

# Appendix M

## FWCA REPORT

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## **UPDATE TO THREATENED AND ENDANGERED SPECIES**

Since the completion of the enclosed U.S. Fish and Wildlife Coordination Act Report for this project, the brown pelican (*Pelecanus occidentalis*) was removed from the List of Threatened and Endangered Species on December 17, 2009. It continues to be protected under the Migratory Bird Treat Act (MBTA, 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).





## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
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Lafayette, Louisiana 70506

July 29, 2009

Colonel Alvin B. Lee  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Lee:

Enclosed is the Service's Fish and Wildlife Coordination Act Report for the Calcasieu River and Pass, Calcasieu and Cameron Parishes, Louisiana Dredged Material Management Plan (DMMP). This report constitutes the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS) and their comments on this report have been incorporated.

Should your staff have any questions regarding the enclosed draft report, please have them contact Angela Trahan of this office at 337/291-3137.

Sincerely,

James F. Boggs  
Supervisor  
Louisiana Field Office

Enclosure

cc: FWS, Atlanta, GA (ES/PP)  
FWS, Southwest Louisiana Refuge Complex, Bell City, LA  
EPA, Dallas, TX  
NMFS, Baton Rouge, LA  
LDWF, Baton Rouge, LA  
OCPR, Baton Rouge, LA





**Calcasieu River and Pass,  
Louisiana Dredged Material Management Plan**

**FISH AND WILDLIFE COORDINATION ACT REPORT**



**PROVIDED TO**

**NEW ORLEANS DISTRICT**

**U.S. ARMY CORPS OF ENGINEERS**

**NEW ORLEANS, LOUISIANA**

**PREPARED BY**

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**U.S. FISH AND WILDLIFE SERVICE**

**ECOLOGICAL SERVICES**

**LAFAYETTE, LOUISIANA**

**July 2009**





## **EXECUTIVE SUMMARY**

The U.S. Fish and Wildlife Service (Service) has prepared the attached Fish and Wildlife Coordination Act Report regarding the U.S. Army Corps of Engineers' (Corps) proposed Calcasieu River and Pass, Louisiana Dredged Material Management Plan (DMMP). The Corps Guidance for Conducting Civil Works Planning Studies Engineering Regulation (i.e., ER 1105-2-100) provides the requirement for the preparation of DMMPs to ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically warranted, and that sufficient confined disposal facilities (CDFs) are available for at least the next 20 years. The current capacity of available disposal sites is estimated at five million cubic yards, while the volume of material needed to be dredged over the next 20 years to maintain authorized dimensions is estimated at 97 million cubic yards.

The project-area comprises coastal wetlands in the Calcasieu-Sabine Basin. Those wetlands support nationally important fish and wildlife resources, but are experiencing continued loss and degradation. Through the Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA), the Corps, the Service, and other Federal and State agencies have jointly developed strategies to protect and restore Louisiana's diminishing coastal wetlands, including those in the Calcasieu-Sabine Basin. One of those strategies includes the beneficial use of maintenance dredged material to restore coastal wetlands.

Four DMMP alternatives were evaluated including alternative Plan A, the no-action alternative; alternative Plan B, the recommended plan, which is primary placement in CDFs, with supplemental placement in beneficial use areas; alternative Plan C, which emphasizes placement in beneficial use areas; and alternative Plan D, which includes placement of material in the Ocean Dredged Material Disposal Site (ODMDS). The Corps expects to conduct future detailed engineering and design work for features of the DMMP which the Service expects will result in a number of changes in costs and environmental impacts of those project features.

The recommended plan was formulated to maximize the use of the Federal and local sponsors' investments in lands, easements, and costs for real estate improvements that have occurred over the life of the project and focuses on placing material primarily in CDFs supplemented with beneficial use disposal areas. Approximately 30 percent of material dredged between River Miles 5 to 36 to maintain navigation would be placed in beneficial use sites for the restoration of subsided and eroded coastal wetlands. Because of the complexity and scope of this proposed project and its relationship to coastal ecosystem restoration, extensive coordination between the Corps and the Service will be required throughout the detailed design phases to ensure that opportunities to protect and restore coastal wetlands and their associated fish and wildlife resource values are fully addressed.

Implementation of the recommended plan (Plan B), as currently envisioned, would benefit a net balance 1,259.68 AAHUs. Approximately 6,306 acres of coastal marsh would be restored through the deposition of dredged material in interior open-water disposal areas and bankline

disposal areas. Dredged material disposal would eliminate 69 acres of emergent marsh and convert 443 acres of Calcasieu Lake to uplands. According to the Wetland Value Assessment (WVA) conducted by Gulf Engineers Consultants, Incorporated (G.E.C., Inc.), in cooperation with the Service, expanding CDFs for alternative Plan B would cause a decrease in net average annual habitat units (-45.47 AAHUs). This decrease would be offset by the creation of 6,306 acres of estuarine marsh (i.e., 1,305.15 AAHUs) through the beneficial use of dredged material. It is our understanding that expansion of existing CDFs 9, 10, 11, and 13 into adjacent emergent marsh would not be necessary for the 20-year DMMP, and upon the request of the resource agencies, the Corps has removed them from the 20-year plan. Impacts associated with expansion of those CDFs would have resulted in the loss of approximately 236.13 AAHUs and 545 acres of emergent marsh habitat.

Alternative Plan C involves using existing boundaries of CDFs, therefore, only those activities associated with beneficial use disposal sites would impact marsh habitat. The creation of beneficial use sites for alternative Plan C would result in a positive net balance of 2,035.08 AAHUs. Potential wetland impacts associated with accessing beneficial use disposal sites have not been evaluated, and detailed design documents have not been developed.

In addition to providing safe and reliable navigation, implementation of the recommended plan could potentially create substantial areas of coastal marsh habitat. In support of comprehensive State and Federal efforts to conserve Louisiana's nationally significant coastal wetlands, avoidance and minimization of direct wetland impacts should be pursued to the greatest extent practicable, regardless of whether or not the project would produce net environmental benefits (expressed in AAHUs). Minimization of direct and indirect project-related impacts would also help to ensure that Corps projects are consistent with the purposes of the restoration plan that was prepared in compliance with Section 303 (d) of Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). In 1998, the Louisiana Coastal Wetlands Conservation and Restoration Task Force updated and revised that plan which is now entitled the Coast 2050 Plan [Louisiana Coastal Wetlands Conservation and Restoration Task Force (LCWCRTF) 1998].

The Service would not object to further detailed planning and implementation of the recommended plan provided that the project incorporates the following recommendations to avoid unnecessary impacts to fish and wildlife resources, to quantify indirect project impacts, to achieve the anticipated wetland creation benefits, and to mitigate for unavoidable project-related wetland impacts:

1. To the greatest extent practicable, beneficial use sites should be considered the primary disposal option over CDFs and should be used prior to disposing in CDFs.
2. According to the Corps, the DMMP will be updated every five years. The Service, the NMFS, the LDNR, and the LDWF should be involved early on in this planning effort to identify any potential change in conditions including additional beneficial use disposal options and the overall placement capacity needed for maintaining the channel.

3. Detailed design documents (e.g., design reports, plans and specifications, etc.) of the waterway and disposal sites should be prepared in consultation with the Service, the NMFS, the LDNR, and the LDWF to avoid unnecessary wetland impacts and to achieve the anticipated wetland creation benefits. At that time, WVA calculations should be updated to more accurately reflect project impacts and/or benefits. The following are some beneficial use disposal area design features that have been implemented for marsh creation projects in the Calcasieu-Sabine Basin and should be considered in all future sites:
  - a. beneficial use disposal areas should have constructed bayous and openings to existing bayous (e.g., fish dips) to facilitate water exchange and aquatic organism access, openings should be constructed after dredged material has stabilized and vegetation has colonized;
  - b. initial marsh elevations should be designed to + 4.5' MLG with a target elevation of + 2.5' MLG (1.1 NAVD 88);
  - c. beneficial use disposal area containment dikes should be breached or degraded to the settled elevations of the disposal area. Such breaches should be undertaken after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface;
  - d. for beneficial use disposal areas along Calcasieu Lake, fish dips or gaps should be located approximately every 1,000 feet to allow for some aquatic organism access and hydraulic exchange with those marsh creation areas; and,
  - e. fish dips should have a minimum bottom width of 20 feet, a minimum depth of at least 1 foot below target marsh elevations (0.0 NAVD 88), and rock armoring on the sides and bottom to minimize scour.
4. Shoreline protection features along the right descending bank between RM 16.5 and RM 18.7 should avoid obstructing Black Lake Bayou and Crab Gully.
5. To allow for some hydraulic exchange and aquatic organism access and to avoid impoundment of shallow open water areas, erosion control/shoreline protection features along the ship channel and waterward of interspersed marsh and shallow open water habitat should also include fish dips or gaps approximately every 1,000 feet. Design of those features should be prepared in consultation with the Service, the NMFS, the LDNR, and the LDWF to avoid unnecessary impacts to fish and wildlife resources.
6. Monitoring of shoreline erosion should be conducted in conjunction with the scheduled 5-year DMMP review. Should shoreline erosion rates increase along natural marsh shorelines relative to the proposed shoreline protection features, efforts should be made to provide protection to those riparian marsh habitats.
7. Fee title or an equivalent easement should be acquired for any mitigation lands to preclude incompatible development and to ensure that the recommended mitigation

values are maintained over the project life; costs for development, maintenance, and monitoring of mitigation lands should be allocated as a project first cost in future project funding estimates and requests.

8. The Corps should continue to coordinate with the Service throughout planning and construction to ensure that the proposed project does not impact waterbird nesting colonies, and threatened or endangered species.
9. Surveys should be conducted to document active, but undocumented, wading bird rookeries and colonial nesting birds within the project areas. If active nests are found, consultation with the Service should be initiated to ensure that project activities do not impact any colonial nesting bird colonies.
10. Project features should be implemented and operated consistent with the Louisiana Coastal Restoration Plan, as required by Section 303(d) of CWPPRA.
11. The Corps should continue planning efforts in coordination with the natural resource agencies to determine the feasibility of constructing bird islands or restoring Rabbit Island with material typically used (e.g., silts and clays) to create such habitat on Louisiana's coast.

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## **INTRODUCTION**

The U.S. Army Corps of Engineers (Corps), New Orleans District, has prepared a dredge material management plan (DMMP) and draft Environmental Impact Statement (EIS) for the disposal of dredged material for the routine maintenance of the Calcasieu River and Pass, Louisiana project (i.e., Calcasieu Ship Channel). The project area includes river mile (RM) -32.0 to 36.0 of the Calcasieu Ship Channel and is located in southwest Louisiana in Cameron and Calcasieu Parishes. The current Calcasieu River and Pass, Louisiana project scope is authorized by the River and Harbor Act of 1946, Public Law (P.L.) 79-525, July 24, 1946; the River and Harbor Act of 1960, P.L. 86-645, July 14, 1960; and Section 201 of the Flood Control Act of 1965, P.L. 89-298, October 27, 1965. The Corps Guidance for Conducting Civil Works Planning Studies Engineering Regulation (i.e., ER 1105-2-100) provides the requirement for the preparation of DMMPs to ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically warranted, and that sufficient confined disposal facilities are available for at least the next 20 years. This report is provided under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and constitutes the report of the Secretary of the Interior required by Section 2(b) of that Act. This report has been coordinated with the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS). Prior coordination provided by those agencies is also included in this draft report (Appendix A).

