



**US Army Corps
of Engineers®**
Galveston District

**DRAFT
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT
BIOLOGICAL ASSESSMENT
APPENDIX B**

**Sabine Pass to Galveston Bay
Port Arthur and Vicinity
Segments 2, 3, 4, 5 and 5A**

**U.S. Army Corps of Engineers
Southwestern Division
Galveston District**

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EXECUTIVE SUMMARY

The Port Arthur Coastal Storm Risk Management System is a federal civil works project to address coastal storm flooding and surge due to increased hurricane forces and rising sea level along the Texas coast, this project specially addresses Port Arthur, TX and vicinity towns within Jefferson County. The Port Arthur Coastal Storm Risk Management System will improve or deviate from the existing Hurricane Flood Protection Project (HFPP) which has protected portions of Jefferson County for over 40 years, the system is comprised of hurricane levees, floodwalls, pump stations, and drainage ditches, the system is managed by the Jefferson County Drainage District, the non-federal sponsor of the civil works project. The PAV CSRMS will include new and raised hurricane levees within or outside of the HFPP system, new floodwalls outside of the HFPP system, improve existing pump station protections, create new pump stations, relocate existing road storm closure gates, relocated existing railroad storm closure gates, improve nine floodwall drainage, and reinstall erosion protection along new floodwalls.

Table 1-Species Table and Effects Determination

Species	Habitat Association	Effect Determination	Effects Analysis
Birds			
Piping Plover	Along the Texas coast, piping plover use beaches, mudflats, sandflats, dunes, and offshore emergent wetland placement areas.	No Effect	Lacks suitable habitat
Red Knot	Along the Texas coast, red knots forage on beaches, oyster reefs, and exposed bay bottoms and roost on high sand flats, reefs, and other sites protected from high tides.	No Effect	Lacks suitable habitat
Eastern Black Rail	Salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced with soils that are moist to saturated, occasionally dry, and interspersed with, or adjacent to, very shallow water of 1-6 cm. Requires dense vegetation cover that allows movement underneath the canopy.	NLAA	Western Levee contains coastal prairie and may contain the species year long. Construction and loss of prairie and wetlands will impact the species during vulnerable nesting/breeding season.
Whooping Crane	Breed, migrate, and forage in coastal marshes and estuaries, inland marshes, lakes, open ponds, shallow bays, salt marsh, and sand or tidal flats, upland swales, wet meadows and rivers, pastures, and agricultural fields.	NLAA	Western Levee contains agricultural fields and coastal prairie. The species could be impacted by flyover and use during construction.
Tricolored Bat	Roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees.	No Effect	Lacks suitable habitat
Reptiles			
Green Sea Turtle	Primarily uses shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and seagrasses.	No Effect	Lacks suitable habitat

Species	Habitat Association	Effect Determination	Effects Analysis
Hawksbill Sea Turtle	Generally, inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they occur at depths of less than 70 feet.	No Effect	Lacks suitable habitat
Kemp's Ridley Sea Turtle	Inhabit shallow coastal and estuarine waters, usually over sand or mud bottoms.	No Effect	Lacks suitable habitat
Leatherback Sea Turtle	Mainly pelagic, inhabiting the open ocean. Found in coastal waters during nesting. Typically nests on beaches with a deep-water approach in Malaysia, Mexico, French Guiana, Suriname, Costa Rica, and Trinidad	No Effect	Lacks suitable habitat
Loggerhead Sea Turtle	Occur in open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers.	No Effect	Lacks suitable habitat
Alligator Snapping Turtle	Found in deeper water of large rivers and their major tributaries, selecting structure over open water and sites with greater canopy cover.	No Effect	Lacks suitable habitat
Mammals			
West Indian Manatee	Marine, brackish, and freshwater systems in coastal and riverine areas with preference near the shore featuring underwater vegetation like seagrass & eelgrass.	No Effect	Lacks suitable habitat
Sperm whale*	Prefer steep depth gradients, along the shelf break (2,300 – 3,280 feet) and deeper oceanic waters.	No Effect	Lacks suitable habitat
Rice's Whale*	Restricted to a very narrow depth corridor along the shelf break in the northeastern Gulf of Mexico.	No Effect	Lacks suitable habitat
Fish			
Oceanic Whitetip Shark*	Reside in tropical and subtropical seas worldwide in the pelagic ocean, generally offshore, on the outer continental shelf, or around oceanic islands in water depths greater than 604 feet.	No Effect	Lacks suitable habitat
Giant Manta Ray*	Prefer offshore environments in the Gulf of Mexico. Manta rays are rarely seen in Texas bays and estuaries. They can occur in waters from 0 ft to 4,000 ft, this behavior is most likely due to prey availability	No Effect	Lacks suitable habitat
Insects			
Monarch butterfly	Monarchs need healthy and abundant milkweed embedded within diverse nectaring habitat. Many monarchs use a variety of roosting trees along the fall migration route. Although monarch butterfly can occur within the project	No Effect	Lacks suitable habitat

Species	Habitat Association	Effect Determination	Effects Analysis
	areas, they will not be affected by construction due to the lack of milkweed presence and unlikelihood of milkweed to occur in the PAV CSRMS sites due to the severe degradation of habitat by invasive species.		
Plants			
Texas Prairie Dawn	Primarily found in sandy loam complexes, the species is predominantly found in pockets of Harris County and Fort Bend County, TX. No known distributions of the species are found in this area of Texas.	No Effect	Lacks suitable habitat
Clams			
Louisiana Pigtoe	Louisiana pigtoe are freshwater dependent mussels that require mud, sand, and gravel substrate. Few individuals have been found in the freshwater tributaries in the Neches River.	No Effect	Lacks suitable habitat
Texas Heelsplitter	Texas heelsplitters are rare species throughout Texas and Louisiana. There is limited knowledge about that species other than individuals have been found in freshwater Neches River tributaries.	No Effect	Lacks suitable habitat

Species protected solely by NMFS are demarcated with an asterisk (*). Sea turtle jurisdiction is shared jointly by USFWS (inland water and nesting beaches) and NMFS (offshore marine environment).

INTRODUCTION

A supplemental environmental assessment is being drafted which will describe impacts not previously discussed in the 2017 FEIS-Sabine Pass to Galveston Bay, Texas Coastal Storm Risk Management and Ecosystem Restoration Environmental Impact Statement. Deviations from the previous FEIS include:

- Evaluation of impacts to wetlands, the original FEIS assumed no impacts to wetlands due to work being within the existing floodwall and levee alignments. However, changes in levee alignments and new levee additions will have impacts to wetlands not previously discussed and mitigated for.
- Evaluation of impacts to essential fish habitat (EFH) from a 60 feet shift outside of the existing right-of-way in the Sabine Neches Waterway.
- Evaluation of impacts to recently listed species protected under the Endangered Species Act (ESA) including the eastern black rail and including the candidate species, monarch butterfly. Further, changes in migration and stop-over habitat "as well as the extension of the Louisiana experimental population" for the whooping crane have changed the original conclusions of the 2015 biological assessment.

PURPOSE

The purpose and need for this project were due to several major historical surge events along the Texas coast. In the Texas-Louisiana border, Hurricane Rita in 2005 resulted in storm surge of 9.24 feet in Port Arthur, Texas, and just over eight feet in Sabine Pass. Hurricane Ike in 2008 produced storm surges from 14 feet near Sabine Pass with 11 to 12 feet across Sabine Lake. Port Arthur was spared the storm surge thanks to its 14- to 17-foot seawall. However, the remaining southern half of Jefferson County was inundated, with estimated high-water marks reaching 18 to 19 feet to the south and east of High Island. Therefore, the USACE studied and produced a Final Environmental Impact Statement in 2017.

The 2017 EIS evaluated three distinct project areas: Orange-Jefferson Coastal Storm Risk Management (CSRM) Project Area, Port Arthur, and Vicinity (PAV) CSRM, and Freeport and Vicinity CSRM. Due to the significant engineering and technical analysis needed for each CSRM system, the Orange-Jefferson, Port Arthur, and Freeport CSRM were separated prior to the pre-construction, engineering, and design phase (PED).

USACE is currently developing the preconstruction engineering and design (PED) of the Port Arthur and Vicinity CSRM system, construction of the system started with the award of contract 1 in April 2020. This BA and forthcoming SEA will only focus on the changes of impacts within the upcoming segments 2, 3, 4, 5, and 5A (otherwise known as PAV02, PAV 03, PAV04, PAV05, and PAV05A). Segment 5, based on discussion with TCEQ and EPA, was split into 5A to separate construction associated or expected to impact the Star Lake Superfund site. All impacts to the project regarding the Star Lake Superfund site were described in the 2017 EIS, excluding the new levees added in PED. The supplemental environmental assessment will address and describe the new levees. All work will be done in accordance with ER 1165-2-132 HTRW no work will be done until a ‘clean’ site is provided or coordinated with USACE. The project scope includes approximately 12,000 linear feet of flood wall replacement along Port Arthur Canal (stations 860+90 to 873+25) and Sabine Neches Canal (station 183+50 to 1464+94.63), removal of existing flood walls, a 50ft levee raise along the Port Arthur Canal, 2,300 linear feet of earthen levee raises, 500 linear feet of concrete pump station protection on three existing pump stations (Lakeview, Stadium Road, and Del-Mar), improvements on existing gravity drain systems, outfall pipe extensions, erosion protection along the earthen levees, 30,400 linear feet of levee raises, construction of a new pump station, and 17,000 linear feet of new levee construction split into northern, north-east, east, and west levees.

FEDERAL NEXUS

Authorization and funding for the Sabine Pass to Galveston Bay Coastal Storm Risk Management and Ecosystem Restoration Project was accomplished by the Bipartisan Budget Act of 2018, Public Law 115-123 Title IV Corps of Engineers – Civil Department of Army

Construction. This authorization is for necessary expenses to construct, rehabilitate and repair damages caused by natural disasters to USACE projects, and to construct flood and storm damage reduction, including shore protection, for projects that currently have signed Chief's Reports as of the date of enactment.

PROJECT DESCRIPTION

The overall project area is located within portions of Jefferson County and surrounds Port Arthur, TX (figure 1). The action area for the purposed of this supplemental biological assessment includes all of Jefferson County, TX with specific construction within Port Arthur, West-Port Arthur, Groves, Port Acres, Viverbo, Nederland, and Port Neches along with existing HFPP system.

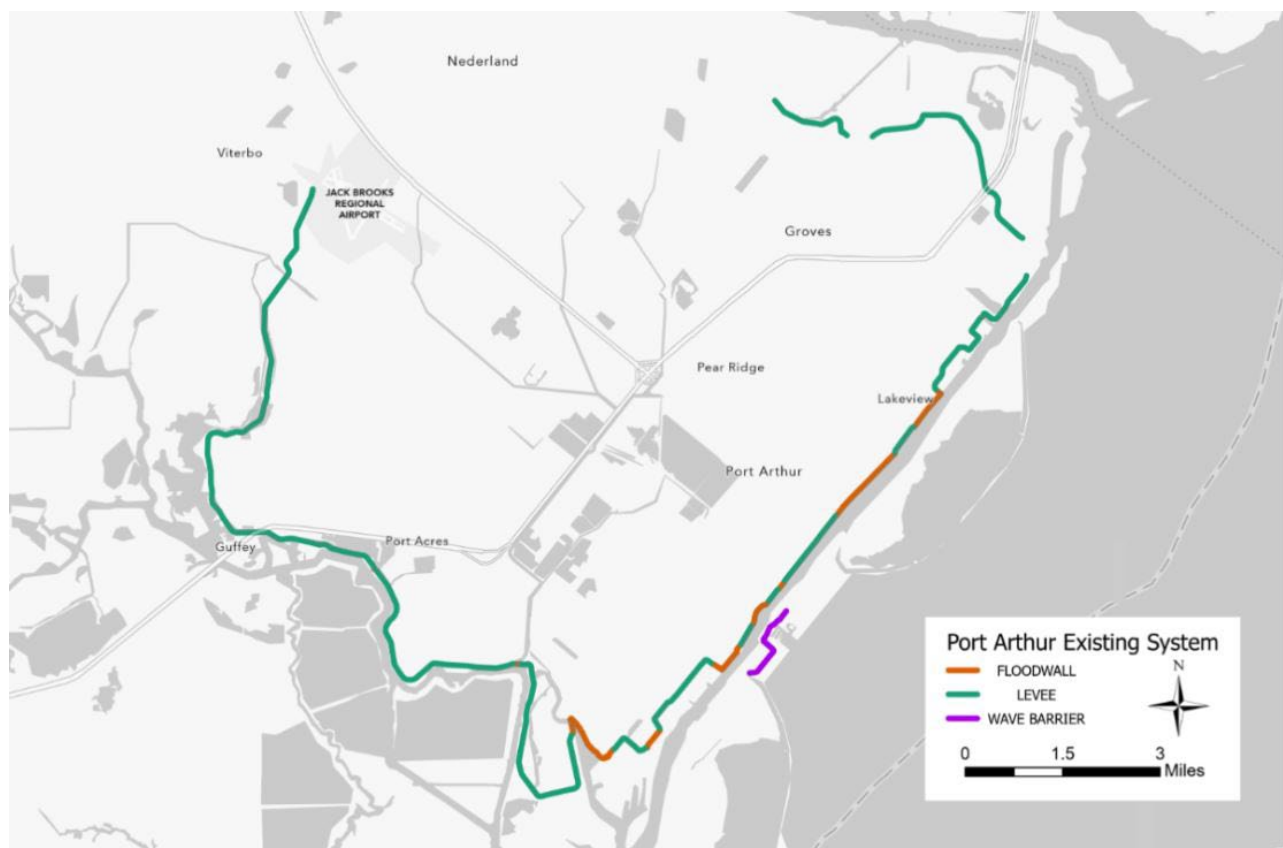


Figure 1-Project Action Area

Action Area Adjacent Sites

While not considered part of the action area, nearby adjacent (15 miles or less) sites include the Sabine Neches Waterway federal channels and placement areas, Big Hill Bayou Wildlife Management Area, Candy Cain Abshier Wildlife Management Area, JD Murphee State Wildlife Management Area, Lower Neches Wildlife Management Area, and Sabine Lake.

2.0 PROJECT DESCRIPTION AND PROPOSED ACTION

2.1 Project Elements

The scope of work includes demolition and replacement of floodwalls to meet current engineering standards, raising of earthen levees to match floodwall elevations, clearing/grubbing project footprints, excavation from commercial borrow sources, installation and replacement of railroad and road closure gates, roadway raises, installation of concrete fronting protection for existing pump stations, construction of a new 3000 CFS pump station including construction of an interior drainage, inlet channel, by-pass structure, outlet structure, modification of existing draining systems along new floodwalls, construction of new three new levees, potential aquatic installation of pile dolphins, potential relocation of an Valero existing road, and erosion protection for levee systems (figure 1).

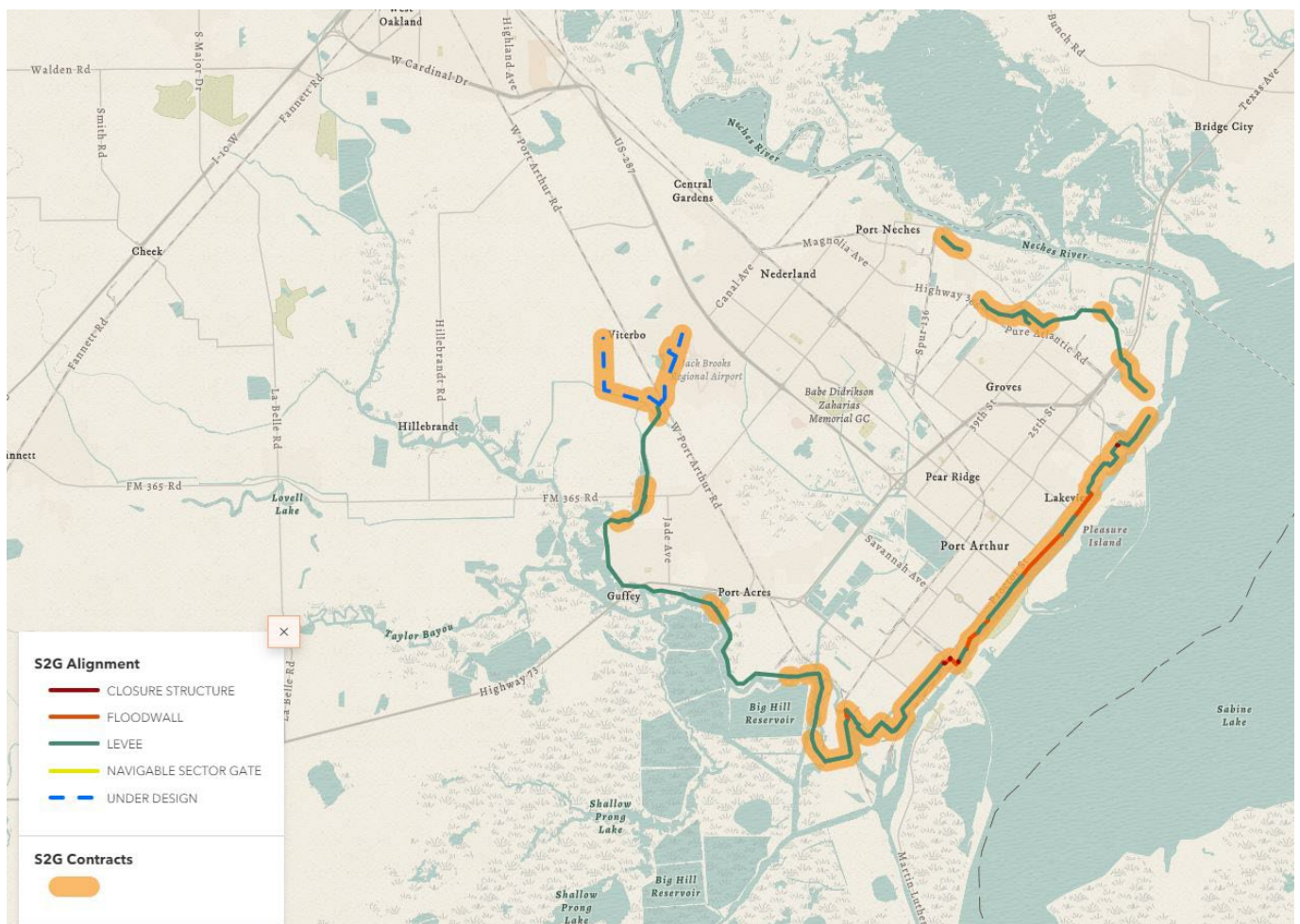


Figure 2-Port Arthur and Vicinity Features

Project Scope by Area

PAV02 will comprise of a 0.1-mile levee raise, 0.2 miles of floodwall replacement and demolition to grade of existing wall, a replacement railroad closure gate, and a roadway raise.

