

Section 11

US FISH AND WILDLIFE SERVICE

COORDINATION ACT REPORT



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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March 14, 1997

Colonel William L. Conner
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Conner:

Enclosed is the Fish and Wildlife Coordination Act Report for the Mississippi River-Gulf Outlet, New Lock and Connecting Channels, Louisiana, Re-evaluation Study. This report is transmitted pursuant 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. The report has been coordinated with the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; copies of letters received from those agencies are enclosed.

We appreciate the cooperation of your staff on this study. Please have them contact Ms. Jane Ledwin (318/262-6662, extension 230) of this office, if additional information is needed.

Sincerely,

David W. Frugé
Field Supervisor

Enclosure

cc: EPA, Dallas, TX
LA Dept. of Natural Resources (CMD), Baton Rouge, LA
Fish and Wildlife Service, Atlanta, GA (AES/HC)
Fish and Wildlife Service, Atlanta, GA (GARD I)

**MISSISSIPPI RIVER-GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS,
LOUISIANA, RE-EVALUATION STUDY
FISH AND WILDLIFE COORDINATION ACT REPORT**

Submitted 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
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March 1997

EXECUTIVE SUMMARY

This is a summary of the findings and recommendations of the Fish and Wildlife Service contained in the Fish and Wildlife Coordination Act Report for the U.S. Army Corps of Engineers' (Corps) Mississippi River-Gulf Outlet (MRGO), New Lock and Connecting Channels, Louisiana, Re-evaluation Study. The Corps has identified a Recommended Plan (RP) that involves construction of a new lock north of, and a by-pass channel adjacent to, the existing lock in the Inner Harbor Navigation Canal (IHNC) located in Orleans Parish, Louisiana. The RP was recently modified to include a graving site (i.e., an offsite construction area) on the north bank of the MRGO, just west of Paris Road. The Corps also modified their spoil disposal plans. The current plan would place contaminated spoil dredged from the IHNC and the top 5 feet of soils excavated from the east bank into confined disposal facilities (CDFs) along the MRGO. The remaining spoil from the east bank would be used to create marsh in shallow open water northeast of the lock.

With the exception of the proposed disposal site and the graving site, the project area consists of heavily urbanized land and industrialized waterways. While lock replacement will have minimal impacts to fish and wildlife resources, other project features could potentially result in significant habitat losses. Construction of the graving site and associated staging areas will eliminate fish and wildlife habitat value at that site, and could significantly reduce the habitat value of the adjacent marsh and forested wetlands. We encourage the Corps to avoid those impacts by considering alternative graving sites. Disposal of uncontaminated spoil to create an estimated 41 acres of emergent marsh is expected to significantly benefit fish and wildlife resources. Those benefits could potentially offset unavoidable project-related habitat losses at the graving site, should the Corps determine there is no suitable alternative to that site. Impacts from contaminated material dredged from the IHNC and the east bank will be greatly reduced by placing that material only in CDFs that have minimal fish and wildlife habitat. The St. Claude and North Claiborne Avenue detour road should be designed to avoid or minimize impacts on forested and marsh habitats.

While the Service does not oppose replacement of the IHNC lock, we recommend that the Corps include the following fish and wildlife conservation measures in the ~~recommended plan~~ RP to ensure that fish and wildlife receive equal consideration during project design and implementation:

- 1.) Further investigate alternative locations (e.g., the Barriere Site) for the graving site that have minimal fish and wildlife habitat value. If the Corps determines that the proposed graving site is the only feasible alternative, minimize impacts to fish and wildlife resources by confining the graving and staging areas to the minimum necessary for project completion. The Corps should ensure that site preparation does not adversely affect (i.e., drain or fill) the adjacent emergent marsh and forested wetlands. In that event, the Corps should coordinate with the Service to quantify any such losses and develop appropriate compensation measures.

- 2.) Minimize potential impacts from contaminated spoil placed in the CDFs by designing those disposal areas to ensure that the material will remain within those areas. That may include constructing internal dikes to increase effluent retention time in the CDFs. The Service is available to work with the Corps in refining spoil disposal plans for those areas.
- 3.) Use uncontaminated material dredged from the lower east bank to create emergent marsh in shallow open water northeast of the IHNC. The proposed creation of approximately 41 acres of marsh with that material would fully compensate for currently anticipated habitat losses. The Corps should conduct post-construction surveys of the marsh creation area to ensure that those losses are fully compensated.
- 4.) Minimize the right-of-way needed (in forested and marsh areas) for the St. Claude and North Claiborne Avenue detour road.