## **DESCRIPTION OF STUDY AREA**

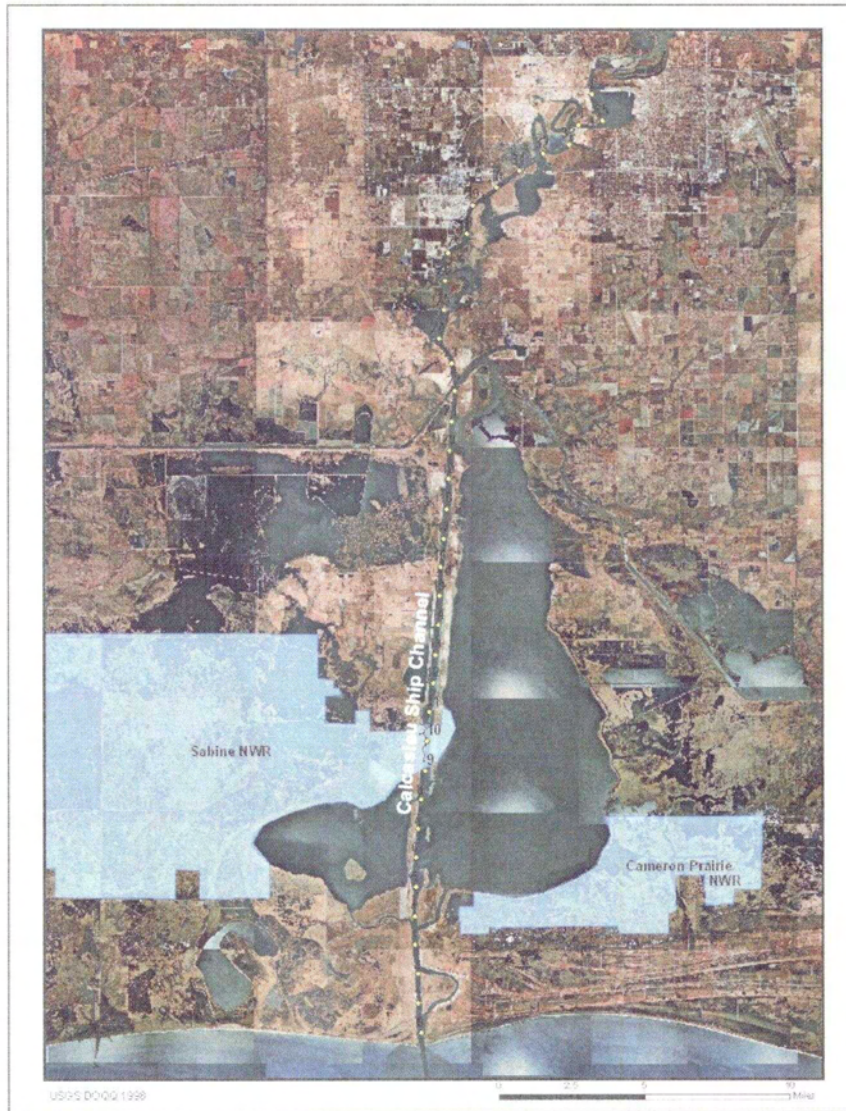
The Calcasieu Ship Channel is located in the Calcasieu-Sabine Basin of the Chenier Plain in southwest Louisiana in Cameron and Calcasieu Parishes (Figure 1). The project area is bordered on the north by U.S. Interstate 10 and on the south by the Gulf of Mexico. Industrial development dominates the northern portion of the channel near Lake Charles, Louisiana. Upland confined disposal facilities (CDFs) flank the east and west boundaries of the channel along with a variety of wetland habitats. Major open water areas that occur throughout the project site include Lake Charles, Prien Lake, Moss Lake, and Calcasieu Lake. The Gulf Intracoastal Waterway (GIWW) traverses through the northern portion of the project site just north of Calcasieu Lake.

## **FISH AND WILDLIFE RESOURCE CONDITIONS**

### **Existing Fish and Wildlife Habitats**

Despite the substantial human alterations referenced above, the extensive wetlands of the Calcasieu-Sabine Basin support nationally significant fish and wildlife resources. In 1990, that basin contained 317,100 acres of marsh and 170 acres of cypress-tupelo swamps [Louisiana

**Figure 1. Calcasieu River and Pass, Louisiana Dredged Material Management Plan Study Area.**



Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority (LCWCRTF) 1998]. The study area comprises a diversity of habitats, including forested lands, scrub/shrub habitats, fresh and estuarine marshes and associated open water. Estuarine marshes include the intermediate, brackish, and saline types. Developed lands consist of industrial areas including oil and gas fields, agricultural areas, and commercial and residential developments. The Calcasieu Ship Channel has played a major role in converting habitat types. Historically, the Calcasieu-Sabine Basin was composed of predominantly brackish and intermediate marsh and submerged aquatic and open water habitats. The majority of marsh loss and convergence to more saline habitats occurred between 1956 and 1974 after the enlargement of the ship channel increased saltwater intrusion. Recently, several hydrologic management projects and marsh creation projects have been implemented to control marsh salinity levels and restore marsh acres (LCWCRTF 1999). Predominant habitats and their associated fish and wildlife values are described below.

### Forested Habitat

Pine-hardwood forested habitat is known to occur north of the GIWW and predominantly around the Lake Charles area. That habitat includes areas dominated by longleaf and loblolly pine, Chinese tallowtree, rough-leaf dogwood, wax myrtle, and deciduous holly. Smaller areas of forested habitat occur along the dredged material disposal areas, distributary ridges, and man-made canal banks. Those areas are vegetated with such species as Chinese tallowtree, wax myrtle, black willow, red maple, and a variety of oak species along the higher elevations.

A well known attribute of the Chenier Plain is the chenier ridge habitat that formed on abandoned beach ridges and is dominated by live oaks and hackberry. Cheniers are important storm barriers limiting saltwater intrusion into marshes, and occur along the southern portion of the project scope between Calcasieu Lake and the Gulf of Mexico. Typically, marshes north of cheniers are fresher than those gulfward.

### Scrub-Shrub Habitat

Typical vegetation in scrub-shrub habitat includes big-leaf sumpweed, common reed, Chinese tallowtree, eastern baccharis, marsh elder, black willow, wax myrtle and goldenrod. Scrub-shrub habitat occurs on dredged material disposal areas, canal spoil banks, abandoned agricultural areas, and drained wetlands. Those habitats often support a variety of wildlife, depending on local conditions; they provide nesting and feeding sites for wading birds, songbirds and other birds, and wildlife escape cover.

### Fresh Marsh

Although saltwater intrusion has contributed to more of a saline/estuarine marsh structure in the Calcasieu-Sabine Basin, hydrologic restoration projects have been implemented to maintain remaining areas of fresh marsh. Fresh marsh is known to occur west of Louisiana Highway 27 within the Sabine National Wildlife Refuge (NWR) and areas north, as well as within the interior marshes east of Calcasieu Lake. Fresh marsh is frequently dominated by alligator weed, roseau cane (common reed), pickerelweed, water hyacinth, and bulltongue.

### Intermediate Marsh

Intermediate marsh occurs within the Calcasieu-Sabine Basin between the fresh and brackish marsh communities predominantly west of Louisiana Highway 27, western route and within the interior marshes between Calcasieu Lake and Louisiana Highway 27, eastern route. Intermediate marsh has an irregular tidal regime, with salinity ranging from 3 to 10 parts per thousand (ppt). The plant community of the intermediate marsh is characterized by a diversity of species also known to be found in freshwater and brackish marshes including wire grass, bulltongue, big cordgrass (hog grass), gulf cordgrass, giant bulrush, and sawgrass. This marsh type is very important to many species of avian wildlife and supports large numbers of wintering waterfowl. It is also critical nursery habitat to larval marine organisms. Gradual changes in salinity conditions can cause this habitat to shift towards brackish marsh.

### Brackish Marsh

Dominant along the ship channel is the brackish marsh plant community. Plant diversity begins to decrease as the habitats become more saline. Brackish marsh salinity averages about 8 ppt and is typically dominated by marshhay cordgrass. Other species that may be found in this habitat type include three-cornered grass, salt marsh bulrush, black needle rush, smooth cordgrass, and big cordgrass. This community may be changed to another marsh type by shifts in salinity. Intrusion of salt water from the Gulf of Mexico up numerous waterways exerts a major influence in the configuration of the various marsh types.

### Saline Marsh

Saline marsh habitat exists in the project area closest to the beach rim of the Gulf of Mexico and along the Lower Lake (i.e., RMs 5 to 12) and Pass (i.e., RMs 0 to 5) portions of the Calcasieu Ship Channel. Saline marsh is a regularly tidally-flooded habitat with a mean salinity of approximately 16 ppt. Saline marsh has the least plant diversity and is often totally dominated by smooth cordgrass. Other species associated with saline marsh habitat includes wiregrass, salt grass, black needle rush, and salt wort.

### Open Water

Small ponds and shallow open water areas associated with each of the above marsh plant communities are scattered throughout the project area. Some of the more defined open water areas include Lake Charles, Prien Lake, Moss Lake, and Calcasieu Lake along the ship channel; Black Lake, Browns Lake, and Mud Lake west of the ship channel; and Willow Lake and Sweet Lake east of the ship channel.

### Submerged Aquatic Vegetation Habitat

Some protected shallow open water habitats within the project area support submerged aquatic vegetation (SAV). Prior to Hurricane Rita concentrations of SAVs occurred as high as 80 percent cover within Cameron Prairie National Wildlife Refuge (NWR) and those concentrations are expected to return (personal communication with NWR personnel 2007). Project area SAV habitats are dominated by widgeon grass and may also be colonized with duckweeds, coontails, bladderworts, watermilfoil, hydrilla, mermaidweeds, and pondweeds. As these aquatic plants die, their decomposition by bacteria and fungi contribute to the food web by providing detritus for many aquatic invertebrates. SAVs are very important to wildlife and are utilized by many duck species.

### Developed Lands

Developed areas are located on the higher elevations of the Pleistocene terrace along the GIWW and around the Lake Charles area and are typically well drained. They include agricultural lands and commercial and residential developments. Levees are also included in this category.

Typically, levees are frequently mowed, and, as such, provide poor wildlife habitat. However, some levees are vegetated with an assortment of scrub/shrub species including marsh elder, eastern baccharis, Chinese tallowtree, common reed, and goldenrod. These higher-elevation areas may provide low-to-moderate-value habitat for terrestrial wildlife, including some migratory bird species.

## **Existing Fishery Resources**

The project-area wetlands and associated shallow waters provide nursery and feeding habitat for recreationally and commercially important estuarine-dependent fishes and shellfishes (e.g., red drum, black drum, Atlantic croaker, spot, sand seatrout, spotted seatrout, southern flounder, Gulf menhaden, striped mullet, blue crab, white shrimp and brown shrimp). Commercial shrimp harvests have been positively correlated with the area of tidal emergent wetlands (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes would likely be adversely impacted by continued losses in estuarine marsh habitat (Turner 1982). Portions of the project area also provides habitat for several species of freshwater fishes that can tolerate low-salinity conditions, including largemouth bass, bluegill, warmouth, gars, freshwater drum, blue catfish and channel catfish.

Salt and brackish marsh acts as nursery areas for myriads of larval forms of shrimp, crabs, redfish, seatrout, menhaden, etc., and greatly enhances the production of marine organisms directly related to the enormous primary productivity of the marsh vegetation. Factors which promote the growth of estuarine marsh plants include: (1) a long growing season; (2) abundant rainfall; (3) presence of soil nutrients; and (4) low tide differential and tidally transported nutrients. Natural factors negatively impacting estuarine marsh include prolonged periods of inundation caused by winds, tides, or rain, especially those periods associated with hurricanes, subsidence, and erosion. Salt marsh also functions as a nitrogen and phosphorus sink (at least seasonally), thereby improving the quality of water that passes through it. In addition, it can alleviate the effects of storms and flooding by acting as a buffer and providing storage for large amounts of water. Vegetative production rates in estuarine marshes are extremely high, providing an abundance of detritus to support the estuarine food web.

Much of the existing project area-wetlands are subject to permitted structural management that varies from semi-impounded to completely impounded marsh. The majority of the water control structures within the semi-impounded management areas are supposed to be operated to allow ingress and egress of estuarine fishery organisms, especially brown shrimp and white shrimp, except during drawdowns, periods of high salinity, or waterfowl seasons. Unmanaged coastal wetlands are of particular importance due to their relative scarcity within the Calcasieu-Sabine Basin.

### Essential Fish Habitat

Estuarine wetlands and associated shallow waters within the project area have been identified as Essential Fish Habitat (EFH) for both postlarval and juvenile stages of gulf stone crab, brown

shrimp, white shrimp, and red drum, as well as the adult stages of the red drum in the nearshore and offshore reaches. EFH has also been designated for various life stages of cobia, lane snapper, dog snapper, and bonnethead shark in the nearshore, marine-portion of the project area and in the lower portions of the estuary. EFH requirements vary depending upon species and life stage. Categories of EFH in the project area include estuarine emergent wetlands, estuarine water column, submerged aquatic vegetation, and estuarine water bottoms. Detailed information on Federally managed fisheries and their EFH is provided in the 2005 generic amendment of the Fishery Management Plans for the Gulf of Mexico, prepared by the Gulf of Mexico Fishery Management Council (GMFMC). That generic amendment was prepared in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), (P.L. 104-297). Estuarine-dependent species such as those listed above also serve as prey for other species managed under the MSFCMA by the GMFMC (e.g., mackerels, snappers, and groupers) and highly migratory species (e.g., billfishes and sharks) managed by the NOAA-Fisheries.

