Coast 2050: Toward a Sustainable Coastal Louisiana, The Appendices

Appendix C — Region 1 Supplemental Information

This document is one of three that outline a jointly developed, Federal/State/Local, plan to address Louisiana's massive coastal land loss problem and provide for a sustainable coastal ecosystem by the year 2050. These three documents are:

- Coast 2050: Toward a Sustainable Coastal Louisiana,

- Coast 2050: Toward a Sustainable Coastal Louisiana, An Executive Summary,

- Coast 2050: Toward a Sustainable Coastal Louisiana, The Appendices.

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For additional information on coastal restoration in Louisiana: www.lacoast.gov or www.savelawetlands.org.

Coast 2050:
Toward a Sustainable Coastal Louisiana,
The Appendices

Appendix C—Region 1 Supplemental Information

report of the

Louisiana Coastal Wetlands Conservation and Restoration Task Force

and the

Wetlands Conservation and Restoration Authority

Louisiana Department of Natural Resources
Baton Rouge, La 1999

ACKNOWLEDGMENTS In addition to those named in the various attributions throughout this Appendix, a number of people played key roles in bringing this document together in its current form. This included editing, table development, writing explanatory and transitional text, and general formatting. These people were: Honora Buras, Ken Duffy, Bill Good, Cathy Grouchy, Bren Haase, Bryan Piazza, Phil Pittman, Jon Porthouse, Diane Smith, and Cynthia Taylor.

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SECTION 1

INTRODUCTION

Region 1 (Fig. 1-1) spans from the Pleistocene Terrace on the north to the Mississippi River and Mississippi River Gulf Outlet on the south. It encompasses the upper, middle, and lower Pontchartrain basins, including the Chandeleur Island chain in Chandeleur Sound. Region 1 covers portions of Livingston, Tangipahoa, St. Tammany, St. Bernard, Orleans, Jefferson, St. Charles, St. John the Baptist, St. James, and Ascension parishes.

This appendix contains information and data, collected by the Region 1 Regional Planning Team (RPT), that was used in the formulation of the Coast 2050 Plan. In order to organize the information during this planning effort, the RPT used "mapping units" which are depicted and summarized here (Figure 1-2).

Within each mapping unit, wetland loss trends and habitat shifts, fish and wildlife resources, infrastructure, and previously proposed strategies were assessed by the RPT, and this information is presented here. Based upon these analyses and in conjunction with regional habitat objectives, strategies were developed for each mapping unit by the RPT, in association with the Planning Management Team (PMT) and others participating in the 2050 process. The PMT took the lead in developing the regional ecosystem strategies but were greatly assisted by the RPT and others. The final regional ecosystem and mapping unit strategies, as well as programmatic recommendations, are also included in this appendix.

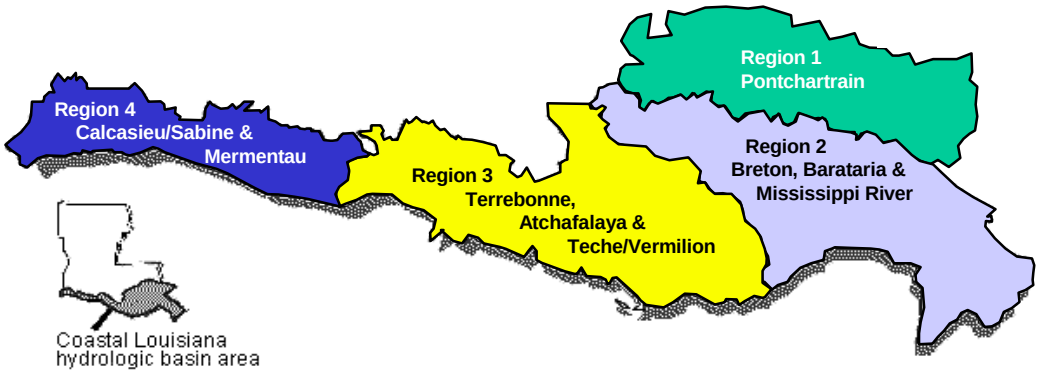

Figure 1-1. Regions used in the Coast 2050 plan.

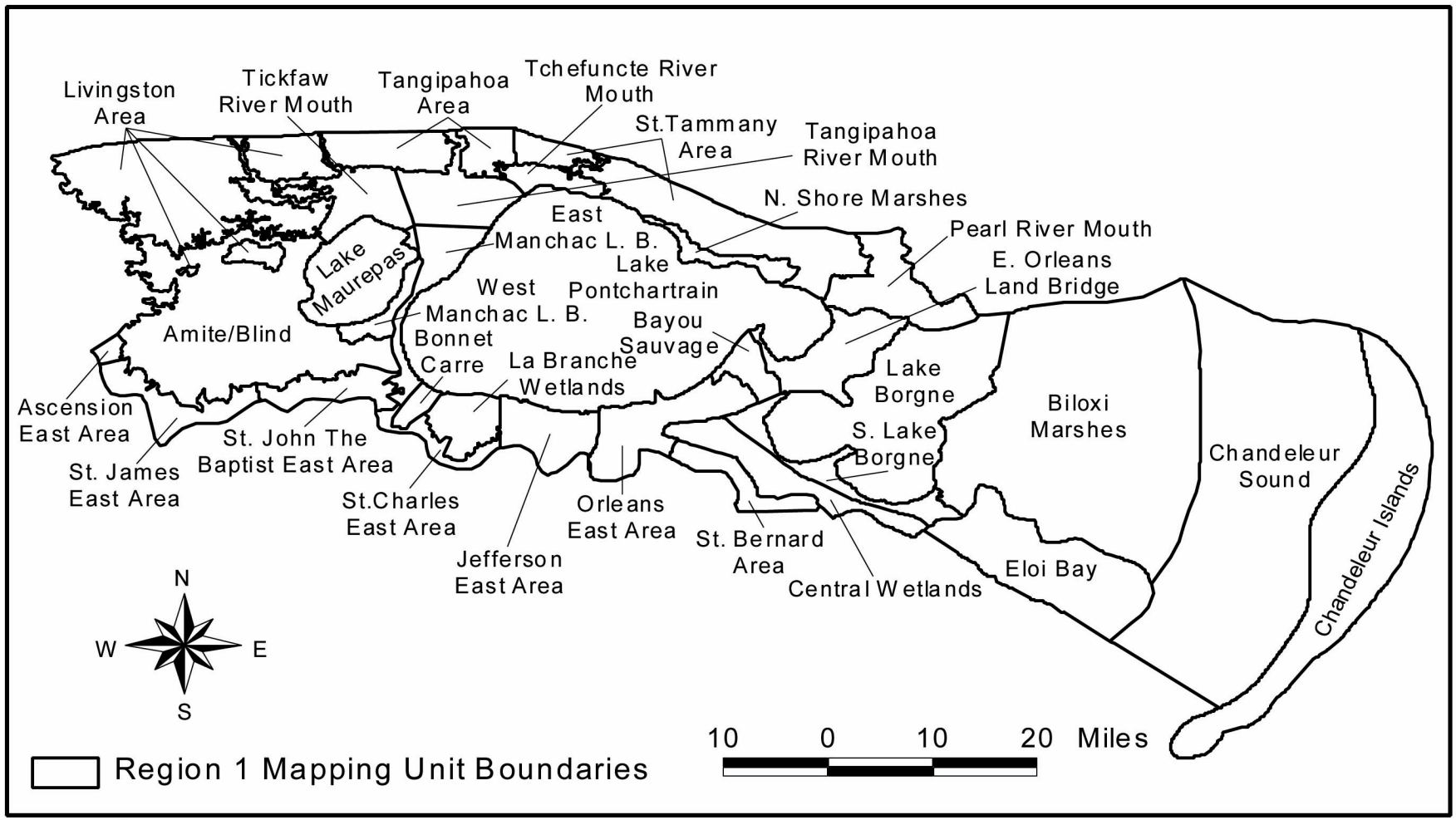

Figure 1-2. Region 1 mapping units.

SECTION 2

REGION 1 COAST 2050 REGIONAL PLANNING TEAM (RPT) MEMBERS (DURING PLAN DEVELOPMENT)

Parish Representatives

Chris Andry - St. Bernard Parish Coastal Zone Management Administrator
Michele Enright - City of New Orleans, Office of Environmental Affairs
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SECTION 3

MAPPING UNIT SUMMARIES

Upper Pontchartrain Basin

Amite/Blind

Location - The Amite/Blind mapping unit is bordered by Lake Maurepas, Interstate Highway 55, and the West and East Manchac Land Bridge units on the east; the Mississippi River on the south; and the city of Gonzales and the Pleistocene Terrace on the west and north. This mapping unit is 190,036 acres in size and includes parts of four parishes—St. James, Ascension, Livingston, and St. John the Baptist.

Habitat Description and Landscape Change - The Amite/Blind unit is almost entirely swamp with some pockets of bottomland hardwoods and fresh marshes. Many of the forests in the unit were logged early in the 20th century. Although there were no significant shifts in habitat type from 1956 to 1990, the swamps have become increasingly stressed. There has been a marked decrease in swamp productivity because of impoundment, flooding, and subsidence. Poor swamp regeneration because of herbivory (i.e., nutria) is also a problem.

Historic Land Loss - Between 1932 and 1990, some 1,600 acres of wetlands were lost in this unit, due mainly to shoreline erosion and direct removal. Additionally, subsidence in the area has been estimated at 1-2 ft/century.

Future Land Loss Projections - In 1990, this unit contained approximately 138,930 acres of swamp and 3,440 acres of marsh. Shoreline erosion in this unit will continue to be a primary cause of loss. Impoundment, flooding, subsidence, and herbivory (i.e., nutria) are expected to increasingly stress area swamps in the future. Nearly 69,500 acres of swamp (50% of the 1990 total) and 40 acres of marsh are projected to be lost by 2050.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley. This makes it extremely important to neotropical migratory songbirds, waterfowl, and many other species of wildlife. The Blind River was designated as a “Scenic Stream” by the Louisiana Department of Wildlife and Fisheries. Three Federally listed species are found in the unit. Bald eagles, which typically nest in cypress trees near fresh to intermediate marshes or open water, had 13 active nests in this unit during the 1996-1997 breeding season. The anadromous Gulf of Mexico sturgeon occurs in the Amite River, where it is believed to spawn. Although rare, the endangered West Indian manatee, a marine mammal, has

also been reported in the Amite and Blind rivers.

This unit has shown steady population trends over the last 10-20 years for blue crab, largemouth bass, and channel catfish. These trends are expected to continue through 2050. The bald eagle, wading birds, woodland birds, and American alligators have increased in this unit over the last 10-20 years. Resident and migrant marsh birds, as well as migrant woodland birds, nutria, muskrat, and other furbearers, have shown a steady trend in this unit. By 2050, the number of bald eagles and alligators are projected to increase in this unit while other species are expected to remain steady.

Infrastructure - The Amite/Blind unit has two U.S. Army Corps of Engineers (USACE) infrastructure projects. The Amite River and Bayou Manchac project is a navigation channel from Lake Maurepas to Port Vincent (44 miles) used primarily for recreation. The Amite River and Tributaries project is a diversion channel from the Amite to the Blind River with a weir to control flooding, particularly in those areas upstream of the mapping unit. The project also includes clearing, snagging, enlarging and realigning the Amite, Blind, and Comite rivers, and Bayou Manchac. Several communities (i.e., French Settlement, Whitehall, and Clio) are located on upland areas, largely surrounded by swamp, in the northwest part of the mapping unit. Flood control is critically important to those communities. The USACE is currently studying the feasibility of constructing a hurricane protection levee in the southern portion of this unit near LaPlace. Three drainage pump stations have also been proposed.

Interstate Highway 10 and U.S. Highway 61 cross the southwest corner of this unit. Interstate Highway 10 is one of the main hurricane evacuation routes for New Orleans and the primary artery into New Orleans from the west. There are about 39.5 miles of primary roads, 25.2 miles of secondary roads, 137.3 miles of tertiary roads, 171.7 miles of pipelines, 15.2 miles of railroads, and 331 petroleum-related well heads in this unit. There are also eight groundwater intakes and one surface water intake in this unit.

Previously Proposed Strategies - Freshwater (and sediment) diversions, hydrologic management, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Diversions have previously been proposed at Bayou Manchac and Blind River. Hydrologic management proposals have included gapping spoil banks along canals to increase water flow to the swamps and minimize impoundments. It has been suggested that shoreline protection along areas such as the mouth of the Blind River would further reduce land loss.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh and forested wetlands with associated aquatic habitats for each. Resource objectives include freshwater finfish, waterfowl, nongame fish and wildlife, endangered species, forestry, recreation and tourism, water quality enhancement, storm buffering capacity, flood water holding capacity, roads, levees, bridges, and communities.

Regional Ecosystem Strategies - The swamps in the upper basin are dying because they are subsiding, flooding, and lack sediment and nutrient input. Strategies in the upper basin of Region 1 include several small diversions similar to the ones from the Mississippi River at Blind River (<2,000 cfs) and the Reserve Relief Canal (<2,000 cfs). These diversions would provide the swamps in this area with sediments and nutrients. These strategies also include outfall management and diversion-related flood protection where needed. Another strategy is to restore natural drainage patterns by gapping spoil banks, plugging canals, and maintaining culverts.

Benefits of Regional Strategies - These strategies are believed to be capable of reducing the estimated swamp loss by 2050 in this mapping unit by only a minimal amount. Nevertheless, these diversions would be beneficial to wildlife and fisheries resources, as well as to recreation and tourism in the area. Area communities would benefit from the improved water quality, floodwater retention, and storm buffering effects of the improved swamps.

Mapping Unit and and Programmatic Strategies - The mapping unit strategies adopted for this unit are maintenance of shoreline integrity (e.g., along Lake Maurepas) and vegetative plantings (e.g., cypress plantings). There are no programmatic strategies for this unit.

Lake Maurepas

Location - The Lake Maurepas mapping unit is 58,321 acres in size, encompasses the entire lake and is contained in three parishes–Livingston, St. John the Baptist, and Tangipahoa.

Habitat Description and Landscape Change - This unit is made up of generally low salinity, open water connected to Lake Pontchartrain through North Pass and Pass Manchac. Since the 1930's, this unit has had no significant change in habitat type. The lake is believed to be nutrient limited.

Historic Land Loss - Not applicable.

Future Land Loss Projections - Not applicable.

Fish and Wildlife Resources - Western Lake Maurepas supports a primarily freshwater fish community, with catfish being the most important commercial species. The anadromous Gulf of Mexico sturgeon is a threatened species found in Lake Maurepas and is believed to spawn in the surrounding tributaries. Although rare, the endangered West Indian manatee, a marine mammal, has also been reported in the lake.

This unit has had stable populations of blue crabs, largemouth bass and channel catfish over the last 10-20 years. These population trends are expected to continue through 2050.

Seabirds, marsh/open water resident and migrant birds, and waterfowl are present in this unit in moderate numbers and have shown steady population trends for the last 10-20 years. This is not expected to change through 2050.

Infrastructure - There are no major infrastructure projects within this unit;

however, it contains 24 oil and/or natural gas wells.

Previously Proposed Strategies - There are no known previously proposed strategies for the Lake Maurepas mapping unit.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh and brackish marsh with associated aquatic habitats for each, forested wetlands and associated aquatic habitats, and open water. Resource objectives include blue crabs, freshwater finfish, waterfowl, and recreation and tourism.

Regional Ecosystem Strategies - There are no regional strategies that would directly affect this unit.

Benefits of Regional Strategies - Not applicable.

Mapping Unit and Programmatic Strategies - The only mapping unit strategy proposed for this unit is vegetative plantings (e.g., restoring beds of submerged aquatic vegetation). Including this unit in an area to be nominated as a National Estuarine Research Reserve is a programmatic strategy.

Tickfaw River Mouth

Location - The Tickfaw River Mouth mapping unit is bordered by Interstate Highway 55 on the east, Lake Maurepas on the south, the Amite/Blind unit on the west, and the Pleistocene Terrace on the north and west. This unit consists of 42,882 acres and is contained in the lower portions of Livingston and Tangipahoa parishes.

Habitat Description and Landscape Change - The unit is almost entirely swamps and bottomland hardwood forests with scattered pockets of fresh marshes. Much of the forest in the unit was logged in the early 20th century. Although there were no significant shifts in habitat type from 1956 to 1990, the swamps have become increasingly stressed. There has been a marked decrease in swamp productivity because of impoundment, flooding, and subsidence. Since construction of the Mississippi River Gulf Outlet (MRGO), increased salinity near North Pass has further stressed the marshes and swamps in those areas. Poor swamp regeneration because of nutria herbivory is also a problem.

Historic Land Loss - Between 1932 and 1990, some 775 acres in this unit were lost. The primary cause of that loss was shoreline erosion. Also, subsidence in the area is estimated at 0-1 ft/century.

Future Land Loss Projections - In 1990, this unit had approximately 22,840 acres of swamp and 2,350 acres of marsh. Shoreline erosion in this unit will continue to be a major cause of land loss. Impoundment, flooding, subsidence, and herbivory (i.e., nutria) are expected to increasingly stress area swamps in the future as well. Nearly 11,500 acres of swamps (50% of the 1990 total) are anticipated to be lost by 2050.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley. This makes it extremely important to neotropical migratory songbirds, waterfowl, and

many other species of wildlife. Two Federally listed species are commonly found in the unit. Bald eagles typically nest in cypress trees near fresh to intermediate marshes or open water. There were two active bald eagle nests within the unit during the 1996-1997 breeding season. The anadromous Gulf of Mexico sturgeon is a threatened species found in the Tickfaw River, where it is believed to spawn. Although rare, the endangered West Indian manatee occasionally enters lakes Pontchartrain and Maurepas, and has been reported in the Tickfaw River during the summer months.

This unit has shown steady population trends over the last 10-20 years for blue crab, largemouth bass and channel catfish. These trends are expected to continue through 2050. Wading birds, woodland birds, and American alligators have increased in this unit over the last 10-20 years. The bald eagle and other raptors, resident and migrant marsh birds, migrant woodland birds, nutria, muskrat, and other furbearers have shown steady population trends in this unit. By 2050, alligators are projected to increase in this unit while other species of wildlife are expected to remain steady.

Infrastructure - The USACE is responsible for the Tickfaw, Natalbany, Ponchatoula and Blood Rivers project, which includes clearing and snagging the lower reaches of each of those waterways for recreational watercraft.

Interstate Highway 55 is the eastern boundary of this unit. Primarily above-grade in the area, it is one of the main hurricane evacuation routes for New Orleans. In addition, there are about seven miles of primary roads, 6.9 miles of secondary roads, 18.3 miles of tertiary roads, 0.7 miles of railroad, 0.4 miles of natural gas pipelines, and six oil and/or natural gas wells present.

Previously Proposed Strategies - Freshwater diversions and hydrologic management have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Freshwater diversions, such as a small diversion proposed at the Tickfaw River, would introduce nutrients into forested wetlands and marshes, increasing their productivity. This should help counteract the effects of flooding and subsidence. Hydrologic management proposals that have been made for this unit include constrictions on the MRGO or the Inner Harbor Navigation Canal (IHNC) to reduce saltwater intrusion into the upper Pontchartrain Basin.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh and forested wetlands, with associated aquatic habitats for each. Resource objectives include freshwater finfish, waterfowl, nongame fish and wildlife, endangered species, recreation and tourism, water quality enhancement, and communities.

Regional Ecosystem Strategies - A regional strategy affecting this unit is restoring natural drainage patterns by gapping spoil banks, plugging canals, and maintaining culverts.

Benefits of Regional Strategies - The one regional strategy is believed to be minimally capable of reducing the

estimated swamp loss in this mapping unit by 2050.

Mapping Unit and Programmatic Strategies - Mapping unit strategies in this unit are shoreline stabilization (e.g., shoreline stabilization along Lake Maurepas), vegetative plantings (e.g., cypress plantings), and dedicated dredging (e.g., dedicated dredging from Lake Maurepas). There are no local or programmatic strategies in this unit.

West Manchac Land Bridge

Location - The West Manchac Land Bridge mapping unit includes the western portion of the land bridge between lakes Maurepas and Pontchartrain. The unit is bordered by Lake Maurepas on the west, the Tickfaw River Mouth mapping unit on the north, Interstate Highway 55 on the east, and the Amite/Blind unit on the south. This unit consists of 13,996 acres and is in Tangipahoa and St. John the Baptist parishes.

Habitat Description and Landscape Change - The West Manchac Land Bridge unit consists primarily of swamps and fresh marshes that grade into broken fresh marshes near Pass Manchac. There are some bottomland hardwood forests in the unit as well. Many of the forests in the unit were logged in the early 20th century. Although there were no significant shifts in habitat type from 1956 to 1990, the swamp has become increasingly stressed. There has been a marked decrease in swamp productivity because of impoundment, flooding, and subsidence. In addition, construction of the MRGO increased salinities in Lake Pontchartrain, North Pass, and Pass Manchac. Higher salinities can penetrate farther into the swamps via oil and gas access canals and the borrow canal for Interstate Highway 55. Swamp regeneration is poor because of nutria herbivory.

Historic Land Loss - Between 1932 and 1990, 660 acres were lost in this unit because of shoreline erosion and direct removal. Subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projections - Shoreline erosion will continue to be a major cause of loss in this unit. Impoundment, flooding, subsidence, and herbivory (i.e., nutria) are expected to increasingly stress area swamps in the future. In 1990, this unit had approximately 2,950 acres of marsh and 8,550 acres of swamp. By 2050, approximately 4,270 acres of swamp (50% of the 1990 total) and 60 acres of marsh are anticipated to be lost.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley. This makes it extremely important to neotropical migratory songbirds, waterfowl, and many other species of wildlife. The Federally listed bald eagle typically nests in cypress trees near fresh to intermediate marshes or open water. There were three active bald eagle nests within the unit during the 1996-1997 breeding season.

This unit has shown steady population trends over the last 10-20 years for blue crab, largemouth bass, and channel catfish. These trends are expected to continue through 2050. The bald eagle

and other raptors, wading birds, woodland birds, and alligators have increased in this unit over the last 10-20 years. Resident and migrant marsh birds, migrant woodland birds, nutria, muskrat, and other furbearers have shown steady population trends in this unit. By 2050, bald eagles and alligators are projected to increase in this unit while the other species of wildlife are expected to remain steady.

Infrastructure - The western portion of the USACE Pass Manchac navigation project lies within this unit and includes snagging and clearing Pass Manchac between lakes Pontchartrain and Maurepas. Interstate Highway 55 is the eastern boundary of this unit. Primarily above-grade in the area, it is one of the main hurricane evacuation routes for New Orleans. There are about 13.2 miles of primary roads, 9.3 miles of secondary roads, 1.9 miles of tertiary roads, 2.1 miles of railroads, no pipelines, and eight oil and/or natural gas wells in this unit.

Previously Proposed Strategies - Freshwater diversions, hydrologic management, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Freshwater diversions, such as small diversions at Bayou Manchac and Blind River, have been proposed to introduce nutrients into forested wetlands and marshes, thereby increasing their productivity. This would help counteract the effects of flooding and subsidence. Hydrologic management proposals have included constrictions on the MRGO or the IHNC to reduce saltwater intrusion into the upper Pontchartrain Basin. Shoreline protection along critically eroding areas, such as between North Pass and Pass Manchac, has also been proposed. The Louisiana Coastal Wetlands Conservation and Restoration Plan notes that preserving the Maurepas/ Pontchartrain land bridge is critical to maintaining the ecological integrity of the upper basin.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh and forested wetlands, with associated aquatic habitats for each. Resource objectives include freshwater finfish, alligators, waterfowl, nongame fish and wildlife, recreation and tourism, and storm buffering ability.

Regional Ecosystem Strategies - Regional strategies affecting this mapping unit include several small diversions, from the Mississippi River at the Reserve Relief Canal (<2,000 cfs), for example, to provide the swamps in this area with sediments and nutrients. These strategies include outfall management and diversion-related flood protection where needed. Another regional strategy affecting this unit is restoring natural drainage patterns by gapping spoil banks, plugging canals, and maintaining culverts.

Benefits of Regional Strategies - These strategies are believed to be minimally capable of reducing the estimated swamp loss in this mapping unit by the year 2050. The diversion should allow no net loss of marsh to occur in this unit. These strategies would be beneficial to wildlife and fisheries resources as well as to recreation and tourism in the area. Area communities would benefit from the improved floodwater retention and storm

buffering effects of the improved swamps.

Mapping Unit and Programmatic Strategies - Four mapping unit strategies for this region are shoreline stabilization (e.g., shoreline stabilization along Lake Maurepas), dedicated dredging (e.g., dedicated dredging from Lake Maurepas), vegetative plantings (e.g., cypress plantings), and restoring hydrology (e.g., improve hydrological exchange). The only programmatic strategy in this unit is to include this unit in an area to be nominated as a National Estuarine Research Reserve.

Middle Pontchartrain Basin

East Manchac Land Bridge

Location - The East Manchac Land Bridge mapping unit includes the eastern portion of the land bridge between lakes Maurepas and Pontchartrain. The unit is bordered by Interstate Highway 55 on the west, the Tangipahoa River Mouth unit on the north, Lake Pontchartrain on the east, and the Bonnet Carré unit on the south. This unit lies within St. John the Baptist and Tangipahoa parishes and consists of 29,873 acres.

Habitat Description and Landscape Change - This unit is primarily made up of intermediate marshes and bottomland forests, with some fresh marshes present. Many of the forests in the unit were logged in the early 20th century. Between 1956 and 1990, the marshes in the northeast portions of the unit have changed from fresh to intermediate. Furthermore, the swamps have become increasingly stressed, and there has been a marked decrease in swamp productivity because of impoundment, flooding, and subsidence. Since construction of the MRGO, increased salinities in Lake Pontchartrain, North Pass, and Pass Manchac can penetrate farther into the swamps via oil and gas access canals and the borrow canal for Interstate Highway 55. In addition, swamp regeneration is poor because of nutria herbivory.

Historic Land Loss - Between 1932 and 1990, approximately 4,450 acres of land were lost in this unit, primarily because of shoreline erosion, direct removal, and herbivory (i.e., alligatorweed flea beetle). Subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projections - In 1990, this unit had approximately 12,470 acres of marsh and 4,490 acres of swamp. Approximately 7,350 acres of marsh (60% of the 1990 total) and 2,250 acres of swamp (50% of the 1990 total) will be lost in this unit by 2050. Although the Lake Pontchartrain and Vicinity Hurricane Protection Mitigation project provides shoreline protection along five miles of the Manchac Wildlife Management Area (WMA), shoreline erosion will continue to be a primary cause of land loss in the unit. Impoundment, flooding, subsidence, and herbivory (i.e., nutria) are expected to increasingly stress area swamps in the future.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley, making it extremely important to neotropical migratory songbirds, waterfowl, and

many other species of wildlife. The Federally listed bald eagle typically nests in cypress trees near fresh to intermediate marshes or open water. There was one active bald eagle nest within the unit during the 1996-1997 breeding season. The Louisiana Department of Wildlife and Fisheries manages the 8,325-acre Manchac WMA located on the south side of Pass Manchac.