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INTRODUCTION

The Inner Harbor Navigation Canal (IHNC) and Lock, located in metropolitan New Orleans, provides a link between the Mississippi River, the Gulf Intracoastal Waterway (GIWW), and the Mississippi River-Gulf Outlet (MRGO). Constructed in 1923 by the Board of Commissioners of the Port of New Orleans, the antiquated lock is currently operated beyond its design capacity. Public Law 84-455, approved by Congress on March 29, 1956, authorized the construction of a new lock and channel to handle increased vessel traffic. Subsequently, the Corps of Engineers (Corps) conducted several site-selection studies for a new lock, and prepared a Draft Evaluation Report for such a site in November 1982. In concert with that effort, the Fish and Wildlife Service prepared a March 19, 1982, planning-aid report, addressing the six alternatives identified by the Corps. Five of those plans involved construction at the existing IHNC lock, while the sixth plan involved construction of a new channel and lock near Violet in St. Bernard Parish. Because of engineering and environmental constraints, the Corps has eliminated the Violet site from further consideration. The Corps' current IHNC lock re-evaluation report identifies construction of a new lock north of the existing IHNC lock as the Recommended Plan (RP).

This report provides an analysis of the impacts on fish and wildlife resources from implementation of the RP, and also provides recommendations to mitigate adverse impacts on those resources. This report constitutes the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act, and the discussion by the Secretary of the Interior as required by Section 4 of the Estuary Protection Act; it should accompany the Corps' current IHNC lock re-evaluation report. The Service prepared this report in coordination with the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service.

DESCRIPTION OF STUDY AREA

The study area is located in southeastern Louisiana within St. Bernard and Orleans Parishes (Figure 1). The IHNC lock, one of the busiest locks in the Nation, is located in Orleans Parish. It connects the Mississippi River (fresh water) with the GIWW (salt water at this location). According to the Corps, salinities at the lock can reach 20 parts per thousand (ppt) during low flow. The area surrounding the lock is highly urbanized. Both the IHNC and adjacent residential and industrial lands have negligible value to fish and wildlife.

scrub/shrub vegetation and an operating landfill, and on the north by brackish marsh and

