

## **5. AFFECTED ENVIRONMENT/ENVIRONMENTAL EFFECTS**

### **5.1. ENVIRONMENTAL CONDITIONS**

5.1.1. The study area for environmental purposes is defined as the area within a distance of three miles from the Bayou Sorrel lock. All direct construction impacts would occur within this area.

5.1.2. The Bayou Sorrel vicinity is rural and mostly undeveloped. One of the main geographical features of the area is the EABPL, which runs generally north-south, and separates the Atchafalaya Basin Floodway from the protected land to the east. Undeveloped land is almost entirely cypress swamp and bottomland hardwood forest. The community of Bayou Sorrel lies mainly along the high bank of Lower Grand River, just outside of the Atchafalaya Basin Floodway. Development in the area is severely limited by the lack of land with sufficient elevation to avoid flooding. Although protected from the floodwaters of the Atchafalaya Basin Floodway, the community of Bayou Sorrel is occasionally threatened and sometimes sustains minor damages from high water levels of Lower Grand River.

### **5.2. SIGNIFICANT RESOURCES AND EFFECTS OF ALTERNATIVES**

#### **5.2.1. Introduction**

5.2.1.1. A resource is considered significant if it is acknowledged in the laws, adopted plans, or other policy statements of public agencies or private groups; if it is recognized as important by some segment of the general public; or if it is determined to be important based on technical or scientific criteria. The attributes and recognition of the significant resources discussed in this report are displayed in Tables 4 and 5. The following sections discuss each significant resource occurring in the study area. The significant resources and brief summary of the impacts to each of the resources has been previously presented in Table 2. The significance of each resource and the existing conditions are described, then the effects of the no-action alternative and the action alternatives are described. Operation and maintenance activities for the economic life of the project (50 years) are included in the discussion of alternative plan effects.

5.2.1.2. There are several resources that often appear in EISs that are not included as significant resources in this document. Federal agencies are required under the Farmland Protection Policy Act to consider the impacts of their actions on prime and unique farmlands. The Natural Resources Conservation Service (NRCS) has determined that no prime or unique farmland is located in the vicinity of Bayou Sorrel. Therefore, prime and unique farmland is not considered a significant resource. Documentation of correspondence with the NRCS is provided in the Environmental Appendix, Section 4. There are no state parks or wildlife management areas, nor are there any national parks, Federal wildlife refuges, or other significant publicly-owned lands in the area. The Magnuson-Stevens Fishery Conservation and Management Act requires Federal

**TABLE 4**  
**ATTRIBUTES OF SIGNIFICANT RESOURCES**

SIGNIFICANT RESOURCE	ECOLOGICAL ATTRIBUTES	CULTURAL ATTRIBUTES	AESTHETIC ATTRIBUTES
Socioeconomic Resources (Section 122 Items)	Socioeconomic resources are generally not associated with ecological significance	The cultural attributes of some areas are the principal reasons for human habitation	---
Air Quality	Non-polluted air is essential for human health and quality of fish and wildlife habitats	---	Non-polluted air provides a pleasing environment
Bottomland Hardwoods and Cypress Swamps	Provides habitat for terrestrial, aquatic, and avian species.	Native Americans and early immigrants settled in forested areas along natural ridges. Remaining forested areas support hunting pursuits.	These areas provide pleasing visual contrast to expanses of open water and developed areas.
Aquatic Habitats	Flooded cypress swamp and bottomland hardwoods are used during high water periods for foraging and spawning. Deeper channels are used during low water periods.	These areas are used for recreational and commercial fishing, which is part of the cultural heritage of the area. These areas also provide traditional transportation routes.	Water bodies surrounded by natural vegetation provide aesthetically pleasing views.
Threatened and Endangered Species	Scarcity of certain species can be indicative of systemic problems in an area	Rapid decline in a species' population is usually related to human activities.	The scarcity of a species contributes to the public's appreciation of that species.
Recreational Opportunities and Aesthetic Quality	The ecological health of an area is directly related to the recreational opportunities provided.	Outdoors recreational activities are an important part of the area's culture.	Outdoors recreational activities flourish in areas of high aesthetic value.
Cultural Resources Including National Register Sites	---	Appreciation of our cultural history is provided, in part, by remaining cultural sites.	Many cultural resources sites have high aesthetic appeal.

