan?
BRFG Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing floodgates, guide walls, and other infrastructure; no major changes to overall footprint, orientation, operations, or bathymetry; H&H and salinity modeling and analysis assume conditions would be the same as existing.	0[1]	No
3a	Gate Relocation on Existing Alignment – Move floodgates farther from Brazos River along existing GIWW alignment; widen chamber wall opening from 75 feet to 125 feet wide.	83	No
3a.1	**Open Channel West/East Gate Relocation – Similar to Alternative 3a but only includes a new east floodgate; removes west floodgate, leaving an open channel on the west side of the river.**	**79**	**Yes[2]**
9a	Open Channel – Remove floodgates and excavate an open channel north of the existing GIWW alignment to straighten this section of the GIWW.	75	No
9b/c	New Alignment/Gates with Control Structures – Excavate new channel north of existing GIWW alignment and construct 125-foot-wide floodgates on the new channel. Alt. 9c includes a flow control structure at existing west gate location, while Alt. 9b does not.	87	No
CRL Alternatives			
No Action	No improvements would be made to the BRFG facility. Normal maintenance activities would continue.	0	No
2a	Rehab Existing Facilities – Rehabilitate existing locks, guide walls, and other infrastructure as needed; no major changes to overall footprint, guide wall orientation, gate operations, or bathymetry; H&H and salinity modeling/analysis assume conditions would be the same as existing.	0[1]	No
3b	Open Channel – Remove existing locks, creating an open channel through the intersection at the GIWW.	71	No
4b.1	**Removal of Riverside Gates – Remove riverside gates, converting the locks to floodgates.**	**71**	**Yes[2]**

[1] BRFG Alternative 2a and CRL Alternative 2a would rehabilitate the existing facilities within the existing footprints.
[2] The Recommended Plan is BRFG Alternative 3a.1 and CRL Alternative 4b.1.

The Recommended Plan includes implementing Alternative 3a.1 (Open Channel West/East Gate Relocation) at the BRFG facility (**Figure 2**) and Alternative 4b.1 (Removal of Riverside Gates) at the CRL facility (**Figure 3**). At the BRFG facility, the Recommended Plan would remove the existing 75-foot-wide east and west floodgates, construct new 125-foot-wide floodgates on the east side of the Brazos River, and construct new wing walls and guide walls for the east floodgates. The new east floodgates would be on the existing GIWW alignment and set back from the Brazos River compared to the existing floodgates to provide a longer approach channel. The Recommended Plan would include an open channel west of the river; therefore, no new floodgates would be constructed west of the river. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on the east side of the river. On the west side of the river, the bypass channel may serve as the permanent open channel, depending on final design of the Recommended Plan.

At the CRL, the Recommended Plan would remove the existing riverside (inner) gates east and west of the Colorado River and rehabilitate the existing GIWW-side (outer) 75-foot-wide gates. To allow navigation through the area during construction, a temporary bypass channel would be constructed on the south side of the existing channel. After construction, the bypass channel would be closed on both sides of the river.

Under the Recommended Plan (and all other alternatives considered), materials that would be dredged during construction and maintenance activities would be deposited into existing DMPAs and ocean dredged material disposal sites (ODMDS).

24.0 IMPACTS ON COASTAL NATURAL RESOURCE AREAS

There are 16 Coastal Natural Resource Areas (CNRAs) listed in 31 Texas Administrative Code (TAC) §501.3, and several of the CNRAs are found in and adjacent to the study areas. **Table 2** provides a brief description of each CNRA, identifies if the CNRA is within the study area, and if the CNRA would be impacted by the Recommended Plan.

25.0 COMPLIANCE WITH GOALS AND POLICIES

The following goals and policies of the TCMP were reviewed for compliance:

25.1 §501.15 – Major Actions

(a) For purposes of this section, "major action" means an individual agency or subdivision action listed in §505.11 of this title (relating to Actions and Rules Subject to the Coastal Management Program), §506.12 of this title (relating to Federal Actions Subject to the Coastal Management Program), or §505.60 of this title (relating to Local Government Actions Subject to the Coastal Management Program), relating to an activity for which a federal environmental impact statement under the National Environmental Policy Act, 42 United States Code Annotated, §4321, et seq is required.

Compliance: This project is subject to Section 501.15 and constitutes a major action. A Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR/EIS) has been prepared for the action.

Table 33. Coastal Natural Resource Areas in Study Areas

Subchapter	Name	Brief Definition (see 31 TAC §501.3)	Present in or adjacent to study areas?	Methods to Minimize or Avoid Potential Impacts
A	Coastal barriers	Undeveloped area on barrier island	Yes (Both)	Dredging and dredged material placement are not expected to have adverse impact.
B	Coastal historic areas	Site identified by Texas Historical Commission as on National Register of Historic Places or a state archeological landmark	No	Project construction will occur in immediate area of the BRFG and CRL; no historic areas will be impacted.
C	Coastal preserves	Any park or wildlife management area owned by the State of Texas	Yes (Both)	Coastal preserves are near the facilities but will not be impacted by project construction.
D	Coastal shore areas	Area within 100 feet landward of high water mark on submerged land	Yes (Both)	Minimal impacts to coastal shore areas will occur.
E	Coastal wetlands	Wetlands as defined by Texas Water Code §11.502	Yes (Both)	Mitigation will occur for 6.0 acres of wetland impacted at BRFG and 0.7 acre of wetland impacted at CRL.
F	Critical dune areas	Protected sand dune complex within 1,000 feet of mean high tide	No	Critical dune areas will not be impacted by project construction.
G	Critical erosion areas	Coastal area experiencing erosion that is a threat to public health and safety, public beach use, general recreation, traffic safety, private or commercial property, fish and wildlife habitat, or an area of national importance	No	Critical erosion areas will not be impacted by project construction or by placement of dredged material.
H	Gulf beaches	Beach that is bordering the Gulf of Mexico	No	Gulf beaches will not be impacted by project construction.
I	Hard substrate reefs	Naturally occurring hard substrate formation	No	No hard substrate reefs will be affected by the project.
J	Oyster reefs	Natural or artificial formation composed of oyster shell in intertidal or subtidal area	No	Oyster growth is limited to the floodgates and lock gates.
K	Submerged land	Land located below waters under tidal influence	Yes (Both)	Dredging, construction, and if used, ODMDS will disturb submerged lands. Areas will rapidly recover after project completion.
L	Special hazard areas	An area having special flood-related erosion hazards, e.g., floodplain	Yes	Dredging and construction will not impact the floodplains.
M	Submerged aquatic vegetation	Rooted aquatic vegetation growing in permanently inundated areas in estuarine and marine systems	Yes (CRL only)	Minor amount of seagrass is located in small tidal ponds in CRL study area but would not be impacted by the project.
N	Tidal sand or mud flats	Silt, clay, or sand substrate that occurs in intertidal areas	Yes (BRFG only)	Minor amount of tidal flat is located in BRFG study area but will not be impacted by the project.
O	Water of the open Gulf of Mexico	Open waters of the Gulf of Mexico within the territorial limits of the state	Yes (Both)	If dredged material is placed ODMDS, open waters will be disturbed intermittently during the life of the project.
P	Water under tidal influence	Water in the state that is subject to tidal influence	Yes (Both)	Projects will have minor impact to GIWW and adjacent wetlands.