Fish and invertebrate species in this unit, including red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, blue crab, largemouth bass, and channel catfish, have shown steady population trends over the last 10-20 years and are expected to continue to do so through 2050. The unit has shown increasing population trends for wading birds, raptors, woodland resident and migrant birds, and alligators for the last 10-20 years. American alligator populations are expected to increase through 2050, while the others are expected to remain steady. Seabirds, shorebirds, raptors, marsh resident and migrant birds, and furbearers have maintained steady populations for the last 10-20 years and are projected to continue to do so through 2050.

Infrastructure - The eastern portion of the USACE Pass Manchac navigation project lies within this unit, and includes snagging and clearing Pass Manchac between lakes Pontchartrain and Maurepas. The North Pass-Pass Manchac project includes maintenance of a navigation channel from Lake Pontchartrain into the east entrance of Pass Manchac. There are about 20 miles of primary roads, 12 miles of secondary roads, 36 miles of tertiary roads, 23 miles of railroads, six miles of pipelines, and 29 oil and/or natural gas wells in this unit. There are two groundwater intakes in this unit, one commercial and one for the St. John water district.

Previously Proposed Strategies - Freshwater diversions, hydrologic management, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Freshwater diversions that have been proposed include those at Bayou Manchac, Blind River, and the Bonnet Carré Spillway. Hydrologic management proposals have included constrictions on either the MRGO or the IHNC to reduce saltwater intrusion into the middle Pontchartrain Basin. Shoreline protection along critically eroding areas, such as between North Pass and Pass Manchac, or along the Manchac WMA, have been considered to further reduce future land loss. The Louisiana Coastal Wetlands Conservation and Restoration Plan notes that preserving the Maurepas/ Pontchartrain land bridge is critical to maintain the ecological integrity of the upper basin.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh with associated aquatic habitats and forested wetlands with associated aquatic habitats. Resource objectives include freshwater finfish, alligators, waterfowl, nongame fish and wildlife, recreation and tourism, and storm buffering ability.

Regional Ecosystem Strategies - The wetlands adjacent to the lake have a low loss rate, probably because the water

diverted through the Bonnet Carré Spillway for flood control provides sediment and nutrients. Authorization would be sought for opportunistically removing pins from the Bonnet Carré Flood Control Structure when the Mississippi River is high. The diverted water would provide additional nutrients and sediment to the wetlands adjoining Lake Pontchartrain. By removing pins early in the year, the fresh water and nutrients would be put in the lake before temperatures would be high enough to cause large algal blooms. Some of the additional water would be moved to the west, perhaps along the Old Hammond Highway borrow pit, to reach the Manchac wetlands. Maintaining the shoreline integrity of Lake Pontchartrain along this mapping unit is expected to reduce marsh loss. Closing the MRGO to deep draft container vessels at Bayou La Loutre when adequate container facilities exist on the Mississippi River, and constructing a sill at Seabrook are additional regional strategies that may impact this unit. In order to close the MRGO, the Millennium Port must be built. Therefore, another regional strategy is to expedite planning for the Millennium Port.

Benefits of Regional Strategies - Implementation of these regional strategies would prevent about 30% of the anticipated marsh loss. These strategies would be beneficial to wildlife and fisheries resources, as well as to recreation and tourism in the area. Communities in the area would benefit as well from increased floodwater retention and storm buffering effects of the improved swamps.

Mapping Unit and Programmatic Strategies - The mapping unit strategies in this unit are shoreline stabilization (e.g., along Lake Maurepas), vegetative plantings (e.g., cypress plantings), dedicated dredging, and hydrologic restoration. A programmatic strategy in this unit is to extend the Joyce and Manchac WMAs.

Tangipahoa River Mouth

Location - The Tangipahoa River Mouth mapping unit lies on the northwest shore of Lake Pontchartrain. The unit is bordered by Interstate Highway 55 on the west, the Pleistocene Terrace and the Tickfaw River Mouth unit on the north, Lake Pontchartrain on the east, and the East Manchac Land Bridge unit on the south. This unit lies almost entirely within Tangipahoa Parish and consists of 40,195 acres.

Habitat Description and Landscape Change - This unit is primarily swamp and bottomland hardwood forest with some fresh marsh present. Much of the forest in the unit was logged in the early 20th century. Construction of the MRGO increased salinities in Lake Pontchartrain, North Pass, and Pass Manchac. High salinity water can then penetrate farther into the swamps through old logging canals. As a result, the marshes in the southern portion of this unit have gone from fresh to intermediate between 1956 and 1990. Furthermore, the swamp has become increasingly stressed, and there has been a marked decrease in swamp productivity because of impoundment, flooding, and subsidence. Nutria herbivory seriously impedes swamp regeneration.

Historic Land Loss - Between 1932 and 1990, some 840 acres of land were lost in this unit primarily because of shoreline erosion. Subsidence in the area is estimated at 0-1 ft/century.

Future Land Loss Projections - This unit is projected to lose approximately 1,670 (38% of the 1990 total) acres of marsh and 10,655(50% of the 1990 total) acres of swamps by 2050. Shoreline erosion will continue to be a primary cause of that loss. Impoundment, flooding, subsidence, and herbivory (i.e., nutria) are expected to increasingly stress area swamps in the future.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley. This makes it extremely important to neotropical migratory songbirds, waterfowl, and many other species of wildlife. The Louisiana Department of Wildlife and Fisheries manages the 15,609-acre Joyce WMA just east of Interstate Highway 55. Two Federally listed species are found in the unit. Bald eagles typically nest in cypress trees near fresh to intermediate marshes or open water. This unit had one active nest during the 1996-1997 breeding season. The anadromous Gulf of Mexico sturgeon is a threatened species found in the Tangipahoa River, where it is believed to spawn.

Fish and invertebrate species in this unit, including red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, blue crab, largemouth bass and channel catfish, have shown steady population trends over the last 10-20 years and are expected to do so through 2050. Brown shrimp have decreased in the area and are projected to continue to decline through 2050. Bald eagles, seabirds, shorebirds, waterfowl, marsh resident and migrant birds, and furbearers have shown steady population trends for the last 10-20 years and should continue to do so through 2050. Wading birds, raptors, woodland resident and migrant birds, and alligator populations have increased in the last 10-20 years. These populations should remain steady through 2050, except for that of American alligators, which is projected to increase.

Infrastructure - There are two USACE projects on the Tangipahoa River. The Tangipahoa River project involves snagging and clearing the lower 50 miles of that river for recreational use. The USACE also maintains a bar channel at the mouth of the river under the Tangipahoa River Navigation project. The USACE beneficially uses material dredged during channel maintenance to nourish the shoreline just west of the mouth of the river. There are 0.73 miles of secondary roads, 12.4 miles of tertiary roads, 5.83 miles of railroads, no pipelines, and ten oil and/or gas wells in this unit. There are four drainage pump stations and three groundwater intakes for communities in this unit.

Previously Proposed Strategies - Freshwater diversions, hydrologic management, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. A freshwater diversion, such as a large diversion at the Bonnet Carré Spillway, has been proposed to introduce nutrients into forested wetlands and marshes, thereby

increasing their productivity. This would help counteract the effects of flooding and subsidence. Hydrologic management proposals have included constrictions on either the MRGO or the IHNC to reduce saltwater intrusion into the middle Pontchartrain Basin. Shoreline protection along critically eroding areas, such as between North Pass and Pass Manchac, has been considered to further reduce future land loss as well.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh with associated aquatic habitats and forested wetlands with associated aquatic habitats. Resource objectives include freshwater finfish, alligators, nongame fish and wildlife, recreation and tourism, and water quality enhancement.

Regional Ecosystem Strategies - Regional strategies affecting this mapping unit include restoring natural drainage patterns (by gapping spoil banks, plugging canals, and maintaining culverts) and to maintain the shoreline of Lake Pontchartrain.

Benefits of Regional Strategies - These strategies are believed to be capable of reducing the estimated wetland loss in this mapping unit by a minimal amount. They would be beneficial to wildlife and fisheries resources in addition to recreation and tourism in the area. Area communities would benefit from the greater storm buffering effects and water quality enhancement of the improved swamps.

Mapping Unit and Programmatic Strategies - Two mapping unit strategies in this unit are the beneficial use of dredged material (e.g., beneficial use from mouth bar dredging) and shoreline stabilization (e.g., around the Tangipahoa River mouth). There are no programmatic strategies in this unit.

Tchefuncte River Mouth

Location - The Tchefuncte River Mouth mapping unit is 15,453 acres in size and lies south of the Pleistocene Terrace, along the north shore of Lake Pontchartrain. It stretches from the Tangipahoa River Mouth unit to the marshes and swamp along Bayou Chinchuba, and lies within St. Tammany and Tangipahoa parishes.

Habitat Description and Landscape Change - This unit is primarily fresh marsh, much of which has been impounded to construct crawfish ponds. There is some swamp and bottomland hardwood forest present, particularly in the eastern portion of the unit. Aside from the crawfish ponds and growing urban development in the forests, there have been no significant habitat changes between 1956 and 1990.

Historic Land Loss - Between 1932 and 1990, approximately 2,570 acres of land were lost, primarily to impoundments and shoreline erosion. It is estimated that there is no subsidence in this unit.

Future Land Loss Projections - By 2050, approximately 3,320 additional acres of marsh will be lost (70% percent of the 1990 total). It is anticipated that approximately 2,010 acres of swamp (50% of the 1990 total) will be lost by 2050. Although shoreline erosion will continue, this unit has great potential for

wetlands restoration in its impounded areas. Urban development will continue to encroach upon an unknown amount of bottomland hardwood forests near the Causeway.

Fish and Wildlife Resources - Three Federally listed species are found in the unit. Bald eagles typically nest in cypress trees near fresh to intermediate marshes or open water. This unit had two active nests during the 1996-1997 breeding season. The anadromous Gulf of Mexico sturgeon is a threatened species found in the Tchefuncte River, where it is believed to spawn. Endangered West Indian manatees occasionally enter lakes Pontchartrain and Maurepas and their associated coastal waters and streams during the summer months, and they have been reported in the Tchefuncte River.

For the past 10-20 years red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, blue crab, largemouth bass, and channel catfish have maintained steady populations. Red drum, black drum, spotted seatrout, southern flounder, white shrimp, brown shrimp, and blue crab populations are expected to decline by 2050. Gulf menhaden, largemouth bass, and channel catfish are expected to remain stable. Populations of bald eagles, seabirds, shorebirds, waterfowl, resident and migrant marsh birds, and furbearers have been steady for 10-20 years and should remain so through 2050. Wading bird, raptor, woodland resident and migrant bird, and American alligator populations have increased over the last 10-20 years. All are expected to remain stable through 2050, except the American alligator population, which is projected to increase.

Infrastructure - The USACE maintains (infrequently) the Tchefuncte River and Bogue Falaya navigation channels, primarily for recreational vessel traffic. There are no railroads and no oil and/or gas wells in this unit. There are 2.4 miles of secondary roads, 14.4 miles of tertiary roads, and 42 miles of pipelines, in this unit. There are four drainage pump stations and three groundwater intakes in this unit.

Previously Proposed Strategies - Freshwater diversions, hydrologic management, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Freshwater diversions, such as the small ones along the Tickfaw River, would introduce nutrients into forested wetlands and marshes. This would increase their productivity, which would help counteract the effects of flooding and subsidence. Hydrologic management proposals that would affect this unit include constrictions on the MRGO or the IHNC to reduce saltwater intrusion into the middle Pontchartrain Basin. Altering the hydrology of impounded areas to more natural conditions has been proposed to potentially restore many acres of fresh and intermediate marshes in this unit. Shoreline protection for critically eroding areas along Lake Pontchartrain has also been considered to further reduce future land loss.

Coastal Use/Resource Objectives - Habitat objectives for the unit are fresh marsh, brackish marsh, forested

wetlands, and associated aquatic habitats. Resource objectives include freshwater finfish, waterfowl, nongame fish and wildlife, endangered species, recreation and tourism, and water quality enhancement.

Regional Ecosystem Strategies - Regional strategies affecting this unit are to maintain the shoreline integrity of Lake Pontchartrain and restore the natural drainage patterns.

Benefits of Regional Strategies - It is believed that shoreline stabilization along this unit would save approximately five percent of the marsh anticipated to be lost by 2050. Freshwater finfish, waterfowl, and nongame fish and wildlife, including some endangered species, would all benefit from this strategy. Communities would benefit from increased recreation and tourism and water quality enhancement as well.

Mapping Unit and Programmatic Strategies - Two mapping unit strategies for this unit are shoreline stabilization (e.g., around the Tchefuncte River mouth) and beneficial use of dredged material (e.g., from mouth bar dredging). Reducing both draining and development of marshes are the only programmatic strategies in this unit.

Bonnet Carré

Location - The Bonnet Carré mapping unit is made up of the Bonnet Carré Spillway, which encompasses 7,080 acres from the Mississippi River to Lake Pontchartrain west of New Orleans. The spillway is located entirely within St. Charles Parish.

Habitat Description and Landscape Change - This unit consists largely of bottomland hardwood forests and swamps with some fresh marshes, upland areas, and open water (i.e., borrow pits and a conveyance channel). There have been no significant habitat shifts in the last 50 years. Since 1956, however, pockets of fresh marsh have developed in the unit.

Historic Land Loss - Between 1932 and 1990, 350 acres were lost in this unit primarily through direct removal during the spillway construction and shoreline erosion. There is essentially no natural wetland loss here. Subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projections - In 1990, this unit had approximately 1,170 acres of marsh and 2,120 acres of swamp. There should be no significant wetland loss in this unit over the next 50 years, although shoreline erosion is expected to continue along the lake.

Fish and Wildlife Resources - This unit is part of one of the largest remaining tracts of forested wetlands in the Lower Mississippi River Valley. This makes it extremely important to neotropical migratory songbirds and many other species of wildlife, particularly because it is so close to New Orleans.

This unit has shown steady population trends for white shrimp, brown shrimp, blue crabs, largemouth bass, and channel catfish over the last 10-20 years and is expected to do so through 2050. Seabirds, shorebirds, waterfowl, marsh resident birds, marsh and woodland migrant birds, furbearers, and American alligators have maintained steady

populations over the last 10-20 years. Seabird and woodland migrant bird populations are projected to decline, and the others are expected to remain steady. Populations of wading and woodland resident birds and raptors have been increasing. The wading bird population should remain steady, and the raptor and woodland resident bird populations are projected to decline through 2050.

Infrastructure - The Bonnet Carré Spillway is a USACE flood control project designed to divert up to 250,000 cfs from the Mississippi River into Lake Pontchartrain to protect New Orleans. Spillway openings can greatly change the salinity structure of Lake Pontchartrain (sometimes Lake Borgne and Mississippi Sound as well) for several months. Recently, the spillway has been the object of considerable controversy because of proposals to use the structure as a freshwater diversion for wetland and fisheries enhancement. There are 2.5 miles of primary roads, 2.2 miles of secondary roads, 35.4 miles of tertiary roads, six miles of railroads, 8.4 miles of pipelines and 21 oil and/or natural gas wells in this unit. There is one surface water intake for a fossil fuel plant.

Previously Proposed Strategies - Although the spillway has been proposed as a way to restore and enhance wetlands in the Pontchartrain Basin, there have been few proposals to address wetlands in the spillway itself because of the low wetland loss rate and flood control operations.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit include freshwater marsh and forested wetlands and associated aquatic habitats. Resource objectives include crawfish, waterfowl, nongame fish and wildlife, recreation and tourism, water quality enhancement, floodwater holding capacity, and utilities infrastructure.

Regional Ecosystem Strategies - A small diversion from the Mississippi River (< 4,000 cfs) through the Bonnet Carré spillway (by pulling some of the structure pins in an opportunistic manner) is a regional strategy that will affect this unit. Restoring natural drainage patterns and maintaining the shoreline of Lake Pontchartrain are other regional strategies that will affect this unit.

Benefits of Regional Strategies - These strategies are expected to reduce losses by a moderate amount in this mapping unit. They should improve fish and wildlife resources, recreation and tourism, and help protect infrastructure in the area.

Mapping Unit and Programmatic Strategies - There are no mapping unit or programmatic strategies in this unit.

La Branche Wetlands

Location - The La Branche Wetlands mapping unit consists of 24,598 acres found along the south shore of Lake Pontchartrain, between the Bonnet Carré Spillway and Kenner. The unit is located north of the back levee, along the east side of the Mississippi River, in St. Charles Parish.

Habitat Description and Landscape Change - This unit contains primarily swamps and hardwood forests in its

southern areas, grading into intermediate and brackish marshes and open water further north. Since the early 1900's, forested acreage in the unit has steadily declined due to development and conversion to marsh and open water. Early impoundments for agriculture led to subsidence and converted some of the intermediate marsh to open water. O'Neil mapped the marsh in the area as brackish and intermediate in 1949, and Chabreck and Linscombe mapped the area in 1968 as fresh and intermediate marsh. In the 1960's, access canals dredged to construct Interstate Highway 10 accounted for additional land loss. Construction of the MRGO increased salinities in Lake Pontchartrain. High salinity water then entered the unit through the access canals, leading to further marsh loss.

Historic Land Loss - Between 1932 and 1990, some 4,640 acres of land became open water in this unit; most occurred between 1956 and 1974. By 2050, some 2,070 acres of marsh and 5,010 acres of swamp are expected to be lost–28% of the wetlands existing in 1990. Shoreline erosion also played a role in land loss along the lake. Since 1990, approximately 480 acres of shrub/scrub and marsh were created in previously open water areas through a Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) dredging project. Subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projections - In 1990, this mapping unit had approximately 10,020 acres of swamp and 7,490 acres of marsh. Shoreline erosion is expected to continue. The State has constructed a 3,000-foot berm to protect the shoreline in the eastern part of the unit and has also closed a canal in that area to stop further loss from saltwater intrusion. Urban development is expected to affect forested wetlands along U.S. Highway 61 and near the New Orleans International Airport.

Fish and Wildlife Resources - The La Branche wetlands are an important area for wading birds, waterfowl, and other waterbirds. The Federally listed bald eagle typically nests in cypress trees near fresh to intermediate marshes or open water. There were two active bald eagle nests within the unit during the 1996-1997 breeding season. The Louisiana Department of Wildlife and Fisheries has designated Bayou Trepagnier, just north of Norco, as a Scenic Stream.

For the last 10-20 years, white shrimp, brown shrimp, blue crab, largemouth bass, and channel catfish populations have been steady. All are projected to remain steady through 2050, except white and brown shrimp, which are expected to decline. Populations of seabirds, shorebirds, waterfowl, marsh resident and migrant birds, woodland migrant birds, and furbearers have been steady for the last 10-20 years. Brown pelican populations have been increasing and are expected to continue to increase through 2050. Seabird and shorebird populations are expected to decline, while marsh resident and migrant bird, woodland migrant bird, and furbearer populations are expected to remain steady through 2050. Bald eagle, wading bird, raptor, woodland resident bird, and American alligator populations have increased for the last 10-20 years.

All are expected to remain stable through 2050.

Infrastructure - Interstate Highways 10 and 310 are above-grade, divided highways that traverse the unit; U.S. Highway 61 is at-grade and parallels Interstate Highway 10. All are primary hurricane evacuation routes for New Orleans and much of southeast Louisiana. A railway, the Illinois Central Gulf Railroad, runs across the top third of the unit on an earthen embankment. Both the railroad and U.S. Highway 61 embankments have culverts and structures to hydrologically connect the areas south of the embankments to areas directly north via several ditches and canals. Hurricane protection levees are located on the east bank of St. Charles Parish, north of U.S. Highway 61. There are three reaches of the levee within this unit, with generic widths of 230-510 ft, 247-486 ft, and 260-305 ft, respectively. The unit contains 6.4 miles of primary roads, 7.8 miles of secondary roads, 21.4 miles of tertiary roads, 12.1 miles of railroads, 23.1 miles of pipelines, and 181 oil and/or natural gas wells. There is one industrial groundwater intake in this unit.

Previously Proposed Strategies - Freshwater diversions, sediment pumping, hydrologic management, beneficial use of dredged material, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Freshwater diversions, such as the large diversion previously proposed at the Bonnet Carré Spillway, introduce nutrients into forested wetlands and marshes. This should increase their productivity and help counteract the effects of flooding and subsidence. Dedicated dredging has already been used to reestablish wetland vegetation in the northeast corner of this unit and could be used to do the same in the area just east of the existing project. Hydrologic management proposals that could affect this unit include constrictions on either the MRGO or the IHNC to reduce saltwater intrusion into the middle Pontchartrain Basin. Portions of the unit south of the railroad are under active marsh management (e.g., water control structures and operation plan) to reduce excessive tidal exchange and saltwater intrusion. Shoreline protection along critically eroding areas could further reduce future land loss.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are freshwater, intermediate, and brackish marsh and associated aquatic habitats for each. Resource priorities include shrimp, blue crabs, saltwater and freshwater finfish, alligators, furbearers, crawfish, waterfowl, nongame fish and wildlife, endangered fish and wildlife, recreation and tourism, scientific study and education, and storm buffering ability.

Regional Ecosystem Strategies - A small diversion (<4,000 cfs) from the Mississippi River through the Bonnet Carré Spillway (by pulling some of the structure pins in an opportunistic manner) is a regional strategy that is expected to reduce losses in this unit. Small diversions from the Mississippi River (<250 cfs) and from Jefferson Parish drainage canals are also expected to reduce La Branche wetland loss. Maintaining the shoreline integrity of Lake Pontchartrain is another regional

strategy that will also reduce future loss. Restoring natural drainage patterns and dedicated delivery of sediments for marsh building are also regional strategies which may affect this unit.

Benefits of Regional Strategies - If the regional strategies are implemented, 90 to 100% of the marsh loss in this unit is likely to be prevented. Wildlife and fisheries resources (shrimp, blue crabs, saltwater and freshwater finfish, alligators, furbearers, crawfish, waterfowl, and nongame fish and wildlife including endangered species), recreation and tourism, water quality, potential for scientific study, and benefits to communities (floodwater retention, storm buffering, and protection of infrastructure) should improve with healthier wetlands.

Mapping Unit and Programmatic Strategies - Shoreline stabilization (e.g., along Lake Pontchartrain) is a mapping unit strategy in this unit along with dedicated dredging (e.g., dedicated dredging from Lake Pontchartrain) and vegetative plantings (e.g., cypress/marsh plantings). Hydrologic management (e.g., improve hydrology of impounded areas), terracing, and marsh creation are other mapping unit strategies. Considering the addition of the La Branche Wetlands to the Bayou Sauvage National Wildlife Refuge (NWR) is a programmatic strategy in this unit.

Lake Pontchartrain

Location - The Lake Pontchartrain mapping unit encompasses the entire lake and is contained in Tangipahoa, St. Tammany, St. John the Baptist, St. Charles, Jefferson, and Orleans parishes.

Habitat Description and Landscape Change - This unit generally has low salinities in the western portion which gradually increase to the east and near the IHNC. The lake is connected to Lake Borgne and the Gulf of Mexico through Chef Menteur Pass and the Rigolets. Construction of the MRGO led to higher salinity water moving through the IHNC into Lake Pontchartrain. Throughout this century, urbanization and reclamation of wetlands in the New Orleans area and the north shore have increasingly stressed the lake by introducing excessive nutrients and pollutants. The lake periodically experiences algal blooms. Shell dredging, which has recently been prohibited, is thought to have altered the lake bottom, perhaps permanently, and increased turbidities. All these factors are believed to be in some way responsible for the change in distribution and species of submerged aquatic vegetation in the lake.

Historic Land Loss - Not applicable.

Future Land Loss Projections - Not applicable.

Fish and Wildlife Resources - The lake supports an estuarine assemblage of fishes. Blue catfish, red drum, spotted seatrout, blue crabs, and brown and white shrimp are commercially important species. The anadromous Gulf of Mexico sturgeon is a Federally listed species commonly found in Lake Pontchartrain. Although rare, the endangered West Indian manatee, a marine mammal, has also been reported in the lake.

Over the last 10-20 years, the Lake Pontchartrain unit has maintained steady populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, blue crabs, largemouth bass, and channel catfish and is expected to do so through 2050. The brown pelican has been increasing in numbers in this unit for the last 10-20 years and should continue to do so through 2050. Seabirds, resident and migrant marsh birds, and waterfowl have maintained steady populations for 10-20 years and are projected to remain steady through 2050.

Infrastructure - The Causeway is an above-grade toll road traversing Lake Pontchartrain which connects Interstate Highway 10 in Metairie to Interstate Highway 12 south of Covington. It is a major hurricane evacuation route for New Orleans, and accommodates much of the commuter traffic from the north shore. There are 24 miles of primary roads, five miles of secondary roads, 2.1 miles of tertiary roads, 7.4 miles of railroads, about 35 miles of pipelines, and 165 oil and/or natural gas wells in this unit. There are two residential and one commercial groundwater intakes in this unit.

Previously Proposed Strategies - Controversial freshwater diversions (i.e., Bonnet Carré) have been proposed to combat saltwater intrusion and benefit fisheries and the surrounding wetlands. Water quality concerns, however, remain unresolved. Other hydrologic management proposals that could affect this unit include closing the MRGO or constricting the IHNC to reduce saltwater intrusion into the middle Pontchartrain Basin.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish marsh and associated aquatic habitats, salt marsh and associated aquatic habitats, and open water. Resource priorities include shrimp, blue crabs, saltwater finfish, recreation and tourism, and water quality enhancement.

Regional Ecosystem Strategies - Constructing a sill at Seabrook is a regional strategy that is expected to directly affect this unit.

Benefits of Regional Strategies - The sill is expected to reduce “dead zones” in Lake Pontchartrain and should be compatible with the fisheries, recreation, water quality, and infrastructure resources of the lake.

Mapping Unit and Programmatic Strategies - Dedicated dredging (e.g., create marsh in Lake Pontchartrain adjacent to the south shore with dedicated dredging), vegetative plantings (e.g., restore submerged aquatic vegetation beds and stabilize lake rim marshes and beaches), shoreline protection (e.g., create wave breaks and fisheries habitat with rubble) are mapping unit strategies in this unit. A programmatic strategy is water quality improvement (e.g., improve Jefferson/Orleans sewer discharge and efficiency of north shore water treatment, evaluate the need to continue a moratorium on drilling, manage removal of fill material, and continue a moratorium on shell dredging).

North Shore Marshes

Location - The North Shore Marshes mapping unit is situated between the Pleistocene Terrace and Lake Pontchartrain. It stretches 14,257 acres along the north shore of the lake from Fontainebleau State Park to the Eden Isles development in St. Tammany Parish.

Habitat Description and Landscape Change - This unit largely contains brackish and intermediate marshes, with small amounts of bottomland hardwood forests present. O'Neil mapped the area in 1949 as brackish marsh; however, Chabreck and Linscombe described the area in 1968 as a mixture of brackish and intermediate marsh. Construction of the MRGO increased salinity in Lake Pontchartrain and corresponded to the period of greatest marsh loss in this unit. Shoreline erosion and residential development along the lake have also contributed to wetland loss.

Historic Land Loss - Between 1932 and 1990, some 3,645 acres of land were lost in this unit. Most of this loss occurred during the construction of the MRGO. Subsidence in the area is estimated at 0-1 ft/century.