**TABLE 5  
RECOGNITION OF SIGNIFICANT RESOURCES**

SIGNIFICANT RESOURCE	INSTITUTIONAL RECOGNITION	TECHNICAL RECOGNITION	PUBLIC RECOGNITION
Socioeconomic Resources (Section 122 Items)	River and Harbor Flood Control Act of 1970; National Environmental Policy Act.	These resources are important for social harmony, especially in urbanized areas.	Social and economic factors affecting communities are of great concern to the general public and elected officials.
Air Quality	Clean Air Act.	Poor air quality has been shown to have adverse effects on humans and wildlife.	The public desires clean air for good health and aesthetic reasons.
Bottomland Hardwoods and Cypress Swamps	Clean Water Act; EO 11990; Fish and Wildlife Coordination Act.	Provides essential habitat for many terrestrial, aquatic, and avian species. These habitats have diminished in size because of human activities.	Environmental groups and segments of the public desire preservation and restoration of forested lands.
Aquatic Habitats	Clean Water Act; EO 11990; Fish and Wildlife Coordination Act.	Aquatic habitats dominate the landscape of this area. The whole ecosystem depends on the aquatic habitats.	Environmental groups and the public use and support preservation of aquatic habitats.
Threatened and Endangered Species	Endangered Species Act.	US government agencies are required to enforce rules protecting and restoring endangered and threatened species.	Environmental groups and most of the public desire protection of these species.
Recreational Opportunities and Aesthetic Quality	Federal Water Project Recreation Act of 1965 (PL89-72).	Facilities for recreation pursuits are recognized as very important by government agencies.	The public makes high demands on public recreational facilities.
Cultural Resources Including National Register Sites	National Historic Preservation Act of 1966; Archeological and Historic Preservation Act of 1974.	Cultural resources provide a linkage to past events, historically important persons, and design and/or construction values. They are able to yield important information about history and prehistory.	Preservation groups support protection, preservation, and enhancement of prehistoric and historic cultural resources.

agencies to consult with the National Marine Fisheries Service (NMFS) on any proposed activity that may adversely affect areas designated as essential fish habitat. There are no areas in the vicinity of Bayou Sorrel designated as essential fish habitat and no effects on downstream essential fish habitat are expected from study alternatives. The NMFS concurred by letter dated November 21, 2002, that the proposed lock replacement would not impact marine fisheries resources or other species of their concern. Documentation is provided in the Environmental Appendix, Section 10. There are no state or Federally-listed scenic streams or rivers located in the area, so those resources are not considered.

## **5.2.2. Waterborne Transportation**

5.2.2.1. Affected Environment. The Bayou Sorrel lock, opened in 1952, represents one of two locks located on the Morgan City to Port Allen Alternate Route, which provides passage between the Mississippi River and the main stem of the GIWW. Primarily serving shallow-draft barge traffic, the Bayou Sorrel lock also accommodates a small number of recreational vessels. Petroleum products and industrial chemicals represent the majority of commodities transported through the structure. In 2000, the average delay for tows transiting the Bayou Sorrel lock was 4.3 hours.

5.2.2.2. No Action. Shallow-draft traffic would experience increasing transit delays and higher transportation costs as longer lock processing times and more frequent lock operations reflect the growing volume of future traffic over this portion of the waterway. As transit delays and transportation costs increase over time, some tows would switch to alternative waterways or products would be diverted to rail carriage. The following are the projected average delays for tows transiting the Bayou Sorrel lock: Year 2010 – 12.7 hours; Year 2020 – 15.0 hours; Year 2030 – 17.5 hours; Year 2040 – 28.9 hours; and Year 2060 – 114.6 hours. This information is repeated in Table 6.

During the period of analysis, there is the possibility of a project flood occurring on the Atchafalaya Basin, Louisiana, project. If this were to happen, the lock could be damaged by flood-fighting efforts, disabling the lock for a period of time. This of course could have significant adverse impacts on waterborne transportation, with the impact commensurate with the lock closure period. No significant efforts have been expended to determine the exact course of action that would be necessary in the event of a project flood because it is assumed that Plan 1 would be implemented under the MR&T project for flood control if a new lock is not constructed.

5.2.2.3. Plans 1 and 2. Same as No Action, except that the possibility of the existing lock being damaged by flood-fighting efforts would be eliminated.

5.2.2.4. Plan 3. The future expected level of transit delays for shallow-draft barge traffic would be considerably reduced. This is considered a significant beneficial impact. The following average delays for tows transiting each of the lock replacement alternatives are as shown in

Table 6. For additional details on the effects of each lock replacement alternative, please refer to the Main Report and the Economic Appendix.

**TABLE 6  
BAYOU SORREL LOCK AVERAGE DELAYS  
BY ALTERNATIVE AND YEAR**

Condition	2000	2010	2020	2030	2040	2060
Without Project	4.3	12.7	15.0	17.5	28.9	114.6
1,200 x 75 Earthen – Plan 3A	0.7	0.9	1.2	1.2	1.2	1.3
1,200 x 75 Concrete – Plan 3B	0.8	1.2	1.6	1.8	2.0	2.0
1,200 x 110 Earthen – Plan 3C	0.4	0.6	0.7	0.7	0.7	0.7
1,200 x 110 Concrete – Plan 3D	0.4	0.6	0.7	0.7	0.7	0.8

**5.2.3. Flood Protection Systems**

5.2.3.1. Affected Environment. The Bayou Sorrel lock is an integral part of the MR&T project, which is the primary flood control program for the Mississippi River and its tributaries from Cape Girardeau Missouri south to the Gulf of Mexico, including the Atchafalaya River. The Bayou Sorrel lock allows navigation traffic to pass through the EABPL, so the lock is critical to flood control for the area between the Atchafalaya Basin Floodway and the Mississippi River, from Morganza, Louisiana to the Gulf of Mexico.

Due to the accumulation of sediments in the Atchafalaya Basin Floodway and other factors, the flood flow-line for a project design flood in the Atchafalaya Basin Floodway has increased since the Bayou Sorrel lock was constructed. A project design flood is the greatest flood having a reasonable probability of occurrence. If a project flood were to occur now, the Bayou Sorrel lock would be incapable of containing it. The structure would be overtopped if flood-fighting efforts were not undertaken.

