



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MAR 23 1993

OFFICE OF  
WATER

G. Edward Dickey  
Acting Assistant Secretary of the Army (Civil Works)  
Department of Army  
Washington, DC 20310-0130

Dear Dr. Dickey:

In accordance with the provisions of the 1992 Memorandum of Agreement (MOA) between the U.S. Environmental Protection Agency (EPA) and the Department of Army under Section 404(q) of the Clean Water Act, I am requesting your review of the decision by Lieutenant Colonel James V. Hall, Acting District Engineer, U.S. Army Corps of Engineers (Corps), New Orleans District, to issue a Section 404 permit to John M. Smyth Company and New Orleans Archdiocese of the Catholic Church (Smyth-Church). The proposed permit would authorize discharges associated with a proposal to alter wetlands located on Point au Fer Island, Louisiana, approximately 28 miles southwest of Morgan City, Terrebonne Parish, Louisiana. The draft Department of the Army permit and Permit Evaluation and Decision Document prepared by the New Orleans District were received by EPA Region 6 on February 16, 1993.

The proposed permit would authorize discharges of approximately 53,000 cubic yards of material dredged from bayous and canals, for construction and/or refurbishment of approximately 20 miles of earthen levees along natural bayous and oil/gas access canals, and to install, operate, and maintain 17 water control structures. As described in the District's draft permit document, the proposed project purpose is to establish a marsh management system "to enhance waterfowl habitat and reduce wetland deterioration," on approximately 3,160 acres of marsh on Point au Fer Island. After a thorough review of available information, EPA has concluded that this case warrants elevation in accordance with the criteria in the MOA for elevation under Part IV, Elevation of Individual Permit Decisions.



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## Aquatic Resources of National Importance

This referral meets the criteria in Part IV of the Section 404(q) MOA. EPA finds that the proposed discharges of dredged material for the purpose of establishing a system to impound and manipulate water levels on marshes of Point au Fer Island would result in substantial and unacceptable adverse effects to aquatic resources of national importance. These and similar marsh areas in Louisiana are widely recognized for their value in supporting the production of commercially and recreationally valuable finfish and shellfish. These dynamic vegetated coastal wetlands also provide valuable wildlife habitat support such as nesting and nursery areas, protective cover and abundant food for a variety of birds, mammals and reptiles. These areas are highly productive systems which provide food chain support for living marine and estuarine systems. In addition, the location of these areas seaward of the Louisiana mainland combined with their vegetated cover provides natural storm buffering, erosion abatement, and shoreline stabilization in an area which frequently experiences significant severe storms.

Each year, Louisiana wetlands provide a significant contribution to the wealth of the State as well as the Nation. Louisiana's marshes contribute a commercial fish and shellfish harvest worth several hundred million dollars annually in landings alone. Further, Louisiana wetlands are recognized as one of the Nation's most biologically productive fish and wildlife habitats. Much of the State's recreational fishing is associated with estuarine systems and Terrebonne Parish is the most popular recreational fishing area in the State.

Louisiana wetlands also contribute an estimated forty percent of the Nation's wild fur and hides harvest with a value of seventeen million dollars. These areas also provide wintering habitat for two-thirds of the ducks and geese of the Mississippi flyway and support waterfowl hunting valued at \$58 million. Each of these benefits depends in large part upon the maintenance of the natural diversity and vitality of Louisiana's coastal vegetated wetland systems, such as those on Point au Fer Island. The United States Congress' recognition of the significance of coastal Louisiana wetlands, including the marshes on Point au Fer Island, is reflected in authorization of federal funding in excess of fifty million dollars annually to restore and replace this rapidly disappearing resource.

## Functions and Values

The functions and values of the Point au Fer Island marshes and similar marsh areas along barrier islands and in coastal Louisiana are well recognized and appreciated by those who depend upon them for their livelihood and enjoyment. The economic figures cited above, however, are merely an indicator of the ecological vitality of the Island's wetlands. It is evident that the Point au Fer Island marshes serve as critical habitat for valuable commercial and recreational fish species such as white and brown shrimp, blue crab, red drum, sand and spotted seatrout, gulf menhaden, and southern

flounder. The Island's marsh habitat is currently sustained by unrestricted, semi-diurnal tidal exchange which is pivotal to the various life stages of these and numerous other species. These areas commonly serve as nursery grounds and also serve as cover from predators or climatic conditions and feeding habitat for both juvenile and adult stages of a range of finfish and shellfish species. Commonly, coastal wetlands such as those on Point au Fer Island also serve as important spawning grounds for a variety of fish species.

In addition to fisheries habitat support, Point au Fer Island wetlands provide habitat for a diverse wildlife population dependent upon these systems. Wildlife known to occur on Point au Fer Island and highly likely to occur on the project site include seven species of mammals, 89 species of waterfowl, wading birds, shorebirds, raptors, and songbirds, five species of amphibians and 16 species of reptiles. These wildlife species depend upon the marshes on Point au Fer Island for all or part of their life cycle. Wetlands on the Island provide forage habitat, winter, breeding and nesting habitat, and escape cover for these species.

Finally, the naturally productive marshes within the project area contribute important nutrients, including detritus, into the associated estuarine system. This nutrient export contributes to the base of the food chain in the Atchafalaya Bay and the Gulf of Mexico aquatic environment. Further, the vegetated marshes improve the capacity of the Island to absorb energy from severe weather events common to the Louisiana coastal environments. The vegetated wetlands coupled with the natural barrier island landform serve to lessen the physical impact of these events on mainland and inland areas.

#### Adverse Environmental Impacts

EPA has determined that the proposed project would have significant adverse effects on the functions and values of the Point au Fer Island wetlands including significant impairment of critical habitat values of the area for a diverse and abundant range of fish and wildlife. The construction and restoration of approximately 20 miles of earthen levees would result in the direct loss of a significant acreage of wetlands and would essentially eliminate the wetlands' open connection with the adjacent estuarine system. While the District has not determined the extent of direct impacts of discharges associated with proposed levee construction and restoration, based upon our experience with similar proposals where EPA exercised its authority under Section 404(c), EPA believes the project could directly destroy up to 80 acres of wetlands. The need for mitigation of the adverse impacts of these direct losses associated with the discharge of 53,000 cubic yards of dredged material is not discussed in the Corps Decision Document nor is mitigation provided in the draft permit.

The secondary effect of physical restrictions created by the levees and water control structures would replace the current open wetland system characterized by limitless access with one that would severely restrict accessibility by fish and shellfish to the project site. Manipulation of water levels as proposed by the applicant would alter the site's wetlands and significantly curtail use of the area by a range of wildlife species adapted to the current regime. Conditions such as long-term flooding would prevent use of the area by a variety of mammal, bird and reptiles species currently adapted to using the site during periods of low tide. Finally, the impoundment structures proposed for the site are likely to severely restrict the tidal exchange present in the current open system and thus alter the export of nutrients and detrital material from the marsh system. These same changes may decrease the effectiveness of the Point au Fer Island wetlands to absorb the energy from passing storms and consequently diminish the Island's ability to protect mainland and inland areas.

The direct and secondary effects of the proposed Point au Fer Island project will contribute to the already significant historic loss of productive wetland systems in Louisiana. The State is currently losing coastal marsh habitat at an alarming rate of almost forty square miles per year and approximately 390,000 acres of marsh have already been impounded for marsh management. Further contributions to the State's decline in natural coastal wetlands as a result of adverse effects to 3160 acres would exacerbate this problem. Additional loss of coastal wetlands would also erode efforts currently underway to restore the State's wetlands through efforts such as the Coastal Wetlands Planning, Protection and Restoration Act.

