

*Coast 2050:  
Toward a Sustainable  
Coastal Louisiana,  
The Appendices*

**Appendix D — Region 2 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.



Suggested citation: Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1999. Coast 2050: Toward a Sustainable Coastal Louisiana, The Appendices. Appendix D—Region 2 Supplemental Information. Louisiana Department of Natural Resources. Baton Rouge, La.

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**For additional information on coastal restoration in Louisiana:** [www.lacoast.gov](http://www.lacoast.gov) or [www.savelawetlands.org](http://www.savelawetlands.org).

Coast 2050:  
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Coastal Louisiana,  
The Appendices

Appendix D—Region 2 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 2 (Fig. 1-1) spans from the Mississippi River Gulf Outlet on the east to Bayou Lafourche on the west. It is bordered on the north and south by the Mississippi River and Gulf of Mexico, respectively, and encompasses the Breton Sound and Barataria hydrologic basins and the Mississippi River “Birdsfoot” delta. Region 2 covers all or part of St. Bernard, Plaquemines, Jefferson, Lafourche, St. Charles, St. James, St. John the Baptist, and Assumption parishes.

This appendix contains information and data, collected by the Region 2 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.

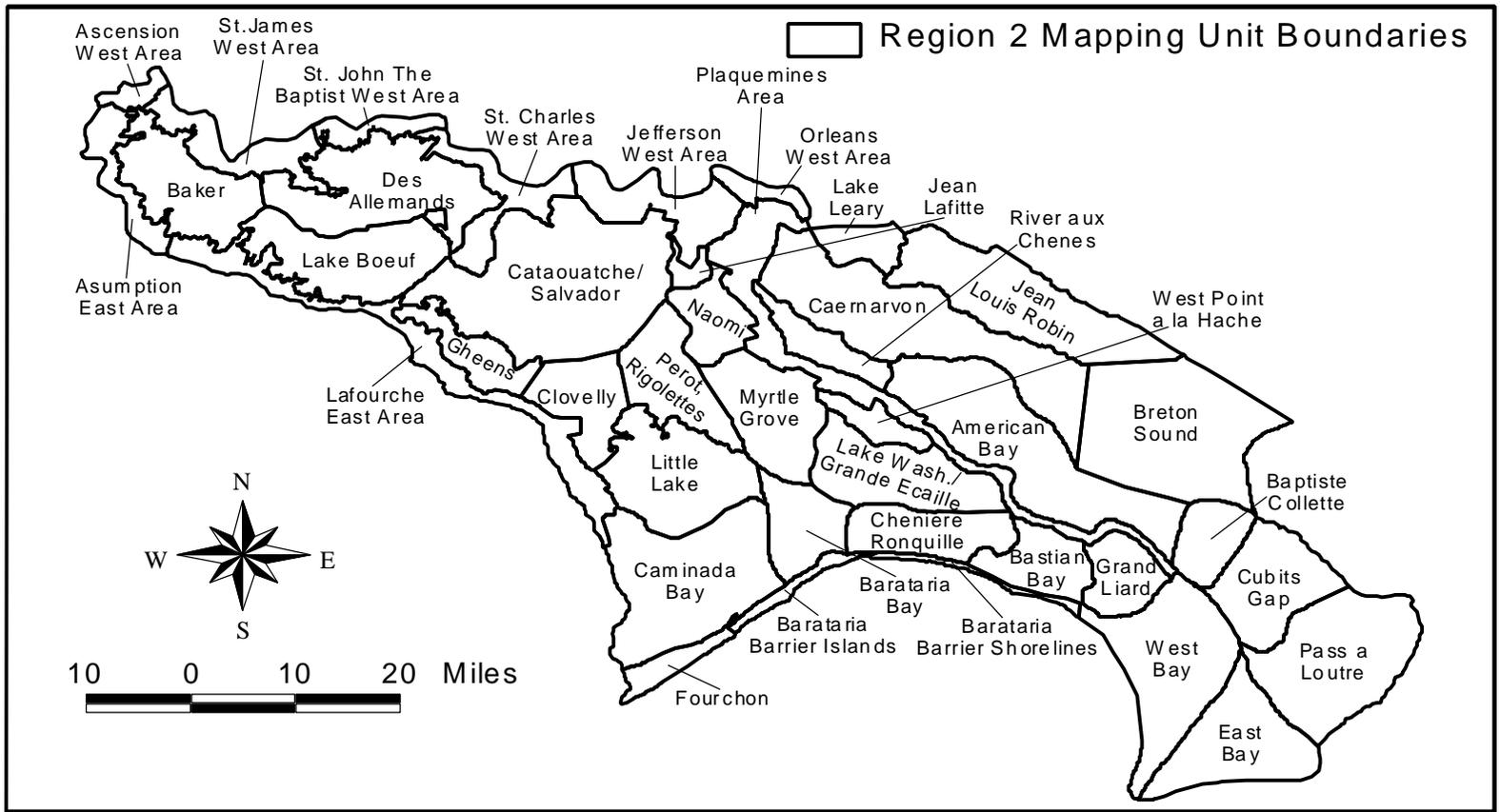


Figure 1-2. Region 2 mapping units.

## SECTION 2

### REGION 2 COAST 2050 REGIONAL PLANNING TEAM (RPT) MEMBERS (DURING PLAN DEVELOPMENT)

#### **Parish Representatives**

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Taliancich, Ed Theriot -  
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Clyde Giordano - Plaquemines Parish  
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Pete Jones - Plaquemines Parish  
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Benny Rousselle - Representative in  
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Chris Andry - St. Bernard Parish Coastal  
Zone Management (CZM)  
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Dan Arceneaux - St. Bernard CZM  
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Woody Crews - Jefferson Parish Marine  
Fisheries Advisory Board  
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#### **Agency Representatives**

Richard DeMay - U.S. Fish and Wildlife  
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#### **Academic Representatives**

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## SECTION 3

### MAPPING UNIT SUMMARIES

#### **Breton Sound Basin**

##### *Caernarvon*

**Location** - This 152,400-acre unit is located in Plaquemines Parish. The northern boundary of the unit extends from the Caernarvon Freshwater Diversion Structure on the Mississippi River along the river to the town of Dalcour. The southern boundary is American Bay. The eastern boundary is Bayou Terre aux Boeufs. The western boundary is River aux Chenes.

**Habitat Description and Landscape Change** - This unit and the three adjacent to it have a unique history. In 1923 and again in 1927, the Mississippi River levee at Caernarvon was destroyed to relieve pressure on upriver levees in New Orleans. These units received massive amounts of sediment, nutrients, and fresh water from the Mississippi River. There must have been some fresh or intermediate marsh in the upper portion of this unit in the 1920's.

By 1949, however, the area was about 50% saline marsh and 50% brackish marsh. In 1968 and 1978, there was some intermediate marsh in the northern portion of the area. By 1988, it was about 75% brackish, and 25% saline, with a trace of intermediate marsh in the north. In 1991, the Caernarvon Freshwater Diversion Structure became

operational, and there is now fresh marsh appearing in the vicinity of Big Mar and around Lake Lery.

**Historic Land Loss** - In 1932, this unit had 73,730 acres of marsh. A major cause of loss in this unit has been storm-related, as hurricanes drove salty water into the fresh/intermediate northern portion. Altered hydrology, caused by numerous canals, has exacerbated the storm-related loss and caused greater tidal scour and saltwater intrusion. Even the massive amounts of sediment deposited in the 1920's could not prevent loss once the river levee was repaired. On the southern edges of the unit, wind-related erosion has been and continues to be fairly extensive.

Between 1932 and 1990, a total of 14,240 acres of marsh were lost in this unit. The greatest land loss (6,560 acres) occurred from 1956-1974 and coincided with Hurricane Betsy and extensive canal building. About 3,320 acres were lost from 1932-1956, and 3,380 acres were lost from 1974-1983. From 1983-1990, the loss was reduced to only 980 acres. Subsidence, high in this area, ranges from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 59,490 acres of marsh. Over the next 50 years, some 13,290 acres of marsh are projected to be lost if nothing is done. The Caernarvon

Freshwater Diversion structure and the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) project that will manage its outfall should prevent the loss of 9,600 acres. Therefore, only 6.2% of the 1990 acreage is projected to be lost.

For three years (1994, 1995, and 1996), the freshwater diversion structure was operated to maximize sediment input by passing 8,000 cubic ft/second (cfs) during the winter months. Recent data from the Louisiana Department of Natural Resources (DNR) indicates that in nine, 500-acre individual plots near Big Mar and Lake Lery, up to 400 acres of marsh may have been created. If this effect continues, even though the structure is not now operated above 4,000 cfs, the above estimate of future marsh loss is too high.

#### **Fish and Wildlife Resources -**

Populations of many species of the estuarine dependent assemblage (red and black drum, spotted seatrout, southern flounder, and brown shrimp) have shown a steady trend over the last 10 to 20 years. Other populations (Gulf menhaden, white shrimp, and blue crab) have had an increasing trend over the same period. The American oyster, an estuarine resident, has shown a greatly increasing trend due to the freshwater diversion. The freshwater assemblage has shown an increasing population trend (channel catfish and especially largemouth bass). Populations of the Spanish mackerel have been steady. In the future, all of the above populations are projected to show increasing trends except for spotted seatrout, southern flounder, and Spanish mackerel, which are projected to remain steady.

Populations of brown pelicans, wading birds, dabbling and diving ducks, rails, gallinules, coots and American alligators have shown increasing trends over the last 10 to 20 years. Other wildlife populations such as seabirds, shorebirds, raptors, furbearers, and game mammals have remained steady. In the future, most populations such as seabirds, wading birds, shorebirds, raptors, furbearers and game mammals are projected to remain steady. Dabbling and diving duck populations are projected to increase, as are those of American alligators, rails, gallinules, and coots.

**Infrastructure** - The 8,000 cfs capacity freshwater diversion at Caernarvon is the major infrastructure in the area. The Mississippi River levee lies next to the river in this unit. Louisiana Highway 39 parallels the river levee. Bayou Terre aux Boeufs is maintained at 5 ft deep by 50 ft wide over a 10-mile stretch. There are 101 miles of oil and gas pipelines in the unit and 847 oil and/or natural gas wells.

#### **Previously Proposed Strategies -**

Preservation of the Terre aux Boeufs ridge in the area, managing hydrology in fresh/intermediate marsh, constructing a reef zone, and protecting the bay shorelines have all been proposed in the past. A major sediment diversion was previously proposed for this unit.

#### **Coastal Use/Resource Objectives -**

The habitat objectives in this unit are to maintain a band of fresh marsh parallel to the river, gradually blending through intermediate and brackish to saline marshes. Resource objectives include increasing or maintaining populations of

shrimp, blue crabs, American oysters, freshwater and saltwater finfish, American alligators, furbearers, and waterfowl. Increasing recreation and tourism, water quality enhancement, and a storm buffer of marsh to protect communities, roads, levees, bridges, and oil and gas infrastructure are also objectives for the area.

**Regional Ecosystem Strategies** - The possibility of enriching the existing diversion with sediment is recommended. A delta-building diversion into American Bay would provide benefits to this unit. Wave absorbers at the head of the bay would greatly reduce edge erosion.

**Benefits of Regional Strategies** - The recommended strategies would prevent less than 50% of the projected loss in this unit. Adding more sediment and nutrients to the unit should improve habitat for freshwater fish, waterfowl, American alligators, and furbearers. Recreation and tourism would also be enhanced. There would be additional marsh that would provide a storm buffer to roads, levees, bridges, oil and gas infrastructure, and the communities along the river. Wave absorbers would prevent the loss of marsh and enhance habitat for estuarine organisms, as well as increase recreation and tourism and the storm buffering capacity of the marsh.

**Mapping Unit and Programmatic Strategies** - Monitoring results from the existing diversion should be evaluated to see how the diversion could be operated to derive maximum benefits. The possibility of a diversion of more than 4,000 cfs should be evaluated. There are

no programmatic strategies proposed for this unit.

### *Lake Lery*

**Location** - This 21,300-acre unit is located in St. Bernard Parish. The unit extends from Big Mar and Bayou Mandeville on the west to Bayou Terre aux Boeufs on the east. The northern boundary is the Bayou La Loutre ridge and the southern boundary is Lake Lery. The small communities of St. Bernard, Estopinal, Toca, and Verret lie along Louisiana Highway 46 just north of this unit. The communities of Reggio and Delacroix lie along Louisiana Highway 300 just to the east.

**Habitat Description and Landscape Change** - This unit and the three adjacent to it have a unique history. In 1923 and again in 1927, the Mississippi River levee at Caernarvon was destroyed to relieve pressure on upriver levees in New Orleans. These units received massive amounts of sediment, nutrients, and fresh water from the Mississippi River. There must have been some fresh or, at least, intermediate marsh in the upper portion of this unit in the 1920's.

By 1949, however, the area was entirely brackish marsh and remained that way through 1988. In 1991, the Caernarvon Freshwater Diversion structure became operational, and there is now fresh marsh appearing in the vicinity of Big Mar and around Lake Lery.

**Historic Land Loss** - In 1932, this unit had approximately 15,880 acres of marsh. By 1990, it had only 12,620 acres of marsh. A total of 3,260 acres was lost between 1932 and 1990. The

major cause of loss in this unit has been storm-related, as hurricanes drove salty water into the northern reaches. About 2,190 acres were lost from 1956-1974, mainly due to Hurricane Betsy. Altered hydrology, caused by numerous canals, has exacerbated the storm-related loss and caused greater tidal scour and saltwater intrusion. Even the massive amounts of sediment introduced in the 1920's could not prevent loss once the river levee was repaired. Nutria herbivory has caused and is continuing to cause marsh loss. About 600 acres were lost from 1974-1983. From 1983-1990, the loss was reduced to only 400 acres. Subsidence is intermediate in this unit (1.1- 2.0 ft/century).

**Future Land Loss Projections** - In 1990, this unit had 12,620 acres of marsh. Over the next 60 years, approximately 3,110 acres, 24.6% of the area, is projected to be lost if nothing is done. However, the Caernarvon Freshwater Diversion and outfall management projects should prevent the loss of 2,090 acres. Therefore, only 8.1% of the unit is projected to be lost.

For three years (1994, 1995, and 1996) the freshwater structure was operated to maximize sediment input by passing 8,000 cfs during the winter months. Recent data from DNR indicates that in seven individual plots near Big Mar and Lake Lery, up to 400 acres of marsh may have been created during that time. If this pattern continues, even though the structure is not planned to be operated above 4,000 cfs, the above estimate of future marsh loss is far too high.

**Fish and Wildlife Resources** - Many species of the estuarine dependent

assemblage (red and black drum, spotted seatrout, southern flounder, and brown shrimp) have shown a steady population trend over the last 10 to 20 years. Other populations (Gulf menhaden, white shrimp, and blue crab) have had an increasing trend over the same period. The American oyster, an estuarine resident, has shown a greatly increasing trend due to the freshwater diversion, and the freshwater assemblage (channel catfish and especially largemouth bass) has shown an increasing population trend. In the future, populations of all the above are projected to show increasing trends, except for southern flounder, which are projected to remain steady.

Brown pelicans, wading birds, dabbling and diving ducks, rails, gallinules, coots, and American alligators have shown increasing population trends over the last 10 to 20 years. Other wildlife populations such as seabirds, shorebirds, raptors, furbearers, and game mammals have remained steady. In the future, most populations (seabirds, wading birds, shorebirds, raptors, furbearers, and game mammals) are projected to remain steady. Dabbling and diving duck populations are projected to increase, as are those of American alligators, rails, gallinules, and coots.

**Infrastructure** - The 8,000 cfs capacity freshwater diversion at Caernarvon is the major infrastructure in the area. The Mississippi River levee lies next to the river, and Louisiana Highway 39 parallels the river levee. There are no primary or secondary roads in the unit. There is nearly a mile of tertiary road within the unit, and there are no railroads present. There are over 28 miles of

natural gas pipelines in the unit and 355 oil and/or natural gas wells.

**Previously Proposed Strategies -**

Managing hydrology in fresh/intermediate marsh, a major freshwater diversion, and a major sediment diversion in this unit were proposed in the past.

**Coastal Use/Resource Objectives -** The habitat objectives in this unit are to have fresh marsh in the western portion of the unit gradually blending through intermediate to brackish in the east.

Resource objectives include shrimp, blue crabs, American oysters, freshwater and saltwater finfish, waterfowl, recreation and tourism, as well as a storm buffer of marsh to protect communities and roads, levees, and bridges.

**Regional Ecosystem Strategies -**

Because this unit is receiving significant benefits from the Caernarvon diversion, no regional strategies are proposed.

**Benefits of Regional Strategies -** Not applicable.

**Mapping Unit and Programmatic Strategies -**

Because this unit is receiving significant benefits from the Caernarvon diversion, no mapping unit or programmatic strategies are proposed.

*River aux Chenes*

**Location -** This 28,986-acre unit lies in Plaquemines Parish just east of the Mississippi River and extends from the communities of Bertrandville to Pointe a la Hache along the river. River aux Chenes is the eastern boundary of the unit.

**Habitat Description and Landscape Change -**

During much of the 1800's, this area was composed of plantations and small farms, with fields extending into what is marsh today. This unit received some sediment and fresh water during the 1920's when the Mississippi River levee near Caernarvon was dynamited for flood control in New Orleans. There might have been fresh to intermediate marsh in the northern portion after that time. By 1949, the unit was mostly brackish with some saline marsh in the southern end. In 1968 and again in 1978, it was classified as mostly brackish, but there was some intermediate marsh in the northern area and less saline marsh in the south. By 1988, the intermediate and saline marsh were gone, and the area was entirely brackish.

**Historic Land Loss -**

In 1932, there were 23,870 acres of marsh in this unit. Approximately 1,260 acres were lost from 1932-1956. Another 2,190 acres of marsh disappeared between 1956 and 1974 when Hurricane Betsy drove salt water into the intermediate marsh. Dredging of canals, mainly from the 1950's to the 1970's, altered the hydrology and allowed tidal scour and saltwater intrusion. A total of 5,120 acres of marsh were lost between 1932-1990. Currently, the driving forces of marsh loss are probably altered hydrology and subsidence. Land loss dropped in the 1974-1983 period to 1,100 acres and even further to only 570 acres from 1983-1990. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections -**

In 1990, this unit had 18,750 acres of

marsh. If nothing is done, this unit is estimated to lose 4,870 acres (26% of the 1990 marsh acreage) by 2050. Some fresh water and nutrients enter the area from the Caernarvon Freshwater Diversion and this will prevent the loss of about 550 acres over 60 years. Thus, by 2050, this unit will lose about 23% of the marsh that was present in 1990.

**Fish and Wildlife Resources** - Many species of the estuarine dependent assemblage (red and black drum, spotted seatrout, southern flounder, and brown shrimp) have shown steady population trends over the last 10 to 20 years. Other populations (Gulf menhaden, blue crab, and white shrimp) have shown increasing population trends over the same period. The resident American oyster has shown increasing populations, while Spanish mackerel populations have remained steady. The freshwater assemblage, represented by largemouth bass and channel catfish, has shown increasing populations. In the future, populations of all of the above are projected to remain steady except those of the American oyster and the freshwater assemblage, which are expected to increase.

The brown pelican and the American alligator have shown increasing population trends over the last 10 to 20 years. Other wildlife (seabirds, shorebirds, wading birds, dabbling and diving ducks, rails, gallinules, coots, raptors, furbearers, and game mammals) have shown steady populations during that time period. In the future, the brown pelican and American alligator are projected to continue to increase, while all other wildlife species will remain steady.

**Infrastructure** - The Mississippi River is revetted through most of this unit. The river's flood control levee runs the entire length of the unit. There is a hurricane protection levee along the 40-arpent line from Phoenix to Pointe a la Hache; Louisiana Highway 39 parallels the river through the area. There are no primary or secondary roads and no railroads. There is about one-half mile of tertiary road in this unit. There are, however, about eight miles of natural gas pipelines and 88 oil and/or natural gas wells in this unit.

**Previously Proposed Strategies** - Freshwater diversions and preservation of the River aux Chenes ridge have been proposed in the past for this unit.

**Coastal Use/Resource Objectives** - The parish prefers that forested wetlands remain in the northern portion of the unit and grade through fresh marsh to intermediate and brackish marsh in the southern portion. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer for communities and help protect navigational facilities.

**Regional Ecosystem Strategies** - A small diversion of less than 5,000 cfs into the upper portion of this unit is recommended. A delta-building diversion into American Bay is recommended. It would provide great benefits to this unit.

**Benefits of Regional Strategies** - The siphon and delta-building diversion would preserve fresh and intermediate

marsh and prevent less than 50% of the projected loss in this unit. It will increase populations of shrimp, blue crabs, saltwater and freshwater finfish, American oysters, American alligators, furbearers, and waterfowl, and will benefit recreation and tourism. The preserved marsh will act as a storm buffer that will protect navigational facilities and communities along the river.

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

*Jean Louis Robin*

**Location** - This 110,000-acre unit is located in St. Bernard Parish, south of the Bayou La Loutre ridge, east of Bayou Terre aux Boeufs, and west of the Mississippi River Gulf Outlet (MRGO) disposal area. The communities of Alluvial City, Yscloskey, Shell Beach, and Hopedale lie on the La Loutre Ridge north of this unit. The communities of Reggio and Delacroix lie along Louisiana Highway 300 to the west.

**Habitat Description and Landscape Change** - The area was about half brackish and half saline in 1949. By 1968, the saline marsh had extended slightly north. By 1988, the saline marsh had again moved slightly northward.

**Historic Land Loss** - In 1932, there were 48,060 acres of marsh in this unit. The area lost 7,000 acres from 1932 to 1974, mostly due to storm-related loss, as hurricanes, such as Betsy, pushed saline waters into northern fresher areas.

Altered hydrology and wind erosion of shorelines also played a role in the loss. Between 1974 and 1990, another 3,120 acres were lost, with subsidence and wind erosion as the major causes. Subsidence is intermediate in this unit, ranging from 1.1-2.0 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 37,940 acres of marsh. By 2050, an additional 9,340 acres are projected to be lost, mainly due to subsidence and wind erosion. The Caernarvon Freshwater Diversion and the marsh creation project that uses dredged material from the MRGO west of the jetties will prevent the loss of 4,420 acres. Therefore, by 2050, over 13% of the marsh acreage present in 1990 will be gone.

**Fish and Wildlife Resources** - Populations of many species of the estuarine dependent assemblage (red and black drum, spotted seatrout, southern flounder, blue crab, and brown shrimp) have shown a steady trend over the last 10 to 20 years. Other species (Gulf menhaden and white shrimp) have shown an increasing trend over the same period. The resident American oyster has shown increasing populations, while Spanish mackerel populations have remained steady. The freshwater assemblage, represented by the largemouth bass, has had steady populations. In the future, populations of all of the above are projected to remain steady, while those of the American oyster are expected to increase.

Brown pelicans, rails, gallinules, coots, and American alligators have shown increasing population trends over the last

10 to 20 years. Other wildlife species such as seabirds, shorebirds, wading birds, dabbling and diving ducks, raptors, furbearers, and game mammals have had steady populations during that time period. In the future, the same wildlife species that have shown increasing population trends are projected to do the same. Seabird, wading bird, shorebird, raptor, and furbearer populations are projected to decline.

**Infrastructure** - There are no primary or secondary roads in the unit; however, eight miles of tertiary roads are present. There are no railroads in this unit. The MRGO runs through the units immediately east of this unit. There are 19.5 miles of natural gas pipelines in the unit and 163 oil and/or natural gas wells. The outfall from two drainage pumps enters the unit and there is one industrial surface-water well.

**Previously Proposed Strategies** - Several plans have proposed building a delta with major sediment diversions into the American Bay area, and the effects would extend into this mapping unit. Other proposed strategies include protecting bay and lake shorelines, developing reef zones, preserving the La Loutre and Terre aux Boeufs ridges, creating some near shore barrier islands, managing hydrology, and developing a reef zone. The Caernarvon Freshwater Diversion project is in place and the outfall should benefit the fresh to intermediate marsh hydrology in this unit.

**Coastal Use/Resource Objectives** - The parish prefers brackish marsh in the northern portion of the unit and saline

marsh in the southern area. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, furbearers, waterfowl, and recreation and tourism. Water quality enhancement is desired. The parish recognizes that the preserved marsh will provide a storm buffer to protect communities and navigational facilities.

**Regional Ecosystem Strategies** - Wave absorbers are recommended around fringing marshes at the southern end of the unit to prevent erosion. A delta-building diversion into American Bay would provide benefits in this unit.

**Benefits of Regional Strategies** - The wave absorbers and delta-building diversion will preserve some brackish marsh and prevent less than 50% of the projected loss in this unit. They will slightly increase populations of shrimp, blue crabs, saltwater finfish, American oysters, furbearers, waterfowl, and will benefit recreation and tourism. The preserved marsh will act as a storm buffer to protect navigational facilities and communities.

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

### *American Bay*

**Location** - This 143,400-acre unit is located in Plaquemines Parish. It includes the marshes just east of the Mississippi River from the community of Pointe a la Hache, south past Fort St. Philip, nearly to Baptiste Collette Bayou.

**Habitat Description and Landscape**

**Change** - In 1949 and 1968, the area was brackish adjacent to the river and saline near Breton Sound and the bays. The high ground near the river was forested. By 1978, the brackish area had expanded, and there was an area of intermediate marsh near Fort St. Philip. By 1988, the saline marsh had expanded toward the river. However, there were numerous breaks in the natural levee near the fort and small delta splays of fresh marsh were building. These small deltas are continuing to grow.

**Historic Land Loss** - In 1932, this unit had 53,870 acres of marsh. From 1932-1974, nearly 6,470 acres of marsh were lost, mainly due to dredging, wind erosion, and subsidence. Between 1974 and 1990, another 5,060 acres were lost due to continued subsidence, wind erosion, and altered hydrology, which allowed higher salinity and greater tidal energies into the area. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 42,340 acres of marsh. The delta splays will continue to build land, but by 2050, some 13,880 acres could be lost due to continued subsidence and wind erosion, if nothing is done. However, the Caernarvon Freshwater Diversion will prevent the loss of about 1,240 acres, mostly in the saline fringe. Even with this project in place, 29.9% of today's acres could be lost.

**Fish and Wildlife Resources** - Many species of the estuarine dependent assemblage (red and black drum, spotted seatrout, southern flounder, and brown

shrimp) have shown a steady population trend over the last 10 to 20 years. Other populations (Gulf menhaden, white shrimp and blue crab) have shown increasing trends over the same period. Populations of the American oyster have shown an increasing trend, and the Spanish mackerel has had steady populations. In the future, all of the above are projected to have steady populations.

Brown pelicans and wading birds have shown increasing population trends over the last 10 to 20 years. Furbearer and American alligator populations have been decreasing over the same time period. Other wildlife populations, such as game mammals, seabirds, shorebirds, ducks, and raptors have been steady. In the future, brown pelican populations are expected to continue to increase, while nearly all other wildlife species are projected to show decreasing populations.

**Infrastructure** - The Mississippi River does not need to be dredged for navigation in this reach. The New Orleans to Venice Hurricane Protection Levee extends from Pointe a la Hache to Bohemia, and Louisiana Highway 39 extends to Bohemia within the hurricane levees. The water supply for towns in this unit comes from the Mississippi River. The Bayou Lamoque Diversion structure, across the river from Empire, can divert up to 12,000 cfs of Mississippi River water into the area, but the Bohemia Freshwater Diversion structure south of Pointe a la Hache is presently inoperable. The Caernarvon Freshwater Diversion structure can pass up to 8,000 cfs into the Breton Sound Basin, and some of the water reaches

this unit. No primary or secondary roads and no railroads are present in the unit. There are nearly 15 miles of tertiary roads in this unit and over 209 miles of oil and gas pipelines. There are 1,083 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies -**

Previous restoration plans recommended major sediment diversions in this area because it is near the Mississippi River and opens to shallow bays. Outfall management of the Bayou Lamoque diversion and restoration and outfall management of the Bohemia diversion was also recommended. Preservation of the forested ridge, protection of bay and lake shorelines, and development of a reef zone have also been proposed.

**Coastal Use/Resource Objectives -** The habitat objectives in this unit involve bands of marsh parallel to the river, with fresh marshes gradually blending through intermediate and brackish to saline marsh. The desired coastal resources are shrimp, blue crabs, American oysters, freshwater and saltwater finfish, American alligators, furbearers, waterfowl, recreation and tourism, and a storm buffer of marsh to protect oil and gas infrastructure.

**Regional Ecosystem Strategies -** A small diversion (less than 1,000 cfs) east of Empire is recommended, and a much larger sediment diversion (about 40,000 cfs) is recommended into the Quarantine Bay area. This diversion would consist of a series of deep man-made crevasses in the natural levee north of Fort St. Philip. The waters would be contained by a low levee between Sable Island and California Point so that the sediments would not seriously impact oystering

areas. A large sediment diversion (from 20,000 cfs to 100,000 cfs) into American Bay is also recommended. Wave absorbers are recommended along the fringing marshes at the northern edge of the unit.

**Benefits of Regional Strategies -**

These strategies would essentially stop all marsh loss and actually create marsh, so by 2050 there would be significantly more marsh than there is today. The large diversion into Quarantine Bay and American Bay would, at first, adversely impact American oysters by importing more fresh water into the area.

However, once salinities stabilized, there would be more American oysters than today. Shrimp and saltwater finfish would be displaced, but populations would increase. The diversion would provide excellent habitat for freshwater finfish, furbearers, American alligators, and waterfowl, and the new marsh created by this diversion would provide a significant storm buffer to communities on both sides of the river. The small diversion near Empire might slightly displace saltwater finfish and shrimp, but, overall, there would be slightly increased populations of these groups. Conditions would be improved for freshwater finfish, waterfowl, furbearers, and American alligators. The wave absorbers would prevent marsh loss and help preserve populations of all groups mentioned above.

**Mapping Unit and Programmatic**

**Strategies -** There are no mapping unit or programmatic strategies recommended in this unit.

## **Mississippi River Birdsfoot Delta**

### *Baptiste Collette*

**Location** - This 33,700-acre unit is located in Plaquemines Parish. It extends from the Mississippi River to the end of the Baptiste Collette Bayou and about three miles on either side of the bayou. It lies across the river from the community of Venice.

**Habitat Description and Landscape Change** - In 1949, the unit was a mixture of fresh, brackish, and saline marsh. In 1968, it was classified as fresh, intermediate, and brackish. The amount of brackish marsh increased in 1978, and by 1988, it was about 60% intermediate, 20% fresh, and 20% brackish.

**Historic Land Loss** - Of the original 14,850 acres of marsh in this unit, about 2,810 acres were lost between 1932 and 1956. The greatest loss was from 1956-1974 when 5,790 acres disappeared due to a combination of subsidence, altered hydrology, and hurricanes. The same forces, with wind erosion added, continued to cause the loss of 1,750 acres from 1974-1990. A total of 10,350 acres of marsh were lost between 1932 and 1990. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had approximately 4,300 acres of marsh. If nothing is done, about 2,900 acres (64% of the 1990 marsh) are projected to be lost by 2050. However, the U.S. Army Corps of Engineers (USACE) uses the material from dredging the bayou to create marsh. By

2050, this effort will save 1,400 acres. Thus, by 2050, only 33% of the present marsh acreage is estimated to be lost.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, all assemblages have had steady populations of representative species: estuarine dependent (red and black drum, spotted seatrout, southern flounder, Gulf menhaden, white and brown shrimp, and blue crab); estuarine resident (American oyster); marine (Spanish mackerel); and freshwater (channel catfish and largemouth bass). In the future, populations of all species in the estuarine dependent assemblage are projected to decrease. Those of the American oyster, Spanish mackerel, largemouth bass, and channel catfish are expected to remain steady.

The brown pelican is the only wildlife species that has shown increasing population trends over the last 10 to 20 years. The American alligator has had decreasing populations over this period. All other wildlife such as seabirds, shorebirds, wading birds, dabbling and diving ducks, geese, rails, gallinules, coots, raptors, furbearers, and game mammals have had steady populations for the last 10 to 20 years. In the future, the pelican populations are expected to continue to increase. Wading bird, shorebird, seabird, and raptor populations are projected to decrease. Other wildlife species are expected to have steady populations.

**Infrastructure** - The Mississippi River adjacent to this unit is at least 45 ft deep. No dredging is required. There is neither a Mississippi River levee in this unit, nor any roads or railroads. Baptiste Collette

Bayou is maintained at a depth of 14 ft and a width of 150 ft for six miles and at a depth of 16 ft and a width of 250 ft to the 16-ft contour. There are nearly 42 miles of oil and gas pipelines and 666 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - A major sediment diversion near this unit and beneficial use of dredged material have been proposed in the past.

**Coastal Use/Resource Objectives** - Fresh marsh is desired near the Mississippi River, and intermediate marsh is desired along the fringes of this unit. Resources that are preferred by the parish are shrimp, blue crabs, freshwater and saltwater finfish, American alligators, furbearers, waterfowl, recreation and tourism, cattle grazing, and a storm buffer of marsh to protect oil and gas infrastructure and communities, such as Venice, on the west bank of the river.

**Regional Ecosystem Strategies** - A sediment trap in the Mississippi River, south of Venice, is proposed in the short term to prevent much of the river's sediment from being lost off the Continental Shelf. A 50,000 cfs diversion into the southern portion of this unit is also recommended. Relocation of the navigation channel would allow river sediments to be better used in this unit.

**Benefits of Regional Strategies** - If the regional strategies described above were implemented, there would be an overall gain of marsh in this unit. The blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism would all be

enhanced. Shrimp and saltwater finfish might be displaced, but should not decrease as they are projected to as a result of no action. A significant storm buffer would also be provided for oil and gas infrastructure and communities.

**Mapping Unit and Programmatic Strategies** - Two mapping unit strategies recommended in this unit are dedicated dredging and beneficial use of dredged material. Both would make use of the sediment resources of the river and the bayou. There are no programmatic strategies proposed for this unit.

### *Cubit's Gap*

**Location** - This 68,900-acre unit is located in Plaquemines Parish. It extends from the Mississippi River to the end of Main Pass and about five miles on either side of the pass. The area includes passes Octave and Raphael and numerous shallow ponds. The community of Pilottown lies in this unit.

**Habitat Description and Landscape Change** - In 1949, this unit was a mixture of fresh, brackish, and saline marsh. By 1978, the saline and brackish marshes were gone, and the area remained a mixture of fresh (85%) and intermediate (15%) marsh through 1988.

**Historic Land Loss** - In 1932, there were 50,040 acres of marsh in this unit. Several hurricanes passed through the area from 1932-1956, and this force, combined with a subsidence rate of more than 3.5 ft/century, caused the loss of 13,420 acres, and another 15,320 acres were lost from 1956-1974. Since then, the area has been slowly rebuilding. There is some gain of marsh every year

due to the sediments and nutrients brought by the river, but there is still a net loss (1,140 acres from 1974-1983 and 1,200 acres from 1983-1990). Much of this loss is caused by continued very high subsidence rates of over 3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 18,960 acres of marsh. With no action, an additional 6,370 acres (34% of the 1990 marsh acreage) are estimated to be lost by 2050. The already constructed Channel Armor Gap Crevasse will preserve 520 acres by 2050. The USACE will "mine" the hopper dredge disposal site in the mouth of Pass a Loutre in 1997 and again every 20 years. The material will be placed to create over 600 acres of marsh. The Delta-Wide Crevasses project will create about 1,100 acres of marsh by 2050. With these projects and no others, approximately 20% of the 1990 acres will still be lost by 2050.