High water conditions on Lower Grand River occasionally cause minor damages and inconveniences in the community of Bayou Sorrel. High water is caused by rainfall in the region between the Atchafalaya River and the Mississippi River. In addition, high water on the Atchafalaya River can cause water levels to rise in the coastal marshes to the south, preventing efficient drainage of the Lower Grand River basin.

5.2.3.2. No Action. A project flood in the Atchafalaya Basin, Louisiana, project would overtop the existing Bayou Sorrel lock if flood-fighting efforts were not undertaken. However, flood-fighting efforts would likely take precedence over preservation of the lock’s integrity, and

whatever is necessary to prevent floodwaters from overtopping the lock structure would be accomplished.

The residents of Bayou Sorrel would continue to be subjected to high water conditions on Lower Grand River during periods of high local rainfall and/or periods of high backwater conditions caused by high water along the coast of Louisiana to the south. The frequency of flooding problems would likely increase in the future as global sea level rise and local soil compaction and subsidence continue.

5.2.3.3. Plans 1, 2, and 3. The float-in floodgate (Plan 1), an in-kind replacement lock, and an improved replacement lock (Plans 3A through 3F) would provide adequate protection from a project flood in the Atchafalaya Basin, Louisiana, project. These features would provide at least the same level of protection as the EABPL, which has been raised to accommodate the current project flood flow-line.

Neither of the plans would affect the frequency, duration, or stage of water levels along Lower Grand River. Any increase in water discharged during lockages at the new lock would be insignificant compared to the volume of water in Lower Grand River.

#### **5.2.4. Business and Industrial Activity**

5.2.4.1. Affected Environment. The community of Bayou Sorrel is rural with business activity limited mainly to retail stores and commercial fish and crawfish dealers. At least one commercial vessel repair yard is located along the GIWW, north of Bayou Sorrel. Several active oil and gas fields occur in the vicinity. Some of these fields are accessible only by boat. A waste disposal company operates a hazardous waste injection well near the northern limits of the community.

Bayou Sorrel is located near the southern boundary of Iberville Parish. The parish has many miles of frontage along the Mississippi River where a large number of oil refineries and other industries are located. Much of the land along the Mississippi River and the high land along the river's abandoned distributaries is farmed. Sugar cane is the main crop grown. Some beef cattle production also occurs.

5.2.4.2. No Action. Business activity in the area would likely change very little in the near future. Ultimately, the viability of the businesses that depend on the patronage of residents and other businesses in the study area would reflect future trends in local population, employment, and income.

5.2.4.3. Plans 1 and 2. Same as No Action.

5.2.4.4. Plan 3. The only business in the area that relies on the Bayou Sorrel lock is the one that supplies the helper boats to assist tows through the lock. These helper boats are needed to help to break apart the larger tows; bring parts of the tows through the lock; and reassemble the tows

on the other side. These boats would no longer be necessary if any of the lock replacement plans are implemented. Whether or not this business could find other work in the area is not known.

### **5.2.5. Employment**

5.2.5.1. Affected Environment. According to the State of Louisiana's Department of Labor, Iberville Parish, where the study area is located, had an unemployment rate of 5.8 percent in the year 1998 compared to the overall state unemployment rate of 4.3 percent. Per capita income in Iberville Parish was estimated to be \$17,236 compared to the state's average of \$18,997. Employment and income statistics specific to the study area were not available but likely fall near the parish average.

5.2.5.2. No Action. Future levels of employment in the area would likely remain at its current level.

5.2.5.3. Plan 1. This plan would affect employment in the area only to the extent that local residents are hired for construction of the floodgate. It is impractical to speculate on the amount of local residents that could be hired for floodgate construction. The successful bidder on the construction could opt to hire local residents or bring in workers from other areas.

5.2.5.4. Plan 2. This plan would affect employment in the area only to the extent that local residents are hired for construction of the in-kind replacement lock. It is impractical to speculate on the amount of local residents that could be hired for lock construction. The successful bidder on the construction could opt to hire local residents or bring in workers from other areas.

5.2.5.5. Plan 3. The construction of a new lock would take approximately three years and would employ a large number of construction workers. However, it is impractical to speculate on the amount of local residents that could be hired for construction of a new lock. The successful bidder on the construction could opt to hire local residents or bring in workers from other areas.

The only people in the local area known to depend on operation of the lock, except for the people who work at the lock, are the people who work on the specialized push-boats used to assist barge tows that are too large to go through the lock in one lockage. The tows must be broken apart and the helper boats, or "picker boats" as they are locally called, help disassemble the tows, bring barges through the lock, and reassemble the tows on the other side. There are one or two of these boats that work at Bayou Sorrel, and two or three people work on each boat. These boats would not be necessary once a new lock is constructed since any of the new locks could accommodate any tow using the GIWW alternate route. So, the people working on the boats would be forced to seek other employment unless the boats could be used elsewhere.

There are 13 full-time employees at the Bayou Sorrel lock. The number of employees that would be required for operation of a new lock would be either the same or very close to the same as the number working at the existing lock.