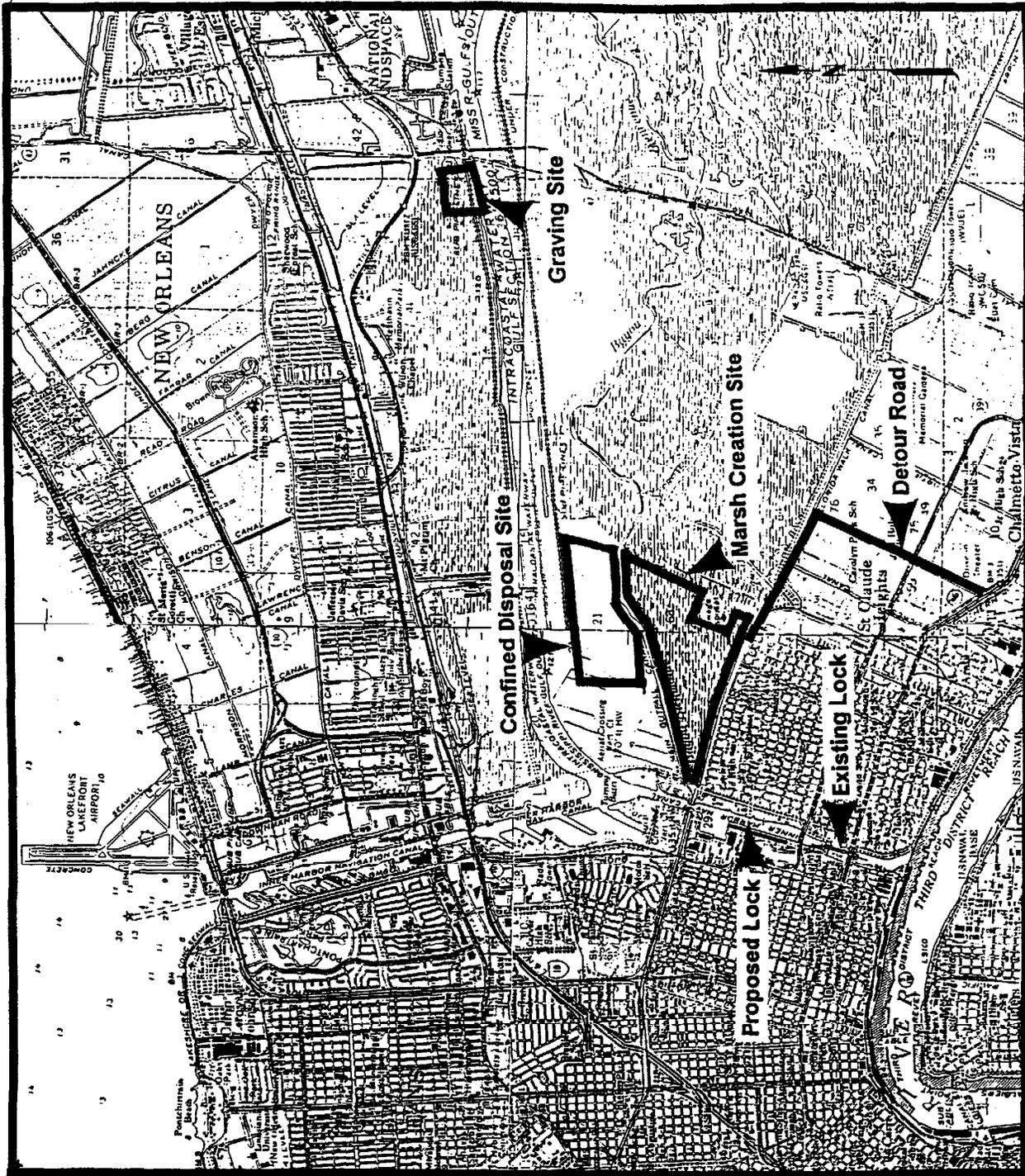


Figure 1. Mississippi River-Gulf Outlet New Lock Study Area

Bayou Bienvenue. The marsh creation site and the surrounding area historically supported forested wetlands and fresh marsh. Developers unsuccessfully attempted to drain part of the area for agriculture. Consequently, the organic soils oxidized and subsided, and have converted to open water averaging 3 feet deep. According to the Corps, the tidal range in the area is approximately 1 foot and average monthly salinities can vary between 3.7 and 18.0 ppt.

FISH AND WILDLIFE RESOURCES

Existing Conditions

Fish and wildlife habitats found in the study area include developed lands, scrub/shrub and forested wetlands, fresh and brackish marsh, and open water. Scrub/shrub communities support woody vegetation less than 20 feet tall and typically occur on disturbed sites (e.g., spoil banks) along the edges of forests, streams, and canals, or on unmaintained levees and vacant lots. Scrub/shrub communities are typically vegetated with black willow, Eastern baccharis, and wax myrtle. Scrub/shrub habitats surround most of the open-water area proposed for marsh creation. There is a remnant stand of forested wetlands behind the back protection levee near the proposed North Claiborne Avenue detour road. Dominant vegetation includes bald cypress, tupelogum, hackberry, red maple, oaks, privet, and greenbriar.

The proposed graving site encompasses a shallow freshwater impoundment surrounded by a mixture of forested and scrub/shrub wetlands, fresh marsh, wooded spoil bank, and maintained levee. Vegetation in the forested areas includes bald cypress, red maple, sweetgum, various oaks, hackberry, Chinese tallow tree, willow, sycamore, and elm. Common scrub/shrub species include wax myrtle, buttonbush, and common privet. Vegetation in the impounded fresh marsh area is dominated by nutsedge, bagscale, rattlebox, morning glory, duckweeds, frogbit, mosquito fern, and water hyacinth.

Historically, the wetlands in and around the proposed disposal area were fresher and consisted of bottomland hardwood forest, cypress-tupelo swamp, and fresh marsh. Many tree stumps and several dead standing trees from the forested wetlands that previously occupied the area remain in the proposed disposal site. Construction of the MRGO and subsequent saltwater intrusion, in addition to drainage and subsidence, has converted those habitats to brackish marsh and open water. Predominant vegetation found in brackish marsh is saltmeadow cordgrass, saltmarsh cordgrass, and leafy threesquare. The open-water area is fairly turbid with highly organic bottom sediments.

Coastal wetlands and associated shallow open waters, such as those found in the study area, are very important to fish and wildlife resources. In addition to providing valuable habitat, wetlands and submerged aquatic vegetation produce vast amounts of organic detritus which are transported to adjacent estuarine waters. Organic detritus is a key component of the estuarine food web which supports a high level of finfish and shellfish productivity. Those habitats also help to improve water quality by acting as a sink for

inorganic nutrients and suspended sediments. Because of subsidence, saltwater intrusion, and development, those habitats are becoming increasingly scarce in the study area.

The IHNC has minimal fishery value in the project area. The proposed spoil disposal site, however, has significant value to finfishes and shellfishes. Recreationally and commercially important finfish and shellfish species commonly found in the study-area marshes and open waters include Gulf menhaden, Atlantic croaker, spotted seatrout, sand seatrout, red drum, black drum, spot, sheepshead, southern flounder, white shrimp, brown shrimp, and blue crab.