### Conclusions

EPA will continue to support efforts to protect and restore Louisiana's valuable coastal wetlands. EPA believes, however, that decisions regarding marsh management projects must reflect the need for careful and thoughtful planning to minimize avoidable adverse impacts to valuable wetland systems.

The scientific literature regarding marsh management projects that depend upon the control of water levels in impounded wetland areas suggests that land loss rates may increase within those areas due to the hydrologic isolation of the wetlands from their surroundings. EPA shares the view of the District in its draft Permit Evaluation and Decision Document that, "[T]he effectiveness of marsh management in creating new marsh, restoring previously existing wetland acreage, or even slowing rate of conversion to open water has not been consistently demonstrated." This concern is recognized in the Governor of Louisiana's nomination of the Barataria-Terrebonne Estuarine Complex under the National Estuary Program. The nomination concludes that physical barriers, like the proposed levee construction and refurbishment that would accompany the proposed project, adversely affect wetland hydrology, sedimentation and productivity. The nomination document suggests removal or breaching of spoil banks to alleviate adverse environmental impacts to the Barataria-Terrebonne Estuarine Complex.

Further, the draft comprehensive restoration plan developed for the Penchant Subbasin, which includes Point au Fer Island, states that efforts to restore the areas wetlands should "manage the subbasin with a light touch ... [by] optimizing the natural processes which now bring freshwater and sediment into the basin..."

In addition, we believe that the need to "restore" the area and "reduce wetland deterioration" in the project area may be unjustified. Although past subsidence rates on Point au Fer Island are estimated to be approximately one centimeter per year, more recent data indicate that the rate of marsh loss on Point au Fer Island is decreasing due to freshwater and sediment input into the ecosystem. Further, data from the Fish and Wildlife Service's National Wetlands Research Center indicates that a net gain of 373 acres of marsh occurred in the project area between 1978 and 1984. The data suggest that the entire Island of Point au Fer is restoring itself naturally. In addition, Corps data compiled by Dr. Ivor van Heerden of Louisiana State University indicates that the rate of marsh loss is on the decrease and that marsh loss could cease by 1995.

Based on our review of the available information, EPA is extremely concerned about the magnitude of environmental impacts of the proposed Point au Fer project on the values and functions of the Island's wetland systems. Because of anticipated adverse direct, secondary and cumulative impacts associated with discharges proposed on Point au Fer Island, EPA has concluded that the proposed marsh management project would result in significant degradation of waters of the United States. This conclusion is based on project impacts to fisheries, special aquatic sites, aquatic ecosystem diversity, productivity and stability, support for aquatic life dependent on aquatic ecosystems, loss of fish and wildlife habitat. I have enclosed a more detailed analysis of EPA's concerns for your review.

EPA has also concluded that the project does not comply with the alternatives analysis requirements of Section 230.10(a) of the Guidelines. The proposed project may not be the least damaging practicable alternative available to meet the project purpose of reducing wetland deterioration and improving wildlife habitat. Available information indicates that (1) wetland deterioration may actually increase at the project site as a result of restrictions to natural tidal exchange and sedimentation in the project area, (2) significant adverse impact to fisheries and wildlife would occur if the project is implemented, and (3) the full benefits of Coastal Wetlands Planning, Protection and Restoration Act projects in the area would not be realized if the proposed project is implemented.

Based on these findings, EPA requests that the Department of Army deny a Section 404 permit for the proposed marsh management project. In addition, EPA believes that future decisions regarding marsh management projects in the Atchafalaya region must more effectively address the cumulative effect of these actions on the region's aquatic environment. EPA strongly recommends that the Corps complete the programmatic EIS initiated in 1987 to address impacts of marsh management proposals.

EPA's Office of Federal Activities agrees that issuance of a Section 404 permit for this project as proposed, would result in significant impacts to the human environment. In the event that Army decides to issue a permit in this case, preparation of an EIS prior to issuance would appear warranted.

I hope you will carefully review the record on this permit case and I look forward to your response to our concerns. If my staff can be of further assistance during your evaluation of this request, please have your staff direct their questions to Joseph P. DaVia of the Office of Wetlands, Oceans and Watersheds. You should also feel free to contact me or Robert H. Wayland, Director of the Office of Wetlands, Oceans and Watersheds at (202) 260-7166.

Sincerely yours,



Martha G. Prothro  
Acting Assistant Administrator

Enclosures (2)

## ENCLOSURE 1

This referral meets the criteria in Part IV of the 1992 Section 404(q) Memorandum of Agreement based upon EPA's finding that proposed discharges would result in substantial and unacceptable adverse effects to aquatic resources of national importance on Point au Fer Island. The Point au Fer Island wetland system provides support for aquatic wildlife habitat, primary biological production and food chain support, storm buffering and erosion abatement, and shoreline protection. EPA has determined that the project, as proposed, would result in the loss or significant impairment of aquatic functions and values associated with the natural wetland system at Point au Fer Island.

### Aquatic Resources of National Importance

It has been EPA's longstanding position that impoundment of coastal wetlands may result in severe adverse environmental impacts to the values and functions of aquatic resources. In 1985, EPA evaluated and prohibited the construction of a proposal to establish approximately nine miles of earthen dikes in tidal wetlands in South Carolina. The purpose of the proposed discharge was to create wetland impoundments affecting a total of 900 acres of coastal wetlands for the primary purpose of attracting waterfowl. Under the authority of Section 404(c) of the Clean Water Act, EPA prohibited discharges associated with the placement of dikes for the purpose of impounding the marsh. This action was taken in response to anticipated unacceptable adverse effects to 900 acres of coastal wetlands. EPA initiated a second Section 404(c) action in 1984 to restrict the impoundment of 550 acres of coastal wetlands in South Carolina. EPA withdrew its proposed determination after the South Carolina Supreme Court ruled that a necessary State permit for the impoundment did not comply with State law.

The permit applicant in this case has proposed to refurbish, construct, and maintain approximately 20 miles of earthen levees and install, maintain, and operate 17 water control structures to control and manipulate water level on seven impoundments totalling 3,160 acres of brackish marsh on Point au Fer Island. In comparing the Point au Fer proposal with EPA's Section 404(c) action in 1985, more than twice the length of levees would be constructed or refurbished and more than three-fold the acreage of coastal wetlands would be adversely impacted. If cases elevated by EPA under the revised Section 404(q) MOA are to consider, as a basis for comparison, resource damages similar in magnitude to those cases evaluated under Section 404(c) of the Clean Water Act, the Point au Fer proposal meets this provision of the MOA.

Other factors support the conclusion that the proposed Point au Fer project would result in substantial and unacceptable impacts to aquatic resources of national importance. The Point au Fer Island system provides habitat support for critical life stages of finfish and shellfish species vital to Louisiana's commercial and recreational

fishing industries. 1991 commercial fishery statistics for the United States indicate that 1.2 billion pounds of fish and shellfish were landed in the State of Louisiana with a value of \$244 million. Again in 1991, the State was second in the Nation behind Alaska in terms of total tonnage of landings and third in terms of value of landings. Further, according to National Marine Fisheries Service (NMFS, 1992) annual fishery statistics, it was estimated that in 1990, a total of 11,440 commercial fishing boats and fishing vessels were based in Louisiana, second nationally in number to Alaska. Finally, NMFS also estimated that in 1990, seafood processors and handlers employed an average of over 5,000 persons, third nationally behind Alaska and California. The 3,160 acres of brackish marsh at the project area alone is conservatively estimated by the National Marine Fisheries Service (NMFS, 1993) to have a total annual commercial fishery value of approximately \$675,000. While exact figures on current value of recreational fishing activities supported by wetlands on Point au Fer Island are not available, significant amounts are spent each year by recreational anglers targeting species which occur in Louisiana coastal waters.