## 5.2.6. Land Use

5.2.6.1. Affected Environment. Most of the land in the project area is undeveloped. Nearly all the undeveloped land is wooded with bottomland hardwood forest and cypress swamp. However, little timber production occurs in the area due to the lack of nearby mills for processing, the difficulties involved in harvesting timber in wetlands and flooded lands, and the relatively small sizes of the second-growth trees. All of the virgin cypress trees in the area were harvested by the early 20<sup>th</sup> century and second-growth trees are not as desirable for timber. Furthermore, there is a limited market for cypress timber.

Some of the higher elevation land along Lower Grand River is in residential use. Only a few retail businesses are located in the area. A major land feature in the area is the EABPL, which is mowed regularly to prevent the growth of woody vegetation that could adversely affect the integrity of the levee. Nearly all of this mowed land is used for cattle grazing.

5.2.6.2. No Action. No significant change land uses in the vicinity of the Bayou Sorrel lock is expected in the absence of Federal action. There is very little high ground for development. Nearly all of the land around Bayou Sorrel is forested and subject to flooding, which makes these areas unsuitable for development. Some small tracts of higher ground along Highway 75 will likely be cleared over time and developed for residential use, pasture, or crawfish ponds.

5.2.6.3. Plan 1. The float-in floodgate and the levee work necessary to tie it into the EABPL would be built on undeveloped Government-owned land and in the existing entrance channel to the lock. The grading site necessary for the floodgate construction would be located along the west bank of the East Access Channel in an area currently used for dredged material disposal. That area would revert to open water after the floodgate is constructed, but could be used for disposal of material dredged during annual maintenance of the GIWW afterwards.

5.2.6.4. Plans 2 and 3. No significant change in land uses in the vicinity of the Bayou Sorrel lock would be expected as a result of a lock replacement plan. The lock construction plans include the conversion of some land to channels, and some open water areas (borrow pits) to land. Existing channel easements, levee rights-of-way, and/or dredged material disposal easements held by the Federal government currently encumber nearly all of the land area necessary for this plan to be constructed. The borrow pits to be used for dredged material disposal are not under an existing easement. That area would require the obtainment of a dredged material disposal easement and temporary easement for access.

There are five residential structures located just outside the northern limit of existing Government property. The structures are within an existing Federal channel easement. These structures are in the area required for construction of this plan and would have to be removed for any replacement lock to be constructed.

The property adjacent to the banks of the GIWW, north of the proposed new lock, is predominately residential property with mowed yards and some trees. Some of the property is

composed of disturbed bottomland hardwood forest. Although several mature oaks, sycamores, and birches grow along the bank, no potential exists for timber production. Placement of erosion protection in the form of rock paving would protect the bankline from continued erosion and loss of land acreage to the channel. No change in land uses within the project area would be expected as a result of the planned erosion protection and mooring buoy placement.

### **5.2.7. Property Values**

5.2.7.1. Affected Environment. Property values, in particular residential property values, within the study area reflect a range of influences, such as the general trend in employment and income growth in the local community. The U.S. Census reported that the median values of owner-occupied housing within Iberville Parish were in fact higher in 1990 than in 1980. The 1990 census reported the median value of owner-occupied housing in Iberville Parish at \$50,600. The median value of owner-occupied housing in the specific study area around the Bayou Sorrel lock was not available, but likely falls near the parish median value.

5.2.7.2. No Action. Future trends in the value of properties in the study area would continue to be subjected to both the broad economic forces at work in the regional economies and the particular quality of life that is unique in the study area. Since there is little new homebuilding in the area, the degree of maintenance for existing structures relative to other nearby areas would also be an important factor affecting the trend in property values. Over the time frame represented by this project (50 years), uncertainty associated with the future supply of housing units and the future trends in the components of housing demand (population, average household size, employment and income) makes predictions of future property values to be a very speculative exercise. Under a more limited time frame, such as over the next decade, no circumstances are evident that suggest the trend in property values in the study area would significantly diverge from that of the rest of Iberville Parish.

Bank erosion would continue along the GIWW. In some areas the bank erosion could be substantial enough to adversely affect the property value of the areas along the channel.

5.2.7.3. Plan 1. No significant changes in property values are expected. Future trends in the value of properties should continue as in the No Action scenario.

5.2.7.4. Plans 2 and 3. The proposed erosion protection along the GIWW would be expected to positively influence the property value of properties that are protected. Access to a waterway generally increases the value of a property, with waterfront property often considered more valuable. This concept is considered to apply to waterfront property along the GIWW at Bayou Sorrel. However, barge tows routinely tie up along the bank while waiting for the lock to open, often to trees along private properties. This is a nuisance encroachment problem for the landowner and increases erosion. Tugboat operators routinely keep their engines running and must use the forces generated by the vessels' engines to pull away from the bank, which accelerates bankline erosion. Rock armament would provide bankline protection and the mooring facilities would alleviate physical damage and erosion to the bankline. Both project

features are expected to improve conditions for property owners adjacent to the GIWW, thus preventing the loss of property value from erosion along the protected section of the channel.

#### **5.2.8. Public/Community Facilities and Services**

5.2.8.1. Affected Environment. The community of Bayou Sorrel has municipal services provided through the Iberville Parish government. The community has regularly scheduled garbage pickup and a municipal water supply. Natural gas is available. No municipal sewerage facilities are provided, so residents have their own septic tanks. The community has a volunteer fire department. The parish sheriff's office located in Plaquemine, the parish seat, provides law enforcement. Postal service is provided through the Plaquemine, Louisiana, Post Office. The Iberville Parish Recreation Department maintains a park and ball field off Highway 75 near the Bayou Sorrel bridge. Several churches are located in the community.