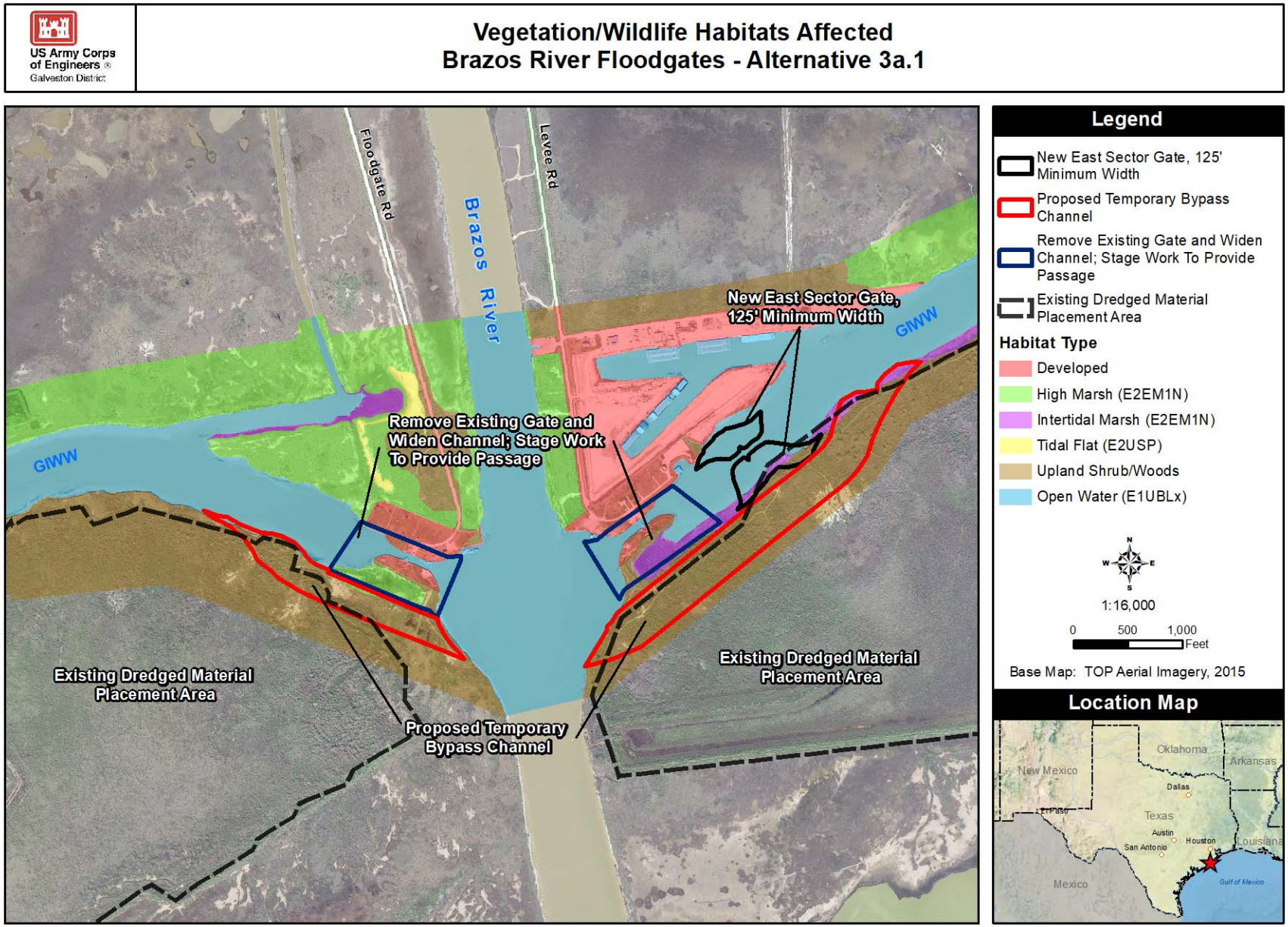

Figure 26 Vegetation/Wildlife Habitats Affected by BRFG Alternative 3a.1 (Recommended Plan)