Historically, wintering waterfowl such as mallard, green-winged teal, and gadwall were common in the study area where fresher wetlands provided excellent habitat. In spite of the conversion from fresher wetlands to brackish marsh and open water, study-area wetlands still provide habitat, albeit of reduced value, for certain waterfowl such as mottled duck and lesser scaup. Other game birds, such as American coots, common snipe, Virginia rails, and sora rails, may occasionally occur in the study area in winter. Clapper rails are year-round residents of coastal Louisiana that also are expected to be found in the study-area marshes.

Numerous species of wading birds, seabirds, shorebirds, and songbirds use the wetlands and scrub/shrub habitats in the study area. Common wading birds include the little blue heron, great blue heron, great egret, snowy egret, cattle egret, white-faced ibis, white ibis, green-backed heron, and yellow-crowned night heron. The graving site is heavily used by several of those species, and may provide nesting habitat for the yellow-crowned night heron. Seabirds using the open-water areas include white pelican, black skimmer, herring gull, laughing gull, and several species of terns. Common shorebirds include killdeer, American avocet, black-necked stilt, and numerous sandpipers. Other nongame birds in the project area include marsh wren, boat-tailed grackle, belted kingfisher, red-winged blackbird, seaside sparrow, yellow-rumped warbler, and several raptors.

Furbearers including muskrat, mink, river otter, nutria, and raccoon occur in the study-area wetlands. Furbearer populations in the area have decreased due to saltwater intrusion and a corresponding decrease in the carrying capacity of brackish marshes. Game mammals that may use the study-area wetlands and scrub/shrub habitats include swamp rabbit, raccoon, and (in forested areas) gray and fox squirrels. Nongame mammals that occur in the study area include Virginia opossum, nine-banded armadillo, and several species of bats, rodents and insectivores.

There have been recent sightings of the endangered West Indian manatee (*Trichechus manatus*) in the outfall slip of the New Orleans Power Plant, approximately one mile east of the proposed graving site. The manatee is a marine mammal that infrequently wanders into coastal waters and streams of southeastern Louisiana during the summer months. Manatees prefer warm water temperatures and feed entirely on aquatic vegetation. The manatee population has declined due to collisions with boats and barges, entrapment in the gates of flood-control structures, poaching, habitat loss, and pollution. We do not expect graving site construction to affect the manatee. In the unlikely event that a manatee is observed in the project area during graving site construction, the Corps should contact

Ms. Deborah Fuller of the Service's Lafayette, Louisiana, office at (318)262-6662, extension 225.

Future Without-Project Conditions

Wetland loss in the study area will continue because of subsidence, saltwater intrusion, erosion, and development. Although increased salinities prevent the re-establishment of cypress swamp, existing forested areas will continue to provide important fish and wildlife habitat. Loss of study-area marshes will reduce primary productivity and finfish and shellfish nursery habitat in those areas. Wetland loss and increased salinity will also decrease habitat values for most dabbling ducks and many wading bird species. Furthermore, those trends will reduce habitat available for swamp rabbit, various furbearers, alligator, other reptiles, and amphibians.

Wetland restoration efforts by State and Federal agencies may help reduce marsh loss in the project area. Restoration activities in the project area include Coastal Wetlands Planning, Protection and Restoration Act projects, and beneficial use of dredged material during Corps maintenance of Federal navigation channels.

FISH AND WILDLIFE CONCERNS AND PLANNING OBJECTIVES

The principal fish and wildlife concern in the study area is the continued conversion of fresh and intermediate marsh to open water and more-saline wetlands. The major human factors contributing to habitat decline are development, flood control and navigation projects, and hydrologic modifications. The latter two factors have resulted in the loss of sediments, nutrients, and freshwater from overbank flooding of the Mississippi River and its distributaries. Construction of the MRGO provided a conduit for saltwater intrusion, which was largely responsible for the conversion of forested wetlands and fresh marshes to brackish and saline marshes and open water. Those habitat alterations have been accompanied by a decline in populations of fish and wildlife that depend on fresher habitats. Because vegetated wetlands provide feeding and nursery habitat for many estuarine finfish and shellfish species, production of those species is reduced when vegetated wetlands are lost.

The Service is also concerned that exposure to contaminants during project construction and maintenance could potentially affect fish and wildlife resources. Contaminants from nearby urban and industrial discharges can adversely affect water quality and fish and wildlife using those waters. The Corps' 1995 Water Quality Report noted that heavy metals, pesticides, and other organic priority pollutants were found in project-area waters and sediments. Because that portion of the IHNC in the project area has minimal fisheries value, the effects of contaminants in bottom sediments are very limited. Dredging of those sediments and spoil disposal activities, however, could increase the exposure of project-area fish and wildlife to contaminants; as exposure increases, so too would the potential for adverse effects to those resources.