**Fish and Wildlife Resources** - Over the last 10 to 20 years all assemblages have had steady populations of representative species: estuarine dependent (red and black drum, spotted seatrout, southern flounder, Gulf menhaden, white and brown shrimp, and blue crab); estuarine resident (American oyster); marine (Spanish mackerel); and freshwater (channel catfish and largemouth bass). In the future, populations of all species in the estuarine dependent assemblage are projected to decrease. Those of the American oyster, Spanish mackerel, largemouth bass, and channel catfish are expected to remain steady.

The brown pelican is the only wildlife species that has shown increasing

population trends over the last 10 to 20 years. All other wildlife such as seabirds, shorebirds, wading birds, dabbling and diving ducks, geese, rails, gallinules, coots, raptors, furbearers, American alligators, and game mammals have shown steady population trends for the last 10 to 20 years. In the future, the pelican populations are expected to continue to increase. Wading bird, shorebird, seabird, and raptor populations are projected to decrease. Other wildlife groups are expected to show steady population trends.

**Infrastructure** - The Mississippi River is maintained at a depth of 45 ft and a width of 1,000 ft adjacent to this unit. Approximately 10 million cubic yards are dredged annually with a hopper dredge, and most of this material is placed into the mouth of Pass a Loutre or South Pass. There are no primary or secondary roads or railroads in this unit. There are 0.4 miles of tertiary roads, 54 miles of pipelines, and 434 oil and/or natural gas wells in the unit. The Delta National Wildlife Refuge (NWR) lies within this unit.

**Previously Proposed Strategies** - Beneficial use of dredged material and a sediment diversion that would affect this unit have been proposed in the past. The CCEER proposed abandonment of the current Birdsfoot Delta and relocation of delta-building processes into shallower water bodies.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in the core of the unit with a fringe of intermediate marsh. The desired coastal resources are shrimp, blue crabs, saltwater and freshwater finfish, American alligators,

furbearers, waterfowl, and recreation and tourism. Cattle grazing is also desired, and scientific study on the Delta NWR is important. The parish recognizes that the preserved marsh will provide a storm buffer to protect communities, navigational facilities, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - Maintaining existing delta splays and building more splays are recommended. Construction of a sediment trap in the Mississippi River south of Venice, and utilizing the material to create marsh is also recommended. Relocation of the navigation channel to prevent the loss of sediment off the Continental Shelf should be studied and implemented if feasible. A large delta-building diversion (50,000 cfs) between Cubit's Gap and Baptiste Collette Bayou is another recommended strategy.

**Benefits of Regional Strategies** - If the regional strategies described above were implemented, there would be an overall gain of marsh in this unit. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, cattle grazing, and recreation and tourism would all be enhanced. Shrimp and saltwater finfish would be displaced, but they would not decrease as they are projected to do if nothing is done. There would be more marsh for educational pursuits and scientists could study the results of a large diversion. A significant storm buffer would be provided for oil and gas infrastructure, navigational facilities, and communities.

**Mapping Unit and Programmatic Strategies** - The mapping unit strategy of beneficially using dredged material is

recommended in this unit. There are no programmatic strategies proposed for this unit.

### *Pass a Loutre*

**Location** - This 114,000-acre unit is a triangle located in the Birdsfoot Delta in Plaquemines Parish. The apex of the triangle is at Head of Passes. One side is South Pass and the other side is a line about a mile north of Pass a Loutre. The Pass a Loutre Wildlife Management Area (WMA) lies within this unit.

**Habitat Description and Landscape Change** - The entire area was classified as fresh marsh in 1949. By 1968, there was some intermediate marsh at the gulfward edges. In 1988, 80% was fresh and 20% intermediate marsh.

**Historic Land Loss** - This unit contained 49,880 acres of marsh in 1932. A total of 22,060 acres of marsh were lost in this unit between 1932 and 1990. Over 20,000 acres had been lost due to subsidence, hurricanes, and altered hydrology from oil field canals by 1974. More recently, the area is slowly healing due to the massive amounts of sediments and nutrients brought by the river. Several agencies have built small delta splays which are growing, and the clumps of roseau cane are slowly coalescing. Only 2,050 acres were lost in the 16 years from 1974-1990, and most of this loss was due to subsidence and storm erosion. Subsidence is very high in this unit, reaching rates of over 3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 27,820 acres of marsh. By 2050, if nothing is done, an

estimated 6,340 acres will be lost. Even with the preservation of 990 acres from the CWPPRA project to build and maintain crevasses, by the year 2050, 19.2% of the 1990 acres will still be lost.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, all fish assemblages have had steady populations of representative species: estuarine dependent (red and black drum, spotted seatrout, southern flounder, Gulf menhaden, white and brown shrimp, blue crab); estuarine resident (American oyster); marine (Spanish mackerel); and freshwater (channel catfish and largemouth bass). In the future, populations of all species in the estuarine dependent assemblage are projected to decrease. Those of the American oyster, Spanish mackerel, largemouth bass, and channel catfish are expected to remain steady.

Over the past 10 to 20 years, brown pelican populations have increased. All other wildlife groups (seabirds, wading birds, shorebirds, dabbling and diving ducks, geese, raptors, rails, gallinules, coots, furbearers, game mammals, and the American alligator) have shown steady populations over this period. In the future, the pelican is expected to continue to increase while seabirds, wading birds, shorebirds, and raptors are projected to have decreasing populations. All other wildlife species groups are expected to remain steady.

**Infrastructure** - The South Pass channel is maintained at a depth of 30 ft and a width of 450 ft, and the bar channel is 600 ft wide. The first maintenance in several years is scheduled in 1998. There are no primary

or secondary roads and no railroads in this unit. There are 0.4 miles of tertiary roads in the unit. Oil and gas exploration is common in the unit, and there are 16 miles of natural gas pipelines and 1,591 oil and/or natural gas wells.

**Previously Proposed Strategies** - Managing fresh to intermediate marsh hydrology, sediment diversions, and beneficial use of dredged material have all been proposed in the past to benefit marshes in this unit. The CCEER proposes abandonment of the current Birdsfoot Delta and relocation of delta-building processes into shallower water bodies.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in the core of the unit with a fringe of intermediate marsh. The desired coastal resources are shrimp, blue crabs, saltwater and freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. Cattle grazing is also desired. The parish recognizes that the preserved marsh will provide a storm buffer to protect communities, navigational facilities, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - Maintaining existing delta splays and building more splays are recommended in this unit. Construction of a sediment trap in the Mississippi River south of Venice and utilizing the material to create marsh in this unit is also recommended. Relocation of the navigation channel to prevent the loss of sediment off the continental shelf should be studied and implemented if feasible.

**Benefits of Regional Strategies** - If the

regional strategies described above were implemented, there would be an overall gain of marsh in this unit. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, cattle grazing, and recreation and tourism would all be enhanced. Shrimp and saltwater finfish would be displaced, but they would not decrease as projections suggest if nothing is done. A significant storm buffer would be provided for oil and gas infrastructure, navigational facilities, and communities.

**Mapping Unit and Programmatic Strategies** - The mapping unit strategies proposed for this unit are to use dedicated dredging to create marsh and to use dredged material from the river beneficially, and to restore hydrology by limiting the depth of South Pass to encourage flow out of Pass a Loutre. There are no programmatic strategies proposed for this unit.

### *East Bay*

**Location** - This 69,600-acre unit in Plaquemines Parish is a triangle with its apex at Head of Passes. It extends along South Pass and Southwest Pass and includes the fringing marshes between these passes. Much of the unit includes the waters of East Bay.

**Habitat Description and Landscape Change** - The entire unit was fresh marsh in 1949. In 1968 and 1978, it was mostly intermediate, with the only fresh marsh near Head of Passes. By 1988, it had freshened more, with 60% being fresh marsh, 20% intermediate marsh, and the remainder scrub/shrub.

**Historic Land Loss** - In 1932, there

were only 8,510 acres of marsh. From then until 1974, approximately 3,000 acres were lost, mainly due to subsidence, altered hydrology and dredging of canals. An additional 720 acres were lost between 1974 and 1990. Subsidence is very high in this unit, reaching rates over 3.5 ft/century.

**Future Land Loss Projections** - By 2050, some 1,870 acres are projected to be lost; this is 39% of the 1990 marsh acreage of 4,790 acres.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, all assemblages have shown steady population trends of representative species: estuarine dependent (red and black drum, spotted seatrout, southern flounder, Gulf menhaden, white and brown shrimp, and blue crab); estuarine resident (American oyster); marine (Spanish mackerel); and freshwater (channel catfish and largemouth bass). In the future, populations of all species in the estuarine dependent assemblage are projected to decrease. The American oyster, Spanish mackerel, largemouth bass, and channel catfish populations are expected to remain steady.

The brown pelican is the only wildlife species that has shown increasing population trends over the last 10 to 20 years. All other wildlife such as seabirds, shorebirds, wading birds, dabbling ducks, rails, gallinules, coots, raptors, and game mammals have shown decreasing population trends during the last 10 to 20 years. Other wildlife such as diving ducks, geese, furbearers, and the American alligator have shown steady population trends. In the future, the pelican population is projected to

increase while all other wildlife groups, except furbearers and the American alligator, are expected to decrease.

**Infrastructure** - Southwest Pass is maintained at a depth of 45 ft and a width of 800 ft. There is one mile of tertiary road and 29 miles of natural gas pipelines in the unit. There are also 1,261 oil and/or natural gas wells in this unit.

**Previously Proposed Strategies** - Managing fresh to intermediate marsh hydrology, sediment diversions, and beneficial use of dredged material have all been proposed in the past to benefit marshes in this unit. The CCEER has proposed abandonment of the current Birdsfoot Delta and relocation of delta-building processes into shallower water bodies.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in the core of the unit with a fringe of intermediate marsh. The desired coastal resources are shrimp, blue crabs, saltwater and freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. Cattle grazing is also desired, and the parish recognizes that the preserved marsh will provide a storm buffer to protect communities, navigational facilities, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - Construction of a sediment trap in the Mississippi River south of Venice and utilizing the material to create marsh in this unit is recommended. Relocation of the navigation channel to prevent the loss of sediment off the continental shelf should be studied and implemented if feasible.

**Benefits of Regional Strategies** - If the regional strategies described above were implemented, there would be an overall gain of marsh in this unit. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, cattle grazing, and recreation and tourism would all be enhanced. Shrimp and saltwater finfish would be displaced, but they would not decrease as they are projected to if nothing is done. A significant storm buffer would be provided for oil and gas infrastructure.

**Mapping Unit and Programmatic Strategies** - Mapping unit strategies include beneficial use of dredged material from South Pass to create marsh to protect Southwest Pass, dedicated dredging to create marsh, and establishment of a reef zone. No programmatic strategies are proposed for this unit.

### *West Bay*

**Location** - This 108,000-acre unit is located in Plaquemines Parish, west of the Mississippi River from Venice to the end of Southwest Pass. The western boundary is Spanish Pass.

**Habitat Description and Landscape Change** - In 1949, this unit was classified as fresh marsh and contained large areas of flotant. By 1968, it was fresh and intermediate marsh. In 1978, it was even more saline and contained all four marsh types. In 1988, it was 30% fresh, 30% intermediate, 20% saline, and the remainder scrub/shrub and flats.

**Historic Land Loss** - The unit contained 59,640 acres of marsh in 1932. The area lost 38,400 acres from 1932-1974,

mostly due to very high subsidence rates, hurricanes that destroyed the flotant, altered hydrology, and canal dredging. Recent loss has been less; only 13,260 acres were lost between 1974 and 1990. Subsidence is very high in this unit, reaching rates of over 3.5 ft/ century.

**Future Land Loss Projections** - In 1990, this unit had 7,980 acres of marsh. It is anticipated that 1,870 acres of marsh will be lost by 2050 (91% of the area). With the CWPPRA West Bay Sediment Diversion and some crevasses, the area should experience a net gain of 7,100 acres by 2050.

**Fish and Wildlife Resources** - For the last 10 to 20 years, fishery populations of the marine assemblage (Spanish mackerel), estuarine resident assemblage (American oyster), freshwater assemblage (largemouth bass and channel catfish), and estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) have shown steady trends. In the future, with construction of the CWPPRA West Bay diversion, the freshwater assemblage is projected to increase, as well as some of the estuarine dependent assemblage (red and black drum, Gulf menhaden, and white shrimp). The remainder of the assemblages are expected to remain steady, except for American oysters and Spanish mackerel, which will decline.

The brown pelican has shown an increasing trend over the last 10 to 20 years. All other wildlife, such as wading birds, seabirds, shorebirds, ducks, geese, raptors, furbearers, game mammals, and

the American alligator have shown a steady trend over the same period. With the construction of the West Bay diversion, marsh will significantly increase in the unit, and all of the above are projected to increase over the next 50 years. As the amount of open water decreases, seabird populations are projected to decrease in this unit.

**Infrastructure** - The Mississippi River is maintained at 45 ft deep adjacent to this unit. All the dredged material is removed by hopper dredge. A CWPPRA demonstration project will determine if the material can be removed with a dustpan dredge and placed near the shore where a cutterhead dredge will create marsh with it. If this is feasible from engineering and economic viewpoints, the land gain may be even greater than discussed. There are 12.2 miles of tertiary roads, 88.5 miles of pipelines, and 1,670 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - Several restoration plans have proposed a large sediment diversion in this unit. Beneficial use of dredged material has also been proposed to benefit marshes in this unit. The CCEER plan proposes abandonment of the current Birdsfoot Delta and relocation of delta-building processes into shallower water bodies.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in the core of the unit with a fringe of intermediate marsh. The desired coastal resources are shrimp, blue crabs, saltwater and freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. Cattle grazing is also desired. The parish recognizes that the preserved

marsh will provide a storm buffer to protect communities, navigational facilities, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - Maintaining existing delta splays and building more splays are recommended in this unit. Construction of a sediment trap in the Mississippi River south of Venice and utilizing the material to create marsh in this unit is also recommended. Relocation of the navigation channel to prevent the loss of sediment off the continental shelf should be studied and implemented if feasible. Plaquemines Parish desires that the barrier shoreline be extended from Sandy Point to Southwest Pass. This could be done with material from the sediment trap.

**Benefits of Regional Strategies** - If the regional strategies described above were implemented, there would be an overall gain of marsh in this unit. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, cattle grazing, and recreation and tourism would all be enhanced. Shrimp and saltwater finfish would be displaced, but they would not decrease as projected if nothing is done. A significant storm buffer would be provided for oil and gas infrastructure, navigational facilities and communities.

**Mapping Unit and Programmatic Strategies** - Mapping unit strategies for this unit are to recommend that Grand Pass be enriched with sediment from the Mississippi River and to use dredged material beneficially. There are no programmatic strategies proposed for this unit.

## **Barataria Basin**

### *Baker*

**Location** - This 73,966-acre unit is located in St. James and Assumption parishes. The river communities of Lagan, Hymel, and Welcome along Louisiana Highway 18 border it on the north. On the west and south, the unit follows the edges of the communities of Belle Terre, Belle Alliance, Klotzville, and Freetown, all on Louisiana Highway 308 along Bayou Lafourche. On the east, it is bordered by Louisiana Highway 20.

**Habitat Description and Landscape Change** - Major habitat types in 1949 were swamp in the lowlands and bottomland hardwoods on the natural levees of the Mississippi River and the bayous that flow through the unit. No change in habitat has occurred in this unit. In 1988, the unit consisted of 50% swamp and 50% bottomland hardwoods. Only a minor amount of marsh exists in the unit. Major waterbodies include bayous Verret and Citamon.

**Historic Land Loss** - Very sparse data are available on historic land loss or causes of loss. However, the Mississippi River levee has severed freshwater, nutrient, and sediment inflow to this unit, and cypress regeneration has been prevented by herbivory and extended flooding. Subsidence is low—less than a foot per century.

**Future Land Loss Projections** - In 1990, this unit had 640 acres of marsh and 32,760 acres of swamp. A rough estimate of land loss indicates that 230 acres, nearly 40% of the existing marsh

(640 acres), will be lost by 2050. In addition, the swamps are excessively flooded and 50% (16,380 acres) are projected to become open water or floating marsh by 2050.

**Fish and Wildlife Resources** - The trends and projections for freshwater fish such as largemouth bass and channel catfish are both steady.

Populations of wading birds, raptors, woodland avifauna, and American alligators have shown increasing trends over the last few years. All other wildlife populations have been steady. Over the next 60 years, dabbling ducks, diving ducks, raptors, and woodland migrants are projected to decrease in numbers, and American alligator populations are expected to increase.

**Infrastructure** - This unit has 3.4 miles of primary roads, one-half mile of secondary roads, 42 miles of tertiary roads, and 1.7 miles of railroads. There are also nearly 120 miles of pipelines and 277 oil and/or natural gas wells.

**Previously Proposed Strategies** - Proposed strategies include diverting fresh water from the Mississippi River into this unit, as well as using dredged material to create wetlands.

**Coastal Use/Resource Objectives** - The parish desires to maintain this unit for forested wetlands. The resource priorities are freshwater finfish, American alligators, furbearers, waterfowl, recreation and tourism, and water quality enhancement.

**Regional Ecosystem Strategies** - Small freshwater diversions off Bayou Lafourche or the Mississippi River, possibly at Lagan and des Allemands, are recommended. Before any extra water is added to this unit, protection from diversion-related flooding would have to be provided to the adjacent developed areas, and outfall of the diversions must be managed by gapping spoil banks and plugging canals.

**Benefits of Regional Strategies** - The small diversions with outfall management and flood protection are projected to slightly improve productivity within the swamp and to reduce some of the future marsh loss. Proper water management in the swamps will allow for cypress regeneration. These strategies are expected to be beneficial to freshwater finfish, American alligators, furbearers, and waterfowl. Recreation and tourism would improve slightly.

**Mapping Unit and Programmatic Strategies** - Herbivory control is recommended as a mapping unit strategy in this unit. A programmatic strategy is suggested for this unit that would allow for selective harvesting of replanted trees in mitigation banks.

### *Lake Boeuf*

**Location** - This 85,200-acre unit is located in Lafourche Parish. It is bordered on the north by Louisiana Highway 307, which connects the communities of Kraemer, Chackbay, and Bayou Boeuf. The northeast border is Bayou des Allemands, the eastern border is U.S. Highway 90, and the western border is Louisiana Highway 304. The

unit is bordered on the south by the communities along Bayou Lafourche from Thibodaux to Raceland.

**Habitat Description and Landscape Change** - In 1949, the area was mainly swamp. There was some fresh marsh south of Lac des Allemands and around Lake Boeuf. Bottomland hardwoods existed on the ridges and natural levees of Bayou Lafourche and the Mississippi River. No habitat change was observed from 1968-1988. In 1988, the unit consisted of 60% swamp, 25% fresh marsh, and 15% bottomland hardwoods.

**Historic Land Loss** - In 1932, this unit had 24,695 acres of marsh. From 1932 to 1974, some 1,155 acres of marsh were lost. This loss was due mainly to altered hydrology, as canal and levee building altered natural flows and caused extended flooding. Shoreline erosion claimed fresh marsh around Lake Boeuf. The greatest amount of loss occurred from 1974-1983, when 2,560 acres were lost. An additional 560 acres disappeared from 1983-1990. The main causes of this recent marsh loss are nutria herbivory, altered hydrology, and shoreline erosion. Subsidence in this unit is 1.1-2.0 ft/century.

**Future Land Loss Projections** - In 1990, this unit was comprised of 20,420 acres of marsh and 45,980 acres of swamp. If no further restoration occurs, this unit is projected to lose 8,040 acres (40% of the 1990 marsh) by 2050. In addition, 27,580 acres (60%) of the swamps will be lost in this unit. The Davis Pond diversion will prevent some of this loss. Therefore, by 2050, this unit will have lost about 53.6% of the 1990 wetlands.

**Fish and Wildlife Resources** - The freshwater fisheries assemblage, including largemouth bass and channel catfish, has shown steady populations over the last 10 to 20 years, as have blue crabs. Projections indicate that these trends will continue into the future.

Populations of the brown pelican, the American alligator, and raptors have shown increasing trends over the last 10 to 20 years. Bald eagles, seabirds, wading birds, shorebirds, dabbling and diving ducks, rails, gallinules, coots, furbearers, and game mammals have shown steady trends over the same period. Projections for the next 50 years show increasing populations of brown pelicans, diving ducks, and American alligators. Raptors and dabbling ducks are projected to decrease, and the other types of wildlife mentioned above are expected to remain steady.

**Infrastructure** - There are 7.3 miles of primary roads, 21.6 miles of secondary roads, 52.5 miles of tertiary roads, 13.8 miles of railroad, and 72.5 miles of oil and gas pipelines in this unit. There are also 355 oil and/or natural gas wells and drainage from two pumping stations enters the unit.

**Previously Proposed Strategies** - A freshwater diversion and hydrologic management of the swamps and fresh-to-intermediate marsh has been proposed for this unit. Beneficial use of dredged material has also been proposed.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh and forested wetlands in this unit. The desired coastal resources are freshwater finfish, American alligators, furbearers,

waterfowl, and recreation and tourism. The preserved marshes are desired to act as a storm buffer to protect communities, roads, levees, and bridges.

**Regional Ecosystem Strategies** - This unit needs sediment input in order to preserve the marsh and swamp. Several small diversions from Bayou Lafourche are recommended in the near term. Construction of the delta-building conveyance channel parallel to Bayou Lafourche is also recommended (see Appendix B for more on the conveyance channel). Once this channel is built, sediment should be diverted into the swamp and marsh of this unit.

**Benefits of Regional Strategies** - Implementation of the recommended strategies would reduce projected marsh loss by slightly less than 50%. Populations of American alligators, furbearers, freshwater finfish, and waterfowl would all increase. Recreation and tourism would continue, and a significant storm buffer would be provided for roads, levees, bridges, and communities.

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

### *Des Allemands*

**Location** - This 108,300-acre unit encompasses portions of St. Charles and St. John the Baptist parishes. It is bordered on the north by Louisiana Highway 3127, on the south by Louisiana Highway 307 and Bayou Des Allemands, on the east by Louisiana Highway 90, and on the west by

Louisiana Highway 20. The Mississippi River communities from Vacherie to Luling lie just north of this unit.

**Habitat Description and Landscape Change** - In 1949, this unit was mainly swamp that surrounded areas of freshwater marsh around Lac Des Allemands. Bottomland hardwood forest could be found along the base of the Mississippi River's natural levee. No change in habitat occurred from 1968-1988, and habitat composition of the area in 1988 was 60% swamp, 30% fresh marsh, and 10% bottomland hardwoods. Major water bodies found in this unit are Lac Des Allemands, Bayou Des Allemands, and the Eighty Arpent Canal.

**Historic Land Loss** - In 1932, this unit had 23,050 acres of marsh. From 1932 to 1956, approximately 590 acres of wetlands were lost. Most of this loss was due to shoreline erosion in the fresh marshes around Lac Des Allemands and altered hydrology, as the Mississippi River levee has severed the flow of freshwater, sediment, and nutrients to the wetlands via natural distributaries and overbank flooding. Canal and levee construction has also impeded the natural hydrology of the unit, causing impoundment of water which kills wetland vegetation and causes poor regeneration of cypress. The largest wetland loss in this unit (3,020 acres) occurred from 1956-1983. An additional 920 acres of wetlands were lost from 1983-1990. The recent loss was caused mainly by wind erosion and altered hydrology. Also, herbivory, primarily by nutria, results in eatouts of fresh marsh vegetation and poor plant regeneration.

In fact, nutria have probably contributed to the conversion of the thick mat floating marsh to a thin mat flotant. Subsidence rates are low (1.1-2.0 ft/century) in this unit.

**Future Land Loss Projections** - In 1990 this unit contained 18,520 acres of marsh and 44,560 acres of swamp. By 2050, approximately 6,730 acres of marsh are projected to be lost, primarily due to altered hydrology, wind erosion, herbivory, and subsidence. A part of this loss is expected to be prevented by the freshwater diversion at Davis Pond. Even with Davis Pond, over 30% of the 1990 marsh will be lost, and over 60% (26,740 acres) of the swamp is projected to become open water or floating marsh.

**Fish and Wildlife Resources** - This unit has shown steady trends for freshwater fish such as largemouth bass and channel catfish, and blue crabs. The paddlefish, which is rare in Louisiana, has been noted in the vicinity of this planning unit. Trends in freshwater fish and shellfish are anticipated to remain steady.

The presence of large cypress trees adjacent to fresh marsh makes this unit attractive to bald eagles. Bald eagles, brown pelicans, raptors, wading birds, other woodland residents, and American alligators have all shown increasing trends in the last 10 to 20 years. Bald eagle, pelican and American alligator numbers are projected to continue to increase. Dabbling ducks, raptors, and coots are projected to decrease as the swamp declines. All other wildlife is expected to remain steady over the next 60 years.

**Infrastructure** - Bayou Chevreuil was enlarged and realigned for flood control from Lac Des Allemands to just past the Dredge Boat Canal and above Louisiana Highway 20. There are 13 miles of primary roads, 22 miles of secondary roads, 68 miles of tertiary roads, 10.4 miles of railroad, and 33 miles of oil and gas pipelines in the unit. There are also 397 oil and/or natural gas wells and two pumping stations that route drainage water into the unit.

**Previously Proposed Strategies** - Several restoration plans have proposed diversion of fresh water from the Mississippi River in order to introduce sediment and nutrients into the swamps and fresh marshes of this unit. Hydrologic management of the swamps and fresh to intermediate marshes of this unit has also been proposed.

**Coastal Use/Resource Objectives** - The parishes prefer that this unit remain a combination of fresh marshes, ponds, and forested wetlands. The resource priorities are freshwater finfish, American alligators, furbearers, waterfowl, recreation and tourism, and water quality enhancement.

**Regional Ecosystem Strategies** - Two or more small diversions off the Mississippi River, with outfall management and flood protection for developed areas, are recommended. A control structure at Bayou Des Allemands and/or culverts in Louisiana Highway 90 are recommended to lower water levels in the swamps.

**Benefits of Regional Strategies** - The regional strategies listed above would prevent less than 50% of the projected

loss of marsh and slightly reduce swamp loss. The strategies would improve freshwater fisheries, waterfowl, and recreation and tourism, and would increase the number of American alligators and furbearers. Water quality would be enhanced, and the strategies would help protect communities, roads, levees, and bridges.

**Mapping Unit and Programmatic Strategies** - Herbivory control is recommended as a mapping unit strategy. A programmatic strategy is suggested for this unit that would allow for selective harvesting of replanted trees in mitigation banks.

#### *Cataouatche/Salvador*

**Location** - This 192,400-acre unit encompasses portions of St. Charles, Jefferson, and Lafourche parishes. The unit is bounded on the south by the Gulf Intracoastal Waterway (GIWW); on the north by Louisiana Highway 90, the community of Boutte, and the low levees around the Bayou Gauche and Churchill Farms areas; on the east by Louisiana Highway 45; and on the west by Bayou Matherne and Louisiana Highway 654 in the Gheens area.

**Habitat Description, Landscape Change** - In 1949, the major habitat type in this unit was fresh marsh, with some swamp in the northwest corner. By 1978, intermediate marsh had encroached into the area. In 1988, the habitat remained mostly fresh marsh (90%), with the remaining 10% divided between intermediate marsh and swamp. Major waterbodies in the area include Lake Cataouatche, Lake Salvador, the GIWW, and Bayou des Allemands.

Lake Salvador is critical in the drainage of the Mississippi River communities, and Lake Cataouatche receives drainage from as far north as Donaldsonville, via Bayou des Allemands.

**Historic Land Loss** - Of the 1932 estimate of 113,700 acres of wetlands in this unit, some 18,040 acres were lost from 1932-1990. The majority (47%) of this loss happened from 1956-1974. Historical loss in this unit was due mainly to canal dredging and altered hydrology from the Mississippi River levee and canal spoil banks. Shoreline wind erosion was a cause of loss on lakes Cataouatche and Salvador. Current loss problems include nutria herbivory, dredging, altered hydrology, and wind erosion. Subsidence ranges from 1.1-2.0 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 95,660 acres of marshland and 11,850 acres of swamp. As marsh is lost, altered hydrology and wind erosion will continue to deteriorate the landscape. If no action is taken, 16,735 acres are likely to be lost by 2050. An additional 5,930 acres of swamp (50%) will also be lost. This is 24.0% of the wetland acreage present in 1990. The Davis Pond Diversion is estimated to preserve 10,320 acres of marsh in this unit by 2050. With this diversion only and no other action, only 6.5% of the 1990 wetland acreage will be lost by 2050.

**Fish and Wildlife Resources** - Most estuarine fisheries populations have shown a steady trend over the last 10 to 20 years (red and black drum, spotted seatrout, and blue crabs). Gulf menhaden and brown shrimp have been

increasing, while white shrimp have been decreasing. Largemouth bass populations have remained steady, and channel catfish numbers have been decreasing. In the future, red and black drum, spotted seatrout, and brown and white shrimp are projected to decrease, while largemouth bass and channel catfish are projected to remain steady.

Many wildlife resources have shown an increasing trend over the last 10 to 20 years (brown pelicans, bald eagles, raptors, wading birds, dabbling ducks, rails, and American alligators). Seabirds, shorebirds, diving ducks, furbearers, rabbits, and deer have shown a steady trend. Over the next 50 years, only the brown pelican and American alligator numbers are projected to increase. All other wildlife populations are projected to remain steady.

**Infrastructure** - The Salvador WMA is present in this unit. The Bayou Segnette Waterway is a navigation channel 6 ft deep by 60 ft wide that runs 12.2 miles from Company Canal at Westwego to the GIWW, via Bayou Segnette. From 1984-1993, traffic on the waterway averaged 2,900 tons of commodities, mostly crude petroleum. A 25-mile stretch of the GIWW runs across the unit just south of Lake Salvador. This 12-ft deep by 125-ft wide canal is used principally for commercial navigation. The Westwego to Harvey Canal, LA Hurricane Protection Project consists of 13 miles of new and enlarged levees and floodwalls from the Ross Canal to Louisiana Highway 90 at Westwego. There are 7.3 miles of primary roads and 33.4 miles of tertiary roads in the unit; however, there are no secondary roads or railroads. There are also 142 miles of oil

and gas pipelines, and 1,021 oil and/or natural gas wells. One pumping station drains water into the unit.

**Previously Proposed Strategies -**

Several restoration plans call for a freshwater diversion from the Mississippi River into this unit. The Davis Pond Freshwater Diversion will become operational in 2001 and will divert up to 10,500 cfs into the basin. Other strategies include preservation of the Barataria Land Bridge, hydrologic management of fresh and intermediate marshes, stabilization of navigation channel banks, protection of the lake shorelines, and beneficial use of dredged material.

**Coastal Use/Resource Objectives -**

Fresh marsh is the desired habitat in this unit. Freshwater fish, American alligators, furbearers, waterfowl, and recreation and tourism are the priorities in this unit. Water quality enhancement and a storm buffer for roads, levees, and communities are also important.

**Regional Ecosystem Strategies -**

Outfall management and sediment enrichment for the Davis Pond Diversion are recommended. Whenever possible, additional water should be diverted through the existing locks at Harvey and Algiers to benefit this unit. The Barataria Land Bridge should be preserved by stabilizing the banks of the GIWW and protecting lake shorelines.

**Benefits of Regional Strategies -**

Implementation of these regional strategies would reduce the loss of marsh in this unit by over 50%. All of the recommended strategies would achieve the habitat objective of preserving fresh

marsh and would enhance the desired resource priorities such as freshwater fish, American alligators, furbearers, waterfowl, and recreation/tourism. The increased amount of marsh in 2050 (over what would have been there with no strategies) would provide a storm buffer to protect communities and infrastructure.

**Mapping Unit and Programmatic Strategies** - Mapping unit strategies include maintaining shoreline integrity along the lakes and stabilizing the shore of the GIWW as well as herbivory control. No programmatic strategies are proposed for this unit.

### *Jean Lafitte*

**Location** - This 8,260-acre unit lies just south of New Orleans in Jefferson and Plaquemines parishes. It is bordered on the north by the “V-Levee,” on the west by Louisiana Highway 45, and on the south and east by Bayou Barataria. It lies totally within the Jean Lafitte National Historical Park, Barataria Unit.

**Habitat Description and Landscape Change** - In 1949, this unit was made up of cypress swamp, bottomland hardwoods, and fresh marsh. By 1968, the fresh marsh had been replaced by intermediate marsh. In 1978, fresh marsh had reclaimed the area, and by 1988, the composition was 45% swamp, 40% bottomland hardwood, and 15% fresh marsh. Most of the fresh marsh is flotant. Bayou Barataria and Harvey Canal are the major water bodies.

**Historic Land Loss** - This unit has lost only 400 acres of the original 1,850 present in 1932. This was due to canal

dredging. No loss has occurred since 1974. Nutria herbivory and altered hydrology are currently problems in this unit. Subsidence is intermediate in this unit (1.1-2.0 ft/century).

**Future Land Loss Projections** - No additional loss is projected in this unit. The 1990 marsh acreage (1,450 acres) and swamp acreage (2,920 acres) will remain steady.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, some estuarine dependent fish assemblage populations (red drum, Gulf menhaden, blue crab, southern flounder, and brown shrimp) have remained steady, while others such as white shrimp have shown decreasing trends. Largemouth bass populations have been increasing, while channel catfish populations have decreased. Projections indicate that all the above-mentioned assemblages will remain steady in the future.

Populations of brown pelicans, wading birds, and raptors have shown increasing trends over the last 10 to 20 years. Seabirds, shorebirds, dabbling and diving ducks, rails, gallinules, coots, furbearers, and game mammals have shown steady populations during the same period. Projections for the next 50 years show that the brown pelican and American alligator will continue to increase while populations of other wildlife mentioned above will show steady trends. Raptor populations, however, will slightly decrease.

**Infrastructure** - The Westwego to Harvey Canal hurricane protection project extends into this unit, with nine miles of levees and floodwalls present

along the Harvey Canal and Bayou Barataria. There are no primary roads. There are 2.2 miles of secondary roads, 16.5 miles of tertiary roads, and 1 mile of gas pipeline in the unit, as well as 18 oil and/or natural gas wells. The outfalls of two drainage pumps are in this unit.

**Previously Proposed Strategies** - Stabilization of navigation canal banks has been proposed in the past.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in this unit, and the desired coastal resources are freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. Scientific study and water quality enhancement are also important in this National Park. The preserved marshes are desired to act as a storm buffer to protect communities, roads, levees, and bridges.

**Regional Ecosystem Strategies** - There are no regional strategies proposed in this unit.

**Benefits of Regional Strategies** - Not applicable.

**Mapping Unit and Programmatic Strategies** - Restoration of hydrology is suggested as a mapping unit strategy in this unit. No programmatic strategies are suggested for this unit.

### *Gheens*

**Location** - This 33,600-acre unit is located in Lafourche Parish. It is bordered on the north and west by Bayou Matherne, the Godchaux Canal, and the Bayou Lafourche communities from Raceland to Larose. It is bordered on the

south and east by the GIWW. The community of Gheens lies along Louisiana Highway 654 within the unit.

**Habitat Description and Landscape Change** - In 1949, this area was mostly cypress swamp, with bottomland hardwoods on the natural levees of Bayou Lafourche and the other bayous in the unit. There was fresh marsh between some of the ridges. No habitat change took place from 1968-1988. In 1988, the composition of the unit was 50% fresh marsh, 30% bottomland hardwoods, and 20% cypress swamp.

**Historic Land Loss** - Loss has been relatively low in this unit which contained 13,580 acres of marsh in 1932. The only loss that occurred was 390 acres from 1932-1956 and 690 acres from 1974-1983. The loss in this unit mainly occurred from direct removal of marsh for canal building. Subsidence in this unit is intermediate (1.1-2.0 ft/century).