In recent years the United States Congress has recognized the significance of coastal Louisiana wetlands, including the marsh systems on Point au Fer Island. This recognition has resulted in provision of Federal funds of up to \$70 million annually for restoration and protection of Louisiana wetlands. In recommending this effort, the Senate Committee on Environment and Public Works noted:

Forty percent of the Nation's coastal wetlands are located in the State of Louisiana. These wetlands support over 30 percent of the nation's fisheries and shell fisheries harvest and 40 percent of its fur harvest; buffer destructive tidal surges caused by hurricanes and storms and reduce flood damages; trap and hold freshwater for coastal communities and retard saltwater intrusion into coastal communities freshwater supplies; and provide wintering habitat for two-thirds of the ducks and geese of the Mississippi flyway.

The Committee report also notes that since 1900, Louisiana has lost more than 1.1 million acres of coastal wetlands. In addition, 80 percent of the Nation's coastal wetland loss is occurring in Louisiana.

Point au Fer Island is within the coastal wetlands area of Louisiana designated by the Federal Task force created by the Coastal Wetlands Planning, Protection, and Restoration Act, P.L. 101-646 (CWPPRA) to receive intensive attention for comprehensive planning, protection, and restoration and annual funding up to \$70 million for these efforts. Congress recognized the national importance of these wetlands which have special significance for fisheries production and other marine habitat. The Point au Fer Island area is the site of several wetland restoration projects proposed by Federal agencies with funds appropriated under CWPPRA. A basic objective of the Task Force is to develop a plan to carry out projects using natural processes wherever



there is that opportunity. For example, approximately \$1.7 million has been allocated to CWPPRA projects entitled (1) Re-establishment of Natural Sediment Delivery System, Atchafalaya Delta, and (2) Point au Fer Island Plugs. The projects involve dredging canals in the Atchafalaya River Delta to allow additional sediment movement from the Atchafalaya River to vegetated wetlands on Point au Fer Island, and plugging existing oil/gas canals to reduce saltwater intrusion and abnormal tidal flushing, and to restore natural sinuosity of the bayou. The full benefits of these projects would not be achieved if the Smyth-Church project were implemented.

#### Site Description

Point au Fer Island is located in the southwestern corner of Terrebonne Parish, Louisiana, approximately 28 miles south of Morgan City, Louisiana. The highest elevations on the Island, along the Gulf Coast beach, are five feet. Otherwise, the marsh elevations range from 0.5 to 1.5 feet above sea level. The Island is bounded on the south by the Gulf of Mexico; on the east by Oyster Bayou; on the north by Four League Bay; and on the west by Atchafalaya Bay. The Island encompasses approximately 42,073 acres of intertidal brackish emergent marsh and contains natural bayous, tidal guts, canals and small open water systems. These numerous water courses connect an extremely diverse and dynamic aquatic ecosystem.

A daily tidal exchange is common in all of the ponds, bayous, lakes and canals on Point au Fer Island. Tidal exchange is greatest during the fall and winter months when the passage of weather fronts is most frequent. Tidal exchanges are currently unrestricted despite the existence of natural and decaying man-made levees on the Island.

The proposed project site consists of 3,160 acres of mostly brackish marsh and shallow open water systems. The dominant emergent plant cover includes wiregrass (Spartina patens), three-cornered grass (Scirpus olneyi), and leafy three-square (Scirpus robustus) (EPA Direct Observation, March, 1993). Along the site's western border with the Gulf of Mexico, smooth cordgrass (Spartina alterniflora), glasswort (Salicornia sp.), black needle rush (Juncus roemerianus), and seashore saltgrass (Distichlis spicata) are common. Some open water areas support widgeon grass (Ruppia maritima) (Ensminger, 1988). A complete list of vegetation found at the site is included in Enclosure 2.

Additionally, natural levees are found along most of the bayous of the Island. The larger bayous, such as Locust Bayou, support stands of vegetation adapted to the elevated levees. These plants include roseau cane (Phragmites australis), hogcane (Spartina cynosuroides), belle-dame (Acnida cuspidata), bushy beardgrass (Andropogon glomeratus), annual saltmarsh aster (Aster subulatus), and baccharis (Baccharis sp.) (Ensminger, 1988). These natural levees have been extensively augmented by man-made spoil banks that were constructed in conjunction with mineral access canals and pipeline

canals. Most of these canal spoil banks have become covered with dense stands of vegetation and in many cases the dominant plants are wiregrass and baccharis.

### Project Description

The permit applicant proposes to dredge approximately 53,000 cubic yards of material from the bottoms of bayous and canals on Point au Fer Island and discharge this material for the construction and/or reconstruction of approximately 20 miles of earthen levees along bayous and access canals. The applicant also proposes to install, operate, and maintain 17 water control structures to facilitate water level management within the leveed area. According to the applicant, this water level management is designed to enhance waterfowl habitat, reduce export of marsh sediments, improve emergent vegetation vigor and acreage, stabilize water levels for the propagation of vegetation and estuarine and marine fisheries use, and prevent further wetland deterioration.

To accomplish project objectives, the applicant has partitioned the proposed project site's 3,160 acres of marsh into seven cells designated as "conservation treatment units" (CTUs) or impoundments. Operation of three of the seven CTUs would include drawdown management and the remaining four CTUs are designed for less rigorous or passive management. Much of the infrastructure necessary for these management units is provided by existing natural and man-made levees. To complete the necessary structures for the proposed impoundments, open segments in the current levee system at the proposed site would be closed by either refurbishing old levee structures or constructing new levees. This would be accomplished with dredged material from the adjacent waterway. In addition, approximately 810 cubic yards of material would be dredged and deposited in association with water control structure repair and installation. The maximum levee height would be approximately 2 to 3 feet above the marsh elevation provided that the adjacent embankment elevations are not exceeded. The water control structures would be either fixed crest weir or variable crest weir structures.

A principle objective for installation of the water control structures and construction or refurbishment of levees is to improve habitat conditions for wintering waterfowl and to improve hunter access through control of water levels in the proposed impoundments. During the fall and winter months, weather conditions can produce low water levels in the coastal marshes and ponds for several days at a time. During these periods, access to ponds for hunting is limited and, additionally, the attractiveness to these ponded areas for waterfowl has decreased. By installing water control structures and levees, water levels can be controlled at a prescribed level. This provides more convenient hunter access and enhances waterfowl habitat. Waterfowl habitat quality can be improved with increased production of preferred waterfowl foods (e.g., widgeon grass) by using water control structures to stabilize water levels.

From April through June, drawdown is proposed in two of five years for CTUs 1, 2, and 3. This drawdown would be attempted by removing the stoplogs on the water control structures and closing the flapgates, thereby allowing discharge of water via tidally induced gravity drainage. The impoundment water level would be established at 12 inches below the average marsh elevation. Exposure of peripheral water bottoms is expected to consolidate substrate sediments and allow oxidation of accumulated organic material. This is intended to stimulate emergent plant germination and growth. After the drawdown, free tidal exchange would be allowed for three months and the water level would be maintained at 12 inches below the average marsh elevation. During the last quarter of the year, the water level within the impoundment would be raised to 6 inches below the average marsh elevation to deepen impounded water to encourage waterfowl use and improve hunter access. For three years in five, drawdown would not be employed in these CTUs and the water control structures would remain open for the first six months of the year. From July through mid-September, water levels would be maintained at 12 inches below the average marsh elevation to enhance vegetative growth. Water levels in the impoundments would then be increased to 6 inches below average marsh elevation for the remainder of the year to promote waterfowl use and hunter access.