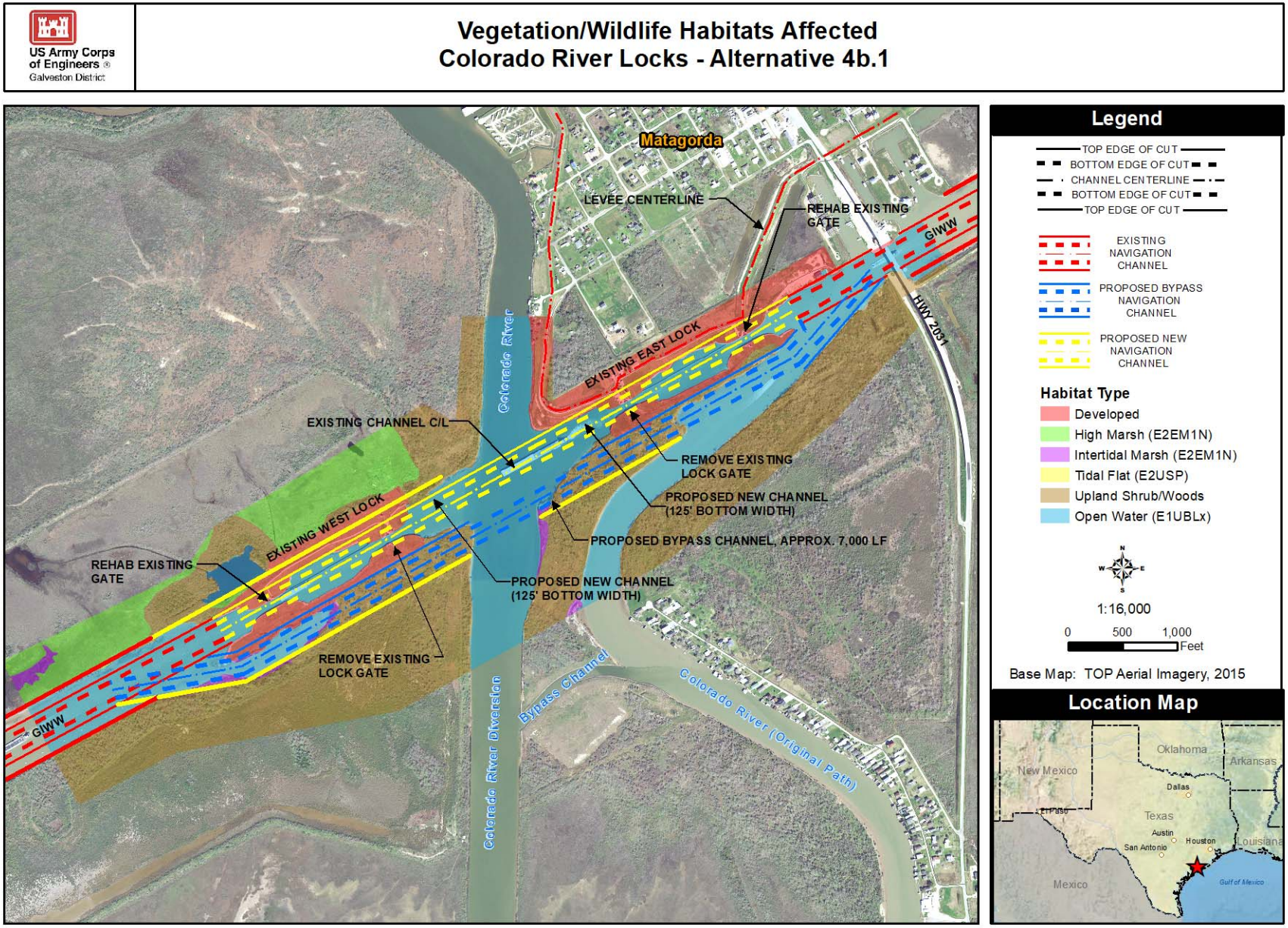

Figure 27 Vegetation/Wildlife Habitats Affected by CRL Alternative 4b.1 (Recommended Plan)

(b) Prior to taking a major action, the agencies and subdivisions having jurisdiction over the activity shall meet and coordinate their major actions relating to the activity. The agencies and subdivisions shall, to the greatest extent practicable, consider the cumulative and secondary adverse effects, as described in the federal environmental impact assessment process, of each major action relating to the activity.

Compliance: The USACE as the Federal sponsor and TxDOT as the non-Federal sponsor have met, coordinated the proposed actions, and considered the cumulative and secondary adverse effects of each the actions, as documented in the DIFR/EIS.

(c) No agency or subdivision shall take a major action that is inconsistent with the goals and policies of this chapter. In addition, an agency or subdivision shall avoid and otherwise minimize the cumulative adverse effects to coastal natural resource areas of each of its major actions relating to the activity.

Compliance: The Recommended Plan is consistent with the goals and policies of this chapter in that it was developed through evaluation of several alternatives and minimizes direct and indirect effects to CNRAs to the extent practicable; therefore, the Recommended Plan has minimized cumulative adverse effects.

25.2 §501.23 – Development in Critical Areas

Compliance with development in critical areas is described below, with emphasis on resource areas defined in **Table 1** that are likely to be affected by the proposed action. As defined in §501.23, critical areas include coastal wetlands, oyster reefs, hard substrate reefs, submerged aquatic vegetation, or tidal sand or mud flats.

(a) Dredging and construction of structures in, or the discharge of dredged or fill material into, critical areas shall comply with the policies in this section. In implementing this section, cumulative and secondary adverse effects of these activities will be considered.

Compliance: Compared to other alternatives that meet the project's purpose and need, the Recommended Plan minimizes impacts to critical areas. During project development, several alternatives were considered. This analysis resulted in the identification of BRFG Alternative 3a.1 and CRL Alternative 4b.1 as the Recommended Plan. These alternatives would satisfy the project's purpose while meeting the engineering capabilities of the USACE, being economically feasible and minimizing impacts to the environment.

(1) The policies in this section shall be applied in a manner consistent with the goal of achieving no net loss of critical area functions and values.

Compliance: The selected BRFG alternative 3a.1 would impact 3.7 acres of high marsh and 2.3 acres of intertidal marsh, and the CRL alternative 4b.1 would impact 0.7 acre of intertidal marsh (**Table 3**). The wetland areas would be mitigated, and therefore, there would be no net loss of coastal wetlands.

Table 34. Impacts to Wetlands and Other Special Aquatic Sites

Alternative	High Marsh	Intertidal Marsh	Tidal Flat	Total
BRFG Action Alternatives				
3A.1	3.7	2.3	0	**6.0**
CRL Action Alternatives				
2A.1	0	0.7	0	**0.7**

(2) Persons proposing development in critical areas shall demonstrate that no practicable alternative with fewer adverse effects is available.

Compliance: During project development, alternatives were evaluated based on minimizing the impacts of the project to adjacent critical areas, including wetlands.

(3) In evaluating practicable alternatives, the following sequence shall be applied:

(A) Adverse effects on critical areas shall be avoided to the greatest extent practicable.

Compliance: As noted above, adverse effects on critical areas have been avoided to the greatest extent practicable by improving the BRFG and CRL within the existing banks of the GIWW and using upland DMPAs. Some areas of coastal wetlands would be removed, but these areas would be mitigated, resulting in no net loss of coastal wetlands for the Recommended Plan.

Unavoidable adverse effects shall be minimized to the greatest extent practicable by limiting the degree or magnitude of the activity and its implementation.

Compliance: The purpose of the project is to improve navigation efficiency at the BRFG and CRL. The proposed alternatives minimize the impacts on coastal wetlands to the extent possible.

(B) Appropriate and practicable compensatory mitigation shall be required to the greatest extent practicable for all adverse effects that cannot be avoided or minimized.