Potential scope items include construction of a new Valero embankment, a new Valero plant road, and concrete dolphin installation within the water in front of the Union Pacific Railway.

PAV03 includes the reconstruction of approximately 3,500 linear feet of existing floodwall and the construction of approximately 1,750 linear feet of new floodwall, fronting protection for 3 pumpstations, raising of an existing levee, 8 road closure structures and 1 railroad closure structure. This construction is taking place within the Valero refinery and connects to PAV02 and PAV03C.

PAV04 will comprise of approximately 10,205 linear feet of new concrete fronting protection on 3 existing pump stations (Lakeview Stadium Road, and Del-Mar) and outfall pipe extensions, 0.4 miles of levee raises, 2 miles of floodwall replacement and demolition of the existing floodwall to grade, modification to 9 gravity drainage systems, and placement of existing riprap on the new floodwall.

PAV05 and 05A will include fronting protection at 1 pump station, approximately 2.2 miles of new earthen levees, 5.4 miles of levee raises, 0.11 miles of floodwall construction, one roadway closure gate, 2 railway closure gates, and 12 levee to floodwall tie ins.

2.1.1 Breakdown of Each Construction Component

Floodwall

There are existing 15ft floodwalls as part of the original Hurricane Flood Protection Project (HFPP) surrounding portions of Jefferson County. A floodwall is a man-made structure designed to shield areas from storm surge and floodwaters. The structure is usually comprised of solid concrete with steel piles and does not allow any passage of water; it is anticipated replacement floodwalls will be constructed with similar material.

The scope of work for the action area includes potential demolition and removal of either all or portions of the existing floodwall through pile and sheet driving to break up the existing concrete of the structure, installation of steel sheet pile to replace the existing structure, subsurface sediment would then be excavated to depth for the concrete wall footing, which is to be cast in place. Excavated areas would be subsequently backfilled and thoroughly compacted. Aquatic construction will include excavation of estuarine bottom to depth for the floodwall footing which is cast in place. Barges and other marine equipment will have spud anchors while working in the water. Typical terrestrial excavation equipment includes excavators, bull dozers, dump trucks, and crawler cranes. Aquatic excavation equipment can include various sizes of clam shell buckets on mechanical dredges or long arm terrestrial crawler cranes. Floodwall construction is anticipated to include clearing, grubbing, and stripping along the planned terrestrial alignments. Further, clearing and grubbing may be expected to remove marsh vegetation along the potential alignments. Cranes would be used to drive piles that will provide structural stability and to drive sheet pile. Existing compacted sheet pile will either be removed or left in place. Floodwall demolition and construction will be done in segments for continued hurricane protection during construction. Formworks would be installed to form the footing and wall stem and reinforcing steel bar would be placed. Concrete mixer trucks would pump concrete to the footing and into

the stem via a concrete boom. Additional earthwork would involve tying the floodwall into adjacent earthen levees and backfilling and compacting around the completed wall. All construction materials for floodwall will be suitable for the marine environment.

In total, up to 2.31 miles of floodwall will impact the terrestrial-marine transitional zone along Jefferson County, TX. Segment 2 (PAV02) includes construction of approximately 0.2 miles of floodwall replacement within Port Arthur Canal and removal of existing floodwall. Segment 4 (PAV04) includes construction of about 2 miles of floodwall replacement along the Sabine Neches Canal (station 183+50 to 1464+94.63), and Segment 5 (PAV05) includes construction of approximately 0.11 miles of replacement flood wall.

Segment 2 (PAV02)

The current floodwall is a solid combi-wall with a T wall/levee tie in which divides the Port Arthur Canal. Northern portions of the canal are a dead-water channel, only influenced by the influx of water from Salt Bayou and rainwater runoff. The southern portions are part of the federal navigation channel in west Port Arthur.

Alignment 1 has construction of the new floodwall along the existing alignment (figure 3). Alignment 2 has a floodwall constructed behind the existing floodwall and Union Pacific railroad bridge but includes installation of dolphin impact barriers in front of the railroad bridge and relocation of a Valero plant road. Alignment 3 has a combination concrete T-wall-levee design tying into the existing wall, crossing the channel bayou, then turning 90 degrees across the railroad with a closure gate and then running parallel to the channel bayou with an earthen levee segment with a 45 degree turn across Highway 87 connecting with the PAV03C alignment.

Alignment 1 was eliminated as it was determined not feasible. Previously, the PDT had six design options but based on coordination with Valero and the Union Pacific railway, only alignments 2 and 3 pursued further design. All designs and alternatives include some disruption of previously undisturbed unconsolidated bottom and/or placement of fill into the waterway. Additionally, a USACE-agency field survey conducted in August 2022, noted behind the existing floodwall, a sheet pile was placed to prevent scouring of the levee and railroad bridge. The containment of water between the existing floodwall and sheetpile has led to the establishment of 0.53 acres of wetlands, further 1 acre of wetlands was found during a joint agency visit in August 2022 along the existing levee, these wetlands were not present at the time of the 2017 EIS; therefore, the forthcoming SEA will evaluate the impact to these wetlands. Mitigation under the Wetland Value Impact Assessment Model will calculate these wetland impacts.

The contractor for PAV02 will continue to utilize adjacent lands for levee and floodwall construction and the contractor will access the site along the existing roadway. Similarly, material from commercial sources will be utilized for all planned construction. Commercial sources will submit proof of compliance under NEPA and testing before being utilized on the federal project.



Figure 3-Port Arthur Segment 2 Alignment 1 (Existing System)

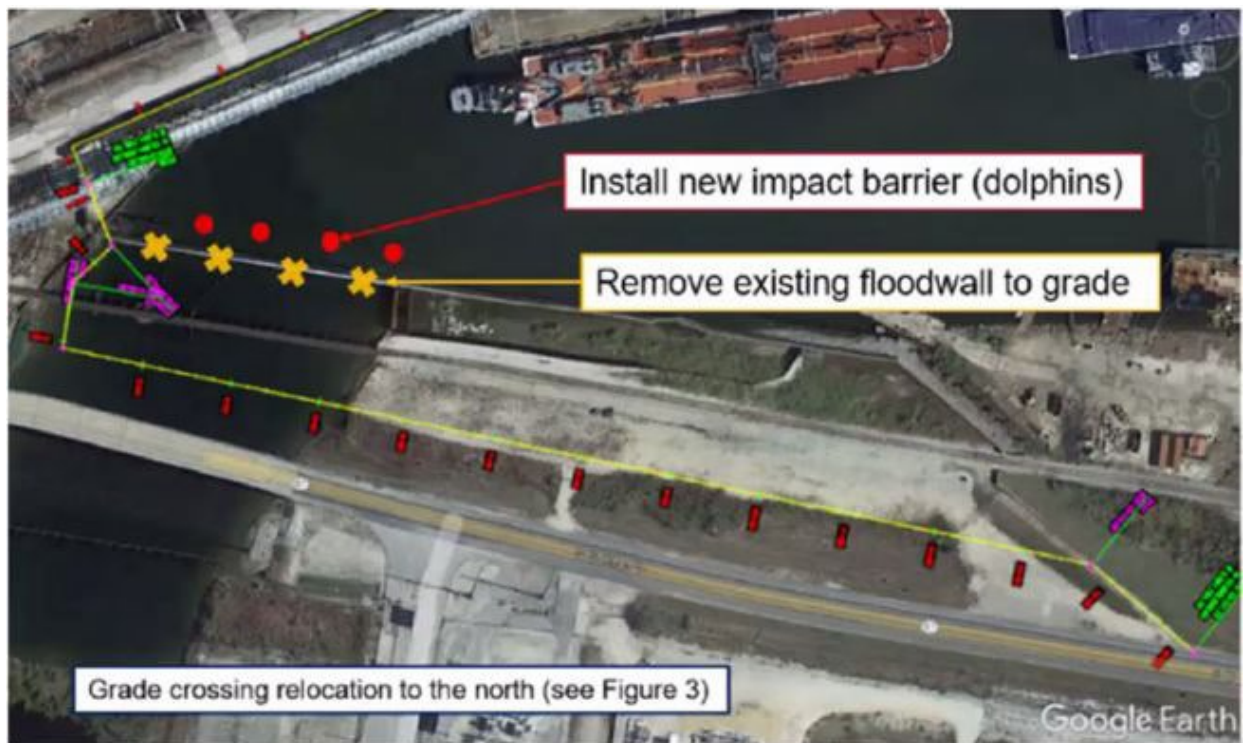


Figure 4-Segment 2 Alignment 2 Design Components

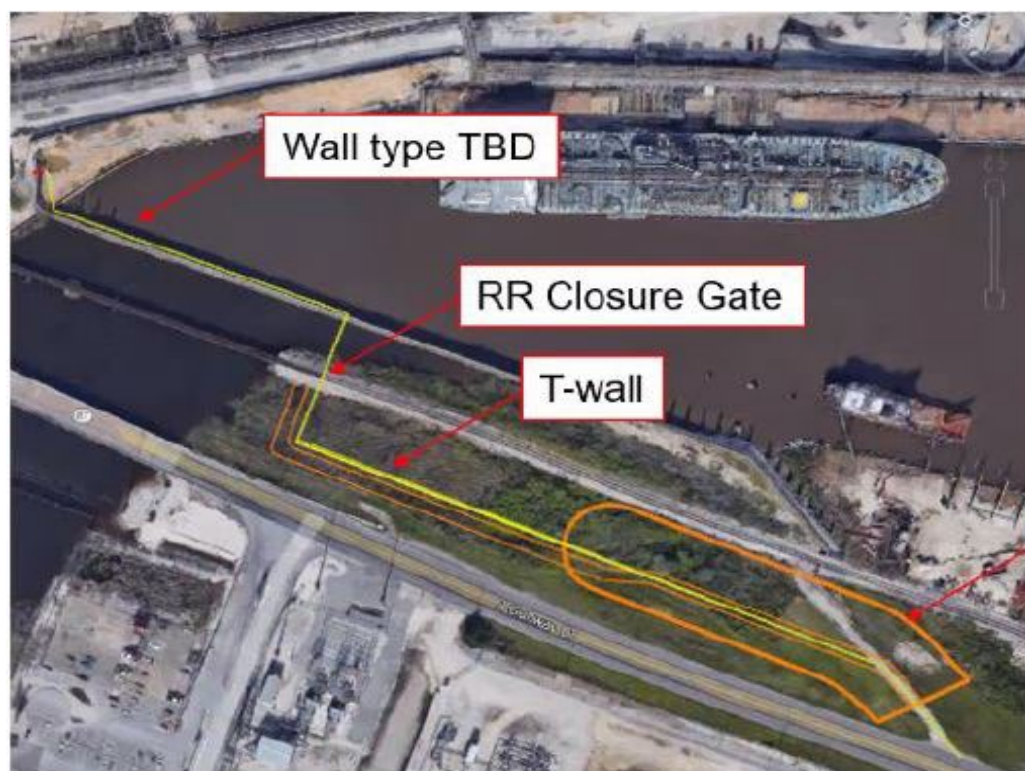


Figure 5-Segment 2 Alignment 3

Segment 3 (PAV03)

Segment PAV03 includes the reconstruction of approximately 3,500 linear feet of existing floodwall and the construction of approximately 1,750 linear feet of new floodwall, 8 road closure structures and 1 railroad closure structure. This construction is taking place within the Valero refinery and connects to PAV02 and PAV03C.

- PAV03A is construction of fronting protection for 3 pumpstations.
- PAV03A.1 is the construction of the levee crossing at HWY 365.
- PAV03B is the raising of approximately 176 linear feet of existing levee, construction of 950 linear feet of new levee, reconstruction of approximately 500 linear feet of floodwall, construction of 1,640 linear feet of new floodwall, construction of 3 road closures, construction of 1 railroad closure and one road raise.
- PAV03C is the raising of approximately 17,200 linear feet of existing levee, construction of 3,306 linear feet of new levee, reconstruction of approximately 5,150 linear feet of existing floodwall, fronting protection for 3 pumpstations, and one road raise.
- PAV03C.1 is Work in Kind construction for approximately 60 linear feet floodwall section at the Motiva tank facility.
- PAV03D is the construction of approximately 640 linear feet of new floodwall, construction of 1 new road closure and construction of 2 railroad closures.

Segment 4 (PAV04)

Segment 4 includes construction of 2 miles of floodwall replacement along the Sabine Neches Waterway. The Sabine Neches Waterway is a deep-water federal channel with depths ranging from -40 to -42ft MLLW. The existing floodwall protects residents within Port Arthur along Seawall Drive, but the new floodwall alignment will shift approximately 60ft towards the flood side (channel side) with construction within the water. Approximately 140ft from the existing floodwall are expected to be temporarily impacted by construction. There are no expected impacts to navigation, coordination has been done with the Sabine Neches Navigation District, U.S. Coast Guard, and Sabine Pilots. Construction equipment will come from existing roadways such as Proctor Street, Lakeshore Drive, and Stadium Road to the project site, riprap from the existing floodwall will be temporarily stored at one of the described staging areas within contract 4 such as Rosehill Park, two previously residential plots along Lake Shore Drive, and Proctor Stret/Main Avenue.

During a joint site survey in March 2023, a rookery has been established within the Proctor/Main Avenue staging area. Therefore, under the Migratory Bird Treaty Act, a season restriction of the site from February to September will be placed in USACE specifications to its contractor. Further, it will be described in the specifications, only the designated staging areas can be utilized during construction or proposed staging areas must be reviewed for compliance under NEPA. Construction equipment and commercial source material will utilize existing roadways and disturbed staging areas during construction. Marine equipment will navigate through the

existing waterway likely on a several large barges and will anchor using a spud anchor. Potential equipment on the barges could include a bucket/crane, and crane excavator, marine vessels will likely be used to move the existing riprap onto the staging areas.

All construction will generate noise, there is no current restriction to minimize noise, however, potentially noise may be restricted to daylight hours due to the proximity to residential properties. Further an increase in total suspended solids will be generated by the anchoring of the spud barges, however, these solids will settle or move due to the high velocity of the channel from ships and due to minimize movement from the construction vessels. A temporary increase in dust due to removal of existing vegetation within the staging areas is expected, however, USACE specifications instruct contractors to wet or water the staging areas to minimize dust production.

The segment is slated to award as a design-build with design estimated to take 365 days from award and construction is not slated to begin until either the contract is constructed or a FONSI describing the project has been issued under the forthcoming supplemental environmental assessment, whichever is achieved first. Construction cannot begin until a signed FONSI is complete. It is assumed the designers, and the construction contractors will be the same, however, USACE contractors have the right to sub-contract work to qualified sub-contractors. All requirements in USACE specifications and plans are applicable and enforced to sub-contractors.