Passive management would be implemented on CTUs 4, 5, 6, and 7, and these cells would not be actively managed for drawdown. The structures in these impoundments would remain open from January through September allowing for limited tidal exchange through the water control structure only. From October through December, the water control structure stoplogs would be set to maintain water levels at six inches below the average marsh elevation, to encourage waterfowl use and improve hunter access. Six inch vertical slots would be provided in some water control structures. These vertical slots would remain open except during waterfowl hunting season.

#### Functions and Values

The functions and values of brackish intertidal wetlands along Louisiana's Gulf Coast are well documented (Bahr et. al., 1983; Conner and Day, 1987; Gosselink, 1984). Although the New Orleans District could not rely on extensive site specific data, the wetland system on Point au Fer Island is virtually identical to other barrier island and coastal brackish wetland systems that have been extensively studied in Louisiana. Point au Fer Island is a diverse, open, and dynamic marsh ecosystem used by numerous wildlife and aquatic organisms. A complete species list is included as Enclosure 2. The extensive and diverse functions and values of the Point au Fer Island marshes and similar marsh areas in Louisiana for finfish habitat, shellfish habitat, wildlife habitat, storm buffering and detrital exchange are well characterized in the scientific literature.

## A. Fishery Values

As stated in the Corps Decision Document, the Point au Fer marshes provide critical nursery habitat for a diverse and important population of finfish and shellfish. EPA also recognizes that the vegetated marshes and shallow water areas are also used as important foraging habitat, escape cover, breeding habitat, and resting habitat for various finfish and shellfish. Species of fish and crustaceans that live as adults in adjacent estuarine and offshore marine waters depend upon the coastal marsh areas for nursery areas. The larvae and juvenile forms of fish and crustaceans make their way to these essential marsh areas to feed and grow to adult life stages in an area generally free from larger predators. After reaching maturity, these species move seaward. The marsh ponds within the area also harbor a variety of resident fishes and invertebrates. Among the more common resident species are anchovies, killifishes, silversides, gobies, and grass shrimp. These species are important food sources for some mammals (e.g., river otter and raccoon), wading birds (e.g., egrets, herons), and fishing birds. When the tide recedes, many of these small fish are trapped in shallow depressions and are easily available for predation. The marshes and open water areas on Point au Fer Island are likely to provide nursery habitat, foraging and feeding habitat, breeding habitat, and escape cover for 44 species of fish and shellfish.

The diverse and abundant assemblage of finfish and shellfish species supported by the Point au Fer Island include species targeted by Louisiana's commercial and recreational fishermen. Important commercial and recreational finfish and shellfish resources found at the proposed project site include: Atlantic croaker, red drum, sand seatrout, spotted seatrout, southern flounder, gulf menhaden, spot, striped mullet, brown shrimp, white shrimp, and blue crab. These species have been identified as being of national economic importance in accordance with the Water Resources Development Act of 1986. As further indication of the commercial and recreational importance of the brown shrimp, white shrimp and red drum, these species are managed under the Magnuson Fishery Conservation and Management Act. Fishery management plans have been prepared for these species and those plans call for the protection of these species' habitat, such as the essential habitat found at the proposed project site wetlands.

## B. Wildlife Values

The Corps' decision document noted that "the project area marshes provide high value habitat for those faunal assemblages associated with brackish coastal wetlands." Point au Fer provides habitat for a diverse wildlife population dependent upon these habitats. Seven species of mammals, 21 species of waterfowl, 17 species of wading birds, 22 species of shorebirds, six species of fishing birds, five species of raptors, 21 species of various songbirds and marsh birds, five species of amphibians and 16 species of reptiles are known to use or are likely to be found on Point au Fer Island, including the proposed project site. The marshes on Point au Fer are likely to provide wintering

habitat, foraging and feeding habitat, breeding and nesting habitat, and escape cover for 120 species of wildlife.

The Corps' Decision Document states that, "Point au Fer Island is uniquely situated between the mainland coastal marshes and the Gulf of Mexico and serves as a stopover to refuel for those species continuing the migration southward as well as a final destination for others." Louisiana's coastal wetlands provide wintering habitat for approximately two-thirds of the Mississippi Flyway ducks and geese. Each winter hundreds of thousands of ducks are attracted to the Atchafalaya Bay and barrier island wetlands, including the Point au Fer Island marshes, because of the abundant food that makes the area one of the most important waterfowl areas in the State. Migratory waterfowl make brief stopovers in the marshes of Point au Fer enroute to traditional wintering areas to the south or breeding areas to the north. Waterfowl may rest and feed in the marshes for only a few days or as long as a month before continuing on their migration. Some species of waterfowl (e.g., gadwall) are attracted to the shallow ponds containing dense stands of aquatic plants like those that occur on Point au Fer Island. In addition to providing habitat for migratory species of waterfowl, Point au Fer Island marshes and ponds are known to currently support a large resident population of mottled duck. Mottled duck prefer nesting habitat made up of low marsh ridges with a minimum of 500 feet of open water. Throughout much of the proposed project site this habitat requirement is present. Snow geese are reported to use the tubers and roots of three-cornered grass and leafy three-square for food and the abundant seed crop produced by these two plants are used by a wide variety of waterfowl and other birds. Both of these plant species are dominant emergent plants in the Point au Fer brackish marshes. Other waterfowl species that are known to depend upon brackish marshes of coastal Louisiana, including the proposed project area are: blue-winged teal, mallard, northern pintail, American widgeon, northern shoveler, green-winged teal, American black duck, gadwall, lesser scaup, ring-neck duck, bufflehead, and ruddy duck.

The Point au Fer marshes provide extremely valuable and productive habitat for furbearers (e.g., river otter, North American mink, nutria, northern raccoon, and common muskrat). The muskrat and nutria are herbivores and are attracted to the Point au Fer marshes because of the tremendous production of preferred plant species. Three-cornered grass which is abundant in the brackish marshes is a preferred food of the muskrat and the habitat requirements for the muskrat are similar to those of this plant species.

Historical records of the landowners confirm that the Island has been an attractive fur producing area and has been managed in the past for furbearers. River otters and minks are marsh-dwelling carnivores on Point au Fer Island. River otters reach their greatest densities in brackish marshes, such as those on the Island, where their primary food sources are aquatic organisms. During low tides in the marsh, crabs and fish are stranded in shallow pools and provide easy prey for otters. The value of the fur harvest can be variable between years due to external factors (e.g., fur market);

however, information provided by Linscombe and Kinler (1985) was applied to the proposed project area and it was estimated that the value of the fur harvest was approximately \$8,600 per year.

Additionally, Point au Fer Island may provide foraging, resting, nesting, escape and breeding habitat for a vast variety of shorebirds (e.g., sandpipers; dowitchers; American avocet; red breasted merganser), wading birds (e.g., roseate spoonbill; herons; egrets; ibises), fishing birds (e.g., belted kingfisher; American white pelican; terns; laughing gull), raptors (marsh hawk; Merlin; American kestrel; peregrine falcon), songbirds and other marsh birds (e.g., red-winged blackbird; sharp-tailed and savannah sparrow; marsh and sedge wrens; yellow, Virginia, king and clapper rails; boat-tailed grackle; sora), reptiles (American alligator; snapping and eastern mud turtle; diamondback terrapin; Missouri slider; western ribbon snake, brown snake, broad-banded water snake, and green water snake) and amphibians (e.g., woodhouse's toad; eastern narrowmouth toad; green tree frog; bronze frog; southern leopard frog). Wading birds are mostly carnivorous, catching frogs, small fish, snakes and assortment of other foods. Egrets and herons prefer to fish in shallow marsh ponds and along the bayous that drain the marshes. The marshes of Point au Fer provide foraging and nesting habitat for egrets and herons.