Compliance: The USACE has developed a compensatory mitigation plan that will offset unavoidable impacts to wetlands.

(4) Compensatory mitigation includes restoring adversely affected critical areas or replacing adversely affected critical areas by creating new critical areas. Compensatory mitigation should be undertaken, when practicable, in areas adjacent or contiguous to the affected critical areas (on-site). If on-site compensatory mitigation is not practicable, compensatory mitigation should be undertaken in close physical proximity to the affected critical areas if practicable and in the same watershed if possible (off-site). Compensatory mitigation should also attempt to replace affected critical areas with critical areas with characteristics identical to or closely approximating those of the affected critical areas (in-kind). The preferred order of compensatory mitigation is:

(A) on-site, in-kind;
(B) off-site, in-kind;
(C) on-site, out-of-kind; and
(D) off-site, out-of-kind.

Compliance: The USACE has prepared a compensatory mitigation plan that includes creation of in-kind wetlands on each of the project sites.

(5) Mitigation banking is acceptable compensatory mitigation if use of the mitigation bank has been approved by the agency authorizing the development and mitigation credits are available for withdrawal. Preservation through acquisition for public ownership of unique critical areas or other ecologically important areas may be acceptable compensatory mitigation in exceptional circumstances. Examples of this include areas of high priority for preservation or restoration, areas whose functions and values are difficult to replicate, or areas not adequately protected by regulatory programs. Acquisition will normally be allowed only in conjunction with preferred forms of compensatory mitigation.

Compliance: The project sites are not within the service areas of any active mitigation banks. Mitigation will be accomplished through on-site creation of wetlands.

(6) In determining compensatory mitigation requirements, the impaired functions and values of the affected critical area shall be replaced on a one-to-one ratio. Replacement of functions and values on a one-to-one ratio may require restoration or replacement of the physical area affected on a ratio higher than one-to-one. While no net loss of critical area functions and values is the goal, it is not required in individual cases where mitigation is not practicable or would result in only inconsequential environmental benefits. It is also important to recognize that there are circumstances where the adverse effects of the activity are so significant that, even if alternatives are not available, the activity may not be permitted regardless of the compensatory mitigation proposed.

Compliance: A total 6.76 acres of tidal wetland, in the form of high marsh and intertidal marsh, would be created between the BRFG and CRL sites. This includes 6.02 acres at the BRFG site and 0.74 acre at the CRL site. Establishing 6.76 acres of wetland habitats at these locations would produce 6.13 Average Annual Habitat Units (AAHUs) to offset the 6.12 AAHUs that would be lost as a result of the Recommended Plan.

(7) Development in critical areas shall not be authorized if significant degradation of critical areas will occur. Significant degradation occurs if:

(A) the activity will jeopardize the continued existence of species listed as endangered or threatened, or will result in likelihood of the destruction or adverse modification of a habitat determined to be a critical habitat under the Endangered Species Act, 16 United States Code Annotated, §§1531 - 1544;

Compliance: Informal consultation has been initiated with preparation of a Biological Assessment (BA), in which a *may affect, not likely to adversely affect* determination has been made for sea turtles, piping plover, and red knot, and a *no effect* determination has been made for other listed species and critical habitat. The U.S. Fish and Wildlife Service (USFWS) is not expected to issue a Biological Opinion or jeopardy determination for the Recommended Plan.

(B) the activity will cause or contribute, after consideration of dilution and dispersion, to violation of any applicable surface water quality standards established under §501.21 of this title;

Compliance: The USACE will incorporate best management practices and conduct water quality and sediment testing prior to construction to insure that the project will not cause or contribute to violation of any applicable surface water quality standards.

(C) the activity violates any applicable toxic effluent standard or prohibition established under §501.21 of this title;

Compliance: The project is not expected to violate any applicable toxic effluent standards or prohibitions under §501.21.

(D) the activity violates any requirement imposed to protect a marine sanctuary designated under the Marine Protection, Research, and Sanctuaries Act of 1972, 33 United States Code Annotated, Chapter 27; or

Compliance: No marine sanctuaries are present in the study areas, and none would be impacted by the project.

(E) taking into account the nature and degree of all identifiable adverse effects, including their persistence, permanence, areal extent, and the degree to which these effects will have been mitigated pursuant to subsections (c) and (d) of this section, the activity will, individually or collectively, cause or contribute to significant adverse effects on:

(i) human health and welfare, including effects on water supplies, plankton, benthos, fish, shellfish, wildlife, and consumption of fish and wildlife;

(ii) the life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, or spread of pollutants or their byproducts beyond the site, or their introduction into an ecosystem, through biological, physical, or chemical processes;

(iii) ecosystem diversity, productivity, and stability, including loss of fish and wildlife habitat or loss of the capacity of a coastal wetland to assimilate nutrients, purify water, or reduce wave energy; or

(iv) generally accepted recreational, aesthetic or economic values of the critical area which are of exceptional character and importance.

Compliance: The effects of the proposed project on plankton, benthos, fish, and shellfish would be local and temporary, primarily caused by increased turbidity during construction. No adverse effects on aquatic life, wildlife, spread of pollutants, ecosystem diversity, or ecosystem function are expected. The project would not have significant adverse effects recreational, aesthetic, or economic values of exceptional character and importance.

(b) The Texas Commission on Environmental Quality (TCEQ) and the Texas Railroad Commission (RRC) shall comply with the policies in this section when issuing certifications and adopting rules under Texas Water Code, Chapter 26, and the Texas Natural Resources Code, Chapter 91, governing certification

of compliance with surface water quality standards for federal actions and permits authorizing development affecting critical areas; provided that activities exempted from the requirement for a permit for the discharge of dredged or fill material, described in Code of Federal Regulations, Title 33, §323.4 and/or Code of Federal Regulations, Title 40, §232.3, including but not limited to normal farming, silviculture, and ranching activities, such as plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices, shall not be considered activities for which a certification is required. The Texas General Land Office (GLO) and the School Land Board (SLB) shall comply with the policies in this section when approving oil, gas, or other mineral lease plans of operation or granting surface leases, easements, and permits and adopting rules under the Texas Natural Resources Code, Chapters 32, 33 and 51 - 53, and Texas Water Code, Chapter 61, governing development affecting critical areas on state submerged lands and private submerged lands, and when issuing approvals and adopting rules under Texas Natural Resources Code, Chapter 221, for mitigation banks operated by subdivisions of the state.