Future Land Loss Projections - By 2050, approximately 1,470 acres will be lost in this area (14.7% of the 1990 total). Shoreline erosion will account for much of that loss. In addition, residential development may continue to convert an unknown amount of wetlands, although much of the land will be managed to maintain wetland integrity.

Fish and Wildlife Resources - This unit contains the last large undeveloped area along the north shore of the lake. It is unique because it is the only area in coastal Louisiana with an interface of sandy beaches, offshore grass beds, and marshes that grade into hardwood hummocks and pine ridges adjacent to and north of the unit. Shallow, open water areas within the marshes also contain lush beds of submerged aquatic vegetation. It is particularly important for migratory songbirds, waterfowl, wading and water birds, and recreationally important fisheries. Because of its importance to fish and wildlife, the U.S. Fish and Wildlife Service has recently established the 11,150-acre Big Branch Marsh NWR, which includes much of this unit.

Populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, blue crab, largemouth bass, and channel catfish have been steady for the last 10-20 years. Red drum, black drum, spotted seatrout, southern flounder, white shrimp, and brown shrimp populations are expected to decline through 2050, while the others should remain steady. Populations of brown pelicans, wading birds, woodland resident and migratory birds, and American alligators have increased over the last 10-20 years. The brown pelican population is expected to increase, while wading bird and American alligator populations are expected to remain steady. Woodland migrant and resident bird populations are expected to decline through 2050.

Infrastructure - The USACE infrequently maintains both Bayou

Lacombe and Bayou Bonfouca for navigation. U.S. Highway 11 runs through the extreme eastern portion of the unit and is an important hurricane evacuation route for New Orleans. There are 2.7 miles of secondary roads, 6.9 miles of tertiary roads, 2.6 miles of railroads, 6.2 miles of pipelines, and no oil and/or natural gas wells in this unit.

Previously Proposed Strategies - Freshwater diversions, managing hydrology, sediment trapping, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. The large freshwater diversion previously proposed at the Bonnet Carré Spillway was designed to introduce nutrients into wetlands, thereby increasing their productivity, which should help counteract the effects of flooding and subsidence. Sediment trapping projects, such as those using Christmas tree fences, would promote sedimentation in shallow open water areas, reduce turbidity, and encourage the growth of submerged aquatic vegetation. Shoreline protection along critically eroding areas, such as between North Pass and Pass Manchac, could further reduce future land loss.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are intermediate and brackish marsh with associated aquatic habitats. Resource priorities include shrimp, blue crabs, saltwater and freshwater finfish, alligators, waterfowl, nongame fish and wildlife, endangered species, recreation and tourism, water quality enhancement, and communities.

Regional Ecosystem Strategies - Regional strategies affecting the North Shore Marshes mapping unit are maintaining the integrity of the Lake Pontchartrain shoreline along this unit, restoring natural drainage patterns, and dedicated delivery of sediment for marsh building.

Benefits of Regional Strategies - It is expected that maintaining shoreline integrity will result in preventing 10-15% of the predicted loss in this unit by 2050. This strategy should benefit wildlife and fisheries resources such as shellfish and finfish, American alligators, waterfowl, nongame and endangered species, recreation and tourism, water quality enhancement, and communities.

Mapping Unit and Programmatic Strategies - Mapping strategies in this unit include terracing, restoring hydrology (e.g., re-establish natural drainage patterns), shoreline stabilization, and vegetative plantings. The only programmatic strategy is to coordinate proposed flood control measures with Coast 2050.

Bayou Sauvage

Location - The Bayou Sauvage mapping unit (14,994 acres) is located in eastern Orleans Parish. It is bounded by the Lake Pontchartrain Hurricane Protection Levee, Lake Pontchartrain, Paris Road, the Maxent Canal, and the GIWW.

Habitat Description and Landscape Change - The area within the Lake Pontchartrain Hurricane Protection Levee is primarily fresh marsh and shallow open water with beds of

submerged aquatic vegetation. Remnants of forested wetlands occur along the old Bayou Sauvage distributary ridge. Intermediate marsh and shrub/scrub are the predominant habitats between Interstate Highway 10 and the lake. In 1949, this unit was largely brackish marsh, with some intermediate marshes and sawgrass on the southwest corner. The area near Point aux Herbes was saline marsh. Between 1949 and 1978, the entire unit was brackish. Construction of a hurricane protection levee in 1956 virtually impounded much of the unit. Breaks in the Maxent Canal levee drained the southern portions of the unit, causing oxidation and subsidence of the marsh. Later improvements in the levees and their water controls led to excessive water levels and converted brackish marsh to fresh marsh and open water.

Historic Land Loss - Between 1932 and 1990, impoundment, flooding, and dredging led to the loss of approximately 3,525 acres of land in this unit. Additional wetlands have been buried under fill from construction of Interstate Highway 10, the Lake Pontchartrain Hurricane Protection Levee, and maintenance of the GIWW. Subsidence in this unit is estimated at 0-1 ft/century.

Future Land Loss Projections - By 2050, up to 3,550 acres (55% of the 1990 total) could be lost in this area. However, two recently constructed hydrological restoration projects funded under CWPPRA (Bayou Sauvage # 1 [PO-16] and Bayou Sauvage #2 [PO-18]) should prevent the loss of over 2,620 acres by 2050.

Fish and Wildlife Resources - Bayou Sauvage NWR comprises the southern two-thirds of this unit. This entire area is extremely important to wintering waterfowl, migratory songbirds, wading birds, and other water birds. The Federally listed endangered bald eagle has nested in cypress trees within the unit. Examples of several State-ranked rare plants, animals, and communities (i.e., coastal live oak forest) also occur in the unit. For the last 10-20 years, the largemouth bass and channel catfish populations have declined but are expected to increase in the future. Brown pelican, wading bird, and American alligator populations have increased in this unit over the last 10-20 years. Brown pelicans and American alligators are expected to increase while wading birds are expected to remain steady through 2050. Populations of seabirds, shorebirds, raptors, resident and migratory marsh and woodland birds, and furbearers have remained steady for the last 10-20 years. All are expected to remain steady through 2050, with the exception of the woodland bird populations, which are expected to decline.

Infrastructure - Interstate Highway 10 and U.S. Highways 11 and 90 cross the unit and are important hurricane evacuation routes for New Orleans and other parts of southeast Louisiana. Two railroads are found in this area; the Southern Railroad runs along Lake Pontchartrain, and the Louisville and Nashville Railroad crosses the southern portion of the unit. Most of this unit is surrounded by the Lake Pontchartrain Hurricane Protection Levee, and the GIWW forms the unit's southern boundary. There are 6.2 miles of

primary roads, 6.4 miles of secondary roads, four miles of tertiary roads, eight miles of railroads, 16.8 miles of pipelines, and four oil and/or natural gas wells in the unit.

Previously Proposed Strategies - Hydrologic management has been the most commonly proposed strategy to preserve and restore wetlands in this unit. Hydrologic management proposals, such as the projects funded under CWPPRA, will better manage the water impounded by the hurricane protection levee, and improve the health of both submerged and emergent vegetation. Protection of the Lake Pontchartrain shoreline has also been proposed.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are fresh and brackish marshes with associated aquatic habitats. Resource priorities include saltwater and freshwater finfish, waterfowl, nongame fish and wildlife, endangered species, recreation and tourism, and scientific study and education.

Regional Ecosystem Strategies - There are no regional strategies expected to affect this mapping unit.

Benefits of Regional Strategies - Not applicable.

Mapping Unit and Programmatic Strategies - Hydrologic management (e.g., re-establish connection to the lakes) is a local strategy for this unit. Other mapping unit strategies include vegetative plantings, continuing the CWPPRA pump project, and evaluating the possible need for pump outfall management. There are no programmatic strategies for this unit.

East Orleans Land Bridge

Location - The East Orleans Land Bridge mapping unit is located southeast of Slidell and northeast of New Orleans and is comprised of the marshlands between the Rigolets, Lake Borgne, Bayou Sauvage, and U.S. Highway 11. It spans 45,638 acres and lies within Orleans Parish.

Habitat Description and Landscape Change - This unit is almost entirely brackish marsh with shallow ponds that contain submerged aquatic vegetation. There is some development on high ground found along the old Bayou Sauvage distributary ridge. In 1949, the unit was mapped as brackish and saline marsh, with a small amount of intermediate marsh along U.S. Highway 11. By 1968, the entire area became brackish and has remained so.

Historic Land Loss - Since 1932, approximately 5,470 acres of land have been lost in this unit. The primary causes of that loss are shoreline erosion and direct removal (i.e., construction of the GIWW and the Lake Pontchartrain Hurricane Protection Levee) which altered hydrology in much of the unit. Subsidence in this unit has been estimated at 0-1 ft/century.

Future Land Loss Projections - By 2050, approximately 3,550 acres (13.9% of the 1990 total) will be lost in this unit. Shoreline erosion and altered hydrology will be largely responsible for the losses.

Fish and Wildlife Resources - The western portion of this unit is part of the Bayou Sauvage NWR. Many shallow, open water areas and ponds filled with submerged aquatic vegetation make this an important wintering area for waterfowl and a nursery area for estuarine fish.

For the last 10-20 years, populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crab, and largemouth bass have been steady. All are expected to decline through 2050 except Gulf menhaden, American oyster, and largemouth bass, which should remain steady. The population trend for Spanish mackerel has been unknown for the same period but is expected to increase through 2050. Seabirds, wading birds, shorebirds, raptors, marsh resident and migrant birds, furbearers, and American alligators have maintained steady populations for the last 10-20 years. Marsh resident birds, furbearers, and American alligators are expected to remain steady through 2050. Seabird, wading bird, shorebird, raptor, and marsh migrant bird populations are expected to decline. The brown pelican population in this unit has increased in the recent past and should continue to do so through 2050.

Infrastructure - Interstate Highway 10 runs through the northwest corner of the unit and U.S. Highway 11 parallels Interstate Highway 10 heading east. U.S. Highway 90 cuts across the center of the unit along the old Bayou Sauvage distributary ridge. These are primary hurricane evacuation routes for New Orleans and much of southeast Louisiana. The GIWW and a short alternate channel traverse the southern third of the unit and are infrequently maintained by the USACE. There are 1.8 miles of primary roads, 15.5 miles of secondary roads, 14.3 miles of tertiary roads, 16.8 miles of railroads, 4.3 miles of pipelines, and 48 oil and/or natural gas wells in this unit.

Previously Proposed Strategies - Hydrologic management, beneficial use of dredged material, and shoreline protection have been the most commonly proposed strategies to preserve and restore wetlands in this unit. Hydrologic management proposed for this area includes a variety of structures in critical areas to re-establish water flow through natural bayous, reducing excessive tidal exchange, retaining fresh water, and protecting submerged aquatic vegetation. Shoreline protection along severely eroding areas, such as Shell Point, and bank stabilization along the GIWW could further reduce future land loss. A CWPPRA project is planned for the area near Bayou Chevee to stop erosion along the reach. Originally designed as a marsh creation project through beneficial use of dredged material, it has evolved into a project similar to the rock breakwater (funded by the Gulf of Mexico program) north of Bayou Chevee that has stopped erosion and fostered lush growth of submerged aquatic vegetation between the breakwater and the shoreline. Shoreline protection west of Point aux Herbes has been proposed to prevent further erosion of the marsh and protect submerged aquatic vegetation. The Louisiana Coastal Wetlands Restoration Plan notes that preserving the East Orleans Land

Bridge is critical in maintaining the ecological integrity of the middle basin.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish marsh and associated aquatic habitats. Resource priorities include shrimp, blue crabs, saltwater finfish, waterfowl, recreation and tourism, water quality enhancement, storm buffering ability, and communities.

Regional Ecosystem Strategies - A regional strategy affecting this unit is a wetland-sustaining Mississippi River diversion of 2,000-5,000 cfs through the Central Wetlands mapping unit (after the MRGO is closed) to maintain the shoreline integrity of Lake Borgne and the East Orleans Land Bridge. Other regional strategies include maintaining the land bridge by marsh creation and shoreline protection, and maintaining the shoreline integrity of Lake Pontchartrain.

Benefits of Regional Strategies - These strategies are expected to reduce wetland loss 60-65% by the year 2050. The improved wetlands resulting from these strategies should improve fish and wildlife resources such as shrimp, blue crab, saltwater finfish and waterfowl in the area. In addition, recreation and tourism, water quality, the unit's function as a storm buffer, and the surrounding communities should benefit from these strategies.

Mapping Unit and Programmatic Strategies - The three common strategies for this unit are dedicated dredging (e.g., from lakes Pontchartrain and Borgne), shoreline protection (e.g., along lakes Pontchartrain and Borgne) and vegetative plantings (e.g., restore submerged aquatic vegetation). There are no local or programmatic strategies in the unit.

Pearl River Mouth

Location - The Pearl River Mouth mapping unit is bordered by Rigolets Pass, Lake Borgne, the Pearl River (Mississippi-Louisiana line), Interstate Highway 10, the Pleistocene Terrace and U.S. Highway 433. This unit is 47,465 acres in size and lies entirely within St. Tammany Parish.

Habitat Description and Landscape Change - This unit grades from swamp and fresh marsh in the north to brackish marsh and shallow ponds along the Rigolets. Many of these ponds contain beds of submerged aquatic vegetation. O'Neil mapped the southern portions of the unit as brackish marsh in 1949. The greatest land losses in this unit occurred between 1956 and 1978 and may be related to construction of U. S. Highway 90 and Louisiana Highway 433, which impounded much of the southwestern portion (Fritchie Marsh) of the unit. The eastern portion of the unit has remained fairly stable over the same period.

Historic Land Loss - Since 1932, approximately 2,810 acres of land were lost in this unit, primarily in Fritchie Marsh. Nutria herbivory, shoreline erosion, and scattered residential development also contributed to that land loss. Subsidence in the area is estimated at 0-1 ft/century.

Future Land Loss Projections - In 1990, this unit consisted of approximately 22,210 acres of marsh and

880 acres of swamp. By 2050, approximately 2,690 acres of land will be lost in this unit (12% of the 1990 total). None of the 1990 swamp acres are expected to be lost. The Fritchie Marsh Hydrologic Restoration project, funded under the CWPPRA, will reduce that loss by 210 acres. Shoreline erosion and herbivory are expected to continue unchecked.

Fish and Wildlife Resources - This unit is extremely important to many fish and wildlife species because so much of it is undeveloped. In addition, it borders one of the largest remaining tracts of bottomland hardwood forests in the southeast. Because of its importance to fish and wildlife, the Louisiana Department of Wildlife and Fisheries established the 34,900-acre Pearl River WMA to protect the area's wetlands and natural resources. Two Federally listed species are found in this unit. Bald eagles typically nest in cypress trees near fresh to intermediate marshes or open water. This unit had two active nests during the 1996-1997 breeding season. The anadromous Gulf of Mexico sturgeon occurs in the Pearl River, where it is believed to spawn.

This unit has exhibited steady population trends for red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, blue crab, largemouth bass, and channel catfish, and these populations should remain stable through 2050. The American oyster population has declined for the last 10-20 years and is expected to continue to decline through 2050. The brown pelican population has exhibited an increasing trend and is expected to continue to do so through 2050. Bald eagle populations are steady and are predicted to remain so. Seabirds, shorebirds, waterfowl, raptors, other avifauna, furbearers, and American alligators have steady populations, and they are expected to remain so through 2050. Wading bird populations are currently increasing but are expected to stabilize by 2050.

Infrastructure - Interstate Highway 10 is the northern border of this unit. U.S. Highway 90 also crosses it. They are both important hurricane evacuation routes for the New Orleans area. The West Pearl River navigation channel connects the mouth of the river to Bogalusa, LA. After a period of inactivity in the 1970's, the USACE resumed channel maintenance in 1989. Further dredging is on hold pending resolution of environmental concerns regarding that project. There are 4.7 miles of primary roads, 10.2 miles of secondary roads, 11.2 miles of tertiary roads, 6.9 miles of railroads, no pipelines, and 15 oil and/or natural gas wells in the unit.

Previously Proposed Strategies - Hydrologic management has been the most commonly proposed strategy to preserve and restore wetlands in this unit. Protecting bay/lake shorelines has also been proposed for this unit. Hydrologic management proposals that would affect this unit include diverting runoff from the C-14 canal into the western portion of Fritchie Marsh and installing a culvert under the U.S. Highway 90 bridge at Salt Bayou.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish marsh and associated

aquatic habitats. Resource priorities include shrimp, blue crab, saltwater finfish, waterfowl, recreation and tourism, water quality enhancement, storm buffering ability, and communities.

Regional Ecosystem Strategies - No regional strategies are expected to affect this unit.

Benefits of Regional Strategies - Not applicable.

Mapping Unit and Programmatic Strategies - Terracing, the beneficial use of dredged material (e.g., beneficial use of dredged material from the Pearl River mouth), maintaining shoreline integrity, and vegetative plantings are mapping unit strategies in this unit. Restricting West Pearl River dredging is the only programmatic strategy in this unit.

Lower Pontchartrain Basin

Central Wetlands

Location - The Central Wetlands mapping unit is bordered by Bayou La Loutre, the Forty Arpent Canal levee, the GIWW and New Orleans, and the MRGO. It is 42,559 acres in size and includes portions of St. Bernard and Orleans parishes.

Habitat Description and Landscape Change - The unit consists primarily of brackish marsh with shallow, open water ponds that contain submerged aquatic vegetation, agricultural land, and uplands. The major habitat types in 1949 were swamp and sawgrass marsh. Construction of the MRGO, which began in 1958, filled many acres of marsh adjacent to the channel (the single biggest loss in this unit), and allowed increased salinities in the area. In the northwest corner of the unit, a previously impounded area largely subsided into open water. By 1978, the swamp was gone and the remaining marsh had become brackish.

Historic Land Loss - Between 1932 and 1990, filling, storms, impoundments, and altered hydrology led to the loss of 13,480 acres of wetlands in this unit. Additionally, subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projection - In 1990, this unit consisted of 21,600 acres of marsh and 90 acres of swamp. It is projected that approximately 1,980 acres of marsh will be lost by the year 2050 in this unit (9% of the 1990 total). None of the 1990 swamp acreage is expected to be lost by 2050. The construction of the Violet Outfall Management project could decrease that loss rate. In addition, during replacement of the IHNC ship lock, the USACE will beneficially use dredged material to create marsh in a shallow open water area (i.e., failed agricultural impoundment) in the northwest corner of the unit. The USACE will also create additional marsh along the north bank of the MRGO as part of channel maintenance. These projects will reduce future loss by about 50%. Nevertheless, altered hydrology and storms are expected to contribute to future land loss.

Fish and Wildlife Resources - This unit is important to many species of migratory and resident wading and water

birds. Many shallow, open water areas filled with submerged aquatic vegetation make this an important wintering area for waterfowl and nursery area for numerous recreationally and commercially important fish species.

Populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, and blue crab have been steady for the last 10-20 years. All are predicted to remain steady through 2050 except Gulf menhaden, which are expected to increase. The American oyster has decreased in number recently and is predicted to decrease through 2050. Populations of seabirds, shorebirds, raptors, and marsh resident and migrant birds have been steady for the last 10-20 years. All should remain steady through 2050 except seabirds, which are predicted to decline. Brown pelican, wading bird, and woodland resident bird populations have increased in the last 10-20 years. The brown pelican population is expected to increase and the wading bird and woodland resident bird populations are expected to remain steady. Furbearer and alligator populations have decreased for the last 10-20 years and are expected to continue to do so in the future.

Infrastructure - The USACE has four infrastructure projects within or bordering the unit. The Bayou Dupre project connects the Mississippi River to Lake Borgne with a locked channel at Violet. The lock was permanently closed in 1950, but the channel is still used for navigation. Bayous La Loutre, St. Malo, and Yscloskey were improved to provide a navigation channel from Bayou St. Malo to Hopedale. Hurricane protection levees, constructed under the Lake Pontchartrain and Vicinity Hurricane Protection Levee project, encompass almost the entire mapping unit. The spoil bank of the MRGO, a navigation channel from New Orleans to the Gulf of Mexico, runs along the northern boundary of the unit. Louisiana Highway 46 is the only major roadway in the area and is an important hurricane evacuation route for several communities (i.e., Violet, Verret, Yscloskey, and Hopedale). Flood and hurricane protection is a major concern of those communities. There are no primary or secondary roads, 24.8 miles of tertiary roads, 1.9 miles of railroads, 22.6 miles of pipelines, and 17 oil and/or natural gas wells in the area.

Previously Proposed Strategies - The most commonly proposed strategies for preserving and restoring wetlands in this unit have been freshwater diversions, hydrologic management of marshes and navigation channels, and beneficial use of dredged material. The large, freshwater diversion project proposed at the Bonnet Carré Spillway was designed to provide nutrients to the marshes in the unit, increasing marsh productivity and longevity. Increased fresh water is expected to further reduce marsh stress from excessive salinities. The State operates the Violet Siphon, a small freshwater diversion from the Mississippi River into a canal in the middle of the unit. The Violet Siphon outfall management project would add several water control structures in the outfall area to better manage freshwater distribution from the siphon. As previously mentioned, the USACE plans to beneficially use spoil to create marsh

in shallow, open water near Bayou Bienvenue.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are intermediate marsh, brackish marsh, and forested wetlands, with associated aquatic habitats for each. Resource priorities include shrimp, blue crab, saltwater finfish, recreation and tourism, storm buffering ability, floodwater holding capacity, navigation and port facilities, roads, levees, bridges, and communities.

Regional Ecosystem Strategies - Regional strategies affecting this unit are closing the MRGO to deep draft ships when adequate container facilities exist on the Mississippi River, a wetland sustaining Mississippi River diversion of 2,000-5,000 cfs though the Central Wetlands mapping unit (after the MRGO is closed), and dedicated delivery of sediment for marsh building.

Benefits of Regional Strategies - These strategies are expected to reduce wetland loss in this region another 50% by the year 2050. As a result, there is no anticipated net loss in this unit. These strategies are expected to be compatible with fisheries in the area and the blue crab fishery should benefit from a Mississippi River diversion. Recreation and tourism, floodwater retention, storm buffering ability, and communities are all expected to benefit from these strategies as well.

Mapping Unit and Programmatic Strategies - Two mapping unit strategies in this unit are beneficial use of dredged material and vegetative plantings. There are no programmatic strategies in this unit.

South Lake Borgne

Location - The South Lake Borgne mapping unit (29,219 acres) is bordered by bayous La Loutre and St. Malo on the east, by the MRGO spoil bank on the south, the GIWW on the west, and by Lake Borgne on the north. It includes portions of St. Bernard and Orleans parishes.

Habitat Description and Landscape Change - The unit is mostly saline and brackish marsh with some open water present. The major habitat type in 1949 was brackish marsh; only Proctor Point had saline marsh. Construction of the MRGO in 1958 led to major losses of wetlands through direct removal and drastically altered the salinities and hydrology of the unit. Since that time, the acreage of saline marsh has gradually increased, while total wetland acres have steadily decreased. Vessel traffic along the MRGO continues to erode many acres of wetlands each year.

Historic Land Loss - Between 1932 and 1990, approximately 7,300 acres of wetlands were lost in this unit. Recently, however, the USACE has created marsh along the MRGO using material dredged during channel maintenance. Subsidence in the area is estimated at 1.1-2.0 ft/century.

Future Land Loss Projection - In 1990, this unit consisted of 16,600 acres of marsh. It is projected that about 3,310 acres of wetlands will be lost in the South Lake Borgne unit by 2050. Efforts by the USACE during channel

maintenance, however, should reduce that loss by creating marsh with dredged spoil and rocking the banks along the disposal areas. Nevertheless, wind, wave and wake erosion, storms, and altered hydrology are expected to cause additional land loss in the future.

Fish and Wildlife Resources - This unit is important to many species of wildlife and fishes, including migratory and resident waterfowl, wading and water birds, furbearers, shellfish, and many recreational and commercial species of fish. The Federally endangered brown pelican can be commonly found foraging and resting throughout this unit.

Populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crab, and Spanish mackerel have been steady for the last 10-20 years. Gulf menhaden and Spanish mackerel populations are expected to remain steady through 2050, while the others are expected to decline. Populations of seabirds, wading birds, shorebirds, raptors, and marsh resident and migrant birds have been steady for the last 10-20 years but are projected to decline through the year 2050. Furbearer and American alligator populations have declined over the last 10-20 years and are expected to do so through 2050. Brown pelican populations have increased in the recent past and are expected to do so through 2050.

Infrastructure - The USACE has two infrastructure projects inside or bordering the unit. Bayous La Loutre, St. Malo, and Yscloskey were improved to provide a navigation channel from Bayou St. Malo to Hopedale. The MRGO, a navigation channel from New Orleans to the Gulf of Mexico, was constructed as well. There are no roads or railroads, about 17 miles of pipelines, and 12 oil and/or gas wells in this unit.

Previously Proposed Strategies - The most commonly proposed strategies for preserving and restoring wetlands in this unit have been freshwater diversions, hydrologic management, beneficial use of dredged material, bank stabilization, development of barrier structures (i.e., reefs or islands), and shoreline protection. The large freshwater diversion project proposed at the Bonnet Carré Spillway was designed to provide nutrients to the marshes in the unit, thereby increasing marsh productivity and longevity. Increased fresh water is thought to further reduce marsh stress from excessive salinities. Bank stabilization and shoreline protection, especially in the MRGO and the lake shore, are very important to the unit as bank and shoreline erosion continue to be a problem. The USACE is currently looking at bank stabilization measures through a feasibility study as well as on-going operations and maintenance. As previously mentioned, the USACE has used spoil to create marsh along the MRGO, and will continue to do so as such opportunities arise.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish marsh and associated aquatic habitats. Resource priorities include shrimp, blue crab, oyster, saltwater finfish, recreation and tourism, water quality enhancement, and oil and gas infrastructure.

Regional Ecosystem Strategies - Regional strategies affecting this unit include building a wetland-sustaining Mississippi River diversion of 2,000-5,000 cfs though the Central Wetlands mapping unit (after the MRGO is closed), maintaining the shoreline integrity in Lake Borgne, stabilizing the north bank of the MRGO, and dedicated delivery of sediment for marsh building.

Benefits of Regional Strategies - These strategies are expected to reduce wetland loss in this unit. By the year 2050, there is projected to be a minor gain in marsh over the 1990 acreage. These strategies should improve saltwater fisheries such as those for shrimp, blue crab, oyster, and finfish in addition to recreation and tourism, water quality enhancement, and surrounding communities.

Mapping Unit and Programmatic Strategies - The mapping unit strategies in this unit are hydrologic restoration (e.g., constrict breaches between Lake Borgne and the MRGO), maintaining shoreline integrity (e.g., protection along the Lake Borgne shoreline), dedicated dredging (e.g., dedicated dredging from Lake Borgne), and beneficial use of dredged material (e.g., beneficial use of MRGO dredged material). The only programmatic strategy is to limit the draft of MRGO vessels to 36 ft (authorized channel depth).

Lake Borgne

Location - The Lake Borgne mapping unit encompasses the entire lake, is 162,505 acres in size, and is located in St. Bernard Parish.