**Future Land Loss Projections** - In 1990, this unit contained 12,500 acres of marsh and 6,910 acres of swamp. If no further restoration occurs, this unit is projected to lose 2,250 acres of marsh by 2050. In addition, 3,460 acres of swamp is expected to be lost. This translates into a loss of approximately 29% of the 1990 wetland acreage.

**Fish and Wildlife Resources** - In this area, the freshwater assemblage (channel catfish and largemouth bass) and a few members of the estuarine dependent assemblage that use the area (red drum, Gulf menhaden, and blue crab) have remained steady over the last 10 to 20

years. These same trends are projected to remain steady in the future.

Populations of wading birds, raptors, woodland avifauna, and American alligators have shown increasing trends over the last 10 to 20 years. Dabbling and diving ducks, furbearers, and game mammals have shown steady numbers over the same period. Projections indicate that populations of wading birds, dabbling and diving ducks, furbearers, and game mammals will remain steady in the future. American alligator populations will continue to increase, and raptor populations are projected to decrease.

**Infrastructure** - This unit contains 1 mile of primary road, 53 miles of tertiary roads, and 58 miles of pipelines, as well as 247 oil and/or natural gas wells. There are no secondary roads or railroads in this unit.

**Previously Proposed Strategies** - Small freshwater diversions from Bayou Lafourche have been proposed in the past.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in this unit, and the desired coastal resources are freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. The preserved marshes are desired to act as a storm buffer to protect communities, roads, levees, and bridges.

**Regional Ecosystem Strategies** - Construction of the delta-building conveyance channel from the Mississippi River parallel to Bayou Lafourche is recommended. Once this channel is built, fresh water, sediment, and

nutrients would be siphoned off to the marshes and swamps in this unit.

**Benefits of Regional Strategies** - Implementation of the recommended strategies would reduce projected marsh loss by less than 50%. Populations of American alligators, furbearers, freshwater finfish, and waterfowl would all increase. Recreation and tourism would continue, and a significant storm buffer would be provided for roads, levees, bridges, and communities.

**Mapping Unit and Programmatic Strategies** - Pump outfall could be managed for wetlands benefit in this unit. No programmatic strategies are recommended for this unit.

### *Clovelly*

**Location** - This 47,800-acre unit in Lafourche Parish is bordered on the north by the GIWW, on the west by the hurricane protection levee paralleling Bayou Lafourche, on the south by a canal that runs from near the LOOP site to Bay L'Ours, and on the east by the western shore of Little Lake and a canal running from Little Lake to the GIWW.

**Habitat Description and Landscape Change** - Major habitat types in 1949 included fresh and intermediate marsh. By 1968, saltwater influence had caused a conversion of some intermediate marshes to brackish marshes. A small amount of brackish marsh remained in 1978. By 1988, the habitat composition was 45% fresh marsh and 55% intermediate marsh. Major waterbodies in the area include the GIWW and the Grand Bayou Canal.

**Historic Land Loss** - Of the 43,045 acres of wetlands in 1932, some 7,835 acres have been lost. Most of this loss (59%) occurred from 1956-1974 and was due to dredging and impounding of the marsh for agriculture. Wind erosion became a problem as the impoundments held water and waves began to erode the shoreline. Subsidence rates are high (2.1-3.5 ft/century).

**Future Land Loss Projections** - In 1990, this unit had 35,210 acres of marsh. If no action is taken, some 5,635 acres (16% of the 1990 wetland acreage) are projected to be lost by 2050. Even with the approved CWPPRA projects (GIWW to Clovelly Wetlands and Bayou Lafourche Siphon Phase I), 12% of the marsh acreage will be gone in 2050.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, channel catfish have shown decreasing population trends while largemouth bass have remained steady. Populations of member species of the estuarine dependent assemblage have generally remained steady (red drum, spotted seatrout, Gulf menhaden, southern flounder, brown shrimp, and blue crab). The black drum has shown increasing populations, and white shrimp numbers have decreased. In the future, all assemblages are projected to have steady populations.

Brown pelican, wading bird, woodland avifauna, raptor, and American alligator populations have shown increasing trends over the last 10 to 20 years. Seabirds, shorebirds, dabbling and diving ducks, rails, gallinules, coots, furbearers, and game mammals have shown steady population trends over the same period. Projections indicate that

the brown pelican and American alligator will continue to increase in numbers, while the other wildlife mentioned above, except for raptors, will continue to have steady populations. Raptor numbers are projected to decrease in this unit in the future.

**Infrastructure** - The Larose to Golden Meadow hurricane protection levee forms the western boundary of the unit. There are no primary or secondary roads and no railroads in this unit. There are 1.5 miles of tertiary roads, 66 miles of pipelines, and 279 oil and/or natural gas wells in the unit. Two pumping stations release drainage water into local canals.

**Previously Proposed Strategies** - A sediment diversion into Clovelly, as well as navigation canal bank stabilization and ridge protection has been proposed for this unit. Another proposed strategy is a freshwater diversion into this mapping unit in order to manage the fresh to intermediate marsh hydrology.

**Coastal Use/Resource Objectives** - The habitat objectives for this unit are fresh and intermediate marsh. Freshwater fish, American alligators, furbearers, waterfowl, and recreation and tourism are the priorities in this unit. Storm buffering for roads, levees, and communities is also important.

**Regional Ecosystem Strategies** - A conveyance channel parallel to Bayou Lafourche is recommended. This is one of the few ways to add sediments and nutrients into this unit from the Mississippi River.

**Benefits of Regional Strategies** - The

Bayou Lafourche conveyance channel would prevent more than 50% of the projected marsh loss in this unit. It would preserve fresh and intermediate marsh and enhance freshwater fish, American alligators, furbearers, waterfowl, and recreation and tourism. The preserved marsh would provide an excellent storm buffer to protect the hurricane levee along Bayou Lafourche, which in turn would protect communities, roads, and bridges.

**Mapping Unit and Programmatic Strategies** - Beneficial use of material dredged from the Barataria Bay Waterway (BBWW) is a proposed mapping unit strategy in this unit. No programmatic strategies are proposed for this unit.

### *Perot/Rigolettes*

**Location** - This 59,500-acre unit lies in Jefferson Parish between Lake Salvador and Little Lake and just west of the BBWW. The villages of Jean Lafitte and Barataria lie on the Bayou Barataria ridge that forms the eastern boundary of this unit.

**Habitat Description and Landscape Change** - In 1949, O'Neil classified the entire area as intermediate marsh (floating three-square). By 1968 and through 1978, the area was brackish marsh except for the triangle of land north of bayous Perot and Rigolettes. In 1988, habitat composition was 47% brackish marsh, 43% intermediate marsh, and 10% fresh marsh.

**Historic Land Loss** - In 1932, this unit contained 43,210 acres of marsh. The

greatest marsh loss was from 1932-1956 when 5,950 acres were lost, mainly due to canal dredging. The BBWW allowed salt water and higher tidal energies to enter the area, and some of the intermediate marsh plants were killed. From 1956-1974, shoreline erosion was the major cause of loss of 4,760 acres. Interior breakup, caused by tidal energies and exacerbated by subsidence, also played a role in marsh loss. From 1974-1983, over 1,700 acres disappeared, mainly along the shores of the bayous. This trend continued from 1983-1990 when nearly 2,300 acres were lost, and, during this period, interior breakup along the southeast shore of Bayou Rigolettes increased. Total loss from 1932-1990 was 14,710 acres. In addition, nutria herbivory has been severe in recent periods. When loss is classified by marsh type, nearly half the loss has occurred in intermediate marsh and half in brackish marsh. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century

**Future Land Loss Projections** - Over the next 50 years, some 10,370 wetland acres (36% of the 1990 acreage of 28,500) are predicted to be lost due to shoreline erosion of the bayous, interior breakup, and herbivory. Two CWPPRA projects, Jonathan Davis Hydrologic Restoration and BBWW Shore Protection West, will prevent the loss of nearly 700 acres. The freshwater diversion at Davis Pond should preserve 3,860 acres over the next 50 years. With the CWPPRA projects and Davis Pond in place, only 20.4% of the marsh present in 1990 would be lost.

**Fish and Wildlife Resources** - Populations of most of the estuarine

dependent assemblage have remained steady over the last 10 to 20 years (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, blue crab, and brown shrimp). White shrimp have exhibited decreasing populations over the same time period, as have channel catfish of the freshwater assemblage. Largemouth bass have shown steady populations. In the future, all the above are projected to have decreasing populations, except Gulf menhaden and blue crab, which are projected to remain steady.

The brown pelican and American alligator have shown increasing trends over the last 10 to 20 years. Seabird, wading bird, shorebird, other avifauna, raptor, and furbearer populations have remained steady over the same period. Dabbling and diving duck and game mammal populations have decreased. In the future, populations of all species and groups are projected to decrease, except the brown pelican which is projected to remain stable.

**Infrastructure** - The reach of the BBWW adjacent to this unit is dredged every few years and all of the dredged material is used beneficially. The unit has no primary or secondary roads and no railroads. There are 10.7 miles of tertiary roads, 43.1 miles of pipelines, and 790 oil and/or natural gas wells.

**Previously Proposed Strategies** - The previously proposed strategies in this unit generally focused on preserving the ridge along the BBWW, stabilizing the banks of the BBWW (which is being done under CWPPRA), protecting the shorelines of the large lakes, diverting fresh water, and managing hydrology by

preventing increase in tidal scour and salinity intrusion. Outfall from the Davis Pond Freshwater Diversion project should benefit this unit as well.

**Coastal Use/Resource Objectives** - The parish desires fresh marsh in this unit because they recognize that diversions are the only method of preventing significant marsh loss. The preferred coastal resources are shrimp, blue crabs, saltwater and freshwater finfish, furbearers, waterfowl, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer to protect communities, roads, levees, and bridges.

**Regional Ecosystem Strategies** - A delta-building diversion of about 15,000 cfs near Myrtle Grove is recommended. In addition, the existing locks should be used to divert as much fresh water from the Mississippi River as possible. Construction of the entire CWPPRA Land Bridge project is recommended.

**Benefits of Regional Strategies** - If all the above strategies were implemented, there would be a net gain of marsh in this unit by 2050. Populations of shrimp, blue crabs, freshwater finfish, furbearers, and waterfowl would all be increased. Recreation and tourism would continue, and a significant storm buffer would be provided for roads, levees, bridges, and communities.

**Mapping Unit and Programmatic Strategies** - Herbivory control is recommended as a mapping unit strategy in this unit. There are no programmatic strategies proposed for this unit.

## *Naomi*

**Location** - This 34,250-acre unit encompasses parts of Jefferson and Plaquemines parishes. It is bordered by the GIWW and the Hero Canal on the north, Bayou DuPont on the south, Bayou Baratavia on the west, and the Mississippi River levee on the east. This unit contains the Pen.

**Habitat Description and Landscape Change** - In 1949, this unit was mainly brackish marsh (80%), with some intermediate marsh (20%) present in the northerly portions. By 1968, the unit had changed to fresh and intermediate marsh, but by 1978, brackish marsh had again reappeared in the southern portions. In 1988, the marsh was categorized as 60% intermediate marsh, 35% brackish marsh, and 5% fresh marsh. Major waterbodies in the area include the Pen, Bayou DuPont, and Cheniere Traverse Bayou.

**Historic Land Loss** - Of the 30,370 acres of wetlands in 1932, about 2,740 were lost by 1956. From 1956-1974, land loss intensified, as 4,380 acres were lost. From 1974-1990, some 3,140 acres of wetlands were lost. Historic causes of loss in this unit were altered hydrology caused by the dredging of oil and gas access canals and subsidence (1.1-2.0 ft/century). Current loss is caused by altered hydrology, subsidence, and herbivory (mainly by nutria). Also, saltwater intrusion is a problem in this area when the wind blows extensively from the southeast.

**Future Land Loss Projections** - If nothing is done to save the marshes in this area, about 7,075 (35%) of the

20,110 marsh acres in 1990 will be lost. The Davis Pond Freshwater Diversion project should preserve 5,950 acres of marsh. Therefore, with Davis Pond and nothing else, 5.6% of the 1900 marsh acreage will be lost by 2050. None of the existing 1990 swamp acreage (1,380 acres) is expected to be lost.

**Fish and Wildlife Resources** - Most of the species in the estuarine dependent assemblage (red drum, Gulf menhaden, southern flounder, white shrimp, brown shrimp, and blue crab) have increased. Black drum and spotted seatrout have remained steady. Freshwater species (channel catfish and largemouth bass) have increased as well, probably due to the influence of the Naomi freshwater siphon off the Mississippi River. In the future, white shrimp and Gulf menhaden populations will increase while spotted seatrout and southern flounder populations decrease. Populations of red and black drum, brown shrimp, and blue crab will remain steady. Freshwater species such as the largemouth bass and channel catfish will show increased populations, due to the continued effects of the Naomi siphon.

Populations of bald eagles, seabirds, shorebirds, and raptors, as well as open water, woodland, and marsh avifauna have remained stable over the last 10 to 20 years and are projected to remain so through 2050. Furbearers (nutria, mink, otter, and raccoon) and game mammals (rabbit, deer, and squirrel) have also remained steady during this time and are projected to continue this trend through 2050. Increasing wildlife populations include brown pelicans, dabbling and diving ducks, rails, coots, gallinules, and American alligators. These species are

projected to have increased populations through 2050.

**Infrastructure** - This unit contains no primary roads or railroads. There are 9.6 miles of secondary roads, 14.6 miles of tertiary roads, 32.8 miles of pipelines, and 154 oil and/or natural gas wells in the unit. The BBWW (controlling depth of 10 ft) borders the area and is used mainly for commercial and recreational navigation. The area contains nine drainage pump stations.

**Previously Proposed Strategies** - The previously proposed strategies in this unit generally focused on preserving the ridge along the BBWW, stabilizing the banks of the BBWW, hydrologic restoration, protecting bay and lake shorelines, and freshwater and sediment diversion into the unit from the Mississippi River.

**Coastal Use/Resource Objectives** - Habitat objectives in this unit include fresh and brackish marshes and their associated aquatic habitats, and forested wetlands and their aquatic habitats.

**Regional Ecosystem Strategies** - A delta-building diversion of about 15,000 cfs into either the Naomi or Myrtle Grove unit is recommended. An opportunity to use the Mississippi River to build marsh exists in this unit and should be used. An outfall management plan would be recommended with any diversion.

**Benefits of Regional Strategies** - A delta-building diversion into this area would have significant benefits by creating land and preventing land loss in the central basin by 2050. In the short

term, diversions would be detrimental to saltwater finfish and shrimp, but, in the long run, there would be more of these resources. These strategies would be highly beneficial to waterfowl and freshwater finfish and would improve recreation and tourism. The restored marsh would provide a storm buffer to protect communities along the river, roads, levees, and bridges.

**Mapping Unit and Programmatic Strategies** - Herbivory control is a mapping unit strategy that should be adopted in the Naomi unit. There are no programmatic strategies in this unit.

### *Little Lake*

**Location** - This unit encompasses 91,500 acres of Jefferson and Lafourche parishes. The north shores of Little Lake and Turtle Bay serve as the northern boundary. On the south it is bordered by a line running from near Yankee Canal through Bay Rambo and Hackberry Bay to the BBWW. The unit is bordered on the east by the BBWW and on the west by the western shore of Little Lake and Louisiana Highway 308.

**Habitat Description and Landscape Change** - In 1949, this unit consisted of intermediate and brackish marsh habitats. By 1968, saltwater influence had caused saline marsh to encroach into the southern reaches of the area; the northern reaches remained brackish. By 1978, intermediate marsh had returned to the northern extent of the unit, and saline marsh remained in the south. In 1988, this unit contained 45% brackish marsh, 35% saline marsh, and 20% intermediate marsh. Major waterbodies in the area include Little Lake, Turtle Bay, and

Bayou Saint Denis, as well as the old distributaries of Bayou Lafourche, including Bayou Raphael and the west fork of Bayou L'Ours.

**Historic Land Loss** - Of the 50,080 acres of wetlands present in 1932, a total of 23,450 acres were lost by 1990. The majority of the loss occurred from 1956-1974 when 10,560 acres of the marsh were lost. Historic loss was caused mainly by altered hydrology from canals and levees, wind erosion on the shoreline of Little Lake, and natural subsidence. From 1983-1990, some 3,450 acres of marsh were lost, mainly due to the same factors. Subsidence rates in the Little Lake unit are high (2.1-3.5 ft/century).

**Future Land Loss Projections** - If nothing is done to protect the remaining marsh from destruction, some 14,330 acres (54% of the 26,630 acres of 1990 marsh) are projected to be lost by 2050. With the hydrologic restoration of the Bayou L'Ours Ridge CWPPRA project, this loss will be cut to 26% by 2050. As the marsh to the south of this unit is lost, saltwater intrusion will worsen. Tidal energy will also increase due to the loss of the barrier islands and marsh south of the unit.

**Fish and Wildlife Resources** - Many species in the estuarine dependent assemblage (red drum, black drum, spotted seatrout, Gulf menhaden, and southern flounder) have shown a steady population trend over the last 10 to 20 years. White shrimp populations have decreased while brown shrimp and blue crab populations have increased. The resident American oyster has also increased, and as the area has become saltier, the largemouth bass population

has decreased. Projections indicate that as marsh is lost in the future, all populations of the estuarine dependent assemblage will decrease, as will the largemouth bass. American oyster populations are projected to continue to increase.

The brown pelican has shown an increasing population trend over the last 10 to 20 years. Seabird, wading bird, shorebird, and raptor populations have remained steady during that period. Dabbling and diving ducks, rails, gallinules, coots, furbearers, game mammals, and American alligators have shown decreasing population trends. Projections for the next 50 years estimate that brown pelican numbers will continue to increase, while all other types of wildlife mentioned above will show declining populations.

**Infrastructure** - The BBWW has a channel 12 ft deep and 125 ft wide. This unit has no roads or railroads, but has 96 miles of pipelines. There are 525 oil and/or natural gas wells.

**Previously Proposed Strategies** - Several restoration plans have called for preservation of the ridge function and stabilization of the banks along the BBWW. Other strategies include freshwater and sediment diversions from Bayou Lafourche, managing hydrology in the brackish/saline marshes, and beneficial use of dredged material.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh in this unit because they recognize that a diversion is the only method of preventing significant marsh loss. The desired coastal resources are shrimp, American

oysters, blue crabs, saltwater and freshwater finfish, furbearers, waterfowl, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer to protect communities, roads, levees and bridges.

**Regional Ecosystem Strategies** - The strategy that would contribute most to the restoration of this unit is the conveyance channel along Bayou Lafourche. Construction of a delta-building diversion of about 15,000 cfs near Myrtle Grove is also recommended. Preservation of the Barataria Land Bridge with dedicated dredging near the Bayou L'Ours ridge and bank stabilization on the southern shoreline of Little Lake should occur. Spoil banks should be gapped and canals plugged in areas where these actions would maximize deposition of sediment in the brackish and saline marshes. Wave absorbers are recommended at the head of Barataria Bay to preserve fringing marshes.

**Benefits of Regional Strategies** - If all the above strategies were implemented, there would be a net gain of marsh in this unit by 2050. Populations of blue crabs, freshwater finfish, American alligators, furbearers, and waterfowl would all be increased as the unit becomes fresher, and recreation and tourism would continue. Shrimp and saltwater finfish would be displaced by the diversions, but they would not decrease as they are projected to do if nothing is done. American oysters would be impacted, and this impact would be addressed during project planning. A significant storm buffer would be provided for roads, levees, bridges, and communities.

**Mapping Unit and Programmatic Strategies** - Drainage pumps should be relocated to place water into the marsh. Dredged material from the BBWW should be used beneficially. The function of the Bayou L'Ours ridge should be maintained by preventing breaching. There are no programmatic strategies proposed for this unit.

### *Myrtle Grove*

**Location** - This 70,200 acre mapping unit is located in Jefferson and Plaquemines parishes. It is bordered on the north by Bayou Dupont and Cheniere Traverse Bayou; on the south by Barataria Bay; on the west by the BBWW; and on the east by Wilkinson's Bayou, the road down the Grand Cheniere ridge, Bayou Grand Cheniere, and the community of Myrtle Grove.

**Habitat Description and Landscape Change** - In 1949, this unit consisted of 60% intermediate marsh and 40% brackish marsh, and by 1968, saline marsh had encroached into the southern reaches. By 1978, the habitat was 100% brackish marsh, and it stayed that way into 1988. Major waterbodies include the BBWW, Bayou DuPont, and Wilkinson's Bay.

**Historic Land Loss** - In 1932, this unit had 61,810 acres of marsh. A total of 12,920 acres (19%) of the 1932 marsh acreage has been lost in this unit. The majority of this loss (5,845 acres) occurred from 1956-1974. Historic loss was due mainly to altered hydrology, wind erosion, subsidence, and direct loss from dredging. Fifteen percent (1,935 acres) of the acreage loss occurred from 1983-1990 and was due mainly to altered

hydrology, wind erosion, and subsidence. Subsidence in Myrtle Grove is high (2.1-3.5 ft/century). As the southern marsh in this unit is lost, the saltwater and tidal intrusion will continue to worsen.

**Future Land Loss Projections** - If no action is taken to stop this loss, approximately 10,220 acres (21% of the 48,890 acres of marsh in 1990) are projected to be lost by 2050. Approved CWPPRA projects (Myrtle Grove Siphon and Naomi Outfall Management) are expected to reduce this no action loss by 4,360 acres. By 2050, only 12% of the 1990 acres are expected to be lost.

**Fish and Wildlife Resources** - Several species in the estuarine dependent assemblage have shown population increases over the last 10 to 20 years (red and black drum, Gulf menhaden, southern flounder, blue crab, and brown shrimp). White shrimp populations have declined, and spotted seatrout populations have remained steady over this period. The estuarine resident American oyster has increased. In the freshwater assemblage, the channel catfish population has increased, while largemouth bass populations have remained steady. In the future, populations of the red and black drum, American oyster, southern flounder, and blue crab are projected to remain steady. Spotted seatrout, Gulf menhaden, and brown and white shrimp populations are projected to decrease. The freshwater assemblage is projected to show an increase in populations.

The brown pelican and American alligator have shown increasing population trends over the last 10 to 20

years. Populations of seabirds, wading birds, shorebirds, dabbling and diving ducks, raptors, rails, gallinules, coots, furbearers, and game mammals have remained steady over this period. Future projections show that over the next 50 years, populations of pelicans, dabbling and diving ducks, rails, gallinules, coots, and American alligators are expected to increase due to the CWPPRA siphons. Seabird, wading bird, shorebird, and raptor populations are projected to decline, and furbearer and game mammal populations should hold steady over the next 50 years.

**Infrastructure** - The BBWW is the only USACE-maintained infrastructure in the unit. Adjacent to the eastern boundary of the unit, the Mississippi River is dredged to a depth of 45 ft and 1000 ft wide, and there is over 75,000 ft of foreshore protection for bank stabilization. There are no primary or secondary roads and no railroads in this unit. There are 3.8 miles of tertiary roads in the unit. Oil and gas extraction is important in the unit, and there are 858 oil and/or natural gas wells and over 22 miles of active pipelines.

**Previously Proposed Strategies** - Previously proposed strategies include protection of ridge functions, bank stabilization, beneficial use of dredged material, and sediment diversion in this unit. A freshwater diversion into the unit has also been proposed to offset saltwater intrusion and better manage the brackish to saline marsh hydrology.

**Coastal Use/Resource Objectives** - This area is a prime site for a river diversion; the parish prefers mainly fresh marsh. Resources desired by the parish

include shrimp, American oysters, crabs, saltwater and freshwater finfish, waterfowl, recreation and tourism, storm buffer, roads, levees, bridges, and communities.

**Regional Ecosystem Strategies** - A sediment building diversion of about 15,000 cfs into the Myrtle Grove unit, possibly at Ironton, is recommended. An opportunity to use the Mississippi River to build marsh exists in this unit and should be used. A conveyance channel parallel to Bayou Lafourche would benefit this unit by providing sediment and nutrients.

**Benefits of Regional Strategies** - The diversions would be highly beneficial to marsh habitat and most resources. It is projected that the diversions would allow a gain in marsh in this unit by 2050. They would, however, have an adverse impact on American oysters that should be compensated. In the short term, diversions would be detrimental to saltwater finfish and shrimp, but in the long run, there would be more of these resources. These strategies would be highly beneficial to waterfowl and freshwater finfish and would improve recreation and tourism. The restored marsh would provide a storm buffer to protect communities along the river, roads, levees, and bridges.

**Mapping Unit and Programmatic Strategies** - Restoring hydrology of this unit by various methods is a mapping unit strategy. Restoration of the function of the Barataria ridge is also a mapping unit strategy. There are no programmatic strategies proposed for this unit.

### *West Pointe a la Hache*

**Location** - This 19,000-acre unit is located in Plaquemines Parish along the Mississippi River from Happy Jack to Deer Range. The southern boundary is the Bayou Grand Cheniere ridge.

**Habitat Description and Landscape Change** - This area was mostly brackish in 1949 and became all brackish in 1968. It developed some saline marsh in 1978 and was all brackish in 1988.

**Historic Land Loss** - In 1932, there were 13,400 acres of wetlands in the unit. Approximately 2,110 acres became open water between 1932 and 1974. Most of the loss was caused by altered hydrology from canal dredging; subsidence also caused loss. From 1974 until 1990, some 2,930 acres of marsh were lost, mainly due to altered hydrology, subsidence, and herbivory. Subsidence is high in the unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had approximately 8,360 acres of marsh. Over the next 50 years, approximately 4,500 acres are projected to be lost if nothing is done. Although the siphon and CWPPRA outfall management project will preserve approximately 2,140 acres through 2050, 28.2% of the 1990 acres will be lost. However, it is unlikely that the Grand Cheniere ridge will be breached, so gulf waters will not be at the toe of the hurricane protection levee. The road down the ridge to Hermitage may be flooded more in the future.

**Fish and Wildlife Resources** - Most species in the estuarine dependent

assemblage have shown increasing population trends over the last 10 to 20 years (red and black drum, Gulf menhaden, southern flounder, brown and white shrimp, and blue crab). Spotted seatrout populations have remained steady over the same period, as have those of the American oyster and Spanish mackerel. Freshwater assemblage populations (channel catfish and largemouth bass) have increased during this period. In the future, populations of all of the above are projected to decline except for spotted seatrout and the American oyster; these populations will remain steady.

Populations of brown pelicans, dabbling and diving ducks, rails, gallinules, and coots have shown increasing trends over the last 10 to 20 years. Seabirds, wading birds, shorebirds, raptors, and game mammals have had steady populations over the same period. Furbearer and American alligator populations have decreased. All the species and groups that were increasing in the past are projected to continue to do so in the future. Seabird, wading bird, shorebird, and raptor populations are projected to decrease. Populations of furbearers, game mammals and American alligators should remain steady in the future.

**Infrastructure** - The USACE hurricane protection levee runs along the northern boundary of this unit. The Mississippi River is not dredged adjacent to this unit, but its banks are revetted. There is a local road down the Grand Cheniere ridge to the village of Hermitage. There are no primary or secondary roads and no railroads. There are five miles of tertiary roads, 24 miles of natural gas

pipelines, and 93 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - Protection of the Grand Cheniere ridge and freshwater and sediment diversions have been proposed to better manage the fresh-to-brackish marsh hydrology.

**Coastal Use/Resource Objectives** - The public prefers fresh marsh near the river, grading to intermediate and then brackish marsh. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater and freshwater finfish, furbearers, waterfowl, and recreation and tourism. Aquifer recharge is also desired, and the parish recognizes that the preserved marsh will provide a storm buffer to protect communities, roads, levees and bridges.

**Regional Ecosystem Strategies** - The outfall of the existing siphons should be maintained even after the CWPPRA program stops. Spoil banks should be gapped and canals plugged where these actions would maximize deposition of sediment in the brackish and saline marshes.

**Benefits of Regional Strategies** - The above strategies would reduce loss in this unit by nearly 100%. Populations of blue crabs, freshwater finfish, American alligators, furbearers, and waterfowl would all increase along with recreation and tourism. Aquifer recharge would be enhanced, and the preserved marsh would provide a storm buffer for roads, levees, bridges, and communities.

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

### *Caminada Bay*

**Location** - This 130,300-acre unit is located in Lafourche Parish. It extends along Louisiana Highway 1 south of Golden Meadow to the Fourchon area. Its northern boundary runs along the ridge of Bayou Raphael and then eastward through Hackberry Bay to Barataria Bay. The community of Leeville is in this unit.

**Habitat Description and Landscape Change** - In 1949, the area contained brackish marsh adjacent to Bayou Lafourche and saline marsh south to Fourchon. There was also a small area of intermediate marsh just east of Golden Meadow. By 1968, higher salinity waters had moved north, and there was no intermediate marsh in the unit. However, there were about equal amounts of brackish and saline marshes. By 1978, the saline marsh nearly covered the unit. By 1988, the area became about 95% saline marsh.

**Historic Land Loss** - From 1932-1974, about 12,620 acres of the original 63,110 acres of marsh were lost. The dredging of numerous oil field canals altered the hydrology and allowed more saline waters and stronger tides into the area. The hurricane surge from Betsy in 1965 drove saline waters deep into the area and caused extensive loss, especially in the northern, fresher areas. Between 1974 and 1990, about 13,970 additional acres of marsh were lost as marsh ponds opened up, especially in the southern

half of the unit. Subsidence and wind erosion were probably the primary causes of this loss in the south, and altered hydrology led to continued loss in the northern portions. Subsidence is high, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 36,520 acres of marsh. By 2050, nearly 19,560 acres are projected to be lost due to continuing subsidence, wind erosion, and altered hydrology. The fresh water from Davis Pond will hug the western portion of the Barataria estuary and provide some nutrients to this area. This will possibly preserve 600 acres. Thus, by 2050, approximately 51.9% of the existing marshes in this unit will be gone. In many areas, bay waters will be very close to Louisiana Highway 1.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, most of the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage has increased, while the southern flounder has remained steady. The same trends are projected to occur in the future, except that the southern flounder is also expected to decrease.

The brown pelican has shown an increasing population trend over the last 10 to 20 years. Populations of most other wildlife such as seabirds, wading birds, and shorebirds, have been steady. Dabbling ducks, diving ducks, and furbearers have shown decreasing population trends in this eroding unit. Decreases are projected in the future for

all wildlife species except the brown pelican, which will continue to increase.

**Infrastructure** - Bayou Lafourche is maintained at a depth of 9 ft and a width of 100 ft from Golden Meadow to Leeville, and 125 ft wide from Leeville to the gulf. It is maintained very infrequently, and whenever possible the dredged material is used for marsh creation. The BBWW runs through the neighboring unit to the east and influences salinity in the area. There are no primary roads or railroads in this unit. There are 10.9 miles of secondary roads, 1.6 miles of tertiary roads, 46 miles of oil and gas pipelines, and 647 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - Major strategies proposed in the past include stabilizing the banks of Bayou Lafourche, managing the area's hydrology, and protecting bay and lake shorelines. A small freshwater diversion into the unit from Bayou Lafourche, a reduction of the salinity in the BBWW, developing reef zones, and preservation of the ridges associated with abandoned distributaries of Bayou Lafourche have also been proposed.

**Coastal Use/Resource Objectives** - Habitat objectives include a large area of fresh marsh in the northwestern portion of the unit, with intermediate and brackish marshes lying to the south and east. Resource objectives include shrimp, blue crabs, American oysters, saltwater finfish, recreation and tourism, and a storm buffer of marsh to protect communities, navigational facilities, roads, levees, bridges, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - Dedicated dredging should be used to create a strip of marsh adjacent to Louisiana Highway 1 for protection. Spoil banks should be gapped and canals plugged to maximize deposition of sediment in the brackish and saline marshes. Wave absorbers at the head of the bay would protect the fringing marshes. The major strategy in this rapidly eroding unit is a delta-building conveyance channel from the Mississippi River, parallel to Bayou Lafourche.

**Benefits of Regional Strategies** - The strategies described above would result in a marsh gain in this unit by 2050. Populations of blue crabs, saltwater finfish, and waterfowl would all increase. Recreation and tourism would increase as well. The preserved marsh would provide a storm buffer for navigational facilities, oil and gas infrastructure, roads, levees, bridges, and communities such as Leeville. The diversion would impact American oysters, but compensation would be addressed as part of the project. Shrimp and saltwater finfish would be displaced, but populations would increase.

**Mapping Unit and Programmatic Strategies** - The shorelines of the BBWW and the Southwest Louisiana Canal should be maintained. Vegetative plantings of mangroves or marsh grasses should occur. Pumps associated with the hurricane protection levee should have their outfall relocated to place the water into the marsh instead of canals. The programmatic strategy in this unit is to use alternative sources of sediment such as red mud, compost, etc. for marsh building.

## *Fourchon*

**Location** - This 17,400-acre unit is located in Lafourche Parish at the mouth of Bayou Lafourche. It is bounded on the north by Louisiana Highway 1, on the south by the Gulf of Mexico, on the west by Bayou Lafourche, and on the east by Caminada Pass.

**Habitat Description and Landscape Change** - This area has been classified as saline marsh since 1949. It contains some valuable relic beach ridges covered with live oaks.

**Historic Land Loss** - The area contained 9,740 acres of marsh in 1932. Between then and 1990, about 2,970 acres of marsh were lost. The greatest loss (1,720 acres) took place from 1974-1983 and was mainly due to altered hydrology and wind erosion of a large pond. Commercial dredging of sand has also caused loss, and subsidence is high in this unit, ranging from 2.1-3.5 ft/century. The shoreline of this unit is retreating at a rate of over 100 ft/year in some places. This is one of the highest landward migration rates in the United States (Barrier Shoreline Feasibility Study). The average rate is 44 ft/year. The jetties at the mouth of the navigation channel interrupt long shore drift and are eroding slightly on the east side and much more rapidly on the west side. Sediment eroded off this headland migrates both east toward Grand Isle and west toward East Timbalier Island.

**Future Land Loss Projections** - In 1990, this unit had approximately 6,770 acres of marsh. If nothing is done, an additional 1,790 acres of marsh are projected to be lost by 2050. Although

the CWPPRA project at West Belle Pass will prevent 330 acres of this loss, 21.6% of the 1990 acreage will be lost. Material from dredging the bar channel of Bayou Lafourche is currently being placed on the beach both east and west of the jetties, and barge loads of rock have been placed east of the jetties in order to slow erosion. They appear to be having some benefit; however, the shoreline will continue to erode unless more major work is done.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, species populations of the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage (Spanish mackerel) has increased. The same trends are projected to occur in the future in this rapidly eroding region.

The brown pelican has shown an increasing population trend over the last 10 to 20 years. Seabirds, wading birds, shorebirds, raptors, dabbling and diving ducks, and rabbits have shown steady populations over the last 10 to 20 years. Furbearer populations have been decreasing over the same period. Projections indicate that populations of all the wildlife mentioned above will decrease over the next 50 years except rabbits, which are expected to remain steady and the brown pelican, which will continue to increase.

**Infrastructure** - Bayou Lafourche is maintained at a depth of 9 ft and a width of 125 ft. Jetties reduce maintenance

dredging of the bar channel. Louisiana Highway 1 is the western boundary of this unit. This highway is the only hurricane evacuation route for Grand Isle, Cheniere Caminada, and the Fourchon area. There are no primary roads or railroads in this unit. There are 5.1 miles of secondary roads, 14.7 miles of tertiary roads, 16 miles of pipelines, and 24 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies -**

Creation and restoration of the barrier shoreline in this unit and management of the brackish-to-saline marsh hydrology have been proposed in the past.

