

Restoration Plan/ Environmental Assessment

for

the Apex Barges Oil Spill, July 28, 1990

May 28, 1997

Prepared by:

Texas General Land Office
Texas Natural Resource Conservation Commission
Texas Parks and Wildlife Department
U. S. Department of the Interior,
 U.S. Fish & Wildlife Service
U. S. Department of Commerce,
 National Oceanic and Atmospheric Administration

SUMMARY

This Restoration Plan describes restoration actions which State and Federal natural resource trustees intend to implement to restore or enhance natural resources injured by the Apex barges oil spill of July 28, 1990 in Galveston Bay, Texas. The document also describes the process followed by the trustees - the Texas General Land Office, Texas Natural Resource Conservation Commission, Texas Parks and Wildlife Department, Department of Interior, U.S. Fish & Wildlife Service, and National Oceanic and Atmospheric Administration of the U.S. Department of Commerce (the "Trustees") - to evaluate the appropriate restoration alternatives and select the restoration actions identified in this plan. These actions will be implemented using funds recovered by the Trustees as part of an October 1994 settlement of natural resource damage claims associated with the oil spill. These funds are required by law to be spent to benefit natural resources and associated resource services injured, destroyed or lost as a result of the spill.

On July 28, 1990, at approximately 1630, the M/V Chandy N was pushing T/B Apex 3417, 3503, and 3510 inbound through the Houston Ship Channel (HSC) in Galveston Bay, Texas. The M/T Hellespont Faith was proceeding in the same direction when it came upon and overtook the M/V Chandy N and the Apex barges. The M/T Shinoussa, proceeding outbound through the HSC, met and passed the M/T Hellespont Faith and collided with the T/B Apex barges. As a result of the collision, approximately 694,000 gallons of a petroleum product (catalytic feedstock oil) were discharged into Galveston Bay from T/B Apex 3417 and 3503.

The oil spill caused injuries to several natural resources. The Trustees conducted a natural resource damage assessment to address those injuries. The assessment focused on losses of finfish and shellfish as a result of direct exposure to oil, the lost use of Galveston Bay fisheries due to spill-related closures, and on injuries to the oiled salt marshes.

In developing this restoration plan, the Trustees focused on the restoration of estuarine emergent wetlands since the productivity and abundance of fishery resources in Galveston Bay, the resources associated with the predominate injuries and losses, are functionally related to the health and abundance of these wetlands. Estuarine emergent wetlands provide a broad array of ecological services benefiting the Galveston Bay system such as water quality improvement, nursery and adult habitat for fishery resources, and avian habitat. All of the natural resources injured by the spill would be restored, replaced, or enhanced, either directly or indirectly, by wetland restoration efforts.

Restoration proposals were solicited from the public and interested agencies. The Trustee Council developed criteria for use to evaluate project proposals and make appropriate project selections. A total of ten proposals received, together with a "No

Action" alternative, are evaluated in this plan according to these criteria. The evaluation of individual restoration proposals was based on information provided in proposals, *interviews with restoration proposal managers, current technical literature sources*, and the best professional judgment of restoration specialists within each trustee agency. The level of analysis is consistent with that required by the National Environmental Policy Act (NEPA), and this document serves as an Environmental Assessment (EA) under that Act.

The Trustees have selected three restoration alternatives: Pierce Marsh Wetland Construction, Interstate 45 Highway Corridor Wetland Construction, and Galveston Island State Park Wetland Construction. Further, the Trustees have a conditionally approved allocation of \$109,000 to implement the San Jacinto State Park Wetland Construction, subject to the resolution of contaminant issues concerning dredged material to be used in the project. If, in the judgment of the Trustees, these issues cannot be adequately resolved, the funds will be used to implement wetland construction in Galveston Bay.

Each project selected for implementation will undergo additional environmental and NEPA review in the permitting process. Although no negative impacts on endangered species were identified for the selected projects, a Section 7 (Endangered Species Act) consultation will be made for each of the projects to ensure compliance. Projects will also be reviewed for compliance with the Texas Historic Preservation Act. All restoration actions selected will, upon implementation, be placed in public trust in perpetuity.