The Service's planning objectives for the re-evaluation study are:

- 1.) Minimize contaminant impacts to fish and wildlife by using only uncontaminated material dredged during project construction to create emergent marsh in open-water areas;
- 2.) Avoid adverse impacts to fish and wildlife resources by locating project features (i.e., the graving site and contaminated spoil disposal) in areas of minimal value to fish and wildlife;
- 3.) Fully mitigate all adverse impacts to fish and wildlife resources.

Preliminary project plans included an alternative that called for construction of the new lock adjacent to the Mississippi River, near Violet, in St. Bernard Parish. By selecting a site for the new lock just north of the existing lock, the Corps avoided significant adverse impacts to fish and wildlife resources that would have been associated with lock construction, operation, and maintenance at the Violet site. Features of the proposed project (i.e., graving site and the temporary access road), however, may still negatively impact fish and wildlife resources in the study area. Accordingly, the Service's remaining concerns are that adverse project impacts from spoil disposal are minimized, and that unavoidable habitat losses associated with graving site activities are fully offset.

DESCRIPTION OF RECOMMENDED PLAN

The Corps has designated construction of a new lock north of the existing IHNC lock as the RP. The prefabricated lock would be constructed at a graving site (see below) and floated into place in three sections. The proposed lock dimensions would be 110 feet wide, 1,200 feet long, and 36 feet deep. The RP also includes the construction of a by-pass channel east of the existing lock in a heavily industrialized area. Construction of the that channel, the main channel, and utility corridors between the proposed lock and the Mississippi River will require the excavation of 1,028,000 cubic yards of material. Approximately 73,000 cubic yards of that material would be discharged into the Mississippi River. The remaining material would be used to backfill around the new lock and the by-pass channel after construction. Construction of the by-pass channel, main channel, and utility corridors north of the new lock will require excavating 2,216,000 cubic yards of material. Originally, the Corps proposed to pump that material into a shallow, open-water area east of the IHNC to create marsh. Because of contaminants in much of that material, spoil disposal could have resulted in significant adverse fish and wildlife impacts. To reduce those impacts, the Corps has recently modified the RP to include placing contaminated material (i.e., IHNC bottom sediments and the upper 5 feet of East Bank soils) in a CDF along the MRGO. The remaining east banks soils from the by-pass channel would be used to create marsh as originally proposed.

The RP also includes construction of a new bridge over the IHNC at St. Claude Avenue and a modified bridge at Claiborne Avenue. A permanent detour road along the

Gueregeh Canal, from St. Claude Avenue to Florida Boulevard, would accommodate vehicle traffic during bridge construction.

The RP includes construction of a graving site located on the north bank of the MRGO, just west of Paris Road. The graving site will require excavating approximately 270,500 cubic yards of material to create a cofferdam where the new lock components will be constructed. Much of that excavated material will be used to realign the hurricane protection levee around the site, as well as to provide fill for staging areas adjacent to the cofferdam.

EVALUATION METHODOLOGY

Estimation of project-related habitat acreage changes is a fundamental technique used to assess project impacts to fish and wildlife resources. Those estimates also form the basis of other evaluations conducted by the Corps. For this project, habitat changes quantified to date are those associated with the acreage needed for spoil disposal to create marsh, and the acreage required for the graving site and associated staging areas. The Corps provided estimates of the acreage to be affected by the proposed work in both those areas. The Service used those estimates to conduct a Habitat Evaluation Procedures analysis (HEP, see Appendix A). HEP is a method of estimating habitat suitability for evaluation species based on field measurements of parameters that limit the relative population density of those species. Using HEP, habitat quality and quantity can be measured for baseline conditions, and can be predicted for future without-project and future with-project conditions. This standardized, species-based method numerically compares future with-project and future without-project conditions to provide an estimate of project impacts on fish and wildlife resources. Because HEP was not designed to evaluate the effects of contaminants on evaluation species, it was not used to assess impacts to fish and wildlife expected to result from contaminated spoil disposal.

PROJECT IMPACTS

Excavation of the bypass channels, utility corridors and the new lock site would have minimal adverse impacts to fish and wildlife. The proposed detour road would affect less than 3 acres of drained bottomland hardwood forest located directly south of the proposed spoil disposal area, between the Florida Walk Canal and Patricia Street.