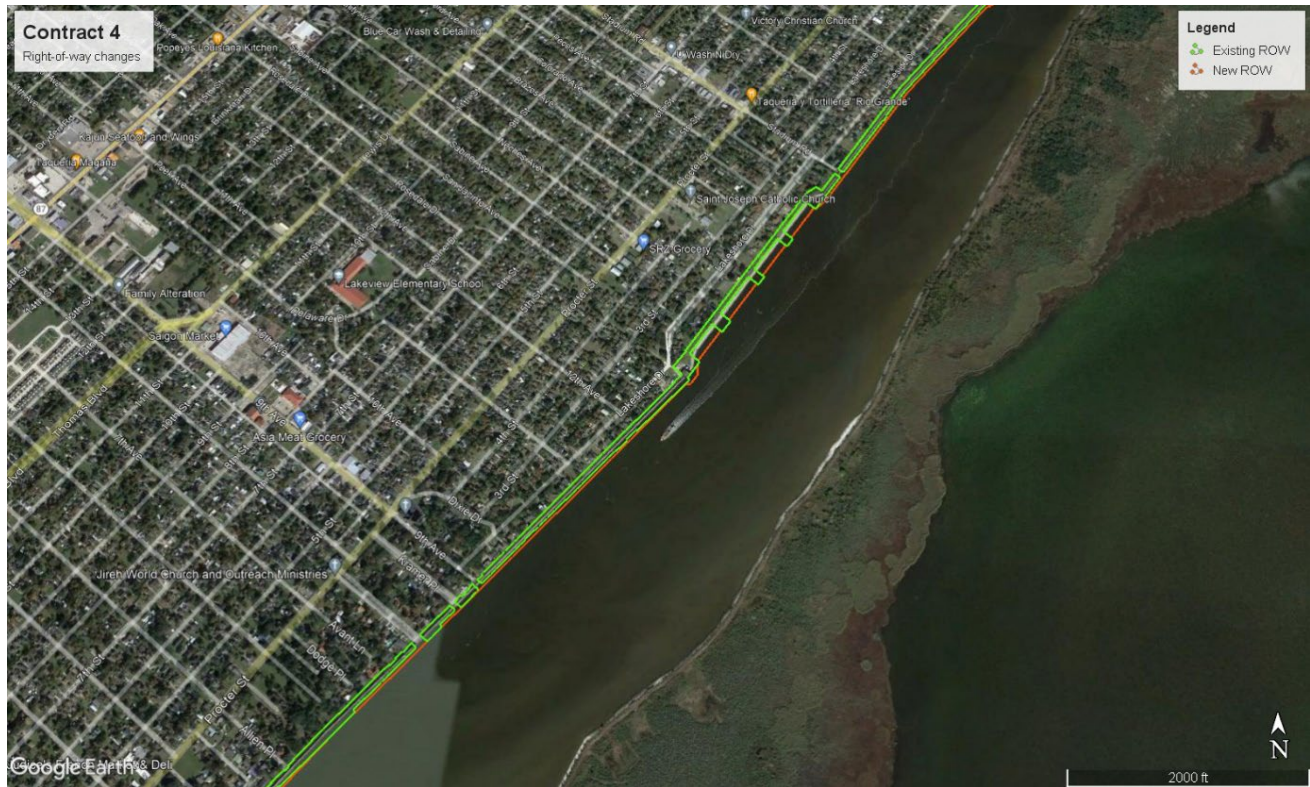


Figure 6-Port Arthur Segment 4 (PAV04) Floodwall Area

Segment 5 (PAV05)

Segment 5 consists of various segmented floodwall replacement totaling 0.11 miles of floodwall construction. All floodwall construction under PAV 05/05A will be done within the existing hurricane flood protection project alignments. No new impacts to environmental resources are expected, all construction will be within described floodwall easements and rights-of-way as described in the 2017 FEIS. Due to the large scale and segmented pieces of contract 5/5A, several disturbed staging areas were proposed and viewed by Texas Parks and Wildlife. No sites will require mitigation since existing wetlands will be avoided and staging will only be on areas that are regularly mowed and maintained by either the NFS or similar entity. These areas are not slated to begin until October 2026, construction of 5 is estimated to take approximately 1-2 years and construction of 5A, pending TCEQ and EPA concurrence will take approximately 1 year to construct. Construction cannot begin until a signed FONSI is complete. It is assumed the designers, and the construction contractors will be the same, however, USACE contractors have the right to sub-contract work to qualified sub-contractors. All requirements in USACE specifications and plans are applicable and enforced to sub-contractors. All construction will generate noise, there is no current restriction to minimize noise. Water-based construction is not expected to occur. A temporary increase in dust due to removal of existing vegetation within the staging areas is expected, however, USACE specifications instruct contractors to wet or water the staging areas to minimize dust production.

Construction Sequencing

1. Mobilization of personnel and equipment to proposed staging areas,
2. Clearing/grubbing/mowing of debris from the planned alignment with 150ft buffer,
3. Demolition and removal of existing wall to grade, excavation within the alignment for stability footing, this work will be tiered to provide continued hurricane protection while construction is ongoing,
4. Installation of concrete and sheet piles within the excavated areas, placement and compactment of material,
5. Reinstalment of any erosion protection features such as riprap,
6. Returning project areas to existing grades/elevations/pre-project conditions

Floodwall Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. It is the contractor's responsibility to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.
- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.

- If construction equipment is over 15 feet tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptibly events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- USACE does not anticipate any impacts to sea turtles, manatees, and giant manta rays while working on floodwall construction. Equipment is slow moving and reasonably healthy individuals will be able to avoid the project area. Turbidity, noise, and avoidance of the area will be resolved when construction is complete.
- USACE does not anticipate any impacts to terrestrial species, sea turtles (both terrestrial and aquatic), whooping crane or eastern black rail. The staging area sites are within residential areas with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

Levee Raises and Improvements

Levee raises and erosion protection includes clearing and grubbing of the planned alignment. Material from the commercial borrow sites are pushed or stacked on top of existing levees to raise the terminal height of the barrier. Equipment such as bulldozers, short and long reach excavators, tractors with pans or discs, skid steer, compactor, barges for access to the site, offroad dump trucks, rough terrain cranes, and welding equipment are all standard tools used for levee raises. Security, turbidity, and flood control temporary barriers may be constructed with metal fencing and selection of TCEQ's BMPs.

Approximately 0.4 miles of earthen levees will be raised to about 21-24 feet within the existing right-of-way as part of PAV04, 0.1 miles of levee will be raised within PAV02, and 2.2 miles as part of PAV05. Totally, 3 miles of levee raise is expected under this supplemental EA.

No new impacts to mitigatable features such as wetlands, coastal prairie, or bottomland hardwoods are expected for levee raises, excluding new levees, all construction will be within existing floodwall easements and rights-of-way as described in the 2017 FEIS.

Existing alignments are in areas that are disturbed and consistently mowed, no diverse vegetation exist on these sites. Noise and dust will be temporarily generated from construction of these levees; however, these items will resolve after construction. Construction also includes seeding of newly constructed levees to reduced erosion and dust; the specifications will include planting of grass seeds after construction. When raises levees, the width of the levee is needed to increase up to 150ft from the existing toes including 15 feet for construction within the right-of-way. Access to these levees will be through existing right of ways and disturbed staging areas. If roads

exist on the current levees, then regrading and repaving will be conducted within the levee alignment; no additional access roads or road work is proposed.

Construction sequencing

1. Mobilization of personnel and equipment to proposed staging areas,
2. Clearing/grubbing/mowing of debris from the planned alignment with 150ft buffer,
3. Placement and compactment of material, and
4. Seeding and turfing of the new levee
5. Returning project areas to existing grades/elevations/preproject conditions.

Levee Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. The contractor will be responsible to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.
- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail, Texas prairie dawn and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.
- If construction equipment is over 15 feet tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid

horizontally on the ground. The equipment will be laid horizontally during low perceptibly events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- USACE does not anticipate any impacts to the terrestrial specie, eastern black rail and whooping crane. The staging area sites are within residential/commercial areas with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

Additional Levees and Levee Features

While updating hydraulic modeling for segments 5 and 5A, a flanking analysis was performed by the USACE engineering research and design center (ERDC) on four new levee alignments, two alternatives for a western levee extension, a northwestern levee extension/gap, and a north middle connection. The Northwest Gap levee is located in Port Neches adjacent to the Neches River and Orange's proposed CSRMS, the levee was described in the 2017 FEIS, however, the levee was 1800 linear feet, and the flanking analysis determined the levee needed to extend approximately 2,500 linear feet parallel to Port Neches Atlantic Road. The conclusions of the EIS remain the same, the levee is located within industrial petrochemical plants Motiva and Indorma, the levee will be along disturbed industrial and residential areas, no impacts to wetlands or sensitive environmental resources are expected, the area is classified as low density urban and invasive species Chinese Tallow forests. Similarly, the north-middle connection levee, a new levee, will be along Atlantic Road, cut through residential properties, and resume along Coke Road, no impacts to wetlands or sensitive biological resources are expected. There will be removal of trees impacting the levee; however, these trees are non-native according to TPWD mapper and are within residential neighborhoods. All trees or vegetation lost will be replanted with saplings bareroot seedlings, if possible.



Figure 7-North-middle-connection



Figure 8-ERDC Flanking New Levees

A western levee extension alternative 1-A, also known as course of action (COA) 1-A was recommended by the project team based on inundation reduction along a major hurricane evacuation route and avoidance of a regional airport and residential neighborhood. COA-2 allows the existing HFPP system along veterbo road and adjacent Jack Rooks Regional Airport, COA-3 impacts the same area as COA1-A but runs parallel to Rhodair Canal, COA-3 is preferred by local landowners. With either COA-1A or COA3 alignments, based on the flanking analysis, a new 0.24-acre pump station, a 4,390 linear feet interior drainage canal, 2,680 liner feet (5.77 acre) inlet channel, 565 linear feet (0.32 acre) outlet structure, and 1-acre bypass structure across Rhodair Canal are required to be constructed adjacent to the proposed alignment to maintain flow. Designs at this time assume flow through the canals will be altered during high flooding events; the canal will flow normally all other times.

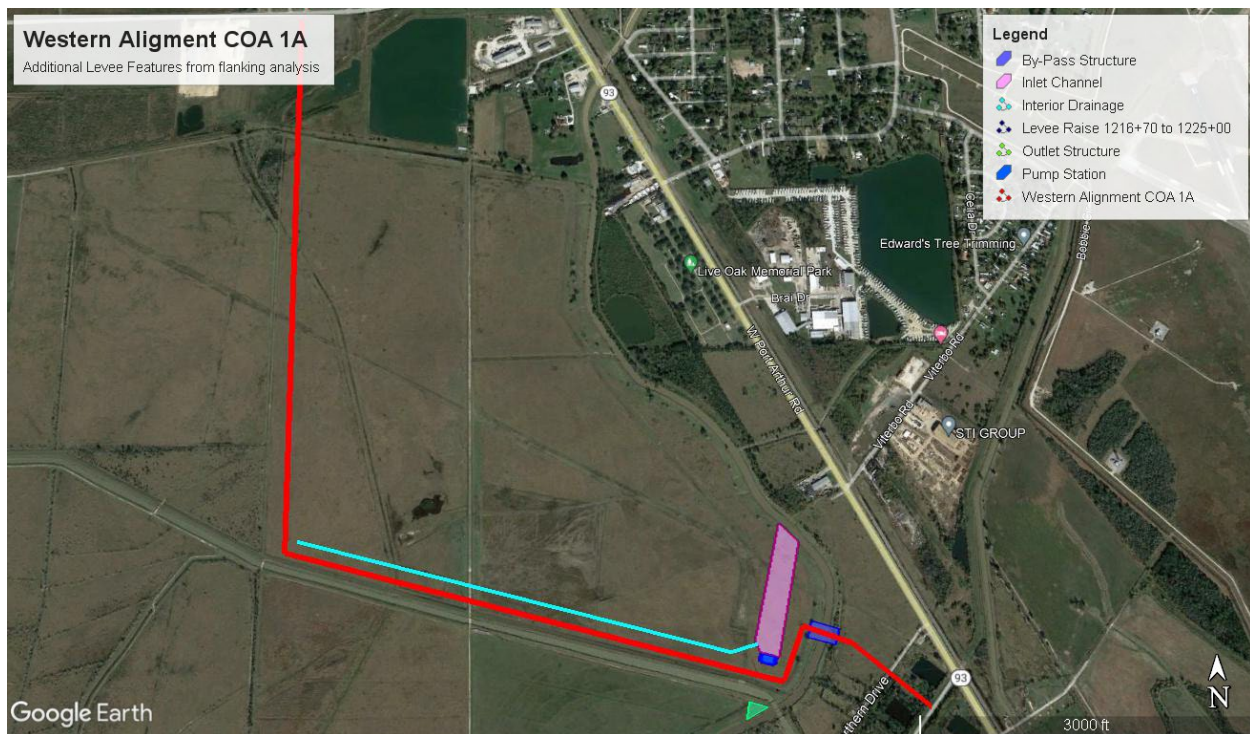


Figure 9-Western Levee Alignment COA 1-A and features

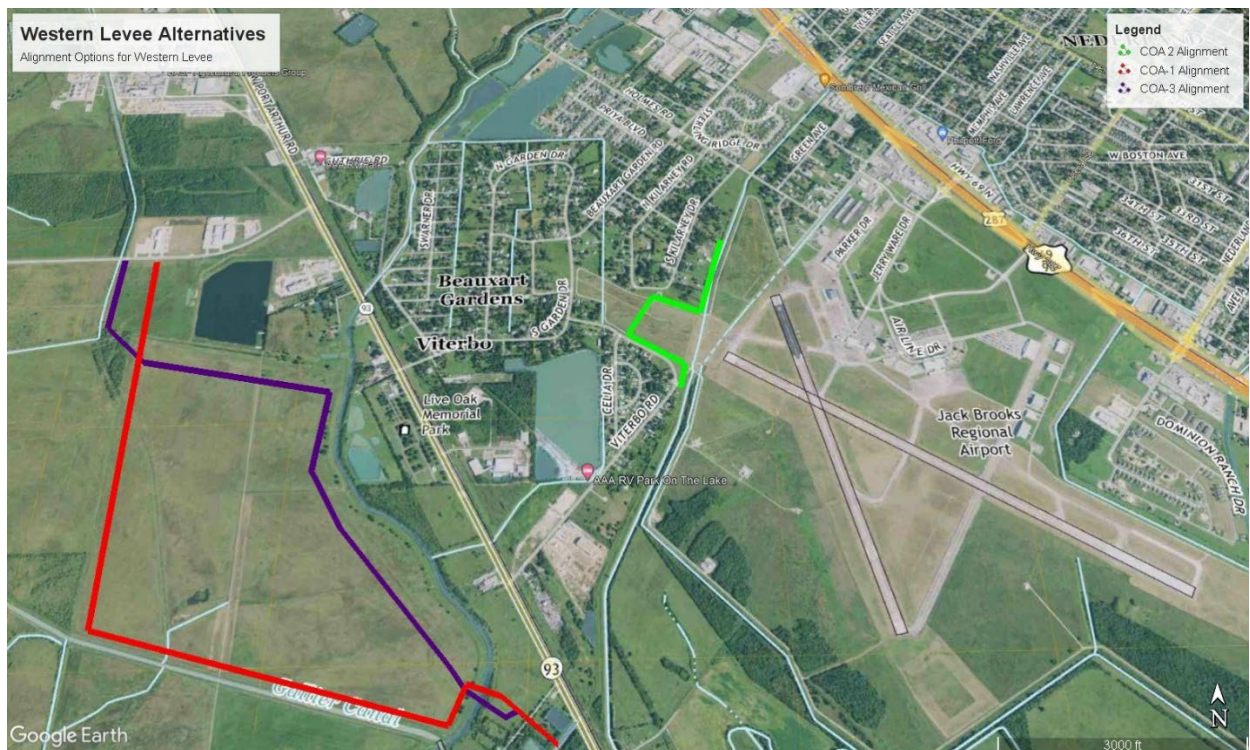


Figure 10-Western Levee Alternatives

Only 10% of the levee was able to be accessed during the March 2023 field visits due a lack of rights-of-entry to the proposed levee, therefore, reference samples were taken in the uppermost parcel of the proposed levee. Based on aerials, prior to the field visit, it was assumed the majority of the alignment was through agricultural/disturbed cattle fields. However, field surveys determined based on hydrology, soils, and vegetation, the uppermost parcel was remnant coastal prairie. Historically, coastal prairie used to be abundant in the Port Arthur and along the Texas coast, however, agricultural rice and crop fields altered soils and hydrology in the ecoregion, only about 1-2% of coastal prairie remains along the Texas coast. Therefore, based on the significance of the ecosystem, mitigation for coastal prairie is required. Either alignments, COA 1-A or COA3 will impact palustrine farmed wetlands and coastal prairie. All alignments will impact freshwater forested wetlands, according to the national wetland inventory, however, based on aerial imagery, freshwater forested wetlands are likely outdated data. All alignments will therefore have mitigation associated with construction.

The lack of rights-of-entry will assume the remaining 90% of the alignment contains coastal prairie, mitigation modeling will assume 47-66 acres of the proposed western levee alignment will have coastal prairie impacts. Acre was determined by design assumptions the levee width from toe to toe will be a maximum of 125' and will taper down to 45', the weighted average comes out to 92' and assumed 15 feet standard right-of-way for construction. Further, this was based on rough drawings of levee features such as a pump station, inlet channel, outlet, interior and drainage. In total, 150ft from the alignment are planned to be impacted by construction and therefore will be included in mitigation.

Table 2-Western Levee Mitigatable Features

Western Levee Alignments	Palustrine-farmed Wetland (acres)	Riverine Wetland (acres)	Coastal Prairie (acres)	Potential Freshwater Forested Wetlands
COA 1-A	24	4	47	13
COA 3	13	4	66	13
COA 2	0	0	0	15

Construction sequencing

6. Mobilization of personnel and equipment to proposed staging areas,
7. Clearing/grubbing/mowing of debris from the planned alignment with 150ft buffer,
8. Placement and compactment of material, and
9. Seeding and turfing of the new levee
10. Returning project areas to existing grades/elevations.