Habitat Description and Landscape Change - This unit is a shallow, brackish, coastal lake connected to Lake Pontchartrain by the Rigolets and Chef Menteur Pass and to the Gulf of Mexico through Mississippi Sound. Construction of the MRGO in 1958 led to increased salinities in this unit through a number of smaller bayous to the south as well as Chef Menteur Pass and the GIWW. Lake Borgne receives the outflow from Lake Pontchartrain, a lake that can be stressed by high nutrient and pollutant input.

Historic Land Loss - Not applicable.

Future Land Loss Projections - Not applicable.

Fish and Wildlife Resources - The lake supports an estuarine assemblage of fishes. Red drum, spotted seatrout, blue crab, brown shrimp, and white shrimp are commercially important species found in the lake. Lake Borgne is particularly important as the site of some of Louisiana's prime oyster grounds. The Federally listed Gulf of Mexico sturgeon has been reported in Lake Borgne, and the Federally endangered brown pelican can commonly be found foraging and resting throughout this unit.

For the last 10-20 years, populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crabs, and Spanish mackerel have been steady. These populations are projected to remain steady through 2050. Seabird, waterfowl, and marsh resident and migrant bird populations have been steady for the last 10-20 years and should remain so through 2050. The population of brown pelicans in the area has

increased in the last 10-20 years and is expected to continue this trend through 2050.

Infrastructure - There is no major Federal, State, or parish infrastructure in Lake Borgne or any roads, railroads, or pipelines. There are 61 oil and/or natural gas wells and one industrial groundwater intake in this unit.

Previously Proposed Strategies - Freshwater diversions and hydrologic management have been the most commonly proposed strategies to combat saltwater intrusion and benefit fisheries in this unit. The large freshwater diversion previously proposed at the Bonnet Carré Spillway was designed in part to increase fresh water into the lake, which was expected to increase oyster productivity. Hydrologic management proposals that could affect this unit include closing the MRGO and altering salinities near Shell Beach.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are fresh and brackish marsh with associated aquatic habitats and open water. Resource priorities include shrimp, blue crabs, oysters, saltwater finfish, recreation and tourism, water quality enhancement, navigation and port facilities, oil and gas infrastructure, and communities.

Regional Ecosystem Strategies - Acquiring oyster leases in the southern lobe of Lake Borgne is a regional strategy which will affect the mapping unit in that it will serve as a site for future marsh creation.

Benefits of Regional Strategies - Acquiring some oyster leases in Lake Borgne will allow the creation of 5,000 acres of marsh. This would affect the oyster fishery where the disturbed leases are located, but in general the creation of marsh should benefit fisheries for shellfish and finfish in the lake. The additional marsh would benefit recreation and tourism; water quality in the lake; oil, gas, and navigation infrastructure; and the nearby communities.

Mapping Unit and Programmatic Strategies - There are no mapping unit strategies in this unit. The only programmatic strategy is to enhance near-shore oyster reefs and/or create a no-oystering zone near shorelines.

Biloxi Marshes

Location - The Biloxi Marshes mapping unit is bordered on the east by the open water of Chandeleur Sound, on the south by bayous La Loutre and St. Malo, on the west by Lake Borgne, and on the north by Mississippi Sound. It is located entirely in St. Bernard Parish.

Habitat Description and Landscape Change - This unit contains about 120,980 acres of brackish to saline marshes with shallow bayous and open water lakes and ponds containing submerged aquatic vegetation. The habitat has remained much the same since 1949.

Historic Land Loss - Between 1932 and 1990, 15,640 acres of marsh have been lost primarily due to shoreline erosion. Subsidence in the area is estimated to be between 0-1 ft/century.

Future Land Loss Projections - In 1990, this unit had approximately 87,00 acres of brackish and salt marshes. It is projected that about 16,080 acres of wetlands in this unit will be lost by the year 2050 (18% of the 1990 total). Continued shoreline erosion is expected to account for most of the land loss.

Fish and Wildlife Resources - This unit is important to many species of migratory and resident wading and water birds. The Federally endangered brown pelican can commonly be found throughout this unit. Many shallow, open water areas, filled with submerged aquatic vegetation, make this an important wintering area for waterfowl and a nursery area for numerous recreationally and commercially important fishes. Some of the larger lagoons and bays are prime oyster grounds. The unit contains the 39,583-acre Biloxi WMA, owned by Biloxi Marsh Company and managed by the Louisiana Department of Wildlife and Fisheries.

Populations of black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crab, and Spanish mackerel have all been steady for the last 10-20 years. Gulf menhaden, American oyster and Spanish mackerel populations are projected to remain steady through 2050, while the others are expected to decrease. The red drum population in the area has increased in the last 10-20 years but is expected to decrease through 2050. Seabird, wading bird, shorebird, raptor, and marsh resident and migrant bird numbers have remained steady for the last 10-20 years but are expected to decline through 2050. The population of brown pelicans has increased in the area and is projected to do so through 2050. Furbearer and American alligator populations have been decreasing for the last 10-20 years and are expected to continue declining through 2050.

Infrastructure - The Biloxi Marshes unit has one USACE infrastructure project bordering it. Bayous La Loutre, St. Malo, and Yscloskey were improved to provide a navigation channel from Bayou St. Malo to Hopedale. There are no roads or railroads, about six miles of pipelines, and 235 oil and/or natural gas wells in the mapping unit.

Previously Proposed Strategies - Freshwater diversions, artificial barrier islands, shoreline protection, and reef zones have been the most commonly proposed strategies to preserve and restore wetlands in this unit. The large freshwater diversion previously proposed at the Bonnet Carré Spillway was designed in part to provide fresh water to this area to moderate the effects of increasing salinities. Construction of artificial oyster reefs or barrier islands along the perimeter of the unit may lessen shoreline erosion. Shoreline protection along critically eroding areas near Lake Borgne could further reduce future land loss.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish and salt marsh and their associated aquatic habitats. Resource priorities include shrimp, blue crabs, oysters, saltwater finfish, furbearers, waterfowl, recreation and tourism, and storm buffering ability.

Regional Ecosystem Strategies - The regional strategies affecting this unit are a wetland sustaining Mississippi River diversion of 2,000-5,000 cfs though the Central Wetlands mapping unit (after the MRGO is closed), maintaining shoreline integrity of Lake Borgne, and dedicated delivery of sediment for marsh building.

Benefits of Regional Strategies - These strategies are expected to reduce the projected wetland loss in this unit about five percent by 2050 and should benefit fisheries such as those for shrimp, blue crabs, oysters, and saltwater finfish. Furbearers, waterfowl, recreation and tourism, and nearby communities will all benefit as well.

Mapping Unit and Programmatic Strategies - Mapping unit strategies for this unit include maintaining shoreline integrity (e.g., develop reef zones/enhance near-shore oyster reefs), vegetative plantings, dedicated dredging (e.g., dedicated dredging from Lake Borgne), beneficial use of dredged material (e.g., beneficial use of MRGO dredged material), and hydrologic restoration (e.g., gap spoil banks). The only programmatic strategy is to enhance near-shore oyster reefs and/or to create no-oystering zones near shorelines.

Eloi Bay

Location - The Eloi Bay mapping unit is bordered on the east by the open water of Breton Sound, on the south by the MRGO spoil bank and south jetty, and on the west and north by Bayou La Loutre. It is 97,965 acres in size and is contained entirely within St. Bernard Parish.

Habitat Description and Landscape Change - This unit covers 25,470 acres of brackish to saline marshes with shallow bayous and open water lakes and ponds containing submerged aquatic vegetation. The habitat type has remained much the same since 1949. The construction of the MRGO, which began in 1958, filled many acres of marsh adjacent to the channel (the single biggest loss in this unit), and altered salinities and hydrology of the unit by increasing acres of saline marsh present. Vessel traffic along the MRGO continues to erode many acres of wetlands each year.

Historic Land Loss - Between 1932 and 1990, about 7,420 acres of wetlands were lost in this unit. Subsidence is estimated at 1.1-2.0 ft/century.

Future Land Loss Projections - The USACE will create additional marsh along the north bank of the MRGO as part of channel maintenance in this unit. Nevertheless, by the year 2050 about 3,150 acres (12% of the 1990 total) of wetlands will be lost.

Fish and Wildlife Resources - This unit is important to many species of migratory and resident wading and water birds. The Federally endangered brown pelican can commonly be found foraging and resting throughout this unit. Many shallow, open water areas filled with submerged aquatic vegetation make this an important wintering area for waterfowl, and a nursery area for numerous recreationally and commercially important fishes. Some of the larger lagoons and bays are prime oyster grounds.

For the last 10-20 years, populations of black drum, spotted seatrout, Gulf

menhaden, southern flounder, white shrimp, brown shrimp, blue crab, and Spanish mackerel have been steady. Populations of red drum have increased, and the American oyster numbers have decreased. All of these populations are expected to decrease through 2050, except for those of red drum, Gulf menhaden, blue crab, and Spanish mackerel, which are projected to be steady. Seabird, wading bird, shorebird, raptor, and marsh resident and migrant bird populations have been steady for the last 10-20 years and are expected to decrease through 2050. Woodland resident bird populations have increased, and woodland migrant bird populations have remained steady. Both are projected to have steady populations through 2050. The brown pelican population has increased for 10-20 years and should continue to do so through 2050. Furbearer and American alligator populations have decreased in the area for the last 10-20 years and will probably continue to do so through 2050.

Infrastructure - The Eloi Bay unit has two USACE infrastructure projects. Bayous La Loutre, St. Malo, and Yscloskey were improved to provide a navigation channel from Bayou St. Malo to Hopedale. The MRGO, a regularly maintained navigation channel from New Orleans to the Gulf of Mexico, is located in this unit as well. There are no roads or railroads, about 24 miles of pipelines, and 546 oil and/or natural gas wells in this unit.

Previously Proposed Strategies - Hydrologic management of marshes and navigation channels, artificial barrier islands, bank stabilization, shoreline protection, and beneficial use of dredged material have been proposed to address land loss in this unit. Hydrologic management proposals that could affect this unit include constrictions on the MRGO to reduce saltwater intrusion in the middle and upper basins and a reduction of local vessel-induced bank erosion. Artificial barrier islands along the perimeter of the unit have been proposed to counter land loss from wave erosion. As part of the Corps' channel maintenance, the regular use of spoil to create marsh along the MRGO is standard practice.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are brackish and salt marsh and their associated aquatic habitats. Resource priorities include shrimp, blue crab, oyster, saltwater finfish, furbearers, waterfowl, recreation and tourism, and storm buffering ability.

Regional Ecosystem Strategies - Stabilizing the north bank of the MRGO with rocks will reduce shoreline erosion. Dedicated delivery of sediment for marsh building is another regional strategy affecting this unit.

Benefits of Regional Strategies - These strategies are projected to reduce future losses in this unit 30-35% by 2050. Fisheries such as those for shrimp, blue crabs, oysters, and saltwater finfish, as well as furbearer and waterfowl resources, should all benefit from these strategies. Recreation and tourism and oil and gas infrastructure should benefit as well.

Mapping Unit and Programmatic Strategies - Hydrologic restoration (e.g., gap spoil banks), restoring fringing marsh

islands, beneficial use of dredged material (e.g., beneficial use of MRGO dredged material), dedicated dredging, and vegetative plantings are mapping unit strategies in this unit. The only programmatic strategy is to enhance near-shore oyster reefs and/or no-oystering zones.

Chandeleur Sound

Location - The Chandeleur Sound mapping unit (390,780 acres) is bordered on the east by the Chandeleur Islands, on the south by the MRGO, on the west by Eloi Bay and the Biloxi Marshes, and on the north by Mississippi Sound. The unit lies entirely within St. Bernard Parish.

Habitat Description and Landscape Change - The unit is a large, shallow, marine bay protected by the Chandeleur Islands. As the Chandeleur Islands and the Biloxi and Eloi marshes continue to erode, Chandeleur Sound will enlarge.

Historic Land Loss - Not applicable.

Future Land Loss Projections - Not applicable.

Fish and Wildlife Resources - Commercially important estuarine and marine species such as red drum, spotted seatrout, Gulf menhaden, brown shrimp, and white shrimp are found in the Chandeleur Sound mapping unit. Federally listed endangered species commonly found in this unit include the Gulf of Mexico sturgeon, and the loggerhead and Kemp's Ridley sea turtles. The Federally endangered brown pelican can also be commonly found throughout this unit.

Populations of black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white and brown shrimp, blue crab, and Spanish mackerel have been steady and are expected to remain so through 2050. Red drum populations have been increasing but are expected to stabilize through 2050.

The brown pelican population in this unit has increased in the last 10-20 years and is projected to do so through 2050. Seabird and marsh resident and migrant bird populations have been steady for the last 10-20 years and should continue to be steady through 2050.

Infrastructure - The MRGO, a navigation channel from New Orleans to the Gulf of Mexico, is located in this unit. There are no roads or railroads, about 90 miles of pipelines, and 476 oil and/or natural gas wells in this unit.

Coastal Use/Resource Objectives - The habitat objective for this mapping unit is open water. Resource priorities include shrimp, blue crab, saltwater finfish, recreation and tourism, and oil and gas infrastructure.

Previously Proposed Strategies - Not applicable.

Regional Ecosystem Strategies - There are no regional strategies for this unit.

Benefits of Regional Strategies - Not applicable.

Mapping Unit and Programmatic Strategies - There are no mapping unit or programmatic strategies in this unit.

Chandeleur Islands

Location - The Chandeleur Islands mapping unit is bordered on the east by the Gulf of Mexico, on the south by Breton Sound, on the west by Chandeleur Sound, and on the north by Mississippi Sound. The unit contains 179,951 acres and is located entirely within St. Bernard Parish.

Habitat Description and Landscape Change - This unit contains a series of barrier islands. The Chandeleurs have beaches fronting low dunes and over-wash areas which gradually grade into salt marsh and extensive seagrass beds in the backbays. The unit includes the Chandeleur Islands, North Islands, New Harbor Islands, Point Neptune, Free Mason Islands, Curlew Islands, Grand Gosier Island, and Breton Islands.

Historic Land Loss - Major storm events have been the cause of most of the land loss and redistribution in this unit. Subsidence in the area is estimated at 1.0-2.0 ft/century.

Future Land Loss Projections - Wind and wave erosion, as well as storm-related loss have been, and will continue to be, a problem in this unit. The islands were seriously damaged by Hurricane Georges in 1998.

Fish and Wildlife Resources - The Breton NWR covers almost the entire mapping unit. The islands in this unit support one of four brown pelican nesting colonies in Louisiana as well as regionally significant seabird colonies. The extensive seagrass beds behind the islands are important wintering areas for canvasback ducks as well as nursery areas for recreationally and commercially important fish species. There are some infrequent occurrences of sea turtle nesting on the islands as well. Most of the refuge is a congressionally designated wilderness area.
The population of brown pelicans has increased in this unit for 10-20 years and should continue increasing through 2050. Populations of seabirds have been steady for 10-20 years but are expected to decrease through 2050.

Infrastructure - The USACE regularly maintains the MRGO navigation channel from New Orleans to the Gulf of Mexico. There are no roads or railroads, about 62 miles of pipelines, and 115 oil and/or natural gas wells in the unit.

Previously Proposed Strategies - Because most of this unit is designated as wilderness, there has been little opportunity for structural measures to offset land loss. The USACE, however, beneficially uses material dredged during channel maintenance by placing it on an underwater berm off Breton Island to nourish that island.

Coastal Use/Resource Objectives - Habitat objectives for this mapping unit are barrier islands and chenier shorelines. Resource priorities include shrimp, blue crab, saltwater finfish, waterfowl, nongame fish and wildlife, recreation and tourism, and storm buffering ability.

Regional Ecosystem Strategies - Maintaining the Chandeleur Islands is the only regional strategy recommended for this unit. Maintenance, however, requires approval by the USFWS as the islands are designated as a wilderness area. If the islands do not recover from the damage of

Hurricane Georges, the USFWS may be requested to remove their wilderness status so the islands can be restored.

Benefits of Regional Strategies - Restoring the islands should benefit shrimp, blue crabs, saltwater finfish, waterfowl, nongame fish and wildlife, and recreation and tourism.

Mapping Unit and Programmatic Strategies - The only mapping unit strategy in this unit is vegetative plantings (e.g., restore submerged aquatic vegetation beds). There are no programmatic strategies recommended for this unit.

SECTION 4

PRIOR AND PREDICTED LAND LOSS, PREVIOUS STRATEGIES AND COAST 2050 STRATEGIES

Wetland Table

Calculation of Rate of Loss in the Absence of Restoration

There are two databases showing land loss in coastal Louisiana.

- The database developed by the National Wetlands Research Center of the U.S. Geological Survey (USGS) covers the entire coast, indicates habitat types, and shows loss and gain from 1956 to 1990.

- The database developed by the New Orleans District of the U.S. Army Corps of Engineers (USACE) covers the coastal marshes over a sixty-year period of record, divided into four time intervals. The product of this database is a set of seven maps depicting the location of land loss per time period. The database is highly consistent, because the same two geologists determined the land/water interface for all periods. However, it does not cover all of the cypress swamps, does not include the drainage of the Sabine River, and does not show habitat types.

In 1991, as part of the CWPPRA planning process, an interagency group of marsh experts gathered to discuss which database to use to project marsh loss for the Louisiana Coastal Wetlands Restoration Plan (published in 1993). The group determined that the USACE database was the most appropriate to use to project future loss, because it had the most extensive loss record and the land/water interface had been consistently delineated. Since land gain was infrequent and localized, the group determined that this parameter was not necessary to project future losses.

The 1991 interagency group chose 1974 through 1990 as the most appropriate base period to determine future loss. The average loss statewide was slightly more than 30 square miles per year from 1974 to 1983. The loss dropped to just over 25 square miles per year in the most recently analyzed time period, 1983 to 1990. There are significant uncertainties in any 60-year projection into the future – rate of sea level rise, frequency of hurricanes and floods, rate of development, etc. The group determined that including the higher 1974-1983 loss with the 1983-1990 loss would compensate for a possible increase in sea level rise. They also felt that the 1974-1990 loss rate most accurately reflected the post-1990 loss rate. Thus, this rate was used in the 1993 CWPPRA

"Louisiana Coastal Wetlands Restoration Plan" and in subsequent feasibility studies conducted under CWPPRA.

Subsequently, as part of feasibility studies done under CWPPRA, another group of marsh experts (including some members of the 1991 group) analyzed the loss patterns on the USACE land loss maps. The group drew polygons around areas where loss patterns seemed to have the same cause. The acres lost in each polygon of similar loss were determined for each of the four time periods. The annual percent of marsh loss between 1974 and 1990 was determined for each polygon. For projection purposes, these rates were assumed to continue into the future.

During the Coast 2050 planning process, local experts on Coast 2050 Regional Planning Teams adjusted a few of the 1974-1990 loss rates to account for one-time losses and false loss associated with extremely high water levels.

Another adjustment during the Coast 2050 process was done because the USACE database included only land to water changes, and therefore did not show embankments of dredged material along channels as land loss. To partially correct this, the most extensive spoil banks, those along the Mississippi River Gulf Outlet, were measured and counted as loss. Since the Louisiana Coastal Wetlands Restoration Plan is now in place, all future loss due to development will be mitigated. Thus, the 1974-1990 loss due to canals, borrow pits, etc. was not included in the rate to be used for projections. Since the Sabine River watershed was not covered by the USACE database, the 1978-1990 loss rate from the USGS database was used in that area.

The USACE database covered all habitats in the coastal area, including the extensive agricultural and residential areas adjacent to the Mississippi River and Bayou Lafourche. The polygons of similar loss included these non-wetland areas. The Coast 2050 experts realized that including these developed areas in the base from which loss was determined produced an inaccurately low loss rate, since the loss rate should apply only to wetlands acreage. Accordingly, the USGS database was used to determine the acres of marsh in 1990 in each polygon. All loss on the USACE loss maps was determined to be in marsh. The adjusted 1974-1990 loss rate was applied to the acres of marsh in 1990 and then to the remaining acres of marsh each year from 1991 through 2050. This determined the acres remaining in 2050 for each polygon, if no restoration occurred.

Adjustment for Restoration Projects

There is one large freshwater diversion from the Mississippi River at Caernarvon and a second under construction at Davis Pond. There are nearly 60 coastal restoration projects authorized on the first six CWPPRA Priority Lists. All these projects either reduce future marsh loss or create marsh. For CWPPRA projects, the additional acres present in the project area at the end of 20 years (as determined by the Wetland Value Assessment) were used to determine the benefits between 1990 and 2010. Then, the longevity of each project (as determined by the CWPPRA

Environmental Working Group) was used to determine the marsh loss reduction/marsh gain for each project for years 2011 through 2050. If the project had longevity of greater than 50 years, the WVA benefits were continued until 2050. If the longevity was less than 30 years, after year 30, the loss rate was returned to the 1974-1990 rate. For the Caernarvon Freshwater Diversion, the benefits from the EIS were used. For the Davis Pond Freshwater Diversion, the benefits from the most recent Fact Sheet were used.

The benefitted acreage in each polygon was calculated as described above. This acreage was then subtracted from the acres projected to be lost. This determined the net amount of marsh to be lost in each polygon.

Location of Lost Land

In order to determine where within each polygon the above loss might be located, the 1993 LANDSAT image was used. The polygons, diversion, and CWPPRA project boundaries were obtained from the Louisiana Department of Natural Resources (DNR). The Natural Systems Engineering Laboratory at LSU developed the prediction maps. They selectively modified parts of the LANDSAT image to reflect the net acreage of marsh lost in each polygon by 2050.

Each 25 m. pixel on the image contained brightness based on combining bands from the original LANDSAT data. Each cell was assigned a pseudo color–dark blue for the lowest end of the brightness range and bright white for the highest end. Generally, solid marsh areas had a high brightness while open water had a low brightness. Areas with an intermediate brightness were assumed to be broken marsh with brightness corresponding to the percentage of land. Brightness was then used as land/water boundary criteria. Areas with brightness higher than the criterion were considered land and those with lower brightness were classified as water.

In order to make the image "lose" land, the criterion for land was then adjusted to a higher value that resulted in less land in the image. This was done iteratively until the amount of land in each polygon matched the acreage predicted to remain in that polygon in 2050 (Table 4-1). Reducing the brightness criterion removed land from the image. The amount of land preserved by CWPPRA projects and the river diversions was then added back to the image in each polygon. In order to clearly indicate the land lost and gained through 2050, maps were printed to show the base marsh in green, the areas to be lost in red, and areas of gain in black. The result is a map of coastal Louisiana that indicates what marsh areas may be lost or gained by 2050. Refer to Figures 1-1 and 1-2 in the Coast 2050 main report. The overall results of the projection also are presented in Chapter 5 of the report.

Prediction of Loss Through 2050 by Mapping Unit

The USGS database was used to determine the acres of swamp and various types of marsh in each mapping unit in 1990 (Table 4-1). The USACE database was used to determine historic losses and the rate of loss from 1974-

1990 for each mapping unit. The benefits of the CWPPRA projects and freshwater diversions were also determined by mapping unit and habitat type. The habitat types to be lost were estimated by superimposing the 2050 loss projection maps onto the 1990 habitat maps. This methodology assumes that the location of future habitat zones will not shift. Since these zones have shifted both north and south in the past, the assumption that they will remain as they were in 1990 is simplistic. Since the USACE database did not include swamps, academics with experience in analyzing swamp loss were contacted and their help was used to determine the amount of swamp predicted to be lost in each mapping unit.

Previously Proposed Strategies Table

Data in this table (Table 4-2) came from an extensive review of past coastal restoration plans, studies, and current projects. Following are the sources and citations for each of the abbreviated footnotes in the table:

Blueprint

Gagliano, S.M. 1994. An environmental-economic blueprint for restoring the Louisiana coastal zone: The state plan. Report of the Governor's Office of Coastal Activities, Science Advisory Panel Workshop. Coastal Environments, Inc., Baton Rouge, La.

CCEER

van Heerden, I.L. 1994. A long-term comprehensive management plan for coastal Louisiana to ensure sustainable biological productivity, economic growth, and the continued existence of its unique culture and heritage. Center for Coastal, Energy, and Environmental Resources, Louisiana State University. Baton Rouge, La.

Coalition to Restore Coastal Louisiana

Coalition to Restore Coastal Louisiana. 1989. Coastal Louisiana: Here today and gone tomorrow? A citizen's program for saving the Mississippi River Delta region to protect its heritage, economy, and environment. Baton Rouge, La. 70 pp.

CWPPRA Basin Report

Louisiana Coastal Wetlands Conservation and Restoration Task Force. 1993. Coastal Wetlands Planning, Protection, and Restoration Act: Louisiana Coastal Wetlands Restoration Plan. Main report and environmental impact statement. Louisiana Coastal Wetlands Conservation and Restoration Task Force, Baton Rouge, La.

Gagliano and van Beek, 1993

Gagliano, S.M., and J.L. van Beek. 1993. A long-term plan for Louisiana's coastal wetlands. Louisiana Department of Natural Resources, Office of Coastal Restoration, Baton Rouge, La.

Lake Pontchartrain Basin Foundation CMP

Lake Pontchartrain Basin Foundation. 1995. Comprehensive management plan. Metairie, La. 79 pp.

Recommendations for Preservation of Wetlands in Eastern Orleans Parish

Gagliano, S.M., D.W. Roberts, and R.J. Savage, Jr. 1989. Recommendations for preservation of wetlands in eastern Orleans Parish. Coastal Environments Inc. Baton Rouge, La. 60 pp.

Region 1 Coast 2050 Strategies Tables

These (Tables 4-3, 4-4, and 4-5) are the final Regional, Mapping Unit, and Programmatic strategies that were formulated and finalized during the year and a half long Coast 2050 process. These strategies were formulated through a joint Federal, State, and local effort that involved agency officials and members of the public.

Table 4-1. Region 1 wetland loss.

UPPER BASIN	Major habitat types in 1949 or 1956	Habitat changes 1956-1988	Subsidence rate	Approximate acres lost	
Amite/Blind	Swamp (Sw) Fresh marsh (F)	No change	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	5,040 400 335 150 715
Tickfaw River Mouth	Swamp (Sw)	No change	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	3,125 320 335 90 30
West Manchac Land Bridge	Swamp (Sw) Fresh marsh (F)	No change	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	3,610 320 230 80 30

Table 4-1. Region 1 wetland loss (Cont.).

UPPER BASIN	Causes of loss*	Comments	Projected acres lost by 2050	
Amite/Blind	Flooding - 1, C Impoundment - 1, C Subsidence - 1, H, C Herbivory - 2, C Direct removal - 3, H Shoreline erosion - 3, H, C	Not all of unit in database. Marked decrease in habitat productivity, no regeneration due to nutria.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	3,440 40 138,930 69,460 48.8
Tickfaw River Mouth	Flooding - 1, C Impoundment - 3, H, C Subsidence - 1, H, Altered hydrology - 1, C Shoreline erosion - 2, H, C Herbivory - 3, C	Not all of unit in database. No regeneration due to nutria.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	2,350 35 22,840 11,420 45.5
West Manchac Land Bridge	Flooding - 1, C Subsidence - 1, C Altered hydrology - 1, H, C Shoreline erosion - 2, H, C Herbivory - 3, C Direct Removal - 3, H Impoundment - 3, H, C	No regeneration due to nutria.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	2,950 60 8,550 4,270 37.7

* H=historic cause, C=current cause

Table 4-1. Region 1 wetland loss (Cont.).