With many, if not most of the Bayou Sorrel community at least partially dependent on commercial fishing, the two boat launches that service the fishermen are very important community facilities. One of the boat launches is situated along Lower Grand River between the Bayou Sorrel bridge and the existing lock. This launch serves fishermen, oil field workers and other boaters operating outside of the Atchafalaya Basin Floodway. The other launch is located along the East Access Channel between the Bayou Sorrel community and the existing lock. This is by far the more heavily used launch, with 100-200 boats launching on a typical day when crawfish are in season. Both launches have back-down ramps, but no other facilities. The launches are maintained by the Iberville Parish government.

5.2.8.2. No Action. Personnel of the Iberville Parish government have indicated that no significant changes to the municipal facilities and services in the Bayou Sorrel area are expected. The USACE is cooperating with the State of Louisiana to plan for upgrading the boat launch located on the East Access Channel. While specific plans have not been prepared, additional amenities at the boat launch in the future are probable.

5.2.8.3. Plans 1, 2, and 3. None of these plans are expected to affect community facilities and services, except as described under Section 5.2.11.

#### **5.2.9. Tax Revenues**

5.2.9.1. Affected Environment. The analysis of tax revenues has indicated a very limited property tax base for residential properties within the study area because of the statewide \$75,000 homestead exemption. This tax feature provides homeowners with an exemption from property taxes on the first \$75,000 of value. With average residential sales prices well below that figure and with generally conservative assessments of property, very little tax is generated on residential property within the study area. As a result, the local government relies on sales taxes from retail sales more than residential property taxes for revenues from the study area.

5.2.9.2. No Action. Business activity in the study area would likely change very little in the near future. As a result, the tax revenues generated by this activity would change little. Over the long term, the level of tax revenues as a function of commercial activity would reflect future trends in local population, employment, and income.

5.2.9.3. Plan 1. There would likely be some level of patronage at local retail businesses by construction workers building the new floodgate, but the degree to which this would occur is unknown. There are very few retail businesses, consisting mainly of combination convenience stores and gas stations, operating in the Bayou Sorrel community. Over the long term, the level of tax revenues as a function of commercial activity would reflect future trends in local population, employment, and income, which are not expected to change significantly because of the rural nature of the area and the lack of suitable land for development.

5.2.9.4. Plans 2 and 3. The new lock construction project would extend over a period of about three years. Certainly during this time there would be some level of patronage of local retail businesses, consisting mainly of combination convenience stores and gas stations, by the construction workers building the new lock. Although far from certain, there could be some opportunity for leasing or rental of properties to construction workers since the Bayou Sorrel community is not in close proximity to any large urban area. Over the long term, the level of tax revenues as a function of commercial activity would reflect future trends in local population, employment, and income, which are not expected to change significantly because of the rural nature of the area and the lack of suitable land for development.

## **5.2.10. Population and Community and Regional Growth**

5.2.10.1. Affected Environment. Census data for Iberville Parish show that the population in 1990 was 31,049 and according to a study conducted by Louisiana Tech University that figure has only increased to 31,258 in 1999. The community of Bayou Sorrel is basically a small rural community with business activity limited to mainly a small number of retail stores and commercial fish and crawfish dealers. With little or no future increase in population or income anticipated, the study area is not expected to have any significant community growth or expansive development activities.

5.2.10.2. No Action. No change in population is expected to occur. Since no available data exists for the specific study area, this "flat line" population growth trend at the parish level is also what is assumed for the study area.

5.2.10.3. Plan 1. Same as No Action. Construction of the new floodgate would not be expected to cause a temporary increase in the population of the area.

5.2.10.4. Plans 2 and 3. The effect of the lock replacement plans on population would be limited to the displacement of the residents of five houses located just to the north of the Government property at the Bayou Sorrel lock. The residents may or may not choose to relocate in the Bayou Sorrel area.

Since the lock replacement project would extend over a three-year period, some construction workers may opt to acquire temporary housing in the vicinity. Even if this occurred, there is likely not sufficient housing available in the area to allow a noticeable increase in the population of the area.

#### **5.2.11. Vehicular Transportation**

5.2.11.1. Affected Environment. Louisiana Highway 75 connects Bayou Sorrel with the city of Plaquemine to the north and the community of Bayou Pigeon to the south. Highway 75 is a two-lane, blacktop road. Located about halfway between the communities of Bayou Sorrel and Bayou Pigeon, Parish Road 404 runs northeast to the town of White Castle along the Mississippi River. Other than Highway 75, the only other way to get to Bayou Sorrel by vehicle is to follow a dirt and gravel road through private land alongside the EABPL, south from Interstate Highway 10 at Ramah.