Levee Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. The contractor will be responsible to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.
- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.
- If construction equipment is over 15 ft tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptibly events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- Excluding the western levee, USACE does not anticipate any impacts to the terrestrial specie, eastern black rail. The staging area sites are within residential/commercial areas

with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

Endangered Species Language to be included in the USACE Contract for the western levee extension

A. Whooping Crane

The following conservation measures would be implemented during construction of the western alignment and minimize the potential for adverse effect to whooping crane:

- A biological monitor qualified to identify Whooping Cranes (that has completed training requirements previously identified) and stop work authority will be present when any construction work is being done in the action area if the work is performed during the non-essential whooping crane population breeding/nesting season (January through June) or the non-essential and wild whooping crane population's wintering season (October 1 through April 15).
- The biological monitor will stop construction work immediately upon discovery of any Whooping Cranes (alive, injured, or dead). The Texas Coastal Ecological Service's Office should be contacted immediately at 281-286-8282; in addition to Mary (Sandra) Lee (Service Species Lead) at Sandra.Lee@fws.gov, Trey Barron (TPWD) at Trey.Barron@tpwd.texas.gov, and Eva Szyszkoski (Louisiana Wildlife and Fisheries Department) at ESzyszkoski@wlf.la.gov, or by phone at 337-536-9596.
- A 1,000 foot-radius of the work site must be delineated before work begins. If a whooping crane is observed within the 1,000-foot radius, the biological monitor shall halt construction activities, including shutting down any running equipment until the bird has vacated the radius of the work area.
- If construction equipment is over 15 feet tall, the equipment must be marked with visual flagging as bird avoidance measures when equipment is in use and laid horizontally on the ground when not in use.
- Workers, temporary or permanent, should be educated on the importance and protection allocated to this species, including but not limited to not collecting feathers or eggs, and not touching or harassing this species.
- Project activity will be limited to daylight hours to the maximum extent possible. If nighttime work is required, aim lighting at work zone and turn off when not needed. All permanent lighting should be pointed away from adjacent piping plover critical habitat, down shielded, and follow the International Dark-Sky Association (<https://www.darksky.org/>) or Bird City Texas (<https://tpwd.texas.gov/wildlife/birding/bird-city-texas>) guidelines.

B. Eastern Black Rail

The following conservation measures would be implemented on the western levee alignment COA 1-A or COA 3 (or similar alignment proposed within the same location) to minimize the potential for adverse direct effects during construction to Eastern Black Rail:

- Pre-Construction and construction disturbance activities within the action area will be prohibited during Eastern Black Rail post-breeding molt periods when they are unable to fly, and nesting/chick rearing periods between July 1 and September 30.
- If construction cannot be prohibited during this critical time period, vegetation clearing will be restricted to not removing all suitable BLRA habitat (dense emergent vegetation) between July 1 through September 30. When vegetation is removed, all vegetation will not be removed in one day and only from areas within the marked or flagged sections of the construction corridors so that a pathway remains open for the birds to escape. Pockets of suitable eastern black rail habitat (refugia) encompassing 10 feet by 20 feet will remain uncleared and/or a biological monitor will ensure dense herbaceous covered pathways are maintained into unaffected areas. The refugia remaining within the project area may be cleared after two days, as needed after the biological monitor verifies no occupancy within these refugia.
- Proposed construction and work easement corridors through suitable BLRA habitat will be marked with biodegradable flagging or posts, and all suitable habitat within a 100-foot buffer from these boundary markers will be surveyed by approved biological monitor prior to any clearing activities.
- A biological monitor qualified to identify Eastern Black Rail (has completed training requirements previously identified) and with stop work authority will be on site while construction is in progress. The biological monitor will stop construction work immediately upon discovery of any Eastern Black Rail (alive, injured, or dead). The Texas Coastal Ecological Service's Office should be contacted immediately at 281-286-8282 and the species lead Mary (Sandra) Lee at 361-225-7316
- The biological monitor will ensure a sufficiently slow pace of all equipment moving through potential suitable habitat to allow birds to escape ahead of equipment or dredge material placement activities. This secretive species will run to escape oncoming disturbance and are not likely to fly to avoid collisions with equipment or materials being deposited within the project area.
- Workers, temporary or permanent, should be educated on the importance and protection allocated to this species, including but not limited to not collecting feathers or eggs, not disturbing nests, and not touching or harassing this species.
- Efforts to mitigate noise and vibration will be implemented within and adjacent to Eastern Black Rail suitable habitat including planning and performing work outside of peak breeding call times (e.g., one hour before and after dawn and one hour before and after dusk).
- Project activity will be limited to daylight hours to the maximum extent possible. If nighttime work is required, aim lighting at work zone and turn off when not needed. All permanent lighting should be pointed away from potential Eastern Black Rail suitable habitat, down shielded, and follow the International Dark-Sky Association (<https://www.darksky.org/>) or Bird City Texas (<https://tpwd.texas.gov/wildlife/birding/bird-city-texas>) guidelines.

C. General Endangered Species

The following conservation measures would be implemented on the western levee alignment COA 1-A or COA 3 (or similar alignment proposed within the same location) to minimize the potential for adverse direct effects during construction to both whooping crane and eastern black rail:

- The Corps and other project proponents will ensure the crew chiefs, crews, supervisors, and biological monitor(s) attend training prior to initiation of, or their participation in project construction activities.
- A qualified biologist will conduct this training, and the scope of training will include:
 - Recognition of Eastern Black Rail and Whooping Cranes, and their habitats.
 - Avoidance and minimization measures to be implemented during construction.
 - Reporting criteria.
 - Contact information for different rescue agencies in the area; by use of wildlife monitoring checklists coordinated with the Service prior to construction.
- Training will include a half-day training session coordinated with the Service on bird identification. Documentation of this training, including a list of attendees will be submitted to the Service prior to the start of construction activity, and as new members are trained.
- A trained or qualified biological monitor will inspect the active work areas prior to the start of work every day for Eastern Black Rail or Whooping Cranes.
- Biological monitor's qualifications will be submitted to Service prior to start of each construction project.
- The Corps will provide the Service with the name of a single point of contact (POC) responsible for communicating with the crew and biological monitor(s) and reporting on endangered species issues during project construction.
- The biological monitor(s) will be on site to ensure Eastern Black Rail and Whooping Cranes are not affected by construction activities.
- Prior to start of work each day, the biological monitor(s) will inspect the project area's existing wetlands, adjacent to and along work areas before work begins each morning.
- Biological monitor(s) will communicate all activities to the POC and the POC will coordinate that information with the Corps and Service as required.
- Prior to start of work each day, all contractors, and work crews will attend a brief training on recognition of Eastern Black Rail and Whooping Cranes, and their habitats, and be updated on the previous day's encounters with these species, if any have occurred, and any observations of nesting or injured wildlife (including other migratory birds or colonial waterbirds).
- The POC and/or biological monitor(s) will be on site to ensure Eastern Black Rail or Whooping Cranes are not affected by construction activities. The POC and/or monitors will ensure that nesting Eastern Black Rail or foraging or nesting Whooping Cranes are not in the project area prior to initiation of construction activities every morning.
- Construction workers will immediately notify the POC and/or monitor(s) if Eastern Black Rail or Whooping Cranes are observed in the immediate or active work area.
- If Eastern Black Rail are found within 100 feet of the work area, all work will be stopped until the bird(s) leaves the construction site. If Whooping Cranes are found within 1,000 feet of the work area, all work will be stopped until the bird(s) leaves the construction

site. In addition, all personnel will be vacated from the site and all equipment be powered off and remain until the bird(s) leave the area. Bird(s) must not be herded away or harassed into leaving the area. If the bird(s) do not relocate (e.g., injured bird(s)) the POC will contact the Service to solicit additional guidance.

Floodwall Drainage Systems

The existing floodwalls have nine drainage systems such as outfall pipes to remove excess water from areas behind the floodwall or to direct water into drainage ditches or underground storm water sewers. The replacement floodwall shall have an extended outfall pipes and pipe flaps to create positive flow into drainage ditches or prevent backflow of excess sea water under normal conditions. An estimated nine existing outfall structures will be improved under PAV04. No drainage improvements are expected under PAV02 or PAV05/PAV05A. No new drainage features are proposed only improvements such as longer pipes, or larger diameter pipes are proposed.

At each of the nine-gravity drainage outfall structures, the existing headwall and inlet on the discharge side will be converted into an inlet-manhole combination. New flexible pipe will be installed with a raised rib non-metallic gasket from the converted manhole to a new flanged gate valve. The flanged gate valve will be connected to new wall pipe at the new floodwall. A new stainless-steel flap gate will be installed to the new wall pipe and penetrate through the new floodwall. The drainage pipes will be the same size as the existing pipes. A flexible plastic pipe segment will be installed to absorb movement in the new floodwall. At wall penetrations, the pipe will be ductile iron and connected to the flexible plastic pipe using restrained transition couplings at the new wall side. A raised rib non-metallic gasket will be used to secure and seal the new flexible pipe to the converted manhole. For backflow prevention into the existing drainage system, a passive automatic stainless-steel flap gate will be mounted to the flood side of the new floodwall, and a gate valve, designed to be opened and closed by the operator, will be installed on the land side of the new floodwall. The existing flap gate becomes redundant and will be removed to reduce future maintenance costs.

Outfall Id	Project Baseline Approx. STA.	Size/Type	Street
D-1	414+12	30-Inch Cast Iron Pipe with Flap gate	Stadium Road
D-2	441+75	16-Inch Concrete Pipe with Flap Gate	13th Avenue
D-3	454+43	24-Inch Concrete Pipe with Cast Iron Flap Gate	11th Avenue
D-4	465+24	12-Inch Cast Iron Flap Gate and 8-Inch Thimble	North of 9th Avenue
D-5	467+93	48-Inch Concrete Pipe with Cast Iron Flap Gate	9th Avenue
D-6	472+47	21-Inch Concrete Pipe with Cast Iron Flap Gate	North of Dryden Place
D-7	478+09	30-Inch Concrete Pipe with Cast Iron Flap Gate	Avant Lane
D-8	487+53	30-Inch Concrete Pipe with Cast Iron Flap Gate	North of Allen Place
D-9	500+97	18-Inch and 24-Inch Concrete Pipes with Cast Iron Flap Gates	South of 3rd Avenue

Figure 11-Existing Drainage Outfalls to be Modified

Borrow Material

Material for all construction efforts will come from commercial borrow sources only. The USACE contractor will be required to submit proof of compliance under NEPA and testing of the material to the USACE-environmental team prior to utilization on any portion of the federal project. Contractor access to the sites will be along already established roadways, no impacts to endangered species or environmental resources are expected.

Railroad and Road Closure Gates and Roadway Raises

A total of three closure gates will be replaced; two roadway gates under PAV05 and one railroad gate under PAV02. Additionally, construction can potentially include one roadway construction and one roadway closure under PAV02 if alignment 2 is selected (figure 11). PAV02 will include a road raise regardless of if either alignment is selected. An alignment recommendation from the design team is expected in April 2023, however, there is no timeline for District selection due to extensive coordination with Valero and Union Pacific.

Closure Gates

Existing railroad swing gates along Port Arthur will be replaced within the railroad. There will be no changes to the gates other than their location for either alignment, all gates will require structural stability that is to be provided by the new floodwall. However, if alignment 2 is selected, then a new Valero plant road will be constructed (Figure 11 (red line) and the existing road closed (blue line)) due to TXDOT's requirements for visibility when crossing a railway. The new road will be in a disturbed and industrialized area, no impacts to natural resources or endangered species are expected.



Figure 12-Valero Road Replacement

Road Raises

Raising the highway and a structural flood gate system were two alternatives considered. A flood gate system will consist of transition sheet piles, T walls and either a swing or a roller gate system. The transition from levee to T wall requires concrete slope paving and the T Wall will include piles, sheet piles, concrete structures on both side of the road opening, and a gate monolith foundation at the road crossing. The flood gate requires regular maintenance. A road raise involves less maintenance and flood fighting operations compared to a flood gate system and the capital costs for a flood gate system will be more than a road raise. Additionally, SH 87 is the primary access way and commuter thoroughfare south of Port Arthur for communities such as Sabine Pass. A road allows open access to the community during hurricane operations while a flood gate bars access. Therefore, a road raise was chosen for the design. By implementing TXDOT's design criteria for the raised crest elevation of the proposed levee, the limits of the road reconstruction are approximately 150 ft south of the bridge over Taylors Bayou to 1,770 ft south of the bridge for an approximate roadway reconstruction length of 1,620 ft or 0.307 miles.

Railroad and Road Closure Gates and Roadway Raises Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. The contractor will be responsible to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.

- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.
- If construction equipment is over 15 ft tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptible events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- USACE does not anticipate any impacts to the terrestrial species, eastern black rail. The staging area sites are within residential/commercial areas with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

Erosion and Fronting Protection

An estimated 2 miles of riprap is proposed to be placed along existing HFPP levees. Large riprap stones will be placed linearly along the existing levee revetment. The stones will be placed at a

slope with cranes, contract staging areas will store excess stones while construction of the floodwall is ongoing. Similarly, staging areas will be utilized by the contractor for the equipment not in use and storage for excess rock. All staging areas will be within disturbed urbanized areas, no impacts to wetlands, natural resources, or endangered species are expected.

Fronting protection features will include installation of T-walls adjacent to the replacement floodwall and existing pump stations. Construction includes pile driving of either steel piles, or concrete slab stem walls. Piles are hammered into sediment through either vibration, hydraulic rams, or diesel-powered rams. Depending on the location for the piling, the hammers may be on barges with cranes adjacent to the floodwall. Approximately 500 linear feet of concrete walls will be installed in front of existing pump stations along the Sabine Neches Waterway: Lakeview, Stadium Road, and Del Mar pump stations as part of PAV04. The fronting protection will protect the existing pump stations and new floodwall from hurricane generated debris, vessel strikes, and match elevations along the replacement floodwall. Aside from temporary noise and dust generated from construction, no permanent impacts to terrestrial resources are expected. All access to the sites will either be through the waterway or through existing roadways. All staging areas will be within disturbed urbanized areas, no permanent impacts to wetlands, natural resources, or endangered species are expected. Temporary impacts will be noise and dust generated from construction.

Erosion Protection Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. The contractor will be responsible to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.
- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.

- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.
- If construction equipment is over 15 ft tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptible events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- USACE does not anticipate any impacts to the terrestrial species, eastern black rail. The staging area sites are within residential/commercial areas with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

Contract Staging Areas and Access

Two potential staging areas are proposed for PAV02 near the proposed alignment. Access to these sites will be through existing roadways and dirt roads. Two potential staging areas are proposed for PAV04 near the proposed alignment. Access to these sites will be through existing roadways and dirt roads. If Proctor Street staging is used, it will be restricted from February to September of any calendar year to reduce impacts under the Migratory Bird Treaty Act (MBTA) due to the established rookery. Six potential staging areas are proposed for PAV05 and PAV05A, these sites were verified with TPWD to contain low quality habitat, these habitats were modeled using the Meadowlark HEP model. Staging areas around PAV05 and PAV05A were selected because they contain disturbed or existing concrete areas that can be utilized by the USACE contractor. All potential impacts to wetlands or sensitive resources will be avoided through the use of contract CADD drawings in the awarded plans.

Staging Areas Best Management Practices

- The contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan. The contractor will be responsible to procure the project's storm water pollution plan with TCEQ.
- The contractor will be staying within outlined contract plans, any sensitive resources will be marked and avoided.
- Work cannot begin until a signed FONSI has been issued.

- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- Site material and planned alignments will be coordinated with the State Historical Preservation Office (SHPO) under the National Historic Preservation Act.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for daily communicating and reporting endangered species issues throughout the construction period.
- If construction equipment is over 15 ft tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptible events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.

Monitoring and Adaptive Management for Mitigation and Endangered Species Management

- All monitoring and adaptive management for mitigation will follow the Supplemental Environmental Assessment's monitoring and adaptive management plan or conservation bank depending on how mitigation is fulfilled in coordination with the resource agencies.
- USACE does not anticipate any impacts to the terrestrial species, eastern black rail. The staging area sites are within residential/commercial areas with consistent mowing, access to and from the site is through residential and commercial properties, there are no biological resources the species could utilize. Any vegetation taller than knee-height will be avoided within the staging area.