MIDDLE BASIN	Major habitat types in 1949 or 1956	Habitat changes 1949/1956-1988	Subsidence rate	Approximate acres lost	
Tchefuncte River Mouth	Fresh marsh (F) Swamp (Sw)	No change	Stable	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	7,340 40 1,050 70 1,410
Tangipahoa River Mouth	Swamp (Sw) Fresh marsh (F)	1956-1978 no change 1978-1988 to Sw, F, and I	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	5,330 90 110 400 240
East Manchac Land Bridge	Swamp (Sw) Fresh marsh (F)	1956-1978 to Sw, I, and F 1978-1988 to I, Sw, and F	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	16,920 540 1,240 2,170 500
Bonnet Carre'	Swamp (Sw)	1956-1978 no change 1978-1988 to Sw and F	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	1,520 50 50 50 200
La Branche Wetlands	Swamp (Sw) Intermediate marsh (I) Brackish marsh (B)	1949-1968 to I and F 1968-1978 to I and B 1978-1988 no change	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	12,130 370 3,380 780 110

Table 4-1. Region 1 wetland loss (Cont.).

MIDDLE BASIN	Causes of loss*	Comments	Projected acres lost by 2050	
Tchefuncte River Mouth	Impoundment - 1, H, C Shoreline erosion - 2, H, C		Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	4,770 3,320 4,020 2,010 60.6
Tangipahoa River Mouth	Shoreline erosion - 1, H, C	Severe shoreline erosion.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	4,390 1,670 21,310 10,655 48.0
East Manchac Land Bridge	Shoreline erosion - 1, H, C Herbivory - 2, C Altered hydrology - 2, H, C Flooding - 2, H, C	Severe shoreline erosion. Lack of cypress regeneration. Mostly fresh marsh understory.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	12,470 7,350 4,490 2,250 56.6
Bonnet Carre'	Direct removal - 1, H, C Shoreline erosion - minor, H, C		Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 % 1990 wetland acres lost by 2050	1,170 0 2,120 0 0.0
La Branche Wetlands	Altered hydrology - 1, H, C Shoreline erosion - 2, H, C Dredging - 3, H		Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 Acres marsh preserved by CWPPRA % 1990 wetland acres lost CWPPRA	7,490 2,070 10,020 5,010 260 39.5

* H=historic cause, C=current cause

Table 4-1. Region 1 wetland loss (Cont.).

MIDDLE BASIN	Major habitat types in 1949 or 1956	Habitat changes 1949/1956-1988	Subsidence rate	Approximate acres lost	
North Shore Marshes	Brackish marsh (B)	1949-1968 to I and B 1968-1988 no change	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	13,145 610 2,475 410 150
Pearl River Mouth	Brackish marsh (B)	1949-1968 to B and I 1968-1978 to F, I, and B 1978-1988 no change	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	25,020 600 1,260 780 170
East Orleans Land Bridge	Brackish marsh (B) Saline marsh (S) Intermediate marsh (I)	1949-1968 to B 1968-1988 no change	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	30,930 2,370 1,750 970 380
Bayou Sauvage	Brackish marsh (B) Intermediate marsh (I) Saline marsh (S)	1949-1978 to B 1978-1988 to F and I	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	9,965 700 1,200 565 1,060

Table 4-1. Region 1 wetland loss (Cont.).

MIDDLE BASIN	Causes of loss*	Comments	Projected acres lost by 2050	
North Shore Marshes	Altered hydrology - 1, H, C Shoreline erosion - 2, H, C	Development pressure	Acres marsh in 1990 Acres marsh lost by 2050 % 1990 acres lost by 2050	9,550 1,470 14.7
Pearl River Mouth	Impoundment - 1, H, C Herbivory - 2, C Shoreline erosion - 3, H, C		Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 Acres marsh preserved by CWPPRA % 1990 wetland acres lost CWPPRA	22,210 2,690 880 0 210 10.7
East Orleans Land Bridge	Shoreline erosion - 1, H, C Dredging - 2, H Altered hydrology - 3, H, C		Acres marsh in 1990 Acres marsh lost by 2050 % 1990 wetland acres lost by 2050	25,460 3550 13.9
Bayou Sauvage	Impoundment - 1, H,C Flooding - 2, H,C Dredging - 2, H, C		Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 Acres marsh preserved by CWPPRA % 1990 wetland acres lost CWPPRA	6,440 3,550 320 0 2,620 13.8

* H=historic cause, C=current cause

Table 4-1. Region 1 wetland loss (Cont.).

LOWER BASIN	Major habitat types in 1949 or 1956	Habitat changes 1949-1988	Subsidence rate	Approximate acres lost	
South Lake Borgne	Brackish marsh (B) Saline marsh (S)	1949-1968 to B with trace I 1968-1978 to all B 1978-1988 to S and B	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	23,900 2,390 3,420 1,100 390
Central Wetlands (includes MRGO disposal)	Swamp (Sw) Intermediate marsh (I)	1949-1968 to B and I 1968-1978 to all B 1978-1988 no change	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	35,080 1,690 11,240 450 100
Biloxi Marshes	Brackish marsh (B) Saline marsh (S)	1949-1968 gained trace I 1968-1978 to all B and S 1978-1988 no change	Low <1 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	102,640 4,820 5,100 3,420 2,300
Eloi Bay	Brackish marsh (B) Saline marsh (S)	1949-1968 no change 1968-1978 gained more S 1978-1988 gained more S	Intermediate 1.1 to 2.0 ft per century	Acres marsh in 1932 Acres lost 1932-1956 Acres lost 1956-1974 Acres lost 1974-1983 Acres lost 1983-1990	32,880 880 5,630 300 610

Table 4-1. Region 1 wetland loss (Cont.).

LOWER BASIN	Causes of loss*	Comments	Projected acres lost by 2050	
South Lake Borgne	Shoreline erosion - 1, H, C Storm related loss - 1, H Dredging - 1, H Altered hydrology - 2, H, C Altered hydrology - 2, H, C		Acres marsh in 1990 Acres marsh lost by 2050 Acres marsh preserved CWPPRA % 1990 wetland acres lost CWPPRA	16,600 3,310 660 15.9
Central Wetlands (includes MRGO disposal)	Fill - 1, H Storm-related loss - 2, H, C Impoundments - 2, H, C Altered hydrology - x, H, C	Altered hydrology is now and will continue to be a problem.	Acres marsh in 1990 Acres marsh lost by 2050 Acres swamp 1990 Acres swamp lost by 2050 Acres marsh preserved by CWPPRA % 1990 wetland acres lost CWPPRA	21,600 1,980 90 0 970 4.7
Biloxi Marshes	Shoreline erosion - 1, H,C		Acres marsh in 1990 Acres marsh lost by 2050 % 1990 acres marsh lost by 2050	87,000 16,080 18.5
Eloi Bay	Fill - 1, H Dredging - 2, H Shoreline erosion - 3, H,C Altered hydrology - 3, H, C		Acres marsh in 1990 Acres marsh lost by 2050 % 1990 acres marsh lost by 2050	25,470 3,150 12.4

* H=historic cause, C=current cause

Table 4-2. Region 1 Previously Proposed Strategies.

	DEFENSIVE								
REGION 1		CRITICAL DEFENSE LINE		MANAGE NAVIGATION CHANNELS		FRESHWATER DIVERSIONS	MANAGE HYDROLOGY		
MAPPING UNITS	Create/ restore barrier islands	Preserve land bridges	Preserve/ protect ridge function	Manage hydrology	Stabilize banks		Swamps	Fresh/ intermediate marsh	Brackish/ saline marsh
UPPER BASIN									
Amite/Blind						1,2,3,4,5	1,4,5,6		
Tickfaw River Mouth						4	1,5	1,5	
Weat Manchac Land Bridge		4,5				4	1,5	1,5	
MIDDLE BASIN									
Tangipahoa River Mouth						4	1,5	1,5	
East Manchac Land Bridge		4,5				4	1,4 5,6	1,4 5,6	
Bonnet Carre'						1,2,4			
La Branche Wetlands						4	1,5	1,5	
Lake Pontchartrain				1,2,4,6		1,2,3,4			
Tchefuncte River Mouth						4	1	1,4	
North Shore Marshes						4		1,4,5,6	
Pearl River Mouth								1,4,5	
East Orleans Land Bridge		1,4,5,7			1,4,7	4			4,7
Bayou Sauvage								1,4,5	
LOWER BASIN									
South Lake Borgne				1,2,4,5,6	1,4	4			
Lake Borgne				1,2,6		1,2,3,4			
Central Wetlands				1,2,4,5,6		2,4		4,6	
Biloxi Marshes	4					4			
Eloi Bay	4,5			2	1,4			4,6	

1 = Blueprint

2 = CCEER

3 = Coalition to Restore Coastal LA

4 = CWPPRA Basin Report

5 = Gagliano and van Beek,1993

6 = Lake Pontchartrain Basin Foundation CMP (recommendations by Saltwater Intrusion/Wetlands Loss Comm.)

7 = Recommendations for Preservation of Wetlands in Eastern Orleans Parish

Table 4-2. Region 1 Previously Proposed Strategies (Cont.).

DEFENSIVE			OFFENSIVE			
REGION 1 / MAPPING UNITS	DEVELOP REEF ZONE	PROTECT BAY/ LAKE SHORELINES	INCREASE ATCHAFALAYA FLOW	RELOCATE NAVIGATION CHANNEL	SEDIMENT DIVERSIONS (or pumping)	USE OF DREDGED MATERIAL
UPPER BASIN						
Amite/Blind		4			4,6	
Tickfaw River Mouth						
West Manchac Land Bridge		4,6				
MIDDLE BASIN						
Tangipahoa River Mouth		4				
East Manchac Land Bridge		4,6				
Bonnet Carre'						
La Branche Wetlands		4,6			4,6	4
Lake Pontchartrain						
Tchefuncte River Mouth		4,6				
North Shore Marshes		4,6				
Pearl River Mouth		4				
East Orleans Land Bridge		1,4,6,7				4,7
Bayou Sauvage		4,6				
LOWER BASIN						
South Lake Borgne	1,5	1,4,6				4,6
Lake Borgne						
Central Wetlands						1,5
Biloxi Marshes	1,5	1,4				
Eloi Bay		1				4,6

1 = Blueprint

2 = CCEER

3 = Coalition to Restore Coastal LA

4 = CWPPRA Basin Report

5 = Gagliano and van Beek,1993

6 = Lake Pontchartrain Basin Foundation CMP (recommendations by Saltwater Intrusion/Wetlands Loss Committee)

7 = Recommendations for Preservation of Wetlands in Eastern Orleans Parish

Table 4-3. Region 1 regional ecosystem strategies.

Restore Swamps	
1	Small Mississippi River diversion at Blind River, with outfall management
2	Small Mississippi River diversion at Reserve Relief Canal, with outfall management
3	Restore natural drainage patterns
4	Provide diversion-related flood protection where needed
Restore/Sustain Marshes	
5	Small diversion from Mississippi River through Bonnet Carré Spillway by opportunistically removing pins from the water control structure
6	Small diversion of Mississippi River into La Branche wetlands
7	Small diversion of Jefferson Parish drainage into La Branche wetlands
8	Wetland-sustaining diversion from the Mississippi River near Violet once the MRGO is closed
9	Dedicated delivery of sediment for marsh building
Protect Bay/Lake Shorelines	
10	Maintain shoreline integrity of Lake Pontchartrain
11	Maintain shoreline integrity of Lake Borgne and protect shoreline of Biloxi Marshes
Restore/Maintain Barrier Islands	
12	Maintain Chandeleur Islands if necessary
Maintain Critical Landforms	
13	Maintain Eastern Orleans Land Bridge by marsh creation and shoreline protection
Special Problems	
Resolve Mississippi River Gulf Outlet (MRGO) Problems	
14	Close MRGO to deep draft navigation when adequate container facilities exist on the river
15	Expedite planning for the Millennium Port
16	Stabilize the entire north bank of the MRGO
17	Acquire oyster leases and create marsh in southern lobes of Lake Borgne
18	Constrict breaches between MRGO and Lake Borgne with created marshes
19	Construct a sill at Seabrook

Table 4-4. Region 1 mapping unit strategies.

AMITE/BLIND	
1	**Maintain Shoreline Integrity**
	e.g., Along Lake Maurepas
2	**Vegetative Plantings**
	e.g., Cypress plantings
LAKE MAUREPAS	
3	**Vegetative Plantings**
	e.g., Restore beds of submerged aquatic vegetation
TICKFAW RIVER MOUTH	
4	**Shoreline Stabilization**
	e.g., Shoreline stabilization along Lake Maurepas
5	**Vegetative Plantings**
	e.g., Cypress plantings
6	**Dedicated Dredging**
	e.g., Dedicated dredging from Lake Maurepas
WEST MANCHAC LAND BRIDGE	
7	**Shoreline Stabilization**
	e.g., Shoreline stabilization along Lake Maurepas
8	**Dedicated Dredging**
	e.g., Dedicated dredging from Lake Maurepas
9	**Vegetative Plantings**
	e.g., Cypress plantings
10	**Restore Hydrology**
	e.g., Improve hydrological exchange
EAST MANCHAC LAND BRIDGE	
11	**Shoreline Stabilization**
	e.g., Along Lake Maurepas
12	**Vegetative Plantings**
	e.g., Cypress plantings
13	**Dedicated Dredging**
	e.g., From Lake Pontchartrain
14	**Restore Hydrology**
	e.g., Improve hydrological exchange
TANGIPAHOA RIVER MOUTH	
15	**Beneficial Use of Dredged Material**
	e.g., Beneficial use from mouth bar dredging
16	**Shoreline Stabilization**
	e.g., Around Tangipahoa River mouth
TCHEFUNCTE RIVER MOUTH	
17	**Shoreline Stabilization**
	e.g., Around Tchefuncte River mouth
18	**Beneficial Use of Dredged Material**
	e.g., Beneficial use from mouth bar dredging

Table 4-4. Region 1 mapping unit strategies (Cont.).

LA BRANCHE WETLANDS	
19	**Shoreline Stabilization**
	e.g., Along Lake Pontchartrain
20	**Dedicated Dredging**
	e.g., Dedicated dredging from Lake Pontchartrain
21	**Vegetative Plantings**
	e.g., Cypress/marsh plantings
22	**Hydrologic Management**
	e.g., Improve hydrology of impounded areas
23	**Terracing and Marsh Creation**
LAKE PONTCHARTRAIN	
24	**Dedicated Dredging**
	e.g., Create marsh in Lake Pontchartrain adjacent to the south shore with dedicated dredging
25	**Vegetative Plantings**
	e.g., Restore submerged aquatic vegetation beds and stabilize lake rim marshes and beaches
26	**Maintain Shoreline Integrity**
	e.g., Create wave breaks and fisheries habitat with rubble
NORTH SHORE MARSHES	
27	**Maintain Shoreline Integrity**
28	**Vegetative Plantings**
29	**Restore Hydrology**
	e.g., Re-establish natural drainage patterns
30	**Terracing**
PEARL RIVER MOUTH	
31	**Beneficial Use of Dredged Material**
	e.g., Beneficial use of Pearl River dredged material
32	**Maintain Shoreline Integrity**
33	**Vegetative Plantings**
34	**Terracing**
EAST ORLEANS LAND BRIDGE	
35	**Dedicated Dredging**
	e.g., Dedicated dredging from lakes Pontchartrain and Borgne
36	**Maintain Shoreline Integrity**
	e.g., Along lakes Pontchartrain and Borgne
37	**Vegetative Plantings**
	e.g., Restore submerged aquatic vegetation beds
BAYOU SAUVAGE	
38	**Continue the CWPPRA Pump Project and Evaluate the Possible Need for Pump Outfall**
39	**Vegetative Plantings**
40	**Hydrologic Management; Re-establish Connection to the Lakes**
CENTRAL WETLANDS	
41	**Beneficial Use of Dredged Material**
42	**Vegetative Plantings**

Table 4-4. Region 1 mapping unit strategies (Cont.).

SOUTH LAKE BORGNE	
43	**Maintain Shoreline Integrity**
	e.g., Protection along the Lake Borgne shoreline
44	**Dedicated Dredging**
	e.g., Dedicated dredging from Lake Borgne
45	**Beneficial Use of Dredged Material**
	e.g., Beneficial use of MRGO dredged material
46	**Hydrologic Restoration**
BILOXI MARSHES	
47	**Maintain Shoreline Integrity**
	e.g., Develop reef zones/enhance near-shore oyster reefs
48	**Vegetative Plantings**
49	**Dedicated Dredging**
	e.g., Dedicated dredging from Lake Borgne
50	**Beneficial Use of Dredged Material**
	e.g., Beneficial use of MRGO dredged material
51	**Hydrologic Restoration**
	e.g., Gap spoil banks
ELOI BAY	
52	**Beneficial Use of Dredged Material**
	e.g., Beneficial use of MRGO dredged material
53	**Dedicated Dredging**
54	**Vegetative Plantings**
55	**Hydrologic Restoration**
	e.g., Gap spoil banks
56	**Restore Fringing Marsh Islands**
CHANDELEUR ISLANDS	
57	**Vegetative Plantings**
	e.g., Restore submerged aquatic vegetation beds

Table 4-5. Region 1 programmatic recommendations.

LAKE PONTCHARTRAIN	
1	**Water quality improvement**
	e.g., Improve Jefferson/Orleans sewer discharge and efficiency of north shore water treatment
	e.g., Evaluate the need to continue moratorium on drilling
	e.g., Manage removal of fill material
	e.g., Continue ban on shell dredging
NORTH SHORE MARSHES	
2	**Coordinate proposed flood control measures with Coast 2050 plan**
PEARL RIVER MOUTH	
3	**Restrict West Pearl River dredging**
LAKE MAUREPAS	
4	**Nominate as National Estuarine Research Reserve (NOAA)**
WEST MANCHAC LAND BRIDGE	
5	**Nominate as National Estuarine Research Reserve (NOAA)**
EAST MANCHAC LAND BRIDGE	
6	**Extend Joyce and Manchac Wildlife Management Areas**
TCHEFUNCTE RIVER MOUTH	
7	**Reduce draining and development of marshes**
LA BRANCHE WETLANDS	
8	**Consider adding to Bayou Sauvage National Wildlife Refuge**
SOUTH LAKE BORGNE	
9	**Limit draft of MRGO vessels to 36 ft (authorized channel depth)**
LAKE BORGNE	
10	**Enhance near-shore oyster reefs/no-oystering zone near shore**
BILOXI MARSHES	
11	**Enhance near-shore oyster reefs/no-oystering zone near shore**
ELOI BAY	
12	**Enhance near-shore oyster reefs/no-oystering zone near shore**

SECTION 5

INFRASTRUCTURE

Roads

Road data was gathered from the U.S. Geological Survey (USGS) digital line graph information. The scale was 1:100,000, and the data was derived from 1983 1:100,000 quadrangle maps. The lengths of the State primary, secondary, and tertiary roads were clipped out of the master database for each mapping unit with a Geographic Information System (GIS) computer program. In the case that a primary, secondary, or tertiary road formed the boundary of two mapping units, that common road length was applied to both mapping units. The technical work was performed by Jay Edwards, USGS, National Wetlands Research Center - Coastal Restoration Field Station, Baton Rouge, Louisiana.

Railroads

Road data was gathered from the U.S. Geological Survey (USGS) digital line graph information. The scale was 1:100,000, and the data was derived from 1983 1:100,000 quadrangle maps. The lengths of the railroads were clipped out of the master database for each mapping unit with a GIS computer program. The technical work was performed by Jay Edwards, USGS, National Wetlands Research Center - Coastal Restoration Field Station, Baton Rouge, Louisiana.

Pipelines

Data for pipelines was gathered from the 1987 Louisiana Geological Survey (LGS) pipelines database. The data source is an LGS industry survey conducted in 1987. The survey was sent to all pipeline operators in the coastal zone, querying the operators for information about pipelines they had laid in the coastal zone, and this dataset represents the responses to that survey. Approximately 60% of the companies that were laying pipelines at that time responded to the survey. However, this does not necessarily translate into 60% of the pipelines, because each company does not operate an equal amount of pipelines. For example, a company that did not respond could lay and operate 75% of the pipelines in the coastal zone or in a particular area of the coastal zone. Because we do not know for sure how incomplete the set is, these data are only meant to be an index to the activity that was going on by the responding operators at the time the survey was taken and should be used with caution. Technical work was done by Jay Edwards, USGS, National Wetlands Research Center - Coastal Restoration Field Station, Baton Rouge, Louisiana.

Oil and/or Natural Gas Wells

Oil and natural gas well data came from the Louisiana Department of Natural

Resources (DNR) Coastal Use Permit database. This electronic database is maintained by the Coastal Management Division (CMD) of the Office of Coastal Restoration and Management, DNR, Baton Rouge, Louisiana. It shows all permits issued for oil and gas well construction in the coastal zone since 1981. This database is complete, and the data presented can be used as an index to oil and gas activity since that year.

Drainage Pump Stations

This data was gathered from the following source:

Himel, W., J. Reed, and D. Clark. 1991. Atlas and database of pump locations for the study of the use of runoff discharges in coastal Louisiana for wetland quality and water quality enhancement. Louisiana Department of Natural Resources. 220 pp.

The information in this report was compiled from local parish governments, CMD field investigators, drainage districts, 1:24,000 scale quadrangle maps, and the 1978 U.S. Fish and Wildlife Service habitat maps. Pump locations were pencilled in on quadrangle maps and later digitized into INFOCAD GIS software.

Water Intakes

Water intake data was compiled from a 1996 USGS database of water intakes in the coastal zone. The source for this data was the 1996 USGS Surface Water Quality Meeting Proceedings. The dataset was built by Christina Saltus, USGS, National Wetlands Research Center - Coastal Restoration Field Station, Baton Rouge, Louisiana.

Navigation Channels

This information was compiled and presented by Mike Liffman and Robin Roberts of the Louisiana Sea Grant College Program, Wetland Resources Building, Louisiana State University, Baton Rouge, Louisiana. The following sources were used to gather the information:

U.S. Army Corps of Engineers, New Orleans District. 1993. Navigation maps of the Atchafalaya River system. Third edition.

U.S. Army Corps of Engineers, Lower Mississippi Valley Division. 1994. Flood control and navigation maps of the Mississippi River. Mississippi River Commission, 60th edition reprint.

U.S. Army Corps of Engineers and Water Resources Support Center. 1995. Waterborne commerce of the United States: Part 2 - waterways and harbors gulf coast, Mississippi River system and Antilles.

U.S. Army Corps of Engineers and Water Resources Support Center. 1997. Navigation Data Center Publications and U.S. Waterway CD: Volume 3. CD-ROM [machine-readable data file].

Battle Creek, MI: Defense Logistics Services Center.

Port Installations

This information was compiled and presented by Mike Liffman and Robin Roberts of the Louisiana Sea Grant College Program, Wetland Resources Building, Louisiana State University, Baton Rouge, Louisiana. Information was gathered in March and April 1998 through personal communication with the following individuals: Davie Breaux, Greater Lafourche Port Commission; Charles Coppels, Vinton Harbor and Terminal Port; John Dixon, West Calcasieu Port, Harbor, and Terminal District; Jerry Hoffpauir, Morgan City Harbor and Terminal District; Ed Kelly, West Cameron Port Commission; Todd Pellegrin, Terrebonne Port Commission; Roy Pontiff, Port of Iberia District; Phil Prejean, West St. Mary Parish Port, Harbor, and Terminal District; Joseph Schexnaider, Twin Parish Port Commission. The following publications provided additional ports information:

U.S. Army Corps of Engineers. 1990. The ports of Baton Rouge and Lake Charles, Louisiana. Port Series No. 21, Revised 1990. Prepared by the Water Resources Support Center. Washington, D.C.: U.S. Government Printing Office.

U.S. Army Corps of Engineers. 1990. The ports of New Orleans, Louisiana. Port Series No. 21, Revised 1990. Prepared by the Water Resources Support Center. Washington, D.C.: U.S. Government Printing Office.

U.S. Army Corps of Engineers. 1991. Mississippi River ports above and below New Orleans. Port Series No. 20A, Revised 1991. Prepared by the Water Resources Support Center. Washington, D.C.: U.S. Government Printing Office.