A two-lane, pontoon (floating) bridge spans the GIWW/Lower Grand River in the Bayou Sorrel community. This bridge is the only practical access route for residents and businesses on the west side of Lower Grand River, where most of the residents of Bayou Sorrel live. The bridge has been knocked out of service or been closed for repairs on several occasions. When this occurs, residents and businesses cope in a variety of ways. Vehicles trapped on the west side of the waterway are sometimes brought to the east side by way of a 22-mile long mud and gravel road that runs alongside the EABPL to the Interstate Highway 10 exit at Ramah. The levee road is not a public road, but some Bayou Sorrel residents use it as a last resort. Vehicles are brought all the way around to the east side of the bridge and boats are used to shuttle people back and forth between their homes and vehicles. Nearly every family in Bayou Sorrel has a boat – some for commercial fishing and some for sport fishing. They leave their boats tied to the east bank of the channel while using their vehicles. School children are shuttled across the bayou in boats to meet school buses. Although residents have learned to cope with bridge outages, the viability of the Bayou Sorrel bridge is a prime concern of area residents.

5.2.11.2. No Action. There are no changes expected in the road and bridge system of the area. Residents would have to continue coping with significant inconveniences during periods of bridge closure.

5.2.11.3. Plans 1 and 2. Same as No Action.

5.2.11.4. Plan 3. A new larger lock would cause an increase in the tonnage of cargo moving through the lock compared to the No Action plan. By 2010, an increase in cargo of 5 percent above the no action plan is projected. By 2020 and beyond, total tonnage increases of 15 to 17 percent above the No Action plan are projected. Importantly, the size of the individual tows is not expected to increase because of constraints imposed by the width of the channel and the bends in the existing channel. A new larger lock would have a greater capability to process more than one tow per lockage which would have the effect of reducing the total number of lockages

in the short run time frame and possibly in the long run as well. Consequently, the total number of times the vehicle bridge has to open would also be lower in the short term, and possibly in the long term, when compared to the No Action plan. Although, the length of time the bridge stays in an open position would likely be longer per event (in order to accommodate more than one tow) it is probable that the reduction in bridge openings would out-weigh this negative consequence, thereby resulting in an overall drop in total bridge open time.

## **5.2.12. Housing**

5.2.12.1. Affected Environment. The residential structures within the study area are comprised mostly of well maintained to poorly maintained single residencies. According to the 1980 census, in the parish of Iberville there were 10,980 housing units with 9,634 of those being occupied year round. In the 1990 census, there were 11,352 housing units with 9,875 of those being occupied year round. Since no available data exists for the specific study area, this relatively “flat line” growth trend in housing at the parish level is also what is assumed for the study area.

5.2.12.2. No Action. The future inventory of housing in the study area will continue to reflect the broad trends in migration; employment; income and real estate trends; and specific circumstances such as the age, quality, and degree of maintenance of individual structures. Prior discussions on future population, employment, and property value trends serves as an indicator of the future of available housing.

5.2.12.3. Plan 1. Same as No Action.

5.2.12.4. Plans 2 and 3. None of the lock replacement plans would be expected to affect the general housing conditions within the study area. This plan would require the removal of five residential structures located just north of the existing Government property at the Bayou Sorrel lock. The structures consist mobile homes and small wood-framed structures. They are in the area where the new lock’s tailbay channel and northern guidewall would be located. The owners of these improvements are tenants by virtue of year-to-year leases from the underlying fee owner of the land. No other structures are located near the proposed lock. These structures are on an existing USACE channel easement for the GIWW. At least one of the residents of these structures complained at the public meeting on the EIS about having to move, so from their point of view, the requirement to move the structures is a negative impact. There would be a financial burden placed upon these residents through them having to find another place to live. A determination has been made that the residents would not be eligible for relocation under the Uniform Relocations Assistance and Real Property Acquisition Policies Act (PL91-646), or URA, since the structures were built on land over which the Government holds a perpetual channel easement for the GIWW.

### **5.2.13. Community Cohesion**

5.2.13.1. Affected Environment. The Bayou Sorrel study area is a small rural fishing village with a close-knit community where neighborhood associations promote various improvements in the community.

5.2.13.2. No Action. No change in community cohesion would be expected to occur.

5.2.13.3. Plan 1. No change in community cohesion would be expected to occur.

5.2.13.4. Plans 2 and 3. No significant change in community cohesion would be expected to occur. However, there are five structures and their occupants that would have to relocate. The five structures are about one-half mile, by vehicle, from the rest of the Bayou Sorrel community, but these residents likely have family and friends in the rest of the Bayou Sorrel community. That cohesion within that small group could be adversely affected if the occupants cannot find other suitable housing in the Bayou Sorrel community.

### **5.2.14. Noise**

5.2.14.1. Affected Environment. Noise levels in the Bayou Sorrel area are generally low due to its rural nature. Cars and trucks on the highway, small boats operating in the bayous, and tows operating in the GIWW are the primary generators of noise. There are no airports in the vicinity so no noise occurs from aircraft. In the last few years, seismic companies, searching for oil and gas reserves have been operating extensively in much of south Louisiana, including the study area. These companies rely heavily on airboats for access to undeveloped sites. The airboats are extremely loud, and can be heard for a long distance.

The Bayou Sorrel community lies immediately adjacent to both sides of the GIWW. Tugboat operators sometimes push their tows up against the bank in the vicinity of residences while waiting to transit the lock. At the public scoping meeting, comments were made about the noise from barge tows near the residences. Normally, tugs leave their generators running constantly and often leave their main engines running while waiting for the lock. In addition, the movement of these vessels, in close proximity to residences, during the night is objectionable to some residents. The lock operators occasionally receive calls from disgruntled residents requesting lock operators to instruct towboat captains to move their vessels or turn off their engines.