Table of Contents

	Page
1.0 Introduction	5
1.1 Purpose and Need for Action.....	5
1.2 Authority.....	5
1.3 Public Participation.....	5
1.4 Administrative Record and Availability.....	6
2.0 Overview of the Oil Spill.....	6
2.1 Summary of the Incident.....	6
2.2 Receiving/ Affected Environment.....	6
2.3 Scope of Natural Resource Injuries Assessment.....	7
2.4 Summary of Settlement.....	8
3.0 Restoration Planning Process.....	8
3.1 Apex Trustee Restoration Council.....	8
3.2 Trustee Council Strategy for Restoration Planning.....	8
3.3 Trustee Council Activities.....	9
4.0 Restoration Alternatives.....	9
4.1 Alternatives Considered.....	10
5.0 Evaluation of Alternatives.....	15
5.1 Trustee Selection Criteria for Project Evaluation	15
5.2 Evaluation of Alternatives	17
6.0 Selected Alternatives	21
7.0 Finding of No Significant Impact	22
8.0 Trustee Council Signatures	23
Figure 1. The extent of oiling in Galveston Bay from the Apex oil spill and locations of restoration alternatives in Galveston Bay.....	25
Appendix I. List of people involved in the preparation of draft plan.....	26
Appendix II. Public Comment Received and Analyzed	27

1.0 INTRODUCTION

1.1 Purpose and Need for Action

This Restoration Plan and Environmental Assessment (RP/EA) describes restoration actions implemented using natural resource damages recovered jointly by State and Federal natural resource Trustees for the injury, loss, destruction, or loss of use of natural resources as a result of the July 28, 1990 Apex barges oil spill in Galveston Bay, Texas. These damages were recovered by the Trustees on behalf of the public as part of a joint settlement entered in Golnoy Barge Co. and Apex R.E. & T. Inc. vs. M/T SHINOUSSA, et al., Civil No. 90-2414 (S.D.Tex.), on October 26, 1994. The Trustees are required by law to use recovered damages to plan and implement actions to restore, rehabilitate, replace or acquire natural resources and services provided by these resources equivalent to those affected by the spill.

1.2 Authority

This Restoration Plan has been developed and prepared jointly by the Texas General Land Office, Texas Natural Resource Conservation Commission, Texas Parks and Wildlife Department, U. S. Department of the Interior (DOI), U.S. Fish & Wildlife Service, and National Oceanic and Atmospheric Administration (NOAA) of the U. S. Department of Commerce, (collectively, "the Trustees") pursuant to their respective authority and responsibilities as designated natural resource trustees under Section 311(f) of the Federal Water Pollution Control Act, 33 U.S.C. 1321(f), Subpart G of the National Contingency Plan 40 CFR 300.600 - 300.615, the Texas Oil Spill Prevention and Response Act, Subpart F of 43 C.F.R. Part 11, and other applicable state and federal laws. For NOAA and DOI, this RP/EA also presents an Environmental Assessment of identified restoration actions (preferred alternatives) pursuant to the National Environmental Policy Act, 42 U.S.C. 4321 et seq.

1.3 Public Participation

A notice of availability of the draft RP/EA was published March 4, 1997 in the Texas Register by Texas Parks and Wildlife Department (TPWD). A 30 day public comment was established with April 7, 1997 as the final date for submitting comment. A concurrent news release was also issued by TPWD soliciting public comment on the DRP/EA.

Comments were submitted in writing to:

Allan Strand, U.S. Fish and Wildlife Service, Lead Administrative Trustee
Representative, APEX Restoration Council, 6300 Ocean Dr., Campus Box 338, Corpus
Christi TX 78412-5599. FAX: (512) 994-8262.

The Trustees considered all written comments prior to adopting a Final Restoration Plan. Further, NOAA and DOI considered all comments in making findings required by the National Environmental Policy Act (NEPA) based on the RP/EA. The written comments received and the Trustees' response, have been summarized in Appendix II.