### **Existing Wildlife Resources**

The project area supports an array of productive coastal habitats, dominated by intermediate and brackish marshes and associated shallow estuarine waters. The project-area wetlands and adjacent shallow waters, as well as the chenier ridges, support numerous Federal-trust wildlife resources, including migratory birds, threatened and endangered species, and various Federal and private land holdings that are held or managed to benefit those species.

The chenier and coastal forest habitats associated with the project area provide nesting habitat for songbirds (e.g., the mockingbird, yellow-billed cuckoo, brown thrasher and northern parula), as well as stopover areas for trans-Gulf migrating songbirds. Other avian species found in project area's forested habitats include the American woodcock, common "yellow-shafted" flicker, belted kingfisher, and several species of raptors (e.g., red-tailed hawk and red-shouldered hawk). Wading bird colonies containing species such as anhinga, great egret, and great blue heron typically occur in wooded wetland and scrub-shrub habitat.

Mammals associated with the project area forested habitats include game species such as eastern cottontail, swamp rabbit, white-tailed deer, and gray and fox squirrels; commercially important furbearers such as river otter, muskrat, and nutria; and other mammal species such as striped skunk, coyote, nine-banded armadillo, and Virginia opossum. Smaller mammals such as the cotton rat, marsh rice rat, and white-footed mouse serve as forage for both mammalian and avian carnivores.

Reptiles which utilize study-area forested habitats include the ground skink, five-lined skink, green anole, and western ribbon snake, and numerous other species. Some of the amphibians expected to be found in study-area forested habitats including small-mouthed salamander, green treefrog, bullfrog, and southern leopard frog.

Wildlife expected to utilize the study-area estuarine marshes include wading birds (e.g., herons, egrets, ibises, and roseate spoonbills), rails, migratory waterfowl (e.g., green-winged teal, blue-

winged teal, mottled duck, gadwall, American widgeon, and lesser scaup), raptors, and songbirds. Brackish marshes having abundant submerged aquatic vegetation often support large numbers of puddle ducks. Shorebirds utilizing estuarine marshes include killdeer, American avocet, black-necked stilt, American oystercatcher, common snipe, and various other species. Seabirds include white pelican, brown pelican, black skimmer, herring gull, laughing gull, and several species of terns. Other nongame birds such as boat-tailed grackle, red-winged blackbird, seaside sparrow, olivaceous cormorant, belted kingfisher, and sedge wren also utilize estuarine marshes.

Estuarine marsh wildlife also includes swamp rabbit, nutria, muskrat, mink, river otter, raccoon, white-tailed deer, and coyote. Reptiles are limited primarily to the American alligator in intermediate and brackish marshes, and the diamond-backed terrapin and gulf salt marsh snake in brackish and saline marshes. Juvenile sea turtles may seasonally utilize bays and saline marsh ponds in the lower Calcasieu Estuary.

### Threatened and Endangered Species

Federally listed threatened or endangered species that are known to occur within the study area include the brown pelican (*Pelecanus occidentalis*), federally listed as an endangered species, and the piping plover (*Charadrius melodus*), federally listed as a threatened species. The American alligator (*Alligator mississippiensis*) is found in the study area, but is classified as "threatened due to similarity of appearance"; alligators are not biologically endangered or threatened. The occurrence of the West Indian manatee (*Trichechus manatus*) in Calcasieu Lake has been documented; however, it is rare. Several species of sea turtles have also been known to occur in the southern portion of Calcasieu Lake.

Brown pelicans are currently known to nest on Rabbit Island in Calcasieu Lake. Pelicans change nesting sites as habitat changes occur. In spring and summer, nests are built in mangrove trees or other shrubby vegetation, although ground nesting may also occur. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

The piping plover as well as its designated critical habitat, occur along the Louisiana coast. Piping plovers winter in Louisiana, and may be present for 8 to 10 months annually. They arrive from the breeding grounds as early as late July and remain until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependent on a mosaic of sites distributed throughout the landscape, because the suitability of a particular site for foraging or roosting is dependant on local weather and tidal conditions. Plovers move among sites as environmental conditions change; and studies have indicated that they generally remain within a 2-mile area. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and

predation.

On July 10, 2001, the Service designated critical habitat for wintering piping plovers (Federal Register Volume 66, No. 132). Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. The project scope does not include designated critical habitat areas associated with the intertidal coastal areas.

West Indian manatees, federally listed as an endangered species, occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatee occurrences and their distribution appear to be increasing, as they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast and infrequently observed along the Texas Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

All contract personnel associated with the project should be informed of the potential presence of manatees and the need to avoid collisions with manatees, which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. All construction personnel are responsible for observing water-related activities for the presence of manatee(s). Temporary signs should be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel movement zones (i.e., work area), and at least one sign should be placed where it is visible to the vessel operator. Siltation barriers, if used, should be made of material in which manatees could not become entangled, and should be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions should be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, should be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area on its own accord, special operating conditions are no longer necessary, but careful observations would be resumed. Care should also be taken during construction and design of dredge placement sites and shoreline protection features to ensure ingress and egress is maintained between interior ponds and the open bays and Gulf to avoid entrapment of individuals. Any manatee sighting should be immediately reported to the Service's Lafayette, Louisiana Field Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821).



The National Marine Fisheries Service (NMFS) is responsible for aquatic marine threatened or endangered species. Please contact Eric Hawk (727/570-5312) in St. Petersburg, Florida, for information concerning this and other sea turtle species in their aquatic environment.

The Corps' July 2, 2007, biological assessment determined that Alternative Plan B of the proposed DMMP is not likely to adversely affect the brown pelican and the piping plover, or its designated critical habitat. The Service concurred with that determination by letter dated November 13, 2007. According to our records piping plover critical habitat and brown pelican nesting habitat would not be impacted by the implementation of the preferred plan. No further ESA consultation with the Service regarding the brown pelican and the piping plover, or its designated critical habitat would be required for the proposed action unless there are changes in the scope or location of the project elements, or the project has not been initiated within one year from the date of this report. Because a majority of the proposed disposal areas designated in the DMMP would not be used within one year, follow-up consultation is likely, and should be accomplished with the Service prior to making expenditures for those disposal areas to ensure that threatened and endangered species information is up-to-date. If the scope or location of the proposed action is changed, re-initiation of consultation should occur as soon as such changes are made.

### Wildlife Refuges

Sabine NWR is comprised of 124,511 acres of coastal marsh west of the Calcasieu Ship Channel, and its primary management objective is to preserve a large area of coastal wetlands for wintering and migrating waterfowl from both the Mississippi and Central Flyways. This refuge is also a major nursery area for many estuarine-dependent marine species as well as being the home for alligators and other reptiles, mammals, and numerous wading, water and marsh birds. Cameron Prairie NWR is located east of the ship channel. Two units (i.e., the Gibbstown and East Cove units) compose this refuge and provide brackish to saline marsh habitats to support alligators, cottonmouth snakes, white-tailed deer, rabbits, roseate spoonbills, and more than 200 other birds, as well as shrimp, crabs, and many species of fish. Should proposed project activities directly or indirectly affect those NWRs, please contact Don Voros, the Southwest Louisiana National Wildlife Refuge Complex Leader (337-598-2216), to obtain a Compatible-Use Determination, and to ascertain the need for a Special Use Permit that may be required should work be conducted on that NWR. There are no state or national parks, state wildlife refuges, or wildlife management areas located near the study area.

### **Future Fish and Wildlife Resources**

As part of the development of the report entitled Coast 2050: Toward a Sustainable Coastal Louisiana which was authorized under the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), future wetland acreages were projected through the year 2050. For the Calcasieu-Sabine Basin, a loss of 38,400 acres (i.e., 12 percent) of marsh and 170 acres (i.e., 100 percent) of swamp was projected between 1990 and 2050, at current levels of coastal

restoration funding (LCWCRTF 1998). Land loss rates within the Calcasieu-Sabine Basin from 1933 to 1990 have averaged approximately 0.5 percent per year. The total Calcasieu-Sabine loss rate is expected to be 12.1 percent over the next 50 years (Dunbar et al. 1992).

The major cause of land loss in the Calcasieu-Sabine Basin is saltwater intrusion caused by the construction and enlargement of the Calcasieu River and Pass navigation channel and the GIWW (LCWCRTF 1998). Those major waterways have allowed saltwater intrusion from the Gulf of Mexico to enter Calcasieu Lake and its surrounding marshes. This increased salinity has stressed less-saline marsh vegetation which has contributed to plant death and ultimately conversion of marsh to shallow open water. Erosion is also a problem along the Calcasieu Lake shoreline and the river and ship channel bankline. Between RMs 5 and 34, erosion is a significant contributor to sediment dredged from the Calcasieu Ship Channel. Ship wakes and wind waves are the predominant mechanism of erosion which contributes about 200,000 cubic yards of sediment to the system each year, more than two-thirds of the known sediment yield. Bankline recession is predominant, and the channel is widening by an average of 7.5 feet per year in this reach (Fischenich 2004).

Sea level rise and subsidence are also a cause of land loss (Penland and Ramsey 1990). The Calcasieu-Sabine Basin presently is experiencing moderate subsidence rates of 1.1 foot/century (Gagliano 1998). The combination of subsidence and sea level rise is called submergence or land sinking. As the land sinks, the marshes become inundated with higher water levels, stressing most non-fresh marsh plants and leading to plant death and conversion of marshes to open water. Other major causes of study-area marsh loss include altered hydrology, storm events, and developments including the direct and indirect impacts of dredge and fill activities (LCWCRTF 1998).

The continued loss of wetlands represents the most serious fish and wildlife-related problem in the study area. Losses in wetlands would result in gains in open water habitat and, to a lesser extent, developed land including CDFs for maintenance dredging. Wetland losses could be expected to cause significant declines in coastal fish and shellfish production and in the study area's carrying capacity for migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals such as white-tailed deer and swamp rabbit. Wetland losses will also reduce storm surge protection of developed lands, and will likely contribute to water quality degradation associated with excessive nutrient inputs.

Aside from marsh loss, salt water intrusion has converted fresh marsh habitats to more brackish communities. Marshes not hydrologically managed will continue to provide habitat for more salt tolerant species. Because of continued saltwater intrusion, habitat quality for freshwater fishes, waterfowl, alligators, and more freshwater-tolerant estuarine species (i.e., Gulf menhaden, white shrimp) will continue to decrease throughout most of this area, while habitat quantity and quality for species which prefer brackish and saline conditions (i.e., brown shrimp, spotted seatrout, and black drum) will increase (LCWCRTF 1999).

## DESCRIPTION OF ALTERNATIVES AND RECOMMENDED PLAN

Four DMMP alternatives were considered for providing disposal options for material dredged from the Calcasieu River and Pass for at least a 20-year project life. The current capacity of disposal sites is estimated at only five million cubic yards, while the volume of material needed to be dredged over the next 20 years to maintain authorized dimensions is estimated at 97 million cubic yards. Alternative Plan A, the no-action alternative or without project condition, consists of a continuation of the current operation and maintenance dredging at the constructed channel dimensions and placing the dredged material at the existing placement sites without modification. Alternative Plan B was formulated to maximize the use of the Federal and local sponsors' investments in lands, easements, and costs for real estate improvements that have occurred over the life of the project and focuses on placing material primarily in confined disposal facilities (CDFs) supplemented with beneficial use disposal areas. Alternative Plan C emphasizes the beneficial use of dredged material in the Upper (i.e., RM 12 and 22) and Lower Lake reaches, and reduces the need for confined disposal of dredged sediments. Alternative Plan D emphasizes the placement of material in the Ocean Dredged Material Disposal Site (ODMDS). For the River Reach, the handling and placement of material dredged under alternative plan D would be identical to the procedures described for alternative Plans B and C due to limited turning area and traffic. However, material dredged from the channel in the Upper Lake and Lower Lake would be placed on hopper barges and transported to the ODMDS for placement.

Alternative Plan C is considered to be a higher risk of uncertainty due to limited information known regarding geotechnical, engineering and design parameters for many of the proposed beneficial use sites. As stated in the planning objectives, the DMMP should be an implementable plan, and because of the level of uncertainty regarding disposal area availability (e.g., landowner and rights-of-way issues) over the life of the DMMP, alternative Plan C was not considered the recommended plan despite its emphasis of beneficial use. Alternative Plan D is not considered environmentally acceptable because it removes sediment from the eroding and subsiding coastal environment and does not optimize beneficial use of dredged materials.