**Coastal Use/Resource Objectives -**

The public prefers brackish marsh in this unit. Desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, scientific study, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer for oil and gas infrastructure, roads, levees, bridges, and communities such as Port Fourchon.

**Regional Ecosystem Strategies -**

Restoration of the Fourchon headland is recommended.

**Benefits of Regional Strategies -**

If the headland is not restored, it will erode significantly by 2050. Restoration will preserve this area and Port Fourchon. Shrimp, blue crabs, American oysters, and saltwater finfish populations will be enhanced. Recreation and tourism will be able to continue, as will scientific studies of the adjacent marshes. The marsh and headland will provide a storm buffer for the community of Port

Fourchon and its navigational facilities, roads, levees, and bridges.

**Mapping Unit and Programmatic**

**Strategies -** There are no mapping unit strategies recommended for this unit.

The programmatic strategy of restricting sand mining on the islands is recommended.

***Barataria Barrier Islands***

**Location -** This 11,200-acre unit is

located at the mouth of Barataria Bay and consists of Grand Isle, Grand Terre Islands, and Grand Pierre Island.

Caminada, Barataria, and Quatre Bayoux passes lie between the islands.

**Habitat Description and Landscape**

**Change -** These islands are constantly changing and eroding. Grand Isle has a hurricane protection dune in front of the island. There are short lengths of breakwaters both in front of and behind the island. In 1988, the unit consisted of 36% saline marsh, 10% forested/shrub habitat, 24% agricultural land, and 30% developed areas.

**Historic Land Loss -** Breakup is

occurring on Grand Terre and Grand Pierre islands. There is gulfside erosion of 4.5 meters per year and bayside erosion of 2.5 meters per year.

According to the Barrier Shoreline Feasibility Study (Step E), Grand Terre Island has been reduced from nearly 4,200 acres in 1884 to 1,270 acres in 1988, a loss of 70% of its land area. The island has also broken in two. Grand Isle was nearly 2,600 acres in 1887. It dropped to 2,260 acres in 1934 and has stabilized at about 2,370 acres. The

subsidence rate in this area is high (2.1-3.5 ft/century).

#### **Future Land Loss Projections -**

According to some projections, Grand Terre will disappear by the year 2033. If the dredged material from the BBWW continues to be used to nourish the island, the western portion should remain longer than projected. Grand Isle is projected to remain as long as the dune is maintained, and Grand Pierre is likely to be gone by 2050.

**Fish and Wildlife Resources -** Over the last 10 to 20 years, species populations of the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage (Spanish mackerel) has increased. The same trends are projected to occur in the future in this rapidly eroding region.

The brown pelican has shown an increasing population trend over the last 10 to 20 years, and this trend is expected to continue through 2050. Other wildlife species, such as dabbling and diving ducks, rails and gallinules, furbearers, and rabbits have shown decreasing numbers over the same time period. Populations of seabirds, wading birds, shorebirds, and squirrels have remained steady, and projections indicate that over the next 50 years, all the above wildlife will show decreasing trends as the islands are eroded away.

**Infrastructure -** Grand Isle is the only inhabited barrier island in the deltaic

plain. The USACE maintains a hurricane protection dune/beach on the gulf side of the island. The BBWW is maintained to dimensions of 12 ft deep by 125 ft wide, and all the dredged material is used beneficially. There are no primary roads or railroads in this unit. There are 7.2 miles of secondary roads, 26.2 miles of tertiary roads, 34 miles of oil and gas pipelines, and nine oil and/or natural gas wells in the unit.

#### **Previously Proposed Strategies -**

Creation and restoration of barrier islands and relocation of navigation channels have been proposed in the past for this unit.

**Coastal Use/Resource Objectives -** The parish prefers barrier island habitat consisting of beach, dunes, and back-bay saline marsh. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, nongame fish and wildlife, endangered species, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer for oil and gas infrastructure.

#### **Regional Ecosystem Strategies -**

Restoration of the barrier islands by the alternative recommended from the Barrier Shoreline Feasibility Study is suggested.

**Benefits of Regional Strategies -** If the barrier islands are not restored, there will be very few of the existing islands left by 2050, except for Grand Isle. Restoration would enhance populations of shrimp, blue crabs, American oysters, and saltwater finfish. Vital habitat would be provided for Neotropical migrants and endangered species, such as the piping

plover. Recreation and tourism would be enhanced. The barrier islands would provide a storm buffer for oil and gas infrastructure.

**Mapping Unit and Programmatic Strategies** - Beneficial use of material from the BBWW or offshore should be used to build islands. The oak ridges behind the islands should be restored. There are no programmatic strategies recommended for this unit.

### ***Barataria Bay***

**Location** - This 43,700-acre unit extends from St. Mary's Point south to the barrier islands and from Lake Grand Ecaille on the east to just west of the BBWW on the west. It is located in Jefferson and Plaquemines parishes.

**Habitat Description and Landscape Change** - The area has been and continues to be saline marsh fringes around Barataria Bay.

**Historic Land Loss** - This unit consisted of 2,645 acres of marsh in 1932. From then until 1974, some 1,080 acres were lost, mainly due to wind erosion and subsidence. These same factors also caused the loss of 765 acres from 1974-1990. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - Wind erosion will continue and will worsen as the barrier islands continue to erode. In 1990, this unit had approximately 800 acres of marsh. It is projected that all remaining marsh will be lost by 2050 if nothing is done. Davis Pond Freshwater Diversion will prevent a small amount of this loss, and there is a CWPPRA project

to utilize material from the BBWW to create marsh. Even with these current projects, by 2050, over 41% of the present marsh will be gone if nothing else is done.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, species populations in the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) and estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage (Spanish mackerel) has shown increased populations. The same trends are projected to occur in the future.

This unit is mainly open water. Over the last 10 to 20 years brown pelican numbers have increased. Queen Bess Island, the reintroduction site of the pelican, is located within this unit. Diving ducks have shown decreasing population trends, while seabirds have remained steady. Over the next 50 years, the brown pelican is expected to continue to increase, seabirds will remain steady, and diving ducks will decrease as food supplies decrease.

**Infrastructure** - There are no roads or railroads in the unit. The 12-ft deep by 125-ft wide BBWW runs through this unit. There are over 32 miles of oil and gas pipelines and 157 oil and/or natural gas wells in this unit.

**Previously Proposed Strategies** - It has been proposed to manage the hydrology of the BBWW and to stabilize its banks, as well as to create a reef zone across the bay and use dredged material to benefit marshes.

**Coastal Use/Resource Objectives** - The parishes prefer saline marsh in this lower bay area. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, and recreation and tourism.

**Regional Ecosystem Strategies** - The draft CWPPRA Barrier Shoreline Feasibility Study has proposed wave absorbers in this unit in addition to restoration of the islands at the mouth of Barataria Bay and the Plaquemines Parish barrier shoreline. These wave absorbers would be made of rock and be 300 ft wide, with a gap of 150 ft between breakwaters. They would be placed at the four-foot depth contour and be about nine feet high from the bottom to the top.

**Benefits of Regional Strategies** - The wave absorbers will preserve some saline marsh and prevent over 50% of the projected loss in this unit. They will increase populations of shrimp, blue crab, saltwater finfish, and American oyster and will help promote recreation and tourism.

**Mapping Unit and Programmatic Strategies** - Using dredged material from offshore or the BBWW to build marsh is a mapping unit strategy proposed for this unit. There are no programmatic strategies proposed for this unit.

### *Lake Washington/Grande Ecaille*

**Location** - The northern boundary of this 77,400-acre unit runs along Bayou Grand Cheniere and then along the Mississippi River from just north of Port Sulphur to Empire in Plaquemines

Parish. The southern boundaries of the unit are lakes Washington and Grand Ecaille.

**Habitat Description and Landscape Change** - The unit was entirely saline in 1949. In 1968 and 1978, it was a mixture of brackish and saline marshes. In 1988, it was 60% saline and 40% brackish marsh.

**Historic Land Loss** - There were 47,100 acres of wetlands in this unit in 1932. Approximately 6,410 acres were lost from 1935-1974 due to subsidence, wind erosion, and dredging. From 1974-1990, approximately 4,120 acres were lost, mainly due to altered hydrology from the dredging, subsidence, and wind erosion. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had approximately 36,570 acres of marsh. If nothing is done, approximately 9,500 acres are projected to be lost by 2050. The Davis Pond Freshwater Diversion will preserve about 740 acres, resulting in a net loss of 24% of the 1990 marsh by 2050. Open water is likely to be present at the base of the hurricane protection levee from Empire to Port Sulphur.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) has shown decreasing population trends. The estuarine resident assemblage (American oyster) has remained steady. These same trends are projected to occur in the future, and the marine assemblage

(Spanish mackerel) is projected to increase.

The brown pelican has shown an increasing trend over the last 10 to 20 years. Populations of seabirds, wading birds, shorebirds, and raptors have been steady over this period. Populations have decreased for diving and dabbling ducks, rails, gallinules, coots, furbearers, game mammals, and the American alligator. Projections over the next 50 years show that populations of all of the above will decrease except for the brown pelican, which will continue to increase.

**Infrastructure** - There are 13 miles of hurricane protection levees along the northern edge of this unit. The Mississippi River is not dredged in this area, and the foreshore is revetted. There are four miles of tertiary roads, 56 miles of oil and gas pipelines, and 382 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - Preserving the Grand Cheniere ridge, developing a reef zone, and constructing a large freshwater and sediment diversion have been proposed in the past. Managing the brackish to saline marsh hydrology and beneficial use of dredged material have also been proposed.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh near the river, grading to intermediate and then brackish marsh near the Gulf of Mexico. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater and freshwater finfish, furbearers, waterfowl, and recreation and tourism. Aquifer recharge is also desired, and the parish recognizes that the preserved marsh will provide a storm buffer to

protect communities, roads, levees and bridges.

**Regional Ecosystem Strategies** - A small diversion from the Mississippi River near Amoretta is recommended. Construction of a delta-building diversion of about 15,000 cfs near Myrtle Grove is also recommended because it would have marsh benefits in this unit. Spoil banks should be gapped and canals plugged where these actions would maximize deposition of sediment in the brackish and saline marshes. Wave absorbers should be built at the heads of the bays to protect the fringing marshes.

**Benefits of Regional Strategies** - The strategies recommended in this unit would prevent over 50% of the projected loss. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism would all be increased as this unit becomes fresher. Aquifer recharge will be enhanced by the diversions. Shrimp and saltwater finfish would be displaced by the diversions, but they would not decrease as projections suggest if nothing is done. American oysters would be impacted, and this impact will be addressed during project planning. A significant storm buffer would be provided to protect roads, levees, bridges, and communities.

**Mapping Unit and Programmatic Strategies** - The parish strongly desires that the hurricane protection levee borrow pit be filled to create marsh. The programmatic strategy to study the borrow canal salinity intrusion issue is proposed for this unit.

## *Cheniere Ronquille*

**Location** - This 51,200-acre unit includes the area known as Cheniere Ronquille in Plaquemines Parish. The northern boundary is the southern portion of lakes Washington and Grand Ecaille.

**Habitat Description and Landscape Change** - The unit has been saline marsh since 1949.

**Historic Land Loss** - In 1932, the unit consisted of 19,550 acres of marsh. From 1932-1974, some 5,290 acres of marsh were lost due to subsidence, wind erosion and canal dredging. The loss rate accelerated from 1974 to 1990 when approximately 7,730 acres were lost, mainly due to subsidence and altered hydrology. Subsidence rates are high, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - Subsidence will continue to be a problem, and tidal energy will increase as the barrier shoreline continues to disappear. In 1990, this unit had 6,530 acres of marsh. By 2050, if nothing is done, approximately 5,980 acres are projected to be lost. The Davis Pond Freshwater Diversion will preserve 1,580 acres, but even with the diversion, over 67% of this unit will be gone by 2050.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, most species in the estuarine dependent assemblage (red and black drum, spotted seatrout, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage species

have increased, while the southern flounder and Gulf menhaden have remained steady. The same trends are projected to occur in the future, with the exception of Gulf menhaden and southern flounder. These two species are projected to decrease by 2050.

The brown pelican has shown an increasing trend over the last 10 to 20 years, and this trend is expected to continue through 2050. All other wildlife such as seabirds, wading birds, shorebirds, dabbling ducks, diving ducks, furbearers, and American alligators have shown decreasing trends in this rapidly eroding unit. Continuing decreases are projected for the future.

**Infrastructure** - There are no primary roads, tertiary roads, or railroads in this unit. There are 0.2 miles of secondary roads, 77 miles of oil and gas pipelines, and 638 oil and/or natural gas wells in this unit.

**Previously Proposed Strategies** - A freshwater and sediment diversion that would impact this unit has been proposed in the past. In addition, relocation of navigation channels and beneficial use of dredged material have also been proposed.

**Coastal Use/Resource Objectives** - The parish prefers brackish marsh in the northern portion of this unit and saline marsh to the south. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, recreation and tourism, aquifer recharge, and storm buffering.

**Regional Ecosystem Strategies** - There are no regional strategies recommended in this unit.

**Benefits of Regional Strategies** - Not applicable.

**Mapping Unit and Programmatic Strategies** - Restoration of the oak ridge that once existed on this chenier is recommended as a mapping unit strategy for this unit. No programmatic strategies are recommended for this unit.

### ***Barataria Barrier Shorelines***

**Location** - This unit extends from Quatre Bayoux Pass along the Plaquemines Parish shoreline to Sandy Point.

**Habitat Description and Landscape Change** - The unit consists of a narrow strip of sand and shell along the Gulf of Mexico and saline marsh to the north. In 1988, the area consisted of 78% saline marsh, 10% forest/shrub, and 12% shoreline.

**Historic Land Loss** - According to the Barrier Shoreline Feasibility Study, breakup (gulfside and landside erosion and inlet widening) and landward rollover has been occurring from Scofield Bayou to Sandy Point. Shoreline retreat has been the dominant process on Cheniere Ronquille and in front of Bay Joe Wise. Shell Island increased in acreage from 313 acres in 1884 to 432 acres in 1932. However, it had lost 270 acres by 1988. Cheniere Ronquille is moving landward at about 16 ft per year; it retreated as much as 4,500 ft landward from 1884-1988.

Subsidence is very high in this unit—greater than 3.5 ft/century.

**Future Land Loss Projections** - Estimates from the Barrier Shoreline Feasibility Study indicate that Cheniere Ronquille will have lost its western point by 2050, and its shoreline will have moved inland up to one third of a mile. Bay Joe Wise will be open to the gulf, with only remnants of its bar remaining, and Shell Island will be nearly gone. Pelican Island, the headland between Fontenelle Pass and Scofield Bayou, is in dynamic equilibrium and is likely to be in existence in 2050. Sandy Point will no longer exist, and Bay Coquette will be open to the gulf.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing population trends. Only the marine assemblage (Spanish mackerel) has increased. The same trends are projected to occur in the future.

The brown pelican has shown an increasing trend over the last 10 to 20 years and should continue to do so through 2050. All other wildlife, such as seabirds, wading birds, shorebirds, dabbling ducks, diving ducks, and furbearers have shown decreasing trends in this rapidly eroding unit. Continuing decreases are projected for the future.

**Infrastructure** - There are no roads or railroads in this unit. However, there are 12 miles of oil and gas pipelines and 45

oil and/or natural gas wells. The 9-ft deep x 80-ft wide Empire to the Gulf Waterway enters the gulf through Fontenelle Pass. The jetties reduce the need for dredging.

**Previously Proposed Strategies** - Creation and restoration of barrier islands, management of hydrology in brackish and saline marshes, and relocation of navigation channels have been proposed in the past.

**Coastal Use/Resource Objectives** - The parish prefers barrier island habitat consisting of beach, dunes, and back-bay saline marsh. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater finfish, non-game fish and wildlife, endangered species, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer for oil and gas infrastructure.

**Regional Ecosystem Strategies** - Restoration of the barrier shoreline by the alternative recommended from the Barrier Shoreline Feasibility Study is suggested.

**Benefits of Regional Strategies** - If the barrier shoreline is not restored, there will be very little of the existing shoreline left by 2050. Restoration would enhance populations of shrimp, blue crabs, American oysters, and saltwater finfish. Vital habitat would be provided for Neotropical migrants and endangered species, such as the piping plover. Recreation and tourism would be enhanced, and the barrier shoreline would provide a storm buffer for oil and gas infrastructure.

**Mapping Unit and Programmatic Strategies** - Beneficial use of dredged material should occur, and the oak ridges behind the islands should be restored. Consideration should be given to movable wave absorbers in the gulf. The Empire jetties should be removed, or a sand bypass system should be built. There are no programmatic strategies recommended for this unit.

### ***Bastian Bay***

**Location** - This 40,600-acre unit is located in Plaquemines Parish and extends from the Mississippi River near Buras to the gulf shoreline. The southeastern boundary is the Grand Liard ridge, and the northwestern boundary is the Empire Waterway and Bastian Bay.

**Habitat Description and Landscape Change** - This area was entirely saline in 1949 and 1968. By 1978, a small amount of brackish marsh developed in the hurricane levee ponding areas. By 1988, the only solid marsh in the area was the brackish marsh in the ponding area. The unit was 43% brackish marsh and 57% saline marsh in 1988.

**Historic Land Loss** - In 1932, this unit had 27,555 acres of marsh. From 1932-1974, some 8,025 acres were lost due to subsidence, wind erosion, and the dredging of numerous oil field canals, deep borrow pits for the hurricane protection levee, and a navigation channel. The loss from 1974-1990 was also very high (15,320 acres) due to the tidal energy allowed into the area by subsidence, wind erosion, and the extensive canal network. Subsidence is

high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 4,210 acres of marsh. By the year 2050, this area will become nearly all open water, as 95% of the marsh that is present today is projected to be gone (3,990 acres). The only marsh left will be that in the ponding areas of the hurricane protection levee. Gulf water will be lapping at the dikes of the ponding area, and the undiked portions of the ponding area may erode. It would then be probable that the hurricane levee would have to be raised.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, the estuarine dependent assemblage (red and black drum, spotted seatrout, Gulf menhaden, southern flounder, white and brown shrimp, and blue crab) and the estuarine resident assemblage (American oyster) have shown decreasing trends. Only the marine assemblage (Spanish mackerel) has increased. The same trends are projected to occur in the future in this rapidly eroding area.

The brown pelican has shown an increasing population trend over the last 10 to 20 years, and this trend will continue through 2050. All other wildlife species, such as seabirds, wading birds, shorebirds, dabbling ducks, diving ducks, and furbearers, have shown decreasing trends in this rapidly eroding unit. Continuing decreases are projected for the future.

**Infrastructure** - There are approximately nine miles of foreshore protection along the Mississippi River bank in this unit. The Mississippi River

does not need to be dredged for navigation in this area. The 9-ft deep by 80-ft wide Waterway from Empire to the Gulf of Mexico passes through this mapping unit, and there is a state-owned lock at Empire that allows boats to enter and leave the Mississippi River. The New Orleans to Venice hurricane protection levee parallels the river through this unit. It was built by pumping sand from the river and covering the sand with clay, and a ponding area was built marshward of the levee to catch clay running off the levee. Louisiana Highway 23 lies within the hurricane protection levee, and water supply to the towns adjacent to this unit comes from the Mississippi River. This unit contains no primary roads or railroads. It contains one mile of secondary road, five miles of tertiary roads, 67 miles of oil and gas pipelines, and 302 oil and/or natural gas wells.

**Previously Proposed Strategies** - Previous restoration plans recommended freshwater or sediment diversions into this area because it is near the Mississippi River and badly eroding. Relocation of the Mississippi River Navigation Channel through this area has also been proposed.

**Coastal Use/Resource Objectives** - The habitat objectives in this unit are to have an area of fresh marsh paralleling the river, with intermediate and brackish marshes lying to the south. Resource objectives include shrimp, blue crabs, American oysters, freshwater and saltwater finfish, American alligators, furbearers, waterfowl, recreation and tourism, aquifer recharge, and a storm buffer of marsh to protect communities,

navigational facilities, and oil and gas infrastructure.

**Regional Ecosystem Strategies** - A small diversion from the Mississippi River near Empire is recommended in the short term. Later, a larger, delta-building diversion of about 15,000 cfs should be built.

**Benefits of Regional Strategies** - Implementation of the two diversions would allow a net gain of marsh by 2050. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism would all be increased as this unit becomes fresher, and aquifer recharge will be enhanced by the diversions. Shrimp and saltwater finfish would be displaced by the diversions, but they would not decrease as they are projected to do if nothing is done. American oysters would be impacted, and this impact will be addressed during project planning. A significant storm buffer would be provided for navigational facilities, roads, levees, bridges, and communities.

**Mapping Unit and Programmatic Strategies** - The parish strongly desires that the hurricane protection levee borrow pit be filled to create marsh. The programmatic strategy for this unit is to locate the source of saline intrusion into the developed area.

### *Grand Liard*

**Location** - This 55,200-acre unit is located in Plaquemines Parish, south of the Mississippi River from Triumph to Venice. The southern boundary is

Spanish Pass and the western boundary is the Bayou Grand Liard ridge.

**Habitat Description and Landscape Change** - In 1949, the unit was fresh, brackish, and saline. In 1968 and 1978, there was only intermediate and brackish marsh. In 1988, the area was 40% intermediate, 40% saline and 20% brackish.

**Historic Land Loss** - There were 29,930 acres of wetlands in 1932. By 1974, some 11,600 acres had been lost, mainly due to subsidence and canal dredging. From 1974-1990, an additional 3,100 acres were lost. Subsidence continued to play a part, but altered hydrology also caused marsh loss, as did herbivory and wind erosion. Subsidence is high in this unit, ranging from 2.1-3.5 ft/century.

**Future Land Loss Projections** - In 1990, this unit had 15,230 acres of marsh. If nothing is done, approximately 7,200 acres (47.3% of the 1990 acreage) are projected to be lost by 2050. By that time, it is likely that Gulf of Mexico waters will be lapping at the hurricane protection levee.

**Fish and Wildlife Resources** - Over the last 10 to 20 years, populations of some species of the estuarine dependent assemblage have remained steady (black drum, spotted seatrout, southern flounder, and Gulf menhaden). Other species have shown decreasing population trends (white and brown shrimp, red drum, and blue crab). The marine assemblage (Spanish mackerel) and the estuarine resident (American oyster) have remained steady. In the future, all members of the estuarine

dependent assemblage are projected to decrease, while the estuarine resident and marine assemblages should remain steady.

Brown pelican populations have shown an increasing trend over the last 10 to 20 years and will continue to do so through 2050. Populations of all other wildlife (wading birds, shorebirds, seabirds, dabbling and diving ducks, geese, raptors, furbearers, game mammals, and the American alligator) have decreased over the same period. Projections indicate that these population declines will continue in the future in this rapidly eroding unit.

**Infrastructure** - The hurricane protection levees from Triumph to Venice lie along the northern boundary of this unit. The developed portion of the parish, adjacent to this unit, is very thin, but Plaquemines Parish has a surface water intake in this unit. The Mississippi River is not dredged adjacent to this unit because it has enough depth naturally. There are no primary or secondary roads and no railroads in this unit. There are 13 miles of tertiary roads, 57 miles of oil and gas pipelines, and 414 oil and/or natural gas wells in the unit.

**Previously Proposed Strategies** - A freshwater and sediment diversion in this unit and management of the brackish to saline marsh hydrology has been proposed in the past.

**Coastal Use/Resource Objectives** - The parish prefers fresh marsh near the river, grading to intermediate and then brackish marsh near the gulf. The desired coastal resources are shrimp, American oysters, blue crabs, saltwater

and freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism. The parish recognizes that the preserved marsh will provide a storm buffer to protect oil and gas infrastructure.

**Regional Ecosystem Strategies** - Construction of a sediment trap in the Mississippi River south of Venice, and utilization of the material to create marsh in this unit is recommended. Relocation of the navigation channel to prevent the loss of sediment off the continental shelf should be studied and implemented if feasible. A delta-building diversion of about 15,000 cfs from the Mississippi River, near Buras, should be directed into Bastian Bay. A diversion such as this would benefit the unit greatly.

**Benefits of Regional Strategies** - If the regional strategies described above were implemented, there would be an overall gain of marsh in this unit. Blue crabs, freshwater finfish, American alligators, furbearers, waterfowl, and recreation and tourism would all be enhanced. Shrimp and saltwater finfish would be displaced, but they would not decrease as they are projected to if nothing is done. American oysters would be impacted, and this impact would be addressed during project planning. Lastly, implementation of the regional strategies would result in a significant storm buffer to protect oil and gas infrastructure.

**Mapping Unit and Programmatic Strategies** - The parish strongly desires that the hurricane protection levee borrow pit be filled to create marsh, and the source of saline intrusion into the developed area should be located. 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 or land gain.

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 made 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 nonwetland 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 environmental impact statement 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. 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***

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***MRSNFR***

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***Barrier Islands Feasibility Study***

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***Existing Projects***

These are existing coastal restoration  
projects that are in the planning phase or  
currently operational.

**Region 2 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.

**Region 2 Depth of Bays Table**

Table 4-6 includes the depth of  
significant bays located in Region 2.  
This information was formulated by  
members of the Region 2 Regional  
Planning Team (RPT) in consultation  
with field personnel.

**Table 4-1. Region 2 wetland loss.**

BARATARIA BASIN	Major habitat types in 1949	Habitat changes in 1949-1988/1990	Subsidence rate	Approximate acres lost	
Baker	Swamp (Sw) Bottomland Hardwood (BLH)	No change 1988 - 50% Sw, 50% BLH	Low <1 ft per century	Acres marsh in 1932	N/D
				Acres lost 1932-1956	N/D
				Acres lost 1956-1974	N/D
				Acres lost 1974-1983	N/D
				Acres lost 1983-1990	
Des Allemands	Swamp (Sw) Fresh (F) Bottomland Hardwood (BLH)	1968-1988 - No change 1988 - 60% S, 30% F, 10% BLH	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932	23,050
				Acres lost 1932-1956	590
				Acres lost 1956-1974	1,320
				Acres lost 1974-1983	1,700
				Acres lost 1983-1990	920
Lake Boeuf	Swamp (Sw) Fresh (F) Bottomland hardwood (BLH)	1968-1988 - No change 1988 - 60%Sw, 25% F, 15% BLH	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932	24,695
				Acres lost 1932-1956	590
				Acres lost 1956-1974	565
				Acres lost 1974-1983	2,560
				Acres lost 1983-1990	560
Gheens	Swamp (Sw) Fresh (F) Bottomland Hardwood (BLH)	1968-1988 - No change 1988 - 50% F, 30% BLH, 20% Sw	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932	13,580
				Acres lost 1932-1956	390
				Acres lost 1956-1974	0
				Acres lost 1974-1983	690
				Acres lost 1983-1990	0

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Causes of loss*	Comments	Projected acres lost by 2050
Baker	Not in database	Not in database. Swamp filling with understory. No regeneration due to herbivory.	Acres marsh in 1990 640 Acres marsh lost by 2050 230 Acres swamp 1990 32,760 Acres swamp lost by 2050 16,380 % 1990 wetland acres lost by 2050 49.7
Des Allemands	Altered hydrology - 1, C Wind - 2, H, C Herbivory - 3, C	Some subsidence. Swamp filling with understory. No regeneration due to herbivory. Loss of flotant?	Acres of marsh in 1990 18,520 Acres lost by 2050 6,730 Acres swamp 1990 44,560 Acres swamp lost by 2050 26,740 Acres preserved CWPPRA/DP 890 % 1990 acres lost with CWPPRA/DP 51.6
Lake Boeuf	Herbivory - 1, C Altered hydrology - 2, C Wind - 3, H, C	Some subsidence. Swamp filling with understory. No regeneration due to herbivory.	Acres of marsh in 1990 20,420 Acres lost by 2050 8,040 Acres swamp 1990 45,980 Acres swamp lost by 2050 27,580 Acres preserved CWPPRA/DP 1,615 % 1990 acres lost with CWPPRA/DP 53.6
Gheens	Direct removal - 1, C	Some subsidence. Swamp filling with understory. No regeneration due to herbivory.	Acres of marsh in 1990 12,500 Acres lost by 2050 2,250 Acres swamp 1990 6,910 Acres swamp lost by 2050 3,460 % 1990 wetland acres lost by 2050 29.4

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Major habitat types in 1949	Habitat changes in 1949-1988/1990	Subsidence rate	Approximate acres lost
Cataouatche/ Salvador	Fresh (F) Some Swamp (Sw) and Bottomland Hardwood (BLH)	Some I added in 1968 F and I in 1978 1988 - 90% F, 10% I, some Sw	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932 113,700 Acres lost 1932-1956 3,500 Acres lost 1956-1974 8,450 Acres lost 1974-1983 3,900 Acres lost 1983-1990 2,190
Clovelly	Fresh (F) Intermediate (I)	to F, I, and B in 1968 to F and I in 1978, small amt. B 1988 - 55%I, 45% F	High 2.1 to 3.5 ft per century	Acres marsh in 1932 43,045 Acres lost 1932-1956 1,325 Acres lost 1956-1974 4,690 Acres lost 1974-1983 730 Acres lost 1983-1990 1,090
Perot,Rigolettes	Intermediate (I)	to B and I in 1968 same in 1978 1988 - 47% B, 43% I, 10% F	High 2.1 to 3.5 ft per century	Acres marsh in 1932 43,210 Acres lost 1932-1956 5,950 Acres lost 1956-1974 4,760 Acres lost 1974-1983 1,700 Acres lost 1983-1990 2,300
Jean Lafitte	Swamp (Sw) Bottomland Hardwood (BLH) Fresh (F)	to Sw, BLH, and I in 1968 to Sw, BLH, and F in 1978 1988 - 45% Sw, 40% BLH, 15% F	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932 1,850 Acres lost 1932-1956 200 Acres lost 1956-1974 200 Acres lost 1974-1983 0 Acres lost 1983-1990 0
Naomi	Intermediate (I) 20% Brackish (B) 80%	to F and I in 1968 to I, F, and B in 1978 1988 - 60% I, 35% B, 5% F	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932 30,370 Acres lost 1932-1956 2,740 Acres lost 1956-1974 4,380 Acres lost 1974-1983 1,370 Acres lost 1983-1990 1,770

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Causes of loss*	Comments	Projected acres lost by 2050
Cataouatche/ Salvador	Herbivory - 1, C Dredging - 2, H Altered hydrology - 3, H, C Wind - 4, H, C	Wind erosion will continue. Saltwater and tides will cause erosion in the future.	Acres of marsh in 1990 95,660 Acres lost by 2050 16,735 Acres swamp 1990 11,850 Acres swamp lost by 2050 5,930 Acres preserved CWPPRA/DP 10,320 % 1990 acres lost with CWPPRA/DP 6.5
Clovelly	Dredging - 1, H Impoundments - 2, H Wind - 3, C	Wind erosion will continue. Saltwater and tides will cause erosion in the future.	Acres of marsh in 1990 35,210 Acres lost by 2050 5,635 Acres preserved CWPPRA/DP 1,385 % 1990 acres lost with CWPPRA/DP 12.1
Perot, Rigolettes	Wind - 1, H, C Altered hydrology - 2, H Herbivory - 2, C Subsidence - 2, H, C Dredging - 3, H	Subsidence is basic cause. It increases saltwater and tidal scour.	Acres of marsh in 1990 28,500 Acres lost by 2050 10,370 Acres preserved CWPPRA/DP 4,560 % 1990 acres lost with CWPPRA/DP 20.4
Jean Lafitte	Dredging - 1, H Altered hydrology - 2, C Herbivory - 2, C	Herbivory very bad and will continue.	Acres of marsh in 1990 1,450 Acres lost by 2050 0 Acres swamp in 1990 2,920 Acres swamp lost by 2050 0
Naomi	Altered hydrology - 1, H, C Subsidence - 1, H,C Dredging - 2, H Herbivory - 3, C	Subsidence will cause future loss. Saltwater a problem when wind from SE.	Acres of marsh in 1990 20,110 Acres lost by 2050 7,075 Acres swamp in 1990 1,380 Acres swamp lost by 2050 0 Acres preserved CWPPRA/DP 5,950 % 1990 acres lost with CWPPRA/DP 5.6

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Major habitat types in 1949	Habitat changes in 1949-1988/1990	Subsidence rate	Approximate acres lost	
Myrtle Grove	Intermediate (I) 60% Brackish (B) 40%	to B, I, and S in 1968 to all B in 1978 same in 1988 - 100% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932	61,810
				Acres lost 1932-1956	3,030
				Acres lost 1956-1974	5,845
				Acres lost 1974-1983	2,110
				Acres lost 1983-1990	1,935
Little Lake	Intermediate (I) Brackish (B)	to B and S in 1968 to B, I, and S in 1978 1988 - 45% B, 35% S, 20% I	High 2.1 to 3.5 ft per century	Acres marsh in 1932	50,080
				Acres lost 1932-1956	4,630
				Acres lost 1956-1974	10,560
				Acres lost 1974-1983	4,810
				Acres lost 1983-1990	3,450
Caminada Bay	Brackish (B) Saline (S) Intermediate (I)	to B and S in 1968 to S and B in 1978 1988 - 95% S, 5% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932	63,110
				Acres lost 1932-1956	4,870
				Acres lost 1956-1974	7,750
				Acres lost 1974-1983	7,110
				Acres lost 1983-1990	6,860
Fourchon	Saline (I)	1968-1988 - No change	High 2.1 to 3.5 ft per century	Acres marsh in 1932	9,740
				Acres lost 1932-1956	300
				Acres lost 1956-1974	460
				Acres lost 1974-1983	1,720
				Acres lost 1983-1990	490
Barataria Bay	Saline (I)	1968-1988 - No change	High 2.1 to 3.5 ft per century	Acres marsh in 1932	2,645
				Acres lost 1932-1956	650
				Acres lost 1956-1974	430
				Acres lost 1974-1983	415
				Acres lost 1983-1990	350

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Causes of loss*	Comments	Projected acres lost by 2050
Myrtle Grove	Altered hydrology - 1, H, C Wind - 2, H, C Subsidence - 3, H, C Dredging - 4, H	Saltwater intrusion and tides will worsen when marsh to south is lost.	Acres of marsh in 1990 48,890 Acres lost by 2050 10,220 Acres preserved CWPPRA/DP 4,360 % 1990 acres lost with CWPPRA/DP 12.0
Little Lake	Altered hydrology - 1, H, C Wind - 2, H, C Subsidence - 3, H, C	Saltwater intrusion and tides will worsen when marsh to south is lost. Tidal energy will worsen due to loss of barrier islands.	Acres of marsh in 1990 26,630 Acres lost by 2050 14,330 % 1990 acres lost by 2050 53.8% Acres preserved CWPPRA/DP 7,420 % 1990 acres lost with CWPPRA/DP 25.9
Caminada Bay	Altered hydrology - 1, H, C Storm-related - 1, H Subsidence - 1, H, C Dredging - 2, H Wind - 3, H, C	Subsidence will be problem in future.	Acres of marsh in 1990 36,520 Acres lost by 2050 19,560 Acres preserved DP/CWPPRA 600 % 1990 acres lost with DP/CWPPRA 51.9
Fourchon	Dredging - 1, H, C Wind - 1, H, C Altered hydrology - 2, H, C Storm-related - 2, C	Will continue to be lost rapidly due to storms.	Acres of marsh in 1990 6,770 Acres lost by 2050 1,790 Acres preserved CWPPRA 330 % 1990 acres lost with CWPPRA 21.6
Barataria Bay	Wind - 1, H, C Subsidence - 2, H, C	Wind erosion and subsidence will continue. Tidal energy will worsen due to loss of barrier islands.	Acres of marsh in 1990 800 Acres lost by 2050 520 Acres preserved DP 190 % 1990 acres lost with DP 41.3