### C. Contribution to the Atchafalaya Bay Estuary

In addition to providing essential habitat for living aquatic resources, the Corps' Decision Document noted that "these marshes at Point au Fer provide tremendous quantities of detrital material which forms the base of the food chain in the Atchafalaya Bay estuary and contributes to maintaining the high level of fisheries productivity in the northern Gulf of Mexico." Coastal marshes, like those at Point au Fer Island, exchange nutrients with adjacent water bodies and the amount of nutrients moving in or out of the marsh varies seasonally. During the growing season, marsh plants have high nutrient demands and much of the available nutrients are tied up in living plant tissue. During this time the marshes may import, if tidal exchange is unrestricted, more nutrients than they export. Throughout the growing season, portions of the plants die and fall to the marsh surface. Some of this material is utilized by microbial organisms where it falls, much is decomposed and incorporated into the substrate to form new marshland. However, some of the plant debris in tidal marshes is transported by currents to downstream estuaries and supplements the food web of aquatic organisms (Chabreck, 1988). The plant debris in the Point au Fer intertidal marshes is expected to be transported by currents to the Atchafalaya Bay estuary and is an important supplement to the food available to aquatic organisms. This detrital material is a major component of the diet of polychaetes, bivalves, gastropods, amphipods, nematodes, copepods, shrimp, and fish.

#### D. Storm Buffering

Finally, as a barrier island, Point au Fer Island is the outermost land area in western Terrebonne Parish. As such, the Island acts as the first line of defense against the adverse effects of coastal storms on that area of the Parish mainland. In a region known for extremely damaging storm events, the marshes of Point au Fer Island serve to attenuate tidal surges and wave action, thereby providing protection for inland areas which would otherwise suffer the full force and damages associated with severe storms.

#### Alternatives analysis - 230.10(a)

The draft permit prepared by the New Orleans District Corps of Engineers states that the purpose of the project is "to enhance waterfowl habitat and reduce wetland deterioration." Additionally, the New Orleans District's Permit Evaluation and Decision Document states that the purpose of the proposed project is "to enhance waterfowl habitat, reduce export of marsh sediments, improve emergent vegetation vigor and acreage, stabilize water levels for the propagation of submergent vegetation and estuarine and marine fisheries use, and prevent further wetland deterioration." As set forth in the following sections of our request for elevation, EPA has concluded that, while the proposed activities may result in increased usage by waterfowl, the proposed marsh management activities would not achieve the marsh enhancement aspects of the project purpose. EPA has determined that the project, as proposed by the applicant, would result in substantial adverse impacts to the very aquatic resources that the applicant proposes to enhance and protect.

While the New Orleans District's draft Permit Decision implies that the purpose of the proposed Point au Fer project merges the goal of marsh restoration and enhancement with the desires of the applicant for long-term economic benefits derived from hunting and trapping leases, the decision making process set forth in the related environmental documentation does not support that perspective. EPA believes that in reviewing alternatives to the applicant's proposed marsh management project, the New Orleans District has inappropriately emphasized the desire of the applicant to provide human access to the area and to manage the area to attract and hold waterfowl. This narrow perspective on the alternatives analysis has led the Corps' decision making process to dismiss options which would result in overall enhancement of wetland values. In order to determine the least damaging practicable alternative as required under Section 230.10(a) of the Guidelines, an objective review of alternatives must fully consider environmental impacts of the proposals. Particularly in this case, where a major component of the stated project purpose is to reduce wetland deterioration, alternatives that are otherwise practicable and would have less adverse impact on the aquatic environment, should be further evaluated to determine the least damaging practicable alternative.

Significant Degradation of Waters of the United States - Section 230.10(c)

Section 230.10(c) of the Section 404(b)(1) Guidelines requires that no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of waters of the United States. In determining significant degradation, the Guidelines direct consideration of such impacts as significant adverse effects on fish, shellfish, wildlife, and special aquatic sites, life stages of aquatic life and other wildlife dependent on aquatic ecosystems, loss of fish and wildlife habitat, support for aquatic life and other wildlife dependent on aquatic ecosystem diversity, productivity and stability, and water circulation, fluctuation, and salinity determinations. In reviewing impacts from discharges into waters of the United States, mitigation can be considered to reduce or offset adverse impacts to the aquatic ecosystem. The following specific adverse impacts are likely to result from proposed discharges to create 3,160 acres of impoundments on Point au Fer Island.

**A. Impairment of Nursery Value**

The marsh wetlands at the Point au Fer site provide significant wetland habitat for numerous fish species including red drum, spotted seatrout, sand seatrout, brown shrimp, white shrimp, Atlantic croaker, southern flounder, gulf menhaden, and blue crab. Construction and refurbishment activities proposed for 20 miles of earthen levees and installation, repair, and operation of 17 water control structures would dramatically change a diverse, open, and dynamic marsh ecosystem used by numerous wildlife and aquatic organisms, into a closed and static type of open water environment favored primarily by waterfowl. Moreover, the levees and water control structures would either block or severely restrict access into and out of the marsh currently being used by fish, shellfish, and other aquatic organisms, thereby severely reducing the nursery and fish and wildlife habitat value of the area to these species.

Seventeen water control structures are proposed for the project (six fixed crest weirs and 11 variable crest weirs). Entrance into the proposed impoundments by aquatic organisms would be limited to those water control structures. For the variable crest weirs, a six inch vertical slot has been added to the structure. The Corps Decision Document states that these slots would facilitate aquatic organism ingress/egress into the marsh. However, the marsh would be blocked at all access points for aquatic organisms ingress and egress except for the slot in the weir. Further, the management schedule described in the Corps Decision Document emphasizes that the slots may be closed three days before duck hunting season and remain closed until three days after duck hunting season. This management scheme would further limit aquatic organism access through the water control structure and into the impounded marsh. In Louisiana, waterfowl hunting season typically occurs at various times during November, December and January. Therefore, this type of operation would preclude aquatic organism use of the slot and negate the proposed benefit during those months. At present, the site can be accessed by aquatic organisms at numerous breach points in the spoil bank levees



existing at the site. The proposed project would reduce the ingress/egress points to a mere six inches at the variable crest weir structure entrance. Even with the slotted weirs, it is expected that there would be a 50 to 90 percent decrease in fishery production (NMFS, Personal Communication, March 1993). Five of the fixed crest weirs would have no slots and ingress/egress of aquatic organisms would be severely restricted or completely blocked.

The proposed management procedures (as described earlier) would be implemented at various times of the year to raise and hold water. At these times, tidal exchange would be severely restricted between the impoundments and the surrounding waters. This management regime is linked solely to enhancing waterfowl habitat without regard to various lifecycle needs of fish and shellfish.

A recent intensive study (Herke et. al., 1987) of the impacts of water control structures on fisheries compared two years productivity data from a 70 hectare marsh pond with a fixed crest weir set 12 inches below marsh level and a similar pond with no structure. Average decrease in fishery production in the managed area ranged from 63 percent to 92 percent for gulf menhaden, brown shrimp, white shrimp, sand seatrout, spotted seatrout, and red and black drum. In another study (Rogers, et. al., 1987), it was shown that a pond having a slotted weir had 80 percent less gulf menhaden, 71 percent less brown shrimp, and 48 percent less white shrimp than an unmanaged control area. Based on these studies, it is reasonably expected that similar impacts would occur to the project area. Therefore, the Corps conclusion that significant adverse impacts to fisheries resources are not expected to occur is highly questionable. EPA has determined that the extensive levees and water control structures as proposed for this marsh management project would severely restrict the ingress and egress of both larval and adult fish and shellfish, and invertebrates into the project area and reduce the nursery value and fishery production of the area significantly.