The Corps' recommended plan is alternative Plan B (Appendix B), which has a high level of certainty regarding disposal area availability for channel maintenance over the life of the DMMP. There is a low risk level of a loss of real estate investment and placement areas due to the withdrawal of easements and other landowner issues. This alternative involves the rehabilitation and maximum use of existing CDFs and expansion of CDFs along Calcasieu Lake. Through the development of this DMMP several additional beneficial use sites have been identified that are potentially suitable for the placement of dredged material that are not currently available for use, primarily because real estate interests have not been acquired from landowners. These additional sites may become available at a later date and will be environmentally cleared under the NEPA regulations allowing the Corps or another agency to use dredge material from the project to restore these sites. Approximately 30 percent of material dredged between RMs 5 to 36 to maintain navigation would be placed in beneficial use sites for the restoration of subsided and eroded coastal wetlands under this plan.

The recommended plan would differ from existing conditions in the way the project is managed.

The existing project is managed largely through the use of contracts with dredging companies who are tasked to provide not only dredging of the ship channel but also decisions on where dredged material would be placed and the management of the placement areas. Under the recommended plan, management of CDFs would be undertaken by the Corps to maximize capacity through scheduled placement of dredged material and subsequent ditching and draining. Dredging contractors would be provided directions regarding the locations for placement of material. Secondly, a major portion of the dredged material would be placed at beneficial use sites over the next 20 years as a General Navigation Feature of the project, which will allow the Corps to provide expenditures for construction of beneficial use sites (e.g., containment dikes). NEPA documentation and other environmental clearances for the sites will be provided by this DMMP.

Alternative Plans B, C, and D, include several additional measures for the management of dredged material from the ship channel. Significant rehabilitation of CDFs is required to sufficiently contain the material allocated for them. CDFs would be managed to maximize surface drainage, desiccation, shrinkage, and consolidation of dredged material. Dikes would be strengthened through the management of levee crowns and access ramps and through vegetation management. Erosion control measures would include rock armoring and the planting of non-woody, drought-resistant vegetation. CDFs would be expanded vertically and horizontally to accommodate additional dredged material within the existing CDF footprint. Although not an integral component of alternative Plans B and C, there would be an opportunity for mining dredged material from CDFs by public and private interests. Material removed from CDFs could provide such uses as construction material, commercial fill, and marsh restoration and allow the prolonged capacity of CDFs. Both alternative Plans B and C would include the potential for placement of material dredged from the inland portions of the channel into the ODMDS during emergency situations, such as a grounded ship or shoaling resulting from a hurricane that poses an immediate threat to navigation. Bank stabilization is incorporated into alternative Plans B and C to reduce shoaling rates in the channel and along the lakeside of the CDFs, thereby reducing the amount of material to be dredged. Rock rip-rap would be used to armor CDFs and areas of the bank along the ship channel that have been shown to be susceptible to erosion from currents and ship passage. According to the draft recommended plan, bank stabilization (i.e., rock armoring) or foreshore dike construction is a project feature along CDFs 17/19 (i.e., RM 18 to 20, left descending bank), CDFs 22/23 (i.e., RM 15.6 to 18, left descending bank), CDFs D/E (RM 11.2 to 15.6, left descending bank), and along the right descending bank of the channel from Mile 16.5 to 18.7. Armoring would also be placed along the lake side of CDF 22. The Texaco Cut would remain open, and would be armored on its northern and southern banks into Calcasieu Lake to reduce erosion resulting from boat traffic, waves, and wind-driven currents.

## **FISH AND WILDLIFE CONCERNS IN THE PROJECT AREA**

Major fish and wildlife resource concerns in the study area include the loss of coastal marsh, the conversion of fresher marshes to more saline habitats, and shoreline erosion along the ship channel. Secondly, the Service is concerned with water-quality degradation from agricultural and urban run-off and industrial discharges into upper Calcasieu Basin waterbodies. Forested

areas that provide habitat for neotropical migrants are also being lost to development and sea level rise and subsidence.

The coastal marshes of the Calcasieu-Sabine Basin have been identified by the North American Waterfowl Management Plan (NAWMP), Gulf Coast Joint Venture, as a key waterfowl wintering area. The Gulf Coast is the terminus of the Central and Mississippi Flyways and is therefore one of the most important waterfowl areas in North America, providing both wintering and migration habitat for significant numbers of the continental duck and goose populations that use both flyways. Aside from being a key waterfowl wintering area, the Chenier Plain provides important year round habitat for over 90 % of the continental population of mottled ducks and serves as a key breeding area for whistling ducks. The goal of the NAWMP, Chenier Plain Initiative is to provide wintering and migration habitat for significant numbers of dabbling ducks, diving ducks, and geese (especially lesser snow and greater white-fronted), as well as year-round habitat for mottled ducks. One restoration strategy identified in that plan is to beneficially use dredge material from navigation projects to restore emergent wetlands and associated mud flats (Esslinger 2001). Loss of the Calcasieu-Sabine basin coastal marshes would adversely impact not only wintering waterfowl, but many other fish and wildlife species which prefer the lower-salinity wetlands. Similarly, the continued loss of vegetated wetlands will also diminish the extent of nursery habitat for estuarine-dependent fishes and shellfishes, thereby reducing the production of commercially and recreationally important species (Turner 1982).

The objective for the Calcasieu-Sabine Basin, as stated in the Coast 2050 Report (LCWCRTF 1998), is to create fresher conditions by the year 2050. Saltwater intrusion is the leading cause of marsh loss in this region. Conversion of fresh marsh to open water or to more saline habitats has occurred throughout much of the basin. Hydrologic restoration is a local strategy recommended for nearly all of the Coast 2050 Region 4 mapping units. Local hydrologic restoration strategies involve the use of dams or water control structures to restore the altered hydrology in the various units. Because several hydrologic restoration projects have been implemented, the respective mapping units have seen marsh loss rates stabilize, and in some areas marsh gains have occurred. For example, the Cameron Creole Plugs CWPPRA project benefited 865 acres of wetlands by constructing two plugs in the Lakeshore Borrow Canal to moderate water circulation and flow and reduce the duration of inundation in conjunction with the Cameron-Creole Watershed Management Project (USGS 2007a). Also, the East Mud Lake Marsh Management CWPPRA project benefited 1,520 acres of marsh by installing water control structures to manage water flow and curtail high salinity water from the Calcasieu Ship Channel (USGS 2007b). Moreover, as a result of implementing those local and regional restoration strategies, the regional marsh loss rate has also decreased (LCWCRTF 1999).

Although hydrologic restoration projects have been successful in providing freshwater introduction and stabilizing the existing marsh vegetation for the Calcasieu-Sabine Basin, large open water areas once colonized by emergent marsh have not regenerated. After saltwater intrusion impacted fresher marshes, those areas experienced increased amounts of soil erosion creating large areas of open water a few inches to 40 inches deep. Secondly, interior shoreline erosion due to increased wave fetch has further aggravated interior marsh loss rates. Outside sediment sources such as beneficial use of dredge material and/or dedicated dredging would be

the only means of restoring those areas to marsh elevations. Several CWPPRA projects have, and are proposing to, utilized maintenance dredged material from the Calcasieu Ship Channel to restore open water areas to their previous marsh elevations. The Sabine Marsh Creation project (CS-28) has benefited approximately 401 net acres of marsh, and is projected to benefit approximately 592 additional acres after project completion, for a total of 1,585 net acres (USGS 2007c). The Service also recently nominated and designed, along with the Corps, the East Cove Marsh Creation Project for CWPPRA, Priority Project List 17. That proposed project would restore approximately 509 acres of saline and brackish marsh acres in the Cameron Prairie NWR using maintenance dredged material from the Calcasieu Ship Channel. Through the CWPPRA planning process Cameron Prairie NWR personnel has also identified additional open water areas on that NWR that could benefit from maintenance dredged material. Recently the Port of Lake Charles, and the State partnered with the Corps to restore 670 acres of marsh in the Black Lake Marsh and Sabine NWR (two areas identified in the DMMP) using dredge material from the Calcasieu Ship Channel.

Furthermore, given the adverse impacts of continued coastal wetland loss, the Service strongly supports those strategies and projects designed to address those losses. To comply with Section 303 (d) of CWPPRA, the Corps must implement and operate project features consistent with the Louisiana Coastal Wetlands Restoration Plan. That plan, developed by the Corps, the Service, and other Federal and State agencies, identified strategies to protect and restore Louisiana's coastal wetlands. Beneficial use of dredge material (i.e., dedicated dredging of sediments from channels) is a Region 4 strategy for mapping units adjacent to the navigation channel. The conversion of marsh or shallow open water habitats (e.g., mudflats) into upland CDFs is not considered to be consistent with the Louisiana Coastal Wetlands Restoration Plan. Efforts to avoid and minimize impacts to those habitats as well as provide benefits to those habitats should continue to be investigated and implemented in the DMMP to the greatest extent practicable.

Shoreline erosion has also been a factor in increased marsh loss rates in the basin, and according to a draft erosion study conducted by the Corps' Engineer Research and Development Center (ERDC), wakes and wind waves are the predominant mechanism of erosion along the Calcasieu River and Ship Channel between RMs 5 and 34 (Fischenich 2004). Shoreline erosion contributes about 200,000 cubic yards of sediment to the system annually, which is more than two-thirds of the known sediment yield (i.e., 300,000 yd<sup>3</sup>). Bankline recession, predominant downstream of the GIWW, is occurring on average 7.5 feet per year (Fischenich 2004). Additionally, with the construction and expansion of several Liquefied Natural Gas (LNG) facilities, ship traffic is expected to increase substantially along the Calcasieu Ship Channel, and ultimately increase wake-induced bankline erosion. It is projected that an additional 900 LNG ships would be using the Calcasieu Ship Channel each year once those facilities are operational (FERC 2006). Uncontrolled erosion of the ship channel has resulted in the unmitigated loss of wetland acreage.

Brown pelican numbers in Louisiana have been increasing. However, due to the passage of Hurricanes Katrina and Rita, critically important nesting habitat which occurred east of the Mississippi River was severely impacted and did not fully recover after the storms. Because of the increased brown pelican nesting population and decrease in suitable nesting habitat, the Service believes that beneficial use of dredged material from the Calcasieu Ship Channel

provides an important opportunity to create habitat that would benefit the recovery and sustainability of the Louisiana's brown pelican population as well as other waterbirds. Rabbit Island, located inland from the Gulf shoreline, provides refuge to numerous waterbirds and has supported nesting brown pelicans since 2001. The continued success of Rabbit Island's brown pelican nesting colony will be dependent on the availability of beneficial use of dredged material for the ship channel. Other potential sites for nesting islands also occur along the channel.

## **EVALUATION METHODOLOGY**

### Alternative Plans Selection Process

In formulating the alternative plans, the Corps screened and evaluated 78 dredge material placement options provided during an interagency brainstorming meeting and two public scoping meetings. During this process three project area reaches were also defined to better assess the need for disposal areas along each reach. Proposed disposal options included, but were not limited to, the three following types of disposal areas: CDFs, beneficial use disposal areas, and ocean disposal in designated areas. To achieve the planning goal and fulfill the objectives of the DMMP, screening criteria were developed (Table 1). During the final screening process, options that were retained after the initial screening process were evaluated using the project/planning objectives, additional screening criteria, planning criteria based on ER 1105-2-100 (i.e., acceptability, completeness, effectiveness, and efficiency), and information from the technical and environmental studies. Options were organized by each of the three channel reaches to optimize dredging frequencies, area characteristics, and location. Viable disposal options were then considered in development of the four final plan alternatives.

### WVA Methodology

Once the alternatives and recommended plan were finalized, G.E.C., Inc. evaluated project-related impacts on fish and wildlife resources associated with both alternative Plans B and C. Because alternative Plan D was not considered environmentally acceptable it was not considered in the evaluation process. Evaluations were conducted using the WVA methodology, which was developed to evaluate proposed CWPPRA projects. The WVA is similar to the Service's Habitat Evaluation Procedures (HEP), in that habitat quality and quantity (acreage) are measured for baseline conditions, and predicted for future without-project and future with-project conditions. Instead of the species-based approach of HEP, each WVA model utilizes an assemblage of variables considered important to the suitability of that habitat type to support a diversity of fish and wildlife species. As with HEP, the WVA provides a quantitative estimate of project-related impacts to fish and wildlife resources; however, the WVA is based on separate models for bottomland hardwoods, fresh/intermediate marsh, brackish marsh, and saline marsh. Although, the WVA may not include every environmental or behavioral variable that could limit populations below their habitat potential, it is widely acknowledged to provide a cost-effective means of assessing restoration measures in coastal wetland communities.