Compliance: Water quality certification from the TCEQ would be consistent with these policies.

(c) Agencies required to comply with this section will coordinate with one another and with federal agencies when evaluating alternatives, determining appropriate and practicable mitigation, and assessing significant degradation. Those agencies' rules governing authorizations for development in critical areas shall require a demonstration that the requirements of subsection (a)(1) - (7) of this section have been satisfied.

Compliance: The USACE will coordinate with the TCEQ in compliance with this section.

(d) For any dredging or construction of structures in, or discharge of dredged or fill material into, critical areas that is subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on the cumulative and secondary adverse effects of the project need not be produced or evaluated to comply with this section if such data and information is produced and evaluated in compliance with §501.15(b) - (c) of this title.

Compliance: This project is subject to §501.15 and constitutes a major action. Coordination has occurred among the State and Federal agencies having jurisdiction over the proposed activity.

25.3 §501.24 – Construction of Waterfront Facilities and Other Structures on Submerged Lands

(a) Development on submerged lands shall comply with the policies in this section.

(1) Marinas shall be designed and, to the greatest extent practicable, sited so that tides and currents will aid in flushing of the site or renew its water regularly.

(2) Marinas designed for anchorage of private vessels shall provide facilities for the collection of waste, refuse, trash, and debris.

(3) Marinas with the capacity for long-term anchorage of more than ten vessels shall provide pump-out facilities for marine toilets, or other such measures or facilities that provide an equal or better level of water quality protection.

Compliance: The project does not involve construction of marinas.

(4) Marinas, docks, piers, wharves and other structures shall be designed and, to the greatest extent practicable, sited to avoid and otherwise minimize adverse effects on critical areas from boat traffic to and from those structures.

Compliance: The proposed east floodgate at the BRFG will be constructed on the existing GIWW alignment, farther east from the Brazos River, while the west floodgate will be permanently removed. At the CRL, the interior (riverside) gates will be permanently removed, and the outer gates will be rehabilitated. Keeping the structures on the existing GIWW alignment minimizes the potential for adverse effects on critical areas from boat and barge traffic that travel through the area. In addition, providing an open channel west of the Brazos River and a wider gate opening (125 feet) east of the Brazos River will reduce the frequency of "tripping" barges, which reduces the potential for impacts to CNRAs along the GIWW banks from mooring, pushing into the banks, and drifting into the banks.

(5) Construction of docks, piers, wharves, and other structures shall be preferred instead of authorizing dredging of channels or basins or filling of submerged lands to provide access to coastal waters if such construction is practicable, environmentally preferable, and will not interfere with commercial navigation.

Compliance: The project is intended to benefit commercial navigation and requires dredging.

(6) Piers, docks, wharves, bulkheads, jetties, groins, fishing cabins, and artificial reefs (including artificial reefs for compensatory mitigation) shall be limited to the minimum necessary to serve the project purpose and shall be constructed in a manner that:

(A) does not significantly interfere with public navigation;

(B) does not significantly interfere with the natural coastal processes which supply sediments to shore areas or otherwise exacerbate erosion of shore areas; and

(C) avoids and otherwise minimizes shading of critical areas and other adverse effects.

Compliance: The project does not involve construction of piers, docks, wharves, bulkheads, jetties, groins, fishing cabins, or artificial reefs.

(7) Facilities shall be located at sites or designed and constructed to the greatest extent practicable to avoid and otherwise minimize the potential for adverse effects from:

(A) construction and maintenance of other development associated with the facility;

(B) direct release to coastal waters and critical areas of pollutants from oil or hazardous substance spills or stormwater runoff; and

(C) deposition of airborne pollutants in coastal waters and critical areas.

Compliance: Construction of the project is not expected to result in release of oil or hazardous substances, or deposition of airborne contaminants into coastal areas. The USACE will incorporate best management practices to prevent release of pollutants from oil, hazardous substance spills, or stormwater runoff.

(8) Where practicable, pipelines, transmission lines, cables, roads, causeways, and bridges shall be located in existing rights-of-way or previously disturbed areas if necessary to avoid or minimize adverse effects and if it does not result in unreasonable risks to human health, safety, and welfare.

Compliance: Infrastructure will be placed in previously disturbed areas to the extent possible.

(9) To the greatest extent practicable, construction of facilities shall occur at sites and times selected to have the least adverse effects on recreational uses of CNRAs and on spawning or nesting seasons or seasonal migrations of terrestrial and aquatic wildlife.

Compliance: Proposed construction will be planned to minimize impacts on recreation, spawning, and nesting.

(10) Facilities shall be located at sites which avoid the impoundment and draining of coastal wetlands. If impoundment or draining cannot be avoided, adverse effects to the impounded or drained wetlands shall be mitigated in accordance with the sequencing requirements of §501.23 of this title. To the greatest extent practicable, facilities shall be located at sites at which expansion will not result in development in critical areas.

Compliance: The project will not impound or drain coastal wetlands. No future expansion of the facilities are planned.

(11) Where practicable, piers, docks, wharves, bulkheads, jetties, groins, fishing cabins, and artificial reefs shall be constructed with materials that will not cause any adverse effects on coastal waters or critical areas.

Compliance: The project does not involve construction of piers, docks, wharves, bulkhead, jetties groins, or fishing cabins.

(12) Developed sites shall be returned as closely as practicable to pre-project conditions upon completion or cessation of operations by the removal of facilities and restoration of any significantly degraded areas, unless:

(A) the facilities can be used for public purposes or contribute to the maintenance or enhancement of coastal water quality, critical areas, beaches, submerged lands, or shore areas; or

(B) restoration activities would further degrade CNRAs.

Compliance: Developed areas that include facilities for the operation of the locks or floodgates will be removed, moved, or rehabilitated. These facilities would not be used for public purposes and would not be used for enhancement of water quality, critical areas, beaches, or shore areas. Renovation or moving the structures would not degrade CNRAs.

(13) Water-dependent uses and facilities shall receive preference over those uses and facilities that are not water-dependent.

Compliance: The proposed project is water-dependent.

(14) Nonstructural erosion response methods such as beach nourishment, sediment bypassing, nearshore sediment berms, and planting of vegetation shall be preferred instead of structural erosion response methods.

Compliance: Erosion control methods will be in compliance with this section.