#### B. Diminished Tidal Exchange

As described in the section above, despite the existence of degraded levees and spoil banks surrounding portions of the project site, the site is subject to semi-diurnal tidal exchanges that occur throughout the year. Free tidal exchange results as breaches exist at various locations in the spoil bank levee and because of "washouts" around existing fixed crest weirs (EPA Direct Observation, March, 1993). As proposed, most CTUs in the project site would be completely enclosed by refurbishing levees and installation and repair of water control structures. The refurbishment of levees and operation of water control structures would serve to limit the normal exchange of tides and water circulation and fluctuation in the project area. Consequently, the biological exchange and open access to aquatic organisms would be severely modified or eliminated in the impoundments for most times during the year, including periods when estuarine fish and invertebrates depend upon tidal marsh exchanges.

### C. Export of Marsh Detritus

Export of plant material as detritus is essential to the maintenance of the fisheries of coastal Louisiana. Although the impoundments may provide an environment for attracting waterfowl, there would be little regular export of nutrients and detrital material from the impoundments due to the separation of the impoundments (by levees and water control structures) from surrounding bayous, canals, and bays. In addition, detritus formation and export is greatest during fall and winter, precisely the time when the management regime calls for raising water levels and impounding the marshes for human access and hunting. Therefore, impoundment of these wetlands is expected to have an unacceptable adverse impact on the export of marsh production necessary to support estuarine food webs in adjacent areas of the Atchafalaya Bay and Gulf of Mexico.

### D. Water Quality Impacts

The impoundments and proposed marsh management schedule place constraints on the frequency of water exchange between the impoundments and the surrounding bayous, canals, and bays. Experience with impounded wetlands in South Carolina has demonstrated that low dissolved oxygen levels in the proposed impoundments are often lethal to fish and invertebrates living in the impoundments. This problem would be most severe during the hot summer months when a reduced tidal exchange exists in the impoundments and thermal conditions in the impoundments are conducive to rapid oxygen depletion. EPA expects that the same kind of problem is likely to occur in the proposed impoundments. The project would also reduce warmer tidal exchanges in the impoundments during cold winter months. This could result in colder water remaining in the impoundments thereby causing fish kills or severely stressed fish populations, due to extreme low temperatures exceeding thermal tolerances. In addition, conversion of 3,160 acres of brackish marsh would eliminate or severely reduce the water treatment capacity of the marsh and replace it with a source likely to contribute to reduced water quality in the surrounding waters. Freshwater exchanges into the impoundments would also be reduced due to the management of water levels. Salinity levels would be expected to rise as evaporation rates increase during hotter summer months in the shallow water impoundments. Juvenile marine fish and shellfish using these waters tend to show greater susceptibility to reduced water quality because of osmotic stresses they experience due to variations in salinity. The health of these species is critically dependent upon relatively narrow ranges of water quality characteristics. EPA is concerned that these water quality impacts typically associated with impoundments have not been completely evaluated by the Corps.

### E. Direct Wetland Loss

The levees, spoil banks, and water control structures existing at the project site have been in place for some time. These man-made levees and water structures are

severely degraded, with numerous breaches/washouts and are therefore not serving their intended functions (EPA Direct Observation, March, 1993). For the proposed project, specific levee segments would be refurbished/constructed with approximately 52,500 cubic yards of dredged material excavated from adjacent waters and an additional 810 cubic yards of material would be dredged and deposited in association with water control structure repair and installation. The Corps decision document states that this proposed deposition from dredging operations is expected to cause negligible additional direct wetland loss. There appears to be little basis in the record for this assessment. Direct wetland losses are not estimated by the Corps, nor is any type of mitigation proposed for these direct losses. In addition, the proposed project would destroy existing natural wetland vegetation on the levees that provides unique habitat for certain wildlife species. EPA is concerned that the Corps has inadequately evaluated the potential direct effects of the discharge of over 53,000 cubic yards of dredged material to refurbish and construct approximately 20 miles of earthen levees and install water control structures in wetlands on Point au Fer Island.

#### F. Cumulative Impacts

Direct wetland loss and associated impacts to fish, shellfish, and wildlife resulting from the proposed project are amplified when considered in the context of historic wetland losses in Louisiana and other marsh management projects permitted on Louisiana's coast. The Corps recognizes that the combined effect of natural and human activities has resulted in the conversion of coastal marshes to open water at an estimated rate of approximately 40 square miles per year (Corps Decision Document at page 3). In addition, as of March, 1992, permits impacting 390,000 acres of marsh were issued by the Corps and permit actions potentially affecting an additional 32,000 acres are pending (Corps Decision Document at pages 36-37). The extensive conversion of intertidal marshes providing a wide range of functions and values to open water is currently contributing to long-term reduction of wildlife and fishery resources in coastal Louisiana. EPA is concerned that the cumulative impacts of these activities should be properly evaluated by the Corps before additional impoundments are permitted.

Since 1900, Louisiana has lost more than 1.1 million acres of coastal wetlands and eighty percent of the Nation's coastal wetlands loss is occurring in Louisiana. Recognizing this historic loss and the importance of coastal Louisiana wetlands, including those on Point au Fer Island, Congress has allocated up to \$70 million per year for restoration and protection of these wetlands. Point au Fer Island is within the coastal wetlands area designated by a Federal task force created by CWPPRA to receive intensive attention for comprehensive planning, protection and restoration. Point au Fer Island and the Atchafalaya Delta region are the site of several CWPPRA funded restoration projects utilizing natural processes to benefit the marshes on Point au Fer Island.

## Conclusion

EPA disagrees with the conclusion of the New Orleans District that the Point au Fer project can be permitted in accordance with the Clean Water Act Section 404(b)(1) Guidelines (40 CFR Part 230). It has been EPA's longstanding policy that impoundment of coastal marshes results in severe adverse environmental impacts to the values and functions of nationally important aquatic resources. EPA continues to support effective marsh restoration efforts such as the named projects under CWPPRA. However, consistent with past policy, we continue to be concerned with issuance of Clean Water Act permits for impoundment of diverse, naturally recovering marsh systems in the face of documented evidence that identifies significant direct, secondary, and cumulative adverse impacts associated with these projects.

EPA is extremely concerned about the magnitude of environmental impacts of a project of this type on the diverse and valuable wildlife and fisheries resources in this area. EPA has determined from available data that the project as proposed would possibly result in enhancement of waterfowl habitat and provide for additional human access into the marsh. These project benefits would occur, however, at the expense of other diverse and valuable aquatic functions currently being performed. As such, EPA has concluded that the proposed project would have significant adverse effects on important commercial and recreational fisheries, wildlife, special aquatic sites, life stages of aquatic life and other wildlife dependent on aquatic ecosystems, loss of fish and wildlife habitat, and support for aquatic life and other wildlife dependent on aquatic ecosystem diversity, productivity and stability. In addition, EPA is concerned about water quality impacts, and effects the project would have on water circulation and fluctuation. EPA also believes that the conclusions reached by the New Orleans District regarding the potential for success of the proposal are contrary to findings by NMFS and existing reports on marsh management. NMFS investigations reveal that in many comparisons of fisheries production or standing crop in managed and controlled marshes, a large and statistically significant decrease in fishery values occurred in the managed marsh.