**Table 1. Initial Screening Criteria for Selection of Disposal Alternatives.**

<b>Constraints</b>
contaminated materials
public oyster grounds
impingement on public access
<b>Considerations</b>
costs
real estate acquisitions, including costs for real estate acquisitions
public use enhancement
long-term facilities operations and maintenance costs
mitigation requirements
<b>Opportunities</b>
use of dredged material for habitat restoration and enhancement
mining of CDFs for commercial use or for CDF construction
armoring of channel sides to reduce erosion and shoaling
disposal of material from private dredging
recreation
storm damage abatement

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of: (1) a list of variables that are considered important in characterizing community-level fish and wildlife habitat values; (2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and, (3) a mathematical formula that combines the Suitability Indices for each variable into a single value for wetland habitat quality, termed the Habitat Suitability Index (HSI).

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU) and is the basic unit for measuring project effects on fish and wildlife habitat. HUs are annualized over the project life to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change (increase or decrease) in AAHUs for each future with-project scenario, compared to future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the fish and wildlife community within that habitat type; a net loss of AAHUs indicates that the project would adversely impact fish and wildlife resources.

The WVA models for fresh/intermediate, brackish, and saline marsh consist of six variables: (1) percent of wetland covered by emergent vegetation; (2) percent open water dominated by SAVs; (3) degree of marsh edge and interspersion; (4) percent of open water less than or equal to 1.5



feet deep; (5) salinity; and, (6) aquatic organism access. By incorporating variables for SAV and shallow, open water into each of the marsh models, impacts to those habitat components are combined with impacts to emergent marshes. Because emergent marsh is of higher overall fish and wildlife value than SAV, and because SAV is of higher value than shallow open waters, those latter components receive proportionally less weight when combined into one AAHU value.

### WVA Assumptions

WVAs were prepared for each of the dredged material placement sites identified in the DMMP/SEIS that would affect emergent marsh and estuarine habitat. Field data and information from interviews with local landowners and environmental managers were obtained by G.E.C., Inc. scientists and were used to compute baseline HSI values and to predict HSIs for each TY. Salinity, water depth, and other characteristics specific to each site, such as nearby restoration projects that would impact aquatic organism access, are included in the assumption explanation for each site. The cubic yardage of dredged material allocated for each placement site was used along with average water depth data to estimate the amount of marsh habitat that may be created as a result of the project. The WVA models forecast the net marsh and estuarine habitat benefits of implementing Plans B and C starting the year project construction begins and ending 50 years after the start of the project. Several CDFs would be constructed toward the end of the 20-year DMMP. Therefore, the period of analysis is extended past the 20-year project life to ensure that irreversible or irretrievable commitments of resources are appropriately quantified.

Most beneficial use (BU) sites were, at the time of report preparation, privately owned. Four of the sites are located in the Sabine and Cameron Prairie NWRs. Privately owned BU sites would be confined by dikes constructed to contain the dredged materials. It is assumed that open water areas would be targeted for the placement of dredge material. An earthen containment dike would be constructed within an open-water area and then filled to capacity with dredge material to create a few hundred acres of intertidal marsh after consolidation and settlement. Additional cells would be constructed at the site for subsequent dredging cycles. The dikes around the cells would be designed to slowly deteriorate and subside to the level of the adjacent marsh substrate, thereby promoting the tidal exchange of water. Earthen dikes may require mechanical degradation to the settled elevations of the BU area if natural erosive processes do not degrade them sufficiently to meet fisheries and tidal access needs. Such breaches would be undertaken after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface. If necessary, tidal creeks would be constructed to ensure tidal flow and organism ingress and egress throughout the project area. For the purposes of the WVAs, it was assumed that dikes would be degraded 3 years after the last pumping event for the respective cell, and the appropriate access value for tidal flow and organism ingress and egress specific to each site was assumed to occur after the dikes were degraded or gaps were constructed (i.e., sites along Calcasieu Lake).

The WVAs assumed that dikes would not be constructed around the four BU sites in the NWRs, but rather material would be allowed to flow unconfined to nourish existing marsh, create new marsh, and create shallow open water habitat. These include BU sites 5 and 18 (Sabine NWR)

and BU sites 19 and 20 (Cameron Prairie NWR). Dredge material slurry would be allowed to overflow existing emergent marsh vegetation within the project area, but would not be allowed to exceed a height of approximately one-foot above the existing marsh elevation. The target elevation of placed and consolidated fill at each BU site, both public and privately owned sites, would be determined through geotechnical analyses during the preparation of plans and specifications for the project. These analyses would consider long-term settlement of the dredged materials and placement area foundations, as well as elevation surveys of the nearby planned wetland habitat to determine the appropriate target range.

In order to sustain future maintenance and operation of the ship channel, it may be necessary to expand some of the existing CDFs identified in the DMMP/SEIS in areas where additional lands or beneficial use placement options are not available. The initial assessment of the 20-year dredged material disposal capacity does not indicate that expansion of CDF sites would be necessary in the near future. However, if additional placement capacity is needed, CDFs 17/19 and D/E would be expanded into adjacent marsh and/or estuarine habitat. Dredged sediments pumped into the horizontally expanded areas of the CDFs would be confined by a containment dike constructed one year prior to pumping. Once dikes are constructed, the expanded areas would be filled to capacity with dredged material which would consolidate to form upland areas. In addition to the emergent marsh and estuarine habitat evaluated in the WVAs, there are approximately 283 additional acres of shallow open water habitat that would be impacted in association with the reclamation of CDFs. Records of the field data and projected habitat changes for the WVAs are available through G.E.C., Inc., Baton Rouge, LA.

## **POTENTIAL SIGNIFICANT IMPACTS**

The draft WVA conducted by G.E.C., Inc. assessed impacts of the project's beneficial use sites and expanded CDFs on wetland habitats in the proposed project area. For the preferred plan, a total capacity of 9,550 acres would be potentially available for the beneficial use of dredged material during the 20-year life of the project. Using the WVA methodology, it is estimated that approximately 6,306 acres of marsh and estuarine habitat would be created as a result of preferred plan, resulting in a net benefit of 1,259.68 AAHUs. If, in the future, more dredged material becomes available for beneficial use, it is assumed that more habitat acreage would be created within the boundaries of the BU sites identified in the DMMP/SEIS. Significant adverse project-related impacts are not expected to occur through implementation of alternative Plan C because that plan involves using existing boundaries of CDFs with the majority of dredged material being used beneficially. Plan C would cause a net increase of 2,035 AAHUs and would create an estimated 10,030 acres of marsh and estuarine habitat. A total of 17,901 acres would be potentially available for the beneficial use of dredged material over the life of the project under Plan C.

For the purpose of discussion, potential significant impacts associated with alternative Plans B and C is evaluated further (Table 2). Previous WVA analyses conducted for this project, which included the expansion of CDFs into adjacent emergent marsh, indicated that a net benefit of 971.36 AAHUs would result from the implementation of that plan. However, after reevaluating

the need for the expansion of CDFs 9, 10, 11, and 13, the Corps removed those CDFs from both Plans B and C and avoided the conversion of 545 acres of marsh into upland habitat. Nevertheless, emergent wetland impacts would result from the upland expansion of CDFs D/E and 17/19. CDF D/E would be further expanded to the 3-foot contour of Calcasieu Lake creating 466 acres of emergent wetland habitat.

**Table 2. Comparison of Environmental Effects of Alternative Plans B and C (acres)**

<b>Environmental Effect</b>	<b>Alternative Plan B</b>	<b>Alternative Plan C</b>
Emergent Wetlands Converted to Uplands	68	0
Area of Calcasieu Lake Converted to Uplands	443	0
Area of Calcasieu Lake Converted to Marsh	466	0
CDF Reclamation of Shallow Open Water Habitat along Ship Channel (CDFs D/E)	281	0
Restored Coastal Wetlands	6,306	10,030

According to that WVA, expanding CDFs for alternative Plan B would cause a decrease in net average annual habitat units (-45.47 AAHUs). This decrease would be offset by the creation of 1,305.15 AAHUs through the beneficial use of dredged material, for a net balance of 1,259.68 AAHUs. Potential wetland impacts associated with accessing those beneficial use disposal sites have not been evaluated, and detailed design documents have not been developed. Once those designs have been further developed a revised WVA should be conducted and coordinated with the Service should emergent wetland habitats be affected. A summary of the WVA analysis is provided in Appendix D.

### **FISH AND WILDLIFE CONSERVATION MEASURES**

The President’s Council on Environmental Quality defined the term “mitigation” in the National Environmental Policy Act regulations to include:

- a) avoiding the impacts altogether by not taking a certain action or parts of an action;
- b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- c) rectifying the impacts by repairing, rehabilitating, or restoring the affected environment;
- d) reducing or eliminating the impacts over time by preservation and maintenance operations during the life of the action; and,
- e) compensation for the impacts by replacing or providing substitute resources or environments.

The Service's mitigation policy (Federal Register, Volume 46, Number 15, pages 7656-7663, January 23, 1991) provides guidance to help ensure that the level of mitigation recommended by the Service is consistent with the value and scarcity of the fish and wildlife resources involved. In keeping with that policy, the Service usually recommends that losses of high-value habitats which are becoming scarce be avoided or minimized to the greatest extent possible. Unavoidable losses of such habitats should be fully compensated by replacement of the same kind of habitat value; this is called "in-kind" mitigation. The mitigation planning goals and associated Service recommendations should be based on those four categories, as shown in Table 3.

**Table: 3. U. S. Fish and Wildlife Service Resource Categories (Federal Register, Vol. 46, pp. 7644-7663, January 23, 1981).**

<b>FWS Resource Categories</b>
<p><u>Resource Category 1</u> - Habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section. The mitigation goal for this Resource Category is that there should be no loss of existing habitat value.</p>
<p><u>Resource Category 2</u> - Habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section. The mitigation goal for habitat placed in this category is that there should be no net loss of in-kind habitat value.</p>
<p><u>Resource Category 3</u> - Habitat to be impacted is of high to medium value for evaluation species and is relatively abundant on a national basis. FWS's mitigation goal here is that there be no net loss of habitat value while minimizing loss of in-kind habitat value.</p>
<p><u>Resource Category 4</u> - Habitat to be impacted is of medium to low value for evaluation species. The mitigation goal is to minimize loss of habitat value.</p>

Coastal marshes are considered by the Service to be aquatic resources of national importance (i.e., Resource Category 2) due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, interjurisdictional fisheries, and public lands). Therefore, the Service recommends that unavoidable losses of those habitats should be compensated via in-kind replacement.

The Corps has minimized impacts to emergent marsh by removing CDFs 9, 10, 11, and 13 expansions from both Plans B and C. The expansion of those CDFs would have converted 545 acres of marsh habitats to upland sites. The preferred plan, Plan B, currently anticipates the loss of approximately 68 acres of emergent wetlands as a result of constructing and/or rehabilitation CDFs. These impacts would be compensated by the creation of 466 acres within Calcasieu Lake and the restoration of 5,840 acres of emergent wetlands, much of which is located on the Sabine and Cameron Prairie NWRs. According to information obtained during several interagency

meetings, should the recommended plan be selected, marsh creation sites would be constructed prior to using CDFs for dredged material placement; thereby mitigating wetland losses. Additionally, 443 acres of estuarine open water habitat in Calcasieu Lake would be converted to uplands as a result of expanding CDFs 17 and 19, and 281 acres of estuarine open water habitat along the ship channel would be impacted as a result of reclaiming CDF D/E. The Corps has indicated that the proposed DMMP is a flexible plan that will allow for periodic updates as additional beneficial use sites become available and alternative options be proposed. Moreover, it is anticipated that proposed foreshore dikes and shoreline protection features along this reach should reduce the overall dredging need over the 20-year life by 12 million cubic yards and may alleviate the need to expand those CDFs. By constructing marsh creation sites prior to using CDFs, impacts to emergent wetlands and estuarine waters may be avoided should sufficient capacity be available due to reduced dredging needs. Therefore, it is imperative that the natural resource agencies are involved early on in the periodic updates of the DMMP.