Careful placement of the remaining 676,000 cubic yards of uncontaminated material dredged from the east bank should create about 41 acres of brackish marsh in a shallow, open-water area northeast of the new lock. That tidal marsh will benefit numerous resident and migratory birds (e.g., wading birds, waterfowl, rails and songbirds), furbearers, and estuarine-dependent fishes and shellfishes. Using HEP, we predicted that marsh creation would yield an increase of 45.33 average annual habitat units (AAHUs) for mink and 30.46 AAHUs for great egret (Table 1).

Table 1. Project-related Habitat Changes: Marsh Creation Site
(all values in average annual habitat units)

Species	Future Without project	Future With project	Net Change
Mink	56.06	101.39	45.33
Great Egret	16.99	47.44	30.46

Approximately 1,540,000 cubic yards of material dredged from the IHNC and the upper 5 feet of the east bank will be placed in CDFs along the south bank of the MRGO. That material could impact up to 240 acres of upland scrub/shrub and low quality wetland habitat in the CDFs. The Corps' analysis of that material indicates that those sediments and soils are contaminated with heavy metals, polycyclic aromatic hydrocarbons (PAHs), and other organic priority pollutants. As part of the Hazardous, Toxic, and Radioactive Waste (HTRW) investigation and the water quality assessment for this re-evaluation study, the Corps conducted water, sediment, and soil analyses in the IHNC, adjoining channels, and the disposal area. The following discussion relies on data from those analyses.

Several heavy metals were found in IHNC bottom sediments (Table 2). Levels of copper, lead, mercury, and zinc exceeded concentrations shown to cause adverse biological effects. The elutriate analyses of the bottom sediments showed that concentrations of those metals also exceeded EPA's chronic saltwater criteria, and copper and zinc exceeded EPA's acute saltwater criteria.

Bottom sediments from the IHNC contained excessive levels of several PAHs. Acenaphthene, phenanthrene, anthracene, pyrene, and chrysene concentrations were several times higher than levels known to adversely affect biota.

Detection limits of several other semi-volatile and volatile organic compounds also were well above concentrations documented to cause adverse biological effects. Detection limits used in the elutriate analyses of two pesticides (endrin and toxaphene) were higher than both EPA's chronic and acute saltwater criteria. Elutriate analyses of pentachloronol had detection limits ten times the chronic saltwater criteria. Dinitrotoluene, dichlorobenzene, hexachlorobutadiene, and dimethyl phthalate sediment analyses also had detection limits exceeding levels known to cause adverse biological effects.

Table 2. Contaminant levels from the Inner Harbor Navigation Canal (Canal Bottom)

Compound	SEDIMENTS					WATER		
	Sediment mg/kg	NOAA ERL/ERM ¹ mg/kg	FDER NOEL/PEL ² mg/kg	EPA ³ mg/kg	Elutriate µg/L	Chronic AWQC ^{4,5} µg/L	Acute AWQC ^{4,5} µg/L	
Arsenic	6.7-11	8.270	8/64	33	<3.0-3.8	36	69	
Copper	17-64	34270	28/170	136	18-200	2.9	2.9	
Lead	18-200	46.7/218	21/160	132	2-29	0.56	140	
Mercury	<0.10-0.90	0.15/0.71	0.1/1.4	0.80	0.2	0.025	2.1	
Zinc	72-330	150/410	68/300	760	81-310	86	95	
Endrin	µg/kg	µg/kg	µg/kg	µg/kg	<0.1	0.0023	0.037	
Toxaphene	5.9-<11	0.02/45*			<5	0.0002	0.21	
Pentachlorophenol	<2,800-<5,000				<58-<77	7.9	13	
2,6-Dinitrotoluene	<570-<3,300			880T	<11			
2,4-Dinitrotoluene	<570-<3,300			880T	<11			
1,3-Dichlorobenzene	<570-<3,300			2,800T	<11			
1,4-Dichlorobenzene	<570-<3,300			2,800T	<11			
1,2-Dichlorobenzene	<570-<3,300			2,800T	<11			
Hexachlorobutadiene	<570-<3,300			1,280	<11			
Dimethyl Phthalate	<570-<3,300			1,960	<11			
Naphthalene	<570-<3,300	160/2,100	130/1,100		<11		1.6	
Acenaphthene	<61-17,000	16/500	22/450		<11-70			
Phenanthrene	480-50,000	240/1,500	140/1,200		<11			
Anthracene	120-7,700	85.3/1,100	85/740		<11			
Pyrene	<62-30,000	665/2,600	290/1,900		<11-15			
Chrysene	<65-7,300	348/2,800	200/1,700		<11			

¹Long et al. 1993 - Effects range low/effects range median, the concentrations (lowest 10 percentile and median values respectively) at which adverse biological effects are observed

²MacDonald 1993 - No observable effect level/probable effect level

³Bolton et al. 1985

⁴Long and Morgan 1990

⁵EPA Ambient (salt)water quality criteria

T - total

Soil analyses from the east bank of the IHNC showed widespread heavy metal contamination in the upper 5 feet (Table 3). Although the Corps did not report results for two common metals, i.e., zinc and copper, levels of arsenic and chromium were moderately elevated. Lead concentrations were many times higher than levels known to cause adverse biological impacts. Mercury concentrations were also quite high, with at least one sample exceeding soil criteria established for compliance with the Resource Conservation and Recovery Act. In addition, levels of silver, although detected in only two samples, also were high enough to cause negative biological effects.