5.2.14.2. No Action. Vessel traffic projections indicate that waiting times for the Bayou Sorrel lock would increase if no action were taken, so there is the probability that noise impacts to residents from tugs would increase correspondingly. Additional noise would be expected in the areas currently used by tows waiting for the lock and in areas beyond where they currently wait due to a higher frequency and length of delays. The noise from tows waiting south of the lock does not impact residents because there are no residential structures located along the GIWW south of the lock. To the north, additional delays would increase both the frequency that

residents are exposed to vessel-generated noise and the number of residents exposed. Other noise conditions would continue essentially the same.

5.2.14.3. Plan 1. All of the construction work associated with this plan would be done to the south and west of the existing lock, far removed from any developed areas. Therefore, no noise impacts are expected.

5.2.14.4. Plan 2. The shortest distance between residences and the northern end of the existing lock is about 3,000 feet. The northern end of the new lock would be about 1,500 feet from the closest residences. The actual lock operation is very quiet and does not appear to cause problems for residents. However, noise from vessels waiting along the waterway on the north side of the lock is a significant problem according to residents of the area.

Noise generated during lock construction from pile driving would be considerable. Guidewall construction on the north side of the new lock would occur within about 700-800 feet of residences located along the other side of the waterway. This distance should be sufficient to reduce noise levels down to acceptable levels for residences.

5.2.14.5. Plan 3. The shortest distance between residences and the northern end of the existing lock is about 3,000 feet. The northern end of the new lock would be about 1,500 feet from the closest residences. The actual lock operation is very quiet and does not appear to cause problems for residents. However, noise from vessels waiting along the waterway on the north side of the lock is a significant problem according to residents of the area.

Noise generated during lock construction from pile driving would be considerable. Guidewall construction on the north side of the new lock would occur within about 700-800 feet of residences located along the other side of the waterway. This distance should be sufficient to reduce noise levels down to acceptable levels for residences.

This plan would reduce the number of vessels that must wait along the bank of the waterway for entry into the lock. Since vessels waiting for the lock are the main cause of noise problems, the project is expected to reduce noise-related problems caused by vessels in the waterway. Although a new lock would be closer to some residences, the 1,500-foot minimum distance should be sufficient to prevent noise from lock operations and maintenance from being a problem.

## **5.2.15. Air Quality**

5.2.15.1. Affected Environment. Iberville Parish, where Bayou Sorrel is located, is designated as a "severe non-attainment" area for ozone under the National Ambient Air Quality Standards (NAAQS), which were developed under the Clean Air Act of 1970, as amended. This means that ozone levels in the parish exceed NAAQS standards. The parish is in attainment for all other monitored pollutants including carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. In severe non-attainment areas for ozone, a threshold limit of 25-tons of

volatile organic compounds per year is used to determine if a conformity determination is required. Federal projects that emit less than 25 tons of volatile organic compounds (VOC) per year are exempt from further compliance requirements.

At least part of the ozone problem in Iberville Parish is caused by emissions from the numerous chemical plants and refineries located along the Mississippi River from Baton Rouge to New Orleans. Vehicular emissions also contribute to the problem. Even though the Bayou Sorrel area is rural, it is located in the southern part of Iberville Parish, which extends north to the Mississippi River industrial corridor. It is in this industrial corridor that most of the ozone originates.

5.2.15.2. No Action. No change in the levels of ozone found in samples from Iberville Parish is expected in the near term. Once a new State Implementation Plan is prepared and approved by the EPA, the air pollution reduction measures contained in it would likely help reduce ozone pollution levels. There is no way of knowing what the success of the revised plan will be at this time. Personnel of the LDEQ have advised that no predictions are made for air quality in Louisiana.

5.2.15.3. Plan 1. No assessment was made for this plan since the analyses performed for Plan 2 showed that the threshold level of 25 tons of volatile organic compounds per year would not be exceeded. This plan would cause the release of considerably less emissions, compared to Plan 2, since much less extensive work would be required.

5.2.15.4. Plans 2 and 3. An assessment was made of the VOC emissions expected from equipment to be used for construction of Plan 2F, which is one of the larger lock plans. The types of equipment to be used and the hours of use were taken from the detailed construction cost estimates prepared for the feasibility study. Construction of this plan is estimated to extend over a 3-year period. For ease of computation, the total amount of emissions expected from project construction was divided by three to estimate the annual emissions. The estimated annual VOC emissions expected from lock construction are 7.9 tons. Most of this amount would be generated by equipment used to excavate the connecting channels for the new lock, including the hydraulic dredge plant, dump trucks, backhoes, and draglines. This estimate is below the 25-ton threshold level requiring a conformity determination. The total amount of VOC emissions expected during project construction is also below the threshold limit, so even if the project construction plan were compressed, the project would still be below the annual 25-ton emission threshold. Since the emission estimate is below the threshold level, no further compliance documentation is planned. A table showing the types of equipment to be used and the calculations made to determine the VOC emissions is shown in Section 5 of the Environmental Appendix. The draft report and results of the air quality analysis were coordinated with the LDEQ. No adverse comments were received from the LDEQ.