Region 1 Mapping Unit Infrastructure Summaries (In Alphabetical Order)

Amite/Blind

1. Roads (miles):
   - Primary: 39.5
   - Secondary: 25.2
   - Tertiary: 137.3

2. Railroads (miles): 15.2

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Enterprise Products Company	58.6	6
Natural Gas	Active	Bridgeline	25.5	20
Natural Gas	Active	Bridgeline	22.0	26
Natural Gas	Active	Bridgeline	12.2	6
Natural Gas	Active	Koch Industries, Inc.	9.0	18
Product	Active	Seagull Energy Corporation	8.3	4.5
Product	Active	Exxon Pipeline Company	7.1	4
Natural Gas	Active	Bridgeline	6.3	18
Product	Active	Exxon Pipeline Company	3.6	6
Product	Active	Exxon Pipeline Company	3.6	8
Product	Active	Exxon Pipeline Company	3.6	12
Natural Gas	Active	Bridgeline	3.6	12
Natural Gas	Active	Bridgeline	3.4	10
Natural Gas	Active	Koch Industries, Inc.	2.3	6
Natural Gas	Active	Koch Industries, Inc.	1.6	2
Natural Gas	Active	Koch Industries, Inc.	0.8	14
Natural Gas	Active	Koch Industries, Inc.	0.3	12

Total pipeline length: 171.8 miles

4. Oil and/or Natural Gas Wells: 331

5. Drainage Pump Stations: 3 (Proposed)

6. Water Intakes:

Operator	Type
Industry	Groundwater
Industry	Groundwater

Water Intakes (Cont.):

Operator	Type
Industry	Surface Water
Industry	Groundwater
Head of Island WTR Sys	Groundwater
French Settlement WTR Co.	Groundwater
French Settlement WTR Co.	Groundwater
Vincent Place Subdivision	Groundwater
Industry	Groundwater

Groundwater intakes: 8 Surface water intakes: 1

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Amite River and Bayou Manchac	A channel 7 ft deep x 600 ft wide from Lake Maurepas to Port Vincent (44 miles).	Originally for commerce, now extensively for recreation.	Recreational navigation
Amite River and Tributaries	Diversion channel from the Amite River at mile 25.3 to mile 4.8 of Blind River (10.6 miles).	Flood control and drainage	
	Control weir and channel.	Retains low flows in the Amite River and allows small boats to pass through weir.	
	Clearing, snagging, enlargement and realignment of the Amite River, Bayou Manchac, Blind River, and Comite River, Cypress Bayou on Comite River to Lake Maurepas.	Flood control and drainage	

8. Port Installations: No major port or terminal installations within this unit.

Ascension East Area

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 3.6
   - Tertiary: 8.2

2. Railroads (miles): 3.9

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	2.3	12
Natural Gas	Active	Koch Industries, Inc.	1.9	14
Natural Gas	Active	Bridgeline	1.3	4
Natural Gas	Active	Koch Industries, Inc.	0.9	2

Total pipeline length: 6.4 miles

4. Oil and/or Natural Gas Wells: 5

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River, Baton Rouge - Gulf of Mexico	Channel from lower limits of Port of New Orleans to Head of Passes, 40 ft deep x 1,000 ft wide, 86.7 miles long.	Navigation - 400 million tons of freight annually.	Commercial and recreational navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
E.I. du Pont de Nemours & Co., Burnside Plant & Co., Burnside Plant Wharf	Mississippi River	1	195	
Ormet Corp., Burnside Terminal, Dry Bulk Transfer Mooring	Mississippi River	2	1,680	
Ormet Corp., Burnside Terminal, Ship Wharf	Mississippi River	2	1,695	
Ormet Corp., Burnside Terminal, Barge Dock and Fleet	Mississippi River	1	2,700	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
River Cement Co., Burnside Terminal Wharf	Mississippi River	1	656	
L & L Cleaning Wharf and Repair Mooring	Mississippi River	1	400	
L & L Fleeting, Mile 175 Dry Bulk Transfer Mooring	Mississippi River	3	1,500	
L & L Fleeting, Mile 179 and Mile 180 Dry Bulk Transfer Moorings	Mississippi River	3	2,700	
GETCO Mile 171 and Mile 172 Dry Bulk Transfer Moorings	Mississippi River	3	2,700	
Koch Gathering Systems, Darrow Oil Field Wharf	Mississippi River	1	311	
Carline's Geismar Fleet, Landing Wharf and Fleet.	Mississippi River	1	390	
Hall-Buck Marine, Belle Helene Terminal Wharf and Landing	Mississippi River	2	800	
Shell Chemical Co., Geismar Plant Wharf	Mississippi River	2	1,390	
Volks Constructors, Geismar Landing	Mississippi River	1	500	
BASF Corp. Chemicals Division, Geismar Wharf	Mississippi River	1	800	
Borden Chemical, Geismar Wharf	Mississippi River		350	
CSX NGL Corp., Riverside Plant Wharf	Mississippi River	1	225	
Allied-Signal, Geismar Wharf	Mississippi River	2	1,875	
Totals		28	20,867	0

Bayou Sauvage

1. Roads (miles):
   - Primary: 6.2
   - Secondary: 6.4
   - Tertiary: 4.0

2. Railroads (miles): 8.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	5.7	20
Natural Gas	Active	Southern Natural Gas Company	5.6	24
Natural Gas	Active	Southern Natural Gas Company	5.5	30

Total pipeline length: 16.8 miles

4. Oil and/or Natural Gas Wells: 4

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Gulf Intracoastal Waterway (GIWW)	266 miles from Harvey and Algiers Locks at New Orleans to the Sabine River. Controlling depth is 12 ft MLG.	Navigation - In 1995, handled 68.3 million tons of freight.	Commercial navigation

8. Port Installations: No major port or terminal installations within this unit.

Biloxi Marshes

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	3.4	12
Natural Gas	Active	Southern Natural Gas Company	2.3	8

Total pipeline length: 5.7 miles

4. Oil and/or Natural Gas Wells: 235

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou La Loutre, St. Malo, and Yscloskey	A channel 6 ft deep x 40 ft wide from Lake Borgne through bayous St. Malo, La Loutre, and Eloi to deep water in Lake Eloi (21.3 miles).	Navigation	See "South Lake Borgne"

8. Port Installations: No major port or terminal installations within this unit.

Bonnet Carré

1. Roads (miles):
   Primary: 2.5
   Secondary: 2.2
   Tertiary: 35.4

2. Railroads (miles): 6.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	4.0	18
Product	Active	Seagull Energy Corporation	2.5	4.5
Natural Gas	Active	Bridgeline	1.5	16
Product	Active	Dow USA	0.4	3

Total pipeline length: 8.4 miles

4. Oil and/or Natural Gas Wells: 21

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Fossil Fuel Plant	Surface Water

Groundwater intakes: 0 Surface water intakes: 1

7. Navigation Channels: No USACE-maintained channels.

8. Port Installations: No major port or terminal installations within this unit.

Central Wetlands

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 24.8

2. Railroads (miles): 1.9

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	5.9	24
Natural Gas	Active	Southern Natural Gas Company	5.7	20
Natural Gas	Active	Koch Industries, Inc.	4.7	20
Natural Gas	Active	Bridgeline	3.3	20
Natural Gas	Active	Koch Industries, Inc.	1.8	24
Natural Gas	Active	Koch Industries, Inc.	1.2	16

Total pipeline length: 22.6 miles

4. Oil and/or Natural Gas Wells: 17

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Dupre	A channel from the highway bridge at Violet to deep water in Lake Borgne, 6 ft deep x 80 ft wide in the canal and bayou, and 100 ft wide in Lake Borgne (7.3 miles).	Navigation	Oil industry (1984-1993 average annual traffic was 136, 000 tons) and recreational navigation
	The turning basin is 100 ft wide x 200 ft long at Violet.		
	The Violet Lock; Connection with the Mississippi River.	Private connection with the Mississippi River, permanently closed in 1950.	
Bayou La Loutre, St. Malo, and Yscloskey	A channel 5 ft x 30 ft in Bayou La Loutre from Hopedale to Bayou St. Malo (6.7 miles).	Navigation	Oil industry (1981-1989 average annual traffic was 26,665 tons); see "Biloxi Marshes"
Mississippi River Gulf Outlet (MRGO)	Foreshore protection from the Bayou Bienvenue Control Structure to the end of Chalmette hurricane protection levee.	To arrest bank degradation occurring along the south bank of the MRGO, which could eventually affect hurricane protection levees.	1984-1993 average annual traffic was 7,193,000 tons

8. Port Installations: No major port or terminal installations within this unit.

Chandeleur Islands

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Chevron Pipeline Company	51.2	20
Natural Gas	Active	Southern Natural Gas Company	3.6	6
Natural Gas	Active	Southern Natural Gas Company	2.8	12
Natural Gas	Active	Southern Natural Gas Company	2.3	4
Natural Gas	Active	Southern Natural Gas Company	1.7	14

Total pipeline length: 61.6 miles

4. Oil and/or Natural Gas Wells: 115

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Gulf Outlet (MRGO)	Extends 75 miles from New Orleans to the 38 ft contour in the Gulf of Mexico via a land cut which is 36 ft x 500 ft. Controlling depth is a minimum of 35 ft MLG.	Navigation - In 1995, carried 5.7 million tons for freight traffic (3.4 million tons foreign and 2/3 million tons domestic.	Commercial navigation

8. Port Installations: No major port or terminal installations within this unit.

Chandeleur Sound

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Chevron Pipeline Company	79.4	20
Natural Gas	Active	Southern Natural Gas Company	5.4	14
Natural Gas	Active	Southern Natural Gas Company	4.0	6
Natural Gas	Active	Southern Natural Gas Company	1.1	10

Total pipeline length: 89.9 miles

4. Oil and/or Natural Gas Wells: 476

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Gulf Outlet (MRGO)	Channel 36 ft deep x 500 ft wide from near Breton Island to Mainland.	Navigation	See "South Lake Borgne"

8. Port Installations: No major port or terminal installations within this unit.

East Manchac Land Bridge

1. Roads (miles):
   Primary: 19.8
   Secondary: 12.4
   Tertiary: 36.4

2. Railroads (miles): 22.6

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Bridgeline	3.5	26
Product	Active	Seagull Energy Corporation	2.6	4.5
Natural Gas	Active	Koch Industries, Inc.	0.1	6

Total pipeline length: 6.2 miles

4. Oil and/or Natural Gas Wells: 29

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
St. John WW Dist. 3	Groundwater
Commercial	Groundwater

Groundwater intakes: 2 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Pass Manchac	See "Manchac Land Bridge West."		
North Pass - Pass Manchac	Channel 9 ft NGVD x 130 ft; distance is 7,000 ft; Within the south entrance channel in Lake Pontchartrain to Pass Manchac.	Navigation	
Lake Pontchartrain and Vicinity Hurricane Protection Mitigation	Shoreline protection along 5 miles at the Manchac Wildlife Management Area.	Shoreline Protection	

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Total Minatone, Blind River Field Dock	North Pass	1	75	
Port Manchac Terminal	North Pass	2	260	
Totals		3	335	0

East Orleans Land Bridge

1. Roads (miles):
   - Primary: 1.8
   - Secondary: 15.5
   - Tertiary: 14.3

2. Railroads (miles): 16.8

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	4.3	12

Total pipeline length: 4.3 miles

4. Oil and/or Natural Gas Wells: 48

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Gulf Intracoastal Waterway (GIWW)	266 miles from Harvey and Algiers Locks at New Orleans to the Sabine River. Controlling depth is 12 ft MLG.	Navigation - In 1995, handled 68.3 million tons of freight.	Commercial navigation
Lake Pontchartrain and Vicinity Hurricane Protection	Chef Menteur Bypass Channel for Lake Pontchartrain; 12 ft x 150 ft, but abandoned when hurricane protection strategy changed.	Hurricane and flood protection	

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Lake Catherine Marina	Ft. Pike Canal	40		1
Chef Harbor	Chef Menteur Pass	70		1
Totals		110	0	2

Eloi Bay

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	10.9	8
Natural Gas	Active	Southern Natural Gas Company	6.2	6
Natural Gas	Active	Koch Industries, Inc.	4.7	12
Natural Gas	Active	Southern Natural Gas Company	2.4	4

Total pipeline length: 24.2 miles

4. Oil and/or Natural Gas Wells: 546

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou La Loutre, St. Malo, and Yscloskey	See "Biloxi Marshes"		
Mississippi River Gulf Outlet (MRGO)	Channel 36 ft deep x 500 ft wide from Bayou La Loutre to Chandeleur Sound	Navigation	See "South Lake Borgne"

8. Port Installations: No major port or terminal installations within this unit.

Jefferson East Area

1. Roads (miles):
   - Primary: 13.8
   - Secondary: 27.8
   - Tertiary: 826.6

2. Railroads (miles): 63.7

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	18.9	18
Natural Gas	Active	Louisiana Gas Service Company	5.5	24
Natural Gas	Active	Louisiana Gas Service Company	3.5	20
Natural Gas	Active	Koch Industries, Inc.	2.3	30
N/A	Abandoned or Inactive	Exxon Pipeline Company	1.2	10
Natural Gas	Active	Louisiana Gas Service Company	0.7	10

Total pipeline length: 32.1 miles

4. Oil and/or Natural Gas Wells: 8

5. Drainage Pump Stations: 12

6. Water Intakes:

Operator	Type
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Country Club/Gardens	Groundwater
Country Club/Gardens	Groundwater
Industry	Groundwater
E. Jefferson WW Dist. 1	Surface Water
Commercial	Groundwater
Industry	Groundwater
New Orleans Sewer and Water	Surface Water
Country Club/Gardens	Groundwater

Groundwater intakes: 11 Surface water intakes: 2

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of New Orleans	33.7 miles from mile 81.2 Above Head of Passes (AHP) to mile 114.9 AHP, the 5.5 mile Inner Harbor Navigational Canal (IHNC), 7 miles of the Mississippi River Gulf Outlet (MRGO) from the IHNC to Bayou Bienvenue, and 5.5 miles of the Harvey Canal. Controlling depths are 45 ft in the Mississippi River, 30 ft in the IHNC, 36 ft in the MRGO, and 12 ft in the Harvey Canal.	Navigation - In 1995, handled 77 million tons of freight (39 million tons foreign and 38 million tons domestic).	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Port of New Orleans Wharves	Mississippi River and Industrial Canal		67,648	
International Lubricant Corp. Wharf	Mississippi River	1	164	
Bertucci Construction Co. Landing	Mississippi River	1	600	
Riverside Ventures Lower Services Mooring	Mississippi River	1	465	
Riverside Ventures Upper Services Mooring	Mississippi River	3	7,720	
American Commercial Barge Line, Harahan Mooring Wharf	Mississippi River	1	1,400	
Louisiana Dock Co. Wharf.	Mississippi River	1	1,700	
T.T. Barge Cleaning, Inc. Wharf	Mississippi River	1	350	
T.T. Coatings, Slip	Mississippi River	1	180	
Hollywood Marine Fleeting, Barge Mooring	Mississippi River	1	2,305	
Wood Resources, East Bank Mooring	Mississippi River	1	4,800	
River Products Shipyard Slip	Mississippi River	3	850	
Lasalles Landing	Mississippi River	1	110	
Louisiana Materials Co., Kenner Mooring	Mississippi River	1	1,000	
Rose Launch Service Mooring	Mississippi River	2	340	
Totals		19	89,632	0

La Branche Wetlands

1. Roads (miles):
   - Primary: 6.4
   - Secondary: 7.8
   - Tertiary: 21.4

2. Railroads (miles): 12.1

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	7.5	30
Natural Gas	Active	Koch Industries, Inc.	7.0	18
Natural Gas	Active	Koch Industries, Inc.	7.0	16
Natural Gas	Active	Koch Industries, Inc.	0.7	12
Natural Gas	Active	Koch Industries, Inc.	0.5	4
Natural Gas	Active	Koch Industries, Inc.	0.4	6

Total pipeline length: 23.1 miles

4. Oil and/or Natural Gas Wells: 181

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Industry	Groundwater

Groundwater intakes: 1 Surface water intakes: 0

7. Navigation Channels: No USACE-maintained channels.

8. Port Installations: No major port or terminal installations within this unit.

Lake Borgne

1. Roads (miles):
   Primary: 0.0
   Secondary: 0.0
   Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 61

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Industry	Groundwater

Groundwater intakes: 1 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Gulf Intracoastal Waterway (GIWW)	266 miles from Harvey and Algiers Locks at New Orleans to the Sabine River. Controlling depth is 12 ft MLG.	Navigation - In 1995, handled 68.3 million tons of freight.	Commercial navigation

8. Port Installations: No major port or terminal installations within this unit.

Lake Maurepas

1. Roads (miles):
   Primary: 0.0
   Secondary: 0.0
   Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 24

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels: No USACE-maintained channels.

8. Port Installations: No major port or terminal installations within this unit.

Lake Pontchartrain

1. Roads (miles):
   - Primary: 24.0
   - Secondary: 5.0
   - Tertiary: 2.1

2. Railroads (miles): 7.4

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	9.2	12
Natural Gas	Active	Southern Natural Gas Company	8.2	30
Natural Gas	Active	Southern Natural Gas Company	8.1	24
Natural Gas	Active	Southern Natural Gas Company	8.1	20
Natural Gas	Active	Koch Industries, Inc.	0.6	16
Natural Gas	Active	Koch Industries, Inc.	0.6	30
Natural Gas	Active	Southern Natural Gas Company	0.3	6
Natural Gas	Active	Koch Industries, Inc.	0.1	14

Total pipeline length: 35.2 miles

4. Oil and/or Natural Gas Wells: 165

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Commercial	Groundwater
Beau Chene Subdivision	Groundwater
Westbend Trailer Park	Groundwater

Groundwater intakes: 3 Surface water intakes: 0

7. Navigation Channels: No USACE-maintained channels.

8. Port Installations: No major port or terminal installations within this unit.

Livingston Area

1. Roads (miles):
   - Primary: 22.4
   - Secondary: 49.6
   - Tertiary: 53.9

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	14.5	24
Natural Gas	Active	Southern Natural Gas Company	14.4	20
Crude Oil	Active	Enterprise Products Company	12.0	6
Natural Gas	Active	Koch Industries, Inc.	10.6	30
Natural Gas	Active	Southern Natural Gas Company	5.3	10
Natural Gas	Active	Southern Natural Gas Company	0.5	20
Natural Gas	Active	Southern Natural Gas Company	0.4	24

Total pipeline length: 57.7 miles

4. Oil and/or Natural Gas Wells: 96

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
French Settlement WTR Co.	Groundwater
River Pines Plantation	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Colyell Comm. WTR Assoc.	Groundwater
Colyell Comm. WTR Assoc.	Groundwater
French Settlement WTR Co.	Groundwater
French Settlement WTR Sys.	Groundwater
French Settlement WTR Co.	Groundwater
French Settlement WTR Co.	Groundwater

Water Intakes (Cont.):

Operator	Type
Commercial	Groundwater
Commercial	Groundwater
Port Vincent WTR Sys.	Groundwater
A & L Mobile Home Park	Groundwater
Bogan Village Trailer Park	Groundwater
Hilltop Mobile Home Park	Groundwater
James Place Mobile Home Park	Groundwater
Oakwood Water Well Subd.	Groundwater
Prestige Place Mobile Home Park	Groundwater
Vincent Acres Water Co.	Groundwater
Killian WTR Sys.	Groundwater
Colyell Bay Water and Sewer	Groundwater
French Settlement WTR Co.	Groundwater
French Settlement WTR Co.	Groundwater
French Settlement WTR Co.	Groundwater
Head of Island WTR Sys.	Groundwater
French Settlement WTR Co.	Groundwater
Cline Subdivision	Groundwater
Commercial	Groundwater

Groundwater intakes: 29 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Amite River and Bayou Manchac	A 7 ft deep channel from Lake Maurepas to Port Vincent.	Recreation	Recreational navigation

8. Port Installations: No major port or terminal installations within this unit.

North Shore Marshes

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 2.7
   - Tertiary: 6.9

2. Railroads (miles): 2.6

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	1.7	30
Natural Gas	Active	Southern Natural Gas Company	1.6	24
Natural Gas	Active	Southern Natural Gas Company	1.5	20
Natural Gas	Active	Southern Natural Gas Company	1.4	6

Total pipeline length: 6.2 miles

4. Oil and/or Natural Gas Wells: None

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Bonfouca	A channel 10 ft deep x 60 ft wide from Slidell to deep water in Lake Pontchartrain (8 miles).	Navigation	Coal and lignite transport; 1990-1993 average annual traffic was 8,000 tons.
Bayou Lacombe	Channel 8 ft deep x 60 ft wide through the entrance bar in Lake Pontchartrain; Snagging and clearing from Mile 0 to Mile 82.	Navigation	Gravel transport; 1981-1985 average annual traffic was 714 tons.

8. Port Installations: No major port or terminal installations within this unit.

Orleans East Area

1. Roads (miles):
   - Primary: 26.6
   - Secondary: 31.4
   - Tertiary: 1,254.2

2. Railroads (miles): 127.2

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	2.6	30
Natural Gas	Active	Southern Natural Gas Company	2.6	24
Natural Gas	Active	Southern Natural Gas Company	2.5	20
Natural Gas	Active	Southern Natural Gas Company	1.5	6
Natural Gas	Active	Koch Industries, Inc.	0.9	18
Natural Gas	Active	Koch Industries, Inc.	0.8	20
Natural Gas	Active	Bridgeline	0.0	20

Total pipeline length: 10.9 miles

4. Oil and/or Natural Gas Wells: 5

5. Drainage Pump Stations: 18

6. Water Intakes:

Operator	Type
Fossil Fuel Plant	Surface Water
Commercial	Groundwater
Industry	Surface Water
Industry	Surface Water
New Orleans Sewer & WTR	Surface Water
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Surface Water
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater

Water Intakes (Cont.):

Operator	Type
Commercial	Groundwater
Commercial	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Commercial	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Fossil Fuel Plant	Groundwater
Commercial	Groundwater
Industry	Groundwater
Industry	Surface Water
Industry	Surface Water

Groundwater intakes: 42 Surface water intakes: 7

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of New Orleans	33.7 miles from mile 81.2 above Head of Passes (AHP) to mile 114.9 AHP, the 5.5 miles Inner Harbor Navigation Canal (IHNC), 7 miles of the Mississippi River Gulf Outlet (MRGO) from the IHNC to Bayou Bienvenue, and 5.5 miles of the Harvey Canal. Controlling depths are 45 ft in the Mississippi River, 30 ft in the IHNC, 36 ft in the MRGO, and 12 ft in the Harvey Canal.	Navigation - In 1995, handled 77 million tons of freight (39 million tons foreign and 38 million tons domestic).	Commercial navigation
Gulf Intracoastal Waterway (GIWW)	266 miles from Harvey and Algiers Locks at New Orleans to the Sabine River. Controlling depth is 12 ft MLG.	Navigation - In 1995, handled 68.3 million tons of freight.	Commercial navigation
Mississippi River Gulf Outlet (MRGO)	Extends 75 miles from New Orleans to the 38 ft contour in the Gulf of Mexico via a land cut which is 36 ft x 500 ft. Controlling depth is a minimum of 35 ft MLG.	Navigation - Serves barge traffic to and from plants manufacturing chemicals and Portland cement. Direct foreign export of fertilizers.	Commercial navigation
Inner Harbor Navigation Canal (IHNC)	Extends 5.5 miles from the Mississippi River to Lake Pontchartrain. Controlling depth of 30 ft MLG to mile 2.1, 30 ft MLG to Seabrook Village, and 15 ft MLG to Seabrook Light.	Navigation - In 1995, handled 25 million tons of freight traffic (3 million tons foreign and 22 million tons domestic).	

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Port of New Orleans Wharves	Mississippi River and Industrial Canal		67,648	
Orleans Marina	Lake Pontchartrain	355		
Coleman's West End Chevron, LTD	New Basin Canal & Lake Pontchartrain			
Municipal Yacht Harbor	Lake Pontchartrain	1		1
South Shore Harbor Marina	Lake Pontchartrain	473		
Bayou Bienvenue Marina	Bayou Bienvenue	50		2
Eddie's Pinto Boat Launch	MRGO			2

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
United States Gypsum Co. Wharf	IHNC	2	602	
Florida Avenue, Roll-on Roll-off Wharf	IHNC	1	482	
U.S. Coast Guard New Orleans Station Wharf	IHNC	1	735	
New Orleans Public Service, Paterson Power Plant Wharf	IHNC	1	424	
Milpark Drilling Fluids Barge Loading Wharf	IHNC	1	500	
Milpark Drilling Fluids Loading Wharf	IHNC	1	275	
American Marine Corp., Construction and Outfitting Wharf and Slip	IHNC	2	2,694	
Bean Dredging Corp. Dock	IHNC	2	715	
Dravo Basic Materials Landing	IHNC	2	1,000	
Louisiana Scrap Metal Co. Wharf	IHNC	1	395	
Schubert's Marine Sales & Service	New Basin Canal	2		
Textron Marine Systems Wharf	Bayou Sauvage	2	1,800	
NASA-Michoud Harbor Dock	GIWW	1	104	
New Orleans Public Bulk Terminal Wharf	GIWW		4,043	
Slip No. 5 Lower Landing	GIWW	3	770	
Slip No. 5 Upper Landing	GIWW	3	790	
Saucer Marine Service, Upper Dock	IHNC	1	240	
Dwyer Road Wharf	IHNC	1	340	
McDonough Marine Service Wharf	IHNC	1	450	
Distributors Oil Co. Wharf	IHNC	1	80	
Surekote Road Wharf	IHNC	1	802	
New Orleans Harbor Police Almonaster Avenue, Bridge Mooring	IHNC	1	4,040	
Trinity Marine Group, Shear Shop Wharf	IHNC	1	260	
Southern Scrap Material Co. Wharf	IHNC	1	451	
Sintes Boat Works, Inc. & Sea Chest	Lake Pontchartrain			
M. G. Meyer Yacht Service Repairs Wharf	IHNC	1	320	
Indian Towing Co. Mooring	IHNC	1	300	
Baroid Industrial Canal Warehouse Wharf	IHNC	1	532	
Barriere Construction Co. Dock	IHNC	1	330	
Morrison Yard Upper Wharf	IHNC	2	854	
Baroid Industrial Canal Ship Wharf	IHNC	1	490	
Morrison Yard Lower Wharf	IHNC	1	550	
Lane & Co. Wharf	IHNC	1	875	
Baroid Industrial Canal Turning Basin Barge Wharf	IHNC	1	670	
Trinity Marine Group Outfitting Wharf	IHNC	2	747	
Port of New Orleans, Upper Slip No. 3 Mooring	IHNC	1	700	
Trinity Marine Group, Plant Wharf	IHNC	1	960	
Missouri Portland Cement Co. Dock	IHNC	1	620	
American Steel Corp. Wharf	IHNC	1	180	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Halter Enterprises Development Corp., Barge Slip	IHNC	3	500	
France Road Terminal, Berth No. 4	IHNC	1	700	
Galvez Street Wharf	IHNC	2	2,735	
France Road Terminal, Berths Nos. 5 and 6	IHNC	1	1,585	
M-I Drilling Fluids Unloading Dock	IHNC	1	500	
Ideal Cement, South Dock House Wharf	IHNC	1	418	
Port of New Orleans, Lower Slip No. 3 Mooring	IHNC	1	200	
Louisiana Materials Co. Wharf	IHNC	1	1,300	
Pontchartrain Materials Corps., Slip	IHNC	3	2,500	
France Road Terminal, Berth No. 6 Roll-on, Roll-off Ramp	IHNC	2	410	
Ideal Cement, North Dock House Wharf	IHNC	1	220	
Florida Avenue Wharf	IHNC	2	542	
U.S. Coast Guard New Orleans Station Small Craft Mooring	IHNC	1	170	
Citadel Cement Wharf	IHNC	1	600	
France Road Terminal, Berth No. 1	IHNC	1	830	
Trinity Marine Group, Barge Basin	IHNC	2	380	
France Road Terminal, Berths, No. 2 and 3	IHNC	0	0	
Jourdan Road Terminal, Berths Nos. 4 and 5	MRGO	1	1,400	
Gulf Outlet Fuel & Marine Supplies, Fuel Dock	MRGO	1	270	
New Orleans Public Service, Michoud Electric Station Oil Dock	MRGO	1	590	
Gulf Marine Mooring Dock	MRGO	1	900	
Lone Star Industries, Michoud Plant Barge Loading Dock	Michoud Canal	1	196	
Lone Star Industries, Michoud Plant Barge Unloading Dock	Michoud Canal	1	585	
Air Products and Chemicals, Ammonia Loading Dock	Michoud Canal	1	200	
Production Management Structural Systems Wharf	Michoud Canal	1	100	
Lone Star Industries Barge Slip	Michoud Canal	1	324	
Air Products and Chemicals, Liquid Oxygen Loading Dock	Michoud Canal	1	168	
Air Products and Chemicals, Liquid Hydrogen Loading Dock	Michoud Canal	1	76	
Lone Star Industries, Michoud Plant Ship Wharf	Michoud Canal	1	840	
Dundee Cement Co., Michoud Dock	Michoud Canal	1	175	
Public Grain Elevator, Shipping and Receiving Wharves	Mississippi River	1	1,863	
Nashville Avenue Wharf	Mississippi River	1	2,759	
Henry Clay Avenue Open Wharf	Mississippi River	1	377	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Henry Clay Avenue Wharf	Mississippi River	1	465	
Bisso Towboat Co. Mooring	Mississippi River	1	120	
E. N. Bisso and Son Dock	Mississippi River	1	400	
Audubon Park Cruise Boat Landing	Mississippi River	1	110	
Bisso Marine Co. Mooring	Mississippi River	1	160	
U. S. Army Corps of Engineers Wharf	Mississippi River	1	260	
Conti Fleeting Mooring	Mississippi River	2	2,760	
St. Maurice Avenue Wharf	Mississippi River	1	1,121	
Alabo Street Wharf	Mississippi River	1	1,316	
Andry Street Wharf	Mississippi River	1	1,374	
Saucer Marine Service, Lower Dock	Mississippi River	1	400	
Poland Avenue Wharf, Berths Nos. 4 and 5	Mississippi River	1	932	
Pauline Street Wharf	Mississippi River	1	581	
Piety Street Wharf	Mississippi River	1	523	
Louisa Street Wharf	Mississippi River	1	521	
Press Street Wharf	Mississippi River	1	947	
Louisa Street Open Wharf	Mississippi River	1	540	
Governor Nicholls Street Wharf	Mississippi River	1	1,211	
Mandeville Street Wharf	Mississippi River	1	1,121	
Esplanade Avenue Wharf	Mississippi River	1	584	
Canal Street Wharf	Mississippi River	1	365	
Canal Street Ferry Landing	Mississippi River	1	140	
International Rivercenter, Cruise Ship Terminal Wharf	Mississippi River	1	840	
Toulouse Street Wharf	Mississippi River	1	448	
Julia Street Wharf	Mississippi River	1	1,189	
Robin Street Wharf	Mississippi River	1	1,216	
Thalia Street Wharf	Mississippi River	1	860	
Erato Street, Lower Wharf	Mississippi River	1	639	
Erato Street, Upper Wharf	Mississippi River	1	428	
Orange Street Wharf	Mississippi River	1	337	
Market Street Wharf	Mississippi River	1	441	
Celeste Street Wharf	Mississippi River	1	720	
St. Andrew Street Wharf	Mississippi River	1	1,598	
Jackson Avenue Ferry Landing	Mississippi River	1	130	
First Street Wharf	Mississippi River	1	1,275	
Harbor Police Third Street Wharf	Mississippi River	1	60	
Washington Avenue Wharf	Mississippi River	1	871	
Seventh Street Wharf	Mississippi River	1	1,196	
Harmony Street Wharf	Mississippi River	1	1,089	
Harmony Street Wharf Annex	Mississippi River	1	118	
Louisiana Avenue, Wharves G, F, and E	Mississippi River	1	1,590	
Louisiana Avenue, Wharves D, C, B, and A	Mississippi River	1	1,876	
Milan Street Wharf	Mississippi River	1	1,270	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Napoleon Avenue, Open Wharf	Mississippi River	1	665	
Napoleon Avenue, Wharf C	Mississippi River	1	1,000	
Napoleon Avenue, Wharf B	Mississippi River	1	265	
Napoleon Avenue, Wharf A	Mississippi River	1	500	
Napoleon Avenue Wharf 'A' Open	Mississippi River	1	340	
Totals		1,017	159,093	5