(15) Major residential and recreational waterfront facilities shall to the greatest extent practicable accommodate public access to coastal waters and preserve the public's ability to enjoy the natural aesthetic values of coastal submerged lands.

Compliance: The proposed project does not involve construction of residential or recreational facilities.

(b) Activities on submerged land shall avoid and otherwise minimize any significant interference with the public's use of and access to such lands.

(16) Erosion of Gulf beaches and coastal shore areas caused by construction or modification of jetties, breakwaters, groins, or shore stabilization projects shall be mitigated to the extent the costs of mitigation are reasonably proportionate to the benefits of mitigation. Factors that shall be considered in determining whether the costs of mitigation are reasonably proportionate to the cost of the construction or modification and benefits include, but are not limited to, environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits.

Compliance: The project will be constructed to minimize erosion.

(c) To the extent applicable to the public beach, the policies in this section are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public.

Compliance: The proposed project will not occur in the vicinity of beaches, and public beach access will not be affected by the project.

(d) The GLO and the SLB, in governing development on state submerged lands, shall comply with the policies in this section when approving oil, gas, and other mineral lease plans of operation and granting

surface leases, easements, and permits and adopting rules under the Texas Natural Resources Code, Chapters 32, 33 and 51 - 53, and Texas Water Code, Chapter 61.

Compliance: The project is not expected to require any oil, gas, or mineral leases.

25.4 §501.25 – Dredging and Dredged Material Disposal and Placement

(a) Dredging and the disposal and placement of dredged material shall avoid and otherwise minimize adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches to the greatest extent practicable. The policies of this section are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public. In implementing this section, cumulative and secondary adverse effects of dredging and the disposal and placement of dredged material and the unique characteristics of affected sites shall be considered.

Compliance: Dredging during construction activities would impact 6.0 acres of wetland at BRFG and 0.7 acre of wetland at CRL. These impacts will be mitigated through on-site marsh creation. Dredged material from project construction or project maintenance will be placed at the approved DMPAs or ODMDS. The dredging operations for construction or maintenance would temporarily impact submerged lands, but would avoid all critical areas, shore areas, and Gulf beach areas.

(1) Dredging and dredged material disposal and placement shall not cause or contribute, after consideration of dilution and dispersion, to violation of any applicable surface water quality standards established under §501.21 of this title.

Compliance: Dredging and dredged material disposal and placement will not result in the violation of any applicable surface water quality standards.

(2) Except as otherwise provided in paragraph (4) of this subsection, adverse effects on critical areas from dredging and dredged material disposal or placement shall be avoided and otherwise minimized, and appropriate and practicable compensatory mitigation shall be required, in accordance with §501.23 of this title.

Compliance: The project has minimized adverse effects to critical areas and will mitigate for the 6.7 acres of coastal wetlands that will be impacted.

(3) Except as provided in paragraph (4) of this subsection, dredging and the disposal and placement of dredged material shall not be authorized if:

(A) there is a practicable alternative that would have fewer adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches, so long as that alternative does not have other significant adverse effects;

(B) all appropriate and practicable steps have not been taken to minimize adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches; or

(C) significant degradation of critical areas under §501.23(a)(7)(E) of this title would result.

Compliance: During project development, several alternatives to improving navigation at the BRFG and CRL were evaluated to identify the least environmentally damaging alternative that was within the engineering capabilities of the USACE and was economically feasible. **T**he Recommended Plan would minimize impact to CNRAs and would provide for compensatory mitigation of impacts to coastal wetlands. No significant degradation of critical areas is expected as a result of the proposed project. Therefore, the criteria under (A), (B), and (C) have been met, and dredging and placement activities associated with the proposed project are not prohibited under this subparagraph.

(4) A dredging or dredged material disposal or placement project that would be prohibited solely by application of paragraph (3) of this subsection may be allowed if it is determined to be of overriding importance to the public and national interest in light of economic impacts on navigation and maintenance of commercially navigable waterways.

Compliance: The proposed action is not prohibited by subparagraph C.

(b) Adverse effects from dredging and dredged material disposal and placement shall be minimized as required in subsection (a) of this section. Adverse effects can be minimized by employing the techniques in this subsection where appropriate and practicable.

Compliance: Adverse effects of dredging and disposal, as described in this DEIS, have been minimized, as discussed under compliance with paragraph (1) of this subsection.

(1) Adverse effects from dredging and dredged material disposal and placement can be minimized by controlling the location and dimensions of the activity. Some of the ways to accomplish this include:

(A) locating and confining discharges to minimize smothering of organisms;

(B) locating and designing projects to avoid adverse disruption of water inundation patterns, water circulation, erosion and accretion processes, and other hydrodynamic processes;

(C) using existing or natural channels and basins instead of dredging new channels or basins, and discharging materials in areas that have been previously disturbed or used for disposal or placement of dredged material;

(D) limiting the dimensions of channels, basins, and disposal and placement sites to the minimum reasonably required to serve the project purpose, including allowing for reasonable overdredging of channels and basins, and taking into account the need for capacity to accommodate future expansion without causing additional adverse effects;

(E) discharging materials at sites where the substrate is composed of material similar to that being discharged;

(F) locating and designing discharges to minimize the extent of any plume and otherwise control dispersion of material; and

(G) avoiding the impoundment or drainage of critical areas.

Compliance: Adverse effects of dredging and dredge disposal will be minimized minimizing the footprint of dredging and using existing disposal sites.

(2) Dredging and disposal and placement of material to be dredged shall comply with applicable standards for sediment toxicity. Adverse effects from constituents contained in materials discharged can be minimized by treatment of or limitations on the material itself. Some ways to accomplish this include:

(A) disposal or placement of dredged material in a manner that maintains physiochemical conditions at discharge sites and limits or reduces the potency and availability of pollutants;

(B) limiting the solid, liquid, and gaseous components of material discharged;

(C) adding treatment substances to the discharged material; and

(D) adding chemical flocculants to enhance the deposition of suspended particulates in confined disposal areas.

Compliance: Sediments to be dredged from the GIWW at the BRFG and CRL alternatives will be tested for a variety of chemical parameters. The project is expected to comply with applicable sediment toxicity standards.