1.4 Administrative Record and Availability

Records documenting the actions of the Trustees in developing this RP/EA, including identifying, screening and evaluating possible restoration alternatives and all public comments received on the draft RP/EA, have been maintained by the U.S. Fish and Wildlife Service as the lead agency selected by the Trustees to coordinate the restoration planning process. These records are available and may be viewed during business hours of 8 AM to 4 PM CST at the offices of the U.S. Fish and Wildlife Service, 6300 Ocean Dr., Campus Box 338, Corpus Christi TX 78412-5599. Please contact Allan Strand, Lead Administrative Trustee Representative at 512-994-9005 to facilitate access to the record documents.

2.0 OVERVIEW OF THE OIL SPILL

2.1 Summary of the Incident

On July 28, 1990, at approximately 1630, the motor vessel M/V Chandy N was pushing tank barges T/B Apex 3417, 3503, and 3510 inbound through the Houston Ship Channel (HSC) in Galveston Bay, Texas. The M/T Hellespont Faith was proceeding in the same direction when it came upon and overtook the M/V Chandy N and the Apex barges. The M/T Shinoussa, proceeding outbound through the HSC, met and passed the M/T Hellespont Faith and collided with the T/B Apex barges. As a result of the collision, approximately 694,000 gallons of a petroleum product (catalytic feedstock oil) were discharged into Galveston Bay environment from two of the Apex barges, T/B Apex 3417 and 3503. The Responsible Parties for the discharge were identified as Golnoy Barge Company, Apex R.E.& T., Inc. (d/b/a Apex Towing Company), Shinoussa Shipping Corporation, and Fidelis Shipping Corporation.

2.2 Receiving/ Affected Environment

The Galveston Bay estuary covers 1420 square kilometers and is the seventh largest estuary in the United States and the largest in Texas. The Galveston Bay system is composed of four main bodies (Galveston Bay, Trinity Bay, West Bay, and East Bay) and several, small, shallow, productive tertiary bays. The estuary is typically six to 12 feet deep.

The estuary contains significant amounts of coastal wetlands that provide nursery areas for estuarine fishery resources and important habitat for avian and mammalian fauna. Approximately 61% of the estuarine shoreline is vegetated by intertidal emergent plant

communities, or coastal wetlands, totaling 108,200 acres. A Galveston Bay National Estuary Program study indicates that the Galveston Bay estuarine community is generally healthy based on the diversity of species.

Estuarine organisms of commercial, recreational, and ecological importance, typically have inshore and offshore components of their life histories. Many species in the Galveston Bay estuary spawn offshore or near estuary passes, and their larvae or postlarvae migrate into the estuarine nursery area to grow and develop prior to offshore migration and maturation. Other taxa such as birds, reptiles, and mammals use estuarine habitats for feeding, refuge, and reproduction. Many estuarine dependent species of fish are harvested from Galveston Bay including flounder, Atlantic croaker, spotted sea trout, sand sea trout, and red drum. In addition, five species of invertebrates (oysters, blue crabs, and three penaeid shrimps) are commercially harvested from the Galveston Bay estuary. During their juvenile stages, these organisms utilize estuarine habitats such as marshes, seagrass beds, oyster reefs and mudflats for feeding and protection. Many species are more abundant in vegetated habitats such as emergent marshes and submerged aquatic vegetation than in adjacent non-vegetated habitats. Fishery production is directly proportional to wetlands acreage. The bay's water and habitats are also important foraging areas for the federally endangered green sea turtle (Chelonia mydas) and Kemp's ridley sea turtle (Lepidochelys kemp), as well as the threatened loggerhead sea turtle (Caretta caretta).

2.3 Scope of Natural Resource Injuries Assessment

Approximately fifty percent of the surface waters of Galveston Bay were exposed to oil over the course of the spill event (Figure 1). A significant amount of oil eventually washed into salt marsh habitat between Houston Point and Cedar Bayou in upper Galveston Bay. The Texas Department of Health issued orders officially closing portions of the bay to finfishing for 2 days, to shrimping for 8 days and to crabbing for 16 days, beginning August 4, 1990. A central portion of the HSC was closed to navigation in full or in part from July 28 to August 6, 1990, while clean-up operations proceeded, with some navigational restrictions remaining in place through August 10, 1990.