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Major habitat types in 1949	Habitat changes in 1949-1988/1990	Subsidence rate	Approximate acres lost
West Pointe a la Hache	Brackish (B) - 90% Saline (S) - 10%	to all B in 1968 to B and S in 1978 1988 - 100% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932 13,400 Acres lost 1932-1956 790 Acres lost 1956-1974 1,320 Acres lost 1974-1983 1,290 Acres lost 1983-1990 1,640
Lake Washington/ Grande Ecaille	Saline (S)	to S and B in 1968 and 1978 1988 - 60% S, 40% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932 47,100 Acres lost 1932-1956 2,440 Acres lost 1956-1974 3,970 Acres lost 1974-1983 2,220 Acres lost 1983-1990 1,900
Bastian Bay	Saline (S)	No change 1968 Some B in 1978 1988 - 43% B, 57% S	High 2.1 to 3.5 ft per century	Acres marsh in 1932 27,555 Acres lost 1932-1956 1,895 Acres lost 1956-1974 6,130 Acres lost 1974-1983 9,140 Acres lost 1983-1990 6,180
Cheniere Ronquille	Saline (S)	1968-1988 - No change	High 2.1 to 3.5 ft per century	Acres marsh in 1932 19,550 Acres lost 1932-1956 2,200 Acres lost 1956-1974 3,090 Acres lost 1974-1983 5,400 Acres lost 1983-1990 2,330

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Causes of loss*	Comments	Projected acres lost by 2050
West Pointe a la Hache	Altered hydrology - 1, H, C Subsidence - 2, H, C Dredging - 3, H Herbivory - 3, C	Nutria may continue to be a problem, unless alligators come in.	Acres of marsh in 1990 8,360 Acres lost by 2050 4,500 Acres preserved CWPPRA 2,140 % 1990 acres lost with CWPPRA 28.2
Lake Washington/ Grande Ecaille	Altered hydrology - 1, H, C Subsidence - 2, H, C Wind - 2, H, C Dredging - 3, H	Subsidence will continue to be a problem. There will be tremendous tidal energy due to loss of barrier islands.	Acres of marsh in 1990 36,570 Acres lost by 2050 9,500 Acres preserved DP 740 % 1990 acres lost with DP 24.0
Bastian Bay	Altered hydrology - 1, C Subsidence - 2, H, C Wind - 2, H, C Dredging - 3, H	Subsidence will continue to be a problem. There will be tremendous tidal energy due to loss of barrier islands.	Acres of marsh in 1990 4,210 Acres lost by 2050 3,990 % 1990 acres lost by 2050 94.8
Cheniere Ronquille	Altered hydrology - 1, C Subsidence - 2, H, C Wind - 2, H, C Dredging - 3, H	Subsidence will continue to be a problem. There will be tremendous tidal energy due to loss of barrier islands.	Acres of marsh in 1990 6,530 Acres lost by 2050 5,980 Acres preserved DP 1,580 % 1990 acres lost with DP 67.4

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Major habitat types in 1949	Habitat changes in 1949-1988/1990	Subsidence rate	Approximate acres lost	
Grand Liard	Brackish (B) Saline (S) Fresh (F)	to I and B in 1968 and 1978 1988 - 40% I, 40% S, 20% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932	29,930
				Acres lost 1932-1956	3,840
				Acres lost 1956-1974	7,760
				Acres lost 1974-1983	1,100
				Acres lost 1983-1990	2,000
Barataria Barrier Islands	Saline (S)	1968-1988 - No change 1988 - 36% S, 30% developed area 24% agricultural land, 10% forest/shrub	High 2.1 to 3.5 ft per century	Acres marsh in 1932	N/D
				Acres lost 1932-1956	N/D
				Acres lost 1956-1974	N/D
				Acres lost 1974-1983	N/D
				Acres lost 1983-1990	N/D
Barataria Barrier Shorelines	Saline (S)	1968-1988 - No change 1988 - 78% S, 12% shoreline, 10% forest/shrub	Very High > 3.5 ft per century	Acres marsh in 1932	N/D
				Acres lost 1932-1956	N/D
				Acres lost 1956-1974	N/D
				Acres lost 1974-1983	N/D
				Acres lost 1983-1990	N/D

**Table 4-1. Region 2 wetland loss (Cont.).**

BARATARIA BASIN	Causes of loss*	Comments	Projected acres lost by 2050
Grand Liard	Subsidence - 1, H, C Altered hydrology - 2, C Dredging - 2, H Herbivory - 3, C Wind - 3	Subsidence will continue to be a problem. May be some filling due to high river.	Acres of marsh in 1990 15,230 Acres lost by 2050 7,200 % 1990 acres lost by 2050 47.3
Barataria Barrier Islands	Wind - 1, H, C Altered hydrology - 2, H, C Storm-related - 2, H, C	Will continue to be lost rapidly due to wind and storms.	Acres of marsh in 1990 N/D Acres lost by 2050 N/D % 1990 acres lost by 2050 N/D
Barataria Barrier Shorelines	Wind - 1, H, C Altered hydrology - 2, H, C Storm-related - 2, H, C	Will continue to be lost rapidly due to wind and storms.	Acres of marsh in 1990 N/D Acres lost by 2050 N/D % 1990 acres lost by 2050 N/D

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BIRDSFOOT DELTA	Major habitat types in 1949	Habitat changes 1949-1988/1990	Subsidence rate	Approximate acres lost	
West Bay	Fresh (F)	to F and I in 1968 to F, S, B, and I in 1978 1988 - 30% F, 30% I, 20% S rest scrub/shrub and flats	Very High > 3.5 ft per century	Acres marsh in 1932	59,640
				Acres lost 1932-1956	21,790
				Acres lost 1956-1974	16,610
				Acres lost 1974-1983	5,960
				Acres lost 1983-1990	7,300
East Bay	Fresh (F)	to I and F in 1968 to I and some F in 1978 1988 - 60% F, 20% I rest scrub shrub and flats	Very High > 3.5 ft per century	Acres marsh in 1932	8,510
				Acres lost 1932-1956	1,970
				Acres lost 1956-1974	1,030
				Acres lost 1974-1983	510
				Acres lost 1983-1990	210
Pass a Loutre	Fresh (F)	to F and I in 1968 same 1978 1988 - 80% F, 20% I	Very High > 3.5 ft per century	Acres marsh in 1932	49,880
				Acres lost 1932-1956	10,820
				Acres lost 1956-1974	9,190
				Acres lost 1974-1983	900
				Acres lost 1983-1990	1,150
Cubit's Gap	Fresh (F) Brackish (B) Saline (S)	to F and I in 1968 same 1978 1988 - 85% F, 15% I	Very High > 3.5 ft per century	Acres marsh in 1932	50,040
				Acres lost 1932-1956	13,420
				Acres lost 1956-1974	15,320
				Acres lost 1974-1983	1,140
				Acres lost 1983-1990	1,200
Baptiste Collete	Fresh (F) Saline (S) Brackish (B)	to I, F, and B in 1968 B increased in 1978 1988 - 60% I, 20% B, 20% F	High 2.1 to 3.5 ft per century	Acres marsh in 1932	14,850
				Acres lost 1932-1956	2,810
				Acres lost 1956-1974	5,790
				Acres lost 1974-1983	830
				Acres lost 1983-1990	920

**Table 4-1. Region 2 wetland loss (Cont.).**

BIRDSFOOT DELTA	Causes of loss*	Comments	Projected acres lost by 2050
West Bay	Subsidence - 1, H, C Storm-related loss - 2, H, C Altered hydrology - 2, H, C Dredging - 3, H	Delta splays creating land.	Acres of marsh in 1990 7,980 Acres lost by 2050 7,270 Acres preserved CWPPRA 14,370 Acres in 2050 with CWPPRA 15,080
East Bay	Subsidence - 1, H, C Altered hydrology - 2, H, C Dredging - 2, H Wind - 3, H, C	Won't be any left in a few years.	Acres of marsh in 1990 4,790 Acres lost by 2050 1,870 % 1990 acres lost by 2050 39.0
Pass a Loutre	Subsidence - 1, H, C Storm-related loss - 2, H, C Altered hydrology - 2, H, C	Delta splays creating land.	Acres of marsh in 1990 27,820 Acres lost by 2050 6,340 Acres preserved CWPPRA 990 % 1990 acres lost with CWPPRA 19.2
Cubit's Gap	Subsidence - 1, H, C Storm-related loss - 2, H, C Altered hydrology - 3, H, C Wind - 3, H, C	Delta splays creating land.	Acres of marsh in 1990 18,960 Acres lost by 2050 6,370 Acres preserved CWPPRA 1,120 % 1990 acres lost with CWPPRA 27.7
Baptiste Collete	Subsidence - 1, H, C Altered hydrology - 2, H, C Storm-related loss - 3, H, C Wind - 3, H, C	Delta splays creating land.	Acres of marsh in 1990 4,500 Acres lost by 2050 2,900 Acres preserved COE MC 1,400 % 1990 acres lost with COE MC 33.3

\* H=historic cause, C=current cause

**Table 4-1. Region 2 wetland loss (Cont.).**

BRETON SOUND BASIN	Major habitat types in 1949	Habitat changes 1949-1988/1990	Subsidence rate	Approximate acres lost
American Bay	Saline (S) Brackish (B)	same 1968 some I in 1978, B increased 1988 - 65% S, 20 % B, 10% I, 5% F	High 2.1 to 3.5 ft per century	Acres marsh in 1932 53,870 Acres lost 1932-1956 3,030 Acres lost 1956-1974 3,440 Acres lost 1974-1983 1,610 Acres lost 1983-1990 3,450
Caernarvon	Brackish (B) Saline (S)	to B, S, and I in 1968 same in 1978 1988 - 75% B, 25% S, trace I	High 2.1 to 3.5 ft per century	Acres marsh in 1932 73,730 Acres lost 1932-1956 3,320 Acres lost 1956-1974 6,560 Acres lost 1974-1983 3,380 Acres lost 1983-1990 980
River aux Chenes	Brackish (B) Some saline (S)	to B, I, and S in 1968 same in 1978 1988 - 100% B	High 2.1 to 3.5 ft per century	Acres marsh in 1932 23,870 Acres lost 1932-1956 1,260 Acres lost 1956-1974 2,190 Acres lost 1974-1983 1,100 Acres lost 1983-1990 570
Lake Lery	Brackish (B)	same 1968, 1978, 1988	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932 15,880 Acres lost 1932-1956 70 Acres lost 1956-1974 2,190 Acres lost 1974-1983 600 Acres lost 1983-1990 400
Jean Louis Robin	Brackish (B) Saline	same 1968, 1978 1988 - 60% B, 40% S	Intermediate 1.1 to 2 ft per century	Acres marsh in 1932 48,060 Acres lost 1932-1956 2,580 Acres lost 1956-1974 4,420 Acres lost 1974-1983 2,370 Acres lost 1983-1990 750

**Table 4-1. Region 2 wetland loss (Cont.).**

BRETON SOUND BASIN	Causes of loss*	Comments	Projected acres lost by 2050	
American Bay	Altered hydrology - 1, C Wind - 2, H, C Subsidence - 2, H, C Dredging - 2, H	Splays at forts creating land. Subsidence will be a problem in portions.	Acres of marsh in 1990 Acres lost by 2050 Acres preserved Caernarvon % 1990 acres lost with Caernarvon	42,340 13,880 1,240 29.9
Caernarvon	Storm-related - 1, H Altered hydrology - 1, H, C Subsidence - 3, H, C Wind - 3, H, C	Hurricane Betsy caused great loss. Caernarvon diversion building land.	Acres of marsh in 1990 Acres lost by 2050 Acres preserved CWPPRA/Caernarvon % 1990 acres lost with CWPPRA/Caernarvon	59,490 13,290 9,600 6.2
River aux Chenes	Storm-related loss - 1, H Altered hydrology - 2, H, C Dredging - 3, H Subsidence - 3, H, C	Hurricane Betsy caused great loss. Subsidence will continue to be a problem.	Acres of marsh in 1990 Acres lost by 2050 Acres preserved Caernarvon % 1990 acres lost with Caernarvon	18,750 4,870 550 23.0
Lake Lery	Altered hydrology - 1, H, C Storm-related - 2, H Herbivory - 2, C	Hurricane Betsy caused great loss.	Acres of marsh in 1990 Acres lost by 2050 Acres preserved Caernarvon % 1990 acres lost with Caernarvon	12,620 3,110 2,090 8.1
Jean Louis Robin	Altered hydrology - 1, H Wind - 1, H, C Storm-related - 1, H Subsidence - 2, H, C	Hurricane Betsy caused great loss. Subsidence will continue to be a problem.	Acres of marsh in 1990 Acres lost by 2050 Acres preserved Caernarvon/MC % 1990 acres lost with Caernarvon/MC	37,940 9,340 4,420 13.0

\* H=historic cause, C=current cause

**Table 4-2. Region 2 previously proposed strategies.**

	<b>DEFENSIVE</b>								
<b>REGION 2</b>	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
<b>Barataria Basin</b>									
Baker						2,4			
Des Allemands						1,4	5	5	
Lake Boeuf						1	5	5	
Gheens						1,2,4			

1 = Blueprint

2 = CCEER

3 = Coalition to Restore Coastal LA

4 = CWPPRA Basin Report

5 = Gagliano and van Beek

6 = BTNEP

7 = MRSNFR

8 = Barrier Shoreline Feasibility Study

E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

REGION 2	DEFENSIVE								
	CRITICAL DEFENSE LINE			MANAGE NAVIGATION CHANNELS		FRESHWATER DIVERSIONS	MANAGE HYDROLOGY		
	Create/ restore barrier islands	Preserve land bridges	Preserve/ protect ridge function	Manage hydrology	Stabilize banks		Swamps	Fresh/ intermediate marsh	Brackish/ saline marsh
<b>Barataria Basin</b>									
Cataouatche/Salvador		5			1,4,5	E,1,2,3,4,5		4,5,6	
Clovelly			1,4,5		1,5	2,3,4		4,5	
Perot/Rigolettes			1,4,5		1,3,4,5	E,3		4,5	
Jean Lafitte					1				
Naomi			1,4,5		1,3	E,4		4,5,6	
Myrtle Grove			1,4		1,3,4	2,4,7			4
Little Lake			1,4	3	1,3,4	2,4			4
Caminada Bay			5	3	4	2			4

1 = Blueprint

2 = CCEER

3 = Coalition to Restore Coastal LA

4 = CWPPRA Basin Report

5 = Gagliano and van Beek

6 = BTNEP

7 = MRSNFR

8 = Barrier Shoreline Feasibility Study

E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	DEFENSIVE								
REGION 2	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
<b>Barataria Basin</b>									
Barataria Bay				3	1,3				
West Pointe a la Hache			1			E,6,7		6	4
Lake Washington/Grand Ecaille			1			2,4,6			4
Bastian Bay						2			
Cheniere Ronquille						1			
Grand Liard						4			4
Fourchon	1,2,3,4,6,8								5
Barataria Barrier Islands	1,2,3,4,6,8								
Barataria Barrier Shorelines	1,2,3,4,6,8								4

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**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	<b>DEFENSIVE</b>								
<b>REGION 2</b>	CRITICAL DEFENSE LINE			MANAGE NAVIGATION CHANNELS		FRESHWATER DIVERSIONS	MANAGE HYDROLOGY		
<b>MAPPING UNITS</b>	Create/ restore barrier islands	Preserve land bridges	Preserve/ protect ridge function	Manage hydrology	Stabilize banks		Swamps	Fresh/ intermediate marsh	Brackish/ saline marsh
<b>Birdsfoot Delta</b>									
West Bay									
East Bay								4	
Pass a Loutre								4	
Cubit's Gap									
Baptiste Collete									
<b>Breton Sound Basin</b>									
American Bay			1			2,4			
Caernarvon			1,4,5			E,2		4	
Lake Lery						4		E,4	
River aux Chenes			1,4,5			1,2			
Jean Louis Robin	4		1,4,5			E		E,4	4

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E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	<b>DEFENSIVE</b>		<b>OFFENSIVE</b>			
<b>REGION 2</b>	DEVELOP REEF ZONE	PROTECT BAY/LAKE SHORELINES	INCREASE ATCHAFALAYA FLOW	RELOCATE NAVIGATION CHANNEL	SEDIMENT DIVERSIONS (or pumping)	USE OF DREDGED MATERIAL
MAPPING UNITS						
<b>Barataria Basin</b>						
Baker						2
Des Allemands						
Lake Boeuf						2
Gheens						

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E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	DEFENSIVE		OFFENSIVE			
REGION 2	DEVELOP REEF ZONE	PROTECT BAY/LAKE SHORELINES	INCREASE ATCHAFALAYA FLOW	RELOCATE NAVIGATION CHANNEL	SEDIMENT DIVERSIONS (or pumping)	USE OF DREDGED MATERIAL
MAPPING UNITS						
<b>Barataria Basin</b>						
Cataouatche/Salvador		4				4
Clovelly					1,5	
Perot/Rigolettes		4				
Jean Lafitte						
Naomi		4			4	
Myrtle Grove					1,4,5,7	4
Little Lake					1,5	4
Caminada Bay	1,5	4				

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E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	DEFENSIVE		OFFENSIVE			
REGION 2	DEVELOP REEF ZONE	PROTECT BAY/LAKE SHORELINES	INCREASE ATCHAFALAYA FLOW	RELOCATE NAVIGATION CHANNEL	SEDIMENT DIVERSIONS (or pumping)	USE OF DREDGED MATERIAL
MAPPING UNITS						
<b>Barataria Basin</b>						
Barataria Bay	1,5					4
West Pointe a la Hache					7	
Lake Washington/Grand Ecaille	1,4,5				1,3,5	4
Bastian Bay				2,3,5	1,3,4,5	
Cheniere Ronquille				2, 3,5	1,3,5	4
Grand Liard					1,5,7	
Fourchon						
Barataria Barrier Islands				2,3,5		
Barataria Barrier Shorelines				2,3		

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E- Existing projects

**Table 4-2. Region 2 previously proposed strategies (Cont.).**

	DEFENSIVE		OFFENSIVE			
REGION 2	DEVELOP REEF ZONE	PROTECT BAY/LAKE SHORELINES	INCREASE ATCHAFALAYA FLOW	RELOCATE NAVIGATION CHANNEL	SEDIMENT DIVERSIONS (or pumping)	USE OF DREDGED MATERIAL
MAPPING UNITS						
<b>Birdsfoot Delta</b>						
West Bay					1,3,4,5	4
East Bay					4	4
Pass a Loutre					4	4
Cubit's Gap					1,4,5	4
Baptiste Collete					1,4,5	4
<b>Breton Sound Basin</b>						
American Bay	1,5	1			1,2,4,7	
Caernarvon	1,5	1			1,2,4,5	
Lake Lery					2	
River aux Chenes						
Jean Louis Robin	1,4,5	1			1,2,4,5	

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6 = BTNEP

7 = MRSNFR

8 = Barrier Shoreline Feasibility Study

E- Existing projects

**Table 4-3. Region 2 regional ecosystem strategies.**

<b>Restore Swamps</b>	
1	Construct small diversions with outfall management
2	Restore natural drainage patterns
3	Prevent diversion-related flooding and remove diverted waters from the upper basin
<b>Restore/Sustain Marshes</b>	
4	Use existing or future locks to divert Mississippi River water
5	Manage outfall of existing diversions
6	Enrich existing diversions with sediment
7	Continue building and maintaining delta splays
8	Construct most effective small diversions
9	Constructing a sediment trap in the Mississippi River south of Venice
10	Construct delta-building diversion in Myrtle Grove/Naomi area (15,000 cfs)
11	Construct delta-building diversion in Bastian Bay (15,000 cfs)
12	Construct delta-building diversion into Benny's Bay (50,000 cfs)
13	Construct delta-building diversion into American Bay (20,000 to 100,000 cfs)
14	Construct delta-building diversion through controlled crevasses into Quarantine Bay
15	Prevent the loss of bedload into deep gulf waters off the continental shelf by relocating the Mississippi River Navigation Channel
16	Dedicated dredging to create marsh near Louisiana Highway 1
17	Dedicated delivery of sediment for marsh building in Caminada Bay
18	Construct large conveyance channel parallel to Bayou Lafourche to divert approximately 30,000 cfs to create a delta lobe in and near Little Lake
19	Gap spoil banks and plug canals in lower bay marshes
<b>Protect Bay and Lake Shorelines</b>	
20	Construct wave absorbers at the heads of bays
21	Construct reef zones across bays
<b>Restore and Maintain Barrier Islands and Barrier Shorelines</b>	
22	Restore/maintain barrier headlands, islands, and shorelines
23	Extend and maintain barrier shoreline from Sandy Point to Southwest Pass
<b>Maintain Critical Land Forms - (Central Basin Land Bridge)</b>	
24	Build entire Breaux Act land bridge shore protection project
25	Preserve bay and lake shoreline integrity on the land bridge
26	Dedicated dredging to create marsh on the land bridge
27	Build the Bayou Lafourche siphon and pump project, if cost effective

**Table 4-4. Region 2 mapping unit strategies.**

<b>BAKER</b>	
<b>1</b>	<b>Herbivory Control</b>
<b>CATAOUATCHE/SALVADOR</b>	
<b>2</b>	<b>Maintain Shoreline Integrity</b>
	e.g., Maintain bay/lake shoreline integrity
	e.g., Stabilize banks of GIWW
<b>3</b>	<b>Herbivory Control</b>
<b>DES ALLEMANS</b>	
<b>4</b>	<b>Herbivory Control</b>
<b>JEAN LAFITTE</b>	
<b>5</b>	<b>Restore Hydrology</b>
<b>NAOMI</b>	
<b>6</b>	<b>Herbivory Control</b>
<b>PEROT/RIGOLETTES</b>	
<b>7</b>	<b>Herbivory Control</b>
<b>GHEENS</b>	
<b>8</b>	<b>Management of Pump Outfall for Wetland Benefits</b>
<b>CLOVELLY</b>	
<b>9</b>	<b>Use of Dredged Material</b>
	e.g., Beneficial use of BBWW material
<b>LITTLE LAKE</b>	
<b>10</b>	<b>Management of Pump Outfall for Wetland Benefits</b>
	e.g., Relocate hurricane protection pumps to put water into marsh
<b>11</b>	<b>Use of Dredged Material</b>
	e.g., Beneficial use of BBWW material
<b>12</b>	<b>Maintain Ridge Function</b>
	e.g., Prevent breaching of Bayou L'Ours ridge
<b>MYRTLE GROVE</b>	
<b>13</b>	<b>Restore Ridge Function of Bayou Barataria</b>
	e.g., Restore Barataria ridge
<b>14</b>	<b>Restore Hydrology</b>
<b>CHENIERE RONQUILLE</b>	
<b>15</b>	<b>Restore Ridge Function</b>
	e.g., Restore oak ridges behind barrier shoreline
<b>BARATARIA BAY</b>	
<b>16</b>	<b>Use of Dredged Material</b>
	e.g., Dredge material from offshore to build marsh
	e.g., Beneficial use of BBWW material
<b>CAMINADA BAY</b>	
<b>17</b>	<b>Maintain Shoreline Integrity</b>
	e.g., Vegetative plantings of mangroves or marsh
	e.g., Stabilize banks of BBWW and SW La. Canal
<b>18</b>	<b>Management of Pump Outfall for Wetland Benefits</b>
	e.g., Relocate hurricane protection pumps to put water into marsh

**Table 4-4. Region 2 mapping unit strategies (Cont.).**

<b>BARATARIA BARRIER ISLANDS</b>	
<b>19</b>	<b>Beneficial Use of Dredged Material</b>
	e.g., Dredging offshore to build barrier island back marshes
	e.g., Beneficial use of BBWW to build islands
<b>20</b>	<b>Restore Ridge Function</b>
	e.g., Restore oak ridges behind barrier islands
<b>BARATARIA BARRIER SHORELINES</b>	
<b>21</b>	<b>Beneficial Use of Dredged Material</b>
<b>22</b>	<b>Restore Ridge Function</b>
	e.g., Restore oak ridges behind barrier islands
<b>23</b>	<b>Restore Barrier Islands</b>
	e.g., Build movable wave absorbers; Remove Empire jetties; Sand bypass at Empire jetties
<b>LAKE WASHINGTON/GRAND ECAILLE</b>	
<b>24</b>	<b>Restore Hydrology</b>
	e.g., Fill hurricane protection levee borrow canal as opportunities arise to make marsh
<b>BAPTISTE COLLETTE</b>	
<b>25</b>	<b>Beneficial Use of Dredged Material</b>
<b>26</b>	<b>Dedicated Dredging to Create Marsh</b>
<b>CUBIT'S GAP</b>	
<b>27</b>	<b>Beneficial Use of Dredged Material</b>
<b>PASS A LOUTRE</b>	
<b>28</b>	<b>Beneficial Use of Dredged Material</b>
<b>29</b>	<b>Dedicated Dredging to Create Marsh</b>
<b>30</b>	<b>Restore Hydrology</b>
	e.g., Limit depth of South Pass; encourage flow out Pass a Loutre
<b>EAST BAY</b>	
<b>31</b>	<b>Beneficial Use of Dredged Material</b>
	e.g., Create marsh to protect SW Pass marsh
<b>32</b>	<b>Dedicated Dredging to Create Marsh</b>
<b>33</b>	<b>Establish Reef Zone</b>
<b>WEST BAY</b>	
<b>34</b>	<b>Introduction of Mississippi River Water and Sediment/Outfall Management</b>
	e.g., Enrich Grand Pass with sediment dredged from river
<b>35</b>	<b>Beneficial Use of Dredged Material</b>
<b>GRAND LIARD</b>	
<b>36</b>	<b>Restore Hydrology</b>
	e.g., Fill hurricane protection borrow canal as opportunities arise to make marsh
<b>37</b>	<b>Study the Borrow Canal Saline Intrusion Issue</b>
<b>BASTIAN BAY</b>	
<b>38</b>	<b>Restore Hydrology</b>
	e.g., Fill hurricane protection borrow canal as opportunities arise to make marsh
<b>39</b>	<b>Beneficial Use of Dredged Material</b>
<b>CAERNARVON</b>	
<b>40</b>	<b>Evaluate Diversion of Greater than 4,000 cfs from Caernarvon; Monitor Existing Diversion and Evaluate to Derive Maximum Benefits</b>

**Table 4-5. Region 2 programmatic recommendations.**

<b>BAKER</b>	
<b>1</b>	<b>Allow for selective harvesting of replanted trees in mitigation banks</b>
<b>DES ALLEMANDS</b>	
<b>2</b>	<b>Allow for selective harvesting of replanted trees in mitigation banks</b>
<b>FOURCHON</b>	
<b>3</b>	<b>Restore barrier islands</b>
	e.g., Restrict sand mining on islands
<b>CAMINADA BAY</b>	
<b>4</b>	<b>Use alternative sources of sediment such as red mud, compost, etc.</b>
<b>LAKE WASHINGTON/GRAND ECAILLE</b>	
<b>5</b>	<b>Study the borrow canal salinity intrusion issue</b>
<b>BASTIAN BAY</b>	
<b>6</b>	<b>Study the borrow canal salinity intrusion issue</b>

**Table 4-6. Region 2 depth of bays.**

<b>Bay/Lake</b>	<b>Depth (ft.)</b>
<b>Breton Sound Basin</b>	
Lake Jean Louis Robin	3 to 5
Lake Coquille	2 to 5
Lake Calebasse	3 to 5
Lake La Fortuna	5 to 7
Black Bay	7 to 8
American Bay	5 to 7; inside 2 to 3
California Bay	3 to 5
Quarantine Bay	3 to 5
Grand Bay	4 to 5; south side 2 to 3
<b>Barataria Basin</b>	
Hospital Bay	4
Yellow Cotton Bay	4 to 5
Pomme d'Or	4 to 5
Cyprien Bay	4 to 5
Sandy Point Bay	2.5 to 5; reefs
Bay Jacques	3 to 5
Adams Bay	6
Bastian Bay	4 to 5
Bay Joe Wise	3 to 5
Lake Washington	4 to 6
Lake Grande Ecaille	5 to 7
Bay Long	3 to 4; filling
Bay Ronquille	3 to 4
Bay Sans Bois	3.5 to 5
Bay Batiste	4.5 to 7
Bay Chene Fleur	4 to 5
Wilkinson Bay	4 to 6
Lake Laurier	3.5 to 6
Round Lake	3.5 to 6
Hackberry Bay	3 to 5
Bay des Ilettes	3 to 5
Caminada Bay	5 to 6
The Pen	2.5 to 4

**Table 4-6. Region 2 depth of bays (Cont.).**

<b>Bay/Lake</b>	<b>Depth (ft.)</b>
<b>Barataria Basin (Cont.)</b>	
Bayou Perot	5 to 6
Bayou Rigolettes	5 to 6
Little Lake	5 to 6
Lake Cataouatche	5 to 7
Clovelly "Lake"	3 to 4

## 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

Railroad 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, 60<sup>th</sup> 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 2 Mapping Unit Infrastructure Summaries (In Alphabetical Order)

### *American Bay*

1. Roads (miles):
  - Primary            0.0
  - Secondary:       0.0
  - Tertiary:         14.8

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	39.9	26
Natural Gas	Active	Southern Natural Gas Company	35.0	20
Natural Gas	Active	Koch Industries, Inc.	33.4	16
Product	Active	Chevron Pipeline Company	13.5	16
Product	Active	Chevron Pipeline Company	13.4	8
Crude Oil	Active	Chevron Pipeline Company	13.2	6
Product	Active	Chevron Pipeline Company	13.1	10
Crude Oil	Active	Chevron Pipeline Company	12.6	20
Natural Gas	Active	Southern Natural Gas Company	8.8	12
Crude Oil	Active	Chevron Pipeline Company	6.6	4
Crude Oil	Active	Chevron Pipeline Company	6.6	12
Natural Gas	Active	Southern Natural Gas Company	5.1	8
Natural Gas	Active	Southern Natural Gas Company	2.5	6
Natural Gas	Active	Southern Natural Gas Company	2.1	4
Natural Gas	Active	Southern Natural Gas Company	2.1	16
Natural Gas	Active	Koch Industries, Inc.	1.2	8
Natural Gas	Active	Koch Industries, Inc.	0.3	12

Total pipeline length: 209.4 miles

4. Oil and/or Natural Gas Wells: 1,083
5. Drainage Pump Stations: None
6. Water Intakes: None
7. Navigation Channels: No USACE-maintained channels.

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Chevron Pipe Line Co., Ostrica Butane Dock	Mississippi River	1	180	
Chevron Pipe Line Co., Ostrica Super Wharf	Mississippi River	2	980	
Chevron Pipe Line Co., Ostrica Barge Dock	Mississippi River	2	320	
Chevron Pipe Line Co., Ostrica T-2 Wharf	Mississippi River	2	450	
Chevron Pipe Line Co., Empire Barge Wharf	Mississippi River	2	630	
Chevron Pipe Line Co., Empire Tanker Wharf	Mississippi River	1	1,100	
Bass Enterprises Production Co., Cox Bay Field Loading Dock	Mississippi River	2	500	
<b>Totals</b>		12	4,160	0

*Ascension West Area*

1. Roads (miles):

Primary            0.0  
 Secondary:      15.0  
 Tertiary:        57.0

2. Railroads (miles): 9.6

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Bridgeline	6.03	20
Natural Gas	Active	Bridgeline	4.35	12
Product	Active	Union Texas Products	3.88	6
Natural Gas	Active	Bridgeline	1.68	16
Natural Gas	Active	Bridgeline	0.58	10

Total pipeline length: 16.5 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
Bayou Lafourche and Lafourche-Jump Waterway	Waterborne commerce statistics include the section of Bayou Lafourche which extends 50 miles from Lockport, LA to the Gulf of Mexico. Controlling depths are 19 ft MLG in the Bar Channel and Jetty Channel, 8 ft MLG to Leeville and Golden Meadow, and 7 ft MLG to Larose and Lockport.	Navigation - In 1995, this section of Bayou Lafourche carried 3.8 million tons of freight (729,000 tons foreign and 3.1 million tons domestic).	Commercial and Recreational Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Triad Chemical Wharf	Mississippi River	1	1,050	
CF Industries, Donaldsonville Ship Wharf	Mississippi River	1	570	
CF Industries, Donaldsonville Barge Wharf	Mississippi River	1	860	
Darrow Fleeting & Switching, Mile 174 Fleet	Mississippi River	1	3,400	
Donaldsonville Fleet & Barge Service Wharf	Mississippi River	2	5,300	
T. T. Barge Cleaning, Modeste Mooring	Mississippi River	1	600	
Mile 183 West Fleet, Dry Bulk Transfer Mooring and Fleet	Mississippi River	2	1,050	
West Bank Fleet	Mississippi River	1	1,200	
G. W. Contractors, Ascension Bulk Terminal, Dry Bulk Transfer Mooring and Fleet	Mississippi River	2	1,095	
<b>Totals</b>		12	15,125	0

*Assumption East Area*

1. Roads (miles):

Primary           0.0  
 Secondary:    28.9  
 Tertiary:       151.5

2. Railroads (miles): 11.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Exxon Pipeline Company	8.4	16
Natural Gas	Active	Panhandle Eastern Corporation	6.3	36
Product	Active	Chevron Pipeline Company	4.4	8
Crude Oil	Active	Exxon Pipeline Company	4.2	4
Crude Oil	Active	Exxon Pipeline Company	4.2	6
Crude Oil	Active	Exxon Pipeline Company	4.2	8
Product	Active	Union Carbide Pipeline Co. (UCAR)	1.8	8
Natural Gas	Active	Bridgeline	1.4	12
Natural Gas	Active	Bridgeline	1.4	20
Natural Gas	Active	Tejas Gas Corporation	0.8	4
Product	Active	Union Texas Products	0.6	6

Total pipeline length: 37.7 miles

4. Oil and/or Natural Gas Wells: 47

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Industry	Surface Water
Assumption WW Dist. 1	Surface Water

Groundwater intakes: 0      Surface water intakes: 2

7. Navigation Channels: No USACE-maintained channels.

Project Name	Project Features	Purpose	Primary User
Bayou Lafourche and Lafourche-Jump Waterway	Waterborne commerce statistics include the section of Bayou Lafourche which extends 50 miles from Lockport, LA to the Gulf of Mexico. Controlling depths are 19 ft MLG in the Bar Channel and Jetty Channel, 8 ft MLG to Leeville and Golden Meadow, and 7 ft MLG to Larose and Lockport.	Navigation - In 1995, this section of Bayou Lafourche carried 3.8 million tons of freight (729,000 tons foreign and 3.1 million tons domestic).	Commercial and Recreational Navigation

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

***Baker***

- 1. Roads (miles):
  - Primary 3.4
  - Secondary: 0.5
  - Tertiary: 41.6

2. Railroads (miles): 1.7

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Exxon Pipeline Company	32.1	16
Product	Active	Chevron Pipeline Company	19.0	8
Crude Oil	Active	Exxon Pipeline Company	14.3	4
Crude Oil	Active	Exxon Pipeline Company	14.3	6
Crude Oil	Active	Exxon Pipeline Company	14.3	8
Product	Active	Union Carbide Pipeline Co. (UCAR)	13.7	8
Natural Gas	Active	Panhandle Eastern Corporation	9.0	36
Natural Gas	Active	Tejas Gas Corporation	0.8	4
Natural Gas	Active	Koch Industries, Inc.	0.5	6
Product	Active	Union Texas Products	0.4	6

Total pipeline length: 118.4 miles

- 4. Oil and/or Natural Gas Wells: 277
- 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.