(3) Adverse effects from dredging and dredged material disposal or placement can be minimized through control of the materials discharged. Some ways of accomplishing this include:

(A) use of containment levees and sediment basins designed, constructed, and maintained to resist breaches, erosion, slumping, or leaching;

(B) use of lined containment areas to reduce leaching where leaching of chemical constituents from the material is expected to be a problem;

(C) capping in-place contaminated material or, selectively discharging the most contaminated material first and then capping it with the remaining material;

(D) properly containing discharged material and maintaining discharge sites to prevent point and nonpoint pollution; and

(E) timing the discharge to minimize adverse effects from unusually high water flows, wind, wave, and tidal actions.

Compliance: During dredging operations, there would be localized, temporary increases in turbidity. The proposed project includes placement of dredged material into existing DMPAs or OMDMA. Discharges from the placement areas would be confined where applicable. The construction, dredging, and dredge material placement would be minimized by planning in a manner to reduce or avoid adverse impacts from unusually high water flows, wave, wind, or tidal actions.

(4) Adverse effects from dredging and dredged material disposal or placement can be minimized by controlling the manner in which material is dispersed. Some ways of accomplishing this include:

(A) where environmentally desirable, distributing the material in a thin layer;

(B) orienting material to minimize undesirable obstruction of the water current or circulation patterns;

(C) using silt screens or other appropriate methods to confine suspended particulates or turbidity to a small area where settling or removal can occur;

(D) using currents and circulation patterns to mix, disperse, dilute, or otherwise control the discharge;

(E) minimizing turbidity by using a diffuser system or releasing material near the bottom;

(F) selecting sites or managing discharges to confine and minimize the release of suspended particulates and turbidity and maintain light penetration for organisms; and

(G) setting limits on the amount of material to be discharged per unit of time or volume of receiving waters.

Compliance: Adverse effects of dredging and dredged material disposal will be minimized by controlling discharges.

(5) Adverse effects from dredging and dredged material disposal or placement operations can be minimized by adapting technology to the needs of each site. Some ways of accomplishing this include:

(A) using appropriate equipment, machinery, and operating techniques for access to sites and transport of material, including those designed to reduce damage to critical areas;

(B) having personnel on site adequately trained in avoidance and minimization techniques and requirements; and

(C) designing temporary and permanent access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement.

Compliance: Adverse effects of dredging and dredged material disposal will be minimized.

(6) Adverse effects on plant and animal populations from dredging and dredged material disposal or placement can be minimized by:

(A) avoiding changes in water current and circulation patterns that would interfere with the movement of animals;

(B) selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species that have a competitive edge ecologically over indigenous plants or animals;

(C) avoiding sites having unique habitat or other value, including habitat of endangered species;

(D) using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics;

(E) using techniques that have been demonstrated to be effective in circumstances similar to those under consideration whenever possible and, when proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiating their use on a small scale to allow corrective action if unanticipated adverse effects occur;

(F) timing dredging and dredged material disposal or placement activities to avoid spawning or migration seasons and other biologically critical time periods; and

(G) avoiding the destruction of remnant natural sites within areas already affected by development.

Compliance: The project will be designed and constructed to minimize impacts to plant and wildlife resources.

(7) Adverse effects on human use potential from dredging and dredged material disposal or placement can be minimized by:

(A) selecting sites and following procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the site, particularly with respect to water quality;

(B) selecting sites which are not valuable as natural aquatic areas;

(C) timing dredging and dredged material disposal or placement activities to avoid the seasons or periods when human recreational activity associated with the site is most important; and

(D) selecting sites that will not increase incompatible human activity or require frequent dredge or fill maintenance activity in remote fish and wildlife areas.

Compliance: The project will be designed and constructed to minimize effects on human use.

(8) Adverse effects from new channels and basins can be minimized by locating them at sites:

(A) that ensure adequate flushing and avoid stagnant pockets; or

(B) that will create the fewest practicable adverse effects on CNRAs from additional infrastructure such as roads, bridges, causeways, piers, docks, wharves, transmission line crossings, and ancillary channels reasonably likely to be constructed as a result of the project; or

(C) with the least practicable risk that increased vessel traffic could result in navigation hazards, spills, or other forms of contamination which could adversely affect CNRAs;

(D) provided that, for any dredging of new channels or basins subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on minimization of secondary adverse effects need not be produced or evaluated to comply with this paragraph if such data and information is produced and evaluated in compliance with §501.15(b)(1) of this title.

Compliance: The proposed bypass channels will be excavated along the same general alignment as previous bypass channels.

(c) Disposal or placement of dredged material in existing contained dredge disposal sites identified and actively used as described in an environmental assessment or environmental impact statement issued prior to the effective date of this chapter shall be presumed to comply with the requirements of subsection (a) of this section unless modified in design, size, use, or function.

Compliance: Existing DMPAs will be presumed to comply with the requirements of subsection (a).

(d) Dredged material from dredging projects in commercially navigable waterways is a potentially reusable resource and must be used beneficially in accordance with this policy.

Compliance: If possible, dredged material will be used to construction on-site wetlands for mitigation purposes.

(1) If the costs of the beneficial use of dredged material are reasonably comparable to the costs of disposal in a non-beneficial manner, the material shall be used beneficially.

(2) If the costs of the beneficial use of dredged material are significantly greater than the costs of disposal in a non-beneficial manner, the material shall be used beneficially unless it is demonstrated that the costs of using the material beneficially are not reasonably proportionate to the costs of the project and benefits that will result. Factors that shall be considered in determining whether the costs of the beneficial use are not reasonably proportionate to the benefits include, but are not limited to:

(A) environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits;
(B) the proximity of the beneficial use site to the dredge site; and
(C) the quantity and quality of the dredged material and its suitability for beneficial use.

(3) Examples of the beneficial use of dredged material include, but are not limited to:

(A) projects designed to reduce or minimize erosion or provide shoreline protection;
(B) projects designed to create or enhance public beaches or recreational areas;
(C) projects designed to benefit the sediment budget or littoral system;
(D) projects designed to improve or maintain terrestrial or aquatic wildlife habitat;
(E) projects designed to create new terrestrial or aquatic wildlife habitat, including the construction of marshlands, coastal wetlands, or other critical areas;
(F) projects designed and demonstrated to benefit benthic communities or aquatic vegetation;
(G) projects designed to create wildlife management areas, parks, airports, or other public facilities;
(H) projects designed to cap landfills or other water disposal areas;
(I) projects designed to fill private property or upgrade agricultural land, if cost-effective public beneficial uses are not available; and
(J) projects designed to remediate past adverse impacts on the coastal zone.