The Trustees proceeded with natural resource damage assessment actions necessary to jointly assess injuries and define an appropriate claim for natural resource damages based on these injuries. That assessment mainly addressed four natural resource injuries caused by the spill - losses of finfish and shellfish as a result of direct exposure to oil, lost use of Galveston Bay fisheries due to spill-related closures, injuries due to oiling of salt marshes, and lost use of Galveston Bay surface waters for navigation attributable to spill-imposed restrictions in the Houston Ship Channel. Injuries to and the lost use of fishery resources dominated the assessment and represented the most significant part of the potential natural resource damages claim.

2.4 Summary of Settlement

A joint settlement of all claims of the Trustees associated with this oil spill was achieved with the Responsible Parties in October of 1994. That settlement included \$1,312,962.24 to compensate the public for the natural resource injuries resulting from this oil spill. These recovered funds were placed into the Galveston Bay Oil Spill Trust Fund, an account established with the Registry of the Federal District Court, Southern District of Texas, pending joint planning and decisions by the Trustees as to the appropriate use of these funds to implement actions to restore, replace, rehabilitate or acquire the equivalent of natural resources injured by this spill.

3.0 RESTORATION PLANNING PROCESS

3.1 Apex Trustee Restoration Council

By Memorandum of Agreement finalized on June 16, 1995 (MOA), the Trustees established the "Galveston Bay/ Apex Barges Oil Spill Natural Resource Trustee Restoration Council" (the "Trustee Council") to oversee the development and implementation of a plan to provide for appropriate restoration actions using natural resource damages recovered for the Apex oil spill. The Trustee Council was guided by the MOA in the implementation of these responsibilities, including provisions dealing with the scope, objectives, coordination practices, public participation and use of funds in the restoration planning process.

3.2 Trustee Council Strategy for Restoration Planning

The overall objective of the restoration planning process was to identify restoration actions appropriate to restore, rehabilitate, replace or acquire natural resources and their services equivalent to those injured or lost as a result of this oil spill. To meet that objective, the benefits of restoration actions must be related or have an appropriate nexus to natural resources injuries and losses that occurred. To ensure restoration actions would achieve this fundamental objective, the Council relied on two primary selection criteria.

Ecological relationship to injuries/ losses - The majority of the natural resource injuries that resulted from this oil spill involved aquatic organisms in Galveston Bay. The oil spill also adversely affected the functioning of some emergent wetland habitats in the area pending natural recovery. These were the predominant injuries resulting from the oil spill. The Trustee Council used these injuries as a primary guide in the development of this RP/EA. Because these injuries involved either emergent wetlands or aquatic organisms that are ecologically dependent on wetlands, the Trustee Council considered the creation or enhancement of wetland habitats as having an appropriate nexus to the key injuries that occurred.

Geographic relationship to injuries/losses - To further ensure restoration actions were appropriately linked to injured natural resources, the Trustee Council determined that the benefits of such actions should accrue to injured resources "on-site", i.e. in the geographic vicinity relevant to those resource injuries. The Trustee Council approached restoration planning with the view that the injured natural resources are part of an integrated ecological system - the Galveston Bay Estuary - and that this system represented the relevant geographic area for siting restoration actions. Within that system, Galveston Bay itself was considered the primary geographic area for siting restoration actions as most injuries and losses occurred in that area. West Bay, East Bay, Trinity Bay, and their associated tertiary bays were considered primary alternative areas in applying this criteria to the evaluation of restoration proposals. Areas further removed from the direct impact of the spill or outside of the tidal Galveston Bay system were not considered as within the geographic vicinity relevant to the resource injuries.

3.3 Trustee Council Activities

The Trustee Council developed a set of criteria to guide the selection of appropriate restoration actions and applied these criteria to objectively evaluate restoration proposals submitted for consideration. This process included a screening of project proposals based on their fundamental selection considerations - whether project benefits would accrue to natural resources and their services injured as a result of the spill, whether project benefits would accrue to such resources in the geographic impact area of the spill, and whether project implementation costs were within the amount recovered in damages. A more detailed description of the criteria used and the process followed by the Trustee Council to identify restoration alternatives and to apply developed criteria, is included in Section 4.0, RESTORATION ALTERNATIVES and Section 5.0, EVALUATION OF RESTORATION ALTERNATIVES.