Very importantly, EPA questions the fundamental need for this marsh management project which purportedly is to decrease wetland deterioration. EPA is concerned that there is existing Corps and Fish and Wildlife Service data which shows that the rates of marsh loss on Point au Fer Island are decreasing and the marshes are beginning to restore naturally. Based on conversations with Dr. Ivor van Heerden of Louisiana State University's Natural Systems Management and Engineering Program, EPA has determined that ample sediment from the Atchafalaya River is available and natural processes are working to transport this sediment to the marshes on Point au Fer Island.

Based on information currently available and after consideration of anticipated adverse direct, secondary and cumulative impacts associated with the proposed marsh management project on 3,160 acres of brackish marsh on Point au Fer Island, we have concluded that this proposed project would result in significant degradation of waters of the United States in violation of Section 230.10(c) of the Guidelines. Moreover, EPA has determined that the proposed project is contradictory to the objectives of CWPPRA and the full benefits of approved CWPPRA projects in the Atchafalaya River Delta and on Point au Fer Island would not be realized if the project proceeds as proposed. Further, EPA has concluded that the proposed project does not comply with Section 230.10(a) of the Guidelines. EPA has determined that the Corps has failed to properly evaluate less environmentally damaging practicable alternatives to the marsh management proposal. In accordance with Section 230.10(d), EPA has also determined that adequate measures to minimize and compensate for potential adverse impacts of the discharge on the aquatic ecosystem have not been proposed. Based on these findings, EPA requests that a Department of Army Section 404 permit be denied for the proposed marsh management project on Point au Fer Island, Louisiana.

Recognizing the adverse environmental impacts that would result from this project, EPA has determined that a project-specific environmental impact statement (EIS) is appropriate. In fact, given the number of similar marsh restoration and marsh management proposals in coastal Louisiana, a programmatic EIS would appear warranted. The Corps recognized the need and agreed to prepare a programmatic EIS on marsh management with formal scoping initiated in 1987. However, the EIS process was halted again in October, 1992, due to lack of funding. Completion of the programmatic EIS is necessary to ensure that subsequent marsh management proposals can be properly evaluated in light of their overall environmental benefits and detriments.

In conclusion, EPA has determined that the marsh management proposal to impound 3,160 acres of brackish marsh would result in significant adverse impacts to fishery and wildlife resources, special aquatic sites, water quality, and contribute to cumulative impacts to Louisiana's coastal marshes. EPA has determined that the project would result in significant degradation of waters of the United States.

ENCLOSURE 2

Plant species of Louisiana coastal brackish marshes that occur or are likely to occur on Point au Fer Island.

<u>Species</u>	<u>Common name</u>
<u>Acnida cuspidata</u>	belle-dame, southern waterhemp
<u>Amaranthus australis</u>	southern waterhemp
<u>Andropogon glomeratus</u>	bushy beardgrass
<u>Aster sp.</u>	aster
<u>Aster subulatus</u>	annual saltmarsh aster
<u>Aster tenuifolius</u>	saltmarsh aster
<u>Baccharis sp.</u>	baccharis
<u>Baccharis halimifolia</u>	eastern baccharis
<u>Bacopa monnieri</u>	coastal water hyssop
<u>Bacopa rotundifolia</u>	round leaf bacopa
<u>Borrchia frutescens</u>	sea oxeye
<u>Cladium jamaicense</u>	Jamaica sawgrass
<u>Cuscuta indecora</u>	pretty dodder
<u>Cyperus odoratus</u>	fragrant flatsedge
<u>Distichlis spicata</u>	seashore saltgrass
<u>Echinochloa walteri</u>	Walter's millet
<u>Eleocharis sp.</u>	spikerush
<u>Eleocharis parvula</u>	dwarf spikerush
<u>Fimbristylis castanea</u>	sand rush
<u>Garardia maritima</u>	-----
<u>Ipomoea sagittata</u>	saltmarsh morning-glory
<u>Ipomoea stolonifera</u>	beach morning-glory
<u>Iva frutescens</u>	marsh elder sumpweed
<u>Juncus roemerianus</u>	black needle rush
<u>Kosteletzkya virginica</u>	swampmarsh mallow
<u>Lantana horrida</u>	calico bush
<u>Lemna minor</u>	common duckweed
<u>Leptochola fascicularis</u>	bearded spangletop
<u>Lythrum lineare</u>	saltmarsh lythrum
<u>Myriophyllum spicatum</u>	watermilfoil
<u>Panicum virgatum</u>	feather grass
<u>Paspalum sp.</u>	paspalum
<u>Paspalum vaginatum</u>	seashore paspalum
<u>Phragmites australis</u>	roseau cane
<u>Pluchea camphorata</u>	camphor weed
<u>Ruppia maritima</u>	widgeon grass

<u>Scirpus californicus</u>	hardstem bulrush
<u>Scirpus olneyi</u>	three-cornered grass
<u>Scirpus robustus</u>	leafy three-square
<u>Scirpus validus</u>	soft-stem bulrush
<u>Sesbania exaltata</u>	tall sesbane
<u>Sesuvium sp.</u>	purslane
<u>Sesuvium portulacastrum</u>	sea purslane
<u>Setaria glauca</u>	yellow foxtail
<u>Setaria magna</u>	giant bristlegrass
<u>Solidago sempervirens</u>	seaside goldenrod
<u>Spartina alterniflora</u>	smooth cordgrass
<u>Spartina cynosuroides</u>	big cord grass, hogcane
<u>Spartina patens</u>	wiregrass
<u>Spartina spartinae</u>	-----
<u>Vallisneria americana</u>	wildcelery
<u>Vigna luteola</u>	yellow cowpea
<u>Zanthoxylum americanum</u>	toothache tree
<u>Zizania sp.</u>	-----
<u>Zizaniopsis miliacea</u>	giant cutgrass

Fish species of Louisiana coastal estuaries and brackish marshes that occur or are likely to occur on Point au Fer Island.

<u>Species</u>	<u>Common name</u>
<u>Achirus lineatus</u>	lined sole
<u>Adinia xenica</u>	diamond killifish
<u>Anchoa mitchilli</u>	bay anchovy
<u>Archosargus probatocephalus</u>	sheepshead
<u>Arius felius</u>	hardhead fish
<u>Brevoortia patronus</u>	gulf menhaden
<u>Chaetodipterus faber</u>	Atlantic spadefish
<u>Citharichthys macrops</u>	spotted whiff
<u>Citharichthys spilopterus</u>	bay whiff
<u>Cynoscion arenarius</u>	sand seatrout
<u>Cynoscion nebulosus</u>	spotted seatrout
<u>Cyprinodon variegatus</u>	sheepshead minnow
<u>Labidesthes sicculus</u>	brook silverside
<u>Lagodon rhomboides</u>	pinfish
<u>Leiostomus xanthurus</u>	spot

<u>Lucania parva</u>	rainwater killifish
<u>Membras martinica</u>	rough silverside
<u>Mendia beryllina</u>	inland silverside
<u>Microgobius thalassinus</u>	green goby
<u>Microgobius gulosus</u>	clown goby
<u>Micropogonias undulatus</u>	Atlantic croaker
<u>Mugil cephalus</u>	striped mullet
<u>Mugil eurema</u>	white mullet
<u>Oligoplites saurus</u>	leatherjacket
<u>Ophidion welshi</u>	crested cusk-eel
<u>Paralichthys albigutta</u>	Gulf flounder
<u>Paralichthys lethostigma</u>	southern flounder
<u>Pogonias cromis</u>	black drum
<u>Pomatomus saltrix</u>	bluefish
<u>Pomoxis annularis</u>	white crappie
<u>Sciaenops ocellatus</u>	red drum
<u>Stellifer lanceolatus</u>	star drum
<u>Strongylura marina</u>	Atlantic needlefish
<u>Syacium gunteri</u>	shoal flounder
<u>Syngnathus louisianae</u>	chain pipefish
<u>Syngnathus scovelli</u>	gulf pipefish
<u>Synodus foetens</u>	inshore lizardfish
<u>Trichiurus lepturus</u>	Atlantic cutlassfish
<u>Trinectes maculatus</u>	hogchoker

Crustacean species of Louisiana coastal estuaries and brackish marshes that occur or are likely to occur on Point au Fer Island.