While impacts to 68 acres of emergent marsh would be mitigated through the beneficial use of dredged material, it should be noted that the Service's mitigation policy does not currently favor compensatory mitigation on NWR System lands (Federal Register, Volume 64, Number 175, pages 49229-49230, September 10, 1999). The Service is authorized to restore degraded habitats within the NWR System, and those habitats are already typically targeted for restoration in the future, irrespective of off-Refuge development. If the Service were to target the NWR System for compensatory mitigation, a significant net loss of wetlands within the watershed may occur. As such, should the recommended alternative be selected, the restoration and/or creation of wetlands associated with CDFs D and E, the Cameron Parish School Board property (i.e., BU site 49), and the Marcantel property (i.e., BU site 50) should be conducted prior to or concurrently with the proposed upland expansion of CDFs D/E and 17/19 and associated wetland impacts. The restoration of wetlands associated with those beneficial use areas outside the NWR System would provide 541.26 AAHUs of benefits which would mitigate the loss of 45.47 AAHUs associated with those CDFs, according to the WVA analysis conducted by G.E.C., Inc.

According to the Corps, design of specific sites, configurations, and design parameters would be determined for the recommended plan through follow-up studies such as geotechnical, engineering design, and possible additional NEPA requirements. To ensure that wetland impacts are accurately accounted for and that natural resources conservation measures are considered equally with engineering and design measures, coordination with the Service and other natural resource agencies (i.e., NMFS, LDWF, and LDNR) should be conducted early on in those follow-up studies.

With implementation of the recommended plan, much of the direct impacts to project-area marshes and EFH would be compensated by creating intertidal emergent marsh habitat in open-water areas within Calcasieu Lake and open water areas in the vicinity of the ship channel. The Corps along with the collaboration with the State and Federal natural resource agencies has invaluable experience designing and constructing beneficial use disposal areas along the Calcasieu Ship Channel. Initial marsh elevations for marsh creation projects in the project area have been designed to + 4.5' MLG with a target elevation of + 2.5' MLG (1.1 NAVD 88). As with previous beneficial use marsh restoration projects, proposed beneficial use placement areas

should have constructed bayous and openings (e.g., fish dips) connecting existing bayous to facilitate water exchange and fish and wildlife access. These openings would be constructed after dredged material has stabilized and vegetation has colonized. Fish dips should have a minimum bottom width of 20 feet, a minimum depth of at least 1 foot below targeted marsh elevations (i.e., 0.0 NAVD 88), and rock armoring on the sides and bottom to minimize scour.

CDF Rehabilitation in the form of foreshore dike construction (i.e., rock armoring) is a project feature along CDFs 17/19 and CDFs D/E. Bank stabilization is also proposed along the right descending bank of the channel from RM 16.5 to 18.7 and along the left descending bank of the channel along CDFs 22 and 23. Armoring would also be placed along the lake side of CDF 22. According to the draft erosion study, RM 21 to 16 and 11 to 5, have the highest erosion yields with approximately 55,000 cubic yards per year (cy/yr) and 70,000 cy/yr, respectively, along approximately 28,000 linear feet of shoreline for each reach (Fischenich 2004). As noted in the Shoaling Technical Report, the placement of shore protection in these areas may reduce the dredging need over the 20-year life of the DMMP by 12 million cubic yards. There is a potential for proposed bank stabilization features to increase velocities north and south of the features and result in increased erosion along those reaches not protected. However, the Corps has indicated that increased erosion rates would be minimal and have included shoreline protection along the west side of the ship channel from approximate RM 16.5 to 18.7 to protect the natural shoreline in the narrow high energy section of the channel. Should shoreline erosion rates increase along natural marsh shorelines relative to proposed shoreline protection features, further evaluations should be conducted to determine the feasibility of providing protection to those riparian marsh habitats, in accordance with the Corps adaptive management guidance [ER 1105-2-100, paragraph 3-5b.(8)].

According to the figure in the draft DMMP/SEIS, proposed shoreline protection would extend from just north of the confluence of Crab Gully and the ship channel (RM 18.7) south to the confluence of Black Lake Bayou (RM 18.7) and the ship channel. To ensure that indirect impacts to estuarine habitats are avoided, the Corps should closely coordinate with the agencies during the design of shoreline protection features. Natural bayous and waterways (e.g., Crab Gully and Black Lake Bayou) should not be obstructed by proposed shoreline protection features, and gaps should be incorporated into the design every 1,000 feet to allow for appropriate hydrologic exchange between the waterway and adjacent marsh habitats, avoid impoundment of shallow open water areas, and provide some estuarine organism access.

Discussions regarding the potential for creating and or restoring brown pelican nesting habitat have been ongoing since June 2007, when the Service proposed the option. During interagency meetings the Service provided additional guidance for the placement of bird islands adjacent to Calcasieu Ship Channel (Appendix C). At this time the Corps has determined that using dredged material beneficially to create or restore bird island habitat along this reach of the Calcasieu Ship Channel is not reasonable because of the unsuitability of dredged sediments and because of the limited dredged material capacity that bird islands provide. However, the Service believes that the silty sediments dredged from the Lower Reach would be suitable in restoring marsh habitat on Rabbit Island and would provide additional habitat for pelicans currently nesting on that island. In addition, according to the Shoaling Technical Report provided in the preliminary draft

EIS, areas of the ship channel could be mined to provide needed construction clays to rehabilitate, raise or expand the dikes on many of the CDFs, as well as provide advanced maintenance to lessen the maintenance dredging burden in areas of high accumulation. It was also stated during an interagency meeting that clay formations (i.e., clay balls) occur at shallow depths (i.e., 30 to 40 feet) along the channel. Those same clay materials could also be mined to provide a suitable foundation for bird islands and would also provide a means to alleviate dredging burden through advanced maintenance dredging.

There is also a possibility of reconfiguring existing CDFs along the right-descending (i.e., west) bank between RMs 6 and 8. While this alternative would not facilitate disposal of maintenance dredged material, the availability of those CDFs for reconfiguring to provide bird habitat should be addressed in the DMMP. Brown pelican nesting habitat is a resource the Service is authorized to protect. Whether through the maintenance dredging program or supplemented by additional coastal restoration programs, the Service believes the creation and/or restoration of bird islands along the Calcasieu Ship Channel is viable and should be considered as a feature of the 20-year DMMP. The Service will continue to work with the Corps and to investigate viable bird island restoration alternatives.

Dredging and disposal activities could potentially result in the re-suspension and increased bioavailability of contaminants, particularly where industry is prevalent (i.e., RMs 22 to 36). Many of the freshwater fishes expected to occur along that channel segment also provide an important food source for wading birds and other migratory birds. Should the results of future Hazardous, Toxic and Radioactive Waste (HTRW) assessments indicate contamination that exceeds NOAA screening levels special procedures (e.g., use sediment curtains, etc.) should be implemented to reduce or prevent contaminant re-suspension and dispersal into important downstream fish and wildlife habitats. Please refer to the following website for those levels: [http://response.restoration.noaa.gov/book\\_shelf/122\\_squirt\\_cards.pdf](http://response.restoration.noaa.gov/book_shelf/122_squirt_cards.pdf). If contaminant levels warrant, the Corps should ensure that such highly contaminated dredged material be deposited in a suitable upland waste disposal facility and adequate measures are taken to prevent dewatering from those disposal areas potentially resulting in adverse impacts.

The list of recognized environmental condition sites (RECs) in the draft HTRW Reconnaissance Report appeared to be incomplete. Upon recommendations by the Service to reevaluate the list of emissions contributors to the Calcasieu Ship Channel, GEC, Inc. extended assessment protocols to include REC sites within 1 mile of the ship channel. The expanded study area resulted in the inclusion of several major REC sites which are now recognized in the report.

## **SERVICE POSITION AND RECOMMENDATIONS**

In addition to addressing dredging needs, disposal capabilities, capacities of disposal areas, environmental compliance requirements, and indicators of continued economic justification, the recommended plan identifies potential beneficial use of dredged material areas. In support of comprehensive State and Federal efforts to conserve Louisiana's nationally significant coastal wetlands, avoidance and minimization of direct wetland impacts should be pursued to the

greatest extent practicable, regardless of whether or not the project would produce net environmental benefits (expressed in AAHUs). Minimization of such impacts would also help to ensure that Corps projects are consistent with the purposes of the restoration plan that was prepared in compliance with Section 303 (d) of the CWPPRA. In 1998, the Louisiana Coastal Wetlands Conservation and Restoration Task Force updated and revised that plan which is now entitled the Coast 2050 Plan (LCWCRFT 1998).

DMMPs can be a collaborative planning tool and an informative document that expresses the current and future needs of the Corps operations and maintenance program as well as inform the natural resource agencies of potential restoration opportunities. As the DMMP is updated throughout its 20-year life, we look forward to facilitating this adaptive management plan with the Corps, the Port, and the other natural resource agencies to address the needs of the Port along with coastal restoration strategies.

The Service recognizes the implementation constraints associated with alternative Plan C and would not object to further detailed planning and implementation of the recommended plan, alternative Plan B, provided that the project incorporates the following recommendations to avoid unnecessary impacts to fish and wildlife resources, to quantify indirect project impacts, to achieve the anticipated wetland creation benefits, and to mitigate for unavoidable project-related wetland impacts:

1. To the greatest extent practicable, beneficial use sites should be considered the primary disposal option over CDFs and should be used prior to disposing in CDFs.
2. According to the Corps, the DMMP will be updated every five years. The Service, the NMFS, the LDNR, and the LDWF should be involved early on in this planning effort to identify any potential change in conditions including additional beneficial use disposal options and the overall placement capacity needed for maintaining the channel.
3. Detailed design documents (e.g., design reports, plans and specifications, etc.) of the waterway and disposal sites should be prepared in consultation with the Service, the NMFS, the LDNR, and the LDWF to avoid unnecessary wetland impacts and to achieve the anticipated wetland creation benefits. At that time, WVA calculations should be updated to more accurately reflect project impacts and/or benefits. The following are some beneficial use disposal area design features that have been implemented for marsh creation projects in the Calcasieu-Sabine Basin and should be considered in all future sites:
  - a. beneficial use disposal areas should have constructed bayous and openings to existing bayous (e.g., fish dips) to facilitate water exchange and aquatic organism access, openings should be constructed after dredged material has stabilized and vegetation has colonized;
  - b. initial marsh elevations should be designed to + 4.5' MLG with a target elevation of + 2.5' MLG (1.1 NAVD 88);



- c. beneficial use disposal area containment dikes should be breached or degraded to the settled elevations of the disposal area. Such breaches should be undertaken after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface;
  - d. for beneficial use disposal areas along Calcasieu Lake, fish dips or gaps should be located approximately every 1,000 feet to allow for some aquatic organism access and hydraulic exchange with those marsh creation areas; and,
  - e. fish dips should have a minimum bottom width of 20 feet, a minimum depth of at least 1 foot below target marsh elevations (0.0 NAVD 88), and rock armoring on the sides and bottom to minimize scour.
4. Shoreline protection features along the right descending bank between RM 16.5 and RM 18.7 should avoid obstructing Black Lake Bayou and Crab Gully.
5. To allow for some hydraulic exchange and aquatic organism access and to avoid impoundment of shallow open water areas, erosion control/shoreline protection features along the ship channel and waterward of interspersed marsh and shallow open water habitat should also include fish dips or gaps approximately every 1,000 feet. Design of those features should be prepared in consultation with the Service, the NMFS, the LDNR, and the LDWF to avoid unnecessary impacts to fish and wildlife resources.
6. Monitoring of shoreline erosion should be conducted in conjunction with the scheduled 5-year DMMP review. Should shoreline erosion rates increase along natural marsh shorelines relative to the proposed shoreline protection features, efforts should be made to provide protection to those riparian marsh habitats.
7. Fee title or an equivalent easement should be acquired for any mitigation lands to preclude incompatible development and to ensure that the recommended mitigation values are maintained over the project life; costs for development, maintenance, and monitoring of mitigation lands should be allocated as a project first cost in future project funding estimates and requests.
8. The Corps should continue to coordinate with the Service throughout planning and construction to ensure that the proposed project does not impact waterbird nesting colonies, and threatened or endangered species that may be listed in the future.
9. Surveys should be conducted to document active, but undocumented, wading bird rookeries and colonial nesting birds within the project areas. If active nests are found, consultation with the Service should be initiated to ensure that project activities do not impact any colonial nesting bird colonies.
10. Project features should be implemented and operated consistent with the Louisiana Coastal Restoration Plan, as required by Section 303(d) of CWPPRA.