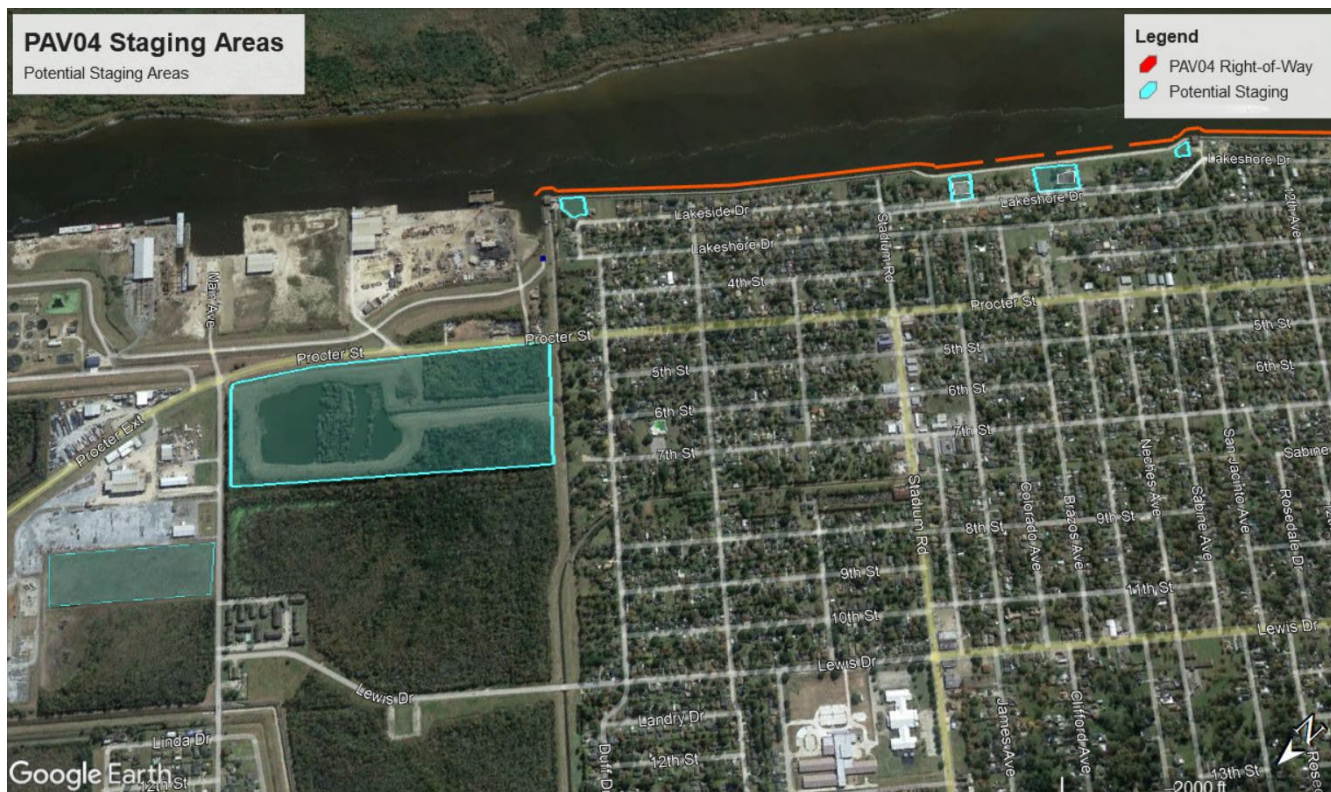


Figure 14-PAV04 Staging

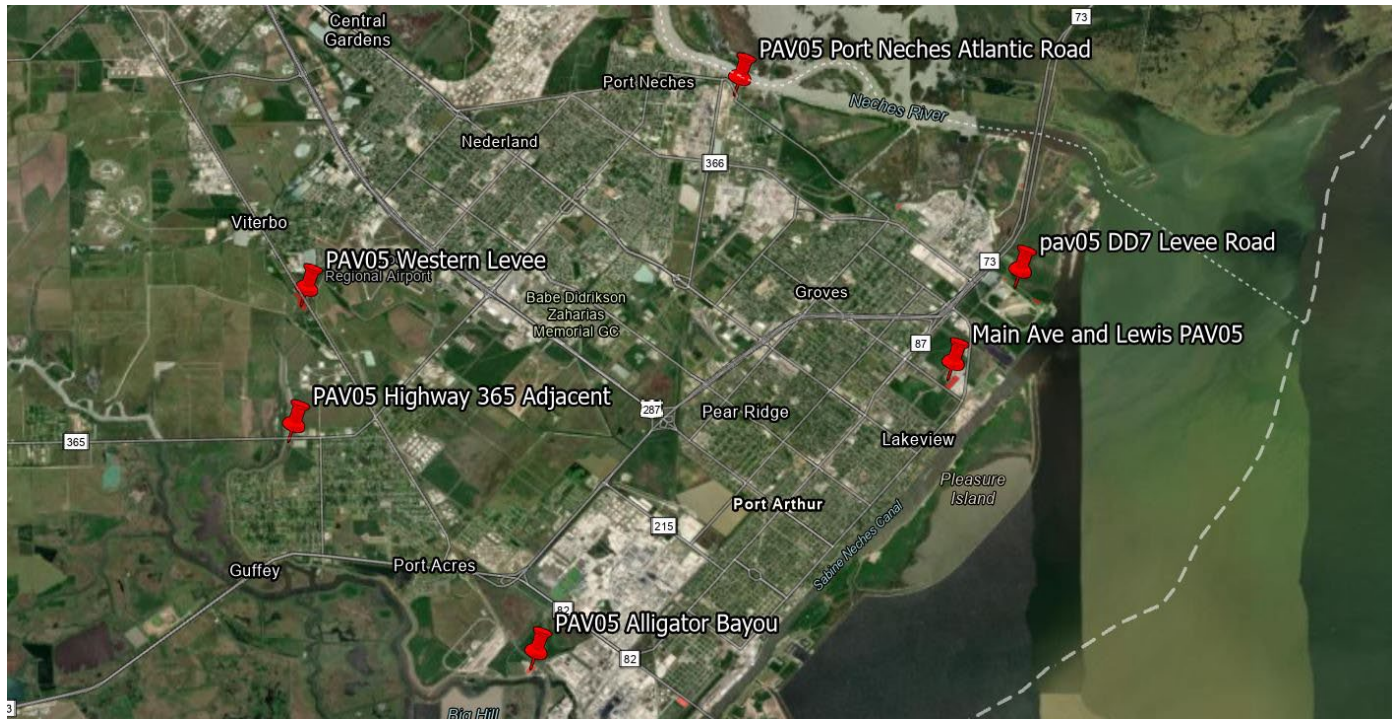


Figure 15-PAV05 and PAV05 Staging

2.1.2 Proposed Changes to Facility/Study Area

The original FEIS determined there would be no impacts to wetlands with construction of the PAV CSR system because it would be within the existing disturbed levee and floodwall alignments. However, during PED, it was determined portions of the CSR system needed to be adjacent or have additional features outside of the existing alignment. These features have not been evaluated by the resource agencies or public for their impact on environmental and human resources. Therefore, a supplemental NEPA document, in the form of an environmental assessment is being conducted.



Figure 16-Deviations from Feasibility and FEIS

Lastly under the Endangered Species Act, recently listed, proposed, and candidate species were not considered under the 2017 FEIS (2015 biological assessment) by both managing agencies USFWS and NMFS. Therefore, updated compliance is needed for this federal project. Further, new information on the whooping crane has changed the conclusions of the previous 2015 biological assessments in the action area. This biological assessment is a continuation for updated compliance for this project.

2.1.3 Operation and Maintenance (post construction actions)

USACE policy is to design to withstand 50 years after project completion, therefore, it can be assumed maintenance intensity and regularity will increase as the structure reaches the targeted terminal. Probable maintenance activities can reasonably be assumed to be levee repair, levee raises, pump station protection repair, floodwall and outfall repair/replacement, and replacement erosion protection such as riprap. Under the proposed Operations and Maintenance Manual, the NFS will assume responsibility of maintenance of the project and its facilities.

2.2 Project Area, Action Area, and Setting

The project area encompasses the existing HFPP surrounding cities within Jefferson County such as Port Arthur, Groves, Nederland, portions of Viterbo, and adjacent to Port Neches. The project is at the most northern tip of Texas with the Sabine Neches Waterway dividing Texas and Louisiana. The action area will follow the existing HFPP with deviations such as construction of three new levees and new floodwall alignments (figure 12). For the purposes of this BA, the action area will be features of PAV02, PAV03, PAV04, PAV05, and PAV05A as part of the overall CSRMS system. The project area lies within the Gulf Prairie and Marsh ecological region, which extends along the Texas Gulf Coast from the Sabine River south to the Rio Grande. The prominent features of this coastal ecosystem include tidal, micro-tidal, and freshwater coastal marshes; bays and lagoons which support extensive seagrass beds, tidal flats, and reef complexes; barrier islands; tallgrass prairie with small depressional wetlands, and forest riparian corridors, oak mottes and coastal woodlots, and dense brush habitats. Wetland habitats provide important wintering and migration stopover habitat for migratory birds including Central Flyway waterfowl, shorebirds, wading birds, and marsh and waterbirds. A string of refuges and wildlife management areas (WMAs) along the coast serve as critical staging areas for waterfowl migrating to and from Mexico.

2.2.1 Existing Land Use in Action Area

The action area surrounds the city of Port Arthur, Texas, and surrounding cities within Jefferson County along the Sabine Neches Waterway. Most of the action area is highly disturbed and is fragmented due to human urbanization and agriculture that surround the action area.

2.2.1 Existing Protected Lands or Trust Resources in Area

McFaddin National Wildlife Refuge (NWR) covers about 58,861 acres in Jefferson and Chambers Counties. Along with the J.D. Murphree WMA, it protects the largest expanse of remaining freshwater marsh on the Texas Coast and thousands of acres of intermediate marsh. The Refuge's southern boundary consists of over 15 miles of Gulf of Mexico shoreline. Remnant dune/beach systems exist along the coastline, although much has been lost through erosion and shoreline retreat, leaving only a low-lying wash over terrace.

J.D. Murphree Wildlife Management Area (WMA) comprises 24,498 acres of fresh, intermediate, and brackish marsh on the Chenier plain in Jefferson County. Extending north and south of the GIWW west of the Sabine-Neches Waterway, the WMA is highly diverse in coastal wetland communities. Texas Point NWR in Jefferson County encompasses 8,952 acres of fresh to saline marshes and some wooded uplands and prairie ridges. The Refuge's southern boundary consists of over 6 miles of Gulf of Mexico shoreline. The Chenier plain is characterized by relict beach fronts that form ridges paralleling the Gulf shore. The term derives from the French name for live oak trees (*chenier*), which typically are found growing atop these ridges.

The project area will not directly impact McFaddin National Wildlife Refuge, J.D. Murphree WMA, or Texas Point National Wildlife Refuge. The southernmost portion of the action area is approximately 7 miles from the tip of the NWRs. However, an indirect effect of construction of the Port Arthur CSRMS is the continued shielding from storm inundation to the JD Murphy Wildlife Management Area and Big Hill Bayou Wildlife Management Area.

2.2.3 Existing Water Resources in Action Area

The Sabine Neches Waterway encompasses the project area as well as diversions into bayous such as Taylor, Cows, and Adams Bayou. Additionally, the waterway diverts into the Neches River terminating at Port of Beaumont and Sabine River into Port of Orange.

2.3 Consultation History

The species evaluated in this report were identified via informal discussion with the USFWS Texas Coastal Ecological Services Field Office (TCESFO) (consultation history shown below) and the USFWS Information for Planning and Consultation (IPaC) system website (USFWS 2022). The IPaC-generated list is included as Attachment B. USACE's evaluation of the potential for listed species to occur in the vicinity of the action area was based on: (1) documented occurrences; (2) existing information on species distribution; and (3) qualitative comparisons of the habitat requirements of each species with vegetation communities or (4) landscape features assumed within the action area. Potential effects to these species resulting from construction of the proposed action were evaluated based on reasonably foreseeable project-related activities.

In addition to this BA, the 2017 Feasibility Study included coordination with USFWS and Texas Parks and Wildlife Department (TPWD).

- September 2015: A BA was submitted to USFWS determining “No Effect” on piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), whooping crane (*Grus americana*), the West Indian manatee (*Trichechus manatus*), four whale species (fin, humpback, sei, and sperm), four sea turtle species (green [*Chelonia mydas*], Kemp's ridley [*Lepidochelys kempi*], loggerhead [*Caretta caretta*], leatherback [*Dermochelys coriacea*] and hawksbill [*Eretmochelys imbricata*]), and four coral species (lobed star [*Orbicella annularis*], mountainous star [*Orbicella faveolate*], boulder star [*Orbicella franksi*], and elkhorn coral [*Acropora palmata*]). As well as “No Effect” on the following Candidate species: Sprague's pipit (*Anthus spragueii*), and two freshwater mussel species (smooth pimpleback [*Quadrula houstonensis*] and Texas fawnsfoot [*Truncilla macrodon*]).

Due to the change in PED, new species, and known scientific information for the whooping crane, USACE has reinitiated consultation with USFWS to meet the requirements of the ESA.

- December 1, 2022: PAV02, PAV04, and PAV05 was created in IPaC using the action area boundaries. An official species list was requested and returned from the TCESFO (2023-0020411) (Attachment B).
- March 20, 2023: IPAC boundaries were edited based on new alignments provided in PED.
- TBD: An informal consultation request was submitted to the TCESFO. A “May Effect, Not Likely to Adversely Affect” determination was made for eastern black rail, a small

population of whooping cranes along PAV CSRMS's western levee extension alignments.

2.4 Conservation Measures

2.4.1 Measures to Be Implemented Prior to Project Construction

Prior to construction, the impacts from projects PAV02, PAV03, PAV04, PAV05, PAV05A will be coordinated with NEPA under a supplemental environmental assessment. The NEPA process include implementation of any terms and conditions and reasonable prudent measures if a biological opinion is issued as well as evaluation of any recommendations from the 2017 FWCAR. Agreed upon BMPs and feasibly CAR recommendations will be implemented into the contract specifications for direction of the government contractor.

2.4.2 Measures to Be Implemented During Project Construction

All guidance collected from environmental laws and regulation as part of the NEPA process will be addressed and upheld within the contract specifications including submission of any deliverables.

2.4.3 Post-Project Site Restoration and Monitoring

Based on the conclusions of the supplement EA and its' mitigation plan, any site restoration and monitoring will be conducted in accordance with agreements between USACE, the resource agencies, and feedback by the public under the NEPA process.

Any operations and maintenance will be the responsibility of the non-federal sponsor, DD7. The USACE and DD7 will implement requirements within the NEPA document into the O&M agreements.

All monitoring will follow the 2017 Monitoring and Adaptive Management Plan (MAMP) and the SEA's mitigation plan.

2.4.4 Adaptive Management Plans

Similar to mitigation plans, based on the conclusions of the supplemental EA and its' adaptive management plans, if applicable, will be conducted in accordance with agreements between USACE, resource agencies, and the public.

3.0 SPECIES AND CRITICAL HABITAT

The USFWS IPaC identified 15 threatened or endangered species of concern for the action area (USFWS 2022 and NMFS 2022). Additionally, the IPaC states that no designated critical habitat is present in the action area (USFWS 2022). Table 1 identifies the evaluated species, scientific name, jurisdiction, and status of each species.

3.1 Species Potentially Occurring in the Action Area

Table 3-Species Potentially Occurring in Action Area

Species	Scientific Name	Jurisdiction	Status
Birds			
Eastern Black Rail	<i>Laterallus jamaicensis jamaicensis</i>	USFWS	Threatened
Piping Plover	<i>Charadrius melodus</i>	USFWS	Threatened
Red Knot	<i>Calidris canutus rufa</i>	USFWS	Threatened
Whooping Crane	<i>Grus americana</i>	USFWS	Endangered
Tricolored Bat	<i>Perimyotis subflavus</i>	USFWS	Endangered
Reptiles			
Green Sea Turtle	<i>Chelonia mydas</i>	USFWS	Threatened
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	USFWS	Endangered
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	USFWS	Endangered
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	USFWS	Endangered
Loggerhead Sea Turtle	<i>Caretta caretta</i>	USFWS	Threatened
Alligator Snapping Turtles	<i>Macrochelys temminckii</i>	USFWS	Proposed Threatened
Mammals			
West Indian Manatee	<i>Trichechus manatus</i>	USFWS	Threatened
Sperm whale*	<i>Physeter macrocephalus</i>	NMFS	Endangered
Rice's Whale*	<i>Balaenoptera ricei</i>	NMFS	Endangered
Fish			
Oceanic Whitetip Shark*	<i>Carcharhinus longimanus</i>	NMFS	Threatened
Giant Manta Ray*	<i>Manta birostris</i>	NMFS	Threatened
Insects			
Monarch butterfly	<i>Danaus plexippus</i>	USFWS	Candidate
Plants			
Texas Prairie Dawn	<i>Hymenoxys texana</i>	USFWS	Endangered
Clams			
Louisiana Pigtoe	<i>Pleurobema riddellii</i>	USFWS	Proposed Threatened
Texas Heelsplitter	<i>Potamilus amphichaenus</i>	USFWS	Proposed Endangered

NLAA = not likely to adversely affect; LAA= likely to adversely affect. Species protected solely by the National Marine Fisheries Service (NMFS) are demarcated with an asterisk (*). Sea turtle jurisdiction is shared jointly by USFWS (inland water and nesting beaches) and NMFS (offshore marine environment).

3.2 Species Eliminated from the Analysis

During the review, it was found that 13 federally listed species would not be affected by the proposed action and, thus, were eliminated from further consideration because no suitable habitat exists, or the Action Area is outside of their known range(s). Because each of these species have no potential to occur in the Action Area, only a brief description of the species range and habitat was provided to document consideration (Table 2).