4.0 RESTORATION ALTERNATIVES

The Trustees began soliciting restoration proposals for consideration in February 1994 through a letter to local public interests groups, governmental agencies and scientific professionals. Responses to this letter varied from general restoration concepts to detailed proposals.

Upon review, the Trustees found that responses to the initial solicitation did not present a reasonable number of restoration alternatives for consideration and, further, that most of the responses did not include sufficient information to address and support a reasoned evaluation of the proposed restoration alternatives. The Trustee Council did attempt to remedy some of the information deficiencies through informal communications with project proponents, but this process yielded mixed results. Finally, in September 1995, the Trustee Council suspended further consideration of these initial restoration proposals and actively solicited additional restoration proposals from the local scientific community, public interest groups and governmental agencies through several public

meetings held in the Houston/Galveston area. This second solicitation included additional guidance on the required content for submitted proposals and set a September 25, 1995 deadline for further restoration project submissions.

Including the detailed restoration proposals received during the initial submission period, a total of ten restoration proposals were received for consideration. Each of these proposals, as well as a "No Action" alternative, are presented and evaluated in this RP/EA. These proposals are each listed and described below, and their locations are shown in Figure 1. The framework for and evaluation of these alternatives is presented in Section 5.0, EVALUATION OF RESTORATION ALTERNATIVES.

4.1 Alternatives Considered:

1 - No Action - Under a No Action alternative, restoration actions would not be undertaken by the Trustees. Natural resources and services would be allowed to return to baseline as the result only of natural recovery, and the Trustees would not take any action to assist in this recovery of injured natural resources.

2 - San Jacinto River Wetland Construction - This alternative would construct an unspecified acreage of wetlands through planting efforts along the San Jacinto River which empties into the Galveston Bay system. The project targets a 10-mile stretch between Lake Houston and Buffalo Bayou for restoration efforts. Much of the initial work proposed in the project would involve adapting brackish marsh plants to the riverine conditions found at the planting site. The adapted species would then be planted along an unspecified length of the river. The project was proposed by the U.S. Department of Agriculture Natural Resources Conservation Service. The proposal requests \$180,000 to fund a portion of the total project cost of \$295,000. Construction of wetlands in this proposal would benefit aquatic organisms that use these freshwater wetlands along the river. These wetlands also provide water-quality functions that should benefit aquatic organisms in the bay system.

3 - Habitat Restoration and Enhancement at the Galveston Bay Prairie Preserve - This alternative would implement a multi-faceted habitat restoration and enhancement effort in the Galveston Bay Prairie Preserve located along the western shore of Galveston Bay. This proposal by the Texas Nature Conservancy is comprised of numerous small projects including 1) acquisition of Attwater Prairie Chicken habitat and wetlands (\$500,000); 2) enhancement of Moses Slough through the construction of double baffled oyster reefs (\$75,000); 3) enhancement of Potts' Cove with the construction of a slotted weir with flap gate to prevent saltwater intrusion (\$17,500); 4) improvement of hydrology through the construction of thru-road structures such as regrading, resurfacing, cattle-guards (\$33,000); 5) establishment of smooth cordgrass along the shoreline of Moses Bayou (\$15,000); 6) control of Chinese tallow trees in the prairie ecosystem (\$21,000); 7) implementation of a prairie burning program (\$25,620); 8) establishment of a managed

cattle grazing program (\$35,000); and 9) mechanical removal of nuisance brush (\$18,500). While greatly benefiting the endangered Attwater Prairie Chicken and several upland communities, the benefits of this project to estuarine and marine resources would mainly come from the construction of a small amount of wetlands along the shoreline of Moses Bayou and oyster reef in Moses Slough.