11. The Corps should continue planning efforts in coordination with the natural resource agencies to determine the feasibility of constructing bird islands or restoring Rabbit Island with material typically used (e.g., silts and clays) to create such habitat on Louisiana's coast.

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# **APPENDIX A**

## **Agency Coordination**





*Angela*  
**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
263 13th Avenue, South  
St. Petersburg, Florida 33701

March 26, 2009

F/SER46/KC;jk  
225/389-0508

Mr. James F. Boggs, Field Supervisor  
Louisiana Field Office  
U.S. Fish and Wildlife Service  
646 Cajundome Blvd., Suite 400  
Lafayette, Louisiana 70506

Dear Mr. Boggs:

NOAA's National Marine Fisheries Service (NMFS) has received the draft Fish and Wildlife Coordination Act Report (Report) for the Calcasieu River and Pass, Dredged Material Management Plan (DMMP). The DMMP and the accompanying Environmental Impact Statement prepared by the New Orleans District of the Corps of Engineers evaluates four plan alternatives. The recommended plan was formulated to maximize the use of the Federal and local sponsors' investments in lands, easements, and costs for real estate improvements that have occurred over the life of the project and focuses on placing material primarily in confined disposal facilities supplemented with beneficial use disposal areas.

NMFS has reviewed the Report and concurs with its findings that the project should incorporate the detailed recommendations to avoid unnecessary impacts to fish and wildlife resources, to quantify indirect project impacts, to achieve the anticipated wetland creation benefits, and to mitigate for unavoidable project-related wetland impacts. However, NMFS would like the opportunity to suggest additional recommendations and revisions to the listed species in the essential fish habitat section (EFH) to be considered in the report.

Regarding recommendation #3e and #5, NMFS recommends that the bottom width linear distance for fish dips be increased from a minimum of 20 feet to 25 feet for both wetland creation design and gapping for shoreline protection features. In addition, NMFS is aware that a shoreline protection rock dike has already been constructed 500 ft into the water fronting the proposed foreshore dike expansion at CDF D and E on the ship channel side. NMFS is also aware that this area has been constructed for at least one year now and will not be filled to upland elevation until at least year seven once the DMMP is implemented. To the best of our knowledge, the rock dike was constructed without fish dips and is tied into land at both the north and south end of the site. NMFS is recommending, if feasible, a temporary design for fish dips be constructed to allow trapped fish to move into and out of this impounded area.

NMFS has one concern regarding consistency with Wetland Value Assessment (WVA) methodology. The horizontal expansion for CDF D and E was evaluated for the emergent marsh and open water conversion to upland on the lake side of the site, but not for the open



water foreshore dike. There is an equal amount of open water that has habitat value and NMFS is recommending that it be included in the WVA for the foreshore upland expansion of this site.

The EFH description in the Existing Fishery Resource section of the Report should reflect detailed information on federally managed fisheries and their EFH provided in the most recently updated, 2005, generic amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. The generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act. NMFS recommends that the life stages of Spanish mackerel, bluefish, and mangrove snapper be eliminated from the document. In addition, the following species and their associated life stages should be added to the document: gulf stone crab, postlarvae and juvenile stages; lane snapper, larvae and juvenile life stages; dog snapper, juvenile life stage; and bonnethead shark, juvenile life stage.

We appreciate the opportunity to review and comment on this Report.

Sincerely,



for Miles M. Croom  
Assistant Regional Director  
Habitat Conservation Division

c:  
LA DNR, CMD, Consistency  
F/SER46, Swafford  
Files





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701

June 5, 2009

F/SER46/KC:jk  
225/389-0508

Mr. Richard Boe, Acting Chief  
Environmental Planning and Compliance Branch  
Planning, Programs, and Management Division  
New Orleans District, U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Mr. Boe:

NOAA's National Marine Fisheries Service (NMFS) has received the draft Dredge Material Management Plan (DMMP) and Supplemental Environmental Impact Statement (SEIS) for the Calcasieu River and Pass, Louisiana, project prepared by the U.S. Army Corps of Engineers, New Orleans District (NOD). The purpose of the study was for the NOD to develop a management plan for the placement of material dredged for the maintenance and operation of the Calcasieu Ship Channel during the next 20 years. Currently the project does not have the adequate dredged material disposal capacity needed to maintain the channel to authorized depths. Existing discharge sites are at or near capacity, and past maintenance deficiencies have resulted in substantial erosion of discharge facilities into adjacent water bodies. As a result, it has become necessary for the NOD to reduce channel widths in some reaches.

The preferred alternative proposed in the in the SEIS designates the placement of dredge material into both confined disposal facilities (CDFs) and beneficial use sites, and emphasizes the rehabilitation and maximum use of CDFs between channel miles 12 and 22. The implementation of the proposed DMMP would result in the conversion of 511 acres of estuarine water column habitat to uplands with the horizontal expansion of existing CDFs (17, 19, D, E). However, the plan also would result in the creation of 6,306 acres of intertidal marsh from beneficial use of dredged material.

NMFS has reviewed the document and finds that it adequately evaluates potential project impacts to essential fish habitat and related marine fishery resources. In addition, the document discloses that, in most cases, the beneficial use sites designated in the preferred plan are scheduled to be used prior to disposing material for the horizontal expansion of the CDFs. The document also indicates that additional beneficial use sites will continue to be evaluated for incorporation into the disposal system during periodic updates of the DMMP.

NMFS is most concerned about the impacts associated with the expansion of CDFs 17 and 19. As proposed for the preferred alternative, this expansion would result in the conversion of 68 acres of marsh and 443 acres of water bottoms to upland elevations. While NMFS understands that these adverse impacts would be offset through the beneficial use of sediment at other



locations, we question the overall need for this level of impact. NMFS recommends the SEIS be revised to include an evaluation of less damaging sediment placement alternatives for this reach (miles 16 to 21) of the Calcasieu Ship Channel. Less damaging alternatives NMFS suggests be considered include using the proposed disposal sites for marsh creation instead of upland confined disposal. If such an option is not feasible, the SEIS should explain the reasoning behind such a determination.

NMFS appreciates the opportunity to review the draft DMMP and SEIS. If you have questions regarding our comments and recommendations, or wish to discuss this matter further, please contact Kimberly Clements at (225) 389-0508, ext 204.

Sincerely,



for Miles M. Croom  
Assistant Regional Administrator  
Habitat Conservation Division

c:  
FWS, Lafayette ✓  
EPA, Dallas  
LA DWF, Balkum  
LA DNR, Consistency  
NOAA PPI, Reid  
F/SER4, Dale  
F/SER46, Swafford  
Files



BOBBY JINDAL  
GOVERNOR

State of Louisiana  
DEPARTMENT OF WILDLIFE & FISHERIES

ROBERT J. BARHAM  
SECRETARY

July 16, 2009

Karl Morgan, Acting Administrator  
Louisiana Department of Natural Resources  
Coastal Management Division  
P.O. Box 44487  
Baton Rouge, LA 70804-4487

RE: *Consistency Number: C20090032*  
*Applicant: COE-NOD*  
*Notice Date: January 20, 2009*  
*Location: Mississippi Sound*

Dear Mr. Morgan:

The professional staff of the Louisiana Department of Wildlife and Fisheries (LDWF) has reviewed the public notice referenced above. The following recommendations have been provided by the appropriate biologist(s):

**Fisheries:**

Although Marine Fisheries staff has been briefed on plan formulation and WVA evaluations, we believe that dredged material should be used beneficially to the maximum extent possible. Per current oyster seed ground management policy, expanding existing Confined Disposal Areas 17 and C/D to upland elevation is acceptable within the pre-existing right-of-way, however, any additional expansion as proposed in the January 2009 Calcasieu River and Pass DMMP into the historic Calcasieu Lake waterbottom must be constructed to marsh elevation.

The Louisiana Department of Wildlife and Fisheries appreciates the opportunity to review and provide recommendations to you regarding this proposed activity. Please do not hesitate to contact Christy Lavergne at 225-765-2386 should you need further assistance.

Sincerely,

Randy Pausina  
Assistant Secretary

c: Christy Lavergne, Biologist Supervisor  
Heather Finely, Biologist Program Manager  
Kyle Balkum, Biologist Program Manager



## **APPENDIX B**

### **Alternative Plan B, Calcasieu Ship Channel Dredged Material Management Plan**



Reach	Section/ River Mile	Placement Sites	Type	Beneficial Use (CY)	Existing Capacity (CY)	Vertical Expansion (CY)	Horizontal Expansion: Upland Creation (CY)	Total Site Capacity (CY)	Total 20-Year Capacity (CY)	20-Year Dredge Quantity (CY)	
River	34 to 36, Coon Island, Port	1	CDF	0	80,700	807,000	0	887,700	1,668,700	1,596,800	
		2	CDF	0	71,000	710,000	0	781,000			
	30 to 34, Turning Basin, Clooney Isl. Loop	3	CDF	0	364,600	1,823,000	0	2,187,600	4,053,300	2,689,800	
		7 (1/2)	CDF	0	207,300	1,658,400	0	1,865,700			
	26 to 30	7 (1/2)	CDF	0	207,300	1,658,400	0	1,865,700	8,035,300	5,877,200	
		8	CDF	0	0	2,478,400	0	2,478,400			
	22 to 26	9	CDF	0	0	2,194,400	1,496,800*	0	3,691,200		
		10	CDF	0	0	1,742,400	774,400*	0	2,516,800	15,568,800	12,706,400
		11	CDF	0	217,800	1,742,400	1,342,400*	0	3,302,600		
		12A	CDF	0	0	2,064,800	0	2,064,800	2,064,800		
	21 to 22	12B	CDF	0	2,095,800	5,588,800	0	7,684,600	7,684,600		
		15	CDF	0	584,000	2,920,000	0	3,504,000	6,214,000	4,458,800	
16 N		CDF	0	0	2,710,000	0	2,710,000				
13		CDF	0	0	11,455,000	2,581,600*	0	14,036,600	14,036,600	10,310,400	
17		CDF	0	309,700	2,026,400	0	2,336,100				
19		CDF	0	0	1,694,000	1,936,500	0	3,630,500			
16 to 21	22	CDF	0	214,500	1,716,800	0	1,931,300	22,582,650	19,885,400		
	Foreshore Dike	CDF	0	0	0	7,465,000	0	7,465,000			
12 to 16	West of Black Lake (50)	BU Site	7,219,750	0	0	0	0	7,219,750			
	D	CDF	2,066,000	398,500	0	4,087,200	0	6,551,700			
	E	CDF	2,066,000	0	0	4,087,200	0	6,153,200	22,503,400	19,475,000	
	Foreshore Dike	CDF	0	0	0	925,000	0	925,000			
Lower Lake	Sabine NWR (5)	BU Site	8,873,500	0	0	0	0	8,873,500			
	Cameron Par. School Bd (49)	BU Site	2,420,000	0	0	0	0	2,420,000	11,696,500	9,261,800	
	Sabine NWR (18)	BU Site	9,276,500	0	0	0	0	9,276,500			
	H	CDF	0	458,000	916,400	0	1,374,400	1,374,400			
	M	CDF	0	0	5,059,200	0	5,059,200	5,059,200			
	N	CDF	0	282,640	0	0	2,826,400	2,826,400	13,329,600	10,853,000	
	Cameron Prairie NWR (19)	BU Site	2,904,000	0	0	0	2,904,000	2,904,000			
	Cameron Prairie NWR (20)	BU Site	1,165,600	0	0	0	1,165,600	1,165,600			
	<b>Total</b>			<b>35,991,350</b>	<b>8,035,600</b>	<b>50,965,600</b>	<b>24,696,100</b>	<b>119,688,850</b>	<b>119,688,850</b>	<b>119,688,850</b>	<b>97,114,600</b>





## **APPENDIX C**

**June 14, 2007, Memorandum  
Identification of Potential Calcasieu Lake Bird Island Areas**



MEMORANDUM

DATE: 14 June 2007

TO: Ms. Sandra Stiles (NOD)

FROM: David Walther (FWS)

SUBJECT: Identification of potential Calcasieu Lake Potential Bird Island Areas

I reviewed Visser et al. (2005) *Nesting Habitat Requirements of the Brown Pelican and Their Management Implications* to help develop ideas about the location and other parameters for creating a bird nesting island. Bird islands in coastal Louisiana are experiencing erosion along with the rest of the coast. The proposed islands would be created for all colonial nesting birds but with greater emphasis on the brown pelican because it is listed as a threatened species and nesting habitat is one of the factors that are limiting recovery, especially since the 2005 hurricane season. In addition, most islands that have brown pelicans nesting on them are also utilized by various other colonial nesting species. Visser et al compared data gathered from brown pelican nesting sites in Louisiana to that presented in the HEP model developed by Hingtgen et al. (1985). Both criteria are presented below for comparison.