<u>Species</u>	<u>Common name</u>
<u>Callinectes sapidus</u>	blue crab
<u>Palaemonetes sp.</u>	grass shrimp
<u>Penaeus aztecus</u>	brown shrimp
<u>Penaeus setiferus</u>	white shrimp
-----	fiddler crab



Mammal species of Louisiana coastal brackish marshes that occur or are likely to occur on Point au Fer Island.

<u>Species</u>	<u>Common name</u>
<u>Lutra canadensis</u>	river otter
<u>Mustela vison</u>	North American mink
<u>Myocastor coypus</u>	nutria
<u>Ondatra zibethicus</u>	common muskrat
<u>Oryzomys palustris</u>	marsh rice rat
<u>Procyon lotor</u>	northern raccoon
<u>Sylvilagus aquaticus</u>	swamp rabbit

Avian species of Louisiana coastal brackish marshes that occur or are likely to occur on Point au Fer Island.

Waterfowl:

<u>Species</u>	<u>Common name</u>
<u>Anas acuta</u>	northern pintail
<u>Anas americana</u>	American widgeon
<u>Anas clypeata</u>	northern shoveler
<u>Anas crecca</u>	green-winged teal
<u>Anas discors</u>	blue-winged teal
<u>Anas fulvigula</u>	mottled duck
<u>Anas platyrhynchos</u>	mallard
<u>Anas rubripes</u>	American black duck
<u>Anas strepera</u>	gadwall
<u>Anser albifrons</u>	greater white-fronted goose
<u>Aythya affinis</u>	lesser scaup
<u>Aythya collaris</u>	ring-necked duck
<u>Branta canadensis</u>	Canada goose
<u>Bucephala albeola</u>	bufflehead
<u>Chen caerulescens</u>	snow goose
<u>Dendrocygna bicolor</u>	fulvous tree duck
<u>Fulica americana</u>	American coot
<u>Gallinula chloropus</u>	common moorhen
<u>Oxyura jamaicensis</u>	ruddy duck
<u>Podiceps nigricollis</u>	eared grebe
<u>Podilymbus podiceps</u>	pied-billed grebe

Wading Birds:  
Species

Ajaia ajaja  
Ardea herodias  
Botaurus lentiginosus  
Bubulcus ibis  
Butorides striatus  
Casmerodius albus  
Egretta caerulea  
Egretta rufescens  
Egretta thula  
Egretta tricolor  
Eudocimus albus  
Hydranassa tricolor  
Ixobrychus exilis  
Nycticorax  
Nycticorax violaceus  
Plegadis falcinellus  
Plegadis chihi

Common name

roseate spoonbill  
great blue heron  
American bittern  
cattle egret  
green-backed heron  
great egret  
little blue heron  
reddish egret  
snowy egret  
tricolored heron  
white ibis  
Louisiana heron  
least bittern  
black-crowned night heron  
yellow-crowned night heron  
glossy ibis  
white-faced ibis

Shore Birds:  
Species

Actitis macularia  
Calidris alpinia  
Calidris bairidii  
Calidris himantopus  
Calidris mauri  
Calidris melanotos  
Calidris minutilla  
Calidris pusilla  
Catoptrophorus semipalmatus  
Gallinago gallinago  
Himantopus mexicanus  
Limnodromus griseus  
Limnodromus scolopaceus  
Limosa haemastica  
Mergus seator  
Numenius phaeopus  
Phalaropus tricolor  
Pluvialis squatarola

Common name

spotted sandpiper  
dunlin  
Baird's sandpiper  
stilt sandpiper  
western sandpiper  
pectoral sandpiper  
least sandpiper  
semipalmated sandpiper  
willet  
common snipe  
black-necked stilt  
short-billed dowitcher  
long-billed dowitcher  
Hudsonian godwit  
red breasted merganser  
whimbrel  
Wilson's phalarope  
black-bellied plover

Recurvirostra americana  
Tringa flavipes  
Tringa solitaria  
Tringa melanoleuca

Fishing Birds:  
Species

Ceryle alcyon  
Larus atricilla  
Pelicanus erythrorhynchus  
Sterna caspia  
Sterna forsteri  
Sterna nilotica

Raptors:  
Species

Asio flammeus  
Circus cyaneus  
Falco columbarius  
Falco sparverius  
Falco peregrinus

Other Marsh Birds:  
Species

Agelaius phoeniceus  
Anmodramus caudacutus  
Anthus spinoletta  
Chordeiles minor  
Cistothorus palustris  
Cistothorus platensis  
Corvus ossifragus  
Coturnicops noveboracensis  
Dolichonyx oryzivorus  
Geothlypis trichas  
Hirundo pyrrhonota  
Hirundo rustica  
Laterallus jamaicensis  
Passerculus sandwichensis  
Porzana carolina  
Quiscalus major

American avocet  
lesser yellowlegs  
solitary sandpiper  
greater yellowlegs

Common name

belted kingfisher  
laughing gull  
American white pelican  
Caspian tern  
Forster's tern  
gull-billed tern

Common name

short-eared owl  
marsh hawk  
merlin  
American kestrel  
peregrine falcon

Common name

red-winged blackbird  
sharp-tailed sparrow  
water pipit  
common nighthawk  
marsh wren  
sedge wren  
fish crow  
yellow rail  
bobolink  
common yellowthroat  
cliff swallow  
barn swallow  
black rail  
savannah sparrow  
sora  
boat-tailed grackle

Rallus elegans  
Rallus limicola  
Rallus longirostris  
Tachycineta bicolor

king rail  
Virginia rail  
clapper rail  
tree swallow

Amphibian species of Louisiana coastal brackish marshes that occur or are likely to occur on Point au Fer Island.

Species

Common name

Bufo woodhousei  
Gastrophryne carolinensis  
Hyla cineres  
Rana clamitans  
Rana sphenocphala

woodhouse's toad  
eastern narrowmouth toad  
green treefrog  
bronze frog  
southern leopard frog

Reptile species of Louisiana coastal brackish marshes that occur or are likely to occur on Point au Fer Island.

Species

Common name

Agkistrodon piscivorus  
Alligator mississippiensis  
Chelydra serpentina  
Coluber constrictor  
Deirochelys reticularia  
Kinosternon subrubrum  
Lampropeltis getulus  
Malaclemys terrapin  
Nerodia clerkii  
Nerodia cyclopion  
Nerodia fasciata confluens  
Nerodia rhombifera  
Pseudemys floridana  
Regina rigida  
Storeria dekayi  
Thamnophis proximus

cottonmouth  
American alligator  
snapping turtle  
eastern yellow-bellied racer  
chicken turtle  
eastern mud turtle  
speckled king snake  
diamondback terrapin  
Gulf salt marsh snake  
green water snake  
broad-banded water snake  
diamondback water snake  
Missouri slider  
glossy crayfish snake  
brown snake  
western ribbon snake

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