Pearl River Mouth

1. Roads (miles):
   - Primary: 4.7
   - Secondary: 10.2
   - Tertiary: 11.2

2. Railroads (miles): 6.9

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 15

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Pearl River	Navigation from mouth to the vicinity of Bogalusa (58 miles). Channel constructed to 7 ft with a bottom width of 100 ft in the river section and 80 ft in the canal section.	Navigation - No commerce reported in 1995.	
Gulf Intracoastal Waterway (GIWW)	266 miles from Harvey and Algiers Locks at New Orleans to the Sabine River. Controlling depth is 12 ft MLG.	Navigation - In 1995, handled 68.3 million tons of freight.	Commercial Navigation

8. Port Installations: No major port or terminal installations within this unit.

St. Charles East Area

1. Roads (miles):
   - Primary: 0.9
   - Secondary: 16.3
   - Tertiary: 111.8

2. Railroads (miles): 35.1

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	15.2	18
Natural Gas	Active	Koch Industries, Inc.	3.9	16
Natural Gas	Active	Koch Industries, Inc.	3.3	12
Natural Gas	Active	Bridgeline	3.2	26
Natural Gas	Active	Koch Industries, Inc.	1.6	30
Natural Gas	Active	Bridgeline	1.0	16
Product	Active	Seagull Energy Corporation	0.7	4.5
Natural Gas	Active	Koch Industries, Inc.	0.5	4
N/A	Abandoned or Inactive	Exxon Pipeline Company	0.4	10
Natural Gas	Active	Evangeline Gas (Supplied by Acadian)	0.4	20
Natural Gas	Active	Koch Industries, Inc.	0.1	6

Total pipeline length: 30.3 miles

4. Oil and/or Natural Gas Wells: 52

5. Drainage Pump Stations: 11

6. Water Intakes:

Operator	Type
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater

Water Intakes (Cont.):

Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
St. Charles WW Dist. 1	Surface Water

Groundwater intakes: 13 Surface water intakes: 1

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of South Louisiana	A channel 53.6 miles long from 114.9 miles above Head of Passes (AHP) to 168.5 miles AHP. Controlling depth is 45 ft.	Navigation - In 1995, handled 204.5 million tons of freight (97.5 million tons foreign and 107 million tons domestic).	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Port of South Louisiana, Globalplex Terminal Wharves	Mississippi River	3	1,481	
Lower River Ship Services Landing	Mississippi River	2	998	
Exxon Moisant Barge Dock	Mississippi River	1	250	
Crescent Ship Service Ama Anchorage Landing	Mississippi River	1	127	
T. L. James and Co. Fleet Mooring	Mississippi River	1	2,100	
T. L. James and Co., St. Rose Landing	Mississippi River	1	300	
Tulane Fleeting, St. Rose Fleet Mooring	Mississippi River	2	7,420	
International Matex, St. Rose Terminal, Berths Nos. 9, 10, 11, 12, and 13	Mississippi River	2	1,405	
International Matex, St. Rose Terminal, Berths Nos. 6 and 7	Mississippi River	2	700	

Port Installations (Cont.):

International Matex, St. Rose Terminal, Berths Nos. 2, 3, and 4	Mississippi River	3	2,360	
Custom Fuel Services, St. Rose Wharf	Mississippi River	1	150	
GNOTS-Reserve, St. Rose East Bank Fleet Mooring	Mississippi River	2	3,180	
Bunge Corp., Destrehan Elevator Wharf	Mississippi River	3	2,300	
Bunge Corp., Barge Repair Wharf.	Mississippi River	1	600	
St. Charles Grain Elevator Wharf.	Mississippi River	3	2,500	
Tulane/Rose/Crescent Destrehan Landing	Mississippi River	3	490	
Tulane/Destrehan Dry Bulk Transfer and Fleet Moorings	Mississippi River	3	7,280	
Canal Barge Co., Luling Bridge Fleet and Dry Bulk Transfer Mooring	Mississippi River	2	5,500	
Upper St. Rose Fleeting, Lower Fleet Mooring	Mississippi River	1	4,000	
TransAmerican Refining Co., Barge Wharf	Mississippi River	1	1,135	
TransAmerican Refining Co., Ship Wharf	Mississippi River	1	800	
GATX Terminals Corp., Good Hope Terminal Dock 4	Mississippi River	1	900	
GATX Terminals Corp., Good Hope Terminal Dock 3	Mississippi River	1	900	
GATX Terminals Corp., Good Hope Terminal, Dock 2	Mississippi River	1	800	
GATX Terminals Corp., Good Hope Terminal, Dock 1	Mississippi River	1	850	
Shell Oil Co., Norco Refinery Wharf, Berth No. 2	Mississippi River	1	900	
Shell Oil Co., Norco Refinery Wharf, Berths Nos. 1 and 1A	Mississippi River	2	1,215	
Shell Chemical Co., Norco Barge Dock	Mississippi River	1	400	
Louisiana Power & Light Co., Little Gypsy Station Fuel Oil Dock	Mississippi River	1	670	
Totals		48	51,711	0

St. James East Area

1. Roads (miles):
   - Primary: 3.4
   - Secondary: 27.9
   - Tertiary: 167.8

2. Railroads (miles): 28.9

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	13.2	18
Natural Gas	Active	Koch Industries, Inc.	6.2	6
Natural Gas	Active	Bridgeline	1.7	10
Natural Gas	Active	Koch Industries, Inc.	1.5	4
Natural Gas	Active	Bridgeline	1.5	12
Crude Oil	Active	Enterprise Products Company	1.4	6
Natural Gas	Active	Bridgeline	1.3	4
Natural Gas	Active	Koch Industries, Inc.	0.7	14
Natural Gas	Active	Koch Industries, Inc.	0.5	12
Natural Gas	Active	Bridgeline	0.4	6

Total pipeline length: 28.4 miles

4. Oil and/or Natural Gas Wells: 124

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
St. James WW Dist. 1	Surface Water
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water
Industry	Groundwater
Industry	Groundwater

Water Intakes (Cont.):

Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water
Industry	Surface Water
Lutcher WTR Sys.	Surface Water
Gramercy WTR Sys.	Surface Water
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water
Industry	Surface Water
Industry	Groundwater
Industry	Groundwater

Groundwater intakes: 14 Surface water intakes: 8

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of South Louisiana	A channel 53.6 miles long from 114.9 miles above Head of Passes (AHP) to 168.5 miles AHP. Controlling depth is 45 ft.	Navigation - In 1995, handled 204.5 million tons of freight (97.5 million tons foreign and 107 million tons domestic).	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Kaiser Aluminum and Chemical Corp., Gramercy Plant Bauxite Dock	Mississippi River	2	900	
Kaiser Aluminum and Chemical Corp., Gramercy Plant Coke Dock	Mississippi River	1	1,165	
Colonial Sugars, Refined Sugar Dock	Mississippi River	1	200	
Colonial Sugars, Raw Sugar Dock	Mississippi River	2	1,100	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
River Parishes Co. Mooring	Mississippi River	1	200	
Lutcher Ferry Landing	Mississippi River	1	140	
Crescent Ship Service Grandview Anchorage Landing	Mississippi River	1	127	
Roussel Landing	Mississippi River	1	250	
John W. Stone Oil Distributor, Paulina Wharf	Mississippi River	2	575	
Peavey Co., St. Elmo Terminal Grain Elevator Wharf	Mississippi River	2	1,800	
Tulane/Paulina Fleet Mooring	Mississippi River	2	2,610	
Convent Marine Companies, Repair Wharf and Fleet Moorings	Mississippi River	3	7,605	
Cargill 'K-2' Convent Grain Transfer Mooring	Mississippi River	2	1,330	
Delta Bulk Terminal Grain Transfer Mooring and Weber Marine Convent Landing	Mississippi River	3	1,603	
Agrico Chemical Co., Uncle Sam Plant Dock	Mississippi River	3	1,345	
Occidental Chemical Corp., Convent Plant Wharf	Mississippi River	2	935	
Zen-Noh Grain Corp. Wharf	Mississippi River	2	2,680	
Dravo Basic Materials Co., Sunshine Yard Landing	Mississippi River	1	500	
Weber Marine, Burnside Lower Fleet Moorings	Mississippi River	3	830	
Jerry's Launch Service, Burnside Anchorage Landing	Mississippi River	3	515	
Crescent Ship Service, Burnside Anchorage Landing	Mississippi River	1	135	
Weber Marine Burnside Wharf and Upper Fleet Moorings	Mississippi River	3	4,600	
CGB Marine Services at 164, Repair Wharf and Fleet Moorings	Mississippi River	3	9,600	
Weber Marine, Sunshine Bridge Dry Bulk Transfer and Fleet Moorings	Mississippi River	2	2,365	
Missouri Portland Cement Co., Union Terminal Wharf	Mississippi River	1	700	
Star Enterprise, Louisiana Plant, Dock No. 1	Mississippi River	1	820	
Star Enterprise, Louisiana Plant, Dock No. 2	Mississippi River	1	900	
Port of South Louisiana, Globalplex Terminal Wharves	Mississippi River	3	1,481	
Totals		53	47,011	0

St. John the Baptist East Area

1. Roads (miles):
   - Primary: 4.2
   - Secondary: 20.7
   - Tertiary: 213.4

2. Railroads (miles): 41.9

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	14.9	18
Crude Oil	Active	Enterprise Products Company	6.0	6
Natural Gas	Active	Bridgeline	2.2	12
Product	Active	Seagull Energy Corporation	2.1	4.5
Natural Gas	Active	Koch Industries, Inc.	2.1	6
Natural Gas	Active	Bridgeline	2.0	6
Natural Gas	Active	Bridgeline	1.4	4
Natural Gas	Active	Koch Industries, Inc.	0.9	8
Natural Gas	Active	Bridgeline	0.6	26
Natural Gas	Active	Koch Industries, Inc.	0.5	4
Natural Gas	Active	Bridgeline	0.0	20

Total pipeline length: 32.7 miles

4. Oil and/or Natural Gas Wells: 65

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
St. John WW Dist. 1	Surface Water

Water Intakes (Cont.):

Industry	Groundwater
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water
Industry	Groundwater
St. John WW Dist. 3	Surface Water
Commercial	Surface Water
Commercial	Surface Water
Industry	Groundwater

Groundwater intakes: 11 Surface water intakes: 5

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of South Louisiana	A channel 53.6 miles long from 114.9 miles above Head of Passes (AHP) to 168.5 miles AHP. Controlling depth is 45 ft.	Navigation - In 1995, handled 204.5 million tons of freight (97.5 million tons foreign and 107 million tons domestic).	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Bayou Steel Corp. Wharf and Landing	Mississippi River	3	1,195	
CGB Marine Services at LaPlace Repair Wharves and Lower East Bank Fleet Mooring	Mississippi River	3	2,375	
Kenner Marine & Machinery Mooring	Mississippi River	1	800	
CGB LaPlace Upper East Bank Fleet Mooring	Mississippi River	1	5,250	
DuPont Pontchartrain Works Barge Dock	Mississippi River	3	790	
Triangle Fleeting Corp. Repair Wharf and East Bank Fleet Moorings	Mississippi River	3	4,835	
Port of South Louisiana, Harbor Services Wharf	Mississippi River	1	78	
Weber Marine Reserve Landing.	Mississippi River	1	195	
Reserve Ferry Landing	Mississippi River	1	145	
Port of South Louisiana, Globalplex Terminal Wharves	Mississippi River	3	1,481	
Louis Dreyfus Corp. Reserve Elevator Wharf	Mississippi River	2	1,800	

Port Installations (Cont.):

Cargill Terre Haute Grain Elevator Wharf	Mississippi River	2	3,150	
Cargill Molasses Division, Terre Haute Bulk Liquid Facility Wharf	Mississippi River	2	795	
Marathon Oil Co, Louisiana Refining Division Dock No. 1	Mississippi River	1	1,100	
Marathon Oil Co, Louisiana Refining Division Dock No. 2	Mississippi River	1	1,000	
Marathon Oil Co, Louisiana Refining Division Dock No. 3	Mississippi River	3	2,200	
St. John Fleeting, Repair Wharves and Garyville Fleet	Mississippi River	3	4,940	
Petroleum Fuel & Terminal Co., Mt. Airy Terminal Wharf	Mississippi River	3	1,375	
Hall-Buck Marine Services Co., Gramercy Bulk Terminal Wharf	Mississippi River	1	1,000	
Kaiser Aluminum and Chemical Corp., Gramercy Plant Chemical Dock	Mississippi River	1	200	
Totals		39	34,704	0

St. Tammany Area

1. Roads (miles):
   - Primary: 44.9
   - Secondary: 57.6
   - Tertiary: 741.1

2. Railroads (miles): 33.2

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 9

5. Drainage Pump Stations: 1

6. Water Intakes:

Operator	Type
Madisonville WTR Sys.	Groundwater
Tchefuncte Club Estates	Groundwater
Commercial	Groundwater
Slidell WTR Sys.	Groundwater
Slidell WTR Sys.	Groundwater
Slidell WTR Sys.	Groundwater
Slidell WTR Sys.	Groundwater
Slidell WTR Sys.	Groundwater
Slidell WTR Sys.	Groundwater
Mandeville WTR Sys.	Groundwater
Mandeville WTR Sys.	Groundwater
Mandeville WTR Sys.	Groundwater
Mandeville WTR Sys.	Groundwater
Bayou Liberty WTR Co.	Groundwater
Bayou Liberty WTR Co.	Groundwater
Bayou Liberty WTR Co.	Groundwater
Bayou Liberty WTR Co.	Groundwater
Cross Gates Utilities Co.	Groundwater
Cross Gates Utilities Co.	Groundwater
LA WTR Service	Groundwater
LA WTR Service	Groundwater
LA WTR Service	Groundwater
LA WTR Service	Groundwater
LA WTR Service	Groundwater
Lakeside Utilities	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Industry	Groundwater
Fontainebleau State Park	Groundwater
Fontainebleau State Park	Groundwater
Fontainebleau State Park	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Greenleaves Utility Corp.	Groundwater
Beau Chene Subdivision	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Commercial	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Southeastern LA WTR & Sew.	Groundwater
Commercial	Groundwater
Slidell WTR Sys.	Groundwater

Water Intakes (Cont.):

Operator	Type
Commercial	Groundwater
Piney Ridge MHP	Groundwater
Pirates Harbor WTR Sys.	Groundwater
St. Tammany WTR Dist. 3	Groundwater
St. Tammany WTR Dist. 3	Groundwater
Shady Oaks MHP	Groundwater
Industry	Groundwater
Azalea Lane Trailer Park	Groundwater
Beau Village S/D	Groundwater
Ben Thomas Rd. WTR Dist.	Groundwater
Bishop MHP	Groundwater
Chahta MHP	Groundwater
Commercial	Groundwater
Lazy Wheels Trailer Park	Groundwater
Coast WW Inc.	Groundwater
Monterey Subdivision	Groundwater
Northshore Utility Co.	Groundwater
Shady Pines MHP	Groundwater
Tammany MHP	Groundwater
Commercial	Groundwater
Kteri Apts.	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Vics Trailer Park	Groundwater
The Woodlands Apts.	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Pine Crest RV & MHP	Groundwater
Briarlake Utilities	Groundwater
Industry	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Industry	Groundwater

Groundwater intakes: 77 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Bonfouca	Extends 8 miles from Slidell to deep water in Lake Pontchartrain. Controlling depth is 10 ft.	Navigation - In 1995, carried 281,000 tons of freight traffic.	Commercial navigation
Bayou Lacombe	8 ft deep x 60 ft wide channel through the entrance bar in Lake Pontchartrain. Cleared and snagged from Mile 8.2 to the mouth.	Recreational navigation	Recreational navigation
Bayou Castine	Provides access to Lake Pontchartrain. USACE maintains the entrance channel to the bayou.	Recreational navigation	Recreational navigation
Tchefuncte and Bogue Falaya Rivers	14 miles long and provides for 10 ft x 125 ft navigation channel from 10 ft depth in Lake Pontchartrain to about Mile 3.5 of the Tchefuncte River. Controlling depth is 8 ft from Mile 3.5 to Washington Street in Covington.	Navigation - In 1995 handled 4,000 tons of freight traffic.	Commercial and recreational navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Marina Chamale Condo Association	Bayou Bonfouca	137		1
Colbert Cove Marina	Bayou Castine	200		
Vac Marine	Bayou Bonfouca	21		
Cypress Cove Marina	Bayou Castine	29		
North Shore Marine	Lake Pontchartrain			
Oak Harbor Marina	Lake Pontchartrain	267		
Mariner's Village Marina	Lake Pontchartrain	175		
Hidden Harbor Marina	Bayou Desire	40		
Yacht Works, Inc.	Bayou Castine			
Bayou Liberty Marina	Bayou Liberty	94		
Indian Landings	Bayou Castine	26		
Casadaban Marine Services	Bayou Liberty			
Prieto Marina	Bayou Castine	240		
Southern Shipbuilding Corp., Slidell Wharf	Bayou Bonfouca		1,160	
Standard Materials, Slidell Slip	Bayou Bonfouca		200	
Pearl River Navigation, Slidell Landing	Bayou Bonfouca	1	150	
Pontchartrain Materials Corp., Slidell Landing	Bayou Bonfouca	1	90	
Totals		1,231	1,600	1

South Lake Borgne

1. Roads (miles):
   - Primary: 0.0
   - Secondary: 0.0
   - Tertiary: 0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	5.4	30
Natural Gas	Active	Southern Natural Gas Company	5.2	20
Natural Gas	Active	Southern Natural Gas Company	4.9	24
Natural Gas	Active	Koch Industries, Inc.	0.8	12
Natural Gas	Active	Southern Natural Gas Company	0.4	30

Total pipeline length: 16.7 miles

4. Oil and/or Natural Gas Wells: 12

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou La Loutre, St. Malo, and Yscloskey	A channel 5 ft deep x 40 ft wide from Lake Borgne to the mouth of Bayou Yscloskey (<1 mile).	Navigation - Average annual freight traffic from 1981-1989 was 26,665 tons.	Oil industry, commercial trappers, and fishermen
Mississippi River Gulf Outlet (MRGO)	A channel 36 ft x 500 ft from GIWW to Bayou La Loutre.	Navigation	Major cargo includes non-metallic minerals, basic chemicals and products, and building cement

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Blackie Campo's	Shell Beach Canal			1

Tangipahoa Area

1. Roads (miles):
   - Primary: 29.2
   - Secondary: 27.1
   - Tertiary: 262.7

2. Railroads (miles): 12.5

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	2.5	3
Natural Gas	Active	Koch Industries, Inc.	2.0	4

Total pipeline length: 4.5 miles

4. Oil and/or Natural Gas Wells: 1

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Commercial	Groundwater
Ponchatoula WTR Sys.	Groundwater
Ponchatoula WTR Sys.	Groundwater
Ponchatoula WTR Sys.	Groundwater
Water District 2	Groundwater
Water District 2	Groundwater
Water District 2	Groundwater
Commercial	Groundwater
Hoover MHP	Groundwater
Commercial	Groundwater
Commercial	Groundwater
Commercial	Groundwater

Water Intakes (Cont.):

Baywood Estates	Groundwater
Charles Rose MHP	Groundwater
L & J Trailer Park	Groundwater
Pine Lake MHP	Groundwater
Commercial	Groundwater

Groundwater intakes: 17 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Tangipahoa River	Removal of snags and logs on the lower 53.5 miles of the river.	Recreational navigation	Recreational navigation

8. Port Installations: No major port or terminal installations within this unit.

Tangipahoa River Mouth

1. Roads (miles):
   - Primary: 0.00
   - Secondary: 0.73
   - Tertiary: 12.40

2. Railroads (miles): 5.83

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 10

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Tangipahoa River	Removal of snags and logs on the lower 53.5 miles of the river.	Recreational navigation	Recreational navigation
Tangipahoa River Navigation	A bar channel 18 ft deep x 100 ft wide through the bar in Lake Pontchartrain at the mouth of the Tangipahoa River.	Navigation	

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Lee's Landing Marina	Tangipahoa River	45		1

Tchefuncte River Mouth

1. Roads (miles):
   Primary: 0.0
   Secondary: 2.4
   Tertiary: 14.4

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	7.8	30
Natural Gas	Active	Southern Natural Gas Company	7.7	24
Natural Gas	Active	Southern Natural Gas Company	7.7	20
Natural Gas	Active	Koch Industries, Inc.	4.8	30
Natural Gas	Active	Koch Industries, Inc.	3.6	16
Natural Gas	Active	Koch Industries, Inc.	3.1	6
Natural Gas	Active	Koch Industries, Inc.	2.7	3
Natural Gas	Active	Koch Industries, Inc.	2.2	4
Natural Gas	Active	Southern Natural Gas Company	1.2	6
Natural Gas	Active	Koch Industries, Inc.	1.2	14

Total pipeline length: 42.0 miles

4. Oil and/or Natural Gas Wells: None

5. Drainage Pump Stations: 4

6. Water Intakes:

Operator	Type
Madisonville WTR Sys.	Groundwater
Tchefuncte Club Estates	Groundwater
LA WTR Service	Groundwater

Groundwater intakes: 3 Surface water intakes: 0

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Tchefuncte River and Bogue Falaya	A channel 10 ft deep and 125 ft wide from a 10 ft depth in Lake Pontchartrain to about Mile 3.5 of the Tchefuncte River (14 miles)	Navigation - average annual traffic for 1981-1989 was 30,627 tons.	Commercial and recreational navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Marina Beau Cane	Tchefuncte River	137		
Madisonville Boat Yard	Tchefuncte River	5		
Colemar Marine Inc.	Tchefuncte River			
Marina Del Ray	Tchefuncte River	250		1
Salty's Marina	Tchefuncte River	180		
Totals		572	0	1

Tickfaw River Mouth

1. Roads (miles):
   - Primary: 7.2
   - Secondary: 6.9
   - Tertiary: 18.3

2. Railroads (miles): 0.7

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	0.2	24
Natural Gas	Active	Southern Natural Gas Company	0.2	20

Total pipeline length: 0.4 miles

4. Oil and/or Natural Gas Wells: 6

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Tickfaw, Natalbany, Ponchatoula, and Blood Rivers	Clearing and snagging Miles 0 - 26 of the Tickfaw River, Miles 0 - 4 of the Blood River, Miles 0 - 10 of the Natalbany River, and Miles 0 - 5.5 of the Ponchatoula River.	Recreational navigation	Recreational navigation

8. Port Installations: No major port or terminal installations within this unit.

West Manchac Land Bridge

1. Roads (miles):
   - Primary: 13.2
   - Secondary: 9.3
   - Tertiary: 1.9

2. Railroads (miles): 2.1

3. Pipelines: None

4. Oil and/or Natural Gas Wells: 8

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Pass Manchac	Removal of snags and logs, 7 miles between lakes Pontchartrain and Maurepas.	Navigation - average annual freight traffic for 1984-1993 was 86,400 tons.	Shells and crude oil

8. Port Installations: No major port or terminal installations within this unit.

SECTION 6

WETLAND DEVELOPMENT/PERMITTED ACTIVITIES

The following account of impacts from development activity comes from Louisiana's Coastal Use Permit data and reflects impacts to wetlands as well as non-wetland habitat. No data are available to correlate permit type with extent of impact in wetlands.

In November 1997, the Louisiana Department of Natural Resources (DNR), in cooperation with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the Environmental Protection Agency, developed the *Louisiana Coastal Wetlands Conservation Plan*. Included in this document was an account of development-related activities in wetlands over the past approximately 15 years. The coast of Louisiana had its highest level of wetland development in the period between 1980 and 1985, whereas the period between 1990 and 1995 showed the lowest development losses.

Importantly, acreage losses per issued permit dropped as well. Data from DNR show that annual losses peaked in 1983 at 2,735 acres, with a low of 196 acres in 1990. Average annual wetland losses for the period 1982-1995 are estimated at 843 acres. This corresponded with an annual average of 860 permits issued between 1980 and 1995. There were 941 permits per year between 1980 and 1985, 793 permits per year between 1985 and 1990, and 846 permits per year between 1990 and 1995. Regions 2 and 3 have sustained and continue to sustain the greatest impact from permit/ development activity. Total acres disturbed in Region 1 declined from 1980 through 1995 (1,256, 1,011, and 1,215 acres, respectively, for 1980-1985, 1985-1990, and 1990-1995).

Oil and gas development has greatly dominated the activities associated with permitted losses in coastal Louisiana. For instance, of the 4,706 permits issued between 1980 and 1985, a total of 3,911 (83.1%) were for oil and gas activity. Between 1985 and 1990, some 2,844 (71.7%) of the total 3,964 permits issued were for oil and gas. Finally, for the period between 1990 and 1995, a total of 4,229 permits were issued, of which 2953 (69.8%) were for oil and gas. Nevertheless, no attempt has been made to correlate rates of loss per permit with specific activity types (i.e., oil/gas, development of fastland, bulkheads, etc.).