Table 4-Species Eliminated from the Analysis

Species	Habitat Association	Effect Determination	Effects Analysis
Birds			
Piping Plover	Along the Texas coast, piping plover use beaches, mudflats, sandflats, dunes, and offshore emergent wetland placement areas.	No Effect	Lacks suitable habitat
Red Knot	Along the Texas coast, red knots forage on beaches, oyster reefs, and exposed bay bottoms and roost on high sand flats, reefs, and other sites protected from high tides.	No Effect	Lacks suitable habitat
Tricolored Bat	Roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees.	No Effect	Lacks suitable habitat
Reptiles			
Green Sea Turtle	Primarily uses shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and seagrasses.	No Effect	Lacks suitable habitat
Hawksbill Sea Turtle	Generally, inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they occur at depths of less than 70 feet.	No Effect	Lacks suitable habitat
Kemp's Ridley Sea Turtle	Inhabit shallow coastal and estuarine waters, usually over sand or mud bottoms.	No Effect	Lacks suitable habitat
Leatherback Sea Turtle	Mainly pelagic, inhabiting the open ocean. Found in coastal waters during nesting. Typically nests on beaches with a deep-water approach in Malaysia, Mexico, French Guiana, Suriname, Costa Rica, and Trinidad	No Effect	Lacks suitable habitat
Loggerhead Sea Turtle	Occur in open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers.	No Effect	Lacks suitable habitat
Alligator Snapping Turtle	Found in deeper water of large rivers and their major tributaries, selecting structure over open water and sites with greater canopy cover.	No Effect	Lacks suitable habitat
Mammals			
West Indian Manatee	Marine, brackish, and freshwater systems in coastal and riverine areas with preference near the shore featuring underwater vegetation like seagrass & eelgrass.	NLAA	Lacks suitable habitat

Species	Habitat Association	Effect Determination	Effects Analysis
Sperm whale*	Prefer steep depth gradients, along the shelf break (2,300 – 3,280 feet) and deeper oceanic waters.	No Effect	Lacks suitable habitat
Rice's Whale*	Restricted to a very narrow depth corridor along the shelf break in the northeastern Gulf of Mexico.	No Effect	Lacks suitable habitat
Fish			
Oceanic Whitetip Shark*	Reside in tropical and subtropical seas worldwide in the pelagic ocean, generally offshore, on the outer continental shelf, or around oceanic islands in water depths greater than 604 feet.	No Effect	Lacks suitable habitat
Giant Manta Ray*	Prefer offshore environments in the Gulf of Mexico. Manta rays are rarely seen in Texas bays and estuaries. They can occur in waters from 0 ft to 4,000 ft, this behavior is most likely due to prey availability	No Effect	Lacks suitable habitat
Insects			
Monarch butterfly	Monarchs need healthy and abundant milkweed embedded within diverse nectaring habitat. Many monarchs use a variety of roosting trees along the fall migration route. Although monarch butterfly can occur within the project areas, they will not be affected by construction due to the lack of milkweed presence and unlikelihood of milkweed to occur in the PAV CSRMS sites due to the severe degradation of habitat by invasive species.	No Effect	Lacks suitable habitat
Plants			
Texas Prairie Dawn	Primarily found in sandy loam complexes, the species is predominantly found in pockets of Harris County and Fort Bend County, TX. No known distributions of the species are found in this area of Texas.	No Effect	Lacks suitable habitat
Clams			
Louisiana Pigtoe	Louisiana pigtoe are freshwater dependent mussels that require mud, sand, and gravel substrate. Few individuals have been found in the freshwater tributaries in the Neches River.	No Effect	Lacks suitable habitat
Texas Heelsplitter	Texas heelsplitters are rare species throughout Texas and Louisiana. There is limited knowledge about that species other than individuals have been found in freshwater Neches River tributaries.	No Effect	Lacks suitable habitat

Species protected solely by NMFS are demarcated with an asterisk (*). Sea turtle jurisdiction is shared jointly by USFWS (inland water and nesting beaches) and NMFS (offshore marine environment).

WHOOPING CRANE

The whooping crane (*Grus americana*) was Federally listed as endangered on March 11, 1967 (32 FR 4001). The whooping crane is the tallest North American bird with males approaching 1.5 meters in height, its snowy white with black primary feathers on the wings, and a bare red face and crown. Whooping cranes form monogamous pairs for life and all whooping cranes return to the same breeding territory in Wood Buffalo National Park, in Canada to nest in late April or May. Whooping cranes return to wintering grounds of Aransas National Wildlife Refuge (NWR) by late October to mid-November where they migrate singly, in pairs, in family groups or in small flocks and remain until March or April.

Whooping cranes are omnivorous and forage by probing and gleaning foods from soil, water, and vegetation. Summer foods include dragonflies, damselflies, other aquatic insects, crayfish, clams, snails, grasshoppers, cricket, frogs, mice, voles, small birds, minnows, reptiles, and berries. During the winter in Texas, they eat a wide variety of plant and animal foods, with blue crabs, clams, and berries; Carolina wolfberry (*Lycium carolinianum*) being predominant in the diet. Foods taken at upland sites include acorns, snails, crayfish, and insects. Waste grains, such as barley and wheat, form an important part of the diet during the spring and fall migrations. The whooping crane was federally listed as endangered on March 11, 1967 (32 FR 4001). Critical habitat has been designated in Aransas, Calhoun, and Refugio counties in Texas, and includes the Aransas National Wildlife Refuge. However, several Texas counties have been labelled as potential habitat.

The main factors for the decline of the whooping crane were loss of habitat to agriculture (hay, pastureland, and grain production), human disturbance of nesting areas, uncontrolled hunting, specimen and egg collection, collisions with power lines, fences, and other structures, loss and degradation of migration stopover habitat, disease such as avian cholera, predation, lead poisoning, and loss of genetic diversity. Biological factors, such as delayed sexual maturity and small clutch size, prevent rapid population recovery. Drought during the breeding season presents serious hazards to the species.

Whooping cranes were originally found throughout most of North America. In the nineteenth century, the main breeding area was from the Northwest Territories to the prairie provinces in Canada, and the northern prairie states to Illinois. Only four populations of whooping cranes exist in the wild, the largest of which is the Aransas-Wood Buffalo population, which breeds in isolated marshy areas of Wood Buffalo National Park in Canada's Northwest Territories. Each fall, the entire population of whooping cranes from this national park migrates some 2,600 miles (4,183 kilometers) primarily to the Aransas NWR and adjacent areas of the central Texas coast in Aransas, Calhoun, and Refugio counties, where it overwinters in oak savannahs, salt marshes, and bays. During migration they use various stopover areas in western Canada and the American Midwest. The three other wild populations have been introduced: an eastern population that migrates between Wisconsin and Florida and two non-migratory populations, one in central Florida, the other in Louisiana.

The natural wild population of whooping cranes spends its winters at Aransas NWR, Matagorda Island, Isla San Jose, portions of Lamar Peninsula, and Welder Point on the east side of San Antonio Bay. The main stopover points in Texas for migrating birds are in the central and eastern Panhandle (USFWS 1995). USFWS reintroduced a non-essential experimental population (NEP) to Vermillion Parish in southwestern Louisiana in 2011. The reintroduced population was designated as NEP under section 10(j) of the ESA of 1973, as amended. A NEP population is a reintroduced population believed not to be essential for the survival of the species, but important for its full recovery and eventual removal from the endangered and threatened list. Since 2011, 10-16 hatched juveniles have been released annually at White Lake Wetlands Conservation Area, and in 2016 a new release area was added 19 miles to the south at Rockefeller Wildlife Refuge. The maximum size of the non-migratory Louisiana population in 2021 was 72 individuals (36 males, 33 females, and 3 unknown) with 66 birds in Louisiana, five in Texas, and one in Oklahoma (Louisiana Department of Wildlife and Fisheries, 2021). The NEP is approximately 90 miles from the action area.

Nesting habitat in northern Canada is in poorly drained regions of freshwater marshes and wet prairies interspersed with numerous potholes and narrow-wooded ridges. Whooping cranes use a variety of habitats during migration, including freshwater marshes, wet prairies, inland lakes, small farm ponds, upland grain fields, and riverine systems. Shallow flooded palustrine wetlands and riverine habitats, such as submerged sandbars, are used for roosting, while croplands and emergent wetlands are used for feeding. The principal winter habitat in Texas is brackish bays, marshes, and salt flats, although whooping cranes sometimes feed in upland sites characterized by oak mottes, grassland swales, and ponds on gently rolling sandy soils (Lewis 1995; Campbell 2003; CWS and USFWS 2007). Members of the NEP population are known to use typical marsh habitat along with rice and crawfish fields year-round in Orange County and a nesting pair has been documented in Jefferson and Chambers County.

EASTERN BLACK RAIL

The eastern black rail is a secretive marsh birds and one of the least understood species in North America. The sparrow-sized bird with slate gray plumage and red eyes lives in remote wetlands of the Midwest and along the coasts of the Atlantic and Pacific oceans and the Gulf of Mexico. Because it only comes out at night, prefers to walk hidden in tall grasses instead of fly and rarely makes a call, very little is known about its behavior and habitat needs.

Not much is known about the subspecies diet, but they are possibly opportunistic foragers. Their bill shape suggests generalized feeding methods such as gleaning or pecking at individual items, thus a reliance on sight for finding food. Examination of specimens collected indicates a diet of small aquatic and terrestrial invertebrates, as well as small seeds. Foraging most likely occurs on or near the edges of stands of emerging vegetation -- both above and below the high-water line.

The eastern black rail was listed as threatened on October 8, 2020, with a Section 4(d) Rule (FR 63764). No critical habitat has been designated for the species. The Section 4(d) Rule allows the Service to establish prohibitions or exceptions to prohibitions for threatened species while

providing for the conservation of a threatened species by allowing flexibility under ESA. None of the 4(d) Rule prohibitions or exceptions to prohibitions apply to this project.

The primary threats to eastern black rail are: (1) habitat fragmentation and conversion, resulting in the loss of wetland habitats across the range; (2) sea level rise and tidal flooding; (3) land management practices (i.e., incompatible fire management practices, grazing, and haying/mowing/other mechanical treatment activities); and (4) stochastic events (e.g., extreme flooding, hurricanes). Human disturbance, such as birders using excessive playback calls of black rail vocalizations, is also a concern for the species. Additional stressors to the species include oil and chemical spills and environmental contaminants; disease, specifically West Nile virus; and predation and altered food webs resulting from invasive species introductions (fire ants, feral pigs, nutria, mongoose, and exotic reptiles).

The eastern black rail has a broad but poorly known breeding range that includes the Atlantic and Gulf Coasts of North America, parts of Colorado, Oklahoma and the mid-west, the West Indies including Cuba, Jamaica and historically Puerto Rico and parts of Central America from Mexico through Panama (Watts, 2016). A total of 1,937 occurrence records were found between 1836 and 2016. Credible evidence of occurrence was found for 21 of the 23 states including 174 counties, parishes, and independent cities and 308 named properties. Based on breeding evidence and seasonality of occurrence, 34 (19%) counties were classified as confirmed, 97 (56%) as probable breeding and 43 (25%) as possible breeding. Many of the named properties are well-known conservation lands including 46 (15%) national wildlife refuges, 44 (14%) state wildlife management areas, 26 (8%) state and municipal parks and many named lands managed by non-governmental conservation organizations.

Since 2010, 247 black rail occurrences have been recorded within 11 of the 23 states in the potential range of the species. Records were found for 53 counties, parishes, and independent cities (Figure 7). Based on breeding evidence and seasonality of occurrence, 2 (4%) counties were classified as confirmed, 35 (66%) as probable breeding and 16 (30%) as possible breeding. Records were found for 92 named properties including 2 (3%) properties classified as confirmed, 73 (79%) as probable breeding and 17 (18%) properties classified as possible breeding.

The eastern black rail is a wetland dependent bird requiring dense overhead cover and soils that are moist to saturated (occasionally dry) and interspersed with or adjacent to very shallow water (typically \leq three centimeters [cm]) to support its resource needs (Watts 2016). Eastern black rail occurs across an elevational gradient that lies between lower and wetter portions of the marsh and their contiguous uplands. Their location across this gradient may vary depending on the hydrologic conditions. These habitat gradients have gentle slopes so that wetlands can have large areas of shallow inundation (sheet water). These wetlands can shrink and expand based on hydrologic conditions and thus provide dependable foraging habitat across the wetted areas and wetland-upland transition zone for the subspecies. Eastern black rail also requires adjacent higher elevation areas (i.e., the wetland-upland transition zone) with dense cover to survive high water events due to the propensity of juvenile and adult black rails to walk and run rather than fly and chicks' inability to fly (USFWS, 2019).

The subspecies requires dense vegetation that allows movement underneath the canopy, and because they are found in a variety of salt, brackish, and freshwater wetland habitats that can be tidally or non-tidally influenced, plant structure is considered more important than plant species composition in predicting habitat suitability (Watts 2016). In terms of nest success, nests must be well hidden in a dense clump of vegetation over moist soil or shallow water to provide shelter from the elements and protection from predators. Flooding is a frequent cause of nest failure; therefore, water levels must be lower than nests during egg-laying and incubation for nests to be successful. In addition, shallow pools that are one to three cm deep may be the most optimal for foraging and for chick-rearing (USFWS 2019).

Texas is a black rail crossroad making it difficult to differentiate breeders from winter residents from migrants (Watts 2016). Black rail in Texas habit tidal salt marshes along the barrier islands and the mainland fringe, as well as drier coastal prairie. The upper Texas coast (Jefferson, Chambers, Galveston, Harris, and Brazoria counties) has a long history of black rail records that are concentrated within national wildlife refuges and state wildlife management areas. Much of the black rail activity along the upper Texas coast has been concentrated on the Bolivar Peninsula and Brazoria, Anahuac and San Bernard National Wildlife Refuges.

TEXAS HEELSPLITTER

The Texas heelsplitter (*Potamilus amphichaenus*) occurs in freshwater tributaries in the Sabine River of Texas and Louisiana and the Neches and Trinity Rivers in Texas (TPWD, 1995). Since 1898 only about 150 individuals have been identified and documented making the species a rare find. The only live specimen that have been collected have been strictly from the Sabine River, but some remnants have been found in the Trinity River (TPWD, 1995). The species has a thin, smooth, elliptical tan-brown or black ombre shell approximately 7 inches in length (USFWS, 2023). The species does exhibit sexual dimorphism with the females having rounder posterior margins while males are pointed (USFWS, 2023). Little is known about the species but the largest threats to the species are suspected to be pollution, riverbed scouring, excess siltation, and freshwater impoundments.

4.0 Assessment of Listed Species and Critical Habitat in the Action Area

4.1 Potential Habitat to Recently Listed Federal Species in the Action Area

The 2017 EIS evaluated the effects of the PAV CSRM system to listed threatened and endangered species (appendix J). This BA is an update to the existing BA and includes impact analysis to newly listed species, wetlands not previously considered, and expansion of the action area in PED.

4.2 EASTERN BLACK RAIL

The project area is within the known range of the eastern black rail. There are no e-Bird records of species occurrence in the action area, however, periodic sightings have been made in nearby

areas such as Wallisville Lake. USACE identified patches of wetlands in a portion of the action area during desk top surveys.

Western Levee Extension

Approximately 24 acres of palustrine farm, 13 acres of freshwater forested, and 4 acres riverine wetlands lie along the COA 1-A western levee extension alignment (NWI, 2023) (figure 13). Similarly, based on desktop sources, COA 3 contains 13 acres palustrine farmed, and 4 acres of riverine wetlands. Similarly, 13 acres freshwater forested are suspected within the planned alignment, however, based on aerial imagery it looks to be highly unlikely. Field surveys when able will validate desktop data and mitigation needs. Both alignments are located within privately owned pasture and are expected to have impacts to coastal prairie. Based on the planned levee dimensions, features, and TPWD mapper data, COA 1-A will impact 47 acres while COA3 will impact 66 acres. COA 2 lies within residential disturbed areas adjacent to a regional airport, only impacts to 15 acres of freshwater forested wetlands are expected, if these wetlands are present.

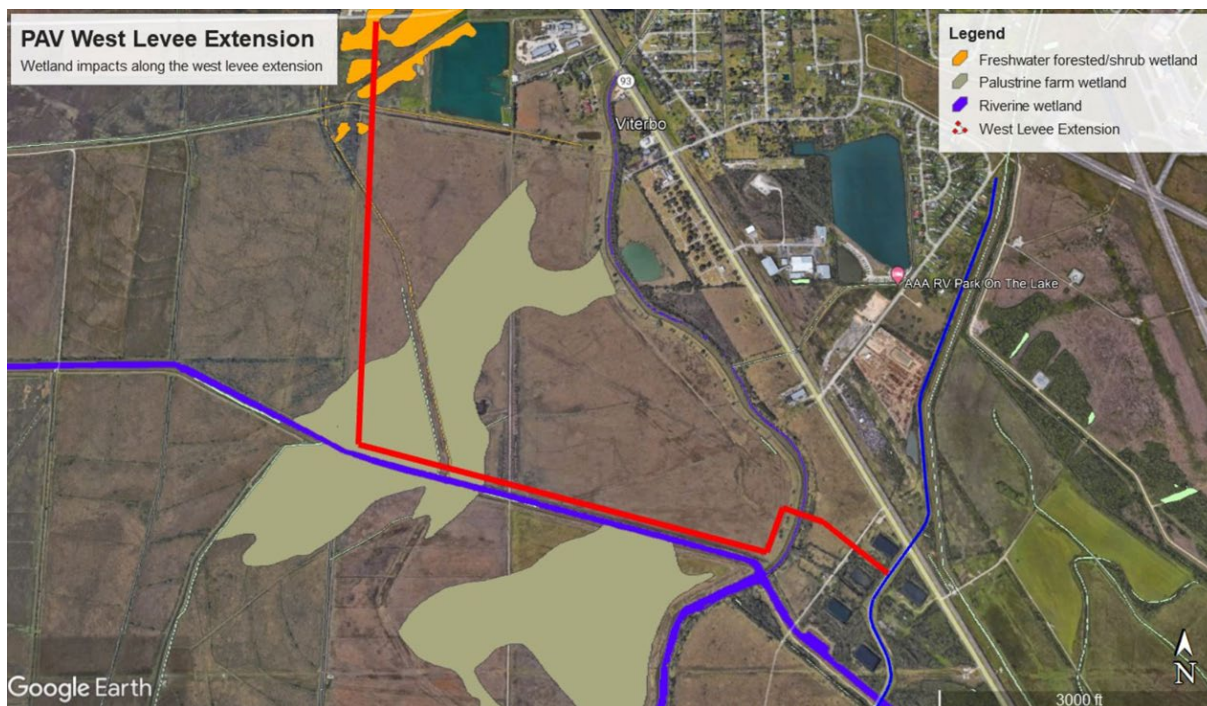


Figure 17-COA1-A's Western Levee Extension NWI Wetlands

The 13 acres of historical freshwater forested wetlands lie primarily within privately owned land, field verification was able to be performed at the northern-most terminal in March 2023. During the field visit, no freshwater forested wetlands were observed, however, coastal prairie was. However, due to an extensive delay in real estate acquisition, the remainder of the wetlands and TPWD mapped coastal prairie were not able to be surveyed. A portion of the western levee extension is classified as agricultural row crops according to the TPWD ecological mapper with

portions classified as coastal prairie, 3m pine plantation, and non-native invasive Chinese tallow forest. Only portions of the alignment are classified as coastal prairie (figure 14).