Compliance: If possible, dredged material will be used to construction on-site wetlands for mitigation purposes.

(e) If dredged material cannot be used beneficially as provided in subsection (d)(2) of this section, to avoid and otherwise minimize adverse effects as required in subsection (a) of this section, preference will be given to the greatest extent practicable to disposal in:

(1) contained upland sites;
(2) other contained sites; and
(3) open water areas of relatively low productivity or low biological value.

Compliance: Disposal of dredged material is expected to occur in existing DMPAs or ODMDS.

(f) For new sites, dredged materials shall not be disposed of or placed directly on the boundaries of submerged lands or at such location so as to slump or migrate across the boundaries of submerged lands in the absence of an agreement between the affected public owner and the adjoining private owner or owners that defines the location of the boundary or boundaries affected by the deposition of the dredged material.

Compliance: The project proposes to use existing disposal sites.

(g) Emergency dredging shall be allowed without a prior consistency determination as required in the applicable consistency rule when:

(1) there is an unacceptable hazard to life or navigation;

(2) there is an immediate threat of significant loss of property; or

(3) an immediate and unforeseen significant economic hardship is likely if corrective action is not taken within a time period less than the normal time needed under standard procedures. The council secretary shall be notified at least 24 hours prior to commencement of any emergency dredging operation by the agency or entity responding to the emergency. The notice shall include a statement demonstrating the need for emergency action. Prior to initiation of the dredging operations the project sponsor or permit-issuing agency shall, if possible, make all reasonable efforts to meet with council's designated representatives to ensure consideration of and consistency with applicable policies in this subchapter. Compliance with all applicable policies in this subchapter shall be required at the earliest possible date. The permit-issuing agency and the applicant shall submit a consistency determination within 60 days after the emergency operation is complete.

Compliance: The project would comply with *section (g)* in the event that emergency dredging is necessary.

(h) Mining of sand, shell, marl, gravel, and mudshell on submerged lands shall be prohibited unless there is an affirmative showing of no significant impact on erosion within the coastal zone and no significant adverse effect on coastal water quality or terrestrial and aquatic wildlife habitat within any CNRA.

Compliance: The project does not involve mining of sand, shell, marl, gravel, or mudshell.

(i) The GLO and the SLB shall comply with the policies in this section when approving oil, gas, and other mineral lease plans of operation and granting surface leases, easements, and permits and adopting rules under the Texas Natural Resources Code, Chapters 32, 33, and 51 - 53, and Texas Water Code, Chapter 61, for dredging and dredged material disposal and placement. TxDOT shall comply with the policies in this subchapter when adopting rules and taking actions as local sponsor of the Gulf Intracoastal Waterway under Texas Transportation Code, Chapter 51. The TCEQ and the RRC shall comply with the policies in this section when issuing certifications and adopting rules under Texas Water Code, Chapter 26, and the Texas Natural Resources Code, Chapter 91, governing certification of compliance with surface water quality standards for federal actions and permits authorizing dredging or the discharge or placement of dredged material. The TPWD shall comply with the policies in this section when adopting rules at Chapter 57 of this title (relating to Fisheries) governing dredging and dredged material disposal and placement. The TPWD shall comply with the policies in subsection (h) of this section when adopting rules and issuing permits under Texas Parks and Wildlife Code, Chapter 86, governing the mining of sand, shell, marl, gravel, and mudshell.

Compliance: The project is not expected to require any oil, gas, or mineral leases.

25.5 §501.28 – Development Within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers

(a) Development of new infrastructure or major repair of existing infrastructure within or supporting development within Coastal Barrier Resource System Units and Otherwise Protected Areas designated on maps dated October 24, 1990, as those maps may be modified, revised, or corrected, under the Coastal Barrier Resources Act, 16 United States Code Annotated, §3503(a), shall comply with the policies in this section.

(1) Development of publicly funded infrastructure shall be authorized only if it is essential for public health, safety, and welfare, enhances public use, or is required by law.

Compliance: The infrastructure is necessary and will be constructed in compliance with the policies in this section.

(2) Infrastructure shall be located at sites at which reasonably foreseeable future expansion will not require development in critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas.

Compliance: There is no reasonably foreseeable future expansion associated with the proposed project.

(3) Infrastructure shall be located at sites that to the greatest extent practicable avoid and otherwise minimize the potential for adverse effects on critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas from:

(A) construction and maintenance of roads, bridges, and causeways; and

(B) direct release to coastal waters, critical areas, critical dunes, Gulf beaches, and washover areas within Coastal Barrier Resource System Units or Otherwise Protected Areas of oil, hazardous substances, or stormwater runoff.

Compliance: Infrastructure will be sited in accordance with this section.

(4) Where practicable, infrastructure shall be located in existing rights-of-way or previously disturbed areas to avoid or minimize adverse effects within Coastal Barrier Resource System Units or Otherwise Protected Areas.

Compliance: Infrastructure will be placed in previously disturbed areas to the extent possible.

(5) Development of infrastructure shall occur at sites and times selected to have the least adverse effects practicable within Coastal Barrier Resource System Units or Otherwise Protected Areas on critical areas, critical dunes, Gulf beaches, and washover areas and on spawning or nesting areas or seasonal migrations of commercial, recreational, threatened, or endangered terrestrial or aquatic wildlife.

Compliance: Proposed construction will be planned to have the least adverse impacts on areas listed in this section.

(b) TCEQ rules and approvals for the creation of special districts and for infrastructure projects funded by issuance of bonds by water, sanitary sewer, and wastewater drainage districts under Texas Water Code, Chapters 49, 50, and 59; water control and improvement districts under Texas Water Code, Chapter 50; municipal utility districts under Texas Water Code, Chapter 54; regional plan implementation agencies under Texas Water Code, Chapter 54; special utility districts under Texas Water Code, Chapter 65; stormwater control districts under Texas Water Code, Chapter 66; and all other general and special law districts subject to and within the jurisdiction of the TCEQ, shall comply with the policies in this section. TxDOT rules and approvals under Texas Transportation Code Chapter 201, et seq., governing planning, design, construction, and maintenance of transportation projects, shall comply with the policies in this section.

Compliance: The proposed project meets the policies of *section (b*).

26.0 CONCLUSION

The USACE has determined that the Recommended Plan complies with the TCMP and will be conducted in a manner consistent with all rules and regulations of the program.