East bank soil analyses also showed elevated levels of PAHs and phthalates in the top 5 feet (excluding fuel tanks, oil-saturated soils, and other areas of concern). Although those compounds were not as widespread as the heavy metals, PAH and phthalate concentrations exceeded levels documented to cause adverse biological effects.

The contaminant levels documented in the IHNC sediments and soils could pose a significant threat to those species using areas affected by contaminated spoil disposal. Exposure through direct contact or ingestion could result injury, and, in some cases, mortality. In addition, the potential for many of the contaminants to bioconcentrate and bioaccumulate poses further long-term risk to trust resources through direct and indirect exposure. Therefore, we are pleased to note that the Corps' revised plan calls for confinement of contaminated dredged material to the CDF; such action will greatly reduce potential exposure of fish and wildlife to those contaminants.

The graving site and staging areas would affect approximately 25 acres of shallow open water, scrub/shrub wetlands, and forested spoil bank habitat. Once the area is cleared, material excavated from the slip would be used to reconstruct the hurricane protection levee around the slip, and to fill staging areas adjacent to the slip. Those activities and post-construction maintenance would essentially eliminate wildlife habitat at that site. The resulting net loss of wildlife habitat value for mink and great egret (i.e., the HEP evaluation species) is shown in Table 4.

The quantified impacts associated with the graving site are directly related to the area needed to excavate the cofferdam, realign the hurricane protection levee, and fill the staging areas. Those activities could potentially affect the emergent marsh and wooded wetlands that surround the graving site. If the proposed work at the graving site reduces water levels in the adjacent wetlands, it could lead to further losses of fish and wildlife habitat value in that area. In that event, the Service would work with the Corps to quantify those losses and develop adequate compensation measures.

Table 3. Contaminant levels from the Inner Harbor Navigation Canal (East Bank)

Compound	RCRA			FDER NOEL/PEL ² mg/kg
	Shallow Soils mg/kg	Deep Soils mg/kg	Soil Criteria mg/kg	
Arsenic	3.4-26.7	2.3-9.6	80	8/64
Chromium	4.7-144	4.7-71.1	400	33/240
Lead	9.6-4,690	3.2-472		21/160
Mercury	0.046-1.5	0.043-20.8	20	0.1/1.4
Silver	2.9-4.4		200	0.5/2.5
Acenaphthene	µg/kg 170-2200	µg/kg		µg/kg 22/450
Phenanthrene	210-6,700	180-<830		140/1,200
Anthracene	280-1,100			85/740
Flouranthene	270-9900	310-<830		380/3,200
Benzo(a)pyrene	770-5400	200-<830		230/1,700
Benzo(a)anthracene	250-4900			160/1,300
Dibenzo(a,h)anthracene	170-940			31/320
Chrysene	810-5,900	220-<830		200/1,700
Pyrene	220-8,400	330-<830		290/1,900
bis(2-ethylhexyl)phthalate	220-260,000	230-8,200	50	
Diethyl phthalate	<830-2300	26-200	60,000	1,280 ³

¹Long et al. 1993

²MacDonald 1993

³Bolton et al. 1985

Table 4. Project-related Habitat Changes: Graving Site
(all values in average annual habitat units)

Species	Future Without project	Future With project	Net Change
Mink	14.07	0.09	-13.98
Great Egret	17.15	0.15	-16.99

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

The Service supports and adopts that definition of mitigation and considers its specific elements to represent the desirable sequence in the mitigation planning process.

Placement of contaminated dredged material into CDFs would significantly reduce the potential for adverse fish and wildlife impacts from contaminants in that material. Those impacts, however, could be minimized by designing spoil containment structures to maximize effluent retention and ensure that all contaminated material remains in the CDFs.

Graving site impacts could be avoided altogether by selecting an alternative site that has minimal fish and wildlife habitat value. Although the Corps has apparently considered several other locations, including one much closer to the lock site (i.e., the Barriere Site) on the IHNC, they have not provided a rationale for selecting the preferred graving site. We encourage the Corps to revisit their site selection, and to give equal consideration to fish and wildlife resources in their decision. Fish and wildlife impacts at the graving site could be rectified by returning the area to pre-project conditions once the lock has been built. The Corps, however, has determined that such rehabilitation is economically infeasible.