***Baptiste Collette***

- 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	13.2	26
Product	Active	Chevron Pipeline Company	12.4	10
Natural Gas	Active	Southern Natural Gas Company	5.2	12
Product	Active	Chevron Pipeline Company	5.1	16
Natural Gas	Active	Koch Industries, Inc.	4.7	12
Natural Gas	Active	Koch Industries, Inc.	1.2	16
Natural Gas	Active	Chevron Pipeline Company	0.1	10

Total pipeline length: 41.9 miles

4. Oil and/or Natural Gas Wells: 666

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, LA	Channel from lower limits of Port of New Orleans to Head of Passes 45 ft deep (MLG) by 1,000 ft wide, 86.7 miles long.	Navigation (40.0 million tons annually)	Commercial and recreational navigation
Mississippi River Outlets, Venice, LA	Baptiste Collette Bayou 14 ft x 150 ft for 6 miles and 16 ft x 250 ft to the 6 ft depth contour.	Navigation	Navigation

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

### ***Barataria Barrier Islands***

1. Roads (miles):

Primary           0.0  
Secondary:       7.2  
Tertiary:         26.2

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Chevron Pipeline Company	14.8	20
Crude Oil	Active	Chevron Pipeline Company	6.7	20
Natural Gas	Active	Koch Industries, Inc.	4.2	36
Product	Active	Exxon Pipeline Company	2.5	12
Product	Active	Dow USA	1.6	8
Natural Gas	Active	Freeport McMoran	1.1	6
Natural Gas	Active	Freeport McMoran	0.9	5
Crude Oil	Active	Exxon Pipeline Company	0.8	12
Crude Oil	Active	Chevron Pipeline Company	0.6	20
N/A	Abandoned or Inactive	Freeport McMoran	0.5	6
Product	Active	Dow USA	0.1	4

Total pipeline length: 33.8 miles

4. Oil and/or Natural Gas Wells: 9

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Barataria Pass - 12-ft contour.	Navigation (average annual traffic from 1984-1993 was 1,389,000 tons).	Navigation
Bayou Rigaud Extension of Barataria Waterway	4.3 mile extension of Bar. Waterway including westerly 4.3 miles of Bayou Rigaud along Grand Isle. Ties into Bayou Lafourche.	Navigation (average annual traffic from 1984-1993 was 1,389,000 tons).	Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Bridge Side Marina	Caminada Bay and Gulf of Mexico	50		2
Bon Voyage Marina, Inc.	Caminada Bay			1
Sand Dollar Marina	Barataria Bay and Gulf of Mexico	46		1
Cigar's Marina & Cajun Cuisine	Gulf of Mexico	65		1
Pirate's Cove	Barataria Pass	94		
<b>Totals</b>		255	0	5

*Barataria Barrier Shorelines*

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.	6.3	36
Crude Oil	Active	Chevron Pipeline Company	1.9	20
Product	Active	Dow USA	1.5	8
Natural Gas	Active	Southern Natural Gas Company	0.8	12
Natural Gas	Active	Chevron Pipeline Company	0.7	6
Natural Gas	Active	Southern Natural Gas Company	0.7	18
Natural Gas	Active	Chevron Pipeline Company	0.3	26

Total pipeline length: 12.2 miles

4. Oil and/or Natural Gas Wells: 45

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Grand Bayou Pass, LA	Channel 6 ft x 60 ft through the entrance bar.	Navigation (safe entrance from Gulf to Grand Bayou).	Recreational navigation, commercial fishing
Waterway from Empire, LA to the Gulf of Mexico	Channel 9 ft x 80 ft, 10 miles long from state-owned Empire Lock to Gulf.	Navigation	Large fishing fleet and oil companies

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

*Barataria 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)
Crude Oil	Active	Exxon Pipeline Company	7.8	12
Product	Active	Exxon Pipeline Company	6.9	12
Natural Gas	Active	Panhandle Eastern Corporation	6.7	36
Natural Gas	Active	Koch Industries, Inc.	5.5	36
Natural Gas	Active	Southern Natural Gas Company	2.6	8
Crude Oil	Active	Exxon Pipeline Company	1.3	16
Natural Gas	Active	Freeport McMoran	0.8	6
Crude Oil	Active	Chevron Pipeline Company	0.7	20
Product	Active	Dow USA	0.2	8

Total pipeline length: 32.5 miles

4. Oil and/or Natural Gas Wells: 157

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Dupre Cut - Bayou St. Denis - W. Edge of Barataria Bay - Barataria Pass - 12 ft contour.	Navigation (average annual traffic from 1984-1993 was 1,389,000 tons).	Navigation

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

### *Bastian Bay*

1. Roads (miles):

Primary        0.0  
 Secondary:    1.1  
 Tertiary:      4.9

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Panhandle Eastern Corporation	14.0	36
Natural Gas	Active	Southern Natural Gas Company	8.0	22
Product	Active	Chevron Pipeline Company	7.9	8
N/A	Abandoned or Inactive	Exxon Pipeline Company	7.0	8
Natural Gas	Active	Chevron Pipeline Company	6.9	6
Crude Oil	Active	Chevron Pipeline Company	6.8	4
Natural Gas	Active	Southern Natural Gas Company	5.7	8
Natural Gas	Active	Koch Industries, Inc.	5.3	20
Crude Oil	Active	Exxon Pipeline Company	3.5	12
Crude Oil	Active	Chevron Pipeline Company	1.7	20

Total pipeline length: 66.8 miles

4. Oil and/or Natural Gas Wells: 302
5. Drainage Pump Stations: None
6. Water Intakes: None
7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Waterway from Empire to the Gulf of Mexico	Channel 9 ft x 80 ft, 10 miles long from state-owned Empire Lock to gulf.	Navigation	Large fishing fleet and oil and gas companies
	Empire Floodgate	Navigation	Large fishing fleet and oil and gas companies

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

### *Breton 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	18.9	20
Natural Gas	Active	Southern Natural Gas Company	12.2	12
Natural Gas	Active	Southern Natural Gas Company	8.9	6
Crude Oil	Active	Chevron Pipeline Company	6.3	6
Crude Oil	Active	Chevron Pipeline Company	3.1	4
Crude Oil	Active	Chevron Pipeline Company	3.1	12
Natural Gas	Active	Southern Natural Gas Company	2.0	10
Natural Gas	Active	Southern Natural Gas Company	1.4	14
Natural Gas	Active	Southern Natural Gas Company	0.8	4

Total pipeline length: 56.7 miles

4. Oil and/or Natural Gas Wells: 603
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 of 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.

***Caernarvon***

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	34.6	26
Natural Gas	Active	Southern Natural Gas Company	16.6	12
Natural Gas	Active	Koch Industries, Inc.	12.1	16
Natural Gas	Active	Southern Natural Gas Company	8.0	10
Natural Gas	Active	Southern Natural Gas Company	7.3	16
Product	Active	Chevron Pipeline Company	7.3	8
Natural Gas	Active	Southern Natural Gas Company	4.5	4
Natural Gas	Active	Koch Industries, Inc.	2.7	20
Natural Gas	Active	Koch Industries, Inc.	2.2	6
Natural Gas	Active	Southern Natural Gas Company	2.1	6

Pipelines (Cont.):

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	1.2	2
Natural Gas	Active	Koch Industries, Inc.	1.1	8
Natural Gas	Active	Southern Natural Gas Company	1.1	8
Natural Gas	Active	Southern Natural Gas Company	0.2	8
Crude Oil	Active	Chevron Pipeline Company	0.1	6
Crude Oil	Active	Chevron Pipeline Company	0.1	4
Crude Oil	Active	Chevron Pipeline Company	0.1	12

Total pipeline length: 101.3 miles

4. Oil and/or Natural Gas Wells: 847
5. Drainage Pump Stations: None
6. Water Intakes: None
7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Terre aux Boeufs	Canal 5 ft x 50 ft;	Navigation	Navigation
	Snagged and cleared and excavated between miles 10.25 and 19.5.		

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

*Caminada Bay*

1. Roads (miles):
  - Primary 0.0
  - Secondary: 10.9
  - Tertiary: 1.6
2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Dow USA	17.8	8
Natural Gas	Active	Koch Industries, Inc.	15.5	36
Natural Gas	Active	Freeport McMoran	4.3	6
Product	Active	Exxon Pipeline Company	2.9	12
Product	Active	Dow USA	2.7	4
Crude Oil	Active	Exxon Pipeline Company	1.3	12
Natural Gas	Active	Enron LA Energy Company	1.1	6
Product	Active	Dow USA	0.5	3
Crude Oil	Active	Exxon Pipeline Company	0.2	16

Total pipeline length: 46.3 miles

4. Oil and/or Natural Gas Wells: 647

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	see "Barataria Barrier Shorelines"	see "Barataria Barrier Shorelines"	see "Barataria Barrier Shorelines"
Bayou Lafourche	Channel 9 ft x 100 ft from Golden Meadow to Leeville.	Navigation - average annual traffic from 1984-1993 was 1,389,000 tons.	Navigation
	Channel 9 ft x 125 ft from Leeville to the Gulf.		

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

9. LOOP, Inc. Facilities: This unit contains 8 miles of 48" LOOP pipeline that carries oil from the Fourchon Pumping Station to the Clovelly Dome Storage Terminal.

*Cataouatche/Salvador*

- 1. Roads (miles):
  - Primary            7.3
  - Secondary:        0.0
  - Tertiary:          33.4

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	24.0	12
Natural Gas	Active	Bridgeline	17.2	22
Natural Gas	Active	Koch Industries, Inc.	14.8	20
Product	Active	Chevron Pipeline Company	13.7	8
Crude Oil	Active	Exxon Pipeline Company	13.0	4
Natural Gas	Active	Koch Industries, Inc.	10.9	16
Natural Gas	Active	Koch Industries, Inc.	8.7	30
Natural Gas	Active	Bridgeline	8.1	14
Natural Gas	Active	Bridgeline	7.5	20
Natural Gas	Active	Bridgeline	7.5	30
Natural Gas	Active	Bridgeline	4.4	26
Natural Gas	Active	Southern Natural Gas Company	3.2	4
Natural Gas	Active	Koch Industries, Inc.	3.1	10
Natural Gas	Active	Bridgeline	2.2	24
Natural Gas	Active	Bridgeline	1.7	16
Natural Gas	Active	Louisiana Gas Service Company	1.2	24
Natural Gas	Active	Bridgeline	1.0	12
Natural Gas	Active	Louisiana Gas Service Company	0.2	16

Total pipeline length: 142.4 miles

- 4. Oil and/or Natural Gas Wells: 1,021
- 5. Drainage Pump Stations: 1
- 6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Segnette Waterway, LA	Channel 9 ft x 60 ft, 12.2 miles long from Company Canal at Westwego, LA to the GIWW via Bayou Segnette.	Navigation - average annual traffic for 1984-1993 was 2,900 tons, mostly crude petroleum	Navigation, commercial fishing and shrimping boats
Harvey Lock			
Intracoastal Canal (5 ft x 40 ft)	Waterway 5 ft x 40 ft, 115 miles long from the Mississippi River to Bayou Teche. Only a section approximately 25 miles long is pertinent to this planning unit. It runs across Lake Salvador and connects the Barataria Waterway on the east side of LS with the GIWW on the southwest corner of LS.	Navigation	Commercial Navigation

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

*Cheniere Ronquille*

1. Roads (miles):

Primary        0.0  
 Secondary:    0.2  
 Tertiary:      0.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Chevron Pipeline Company	7.8	8
Crude Oil	Active	Chevron Pipeline Company	12.2	20
Crude Oil	Active	Exxon Pipeline Company	12.5	12
Natural Gas	Active	Koch Industries, Inc.	3.1	20
Natural Gas	Active	Koch Industries, Inc.	5.6	36
Natural Gas	Active	Panhandle Eastern Corporation	14.4	36
Natural Gas	Active	Southern Natural Gas Company	1.3	8
Natural Gas	Active	Southern Natural Gas Company	5.6	12
Natural Gas	Active	Southern Natural Gas Company	5.8	18
Natural Gas	Active	Southern Natural Gas Company	8.7	22

Total pipeline length: 77.0 miles

4. Oil and/or Natural Gas Wells: 638
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.

***Clovelly***

1. Roads (miles):
  - Primary        0.0
  - Secondary:    0.0
  - Tertiary:     1.5
2. Railroads (miles): 0.0
3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Exxon Pipeline Company	19.7	16
Natural Gas	Active	Koch Industries, Inc.	9.5	20
Product	Active	Chevron Pipeline Company	8.5	8
Crude Oil	Active	Exxon Pipeline Company	8.2	6
Natural Gas	Active	Panhandle Eastern Corporation	7.9	36
Natural Gas	Active	Southern Natural Gas Company	7.7	16
Natural Gas	Active	Koch Industries, Inc.	4.6	8
Crude Oil	Active	Exxon Pipeline Company	0.0	12

Total pipeline length: 66.1 miles

4. Oil and/or Natural Gas Wells: 279
5. Drainage Pump Stations: 2
6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Gulf Intracoastal Waterway	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.

*Cubit's Gap*

1. Roads (miles):

Primary 0.0  
 Secondary: 0.0  
 Tertiary: 0.4

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	11.2	18
Natural Gas	Active	Chevron Pipeline Company	11.0	10
Natural Gas	Active	Panhandle Eastern Corporation	10.4	24
Natural Gas	Active	Southern Natural Gas Company	7.1	16
Natural Gas	Active	Chevron Pipeline Company	6.4	12
Natural Gas	Active	Southern Natural Gas Company	3.0	26
Natural Gas	Active	Chevron Pipeline Company	1.9	16
Product	Active	Chevron Pipeline Company	1.6	10
Product	Active	Chevron Pipeline Company	1.4	16

Total pipeline length: 54.0 miles

4. Oil and/or Natural Gas Wells: 434

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, LA	Channel from lower limits of Port of New Orleans to Head of Passes, 45 ft deep (MLG) by 1,000 ft wide, 86.7 miles long.	Navigation - 400 million tons annually.	Commercial and recreational navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Associated Branch Pilots and Crescent River Port Pilot Association Piers	Mississippi River	2	480	
Texaco Pipeline Co., Pilottown Crew Boat Dock	Mississippi River	3	245	
<b>Totals</b>		5	725	0

*Des Allemands*

1. Roads (miles):

Primary 12.9  
 Secondary: 21.9  
 Tertiary: 67.7

2. Railroads (miles): 10.4

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Union Carbide Pipeline Co. (UCAR)	18.3	8
Natural Gas	Active	Bridgeline	7.8	20
Natural Gas	Active	Evangeline Gas (Supplied by Acadian)	3.0	26
Natural Gas	Active	Tejas Gas Corporation	2.7	6
Natural Gas	Active	Bridgeline	1.3	4
Natural Gas	Active	Bridgeline	0.3	26
Natural Gas	Active	Bridgeline	0.1	16

Total pipeline length: 33.5 miles

4. Oil and/or Natural Gas Wells: 397

5. Drainage Pump Stations: 2

6. Water Intakes:

Operator	Type
Fossil Fuel Plant	Surface Water
Nuclear Power Plant	Surface Water

Groundwater intakes: 0      Surface water intakes: 2

7. Navigation Channels: No USACE-maintained channels.

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

*East Bay*

1. Roads (miles):

    Primary      0.0

    Secondary:  0.0

    Tertiary:    1.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Chevron Pipeline Company	19.4	10
Natural Gas	Active	Southern Natural Gas Company	9.8	18

Total pipeline length: 29.2 miles

4. Oil and/or Natural Gas Wells: 1,261

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, LA	Channel down Southwest Pass 45 ft (MLG), 800 ft wide, 17 miles long.	Navigation	Navigation
Southwest Pass Lower Jetty and Bar Channel	Channel 40 ft deep, 600 ft wide.	Navigation	Navigation
South Pass Channel	30 ft deep, 450 ft wide, 13.5 miles long.	Navigation	Navigation

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

*Fourchon*

1. Roads (miles):

Primary            0.0  
 Secondary:       5.1  
 Tertiary:         14.7

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Chevron Pipeline Company	15.1	20
Natural Gas	Active	Chevron Pipeline Company	0.4	12
Natural Gas	Active	Chevron Pipeline Company	0.3	20

Total pipeline length: 15.8 miles

4. Oil and/or Natural Gas Wells: 24

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Lafourche	Channel 9 ft x 125 ft from Leeville to the gulf.	Navigation - average annual traffic from 1984-1993 was 1,389,000 tons.	Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Greater Lafourche Port Commission	Bayou Lafourche, GIWW	170	25,427	
Port Fourchon Marina	Bayou Lafourche	48		1
<b>Totals</b>		218	25,427	1

9. LOOP, Inc. Facilities: Fourchon Booster Station. This station pressurizes oil arriving via a 46" pipeline from the Marine Pumping Platform and sends it to the Clovelly Dome Storage Terminal via a 46" pipeline. It also supplies the marine pumping platform with diesel fuel. It contains four 6,000 horsepower (hp) pumps powered by 13,800 volt electric motors, two 30,000 barrel (bbl) diesel storage tanks, switchgear, a communications tower and equipment, and an emergency generator. Land alterations include a levee, roads, and fencing. LOOP also maintains a small boat harbor in this unit. It consists of a dock, marina, loading facility, helipad, warehouse, office building, hose testing building, and guardhouse. This unit contains 3 miles of 48" pipeline that comes in from the Marine Pumping Platform.

***Gheens***

1. Roads (miles):

Primary 1.2  
 Secondary: 0.0  
 Tertiary: 53.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	7.1	12
Natural Gas	Active	Panhandle Eastern Corporation	6.4	36
Natural Gas	Active	Bridgeline	6.3	14
Natural Gas	Active	Bridgeline	6.2	20
Natural Gas	Active	Bridgeline	6.2	30
Crude Oil	Active	Exxon Pipeline Company	5.5	4
Crude Oil	Active	Exxon Pipeline Company	5.1	12
Crude Oil	Active	Exxon Pipeline Company	5.1	16
Crude Oil	Active	Exxon Pipeline Company	4.4	6
Natural Gas	Active	Koch Industries, Inc.	2.6	30
Product	Active	Chevron Pipeline Company	1.3	8
Natural Gas	Active	Koch Industries, Inc.	1.3	4
Natural Gas	Active	Koch Industries, Inc.	1.0	8

Total pipeline length: 58.5 miles

4. Oil and/or Natural Gas Wells: 247

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 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.

***Grand Liard***

1. Roads (miles):

Primary           0.0  
 Secondary:     0.0  
 Tertiary:       13.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	9.7	10
N/A	Abandoned or Inactive	Exxon Pipeline Company	7.2	8
Natural Gas	Active	Panhandle Eastern Corporation	7.1	36
Product	Active	Chevron Pipeline Company	4.4	4
Natural Gas	Active	Southern Natural Gas Company	4.2	20
Natural Gas	Active	Chevron Pipeline Company	3.9	26
Natural Gas	Active	Southern Natural Gas Company	3.9	8
Natural Gas	Active	Koch Industries, Inc.	3.8	12
Crude Oil	Active	Chevron Pipeline Company	3.6	4
Product	Active	Chevron Pipeline Company	2.8	8
Natural Gas	Active	Southern Natural Gas Company	2.6	22
Natural Gas	Active	Chevron Pipeline Company	2.0	22
Natural Gas	Active	Panhandle Eastern Corporation	1.7	20
N/A	Abandoned or Inactive	Exxon Pipeline Company	0.4	4
Natural Gas	Active	Koch Industries, Inc.	0.1	10
Natural Gas	Active	Southern Natural Gas Company	0.1	12

Total pipeline length: 57.5 miles

4. Oil and/or Natural Gas Wells: 414

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
Plaquemines Parish WW	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.

*Jean Lafitte*

1. Roads (miles):

Primary      0.0

Secondary:    2.2

Tertiary:      16.5

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Bridgeline	0.6	22
Natural Gas	Active	Koch Industries, Inc.	0.4	20

Total pipeline length: 1.0 miles

4. Oil and/or Natural Gas Wells: 18

5. Drainage Pump Stations: 2

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Dupre Cut - Bayou St. Denis - W. Edge of Barataria Bay - Barataria Pass - 12 ft contour.	Navigation - average annual traffic was 1,389,000 tons.	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

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

*Jean Louis Robin*

1. Roads (miles):

Primary 0.0

Secondary: 0.0

Tertiary: 8.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	8.5	8
Natural Gas	Active	Southern Natural Gas Company	6.8	6
Natural Gas	Active	Koch Industries, Inc.	4.2	12

Total pipeline length: 19.5 miles

4. Oil and/or Natural Gas Wells: 163

5. Drainage Pump Stations: 2

6. Water Intakes:

Operator	Type
Industry	Surface Water

Groundwater intakes: 0      Surface water intakes: 1

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 of freight traffic (3.4 million tons foreign and 2.3 million tons domestic).	Commercial navigation
Bayou Terre aux Boeufs	Canal 5 ft deep x 50 ft wide; Snagged and cleared and excavated between miles 10.25 and 19.5.	Navigation	Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Reggio Marine	Reggio Bayou			2
End of the World Marina	Bayou Terre aux Boeufs	20		1
Pip's Place Marina, Inc.	Bayou La Loutre			2
Melerine's Boat Launch	Bayou Terre aux Boeufs			
Serigne's Boat Launch	Bayou Terre aux Boeufs			
<b>Totals</b>		20	0	5

*Jefferson West Area*



Water Intakes (Cont.):

Operator	Type
Industry	Groundwater
W. Jefferson WW Dist. 2	Surface Water
Gretna WW	Surface Water
Westwego WTR Sys.	Surface Water
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water

Groundwater intakes: 14      Surface water intakes: 4

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 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 tons foreign and 38 million tons domestic).	Commercial navigation
Gulf Intracoastal Waterway (GIWW)	200 miles from the 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
Bayou Segnette	Extends 12.2 miles from the southern end of Company Canal at Westwego and follows the existing channel of Bayou Segnette southward to approximately mile 5.6, then runs southerly via new land cut to the east of Lake Salvador, to the GIWW at Bayou Villars and the head of Barataria Bay Waterway.	Navigation - In 1995, handled 1,000 tons of food and farm products.	Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Port of New Orleans Wharves	Mississippi River and Industrial Canal		67,648	
Avondale Shipyards, Harvey Division, South Yard Wharf	Harvey Canal	1	450	
Avondale Industries, Harvey Canal Steel Sales Division Barge Dock	Harvey Canal	1	120	
Avondale Industries, Harvey Division, South Yard Basin	Harvey Canal	1	150	
Plexco Wharf	Harvey Canal	1	700	
Mayronne Drilling Mud & Chemical Co., Harvey Wharf	Harvey Canal	1	150	
Metal Building Products Dock	Harvey Canal	1	300	
Mayronne Drilling Mud & Chemical Co., Harvey Warehouse Wharf	Harvey Canal	1	200	
Rathborne Land Company, Harvey Canal Wharf	Harvey Canal	1	300	
U.S. Army Corps of Engineers, Harvey Canal Depot Dock	Harvey Canal	3	390	
Salathe Oil Co. Dock	Harvey Canal	1	200	
Tassin International Harvey Canal North Wharf	Harvey Canal	1	332	
Chevron U.S.A., Harvey Terminal Wharf	Harvey Canal	1	400	
Gretna Machine & Iron Works, Slip and Gas Freeing Canal Wharf	Harvey Canal	3	622	
M-I Drilling Fluids Co., Harvey Terminal Dock	Harvey Canal	1	290	
Pool Company, Gulf Offshore Operations Division Wharf	Harvey Canal	1	1,200	
Otto Candies, Mooring Basin	Harvey Canal	3	840	
Lennard Pipelines Dock	Harvey Canal	1	200	
Energy Coatings Company Wharf	Harvey Canal	1	1,000	
Evans Industries, North Yard Wharf	Harvey Canal	1	1,465	
Evans Industries, South Yard Basin and Wharf	Harvey Canal	3	1,950	
Total Services, Harvey Canal Wharf	Harvey Canal	1	680	
Avondale Industries, Boat Division, Hicks Yard Wharf	Harvey Canal	1	498	
Geosource Basin	Harvey Canal	3	1,495	
Reagan Equipment Co. Dock	Harvey Canal	1	215	
Dixie Carriers Harvey Canal Dock	Harvey Canal	1	300	
Oil Field Maintenance & Fabrication Dock	Harvey Canal	0	0	
Simon's Diesel Repair Dock	Harvey Canal	1	295	
Chandler Welding Corp. Wharf	Harvey Canal	1	381	
Baroid Corp., Harvey Canal Dock	Harvey Canal	3	268	
Marine Structures Shipyard Wharf	Harvey Canal	0	0	
American Tugs Dock	Harvey Canal	1	240	
George W. Buras Wharf	Harvey Canal	3	310	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Skipper Hydraulic Wharf	Harvey Canal	3	380	
Tassin International, Harvey Canal South Dock	Harvey Canal	1	113	
Intracoastal Terminal Wharf	Harvey Canal	1	510	
Evans Industries Main Wharf	Harvey Canal	3	665	
Evans Industries Mooring Wharf	Harvey Canal	1	575	
Halliburton Services, Wharf and Barge Repair Slip	Harvey Canal	3	1,173	
A-Ready Welding Machine Shop Wharf	Harvey Canal	1	300	
Saint Marine Transportation Dock	Harvey Canal	1	30	
Louisiana Materials Co. Dock	Harvey Canal	1	435	
Stewart Construction Co. Wharf	Harvey Canal	1	233	
S. Parish Oil Company Wharf	Harvey Canal	1	211	
Barriere Construction Co., Harvey Mooring	Harvey Canal	1	978	
Standard Supply & Hardware Co. Wharf	Harvey Canal	1	151	
Chevron U. S.A. Harvey Terminal Gulf Dock	Harvey Canal	1	428	
A & R Capital Corp. Dock.	Harvey Canal	1	321	
Kody Marine Wharf	Harvey Canal	1	300	
Jefferson Marine Towing Dock	Harvey Canal	1	180	
MOORCO, Inc. Wharf	Harvey Canal	1	300	
Taulli Construction Co. Dock	Harvey Canal	1	75	
Houma Industries Dock	Harvey Canal	1	375	
Total Marine Services of Jefferson, Slip and Landing	Harvey Canal	2	290	
William-McWilliams Co., Harvey Yard Dock	Harvey Canal	1	625	
Exxon Company, U.S.A., Harvey Production District Dock	Harvey Canal	1	60	
International Garnet Dock	Harvey Canal	1	210	
Eymard & Sons Shipyard Slip	Harvey Canal	3	340	
Louisiana Marsh Equipment Landing	Harvey Canal	1	400	
C.E. Natco Dock	Harvey Canal	1	127	
Stewart & Stevenson Services Dock	Harvey Canal	1	1,350	
Houma Industries Landing	Harvey Canal	1	75	
Buckner Rental Service, Inc. Dock	Harvey Canal	1	250	
Texaco, Harvey Warehouse Dock	Harvey Canal	1	1,000	
Strike-N-Arc, Inc., Harvey Dock	Harvey Canal	2	400	
Harvey Canal Marine Repair, Inc., Wharf and Slip	Harvey Canal	3	387	
Shell Oil Co., Harvey Canal Wharf	Harvey Canal	1	1,000	
Avondale Industries, Inc., Harvey Quick Repair Division Wharf and Slip	Harvey Canal	2	401	
Southport Inc., Dock	Harvey Canal	1	580	
Platform Service, Inc., Slip	Harvey Canal	3	363	
Southern Shell Fish Co. Slips	Harvey Canal	2	235	
Freeport Sulphur Co., Harvey Terminal Wharf	Harvey Canal, GIWW	2	1,060	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Charles E. Spahr, III, Distributor, Harvey Phillips 66 Bulk Plant Wharf	Harvey Canal, GIWW	1	125	
West Side Oil Co., Harvey Bulk Plant Wharf	Harvey Canal, GIWW	1	200	
Conti Fleeting Marrero Fleet Mooring	Mississippi River	1	2,730	
Industrial Pump Sales and Repair Dock	Mississippi River	1	295	
Pacific Molasses Co., Westwego Terminal Wharf	Mississippi River	2	850	
Progressive Barge Line, Westwego Mooring	Mississippi River	1	500	
Gold Bond Building Products, Westwego Gypsum Plant Wharf	Mississippi River	1	720	
Avondale Industries, Westwego Plant Dock	Mississippi River	1	300	
Paktank Corp., Westwego Terminal Dock	Mississippi River	1	560	
K & C Sand, Westwego Landing	Mississippi River	1	500	
Continental Grain Co., Westwego Equipment Wharf	Mississippi River	1	120	
Continental Grain Co., Westwego Barge Slip	Mississippi River	1	720	
Continental Grain Co., Westwego Elevator Wharf	Mississippi River	2	3,674	
Beverly Industries, Westwego Landing	Mississippi River	2	1,584	
Louisiana Power and Light Co., Nine Mile Point Steam Electric Station, Fuel Oil Dock	Mississippi River	1	600	
Koch-Ellis Barge & Ship Service Wharf	Mississippi River	3	2,325	
Casteel Transportation, Nine Mile Point Mooring	Mississippi River	1	650	
Avondale Industries, Main Plant Gas Freeing Wharf	Mississippi River	1	190	
Avondale Industries, Main Plant Wet Dock No. 4	Mississippi River	1	150	
Avondale Industries, Main Plant Wet Dock No. 3	Mississippi River	1	1,591	
Avondale Industries, Main Plant Wet Dock No. 2	Mississippi River	1	195	
Avondale Industries, Main Plant, Upper Yard Dock	Mississippi River	1	200	
Avondale Industries, Main Plant Wet Dock No. 1	Mississippi River	1	1,250	
International-Matex Tank Terminals, Avondale Dock No. 2	Mississippi River	2	595	
International-Matex Tank Terminals, Avondale Dock No. 1	Mississippi River	1	700	
International-Matex Tank Terminals, Avondale Dock No. 3	Mississippi River	1	300	
The Permian Corp., Avondale Wharf	Mississippi River	1	500	
Point Landing Fuel Services Wharf	Mississippi River	1	185	
Louisiana Dock Co., Willwood Fleet Mooring	Mississippi River	2	150	
New Orleans Shipyard Slip	Mississippi River	3	570	
Elmwood Fleet, New Orleans Harbor Fleet	Mississippi River	1	4,600	
Azalea Fleet Mooring	Mississippi River	3	975	
American Cyanamid Co., Waggaman Dock	Mississippi River	1	630	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Wood Resources Corp., Point Landing Lower Ama River Fleet Mooring	Mississippi River	1	1,500	
Perry Street Wharf	Mississippi River	2	1,500	
Compass Dockside Gretna Fleet Mooring	Mississippi River	2	1,575	
John W. Stone, Gretna Lower Fuel Dock	Mississippi River	1	390	
John W. Stone, Gretna Upper Fuel Dock	Mississippi River	1	800	
John W. Stone, SP Dock	Mississippi River	0	0	
Publicker Chemical Corp. Gretna Wharf	Mississippi River	1	680	
Jackson Avenue Ferry, Gretna Landing	Mississippi River	1	175	
IMTT	Mississippi River	2	1,400	
IMTT	Mississippi River	1	400	
Whiteman Towing Co. Landing	Mississippi River	1	285	
Witco Chemical Dock	Mississippi River	1	200	
Delta Commodities Terminal, Wharf No. 3	Mississippi River	3	675	
Delta Commodities Terminal, Wharf No. 2	Mississippi River	1	700	
Delta Commodities Terminal, Wharf No. 1	Mississippi River	1	700	
Stan-Blast Abrasives Co. Wharf	Mississippi River	1	420	
Adams Land and Marine Dock	Mississippi River	1	175	
Texaco Marrero Terminal Wharf	Mississippi River	1	746	
Amerada Hess Corp., Marrero Terminal Dock No. 1	Mississippi River	1	850	
Amerada Hess Corp., Marrero Terminal Dock No. 2	Mississippi River	1	255	
Amerada Hess Corp., Marrero Terminal Dock No. 3	Mississippi River	1	380	
<b>Totals</b>		169	143,515	0

*La Loutre*

1. Roads (miles):
  - Primary 0.0
  - Secondary: 0.0
  - Tertiary: 0.4
2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Chevron Pipeline Company	5.9	8
Natural Gas	Active	Southern Natural Gas Company	5.2	18
Natural Gas	Active	Chevron Pipeline Company	5.0	10

Total pipeline length: 16.1 miles

4. Oil and/or Natural Gas Wells: 1,591

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
South Pass Channel	30 ft deep, 450 ft wide, 13.5 miles long.	Navigation - 400 million tons annually.	Commercial and recreational navigation
South Pass Bar Channel	30 ft deep, 600 ft wide.	Navigation - 400 million tons annually.	Commercial and recreational navigation

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

*Lafourche East Area*

1. Roads (miles):

Primary           7.2  
 Secondary:     60.2  
 Tertiary:       415.3

2. Railroads (miles): 34.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Crude Oil	Active	Exxon Pipeline Company	27.6	6
Natural Gas	Active	Panhandle Eastern Corporation	24.6	36

Pipelines (Cont.):

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	23.1	12
Crude Oil	Active	Exxon Pipeline Company	13.8	12
Natural Gas	Active	Koch Industries, Inc.	11.2	4
Crude Oil	Active	Exxon Pipeline Company	10.9	16
Crude Oil	Active	Exxon Pipeline Company	6.7	8
Natural Gas	Active	Panhandle Eastern Corporation	2.9	20
Crude Oil	Active	Exxon Pipeline Company	2.8	4
Natural Gas	Active	Southern Natural Gas Company	1.4	16
Natural Gas	Active	Bridgeline	1.4	14
Natural Gas	Active	Koch Industries, Inc.	1.3	20
Natural Gas	Active	Koch Industries, Inc.	1.1	30
Product	Active	Dow USA	0.9	4
Crude Oil	Active	Exxon Pipeline Company	0.5	4
Crude Oil	Active	Exxon Pipeline Company	0.3	4
Crude Oil	Active	Exxon Pipeline Company	0.0	4
Crude Oil	Active	Exxon Pipeline Company	0.0	16
Product	Active	Chevron Pipeline Company	0.0	8

Total pipeline length: 130.5 miles

4. Oil and/or Natural Gas Wells: 874
5. Drainage Pump Stations: 12
6. Water Intakes:

Operator	Type
Industry	Surface Water

Groundwater intakes: 0      Surface water intakes: 1

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Bayou Lafourche and Lafourche-Jump Waterway	Waterborne commerce statistics include the section of B. Lafourche which extends 50 miles from Lockport, LA to the Gulf of Mexico. Controlling depths are 19 ft MLG in the Bar Channel and Jetty Channel, 8 ft MLG to Leeville and Golden Meadow, and 7 ft MLG to Larose and Lockport.	Navigation - In 1995, this section of B. Lafourche carried 3.8 million tons of freight (729,000 tons foreign and 3.1 million tons domestic).	Commercial and recreational navigation

Navigation Channels (Cont.):

Project Name	Project Features	Purpose	Primary User
Gulf Intracoastal Waterway (GIWW)	26.6 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:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Irvin P. Melancon Recreational Boat Launch	Unnamed Canal	1	0	5

9. LOOP, Inc. Facilities: Clovelly Dome Storage Terminal. Oil is pumped here from the Fourchon Booster Station and is stored in underground salt caverns. It contains eight underground storage caverns, each 200 ft in diameter and 1,400 ft deep, with a capacity of 5,300,000 barrels (bbl). Each cavern is served by 5 wells. The terminal also contains four 6,000 hp pumps, a 220-acre brine storage reservoir, a field operations building, a control building, and metering equipment. Also present are a control, maintenance, and communications building. The Galliano Onshore Operations building is also present in this unit and consists of a control, maintenance, warehouse, chemical storage, and laboratory building. Land alterations include a hurricane protection levee, helipad, and roads. This unit contains 14 miles of 48" LOOP pipeline that carries oil from the Fourchon Booster Station to the Clovelly Dome Storage Terminal.