4 - Dredging the Channel to Liberty for Reconstruction of Vingt-et-Une Islands - This alternative would reduce the shoaling problem in the channel to Liberty, Texas and use dredge material for creation of an island (part of the Vingt-et-Une Islands) that could be enhanced in the future as a rookery island. The Vingt-et-Une Islands are state-owned and provide colonial waterbird nesting habitat. Due to extensive erosion, only one island remains from the 21-island chain mapped in 1831; this island has been leased by the National Audubon Society from the Texas General Land Office for the past thirty-five years. Jeri's Seafood, Inc., proposes to dredge 16,400 linear feet of the federally authorized channel to Liberty between stations 340 to 410 near Smith Point, Chambers County to obtain material for construction of a new island. The cost of this alternative would fund only the dredging and is estimated at \$1.6 million. The primary benefit of this project would be to improve navigational access to portions of the Galveston Bay system. The island construction associated with dredging would provide nesting habitat for colonial waterbirds. If the island provides erosional protection to the wetlands of Smith Point, the project would benefit natural resources dependent on these wetlands. Salt marsh habitat provides nursery functions for many finfishes and crustaceans in Galveston Bay and foraging habitat for birds. These wetlands also provide water-quality functions that should benefit aquatic organisms in the bay system.

5 - Restoration of Colonial Waterbird Nesting Habitat on Vingt-et-Une Islands - The Vingt-et-Une Islands located near Smith Point in western Galveston Bay have undergone severe erosion, and only one island remains from the 21-island chain mapped in 1831. This project, proposed by the Houston Audubon Society, would restore the remaining relatively-low elevation island to a 5-acre island suitable as colonial waterbird nesting habitat. The source of construction material is likely to be sand from a nearby site, and geotextile tubes are proposed to prevent future erosion of island shorelines. The project cost is \$529,650. This alternative would mainly benefit colonial waterbirds. If the island provides erosional protection to the wetlands of Smith Point, the project would benefit natural resources dependent on these wetlands. Salt marsh habitat provides nursery functions for many finfishes and crustaceans in Galveston Bay and foraging habitat for birds. These wetlands also provide water-quality functions that should also benefit aquatic organisms in the bay system.

6 - Swan Lake Wave Barrier and Wetland Construction - This alternative proposed by the Texas Parks and Wildlife Department (TPWD) involves construction of a segmented rock barrier at the entrance to Swan Lake and construction of salt marsh behind the barrier. This area on the western shore of Galveston Bay is subject to high wave energy and erosional forces. The rock barrier is necessary to allow construction of wetlands in

protected waters. Project proponents also anticipate that natural sediment accumulation will occur once barriers are installed, and this shoaling will result in additional wetland growth in the area. The barrier will be constructed with large tidal passes and bird nesting areas, and the protected areas behind the barrier will provide ideal locations for future deposition of dredged sediment and creation of wetland habitat. The amount of wetlands actually constructed in the project will be dependent upon the length of rock barrier. TPWD estimates that the cost of two barrier segments and the construction of 20 acres of wetlands will total \$1.1 million. The construction of salt marsh habitat would benefit aquatic organisms, because this habitat provides nursery functions for many finfishes and crustaceans in Galveston Bay. These wetlands also provide water-quality functions that should also benefit aquatic organisms in the bay system. In addition, this alternative would benefit birds by providing nesting, resting, and foraging habitat.

7 - Wetland Construction in Galveston Bay - This alternative would construct emergent estuarine wetlands within Galveston Bay. ENTRIX, Inc. proposes to implement a phased plan that would consist of site selection, permitting, construction of wave barriers, transplanting smooth cord grass, and follow-up monitoring. Potential sites would be evaluated by the following criteria: presence of critical wetland loss; property ownership; vegetative colonization potential; public access; equipment type and accessibility; exposure to wave energy; and direct restoration of habitat injured by the Apex spill. Potential sites identified include Marrow Marsh; Swan Lake; Mesquite Knoll; Tabbs Bay; Dickinson Bay; northern shoreline of East Galveston Bay; Goose Creek; and the western shoreline of Trinity Bay. The estimated cost is \$29,900 per acre of salt marsh constructed. The construction of salt marsh habitat in this alternative would benefit natural resources in the Galveston Bay system. These marshes provide nursery habitat for many finfishes and crustaceans and foraging habitat for birds. In addition, these wetlands provide water-quality functions that should also benefit aquatic organisms in the bay system.