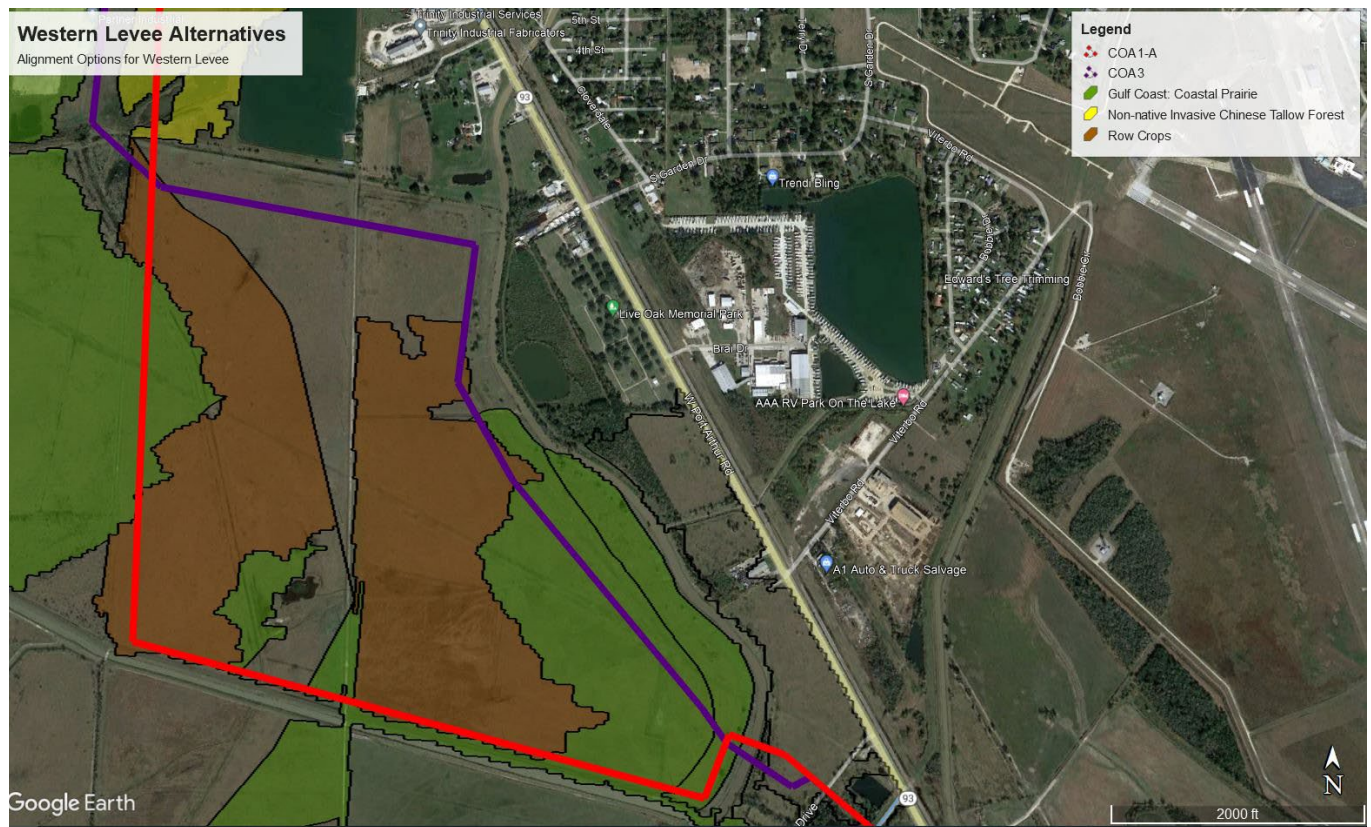


Figure 18-TPWD Ecological Mapper of the Western Levee Alignment Alternatives

Based on historical imagery and topography analysis, the area classifies as coastal prairie is highly disturbed and lacked the sufficient vegetative cover and variable topography meant to support the species (Figure 20-Historical Imagery of the Western Levee Alignment). However, a field visit conducted in March 2023 in the upper northern-most terminus of the western levee confirmed coastal prairie instead of freshwater forested wetlands with non-native invasive tallow forest/shrubland as indicated by the TPWD ecological mapper (Figure 19-TPWD Ecological Mapper of the Western Levee Alignment Alternatives).

While juvenile and adult eastern black rails can fly, the species rarely does, it prefers the dense coverage of tall native shrubs, usually torso height. Chicks lack the ability to fly and therefore, need access to escape disruptive events such as flood, fire, and human disturbance. While 90% of the proposed western levee is unable to be accessed, the action area is within the known range of BLRA. There are no e-Bird records of species occurrence in the action area, but USACE identified one patch of potentially suitable habitat (i.e. appropriate substrate saturation and vegetation density) in the northern-most terminus of the western levee. The western levee is not

assumed to include preferred habitat (for Texas) since the areas are not dominated by gulf cordgrass (*Spartina spartinae*), salt meadow cordgrass (*S. patens*), salt grass (*Distichlis spicata*), sea oxeye (*Borrchia frutescens*), and eastern baccharis (*Baccharis halimifolia*). However, eastern black rail may occur in inland palustrine emergent wetlands or coastal prairie that have dense herbaceous cover that allow tunnels for BLRA to escape predation. No BLRA have been documented in the action area; however, call-playback auditory surveys were not performed. Due to the lack of field validation, **it is possible that eastern black rail may be in the vicinity of the western levee at the time of construction since potential habitat is present; therefore, presence of eastern black rail is assumed at the western levee COA 1-A or COA 3 project site. It is not assumed at western levees COA 2 due to human development and lack of suitable habitat.**

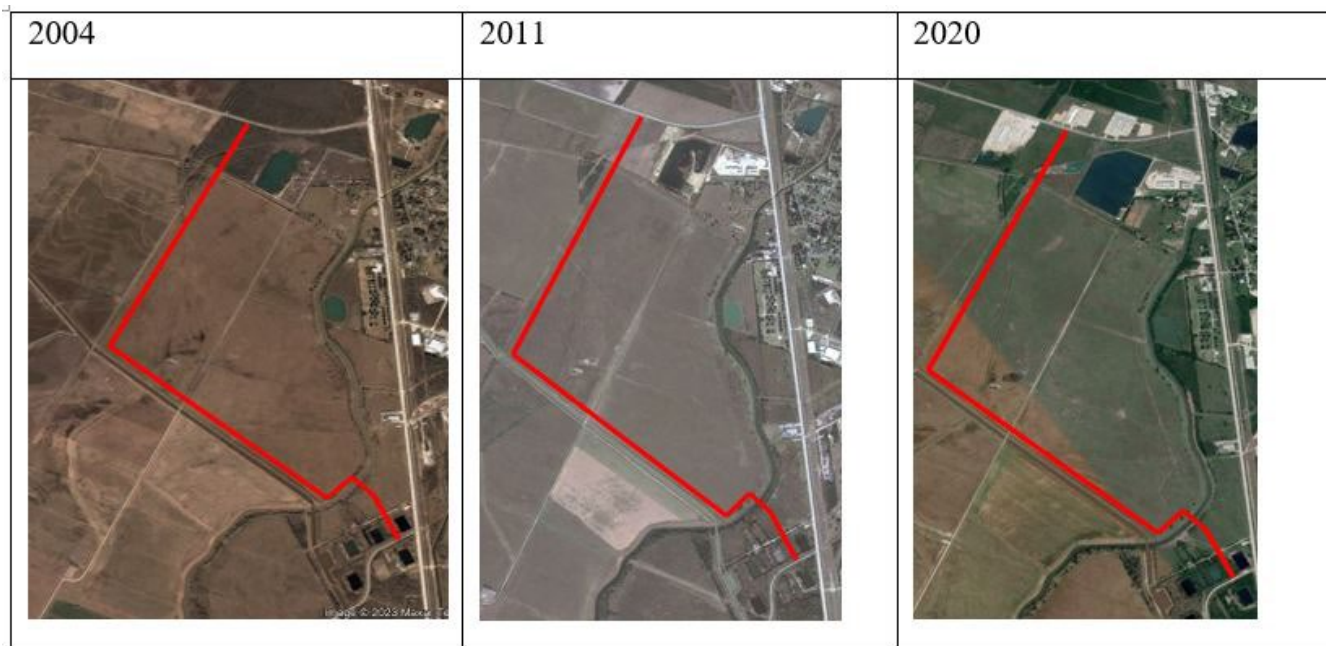


Figure 19-Historical Imagery of the Western Levee Alignment

Staging Area

The PAV CSRM contractors will be utilizing staging areas for temporary equipment storage and office locations. All designated potential staging areas have been selected that avoid wetlands, have direct access to existing roadways, and are consistently mowed and or concrete. Therefore, with the best management practices included in this document, **the staging areas do not provide suitable habitat for the eastern black rail.**

PAV02 Emergent Wetlands

During the coordination for the 2017 EIS, no wetlands were present near the existing floodwall. However, changes to the project since 2017 has led to the establishment of 1.53 acres of wetlands. The wetlands were discovered during a joint field visit with the resource agencies in spring 2022 and 2023. Therefore, any impacts to these wetlands were not discussed or evaluated.

The fringe marshes are classified as Gulf Coast Chenier Plain Fresh and Oligohaline Tidal Marsh. Chenier plains marshes are characterized by deep mineral dense soils saturated with organic matter (TPWD, 2022). The habitat contains species able to withstand salinities less than 4 ppt such as: maidencane (*Panicum hemitomon*), seashore paspalum (*Paspalum vaginatum*), marshmillet (*Zizaniopsis miliacea*), common cattail (*Typha latifolia*), marshhay cordgrass (*Spartina patens*), bulrushes (*Schoenoplectus* spp. bulrushes), and common reed (*Phragmites australis*) (TPWD, 2022). A portion of the floodwall construction will impact 1.53 acres of estuarine marsh, based on a field visit conducted in August 2022 and March 2023, the vegetation was dense enough to provide some canopy coverage for the eastern black rail. However, access to the site is through an existing roadway, railway, and adjacent deep channelized waters, there is minimal access to the site for the eastern black rail. Further, after demolition and construction of the new floodwalls, the hydrology supporting these tidal wetlands will be permanently lost. Any eastern black rails using the site will move off-site during construction to more suitable adjacent habitats. Further, due to loss of hydrology after construction, it is not likely eastern black rail will move back to the site. **Adjacent floodwall wetlands do not support black rail habitat.**

Critical Habitat Adverse Modification

Since no critical habitat has been designated for the eastern black rail, no adverse impacts are expected to critical habitat.

Critical Habitat Beneficial Effects

Since no critical habitat has been designated for the eastern black rail, no direct beneficial habitat impacts are expected to critical habitat. All lands and wetlands will be permanently converted to levees for the CSRM system, wetlands impacted will be mitigated for. Aside from the PAV02 emergent wetlands and western levee, all lands impacted do not provide the needed resources for the eastern black rail. There is other higher quality habitat adjacent to the site including the McFaddin National Wildlife Refuge, J.D. Murphree Wildlife Management Area, and Texas Point National Wildlife Refuge which will be protected with the construction of the PAV CSRMS.

Direct Effects

Within the perimeter of the new western levee alignment, coastal prairie and wetland habitat is considered suitable and could support individuals due to connectivity to upland areas for nesting and foraging, as well as the dense herbaceous cover that could be used for escape from predators. Similarly, along the Texas coast, rails have utilized dense vegetative areas outside of the nesting season and it can be assumed that individuals may be at the site at all times of the year. If present during clearing activities outside of the nesting and breeding season, the eastern black rail would likely vacate the area to avoid the noise and vibrations before being impacted by the clearing/grubbing/mowing equipment by contractor personnel. However, the largest risk to the species is vegetation clearing during the nesting and breeding season in the densely vegetated portions of the action area.

The eastern black rail is one of the smallest rails in North America and their nests and chicks are not easily spotted, a chick is roughly the size of a cotton ball (USFWS, 2023). Mowing during

this critical period could lead to mortality of individual eastern black rail, as well as their eggs due to the lack of visibility. To best minimize any impacts to the species, USACE will commit to restricting vegetation clearing outside of the breeding season within the 150ft of the proposed western levee alignments. This seasonal restriction will therefore avoid the potential for mortality of individual breeding and/or nesting eastern black rail and their eggs. It is expected, once vegetation has been cleared, eastern black rail are expected to continue to move away from the area to find suitable habitat due to the lack of vegetation.

USACE will continue to maintain and mow the action area prior to March to September to reduce the likelihood of any individuals moving back into the construction site. Conservation measures provided by USFWS will be incorporated into the project specifications. The action will have a direct impact on potential habitat since construction of the western levee will modify hydrology to wetlands within and adjacent to the structure since all wetlands in the area are freshwater and not tidally influenced. There will be a direct and permanent loss for wetlands located within the planned alignment. Although, the area will no longer function as low-quality potential habitat, the overall impact to the species is minor since the species has several higher quality wetlands and potential habitat available in McFaddin National Refuge, J.D. Murphree Wildlife Management Area, or Texas Point National Wildlife Refuge. All wetlands identified in the project area will be fully mitigated as outlined in the Habitat Analysis and Mitigation Plan in the Supplemental Environmental Assessment.

Indirect Effects

Construction will temporarily generate increased noise, dust, vibrations, traffic, and vehicle emissions. Indirect noise impacts from construction are not expected to be significant. Further, a consequence of CSRMS structures is the indirect link to additional urbanization and industrialization of the area due to increased protection from flooding, storm surge, and other similar adverse weather events.

Cumulative Effects

The main cause of project-induced effects to eastern black rail is conversion of wetlands and coastal prairie which will be permanently replaced by the project's levee and floodwall system. However, the PAV CSRMS has minimized impacts to be within the existing HFPP system when able. Due to the project's adverse impacts on degraded wetlands and coastal prairie, USACE will implement compensatory mitigation for the loss of this resource.

Construction of the Port Arthur CSRMS is ongoing throughout Jefferson County, Texas. This project, due to its capacity to protect residential and industrial properties from storm and flooding, may contribute to the regional development in Jefferson County, while this is not the purpose of the project. Due to the increase in human development, the overall effect on eastern black rail, as well as other wildlife species will be impacted. However, similar to protection of the human environment, the PAV CSRMS system will preserve wetlands, coastal prairie, and high-quality habitat in adjacent wildlife management areas from coastal storms and flooding.

The project cumulatively will increase protection for people, property, and natural resources within Jefferson County.

USACE can reasonably expect future state, local, or private entities to conduct construction activities within the Corps' action area that may be required for transportation system maintenance, private development, or utility/ pipeline installations. However, because these construction activities may require 404 and Section 10 permitting by the Corps if impacting waters of the U.S. If these actions are likely to impact waters of the U.S. or potential habitat, these actions will require consultation under Section 7 between the USACE and the Service. Actions such as these do not fall under the definition of future state, tribal, local, or private actions.

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Federal Civil Works construction that may impact the species is Coastal Texas's Ecosystem Restoration features, maintenance dredging of the Sabine Neches Waterway after final construction of the Sabine Neches Channel Improvement Project, and adjacent Orange CSRMS.

4.3 WHOOPING CRANES

Although their primary migration route is to the west of the proposed action, occasionally whooping cranes have passed through the Jefferson County region on the way to and from their principal winter habitat in and around the Aransas National Wildlife Refuge in the Texas coastal bend region. Several sightings have been documented within the JD Murphree State Wildlife Management Area, presumably from the Louisiana population (eBIRD). Cranes may rest along in brackish bays, marshes, and salt flats, feeding primarily on blue crabs, clams, snails, and insects. The parts of the action area contain coastal prairie and coastal prairie pond shore habitat. However, the type of coastal marsh system these large birds prefer is not present in the area that would be affected by construction of PAV05. Despite the lack of preferred habitat, in 2021, a breeding pair spent significant time in Jefferson County, Texas establishing a territory and nesting three times, resulting in one successful chick hatching (Louisiana Department of Wildlife and Fisheries 2021). This pair is likely to remain and continue to nest in Jefferson County in future years. Although the habitat is not conducive for breeding or foraging, there is a possibility of birds temporarily using the action area.

Western Levee Extension

While the western levee is not located near any potential feeding sources such as brackish bays, marshes, and salt flats; there is a potential for strikes for whooping cranes flying over the project area and whooping cranes in the area have been known to stop in agricultural fields.