*Lake Boeuf*

1. Roads (miles):
  - Primary 7.3
  - Secondary: 21.6
  - Tertiary: 52.5
2. Railroads (miles): 13.8

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Chevron Pipeline Company	18.5	8
Crude Oil	Active	Exxon Pipeline Company	13.1	16
Natural Gas	Active	Panhandle Eastern Corporation	9.7	36
Crude Oil	Active	Exxon Pipeline Company	6.5	4
Crude Oil	Active	Exxon Pipeline Company	6.5	6
Crude Oil	Active	Exxon Pipeline Company	6.5	8
Crude Oil	Active	Exxon Pipeline Company	5.8	8
Crude Oil	Active	Exxon Pipeline Company	2.4	6
Natural Gas	Active	Koch Industries, Inc.	1.9	12
Product	Active	Dow USA	1.4	4
Crude Oil	Active	Exxon Pipeline Company	0.1	8
Crude Oil	Active	Exxon Pipeline Company	0.1	8
Crude Oil	Active	Exxon Pipeline Company	0.1	8

Total pipeline length: 72.6 miles

4. Oil and/or Natural Gas Wells: 355

5. Drainage Pump Stations: 2

6. Water Intakes: None

7. Navigation Channels: No USACE-maintained channels.

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

*Lake Lery*

1. Roads (miles):

    Primary       0.0

    Secondary:   0.0

    Tertiary:     0.9

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	8.6	20
Natural Gas	Active	Koch Industries, Inc.	4.9	16
Natural Gas	Active	Koch Industries, Inc.	4.7	20

Pipelines (Cont.):

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	4.0	26
Natural Gas	Active	Southern Natural Gas Company	3.1	16
Natural Gas	Active	Southern Natural Gas Company	3.0	12

Total pipeline length: 28.3 miles

4. Oil and/or Natural Gas Wells: 355
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 Washington/Grand Ecaille***

1. Roads (miles):
  - Primary 0.0
  - Secondary: 0.0
  - Tertiary: 4.0
2. Railroads (miles): 0.0
3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Chevron Pipeline Company	13.8	8
Natural Gas	Active	Koch Industries, Inc.	10.3	20
Natural Gas	Active	Southern Natural Gas Company	8.8	12
Natural Gas	Active	Southern Natural Gas Company	8.7	8
Crude Oil	Active	Exxon Pipeline Company	5.3	12
Natural Gas	Active	Koch Industries, Inc.	2.3	8
Natural Gas	Active	Southern Natural Gas Company	2.2	4
Natural Gas	Active	Southern Natural Gas Company	2.0	18
Natural Gas	Active	Freeport McMoran	1.6	3
Natural Gas	Active	Koch Industries, Inc.	1.2	6

Total pipeline length: 56.2 miles

4. Oil and/or Natural Gas Wells: 382
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.

***Little Lake***

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	Exxon Pipeline Company	19.1	16
Natural Gas	Active	Panhandle Eastern Corporation	14.7	36
Natural Gas	Active	Southern Natural Gas Company	13.3	12
Crude Oil	Active	Exxon Pipeline Company	12.4	12
Natural Gas	Active	Southern Natural Gas Company	8.5	8
Natural Gas	Active	Southern Natural Gas Company	5.2	4
Natural Gas	Active	Enron LA Energy Company	4.4	4
Natural Gas	Active	Enron LA Energy Company	4.4	8
Natural Gas	Active	Enron LA Energy Company	3.9	6
Natural Gas	Active	Southern Natural Gas Company	3.1	12
Natural Gas	Active	Southern Natural Gas Company	2.9	12
Natural Gas	Active	Southern Natural Gas Company	1.5	8
Natural Gas	Active	Southern Natural Gas Company	1.2	12
Product	Active	Dow USA	1.0	4
Natural Gas	Active	Southern Natural Gas Company	0.7	8
Natural Gas	Active	Southern Natural Gas Company	0.1	8

Total pipeline length: 96.4 miles

4. Oil and/or Natural Gas Wells: 525
5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Dupre Cut- Bayou St. Denis- W. Edge of Barataria Bay - Barataria Pass - 12 ft contour.	Navigation - average annual traffic from 1984-1993 was 1,389,000 tons.	Navigation

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

*Myrtle Grove*

1. Roads (miles):

Primary 0.0  
 Secondary: 0.0  
 Tertiary: 3.8

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Chevron Pipeline Company	8.0	8
Natural Gas	Active	Bridgeline	4.7	10
Natural Gas	Active	Southern Natural Gas Company	4.3	8
Natural Gas	Active	Panhandle Eastern Corporation	3.4	36
Natural Gas	Active	Southern Natural Gas Company	1.4	12
Natural Gas	Active	Koch Industries, Inc.	0.4	8

Total pipeline length: 22.2 miles

4. Oil and/or Natural Gas Wells: 858

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Dupre Cut- Bayou St. Denis- W. Edge of Barataria Bay - Barataria Pass - 12 ft contour.	Navigation - average annual traffic from 1984-1993 was 1,389,000 tons.	Navigation

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

*Naomi*

1. Roads (miles):

Primary           0.0  
 Secondary:     9.6  
 Tertiary:       14.6

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Southern Natural Gas Company	14.5	12
Natural Gas	Active	Southern Natural Gas Company	7.7	16
Natural Gas	Active	Koch Industries, Inc.	6.9	16
Natural Gas	Active	Southern Natural Gas Company	2.3	99
Natural Gas	Active	Bridgeline	1.4	10

Total pipeline length: 32.8 miles

4. Oil and/or Natural Gas Wells: 154

5. Drainage Pump Stations: 9

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Extends 41.3 miles from the GIWW to the Gulf of Mexico with a side channel to Grand Isle. Controlling depth 10 ft MLG.	Navigation - In 1995, handled 253,000 tons of freight traffic.	Commercial and recreational navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Cochiaria Marina	Bayou Barataria	300		2
Joe's Landing	Bayou Barataria			1
Lafitte C-Way Marina	BBWW	80		3
Lafitte Harbor Marina	BBWW	40		2
<b>Totals</b>		420	0	8

*Orleans West Area*

1. Roads (miles):

Primary            1.5  
 Secondary:      0.0  
 Tertiary:        199.7

2. Railroads (miles): 1.9

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	2.4	16
Natural Gas	Active	Koch Industries, Inc.	1.7	12
Natural Gas	Active	Bridgeline	1.6	30
Natural Gas	Active	Bridgeline	1.1	22

Total pipeline length: 6.8 miles

4. Oil and/or Natural Gas Wells: 4

5. Drainage Pump Stations: 3

6. Water Intakes:

Operator	Type
Country Club/Gardens	Groundwater
Industry	Groundwater
Industry	Surface Water

Groundwater intakes: 2      Surface water intakes: 1

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 millions tons of freight.	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Algiers Lock	GIWW & Mississippi River			
Sun Drilling Products, Algiers Canal Wharf	Algiers Canal	1	300	
Dickson Welding Dock	Algiers Canal	1	200	
Lower Algiers Ferry Landing	Mississippi River	3	420	
Harbor Towing & Fleeting, Star Fleet Mooring	Mississippi River	1	1,500	
Compass Dockside Algiers Fleeting Wharf	Mississippi River	1	300	
Compass Dockside Algiers Repair Dock (Lower Navy Wharf)	Mississippi River	1	1,500	
Avondale Industries, Algiers Facility, Hines Lane Wharf	Mississippi River	2	1,972	
Avondale Industries, Algiers Facility, Merrill Avenue Wharf	Mississippi River	1	1,490	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Crescent Towing & Salvage Co., Algiers Mooring	Mississippi River	3	659	
Cooper/T. Smith Derrick Fleet Mooring	Mississippi River	1	1,825	
Bermuda Street Fireboat Wharf	Mississippi River	2	400	
Algiers Point Landing	Mississippi River	1	80	
Canal Street Ferry, Algiers Landing	Mississippi River	1	186	
Powder Street Wharf	Mississippi River	3	351	
Capital Marine Supply, Algiers Fleet Mooring	Mississippi River	1	710	
Port Ship Service West Bank Wharf	Mississippi River	1	40	
<b>Totals</b>		24	11,933	0

*Perot/Rigolettes*

1. Roads (miles):

Primary           0.0  
 Secondary:      0.0  
 Tertiary:        10.7

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Product	Active	Chevron Pipeline Company	11.6	8
Natural Gas	Active	Southern Natural Gas Company	8.1	12
Natural Gas	Active	Southern Natural Gas Company	7.0	16
Crude Oil	Active	Exxon Pipeline Company	6.7	6
Natural Gas	Active	Southern Natural Gas Company	2.7	4
Natural Gas	Active	Bridgeline	1.9	10
Crude Oil	Active	Exxon Pipeline Company	1.3	16
Natural Gas	Active	Koch Industries, Inc.	1.2	20
Crude Oil	Active	Exxon Pipeline Company	1.1	12
Crude Oil	Active	Exxon Pipeline Company	1.0	8
Natural Gas	Active	Southern Natural Gas Company	0.5	3

Total pipeline length: 43.1 miles

4. Oil and/or Natural Gas Wells: 790

5. Drainage Pump Stations: None

6. Water Intakes: None

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Barataria Bay Waterway, LA	Channel 12 ft x 125 ft, 37 miles long from Bayou Villars to Grand Isle. Follows Bayou Barataria - Dupre Cut - Bayou St. Denis - W. Edge of Barataria Bay - Barataria Pass - 12 ft contour.	Navigation - average annual traffic from 1984-1993 was 1,389,000 tons.	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

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

*Plaquemines*

1. Roads (miles):

Primary           0.0  
 Secondary:     45.6  
 Tertiary:       337.8

2. Railroads (miles): 60.3

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	10.4	12
Natural Gas	Active	Bridgeline	4.9	30
Natural Gas	Active	Southern Natural Gas Company	4.6	12
Natural Gas	Active	Southern Natural Gas Company	2.6	16
Natural Gas	Active	Bridgeline	2.4	10
Natural Gas	Active	Southern Natural Gas Company	2.3	8
Crude Oil	Active	Chevron Pipeline Company	1.9	6
Crude Oil	Active	Chevron Pipeline Company	1.5	20
Natural Gas	Active	Bridgeline	1.4	22
Natural Gas	Active	Bridgeline	1.3	6
Natural Gas	Active	Koch Industries, Inc.	1.2	16
Natural Gas	Active	Southern Natural Gas Company	1.0	4
Crude Oil	Active	Chevron Pipeline Company	0.9	4
Crude Oil	Active	Chevron Pipeline Company	0.9	12
Natural Gas	Active	Koch Industries, Inc.	0.4	8

Pipelines (Cont.):

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Freeport McMoran	0.4	3
Natural Gas	Active	Southern Natural Gas Company	0.2	26
Natural Gas	Active	Koch Industries, Inc.	0.1	6
Natural Gas	Active	Southern Natural Gas Company	0.1	20
Natural Gas	Active	Southern Natural Gas Company	0.0	99
Natural Gas	Active	Koch Industries, Inc.	0.0	20

Total pipeline length: 38.5 miles

4. Oil and/or Natural Gas Wells: 416

5. Drainage Pump Stations: 20

6. Water Intakes:

Operator	Type
Plaquemines Parish WW	Surface Water
Industry	Surface Water

Groundwater intakes: 0      Surface water intakes: 9

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of Plaquemines	81.2 miles from mile 0 above Head of Passes (AHP) to mile 81.2 AHP. Controlling depth is 45 ft.	Navigation - In 1995, handled 72.9 million tons of freight (24.4 million tons foreign and 48.5 million tons domestic).	Commercial navigation

Navigation Channels (Cont.):

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
Empire Waterway	10 miles from Empire to the Gulf of Mexico. Controlling depths are 6 ft MLG through Doullut Canal, 9 ft MLG from Doullut Canal to the jetties and 14 ft MLG in the Bar Channel.	Navigation - In 1995, handled 915,000 tons of freight including petroleum, food and farm products, and manufactured goods.	Commercial navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Myrtle Grove Marina	Wilkinson Canal		1	
Happy Jack Marina	Happy Jack Canal		1	
Delta Marina	Doullut Canal			
Beshel Boat Launch	Pointe a la Hache Marine Canal			
Hi Ridge Marina	Grand Bayou	10	1	
Joshua's Marina	Buras Canal	5	1	
Barriere Construction Co., Bell Chasse Mooring	Algiers Canal	1	1,413	
OSS Enterprises, Inc. Dock	Algiers Canal	1	195	
Harbour & Port Contractors, Inc. Dock	Algiers Canal	1	280	
Brown & Root, Inc., Belle Chasse Terminal Dock	Algiers Canal	1	2,858	
Circle, Inc. Dock	Algiers Canal	1	1,300	
C.F. Bean Mooring	Algiers Canal	1	600	
Green Hill Petrol	Algiers Canal	2	750	
Hugh Eymard Towing Co. Dock	Algiers Canal	1	195	
Comet Construction Co. Dock	Algiers Canal	2	320	
Production Management Industries Wharf	Algiers Canal	2	485	
Redneb Services, Inc. Dock	Algiers Canal	1	220	
Marine Engineering Dock	Algiers Canal	2	420	
Quarles Drilling Corp. Dock	Algiers Canal	1	200	
Canal Barge Company Belle Chasse Fleet Mooring	Algiers Canal	2	360	
John W. Stone, Algiers Canal Fueling Dock	Algiers Canal	1	195	
Strike-N-Arc, Algiers Canal Dock	Algiers Canal	1	170	
H.B.H., Inc., Algiers Canal Fabrication Facility Bulkhead	Algiers Canal	0	0	
Taylor Diving & Salvage Co. Dock	Algiers Canal	1	500	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
United Tugs Algiers Canal Dock	Algiers Canal	0	0	
Harbor Construction Co. Dock	Algiers Canal	3	588	
B & I Welding Services, Inc., Algiers Canal Dock	Algiers Canal	1	390	
Independent Towing Co. Wharf	Algiers Canal	1	650	
Mosby Enterprises, Inc., Algiers Canal Dock	Algiers Canal	2	1,200	
M & W Marine Service Wharf	Algiers Canal	1	195	
Marine Systems, Inc. Algiers Canal Dock	Algiers Canal	1	300	
Elmwood Drydock and Repair, Gas Freeing Plant Mooring	Bayou Barataria	2	1,330	
McDonough Marine Service, Bayou Barataria Mooring	Bayou Barataria	3	5,100	
Oil Field Barges Landing	Bayou Barataria	1	500	
Elmwood Drydock and Repair, Shipyard Wharf	Bayou Barataria	1	350	
Freeport Sulphur Co., Canal Liquid Sulphur Pier	Freeport Barge Canal	2	630	
Freeport Sulphur Co., Barge Mooring Wharf	Freeport Barge Canal	1	400	
Freeport Sulphur Co., Canal Work Dock	Freeport Barge Canal	1	100	
Freeport Sulphur Co., Canal Fuel Wharf	Freeport Barge Canal	1	110	
Pointe a la Hache Ferry Landing	Mississippi River	1	190	
Bass Enterprises Production Co., Pointe a la Hache Wharf	Mississippi River	0	0	
Texaco Pipeline Co., Pointe a la Hache Wharf	Mississippi River	1	200	
Electro-Coal Transfer Terminal Barge Unloading Dock No. 1	Mississippi River	1	1,200	
Electro-Coal Transfer Terminal, No. 2 Dock	Mississippi River	2	2,346	
Electro-Coal Transfer Terminal Barge Unloading Dock No. 2	Mississippi River	1	1,200	
Electro-Coal Transfer Terminal No. 1 Dock	Mississippi River	2	3,240	
Shell Pipe Line Corp., Southwest Pass Barge Wharf	Mississippi River	1	1,800	
Scarsdale Ferry Landing	Mississippi River	1	190	
Plaquemines Port Authority Dock	Mississippi River	1	135	
AMAX Metals Recovery, Lower Wharf	Mississippi River	1	800	
AMAX Metals Recovery, Upper Wharf	Mississippi River	1	440	
Chevron Pipe Line Co., E-3 TB Boat Landing	Mississippi River	1	60	
Nola Centurion Fabricators Slip	Mississippi River	1	4	
Corps of Engineers Wheeler Dock	Mississippi River	2	602	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Marathon Petroleum Co. Venice Terminal, Pier 2 Barge Dock	Mississippi River	1	390	
Marathon Petroleum Co. Venice Terminal, Pier 1 Ship Dock	Mississippi River	1	1,000	
Motto's Basin	Mississippi River	2	261	
Chevron Pipe Line Co., Buras Boat Landing	Mississippi River	1	8	
Chevron Pipe Line Co., Empire Terminal, Sunrise Landing	Mississippi River	1	33	
Bass Enterprises Production Co., Cox Bay Field, West Bank Dock	Mississippi River	1	50	
Phillips Petroleum Co., Largo Pipeline Terminal Wharf	Mississippi River	1	195	
Freeport Sulphur Company, Dock No. 1-B	Mississippi River	1	732	
Freeport Sulphur Company, Dock No. 1	Mississippi River	1	1,258	
Freeport Sulphur Company, Dock No. 1-A	Mississippi River	1	1,258	
West Pointe a la Hache Ferry Landing	Mississippi River	1	100	
Koch Gathering Systems, West Pointe a la Hache Wharf	Mississippi River	1	254	
International Marine Terminals Shiploader Wharf	Mississippi River	2	2,088	
International Marine Terminals Coal Wharf	Mississippi River	2	1,942	
International Marine Terminals Crane Wharf	Mississippi River	2	1,871	
Mississippi River Grain, Wharf	Mississippi River	2	1,810	
BP Oil, Alliance Refinery Fleet Wharf	Mississippi River	1	200	
BP Gil, Alliance Refinery Coke Wharf	Mississippi River	1	740	
BP Oil, Alliance Refinery Tanker and Barge Wharves	Mississippi River	2	1,585	
Dockside Elevators Mooring	Mississippi River	1	195	
Chevron Chemical Co., Oak Point Plant Wharf	Mississippi River	1	675	
Port Ship Service, Belle Chasse Landing	Mississippi River	1	110	
J & R Shell Yard Dock	Mississippi River	1	200	
Maritime Oil Recovery Dock	Mississippi River	1	440	
Belle Chasse Marine Transportation Landing	Mississippi River	1	120	
Gulf Star Fuel Associates Wharf	Mississippi River	1	280	
Plaquemines Parish Ferry Repair Dock	Mississippi River	1	135	
Belle Chasse Ferry Landing	Mississippi River	1	190	
<b>Totals</b>		109	52,835	0

***River aux Chenes***

- 1. Roads (miles):
  - Primary 0.0
  - Secondary: 0.0
  - Tertiary: 0.5
- 2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	4.0	16
Natural Gas	Active	Southern Natural Gas Company	2.3	4
Natural Gas	Active	Southern Natural Gas Company	1.0	12
Natural Gas	Active	Southern Natural Gas Company	1.0	16

Total pipeline length: 8.3 miles

- 4. Oil and/or Natural Gas Wells: 88
- 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.

***St. Charles West Area***

- 1. Roads (miles):
  - Primary 15.8
  - Secondary: 21.5
  - Tertiary: 245.9
- 2. Railroads (miles): 45.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	32.4	16
Natural Gas	Active	Koch Industries, Inc.	20.7	12
Natural Gas	Active	Evangeline Gas (Supplied by Acadian)	14.8	26
Natural Gas	Active	Louisiana Gas Service Company	11.0	24
Natural Gas	Active	Koch Industries, Inc.	10.1	30
Natural Gas	Active	Bridgeline	7.9	14
Natural Gas	Active	Bridgeline	6.6	12
Natural Gas	Active	Bridgeline	5.6	20
Natural Gas	Active	Bridgeline	5.0	30
Natural Gas	Active	Bridgeline	4.5	16
Natural Gas	Active	Koch Industries, Inc.	2.9	10
Natural Gas	Active	Bridgeline	2.7	22
Natural Gas	Active	Evangeline Gas (Supplied by Acadian)	1.9	20
Natural Gas	Active	Koch Industries, Inc.	1.6	6
Natural Gas	Active	Bridgeline	1.5	26
Product	Active	Union Carbide Pipeline Co. (UCAR)	0.9	8
Natural Gas	Active	Koch Industries, Inc.	0.3	12

Total pipeline length: 130.4 miles

4. Oil and/or Natural Gas Wells: 245

5. Drainage Pump Stations: 14

6. Water Intakes:

Operator	Type
Industry	Groundwater
Industry	Groundwater
St. Charles WW Dist. 2	Surface Water
Industry	Groundwater
Industry	Surface Water
Industry	Groundwater
Industry	Groundwater

Groundwater intakes: 5      Surface water intakes: 2

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of South Louisiana	53.6 miles from mile 114.9 above Head of Passes (AHP) to mile 168.5 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
Tulane/Kenner Bend Fleet, Landing Wharf and Fleet Moorings	Mississippi River	2	4,500	
Wood Resources Corp., Point Landing Upper Ama Fleet	Mississippi River	1	4,400	
ADM/GROWMARK Ama Fleet	Mississippi River	3	2,206	
GNOTS-Reserve, St. Rose West Bank Fleet Mooring	Mississippi River	3	7,095	
Monosanto Co. Barton Plant, Fuel Oil Dock	Mississippi River	1	430	
Monosanto Co. Barton Plant, Ammonia Dock	Mississippi River	1	312	
Monosanto Co. Barton Plant, DAP Dock	Mississippi River	1	625	
Canal Barge Co., Luling Bridge Fleet Wharf	Mississippi River	1	300	
Bayou Fleet Moorings	Mississippi River	2	1,200	
Louisiana Materials Co., Hahnville Landing	Mississippi River	1	300	
Upper St. Rose Fleeting, Upper Fleet Mooring	Mississippi River	3	5,606	
Union Carbide Corp., Taft Plant Dock No. 4	Mississippi River	1	400	
Union Carbide Corp., Taft Plant Dock Nos. 2 & 3	Mississippi River	3	1,330	
Union Carbide Corp., Taft Plant Dock No.1	Mississippi River	2	780	
Agrico Chemical Co., Taft Plant Wharf	Mississippi River	2	1,200	
Occidental Chemical Corp. Taft Plant Dock	Mississippi River	3	1,810	
Louisiana Power & Light Co. Waterford Steam Electric Plants 1 & 2 Wharf	Mississippi River	1	425	
<b>Totals</b>		31	32,919	0

*St. James West Area*

1. Roads (miles):

Primary            8.6  
 Secondary:    20.6  
 Tertiary:        218.2

2. Railroads (miles): 22.7

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	5.1	6
Natural Gas	Active	Koch Industries, Inc.	4.0	4
Natural Gas	Active	Bridgeline	2.7	10
Product	Active	Chevron Pipeline Company	2.3	8
Crude Oil	Active	Exxon Pipeline Company	2.3	16
Product	Active	Union Carbide Pipeline Co. (UCAR)	1.6	8

Total pipeline length: 18.0 miles

4. Oil and/or Natural Gas Wells: 196

5. Drainage Pump Stations: None

6. Water Intakes:

Operator	Type
St. James WW Dist. 2	Surface Water
Industry	Groundwater

Groundwater intakes: 6      Surface water intakes: 1

7. Navigation Channels: No USACE-maintained channels.

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Port of South Louisiana, Globalplex Terminal Wharves	Mississippi River	3	1,481	
Vacherie Ferry Landing	Mississippi River	1	140	
Valley Fleet, Repair Wharf and Fleet Mooring	Mississippi River	3	8,800	
Tulane/Oak Alley Fleet Mooring	Mississippi River	2	4,460	
St. James Sugar Cooperative Dock	Mississippi River	1	300	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
United States Department of Energy, Strategic Petroleum Reserve Dock No. 1	Mississippi River	1	940	
United States Department of Energy Strategic Petroleum Reserve Dock No. 2	Mississippi River	1	940	
Capline Terminal Dock No. 1	Mississippi River	1	1,000	
Capline Terminal Dock No. 2	Mississippi River	1	1,000	
Capline Terminal Dock No. 3	Mississippi River	1	500	
Capline Terminal Dock No. 4	Mississippi River	1	800	
Koch St. James Terminal No. 1 Dock	Mississippi River	1	500	
Koch St. James Terminal No. 2 Dock	Mississippi River	1	850	
Koch St. James Terminal No. 5 Dock	Mississippi River	1	900	
Ergon St. James Terminal Wharf	Mississippi River	2	1,310	
Carline St. James Marine, Repair Landing and Fleet Moorings	Mississippi River	3	4,285	
Welcome Fleet & Barge Service, Fleet Mooring	Mississippi River	1	5,200	
Bean Resources, LaPlace Oil Transfer Facility Wharf	Mississippi River	1	250	
Chevron Chemical Co., St. James Plant Wharf	Mississippi River	2	2,102	
Agrico Chemical Co., Faustina Works Barge Wharf	Mississippi River	1	790	
Agrico Chemical Co., Faustina Works Ship Wharf	Mississippi River	2	1,240	
Sunshine Oil & Storage Wharf	Mississippi River	1	335	
River Repair, Landing and Point Houmas Fleet Moorings	Mississippi River	2	4,450	
<b>Totals</b>		34	42,573	0

The U.S. Department of Energy operates a Strategic Petroleum Reserve Facility in the St. James West Area mapping unit. It is situated on the right descending (west) bank of the Mississippi River, with the two docks central to a point about 152 river miles above the Head of Passes. The 1996 year-end inventory showed 105,554 m<sup>3</sup> to be stored in the facility; however, the facility is capable of storing more.

*St. John the Baptist West Area*

1. Roads (miles):
  - Primary 0.0
  - Secondary: 17.1
  - Tertiary: 81.6
  
2. Railroads (miles): 9.2

3. Pipelines: None
4. Oil and/or Natural Gas Wells: 19
5. Drainage Pump Stations: None
6. Water Intakes:

Operator	Type
St. John WW Dist. 2	Surface Water
Industry	Groundwater
Industry	Groundwater
Industry	Surface Water
St. John WW Dist. 3	Surface Water
Industry	Surface Water

Groundwater intakes: 2      Surface water intakes: 4

7. Navigation Channels:

Project Name	Project Features	Purpose	Primary User
Mississippi River Port of South Louisiana	53.6 miles from mile 114.9 above Head of Passes (AHP) to mile 168.5 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
CGB Marine Services at LaPlace, West Bank Fleet Mooring	Mississippi River	1	8,000	
Triangle Fleeting Corp. Lucy Fleet Mooring	Mississippi River	1	2,750	
Triangle Fleeting Corp. West Bank Fleet Mooring	Mississippi River	1	2,745	
Cargo Carriers Reserve Cleaning Wharf and Fleet Mooring, Lower Section	Mississippi River	2	2,100	
Edgard Ferry Landing	Mississippi River	1	145	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Cargo Carriers Reserve Landing and Fleet Mooring, Upper Section	Mississippi River	2	6,000	
St. John Fleeting, Edgard Fleet	Mississippi River	1	10,000	
Cargo Carriers Terre Haute Fleet Mooring	Mississippi River	1	7,900	
<b>Totals</b>		10	39,640	0

*West Bay*

1. Roads (miles):
  - Primary            0.0
  - Secondary:       0.0
  - Tertiary:          12.2

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Chevron Pipeline Company	20.3	10
Product	Active	Chevron Pipeline Company	16.5	10
Natural Gas	Active	Southern Natural Gas Company	8.0	6
Product	Active	Chevron Pipeline Company	7.9	8
Natural Gas	Active	Southern Natural Gas Company	7.1	20
Natural Gas	Active	Koch Industries, Inc.	6.8	10
Natural Gas	Active	Panhandle Eastern Corporation	5.8	24
Natural Gas	Active	Panhandle Eastern Corporation	4.6	20
Natural Gas	Active	Chevron Pipeline Company	3.9	26
Natural Gas	Active	Chevron Pipeline Company	3.7	22
Natural Gas	Active	Southern Natural Gas Company	3.2	10
Natural Gas	Active	Panhandle Eastern Corporation	0.5	36
Product	Active	Chevron Pipeline Company	0.4	4

Total pipeline length: 88.7 miles

4. Oil and/or Natural Gas Wells: 1,670
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, LA	Channel down Southwest Pass 45 ft MLG x 800 ft wide, 17 miles long.	Navigation - handles 400 million tons annually.	Commercial and recreational navigation
Southwest Pass Lower Jetty and Bar Channel	Channel 40 ft MLG x 600 ft wide	Navigation - handles 400 million tons annually.	Commercial and recreational navigation
Mississippi River Outlets, Venice, LA	Tiger Pass, 14 ft x 150 ft for 12 miles and 16 ft x 250 ft to the 6-ft depth contour.	Navigation	Navigation

8. Port Installations:

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Venice Marina	Tiger and Tante Phine Passes	109	4	
Cypress Cove Marina	Mississippi River and Tiger Pass	120	3	
Chevron U. S.A., Venice West Slip	Grand Pass	3	1,125	
Chevron U.S.A., Inc. Venice Base, Mooring	Grand Pass	1	150	
Berwick Bay Oil Co., Venice Dock	Grand Pass	1	175	
Venice Ice Co. Wharf	Grand Pass	2	390	
Chevron U.S.A. Venice Base, East Slip	Grand Pass	3	1,008	
Jensen Seafood Wharf	Grand Pass	1	5	
Chevron U.S.A., Venice Base, Jump Basin Mooring	Grand Pass	3	372	
Plaquemines Parish Jump Basin, West Side Mooring	Grand Pass	1	222	
Tesoro Petroleum Distributing Co., Venice Wharf	Grand Pass	1	200	
Seafresh Seafood Co. Wharf	Grand Pass	1	225	
Texaco, Venice Slip	Grand Pass	3	875	
U. S. Fish and Wildlife Service, Venice Upper Slip	Grand Pass	3	155	
Offshore Shipyard Wharf	Grand Pass	1	630	
U. S. Fish and Wildlife Service, Venice Mooring	Grand Pass	1	125	
Ellzey's Marine Supplies Mooring Basin	Grand Pass	0	0	
Milpark Drilling Fluids Wharf	Grand Pass	2	560	
Terrebonne Fuel & Lube Co. Fuel Dock	Grand Pass	2	520	
Shell Offshore, Venice Slip	Grand Pass	3	959	
L and L Oil Co., Venice Fuel Wharf	Grand Pass	2	335	
U. S. Fish and Wildlife Service, Venice Lower Slip	Grand Pass	1	2	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Freeport Sulphur Company, Venice Terminal	Grand Pass	1	2	
Warren Petroleum Co., Venice Refinery LPG and Mooring Wharves	Pass Tante Phine	2	1,630	
Chevron Pipeline Co., W-1TB, Scott's Landing	Southwest Pass	1	100	
Chevron Pipeline Co., W-2TB, Boat Landing	Southwest Pass	1	100	
Chevron Pipeline Co., W.-OTB Boat Landing	Southwest Pass	1	60	
Associated Branch Pilots Southwest Pass Station Wharf	Southwest Pass	1	65	
P & L Seafoods Venice Dock	Tidewater Access Channel	3	490	
Fulton Seafood Dock	Tiger Pass	1	297	
Conoco, Venice Wharf	Tiger Pass	1	350	
M.I. Drilling Fluids Co., Venice # 1 Wharf	Tiger Pass	1	180	
Dresser Industries, Venice Dock	Tiger Pass	1	280	
Schlumberger Well Services, Venice Wharf	Tiger Pass	1	230	
Halliburton Services, Venice Base Wharf	Tiger Pass	2	416	
Patterson Rental Tools, Wharf	Tiger Pass	1	280	
Dia-Log Company Dock	Tiger Pass	1	110	
Cortech Industries, Venice Wharf	Tiger Pass	1	370	
Baroid Corp., Venice Yard No. 1 Wharf	Tiger Pass	1	240	
Exxon Co. USA, Venice Mooring Basin	Tiger Pass	1	380	
Atlas Wireline Services, Venice Dock	Tiger Pass	1	260	
Newman Crane Service, Wharf No. 1	Tiger Pass	2	200	
Louisiana Fruit Co., Slip No 1., Mooring Wharf	Tiger Pass	1	165	
Arco Oil and Gas Co., Slip No. 1 Wharf	Tiger Pass	1	200	
Global Drilling Fluids Outer Wharf	Tiger Pass	1	150	
Newman Crane Service, Wharf No. 2	Tiger Pass	1	300	
Mayronne Drilling Mud and Chemical Co., Venice Wharf	Tiger Pass	1	200	
Pennzoil Co., Venice Base Wharf	Tiger Pass	1	250	
Dowell Schlumberger Venice District Wharf	Tiger Pass	2	600	
Global Drilling Fluids Inner Wharf	Tiger Pass	1	400	
McDermott, Venice Base Wharf	Tiger Pass	3	855	
Arco Oil and Gas Co., Slip No. 2 Wharf	Tiger Pass	1	700	
BJ-Titan Services, Venice District Wharf	Tiger Pass	1	400	
Milpark Drilling Fluids, Slip No. 2 Dock	Tiger Pass	1	610	
International Drilling Fluids Venice Dock	Tiger Pass	1	600	
The Western Co. of North America, Venice Wharf	Tiger Pass	1	272	
Allied Towing Service, Venice Dock	Tiger Pass	2	7	
Marathon Oil Co., Venice Shore Base Wharf	Tiger Pass	1	380	
Wedge Wireline, Inc., Venice District Dock	Tiger Pass	1	148	
M.I. Drilling Fluids Co., Venice #2 Wharf	Tiger Pass	2	869	

Port Installations (Cont.):

Installation	Waterway	Berths	Berthing Space (ft.)	Launching Ramps
Mobil Oil Exploration and Producing Southeast, Inc., Venice Wharf	Tiger Pass	1	600	
Bud's Boat Rental Wharf and Moonng Basin	Tiger Pass	3	480	
John W. Stone, Venice Fuel Dock	Tiger Pass	1	400	
OSCA, Venice Dock	Tiger Pass	1	200	
Delta Well Surveyors Dock	Tiger Pass	1	65	
Torch Venice Terminal Wharf	Tiger Pass	1	782	
Iron Fab of Louisiana Wharf	Tiger Pass	2	745	
Venice Wholesale Seafood Dock	Tiger Pass	2	360	
Plaquemines Parish Venice Boat Harbor	Tiger Pass	0	0	
Newpark Environmental Services, Venice Dock	Tiger Pass	1	195	
Baroid Corp., Venice Yard No. 2 Wharf	Tiger Pass	2	1,010	
U. S. Coast Guard Station, Venice Mooring	Tiger Pass	3	440	
<b>Totals</b>		330	26,463	0

*West Pointe a la Hache*

1. Roads (miles):
  - Primary 0.0
  - Secondary: 0.0
  - Tertiary: 5.0

2. Railroads (miles): 0.0

3. Pipelines:

Type	Status	Operator	Length (miles)	Size (inches)
Natural Gas	Active	Koch Industries, Inc.	8.4	20
Natural Gas	Active	Southern Natural Gas Company	6.1	8
Natural Gas	Active	Southern Natural Gas Company	4.4	12
Natural Gas	Active	Koch Industries, Inc.	3.8	8
Natural Gas	Active	Southern Natural Gas Company	1.3	4

Total pipeline length: 24.0 miles

4. Oil and/or Natural Gas Wells: 93
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.

## SECTION 6

### WETLAND DEVELOPMENT/PERMITTED ACTIVITIES

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

In November 1997, the 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 is an account of development-related activities in wetlands over approximately the past 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; 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 and development activity. Total acres disturbed in Region 2

declined slightly from 1980 through 1995 (2,504, 2,247, and 2,391 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, 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 2,953 (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 fastlands, bulkheads, etc.).