8 - Pierce Marsh Wetland Construction - This alternative would construct 34 acres of estuarine emergent wetlands and submerged aquatic vegetation on state owned lands within Pierce Marsh, Galveston County, Texas. The project is proposed by the U.S. Fish and Wildlife Service (USFWS) and the Galveston Bay Foundation (GBH). Wetlands will be constructed in shallow open water by building low levees or terraces in an open box design. The terraces will be planted with smooth cordgrass, and the protected areas within the cells will be planted with seagrasses. This technique has been successfully used for wetland construction in Louisiana. The estimated cost of the project is \$207,000. Project proponents have also applied for matching funds through the North American Wetland Conservation Act. If obtained, these funds would be used to acquire 1600 acres of wetlands adjacent to the proposal site. and a conservation easement would provide for protection of these wetlands in perpetuity. The construction of salt marsh and seagrass habitats in this alternative would benefit natural resources in the Galveston Bay system. Marshes and seagrass beds provide nursery habitat for many finfishes and

crustaceans and foraging habitat for birds. In addition, these wetlands provide water-quality functions that should benefit aquatic organisms in the bay system.

9 - Galveston Island State Park Wetland Construction - This alternative proposed by the Texas Parks and Wildlife Department (TPWD) involves construction of 4000 linear feet of wave-protection berms with associated wetland habitats on the West Bay shoreline of the Galveston Island State Park. The berms would simulate sand/shell spits and nesting islands, and would act as cells for receiving material to increase the level of submerged land to wetland planting grade. Habitats created would include a minimum of 115 acres of intertidal wetland, 25 acres of salt-flat/high-marsh wetland, one acre of seagrass beds, and three acres of colonial waterbird nesting habitat. The total project cost is \$1,987,000, and TPWD has requested \$537,000 in funding from the Apex Trustee Council. TPWD will provide some of the remaining funds but is also applying for a grant through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program. If the CWPPRA grant is not received, TPWD proposes to utilize the requested Apex funds to undertake a scaled-down version of the project that includes the construction of 1000 linear feet of shoreline protection (barrier islands) and development of at least 30 acres of intertidal wetlands. The construction of salt marsh and seagrass habitats in this alternative would benefit natural resources in the Galveston Bay system. Marshes and seagrass beds provide nursery habitat for many finfishes and crustaceans and foraging habitat for birds. In addition, these wetlands provide water-quality functions that should benefit aquatic organisms in the bay system. This alternative would also benefit birds by providing nesting and resting habitat.

10 - Interstate 45 Highway Corridor Wetland Construction - This alternative involves construction of a 57-acre wetland at a dredge-disposal site and borrow pit. The project area is located within a large salt marsh complex along the main highway onto Galveston Island and is currently used as a leveed dredge-disposal storage area. Several deep open-water ponds are also present on the site. This project is proposed by Scenic Galveston, an affiliate of Scenic Texas/America, in conjunction with the U.S. Fish and Wildlife Service (USFWS) and will relocate the stored dredge material to adjacent ponds and construct an emergent wetland. The project is estimated to cost \$350,000 and implementation is dependent upon acquisition of the targeted property by Scenic Galveston using dedicated private funding. Negotiations on the acquisition are in progress. The construction of salt marsh habitat in this alternative would benefit natural resources in the Galveston Bay system. These marshes provide nursery habitat for many finfishes and crustaceans and foraging habitat for birds. In addition, these wetlands provide water-quality functions that should also benefit aquatic organisms in the bay system.

11 - San Jacinto State Park Wetland Construction - This alternative involves the creation of emergent brackish marsh in open-water ponds within the San Jacinto Historical State Park. This project proposed by the Texas Parks and Wildlife Department will use dredged material from the HSC (from near Morgans Point) to create approximately 40

acres of wetlands. The proposal calls for installing a temporary water-control structure, filling the area with dredged sediments, and planting with smooth cordgrass. The cost of the project is estimated to be \$139,100. The construction of brackish marsh in this alternative would benefit natural resources in the Galveston Bay system. These marshes provide nursery habitat for some finfishes and crustaceans and foraging habitat for birds. In addition, these wetlands provide water-quality functions that should also benefit aquatic organisms in the bay system.