Typical construction equipment includes cranes which do not have a specified height restriction. Contracting mechanisms can be proposed to limit the height of construction cranes, however, poor visibility of any crane size can still result in whooping crane strikes. The western levee appears to be consistently mowed and maintained pasture; however, field verification of the project area is limited due to issues with rights-of-entry. It is unlikely due to the noise and dust generated from construction for whooping cranes to use the project area during construction due to adjacent agricultural pasture. However, to reduce any impacts to the LA population of whooping cranes, while also allowing variability of construction crane height, the USACE will utilize the BMPs listed below in 6.0 voluntary conservation measures and monitoring. **The western levee alignment may impact whooping cranes.**

Staging Area

The contractor staging areas will be used for the temporary storage of equipment and offices for the project. The contractor is directed to follow all federal, state, and local regulation for the control of pollutants. The staging areas are not located near feeding sources and are located near high traffic areas for accessibility. There is minimal to no impact to whooping cranes because work is not actively conducted during the staging areas. The tall construction equipment (15 meters or greater) will be lower as they transition from the project site to the staging area due to roadway safety. Further, the contractor will be directed in the contract specifications to lower this equipment when not in use. If any whooping crane should temporarily stop over in the project area, the contractor will be directed to temporarily stop all activities until the species leaves of its own volition. **The staging areas will not impact whooping cranes.**

PAV02 Floodwall Alignments

During the coordination for the 2017 EIS, no wetlands were present near the existing floodwall. However, changes in tidal exchange since 2017 has led to the establishment of estuarine marsh wetlands. The wetlands were discovered during a joint field visit with the resource agencies in spring 2022. PAV02's floodwall alignment will impact fringe chenier marsh, which has the highest probability to be utilized by whooping cranes. However, the wetlands are located behind the current floodwall adjacent to both a busy waterway, roadway, railway, and petrochemical plant. The waterway, roadway, and railway consistently have vessels servicing the nearby Valero plant and surrounding area. The likelihood for a whooping crane to stop within the planned alignments is unlikely compared to Jefferson County's other potential feeding grounds outside of urban and industrial areas. To reduce any potential impacts of strikes or unlikely event of stop over, the USACE will utilize BMPs in section 5.0. **The PAV02 flood wall alignment areas will not impact whooping cranes.**

Critical Habitat Adverse Modification

Critical habitat has been designated for the whooping crane, currently, critical habitat is designed within areas near the Aransas Natation Wildlife Refuge, however, Jefferson County is listed as potential. Since no critical habitat has been designed in Jefferson County under the Federal Register, no adverse impacts are expected to critical habitat.

However, examples of adverse modification for potential habitat include vegetation clearing, mowing, grubbing, and stripping within levee or floodwall terrestrial alignments. Freshwater wetlands within western levee alignments will be permanent loss to the system; tidally influenced wetlands would also be permanently lost from floodwalls; all wetlands would be mitigated. All project areas are highly disturbed, mowed/maintained, and would not be suitable for the whooping crane excluding the western levee.

Aside for the areas described in section 4.0, all project components lie along existing levees and floodwalls, it is unlikely that a whooping crane would stop over those areas. Therefore, to reduce any likelihood of strike or encounter, the USACE will incorporate the BMPs listed in section 5.0 below, these are the standard BMPs USACE has received from the USFWS for the whooping crane. No potential habitat will be loss to the action area since these areas are either urbanized, highly disturbed, or lacking required resources. However, whooping cranes from the LA population may use the western levee for roosting.

Critical Habitat Beneficial Effects

Since no critical habitat exists within the action area, no beneficial impacts are expected to critical habitat. While the work will have no direct beneficial effect since lands will be permanently converted to levees for the CSRMS system, wetlands impacted will be mitigated for. There is other higher quality habitat adjacent to the site including the McFaddin National Wildlife Refuge, J.D. Murphree Wildlife Management Area, and Texas Point National Wildlife Refuge which will be protected with the construction of the PAV CSRMS.

Direct

The type of coastal marsh system these large birds prefer is not present in the area that would be affected by construction. Whooping crane habitat is not expected to be affected by preconstruction and construction elements of the western levee. Recently the species has been spotted feeding and foraging in similar parts of North-East Texas in addition to the recently introduced breeding pair. The noise and dust make it unlikely the species will utilize the project area for feeding or stop-over. However, whooping cranes are a mobile species and have the possibly to fly over the construction site, especially as more sittings near the project area have occurred in recent years. The largest threat to the species is strikes against tall stationary equipment; typical construction equipment includes tall equipment (15 meters or greater) and has the possibility of a strike. The species is most vulnerable to have a strike during periods of low visibility such as fog, dusk, dawn, and adverse weather. To reduce any potential strikes while also allowing variability of construction crane height, the USACE will utilize the conservation measures to reduce the likelihood of any impacts to whooping cranes.

Indirect

Construction will temporarily generate increased noise, dust, vibrations, traffic, and vehicle emissions. Indirect noise impacts from construction are not expected to be significant. Further, a consequence of CSRMS structures is the indirect link to additional urbanization and industrialization of the area due to increased protection from flooding, storm surge, and other similar adverse weather events.

Cumulative Effects

The main cause of project-induced effects to whooping cranes is conversion of wetlands and coastal prairie which will be permanently replaced by the project's levee and floodwall system. However, the PAV CSRMS has minimized impacts to be within the exiting HFPP system when able. Due to the project's adverse impacts on degraded wetlands and coastal prairie, USACE will implement compensatory mitigation for the loss of this resource.

Construction of the Port Arthur CSRMS is ongoing throughout Jefferson County, Texas. This project, due to its capacity to protect residential and industrial properties from storm and flooding, may contribute to the regional development in Jefferson County, while this is not the purpose of the project. Due to the increase in human development, the overall effect on whooping cranes, as well as other wildlife species will be impacted. However, similar to protection of the human environment, the PAV CSRMS system will preserve wetlands, coastal prairie, and high-quality habitat in adjacent wildlife management areas from coastal storms and flooding. The project cumulatively will increase protection for people, property, and natural resources within Jefferson County.

USACE can reasonably expect future state, local, or private entities to conduct construction activities within the Corps' action area that may be required for transportation system maintenance, private development, or utility/ pipeline installations. However, because these construction activities may require 404 and Section 10 permitting by the Corps if impacting waters of the U.S, these actions will require separate consultation under Section 7 between the USACE and the U.S. Fish and Wildlife Service. Actions such as these do not fall under the definition of future state, tribal, local, or private actions.

Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Federal Civil Works construction that may impact the species is Coastal Texas's Ecosystem Restoration features, maintenance dredging of the Sabine Neches Waterway after final construction of the Sabine Neches Channel Improvement Project, and adjacent Orange CSRMS.

5.0 CONCLUSION AND DETERMINATION

5.1 MAY AFFECT, LIKELY TO ADVERSELY AFFECT DETERMINATION FOR LISTED SPECIES

It is USACE's opinion based on the desktop information, previous surveys, anticipated construction equipment and sequencing, there are no anticipate may affect, likely to adversely affected determinations for any of the listed species including proposed, candidate, or recently listed. The newly listed species are the giant manta ray, eastern black rail, whooping crane, or candidate species: monarch butterfly. This includes proposes species: alligator snapping turtle, Louisiana pigtoe, and Texas heelsplitter.

5.2 MAY AFFECT NOT LIKELY TO ADVERSELY AFFECT DETERMINATION FOR LISTED SPECIES

This Supplemental BA updates the conclusions presented regarding the potential effects of implementing the 2015 BA. It accounts for modifications to several project elements not originally described in the 2015 BA and incorporates new available information on the effects to whooping crane and the recently listed eastern black rail.

Based upon the findings of this supplemental BA, USACE has determined that the effects determination have not changed for any species previously considered in the 2015 BAs, (excluding whooping crane), and for which concurrence was provided. For the Monarch butterfly, Louisiana pigtoe, Texas heelsplitter, and alligator snapping turtle which concurrence was not requested, the additional information provided in this supplemental BA has informed the no effect determination. For the eastern black rail and whooping crane, the USACE has determined that the construction activities planned in the action area, specifically, the western levee, with the inclusion of all the recommended conservation measures listed in 5.3 of this documents, **may affect but is not likely to adversely affect the species.**

5.3 VOLUNTARY CONSERVATION MEASURES AND MONITORING

The USACE acknowledges the potential usage and occurrence of the previously discussed threatened and endangered species within the western levee action area. The USACE commits to minimizing effects of the project to the greatest extent possible in both the planning and construction phases of the project and will include the general and species-specific conservation measures below.

5.3.1 General Conservation Measures

The following conservation measures would be incorporated into all PAV CSRMS construction contracts for the protection of all listed species:

- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of the eastern black rail and whooping crane and their habitat; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- USACE contractors will implement all standard best management practices from TCEQ's Storm Water Pollution Plan.
- The contractor will be staying within outlined contract plans, any sensitive resources will be avoided.

- Contractor will be staying with rights-of-way as described in the supplemental EA and awarded project plans.
- Contractor will not utilize the staging area that contains known nesting bird concerns from February to September of any calendar year.
- The contractor will implement all standard best management practices from TCEQ's water quality certification under the forthcoming supplemental EA.
- Site material and planned alignments will be tested under USACE HTRW standards prior to utilization.
- All contractor staging areas and access will be within designated and coordinated existing or disturbed sites.
- Project equipment and vehicles transiting between the staging area and construction site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.
- Use of construction lighting at night shall be directed toward the construction activity area and shielded from view outside of the action area to the maximum extent practicable.
- The construction contractor must restore all staging areas and access roads created and/or cleared for the project to pre-construction conditions.
- Prior to the start of work each day, the action area will be surveyed for the presence of whooping cranes within 1,000 ft of the action area. If whooping cranes are observed, no work will be performed until the birds have moved away from the action area, of their own volition. If birds move into the action area during project construction implementation, all mechanized equipment actions will cease until the birds vacate the action area. Construction equipment over 15ft will be lower.
- If construction equipment is over 15 ft tall, the equipment must be marked with visual flagging when equipment is in use. If the equipment is not in use, it will be laid horizontally on the ground. The equipment will be laid horizontally during low perceptibly events such as dusk/night, dawn, and events such as fog or inclement weather to avoid whooping crane strikes during low visibility conditions.
- Workers, temporary or permanent, should be educated on the importance and protections allocated to this species, including but not limited to no collection of features or eggs and do not touch or harass birds.
- All whooping crane sightings should be immediately reported the USACE lead biologist who will immediately to the USACE lead biologist. The lead biologist will inform the Texas Coastal Ecological Services Field Office at 281-286-8282, Wade Harrel (Service Species Lead) at Wade_Harrell@fws.gov, Trey Barron (TPWD) at Trey.Barron@tpwd.texas.gov, and Eva Szyszkoski (Louisiana Wildlife and Fisheries Department) at ESzyszkoski@wlf.la.gov or by phone at (337) 536-9596.

5.3.2 Western Levee Conservation Measures

The following conservation measures would be implemented on the western levee alignment COA 1-A or COA 3 to minimize the potential for adverse direct effects during construction to BLRA and/or whooping crane:

- The Corps and other project proponents will ensure the crew chiefs, crews, supervisors, and biological monitor(s) attend training prior to initiation of, or their participation in project construction activities.
- A qualified biologist will conduct this training, and the scope of training will include:
 - Recognition of Eastern Black Rail and Whooping Cranes, and their habitats.
 - Avoidance and minimization measures to be implemented during construction.
 - Reporting criteria.
 - Contact information for different rescue agencies in the area; by use of wildlife monitoring checklists coordinated with the Service prior to construction.
 - A minimum of one qualified biological monitor will be assigned to each active work area. The biological monitor will inspect the active work areas prior to the start of work every day and continuously throughout the day.
- Biological monitor's qualifications will be submitted to Service prior to start of each construction project.
- The Corps will provide the Service with the name of a single point of contact (POC) responsible for communicating with the crew and biological monitor(s) and reporting on endangered species issues during project construction.
- The biological monitor(s) will be on site to ensure Eastern Black Rail and Whooping Cranes are not affected by construction activities.
- Prior to start of work each day, the biological monitor(s) will inspect the project area's existing wetlands, adjacent to and along work areas before work begins each morning.
- Biological monitor(s) will communicate all activities to the POC and the POC will coordinate that information with the Corps and Service as required.
- Prior to start of work each day, all contractors, and work crews will attend a brief training on recognition of Eastern Black Rail and Whooping Cranes, and their habitats, and be updated on the previous day's encounters with these species, if any have occurred, and any observations of nesting or injured wildlife (including other migratory birds or colonial waterbirds).
- The POC and/or biological monitor(s) will be on site to ensure Eastern Black Rail or Whooping Cranes are not affected by construction activities. The POC and/or monitors will ensure that nesting Eastern Black Rail or foraging or nesting Whooping Cranes are not in the project area prior to initiation of construction activities every morning.
- Construction workers will immediately notify the POC and/or monitor(s) if Eastern Black Rail or Whooping Cranes are observed in the immediate or active work area.
- If Eastern Black Rail are found within 100 feet of the work area, all work will be stopped until the bird(s) leaves the construction site. If Whooping Cranes are found within 1,000 feet of the work area, all work will be stopped until the bird(s) leaves the construction site. In addition, all personnel will be vacated from the site and all equipment be powered off and remain until the bird(s) leave the area. Bird(s) must not be herded away or harassed into leaving the area. If the bird(s) do not relocate (e.g., injured bird(s) the POC will contact the Service to solicit additional guidance.

5.3.3 EASTERN BLACK RAIL

The following conservation measures would be implemented on the western levee alignment COA 1-A or COA 3 to minimize the potential for adverse direct effects during construction to BLRA:

- Pre-Construction and construction disturbance activities within the action area will be prohibited during Eastern Black Rail post-breeding molt periods when they are unable to fly, and nesting/chick rearing periods between July 1 and September 30.
- If construction cannot be prohibited during this critical time period, vegetation clearing will be restricted to not removing all suitable BLRA habitat (dense emergent vegetation) between July 1 through September 30. When vegetation is removed, all vegetation will not be removed in one day and only from areas within the marked or flagged sections of the construction corridors so that a pathway remains open for the birds to escape. Pockets of suitable BLRA habitat (refugia) encompassing 10 feet by 20 feet will remain uncleared and/or a biological monitor will ensure dense herbaceous covered pathways are maintained into unaffected areas. The refugia remaining within the project area may be cleared after two days, as needed after the biological monitor verifies no occupancy within these refugia.
- Proposed construction and work easement corridors through suitable BLRA habitat will be marked with biodegradable flagging or posts, and all suitable habitat within a 100-foot buffer from these boundary markers will be surveyed by approved biological monitor prior to any clearing activities.
- A biological monitor qualified to identify Eastern Black Rail and with stop work authority will be on site while construction is in progress. The biological monitor will stop construction work immediately upon discovery of any Eastern Black Rail (alive, injured, or dead). The Texas Coastal Ecological Service's Office should be contacted immediately at 281-286-8282 and the species lead Mary (Sandra) Lee at 361-225-7316.
- The biological monitor will ensure a sufficiently slow pace of all equipment moving through potential suitable habitat to allow birds to escape ahead of equipment or dredge material placement activities. This secretive species will run to escape oncoming disturbance and are not likely to fly to avoid collisions with equipment or materials being deposited within the project area.
- Workers, temporary or permanent, should be educated on the importance and protection allocated to this species, including but not limited to not collecting feathers or eggs, not disturbing nests, and not touching or harassing this species.
- Efforts to mitigate noise and vibration will be implemented within and adjacent to Eastern Black Rail suitable habitat including planning and performing work outside of peak breeding call times (e.g., one hour before and after dawn and one hour before and after dusk).
- Project activity will be limited to daylight hours to the maximum extent possible. If nighttime work is required, aim lighting at work zone and turn off when not needed. All permanent lighting should be pointed away from potential Eastern Black Rail suitable habitat, down shielded, and follow the International Dark-Sky Association (<https://www.darksky.org/>) or Bird City Texas (<https://tpwd.texas.gov/wildlife/birding/bird-city-texas>) guidelines.

5.3.4 WHOOPING CRANE

The following conservation measures would be implemented during construction of the western alignment COA 1-A or COA3 (or similar alignment proposed within the same location) and minimize the potential for adverse effect to whooping crane:

- A biological monitor qualified to identify Whooping Cranes and stop work authority will be present when any construction work is being done in the action area if the work is performed during the non-essential whooping crane population breeding/nesting season (January through June) or the non-essential and wild whooping crane population's wintering season (October 1 through April 15).
- The biological monitor will stop construction work immediately upon discovery of any Whooping Cranes (alive, injured, or dead). The Texas Coastal Ecological Service's Office should be contacted immediately at 281-286-8282; in addition to Mary (Sandra) Lee (Service Species Lead) at Sandra Lee at Mary_Lee@fws.gov, Trey Barron (TPWD) at Trey.Barron@tpwd.texas.gov, and Eva Szyszkoski (Louisiana Wildlife and Fisheries Department) at ESzyszkoski@wlf.la.gov, or by phone at 337-536-9596.
- A 1,000 foot-radius of the work site must be delineated before work begins. If a whooping crane is observed within the 1,000-foot radius, the biological monitor shall halt construction activities, including shutting down any running equipment until the bird has vacated the radius of the work area.
- If construction equipment is over 15 feet tall, the equipment must be marked with visual flagging as bird avoidance measures when equipment is in use and laid horizontally on the ground when not in use.
- Workers, temporary or permanent, should be educated on the importance and protection allocated to this species, including but not limited to not collecting feathers or eggs, and not touching or harassing this species.
- Project activity will be limited to daylight hours to the maximum extent possible. If nighttime work is required, aim lighting at work zone and turn off when not needed. All permanent lighting should be pointed away from adjacent piping plover critical habitat, down shielded, and follow the International Dark-Sky Association (<https://www.darksky.org/>) or Bird City Texas (<https://tpwd.texas.gov/wildlife/birding/bird-city-texas>) guidelines.

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