The Service's Mitigation Policy (*Federal Register*, Vol. 46, pp. 7644-7663, January 23, 1981) defines four resources categories used to ensure that the level of mitigation recommended will be consistent with the fish and wildlife resource values impacted. Activities at the proposed graving site are expected to affect shallow open water, scrub/shrub, and forested spoil bank habitat. The open water and scrub/shrub habitat at that site provide only moderate value to wildlife. Much of the vegetation on the spoil banks consists of opportunistic species (e.g., Chinese tallow tree, black willow, etc.) typical of many disturbed sites in the study area. Such habitat is also of moderate value to wildlife. Therefore, the mitigation goal for those habitats is no net loss of habitat value, while minimizing loss of in-kind habitat value.

As previously noted, the RP includes a spoil disposal plan that would create approximately 41 acres of emergent marsh habitat. Using HEP, we compared the habitat impacts from the graving site to the habitat benefits from the newly created marsh for both mink and great egret. As shown in Table 5, wildlife benefits from the emergent marsh created with dredged material should fully compensate the direct adverse wildlife impacts at the graving site. Therefore, no further compensation would be required.

The final mitigation issue involves the potential, relatively minor, impact of the St. Claude and North Claiborne detour road on remnant forested land and adjacent brackish marsh. Those impacts should be avoided or greatly minimized via careful right-of-way alignment.

Table 5. Net Habitat Changes at the Graving Site and Marsh Creation Site
(All values in average annual habitat units)

	Graving Site	Marsh Creation Site	Net Difference
Mink	-13.98	45.33	31.35
Great Egret	-16.99	30.46	13.47

CONCLUSIONS AND RECOMMENDATIONS

While lock replacement will have minimal impacts to fish and wildlife resources, various project features could potentially result in significant habitat losses. Construction of the graving site and associated staging areas will eliminate moderate-value fish and wildlife habitat at that site, and could reduce the value of adjacent marsh and forested habitats. We encourage the Corps to avoid those impacts by further considering alternative locations for the graving site. Disposal of uncontaminated spoil to create emergent marsh is, however, expected to significantly benefit fish and wildlife resources in the disposal area. Furthermore, those benefits could potentially offset unavoidable project-related habitat losses at the graving

site, should the Corps determine there is no suitable alternative to that site. Impacts from contaminated material dredged from the IHNC and the east bank will be greatly reduced by placing that material only in CDFs that have minimal fish and wildlife habitat.

To ensure that fish and wildlife receive equal consideration during further project planning, design, and implementation, the Service recommends that the Corps include the following fish and wildlife conservation measures in the RP:

- 1.) Further investigate alternative locations (e.g., the Barriere Site) for the graving site that have minimal fish and wildlife habitat value. If the Corps determines that the proposed graving site is the only feasible alternative, minimize impacts to fish and wildlife resources by confining the graving and staging areas to the minimum necessary for project completion. The Corps should ensure that site preparation does not adversely affect (i.e., drain or fill) the adjacent emergent marsh and forested wetlands. In that event, the Corps should coordinate with the Service to quantify any such losses and develop appropriate compensation measures.
- 2.) Minimize potential impacts from contaminated spoil placed in the CDFs by designing those disposal areas to ensure that the material will remain within those areas. That may include constructing internal dikes to increase effluent retention time in the CDFs. The Service is available to work with the Corps in refining spoil disposal plans for those areas.
- 3.) Use uncontaminated material dredged from the lower east bank to create emergent marsh in shallow open water northeast of the IHNC. The proposed creation of approximately 41 acres of marsh with that material would fully compensate for currently anticipated habitat losses. The Corps should conduct post-construction surveys of the marsh creation area to ensure that those losses are fully compensated.
- 4.) Minimize the rights-of-way needed (in forested and marsh areas) for the St. Claude and North Claiborne Avenue detour road.

FISH AND WILDLIFE SERVICE POSITION

The Service does not oppose replacement of the IHNC lock. Certain project features (i.e., the graving site and spoil disposal on wetlands in CDFs), however, could have potentially significant adverse impacts to fish and wildlife resources. The Service strongly supports using clean dredged material to create brackish marsh that will improve fish and wildlife habitat in the project area. Furthermore, such marsh creation could provide fish and wildlife habitat benefits to offset unavoidable habitat losses at the proposed graving site, if the Corps determines that is the only feasible location. The Service believes that project implementation would result in minimal adverse fish and wildlife impacts, provided the Corps implements the Service's aforementioned fish and wildlife conservation measures.

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