	Visser et al.	Hingtgen et al.
<u>Island Location</u>		
Distance from (main)land	4.3 miles	0.25 miles
Distance from island	0.2 miles	
Closest boat launch	3.1 miles	
Closest human activity		0.25
<u>Island Parameters</u>		
Size	24.7 – 172.97 acres	4.9 – 19.8 acres
Beach width	31 yards	
Water/land ratio	70% w/in 12.4 mile radius	
Elevation	min of 4.9 acres @ 12 inches above MSL	2 feet
Vegetation		50% woody vegetation (2-35 feet in height)

The above parameters were used to identify areas (see attached map) within Calcasieu Lake but were modified in the following ways:

The 4.3 mile distance from mainland was not utilized because the distance from the lakes' shores would have eliminated almost the entire lake (and pelicans are nesting on Rabbit Island within West Cove). The 0.25 mile (1,320 feet) was utilized as a buffer around the entire lake shore because that distance is the same distance as the "from closest human activity parameter." Because that parameter is similar to the distance from island parameter the larger distance (0.25 miles) was utilized with the exception of the southeastern most area which could expand an existing island along the channels eastern bank (similar to that which was done for Queen Bess Island). A straight line distance of 3 miles (i.e., buffer) was utilized to identify areas around boat launches that may not be good locations due to disturbance. If the buffer identified an area but that area was not accessible via 3 miles of waterways the buffer was ignored because the true distance was greater than 3 miles. A 1,000-foot buffer was estimated around oil wells and pipelines to compensate for errors in exact location and potential work activities associated with those facilities that may disturb birds. Because erosion associated with frontal passages (i.e., winds from the northwest) can be severe, most areas were placed southeast of a land mass.

Anderson et al. 1982, p. 28 stated: "The offshore area within 30 to 50 km (18 to 30 mi) of a colony during the breeding season is critical to pelicans for feeding young." Hingtgen et al. cited literature that found brown pelicans forage in marine waters within 20 miles of the shore and most foraging occurs within 12 miles of the nest site. Based on the above information and a review by the Service's Migratory Bird Office it is believed that created islands that are farther than 18 miles from the coast will not be expected to be utilized by brown pelicans (but could be built for other bird species) and brown pelican islands should, if feasible be no farther than 9 miles from the coast. Therefore, the priority of potential nesting locations begins with those closest to the gulf because they would be the most likely to be utilized by brown pelicans

Examination of four papers that discussed characteristics of islands with nesting birds other than brown pelicans was undertaken. Two papers examined had information gathered from Louisiana (Clark unknown date and Greer 1985), the third was from Texas (Mendoza 1985), while the fourth was a chapter from the First Regional Workshop on Dredging, Beach Nourishment, and Birds on the South Atlantic Coast (ERDC/EL TR-06-10). The latter contained a review of some previous studies and presentations given at a workshop. Three of the papers only examined islands created with disposed dredge material (i.e., Clark, ERDC/EL TR-06-10, and Mendoza).

As with the brown pelican nesting islands studies criteria for development or management of nesting islands for other birds was compared. Some of the large variations that were noted in the criteria are a result of differences between birds that nest on bare or nearly-bare ground that is generally at a lower elevation and those that nest in herbaceous or shrub/scrub habitat that is generally located at higher elevations. Criteria are presented below for comparison.

Criteria	Mendoza	Greer	Clark	ERDC
Mean Island size (acres)	4.9 (±23.1)	13.4	5-10 (x7.5*)	2-20 (x11)

9.2

Distance to:

Mainland (miles)	3.2 ( $\pm 2.5$ )	0.6	0.5
1.4			
Island (miles)	0.4 ( $\pm 0.5$ )		
0.4			
% shrub/scrub	25 ( $\pm 38$ )	>90(x95)	
60			
% herb.	69 ( $\pm 39$ )	<30(x15)	
42			
Elevation (feet)	>3.3&<9.8	3-6 MSL	2.2-16
>2.8&<10.6			
Topography	variable		
Beach slope/width			<3 ft rise/100
ft			
Redeposition	periodically	every few years	rotationally
Dike			better without

\*x=mean

I attempted to define common criteria for nesting islands used by brown pelicans and other nesting birds and specific ranges of criteria utilizing minimum, maximum and mean values:

Minimum size: 5 acres (4.9); because of the relative smaller size of Calcasieu Lake (as compared to other Louisiana bays) and oyster reefs a maximum size was not defined.

Distance to land: No closer than ¼ mile (1,320 feet); ideally ½ mile (2,640 feet)

Elevation: No lower than 3 feet above MSL for approximately 60% of the island and no elevation greater than 10.6 feet. The maximum elevation should probably not be that high; this mean height includes elevations from North Carolina beaches that are much higher than on the Gulf Coast. A more likely maximum elevation would be 8 feet (mean of maximum value for Mendoza and Clark); however, the maximum should be a limit, not a criterion that should be reached.

Beach width/slope: Material should be allowed to flow and create a slope that would provide bare areas for ground nesting birds, loafing habitat for brown pelicans and landing areas for their fledglings, i.e., dredged material may not have to be placed to the top of containment dikes.

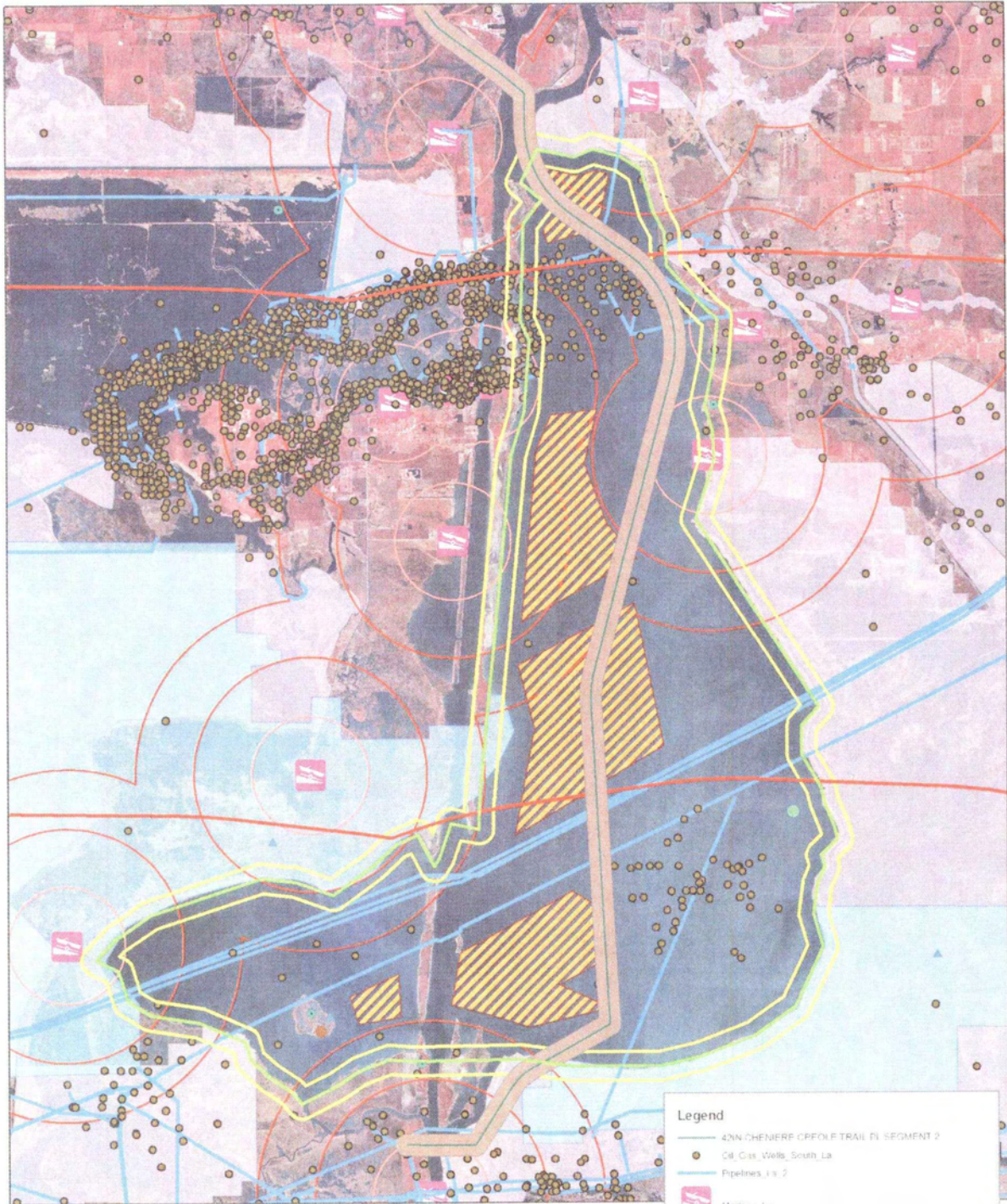
Other common factors not included were vegetation (areas normally revegetate rather quickly and type of vegetation i.e., herb versus shrub/scrub, which is typically associated with elevation), and topography (also addressed via elevation).

Not all factors have been identified that should be considered when locating/creating a bird island but this represents an attempt to identify some potential areas and criteria and combine those that are common to brown pelicans and other nesting birds.

Review of this proposal by other natural resource agencies has not been done therefore

their comments have not been included. In addition, a LNG pipeline is currently being constructed through the eastern portion of Calcasieu Lake. The route of that pipeline when obtained will be placed on the attached map along with a 1,000 feet buffer.

David Walther



# Calcasieu River and Passes Potential Bird Island Areas

0 6,500 13,000 26,000 Feet

**Legend**

- 42N CHENIERE CADEAU TRAIL PL SEGMENT 2
- Cal. Cas. Wells, South La.
- Pipelines, i.s. 2
- MapInfo\_Lit
- ▨ Calcasieu potential bird island areas

**Distance to offshore area**

**Buffer Distance**

- 0.00 - 9.00
- 9.00 - 18.00
- Buffer\_of\_42N\_CHENIERE\_CADEAU\_TRAIL\_PL\_SEGMENT\_2





## **APPENDIX D**

### **Summary of Wetland Value Assessment**



### Acreage and AAHU Impacts of Plan B

Site	Acreage Available for Beneficial Use of Dredged Material	Marsh Created (acres)	Marsh Converted to Uplands (acres)	Open Water/Estuarine Habitat Converted to Uplands (acres)	Total AAHU
BU 5	3,083	3,000	0	0	500.37
BU 18	1,572	1,000	0	0	129.83
BU 19	1,026	300	0	0	70.36
BU 20	1,867	300	0	0	63.33
BU 49	639	600	0	0	167.61
BU 50	887	640	0	0	251.67
CDF D/E marsh expansion	476	466	0	0	121.98
CDF D/E upland expansion	0	0	7	286	-21.31
CDF 17/19 upland expansion	0	0	61	157	-24.16
<b>Totals</b>	<b>9,550</b>	<b>6,306</b>	<b>68</b>	<b>443</b>	<b>1,259.68</b>

### Acreage and AAHU Impacts of Plan C

Site	Acreage Available for Beneficial Use of Dredged Material	Marsh Created (acres)	Marsh Converted to Uplands (acres)	Open Water/Estuarine Habitat Converted to Uplands (acres)	Total AAHU
BU 4	1,279	476	0	0	165.17
BU 5	3,083	3,000	0	0	500.37
BU 6	990	564	0	0	104.45
BU 7	2,498	1,694	0	0	246.39
BU 18	1,572	1,000	0	0	129.83
BU 19	1,026	300	0	0	70.36
BU 20	1,867	300	0	0	63.33
BU 24	2,327	490	0	0	97.01
BU 48	1,475	708	0	0	162.75
BU 49	639	600	0	0	167.61
BU 50	887	640	0	0	251.67
BU 52	258	258	0	0	76.14
<b>Totals</b>	<b>17,901</b>	<b>10,030</b>	<b>0</b>	<b>0</b>	<b>2,035.08</b>