Oil and gas activity has been extensive in Region 2 over the 15-year reporting period, averaging over 225 permits per year. However, fastland development in the West Bay, Naomi, Perot/Rigolettes, and Barataria Barrier Shorelines mapping units was among the highest in the coastal zone. While oil and gas activity during the period between 1990 and 1995 increased relative to the period between 1985 and 1990, fastland development permits decreased. Combined with the subsidence characteristics of Region 2, permit activity may be an important contributor of wetlands loss.

## 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 were 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 observations 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 Region 2 Fisheries matrix was developed through the collaborative effort of the LDWF and the National Marine Fisheries Service (NMFS). Contributors to this effort for Region 2 were Robert Ancelet, Mark Schexnayder, Greg Laiche, Clarence Luquet, Keith Ibos, Randall Pausina, Brian McNamara 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 two 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 area. 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	La. Dept. of Wildlife and Fisheries
	Larry McNease	La. Dept. of Wildlife and Fisheries
	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	La. Dept. of Wildlife and Fisheries
Dabbling ducks, diving ducks, geese	Robert Helm	La. Dept. of Wildlife and Fisheries
Nutria, muskrat, mink, otter, raccoon, American alligator	Noel Kinler	La. Dept. of Wildlife and Fisheries
	Larry McNease	La. Dept. of Wildlife and Fisheries
Rabbits, squirrels, white-tailed deer	Mike Olinde	La. Dept. of Wildlife and Fisheries
	Dave Moreland	La. Dept. of Wildlife and Fisheries
	Quin Kinler	Natural Resources Conservation Service

**Table 7-1. Region 2 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	Comments											
Baker	NA/NA	Sy/Sy	Sy/Sy										
Des Allemands	U/U	NA/NA	NA/NA	U/U	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Lake Boeuf	NA/NA	NA/NA	NA/NA	U/U	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Gheens	Sy/Sy	NA/NA	NA/NA	Sy/Sy	NA/NA	NA/NA	NA/NA	NA/NA	Sy/Sy	NA/NA	Sy/Sy	Sy/Sy	
Cataouatche/ Salvador	Sy/D	Sy/D	Sy/D	I/Sy	NA/NA	NA/NA	D/D	I/D	Sy/Sy	NA/NA	Sy/Sy	D/Sy	Davis Pond influence
Clovelly	Sy/Sy	I/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	D/Sy	Sy/Sy	Sy/Sy	NA/NA	Sy/Sy	D/Sy	
Perot/ Rigolettes	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	NA/	D/D	Sy/D	Sy/Sy	NA/NA	Sy/D	D/D	
Jean Lafitte	Sy/Sy	NA/NA	NA/NA	Sy/Sy	Sy/Sy	NA/NA	D/Sy	Sy/Sy	Sy/Sy	NA/NA	I/Sy	D/Sy	
Naomi	I/Sy	Sy/Sy	Sy/D	I/I	I/D	NA/NA	I/I	I/Sy	I/Sy	NA/NA	I/I	I/I	River siphon influence
Myrtle Grove	I/Sy	I/Sy	Sy/D	I/D	I/Sy	I/Sy	D/D	I/D	I/Sy	NA/NA	Sy/I	I/I	
Little Lake	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	I/I	D/D	I/D	I/D	NA/NA	D/D	NA/NA	
Caminada Bay	D/D	D/D	D/D	D/D	Sy/D	D/D	D/D	D/D	D/D	I/I	NA/NA	NA/NA	
Fourchon	D/D	I/I	NA/	NA/									
Barataria Bay	D/D	I/I	NA/NA	NA/NA									
West Pointe a la Hache	I/D	I/D	Sy/Sy	I/D	I/D	Sy/Sy	I/D	I/D	I/D	Sy/NA	I/D	I/D	River siphon influence
Lake Washington / Grand Ecaille	D/D	D/D	D/D	D/D	D/D	Sy/Sy	D/D	D/D	D/D	NA/I	NA/NA	NA/NA	

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

**Table 7-1. Region 2 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	Comments											
Bastian Bay	D/D	I/I	NA/NA	NA/NA									
Cheniere Ronquille	D/D	D/D	D/D	Sy/D	Sy/D	D/D	D/D	D/D	D/D	I/I	NA/NA	NA/NA	
Grand Liard	D/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	D/D	D/D	D/D	Sy/Sy	NA/NA	NA/NA	
Fourchon Shoreline	D/D	I/I	NA/NA	NA/NA									
Barataria Barrier Islands	D/D	I/I	NA/NA	NA/NA									
Barataria Barrier Shorelines	D/D	I/I	NA/NA	NA/NA									
West Bay	Sy/I	Sy/I	Sy/Sy	Sy/I	Sy/Sy	Sy/D	Sy/I	Sy/I	Sy/I	Sy/D	Sy/I	Sy/I	
East Bay	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/Sy	Sy/Sy	
Pass a Loutre	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/Sy	Sy/Sy	
Cubit's Gap	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/Sy	Sy/Sy	
Baptiste Collette	Sy/D	Sy/D	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/D	Sy/D	Sy/D	Sy/Sy	Sy/Sy	Sy/Sy	
American Bay	Sy/Sy	Sy/Sy	Sy/Sy	I/Sy	Sy/Sy	I/Sy	I/Sy	Sy/Sy	I/Sy	Sy/Sy	NA/	NA/	
Breton Sound													
Lake Lery	Sy/I	Sy/I	Sy/I	I/I	Sy/Sy	I/I	I/I	Sy/I	I/I	NA/NA	I/I	I/I	River siphon influence
Caernarvon	Sy/I	Sy/I	Sy/Sy	I/I	Sy/Sy	I/I	I/I	Sy/I	I/I	Sy/Sy	I/I	I/I	River siphon influence
River aux Chenes	Sy/Sy	Sy/Sy	Sy/Sy	I/Sy	Sy/Sy	I/I	I/Sy	Sy/Sy	I/Sy	Sy/Sy	I/I	I/I	
Jean Louis Robin	Sy/Sy	Sy/Sy	Sy/Sy	I/Sy	Sy/Sy	I/I	I/Sy	Sy/Sy	Sy/Sy	Sy/Sy	Sy/Sy	NA/NA	

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

**Table 7-2. Region 2 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 is particularly rare or important to wildlife.

**Status:** 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.						
<b>Breton Sound Basin</b>																																												
American Bay	OW	66	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH						W	Lo	Sy	D		NH				NH			W	Lo	Sy	Sy	
	BM	8		NH				NH				Mu	Hi	Sy	D	Mu	Hi	I	D	Mu	Hi	Sy	D	W	Mo	Sy	D	W	Lo	Sy	D		NH			Mu	Lo	Sy	D	Mu	Lo	Sy	D	
	SM	18		NH				NH				Mu	Hi	Sy	D	Mu	Hi	I	D	Mu	Hi	Sy	D	W	Lo	Sy	D	W	Lo	Sy	D		NH			NH			Mu	Lo	Sy	D		
Breton Sound	OW	100	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH					W	Mo	Sy	Sy		NH				NH				NH				
Caernarvon	OW	60	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH			W	Lo	I	I	W	Mo	I	I		NH				NH			W	Lo	Sy	Sy
	BM	32		NH				NH				Mu	Hi	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	I	I	W	Lo	I	I		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I	
	SM	7		NH				NH				Mu	Hi	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Lo	I	I	W	Lo	I	I		NH				NH			Mu	Lo	I	I	
Jean Louis Robin	OW	64	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH			W	Lo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	BM	18		NH				NH				Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	D	Mu	Mo	I	I	
	SM	16		NH				NH				Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	Sy	Sy	W	Lo	Sy	Sy		NH				NH			Mu	Lo	I	I	
Lake Lery	OW	35	W	Mo	I	I		NH				Mu	Mo	Sy	Sy		NH					NH			W	Lo	I	I	W	Mo	I	I		NH				NH			W	Lo	Sy	Sy
	BM	58		NH				NH				Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	I	I	W	Lo	I	I		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I	
River aux Chenes	OW	31	W	Hi	I	I		NH				Mu	Mo	Sy	Sy		NH					NH			W	Lo	Sy	Sy	W	Mo	Sy	Sy		NH				NH			W	Lo	Sy	Sy
	BM	63		NH				NH				Mu	Mo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	Sy	W	Lo	Sy	Sy		NH			Mu	Lo	Sy	D	Mu	Mo	Sy	Sy	
<b>Mississippi River Basin</b>																																												
Baptiste Colette	OW	82	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH			W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy		NH			W	Hi	Sy	Sy
	FM	8		NH				NH				Mu	Lo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy	Mu	Lo	Sy	D	Mu	Hi	Sy	Sy	
	IM	6		NH				NH				Mu	Mo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy	Mu	Lo	Sy	D	Mu	Hi	Sy	Sy	
Cubit's Gap	OW	68	W	Mo	I	I		NH				Mu	Hi	Sy	Sy		NH					NH			W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy		NH			W	Hi	Sy	Sy
	FM	26		NH				NH				Mu	Lo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy	Mu	Lo	Sy	D	Mu	Hi	Sy	Sy	

**Table 7-2. Region 2 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 is particularly rare or important to wildlife.

**Status:** 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		Avifauna (cont.)												Furbearers												Game Mammals												Reptiles												
	Habitat	% of Unit	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								
	Type		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.													
<b>Breton Sound Basin</b>																																																			
American Bay	OW	66	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	D	Sy	NH			NH				Mu	Lo	D	Sy						
	BM	8	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Lo	D	Sy				
	SM	18	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	Sy	Sy	NH					NL				Mu	Lo	D	Sy				
Breton Sound	OW	100	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH						NH				NH																							
Caernarvon	OW	60	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Lo	D	Sy	Mu	Lo	D	Sy	NH					NH								Mu	Lo	Sy	Sy				
	BM	32	Ne	Hi	Sy	Sy		NH						Mu	Hi	Sy	Sy	NH					Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Lo	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Mo	I	I
	SM	7	Ne	Hi	Sy	Sy		NH						Mu	Hi	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	NH					Mu	Lo	Sy	Sy				
Jean Louis Robin	OW	64	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Lo	D	Sy	Mu	Lo	D	Sy	NH					NH								Mu	Lo	Sy	Sy				
	BM	18	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Lo	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Mo	I	I
	SM	16	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	NH					Mu	Lo	Sy	Sy				
Lake Lery	OW	35	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	NH					NH				Mu	Mo	I	I				
	BM	58	Ne	Hi	Sy	Sy		NH						Mu	Hi	Sy	Sy	NH					Mu	Mo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH				Mu	Lo	Sy	Sy	Mu	Mo	I	I
River aux Chenes	OW	31	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	NH					NH				Mu	Mo	I	I				
	BM	63	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH				Mu	Lo	Sy	Sy	Mu	Mo	I	I
<b>Mississippi River Basin</b>																																																			
Baptiste Colette	OW	82	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH								Mu	Lo	D	Sy				
	FM	8	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH				Mu	Lo	Sy	Sy	Mu	Lo	D	Sy
	IM	6	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH				Mu	Lo	Sy	Sy	Mu	Lo	D	Sy
Cubit's Gap	OW	68	Mu	Mo	Sy	Sy		NH						Mu	Mo	Sy	Sy	NH					Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH								Mu	Mo	Sy	Sy				
	FM	26	Ne	Hi	Sy	D		NH						Mu	Hi	Sy	D	NH					Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH					NH				Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy

**Table 7-2. Region 2 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 is particularly rare or important to wildlife.

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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.											
East Bay	OW	88	W	Mo	I	I	NH					Mu	Hi	Sy	Sy	NH					NH					W	Lo	Sy	D	W	Lo	Sy	D	W	Mo	Sy	D	NH				W	Lo	Sy	D				
	FM	5		NH			NH					Mu	Lo	D	D	Mu	Mo	D	D	Mu	Hi	D	D			W	Lo	D	D	W	Lo	Sy	D	W	Mo	Sy	D	Mu	Lo	D	D	Mu	Lo	D	D				
	BB	1		NH			NH					Mu	Mo	D	D	Mu	Lo	D	D	Mu	Mo	D	D				NH				NH				NH				NH				NH						
Pass a Loure	OW	73	W	Mo	I	I	NH					Mu	Hi	Sy	Sy	NH					NH					W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy	NH				W	Hi	Sy	Sy				
	FM	22		NH			NH					Mu	Lo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D			W	Hi	Sy	Sy	W	Hi	Sy	Sy	W	Hi	Sy	Sy	Mu	Lo	Sy	D	Mu	Hi	Sy	Sy				
West Bay	OW	85	W	Mo	I	I	NH					Mu	Hi	Sy	D	NH					NH					W	Mo	Sy	I	W	Mo	Sy	I	W	Mo	Sy	I	NH				W	Mo	Sy	I				
	FM	5		NH			NH					Mu	Lo	Sy	Sy	Mu	Hi	Sy	I	Mu	Hi	Sy	I			W	Mo	Sy	I	W	Mo	Sy	I	W	Mo	Sy	I	Mu	Lo	Sy	I	Mu	Mo	Sy	I				
	BB	1		NH			NH					Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy			NH				NH				NH				NH				NH							
<b>Barataria Basin</b>																																																	
Baker	FS	44		NH			NH					NH				Ne	Hi	I	Sy	NH						Mu	Lo	Sy	D		NH			NH				Mu	Mo	I	Sy	NH							
	HF	51		NH			NH					NH				NH					NH						Mu	Lo	Sy	D		NH			NH				Mu	Hi	I	D	NH						
Barataria Bay	OW	97	W	Hi	I	I	NH					Mu	Hi	Sy	Sy	NH					NH						NH			W	Lo	D	D	NH				NH				NH							
	SM	2	Ne	Hi	I	I	NH					NH				NH					NH					Mu	Lo	D	D		NH			NH				NH			Mu	Lo	D	D					
Barataria Barrier Islands	OW	64	W	Hi	I	I	NH					Mu	Hi	Sy	Sy	NH					NH						W	Lo	D	D	NH				NH				NH				NH						
	SM	12		NH			NH					Mu	Mo	Sy	D	Mu	Mo	Sy	D	Mu	Mo	Sy	D			W	Lo	D	D	W	Lo	D	D	NH				NH				NH			Mu	Lo	D	D	
	HF	2		NH			NH					NH				NH					NH							NH			NH				NH				NH				NH						
	BB	2		NH			NH					Mu	Mo	Sy	D	Mu	Lo	Sy	D	Mu	Mo	Sy	D			NH		NH		NH			NH				NH				NH				NH				
	AU	19		NH			NH					NH				St	Lo	Sy	D	Mu	Lo	Sy	D			NH		NH		NH			NH				NH			Mu	Lo	Sy	D	NH					
Barataria Barrier Shorelines	OW	74	W	Hi	I	I	NH					Mu	Hi	Sy	Sy	NH					NH						W	Lo	D	D	NH				NH				NH				NH						
	SM	20		NH			NH					Mu	Mo	D	D	Mu	Mo	D	D	Mu	Mo	D	D			W	Lo	D	D	W	Lo	D	D	NH				NH				NH			Mu	Lo	D	D	
	HF	1		NH			NH					NH				NH					NH							NH			NH				NH				NH				St	Mo	D	D	NH		
	BB	2		NH			NH					Mu	Mo	D	D	Mu	Lo	D	D	Mu	Mo	D	D			NH			NH			NH				NH				NH				NH					

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

Mapping Unit	1988		Avifauna (cont.)												Furbearers												Game Mammals												Reptiles							
	Habitat Type	% of Unit	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.								
East Bay	OW	88	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH				NH					NH				NL				NH				NL				Mu	Lo	Sy	Sy	
	FM	5	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy	Mu	Lo	D	D		NH				Mu	Lo	D	D	Mu	Lo	Sy	Sy
	BB	1		NH				NH					NH				NH					NH					NH				NH					NH				Mu	Lo	Sy	Sy			
Pass a Loutre	OW	73	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH				Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy	NH				NH				NH				Mu	Mo	Sy	Sy	
	FM	22	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy				
	BB	1		NH				NH					NH				NH					NH					NH				NH					NH				Mu	Lo	Sy	Sy			
West Bay	OW	85	Mu	Mo	Sy	D		NH				Mu	Mo	Sy	D		NH				Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy	NH				NH				NH				Mu	Lo	Sy	Sy	
	FM	5	Ne	Hi	Sy	I		NH				Mu	Hi	Sy	I		NH				Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy	Mu	Lo	Sy	I		NH				Mu	Lo	Sy	I	Mu	Mo	Sy	Sy
	BB	1		NH				NH					NH				NH					NH					NH				NH					NH				Mu	Lo	Sy	Sy			
<b>Barataria Basin</b>																																														
Baker	FS	44	Ne	Lo	Sy	Sy		Ne	Mo	I	Sy		Mu	Lo	Sy	Sy		Mu	Mo	Sy	Sy		Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy		Mu	Mo	I	I
	HF	51		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
Barataria Bay	OW	97	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH					NH					NH				NH					NH				NH				NH		
	SM	2		NH				NH					NH				NH					NH					NH				NH					NH				NH				NL		
Barataria Barrier Islands	OW	64	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH					NH					NH				NL					NH				NL				NL		
	SM	12	Ne	Mo	Sy	D		NH				Ne	Mo	Sy	D		NH				Mu	Lo	D	D		Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NL			
	HF	2	Ne	Mo	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Lo	D	D		Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NL			
Barataria Barrier Shorelines	BB	2		NH				NH					NH				NH					NH					NH				NH					NH				NH				NH		
	AU	19		NH				Ne	Lo	Sy	D			NH			Mu	Lo	Sy	D		NH					NH				NH					NH				NH				NH		
	OW	74	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH					NH					NH				NL					NH				NL				NL		
Barataria Barrier Shorelines	SM	20	Ne	Mo	D	D		NH				Ne	Mo	D	D		NH				Mu	Lo	D	D		Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NL			
	HF	1		NH				Ne	Mo	D	D			NH			Mu	Hi	D	D		Mu	Lo	D	D		Mu	Lo	D	D	Mu	Lo	D	D		NH				NL				NL		
	BB	2		NH				NH				Mu	Mo	Sy	Sy		NH					NH					NH				NL					NH				NL				NH		

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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.				
Bastian Bay	OW	88	W	Hi	I	I	NH				Mu	Hi	Sy	Sy	NH				NH				NH				W	Lo	D	D	NH				NH				NH			
	SM	6		NH			NH				Mu	Mo	D	D	Mu	Mo	D	D	Mu	Mo	D	D	W	Lo	D	D	W	Lo	D	D	NH				NH				Mu	Lo	D	D
Caminada Bay	OW	71	W	Hi	I	I	NH				Mu	Hi	Sy	Sy	NH				NH				W	Lo	D	D	W	Lo	D	D	NH				NH				NH			
	SM	26		NH			NH				Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	Sy	D	W	Lo	D	D	NH				NH				Mu	Lo	D	D
Cataouatche/Salvador	OW	37	W	Lo	I	I	NH				Mu	Mo	Sy	Sy	NH				NH				W	Lo	I	Sy	W	Mo	Sy	Sy	NH				NH				W	Hi	I	Sy
	FM	49		NH			NH				Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	I	Sy	W	Mo	Sy	D	NH				Mu	Lo	Sy	Sy	Mu	Hi	I	Sy
	FS	6		NH			Ne	Hi	I	I		NH			Mu	Hi	I	Sy	NH				Mu	Lo	Sy	Sy	NH				NH				Mu	Mo	I	Sy	NH			
Cheniére Ronquille	HF	5		NH			NH				NH				NH				NH				W	Lo	Sy	Sy	NH				NH				Mu	Hi	I	D	NH			
	OW	86	W	Hi	I	I	NH				Mu	Hi	Sy	Sy	NH				NH				NH				W	Lo	D	D	NH				NH				NH			
	SM	13		NH			NH				Mu	Mo	D	D	Mu	Mo	D	D	Mu	Mo	D	D	W	Lo	D	D	W	Lo	D	D	NH				NH				Mu	Lo	D	D
Clovelly	OW	20	W	Lo	I	I	NH				Mu	Mo	Sy	Sy	NH				NH				W	Lo	Sy	Sy	W	Mo	D	D	NH				NH				W	Lo	Sy	Sy
	FM	34		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	40		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
	HF	5		NH			NH				NH				NH				NH				W	Lo	Sy	Sy	NH				NH				Mu	Hi	I	D	NH			
Des Allemands	OW	17	W	Lo	I	I	NH				Mu	Lo	Sy	Sy	NH				NH				W	Lo	Sy	Sy	W	Lo	Sy	Sy	NH				NH				W	Mo	Sy	Sy
	FM	18		NH			NH				Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	D	W	Lo	Sy	Sy	NH				Mu	Lo	Sy	Sy	Mu	Mo	Sy	D
	FS	41		NH			Ne	Hi	I	I		NH			NH				NH				W	Lo	Sy	D	NH				NH				Mu	Mo	I	Sy	NH			
Fourchon	HF	19		NH			NH				NH				NH				NH				W	Lo	Sy	Sy	NH				NH				Mu	Hi	I	D	NH			
	OW	50	W	Hi	I	I	NH				Mu	Hi	Sy	Sy	NH				NH				W	Lo	Sy	D	W	Lo	Sy	D	NH				NH				NH			
	SM	39		NH			NH				Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Lo	Sy	D	W	Lo	Sy	D	NH				NH				W	Lo	Sy	D
	HF	2		NH			NH				NH				NH				NH				NH				NH								NH				St	Mo	Sy	D
	BB	3		NH			NH				Mu	Hi	D	D	Mu	Lo	Sy	D	Mu	Hi	D	D	NH				NH								NH				NH			
Gheens	AU	6	W	Lo	I	I	NH				NH			Ne	Mo	Sy	Sy	Mu	Lo	Sy	D	NH				NH								NH				Mu	Lo	Sy	D	
	FM	37		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	Hi	Sy	Sy
	FS	21		NH			Ne	Lo	Sy	Sy	NH				Mu	Hi	I	Sy	NH				W	Lo	Sy	Sy	NH				NH				Ne	Mo	I	Sy	NH			

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Mapping Unit	1988		Avifauna (cont.)												Furbearers												Game Mammals												Reptiles															
	Habitat	% of Unit	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											
	Type		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.								
Bastian Bay	OW	88	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	NH				NH				NH				NH				NH				NH				NL				NH				NL				NL			
	SM	6	Ne	Mo	D	D	NH				Mu	Mo	D	D	NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	NH				NL				Mu	Lo	D	D
Caminada Bay	OW	71	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	NH				NH				NL				Mu	Lo	D	D
	SM	26	Mu	Hi	Sy	D	NH				Mu	Hi	Sy	D	NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	NH				NH				Mu	Lo	D	D				
Cataouatche/Salvador	OW	37	Mu	Mo	Sy	Sy	NH				Mu	Hi	Sy	Sy	NH				Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH				NH				Mu	Lo	Sy	Sy				
	FM	49	Ne	Hi	Sy	Sy	NH				Mu	Hi	Sy	Sy	NH				Mu	Hi	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH				Mu	Mo	Sy	Sy	Mu	Hi	I	I				
	FS	6	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	Lo	Sy	Sy	Mu	Mo	I	I				
	HF	5		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	I	I								
Cheniere Ronquille	OW	86	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	NH				NL				NL				NL				NL				NH				NL				NL											
	SM	13	Ne	Mo	D	D	NH				Mu	Mo	D	D	NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	NH				NL				Mu	Lo	D	D				
Clovelly	OW	20	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	NH				NH				NH				Mu	Hi	I	I				
	FM	34	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	Hi	I	I								
	IM	40	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	Hi	I	I								
	HF	5		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	I	I								
Des Allemands	OW	17	Mu	Mo	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				NH				Mu	Mo	I	I								
	FM	18	Ne	Hi	Sy	Sy	NH				Mu	Hi	Sy	Sy	NH				Mu	Hi	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	NH				Mu	Lo	Sy	Sy	Mu	Hi	I	I								
	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	Lo	Sy	Sy	Mu	Mo	I	I				
	HF	19		NH			Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Mo	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	Mu	Mo	I	I				
Fourchon	OW	50	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	NH				NL				NL				NL				NH				NH				NH				NL											
	SM	39	Mu	Hi	Sy	D	NH				Mu	Hi	Sy	D	NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Mo	Sy	Sy	NH				NH				NL											
	HF	2		NH			Ne	Mo	Sy	D		NH			Mu	Mo	Sy	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	Sy	NH				NH				NL											
	BB	3		NH			NH				NH				NH				NH				NH				NH				NH				NH				NH															
	AU	6		NH			Ne	Lo	Sy	D		NH			Mu	Lo	Sy	D	NH				NH				NH				Mu	Lo	D	D	NH				NH															
Gheens	FM	37	Ne	Hi	Sy	Sy	NH				Mu	Hi	Sy	Sy	NH				Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy	NH				Mu	Mo	Sy	Sy	Mu	Hi	I	I								
	FS	21	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	I								

**Table 7-2. Region 2 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;

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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.									
	HF	25		NH				NH				NH				NH					W	Lo	Sy	Sy			NH				NH				Mu	Hi	I	D			NH						
	AU	15		NH				NH				NH			St	Lo	Sy	Sy	St	Lo	Sy	Sy			NH				NH				NH			Mu	Mo	Sy	Sy			NH					
Grand Liard	OW	59	W	Hi	I	I		NH			Mu	Hi	Sy	Sy		NH				NH					W	Lo	D	D	W	Lo	D	D	W	Lo	D	D			NH			W	Lo	D	D		
	IM	8		NH				NH			Mu	Mo	D	D	Mu	Hi	D	D	Mu	Hi	D	D	Mu	Hi	D	D	W	Lo	D	D	W	Lo	D	D	W	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	
	BM	7		NH				NH			Mu	Mo	D	D	Mu	Hi	D	D	Mu	Hi	D	D	Mu	Hi	D	D	W	Lo	D	D	W	Lo	D	D	W	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	
	SM	11		NH				NH			Mu	Hi	D	D	Mu	Hi	D	D	Mu	Hi	D	D	Mu	Hi	D	D	W	Lo	D	D	W	Lo	D	D	W	Lo	D	D			NH			Mu	Lo	D	D
	AU	9		NH				NH				NH			St	Lo	Sy	Sy	Mu	Lo	Sy	Sy			NH				NH				NH			Mu	Lo	Sy	Sy			NH					
Jean Lafitte	OW	5	W	Lo	I	I		NH			Mu	Lo	Sy	Sy		NH				NH					W	Mo	Sy	Sy	W	Lo	Sy	Sy			NH					NH			W	Mo	Sy	Sy	
	FM	12		NH				NH			Mu	Lo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Lo	Sy	Sy			NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy				
	IM	6		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	I	Sy	Mu	Hi	Sy	Sy	W	Mo	Sy	Sy	W	Lo	Sy	Sy			NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	Sy				
	FS	35		NH				Ne	Lo	Sy	Sy		NH		Mu	Hi	I	Sy		NH				W	Mo	Sy	Sy			NH			NH			Mu	Mo	I	Sy			NH					
	HF	35		NH				NH				NH				NH				NH					Mu	Lo	Sy	Sy			NH			NH			Mu	Hi	I	D			NH				
	AU	7		NH				NH				NH			St	Lo	Sy	Sy	St	Lo	Sy	Sy			NH				NH				NH					St	Lo	Sy	Sy			NH			
Lk. Washington/Grand Ecaille	OW	51	W	Hi	I	I		NH			Mu	Hi	Sy	Sy		NH				NH					W	Lo	D	D	W	Lo	D	D			NH					NH			W	Lo	D	D	
	BM	12		NH				NH			Mu	Mo	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	35		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		

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**Habitat Types:** OW = Open Water; AB = Aquatic Bed; FM = Fresh Marsh; IM = Intermediate Marsh; BM = Brackish Marsh; SM = Saline Marsh;

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

Mapping Unit	1988 Habitat		Avifauna (cont.)												Furbearers												Game Mammals												Reptiles							
	Type	% of Unit	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.								
	HF	25		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	Lo	Sy	Sy				
	AU	15		NH			Ne	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy				
Grand Liard	OW	59	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D		NH				NH				NH			Mu	Lo	D	D			
	IM	8	Ne	Hi	D	D		NH				Mu	Hi	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D			
	BM	7	Ne	Hi	D	D		NH				Mu	Hi	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D			
	SM	11	Ne	Hi	D	D		NH				Mu	Hi	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D	Mu	Lo	D	D			
	AU	9		NH			Ne	Mo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			Mu	Lo	D	D				
Jean Lafitte	OW	5	Mu	Lo	Sy	Sy		NH				Mu	Lo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH				NH			Mu	Hi	I	I			
	FM	12	Ne	Hi	Sy	Sy		NH				Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Hi	I	I			
	IM	6	Ne	Hi	Sy	Sy		NH				Mu	Hi	Sy	Sy		NH			Mu	Mo	Sy	Sy	Mu	Mo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Hi	I	I			
	FS	35	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		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I				
	HF	35		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	Mo	Sy	Sy				
	AU	7		NH			Ne	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy				
Lk. Washington/Grand Ecaille	OW	51	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH				NH			Mu	Lo	D	D			
	BM	12	Ne	Hi	Sy	Sy		NH				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			
	SM	35	Ne	Hi	Sy	Sy		NH				Mu	Hi	Sy	D		NH			Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D		NH			NL			Mu	Lo	D	D

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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.				
Lake Boeuf	FM	24	W	Lo	I	I		NH			Mu	Lo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Mo	Sy	Sy	W	Lo	Sy	D	W	Lo	Sy	I		NH			Mu	Lo	Sy	Sy	Mu	Mo	Sy	D
	FS	54		NH			Ne	Mo	Sy	Sy		NH			Mu	Hi	Sy	Sy		NH			W	Lo	Sy	D		NH			NH			Mu	Mo	Sy	Sy		NH			
	HF	15		NH				NH				NH				NH				NH			W	Lo	Sy	D		NH			NH			Mu	Hi	I	D		NH			
Little Lake	OW	69		NH				NH			Mu	Hi	Sy	Sy		NH				NH			W	Lo	D	D	W	Lo	D	D		NH				NH			W	Lo	D	D
	BM	13	W	Hi	I	I		NH			Mu	Mo	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	12		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
Myrtle Grove	OW	51	W	Mo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Lo	Sy	I	W	Mo	Sy	I		NH				NH			W	Lo	Sy	I
	BM	38		NH			Ne	Lo	Sy	Sy	Mu	Mo	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	Sy	I	W	Lo	Sy	I		NH			Mu	Lo	Sy	D	Mu	Lo	Sy	I
	AU	6		NH				NH				NH			St	Lo	Sy	Sy	St	Lo	Sy	Sy		NH				NH			NH			Mu	Lo	Sy	Sy		NH			
Naomi	OW	26	W	Lo	I	I		NH			Mu	Mo	Sy	Sy		NH				NH			W	Mo	I	I	W	Mo	I	I		NH				NH			W	Mo	I	I
	IM	40		NH			Ne	Lo	Sy	Sy	Mu	Lo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Hi	Sy	Sy	W	Mo	I	I	W	Mo	I	I		NH			Mu	Lo	Sy	Sy	Mu	Mo	I	I
	BM	14		NH				NH			Mu	Mo	Sy	Sy	Mu	Hi	Sy	Sy	Mu	Hi	Sy	Sy	W	Mo	I	I	W	Mo	I	I		NH			Mu	Lo	Sy	Sy	Mu	Lo	I	I
	HF	6		NH				NH				NH				NH				NH			W	Lo	Sy	Sy		NH			NH			Mu	Hi	Sy	D		NH			
	AU	5		NH				NH				NH			St	Lo	Sy	Sy	St	Lo	Sy	Sy		NH				NH			NH			Mu	Mo	Sy	Sy		NH			
Perot/Rigolettes	OW	45	W	Mo	I	I		NH			Mu	Mo	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	Sy	D	Mu	Hi	Sy	D	W	Lo	D	D	W	Lo	D	D		NH			Mu	Lo	Sy	D	Mu	Lo	D	D
	IM	20		NH				NH			Mu	Lo	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
	BM	23		NH				NH			Mu	Mo	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
West Pointe A La Hache	OW	50	W	Mo	I	I		NH			Mu	Hi	Sy	Sy		NH				NH			W	Lo	I	I	W	Mo	I	I		NH				NH			W	Lo	I	I
	BM	44		NH				NH			Mu	Hi	Sy	D	Mu	Hi	Sy	D	Mu	Hi	Sy	D	W	Mo	I	I	W	Mo	I	I		NH			Mu	Lo	Sy	D	Mu	Lo	I	I

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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.								
Lake Boeuf	FM	24	Ne	Hi	Sy	Sy		NH				Mu	Hi	Sy	Sy		NH				Mu	Hi	Sy	Sy		Mu	Lo	Sy	Sy		Mu	Lo	Sy	Sy		NH				Mu	Lo	Sy	Sy	Mu	Hi	I	I			
	FS	54		NH				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	Hi	I	I			
	HF	15		NH				Ne	Hi	I	D		NH			Mu	Hi	Sy	D	Mu	Mo	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			
Little Lake	OW	69	Mu	Mo	Sy	Sy		NH				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	13	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Mo	D	D	Mu	Mo	D	D	Mu	Mo	D	D	Mu	Lo	Sy	D		NH				Mu	Lo	Sy	D	Mu	Lo	D	D	
	SM	12	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	D	D	Mu	Lo	Sy	D		NH				Mu	Lo	Sy	D	Mu	Mo	D	D	
Myrtle Grove	OW	51	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	38	Mu	Hi	Sy	D		NH				Mu	Hi	Sy	D		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	
	AU	6		NH				Ne	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	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		
Naomi	OW	26	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	I	I
	IM	40	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	I	I	
	BM	14	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	I	I	
	HF	6		NH				Ne	Hi	Sy	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		NH				Mu	Lo	Sy	Sy		
	AU	5		NH				Ne	Lo	Sy	Sy		NH			Mu	Lo	Sy	Sy	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		
Perot/Rigolettes	OW	45	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH				Mu	Lo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	Sy	D		NH				NH					NH				Mu	Mo	I	D
	FM	5	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Mo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	D	D		NH				Mu	Lo	D	D	Mu	Mo	I	Sy	
	IM	20	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Mo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	D	D		NH				Mu	Lo	D	D	Mu	Mo	I	Sy	
	BM	23	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Mo	Sy	D	Mu	Mo	Sy	D	Mu	Lo	Sy	D	Mu	Lo	D	D		NH				Mu	Lo	D	D	Mu	Lo	Sy	Sy	
West Pointe A La Hache	OW	50	Mu	Mo	Sy	Sy		NH				Mu	Mo	Sy	Sy		NH				Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	D	Sy		NH				NH					NH				Mu	Lo	D	Sy
	BM	44	Ne	Hi	Sy	D		NH				Mu	Hi	Sy	D		NH				Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	D	Sy	Mu	Lo	Sy	Sy		NH				Mu	Lo	Sy	Sy	Mu	Lo	D	Sy	

Two hundred copies of this public document, Appendix D, were published in this first printing at a total cost of \$1,566.23. This document was published by the Louisiana Department of Natural Resources, P.O. Box 94396, Baton Rouge, La. 70804-9396 to fulfill the requirements of a coastal restoration plan under the authority of Public Law 101-646. This material was printed in accordance with the standards for printing by state agencies established pursuant to R.S. 43:31. Printing of this material was purchased in accordance with the provisions of Title 43 of the Louisiana Revised Statutes.