Region 1 has been characterized by moderate permit activity, with a decreasing trend from 1980 to the early 1990's. The oil and gas industry dominated the permit activity for this region, although development of fastlands was relatively high in the 1980's. More recently, minor developments, including bulkheads and piers, have increased. Activity has been focussed primarily in the northern reaches of the region and along the rivers and lakes (Amite/Blind, lakes Maurepas and Pontchartrain, and Eloi Bay mapping units).

SECTION 7

FISH AND WILDLIFE

Methodology for Historic Trends in Fisheries Production

In order to assess the recent trends and future projections of fishery populations within the Coast 2050 study area, four broad species assemblages were established based on salinity preferences. These assemblages were marine, estuarine dependent, estuarine resident, and freshwater. Within each of the four assemblages, guilds of fishery organisms were established. As used in this document, guilds are groupings of ecologically similar species identified by a single, representative species and, hereafter, the terms guild and species are used interchangeably. Fishery guilds common to coastal Louisiana, within each salinity-preference assemblage are:

- Spanish mackerel guild - marine;
- red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, white shrimp, brown shrimp, and blue crab guilds - estuarine dependent;
- American oyster guild - estuarine resident; and
- largemouth bass and channel catfish guilds - freshwater.

In a broad sense, each of the 12 guilds is uniquely identified by the combination of the representative species' habitat preference, salinity preference, primary habitat function, seasonal occurrence in the estuary, and spawning or migratory seasons. Habitat and life history information is based on available scientific literature specific to the northwestern Gulf of Mexico, but is somewhat generalized to accommodate the establishment of guilds.

Once the species representing each fishery guild was identified, population changes of each species were assessed and displayed by using a matrix for each of the four coastal regions. The matrices display mapping units and guilds and, within the mapping units, provide information on the population stability (recent change trends) and population projections for each species group (Table 7-1). The discussion of fishery population projections follows this section. Most of the recent trend information was provided by fishery biologists of the Louisiana Department of Wildlife and Fisheries (LDWF). The assessments were based on LDWF fishery independent sampling data and personal observation of area fisheries biologists, and generally span a period of 10 to 20 years. Staff of LDWF believe that, due to selectivity of sample gear, the trend information is most reflective of recent changes in the subadult portion of each guild.

The projections of possible future changes in fishery production for coastal Louisiana are based solely on landscape change model predictions discussed in the main report. The key parameters in making those projections were percent and pattern of wetland loss in each mapping unit. Numerous other factors which could not be forecast, such as changes in water quality, fishery harvest levels, wetland development activities (e.g., dredging and filling), and blockages of migratory pathways also could negatively impact fishery production. These factors and the potentially great inaccuracy in predicting land loss 50 years into the future, especially when considering landscape changes at a mapping unit scale, limit the precision of the predicted changes in fishery production.

Information provided in the matrix was developed through the collaborative effort of the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS). Contributors to this effort for Region 1 were John F. Burdon, Mark Lawson, and Glenn Thomas of the LDWF and Rickey Ruebsamen and Richard Hartman of the NMFS.

Methodology for Wildlife Functions, Status, Trends, and Projections

Louisiana's coastal wetlands, extending from the forested wetlands at the upper end to the barrier shorelines bordering the gulf, provide a diverse array of habitats for numerous wildlife communities. In addition to fulfilling all life-cycle needs for many resident species, coastal wetlands provide wintering or stopover habitat for migratory waterfowl and many other birds. The bald eagle and brown pelican, protected by the Endangered Species Act, are recovering from very low populations over the last three decades. These species are projected to continue to increase in the future, independent of near-term wetland changes. The fate of other species groups in coastal Louisiana will be influenced by habitat conditions within their areas. The prediction of extensive land loss and habitat change by the year 2050 prompted an examination of the effect of such losses and changes on the abundance of wildlife.

To assess habitat functions and the status, recent trends, and future projections of wildlife abundance within the Coast 2050 study area, 21 prominent wildlife species and/or species groups were identified:

- Brown pelican
- Bald eagle
- Seabirds, such as black skimmer, royal tern, common tern, and laughing gull
- Wading birds, such as great blue heron, snowy egret, and roseate spoonbill
- Shorebirds, such as piping plover, black-necked stilt, American avocet, and willet
- Dabbling ducks, such as mallard, gadwall, mottled duck, and wood duck
- Diving ducks, such as greater scaup, ring-necked duck, redhead, and canvasback

- Geese, such as snow goose, white-fronted goose, and Canada goose
- Raptors, such as northern harrier, peregrine falcon, and American kestrel
- Rails, gallinules, and coots, such as king rail, sora rail, and purple gallinule
- Other marsh and open water residents, such as anhinga, least bittern, and seaside sparrow
- Other woodland residents, such as pileated woodpecker, Carolina chickadee, and belted kingfisher
- Other marsh and open water migrants, such as tree swallow, barn swallow, and Savannah sparrow
- Other woodland migrants, such as hermit thrush, American robin, and cedar waxwing
- Nutria
- Muskrat
- Mink, otter, and raccoon
- Rabbits
- Squirrels
- White-tailed deer, and
- American alligator

A matrix was developed for each region to present the habitat function and the status, trend, and projection for the above listed species and/or species groups for each habitat type within each mapping unit (Table 7-2).

"Habitat functions" considered were nesting (Ne), wintering area (W), stopover habitat (St), and multiple functions (Mu). "Status" categories included the following: not historically present (NH), no longer present (NL), present in low numbers (Lo), present in moderate numbers (Mo), and present in high numbers (Hi). Not historically present means that the species or species group has not been present in the given area for over about 50 years. "No longer present" means that the species or species group was present in the given area sometime during the last 50 years, but is not currently present.

"Trend" refers to changes in abundance over the last 10 to 20 years, and "projection" refers to a prediction of changes in wildlife abundance through the year 2050; "trend" and "projection" categories include steady (Sy), decrease (D), increase (I) and unknown (U).

"Habitat Types" reflect 1988 conditions and include the following: open water (OW); aquatic bed (AB); fresh marsh (FM); intermediate marsh (IM); brackish marsh (BM); saline marsh (SM); fresh swamp (FS); hardwood forest (HF); barrier beach (BB); and agriculture/ upland (AU). Habitat types comprising less than 5% of a unit are shown only if that habitat type is particularly rare or important to wildlife in the given mapping unit.

"Habitat function," "status," and "trend" information displayed in each regional matrix represents common understandings of the selected species and/or species groups, field observations, some data, and recent habitat changes. "Projection" information is based almost exclusively on the predicted conversion of marsh to open water and the gradual relative sinking and resultant deterioration of forested habitat throughout the study area. Such predictions may or may not prove to be accurate. Additionally, numerous other factors including water quality, harvesting level, and habitat changes elsewhere in the species' range

cannot be predicted and were not considered in these projections. Therefore, the projections are to be viewed and used with caution.

The matrices were compiled by Gerry Bodin (U.S. Fish and Wildlife Service) and Quin Kinler (Natural Resources Conservation Service).

The individuals responsible for synthesizing the information displayed in each regional matrix are identified below:

Species or Species Group	Individuals	Agency Affiliation
Brown pelican, bald eagle	Tom Hess	LDWF
	Larry McNease	LDWF
	Terry Rabot	U.S. Fish and Wildlife Service
Seabirds, wading birds, shorebirds, raptors, rails, gallinules, coots, other marsh and open water residents, other woodland residents, other marsh and open water migrants, other woodland migrants	Bill Vermilion	LDWF
Dabbling ducks, diving ducks, geese	Robert Helm	LDWF
Nutria, muskrat, mink, otter, raccoon, American alligator	Noel Kinler	LDWF
	Larry McNease	LDWF
Rabbits, squirrels, white-tailed deer	Mike Olinde	LDWF
	Dave Moreland	LDWF
	Quin Kinler	Natural Resources Conservation Service

Table 7-1. Region 1 fish and invertebrate population status and 2050 change.

	Fish and Invertebrate Guilds (Species)												
	Red drum	Black drum	Spotted seatrout	Gulf menhaden	Southern flounder	American oyster	White shrimp	Brown shrimp	Blue crab	Spanish mackerel	Largemouth bass	Channel catfish	
Mapping Unit	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Comments
Amite/Blind	NA/NA	NA/NA	NA/NA	U/U	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Lake Maurepas	NA/NA	NA/NA	NA/NA	U/U	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Tickfaw River Mouth	NA/NA	NA/NA	NA/NA	U/U	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
West Manchac Land Bridge	U/U	U/U	NA/NA	U/U	U/U	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Tangipahoa River Mouth	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	Sy/Sy	D/D	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
East Manchac Land Bridge	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Lake Pontchartrain	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	Sy/Sy	U/U	Sy/Sy	Sy/Sy	
Bonnet Carre'	U/U	U/U	U/U	U/U	U/U	NA/NA	Sy/Sy	Sy/Sy	Sy/Sy	NA/	Sy/Sy	Sy/Sy	
La Branche Wetlands	U/U	U/U	U/U	U/U	U/U	NA/NA	Sy/D	Sy/D	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Tchefuncte River Mouth	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	NA/NA	Sy/D	Sy/D	Sy/D	NA/NA	Sy/Sy	Sy/Sy	

NOTES: Steady=Sy, Decrease=D, Increase=I, Unknown=U, Not Applicable=NA

Table 7-1. Region 1 fish and invertebrate population status and 2050 change (Cont.).

	Fish and Invertebrate Guilds (Species)												
	Red drum	Black drum	Spotted seatrout	Gulf menhaden	Southern flounder	American oyster	White shrimp	Brown shrimp	Blue crab	Spanish mackerel	Largemouth bass	Channel catfish	
Mapping Unit	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Trend/ Projection	Comments
North Shore Marshes	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	NA/NA	Sy/D	Sy/D	Sy/Sy	U/U	Sy/Sy	Sy/Sy	
Pearl River Mouth	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	D/D	Sy/Sy	Sy/Sy	Sy/Sy	U/U	Sy/Sy	Sy/Sy	
East Orleans Land Bridge	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	U/I	Sy/Sy	U/U	
Bayou Sauvage	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	U/U	NA/NA	D/I	D/I	Freshwater impoundment
Chandeleur Sound	I/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	NA/NA	
Chandeleur Islands	I/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	NA/NA	
Lake Borgne	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	NA/NA	
South Lake Borgne	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	NA/NA	NA/NA	
Central Wetlands	Sy/Sy	Sy/Sy	Sy/Sy	Sy/I	Sy/Sy	D/D	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	NA/NA	NA/NA	
Biloxi Marshes	I/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/Sy	NA/NA	NA/NA	
Eloi Bay	I/Sy	Sy/D	Sy/D	Sy/Sy	Sy/D	D/D	Sy/D	Sy/D	Sy/Sy	Sy/Sy	NA/NA	NA/NA	

NOTES: Steady=Sy, Decrease=D, Increase=I, Unknown=U, Not Applicable=NA

Table 7-2. Region 1 wildlife functions, status, trends, and projections.

Habitat Types: OW = Open Water; AB = Aquatic Bed; FM = Fresh Marsh; IM = Intermediate Marsh; BM = Brackish Marsh; SM = Saline Marsh; FS = Fresh Swamp; HF = Hardwood Forest BB = Barrier Beach; AU = Agriculture/Upland. Habitat types comprising less than 5% of unit are shown only if habitat type is particularly rare or important to wildlife.

S**tatus:** NH = Not Historically Present; NL = No Longer Present; Lo = Low Numbers; Mo = Moderate Numbers; Hi = High Numbers

Functions of Particular Interest: Ne = Nesting; St = Stopover Habitat; W = Wintering Area; Mu = Multiple Functions

Trends (since 1985) / **Projections** (through 2050)**:** Sy = Steady; D = Decrease; I = Increase; U = Unknown

Mapping Unit	1988 Habitat		Avifauna																																					
	Type	% of Unit	Brown Pelican				Bald Eagle				Seabirds				Wading Birds				Shorebirds				Dabbling Ducks				Diving Ducks				Geese				Raptors				Rails, Coots, and Gallinules			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Upper Pontchartrain Basin																																								
Amite / Blind	FS	73		NH			Ne	Hi	I	I		NH			Ne	Hi	I	Sy		NH			Mu	Lo	Sy	Sy		NH				NH				NH				NH		
	HF	21		NH				NH				NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH				NH				NH		
Lake Maurepas	OW	100		NH				NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
Tickfaw River Mouth	FS	53		NH			Ne	Lo	Sy	Sy		NH			Ne	Hi	I	Sy		NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Mo	Sy	Sy		NH		
	HF	37		NH				NH				NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
West Manchac Land Bridge	OW	6		NH				NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	FM	22		NH				NH			Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D
	FS	61		NH			Ne	Lo	I	I		NH			Ne	Hi	I	Sy		NH			W	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	11		NH				NH				NH				NH				NH			W	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Middle Pontchartrain Basin																																								
East Manchac Land Bridge	OW	7		NH				NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	IM	41		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D
	FS	15		NH				NH				NH			Ne	Hi	I	Sy		NH			W	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	34		NH				NH				NH				NH				NH			W	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Tangipahoa River Mouth	FM	10		NH				NH			Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
	FS	53		NH			Ne	Lo	Sy	Sy		NH			Ne	Hi	I	Sy		NH			W	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	34		NH				NH				NH				NH				NH			W	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Tchefuncte River Mouth	OW	18		NH				NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	FM	28		NH				NH			Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
	FS	26		NH				NH				NH			Ne	Hi	I	Sy		NH			W	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	22		NH			Ne	Lo	Sy	Sy		NH				NH				NH			W	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		

Table 7-2. Region 1 wildlife functions, status, trends, and projections.

Habitat Types: OW = Open Water; AB = Aquatic Bed; FM = Fresh Marsh; IM = Intermediate Marsh; BM = Brackish Marsh; SM = Saline Marsh; FS = Fresh Swamp; HF = Hardwood Forest BB = Barrier Beach; AU = Agriculture/Upland. Habitat types comprising less than 5% of unit are shown only if habitat type is particularly rare or important to wildlife.

S**tatus:** NH = Not Historically Present; NL = No Longer Present; Lo = Low Numbers; Mo = Moderate Numbers; Hi = High Numbers

Functions of Particular Interest: Ne = Nesting; St = Stopover Habitat; W = Wintering Area; Mu = Multiple Functions

Trends (since 1985) / **Projections** (through 2050)**:** Sy = Steady; D = Decrease; I = Increase; U = Unknown

Mapping Unit	1988 Habitat Type	% of Unit	Avifauna (cont.)																Furbearers										Game Mammals												Reptiles			
			Other Marsh/ OW Residents				Other Wood-land Resid.				Other Marsh/ OW Migrants				Other Wood-land Migrants				Nutria				Muskrat				Mink, Otter, and Raccoon				Rabbits				Squirrels				Deer				American Alligator			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Upper Pontchartrain Basin																																												
Amite / Blind	FS	73	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	Sy	D	Mu	Mo	I	D	Mu	Mo	I	I
	HF	21		NH			Ne	Hi	I	D		NH			Mu	Mu	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Mo	Sy	D	Mu	Mo	I	S	Mu	Lo	Sy	Sy
Lake Maurepas	OW	100	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH				NH				NH				NH				NH				NH				NH				NH		
Tickfaw River Mouth	FS	53	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	D	Mu	Lo	Sy	Sy	Mu	Mo	I	D	Mu	Mo	I	I
	HF	37		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	D	Mu	Mo	Sy	Sy	Mu	Mo	I	S	Mu	Lo	Sy	Sy
West Manchac Land Bridge	OW	6	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	I
	FM	22	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Mo	I	I
	FS	61	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	D	Mu	Mo	I	I
	HF	11		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Mo	D	D	Mu	Mo	Sy	D	Mu	Lo	Sy	Sy
Middle Pontchartrain Basin																																												
East Manchac Land Bridge	OW	7	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	I
	IM	41	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Mo	I	I
	FS	15	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	D	Mu	Mo	I	I
	HF	34		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Mo	D	D	Mu	Lo	Sy	D	Mu	Lo	Sy	Sy
Tangipahoa River Mouth	FM	10	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Mo	I	I
	FS	53	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	D	Mu	Mo	I	I
	HF	34		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Mo	D	D	Mu	Mo	Sy	D	Mu	Lo	Sy	Sy
Tchefuncte River Mouth	OW	18	Mu	Mo	Sy	Sy		NH			Mu	Mu	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	I
	FM	28	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Mo	I	I
	FS	26	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	D	Mu	Mo	I	I
	HF	22		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Mo	D	D	Mu	Mo	Sy	D	Mu	Lo	Sy	Sy

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Mapping Unit	1988 Habitat Type	% of Unit	Avifauna: Brown Pelican				Bald Eagle				Seabirds				Wading Birds				Shorebirds				Dabbling Ducks				Diving Ducks				Geese				Raptors				Rails, Coots, and Gallinules			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Bonnet Carre'	OW	5		NH				NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	FM	17		NH				NH			Mu	Lo	Sy	D	Ne	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
	FS	30		NH				NH				NH			Ne	Hi	I	Sy		NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	41		NH				NH				NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
	AU	6		NH				NH				NH			St	Lo	I	Sy	Mu	Lo	I	Sy		NH				NH				NH			Mu	Lo	I	Sy		NH		
LaBranche Wetlands	OW	16	W	Lo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy
	IM	10		NH				NH			Mu	Mo	Sy	D	Mu	Hi	I	Sy	Mu	Hi	Sy	D	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	D	Mu	Mo	Sy	Sy
	BM	17		NH				NH			Mu	Mo	Sy	D	Mu	Hi	I	Sy	Mu	Hi	Sy	D	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	D	Mu	Lo	Sy	Sy
	FS	41		NH			Ne	Mo	I	Sy		NH			Ne	Hi	I	Sy		NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Mo	I	Sy		NH		
	HF	9		NH				NH				NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Lake Pontchartrain	OW	100	W	Mo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Hi	Sy	Sy		NH				NH			W	Lo	Sy	Sy
North Shore Marshes	OW	27	W	Mo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	IM	25		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
	BM	40		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
	HF	6		NH			Ne	Lo	Sy	Sy		NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Bayou Sauvage	OW	23	W	Lo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy
	FM	36		NH				NH			Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	IM	8		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	HF	26		NH				NH				NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	Sy	D		NH		
East Orleans Land Bridge	OW	39	W	Mo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Mo	Sy	D	W	Mo	Sy	D		NH				NH			W	Mo	Sy	Sy
	BM	56		NH				NH			Mu	Mo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	D	W	Mo	Sy	D		NH			Mu	Lo	Sy	D	Mu	Mo	Sy	Sy

Table 7-2. Region 1 wildlife functions, status, trends, and projections.

Habitat Types: OW = Open Water; AB = Aquatic Bed; FM = Fresh Marsh; IM = Intermediate Marsh; BM = Brackish Marsh; SM = Saline Marsh; FS = Fresh Swamp; HF = Hardwood Forest BB = Barrier Beach; AU = Agriculture/Upland. Habitat types comprising less than 5% of unit are shown only if habitat type is particularly rare or important to wildlife.

S**tatus:** NH = Not Historically Present; NL = No Longer Present; Lo = Low Numbers; Mo = Moderate Numbers; Hi = High Numbers

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Trends (since 1985) / **Projections** (through 2050)**:** Sy = Steady; D = Decrease; I = Increase; U = Unknown

Mapping Unit	1988 Habitat Type	% of Unit	Avifauna (cont.) Other Marsh/ OW Residents				Other Wood- land Resid.				Other Marsh/ OW Migrants				Other Wood- land Migrants				Furbearers Nutria				Muskrat				Mink, Otter, and Raccoon				Game Mammals Rabbits				Squirrels				Deer				Reptiles American Alligator			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Bonnet Carre'	OW	5	Mu	Mo	Sy	Sy		NH			Mu	Mu	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	Sy	Sy
	FM	17	Ne	Hi	Sy	Sy		NH			Ne	Mu	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	FS	30	Ne	Lo	Sy	Sy	Mo	Ne	I	Sy	Ne	Mu	Sy	Sy	Mo	Mu	I	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	HF	41		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy
	AU	6		NH			Ne	Lo	I	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy
LaBranche Wetlands	OW	16	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	Sy
	IM	10	Ne	Hi	Sy	D		NH			Mu	Hi	Sy	D		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	Sy
	BM	17	Ne	Hi	Sy	D		NH			Mu	Hi	Sy	D		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	Sy
	FS	41	Ne	Lo	Sy	Sy	Ne	Mo	I	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	I	Sy
	HF	9		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
Lake Pontchartrain	OW	100	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH				NH				NH				NH				NH				NH				NH				NH		
North Shore Marshes	OW	27	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	Sy
	IM	25	Ne	Hi	Sy	Sy		NH			Ne	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	Sy
	BM	40	Ne	Hi	Sy	Sy		NH			Ne	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	Sy
	HF	6		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
Bayou Sauvage	OW	23	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Mo	I	I
	FM	36	Ne	Hi	Sy	Sy		NH			Ne	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I
	IM	8	Ne	Hi	Sy	Sy		NH			Mu	Mo	Sy	SY		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I
	HF	26		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
East Orleans Land Bridge	OW	39	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH				NH			Mu	Lo	Sy	Sy
	BM	56	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	D		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy

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Trends (since 1985) / **Projections** (through 2050)**:** Sy = Steady; D = Decrease; I = Increase; U = Unknown

Mapping Unit	1988 Habitat		Avifauna																																	
	Type	% of Unit	Brown Pelican				Bald Eagle				Seabirds				Wading Birds				Shorebirds				Dabbling Ducks				Diving Ducks				Geese				Raptors				Rails, Coots, and Gallinules			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Pearl River Mouth	OW	28	W	Lo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			W	Mo	Sy	Sy
	FM	15		NH			Ne	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	IM	17		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	BM	15		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	HF	21		NH			Ne	Lo	Sy	Sy		NH				NH				NH			Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	D		NH		
Lower Pontchartrain Basin																																										
Central Wetlands	OW	19	W	Lo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH			W	Lo	D	D	W	Lo	D	D		NH				NH			W	Lo	D	D
	FM	5		NH				NH			Mu	Lo	Sy	D	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D
	BM	45		NH				NH			Mu	Hi	Sy	D	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D
	AU	26		NH				NH				NH			St	Lo	I	Sy	Mu	Lo	I	Sy		NH				NH				NH				NH				NH		
South Lake Borgne	OW	42	W	Mo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH			W	Lo	D	D	W	Lo	D	D		NH				NH			W	Lo	D	D
	BM	24		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Lo	D	D
	SM	32		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	D	D	W	Lo	D	D		NH				NH			Mu	Lo	D	D
Lake Borgne	OW	100	W	Mo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH				NH			W	Hi	Sy	Sy		NH				NH				NH		
Biloxi Marshes	OW	76	W	Mo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH			W	Mo	Sy	Sy	W	Hi	Sy	Sy	W	Lo	Sy	Sy		NH				NH		
	BM	10		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	Sy	W	Mo	Sy	Sy	W	Lo	Sy	Sy	Mu	Lo	Sy	D	Mu	Mo	Sy	Sy
	SM	14		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Mo	Sy	Sy
Eloi Bay	OW	69	W	Mo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH			W	Mo	Sy	Sy	W	Mo	Sy	Sy	W	Lo	Sy	Sy		NH				NH		
	BM	5		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	Sy	W	Mo	Sy	Sy	W	Lo	Sy	Sy	Mu	Lo	Sy	D	Mu	Mo	Sy	Sy
	SM	20		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	Sy	Sy	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Mo	Sy	Sy
	AU	5		NH				NH				NH			St	Lo	I	Sy	Mu	Lo	I	Sy		NH				NH				NH				NH				NH		
Chandeleur Sound	OW	100	W	Hi	I	I		NH			Mu	Hi	Sy	Sy		NH				NH				NH			W	Mo	Sy	Sy		NH				NH				NH		

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Habitat Types: OW = Open Water; AB = Aquatic Bed; FM = Fresh Marsh; IM = Intermediate Marsh; BM = Brackish Marsh; SM = Saline Marsh; FS = Fresh Swamp; HF = Hardwood Forest BB = Barrier Beach; AU = Agriculture/Upland. Habitat types comprising less than 5% of unit are shown only if habitat type is particularly rare or important to wildlife.

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Mapping Unit	1988 Habitat Type	% of Unit	Avifauna (cont.)																Furbearers												Game Mammals														Reptiles			
			Other Marsh/ OW Residents				Other Wood-land Resid.				Other Marsh/ OW Migrants				Other Wood-land Migrants				Nutria				Muskrat				Mink, Otter, and Raccoon				Rabbits				Squirrels				Deer				American Alligator			
			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Pearl River Mouth	OW	28	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy		NH				NH				NH			Mu	Mo	Sy	Sy
	FM	15	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	IM	17	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	BM	15	Ne	Hi	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy
	HF	21		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy
Lower Pontchartrain Basin																																														
Central Wetlands	OW	19	Mu	Mo	Sy	Sy					Mu	Lo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NH			Mu	Lo	D	D
	FM	5	Ne	Hi	Sy	Sy					Mu	Hi	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D
	BM	45	Ne	Hi	Sy	Sy					Mu	Hi	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D
	AU	26		NH			Ne	Lo	I	Sy					Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	D	D
South Lake Borgne	OW	42	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NH			Mu	Lo	D	D
	BM	24	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D
	SM	32	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D
Lake Borgne	OW	100	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH				NH				NH				NH				NH				NH				NH				NH		
Biloxi Marshes	OW	76	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NH			Mu	Lo	D	D
	BM	10	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	Sy		NH				NL			Mu	Lo	D	D
	SM	14	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	Sy		NH				NL			Mu	Lo	D	D
Eloi Bay	OW	69	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NH			Mu	Lo	D	D
	BM	5	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	Sy		NH				NL			Mu	Lo	D	D
	SM	20	Ne	Hi	Sy	D					Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	Sy		NH				NL			Mu	Lo	D	D
	AU	5		NH			Ne	Lo	I	Sy	Mu	NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D
Chandeleur Sound	OW	100	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH				NH				NH				NH				NH				NH				NH				NH		

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			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Chandeleur Islands	OW	87	W	Hi	I	I		NH			Mu	Hi	Sy	Sy		NH				NH				NH			W	Mo	Sy	Sy		NH				NH				NH		
	AB	8	W	Hi	I	I		NH			Mu	Hi	Sy	D		NH				NH			W	Lo	Sy	Sy	W	Mo	Sy	Sy		NH				NH				NH		
	SM	2	Ne	Hi	I	I		NH				NH				NH				NH			W	Lo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			Mu	Lo	Sy	Sy
	BB	3	Ne	Hi	I	I		NH			Mu	Hi	Sy	D		NH				NH				NH				NH				NH				NH				NH		

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			Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.	Func.	Status	Trend	Proj.
Chandeleur Islands	OW	87	Mu	Mo	Sy	Sy					Mu	Mo	Sy	Sy		NH				NH				NH				NH				NH				NH				NH				NH		
	AB	8		NH								NH				NH				NH				NH				NH				NH				NH				NH				NH		
	SM	2		NH								NH				NH				NH				NH				NH				NH				NH				NH				NH		
	BB	3	Mu	Mo	Sy	D					Mu	Mo	Sy	D		NH				NH				NH				NH				NH				NH				NH				NH		

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