## 5.2.16. Bottomland Hardwoods and Cypress Swamps

### 5.2.16.1. Affected Environment.

5.2.16.1.1. *Soils and Vegetation.* The Bayou Sorrel area is surrounded by extensive bottomland forests and cypress swamps. The forests and swamps occur both within and outside of the Atchafalaya Basin Floodway. The Atchafalaya Basin Floodway is the largest river swamp in North America and contains some of the largest remaining tracts of bottomland hardwood forests and cypress/tupelo swamps in the Lower Mississippi River Valley. Within the floodway, these woodlands are subjected to the annual rise and fall of the Atchafalaya River. Normally the river rises during the winter or early spring and begins to fall during the early summer. Outside the floodway the variation in water levels is dependent mainly on local rainfall, but is also influenced by the river since high river discharge increases water levels in the freshwater marshes to the south and diminishes the ability of local rainfall to drain to the Gulf of Mexico.

The elevation of the land and its susceptibility to flooding greatly influences the plant species composition of the forests and swamps. Barely perceivable elevation changes of one to two feet can make the difference between a cypress/tupelo-dominated swamp and a bottomland hardwood forest. Slight differences in elevation often indicate changes in soil types. Frequently-flooded Sharkey clay and Fausse soils are the two principal soil types found in the study area outside of the floodway. Sharkey clays are highly fertile, poorly drained, low permeability soils composed of clayey alluvium. Fausse soils are also composed of clayey alluvium and are very fertile, but they are very poorly drained and have very slow permeability. Fausse soils flood more frequently than Sharkey clays and may be inundated throughout the year.

Convent and Fausse soils are found within the floodway. Convent soils consist of loamy alluvium, and are characterized as somewhat poorly drained, moderately permeable, and fertile. Convent soils are found mainly along the natural levees of distributaries. The proportion of Convent soils and associated vegetation in the floodway is increasing due to the annual (or nearly annual) deposition of sediments from floodwaters. Thus, the proportion of Fausse soil and its associated vegetational community is decreasing. Fausse soils within the floodway have the same characteristics as those found outside the floodway (U.S. Dept of Agriculture, 1977).

Bottomland hardwood tree species observed growing on Sharkey soils in the study area include sugarberry (locally called hackberry), Drummond red maple, black willow, sycamore, live oak, water oak, and Nuttall oak. Other bottomland species commonly found growing in Sharkey soils include green ash, water hickory (bitter pecan), overcup oak, common persimmon, sweetgum, and honey locust. Vines, shrubs, forbs, and grasses include blackberry, dewberry, poison ivy, grass-leaf grousel, bushy bluestem, morning glory, elderberry, ragweed, common cocklebur, peppervine, rattan, and butterweed. Throughout the project area, Fausse soils support bald cypress, water tupelo, red maple, and black willow. Other tree species found on Fausse soils include green and pumpkin ash, water and honey locust, water elm, and sweetgum. Understory vegetation includes buttonbush, swamp privet, blackberry, poison ivy, grass leaf groundsel, smartweed, common cocklebur, and greenbrier.

Vegetation commonly found on the Convent soils includes black willow, sycamore, sugarberry, green ash, sweetgum, water hickory, Nuttall oak, overcup oak, and red maple. Understory vegetation includes poison ivy, blackberry, grass-leaf groundsel, smartweed, common cocklebur, and greenbrier.

Within the Atchafalaya Basin Floodway, the USACE has developed a series of confined dredged material disposal areas encompassing about 375 acres. These disposal areas contain material dredged from the GIWW during annual maintenance dredging. The disposal areas range in size from about 25 to 105 acres, and some are adjacent to each other. Some of these areas are nearly filled to capacity, while more recently constructed areas only have a small amount of their capacity used. All of these disposal areas were constructed in areas of bottomland hardwood forest and cypress swamp. The trees existing in these areas are able to survive until the dredged material becomes too deep around their root system and interferes with the ability of their roots to exchange gases. This may take 1-10 years to occur. As the existing trees die off, they are usually replaced with light-seeded species such as black willow and sycamore. Black willows appear to be quite tolerant of sediment deposition and are able to thrive even after several feet of dredged material has been placed around them. Therefore, the older disposal areas with the highest elevations are normally dominated by willows and sycamores.

5.2.16.1.2. *Wildlife.* Bottomland hardwood forests, swamps, and the margins of permanent water bodies provide outstanding wildlife habitat in the project area. The wildlife resources of the floodway have historically been recognized for their diversity and abundance due to the variety and magnitude of available habitats. Wildlife species include game animals, fur animals, migratory birds, endangered species, and numerous other non-game species (USFWS, 1981).

Forested wetlands in the study area provide prime habitats for a variety of wading birds including green-backed heron, little blue heron, snowy egret, yellow-crowned night heron, and white ibis (Kennedy, 1977; Martin and Lester, 1990). An active wading bird colony is located about 2 miles south-southeast of the Bayou Sorrel lock. Species found in the colony during the 1996 nesting season included little blue heron, great egret, snowy egret, and great blue heron. The size of the rookery has varied from more than 15,000 adult birds in 1983 to approximately 145 nesting birds in 1996 (Louisiana Natural Heritage Program, 1997).

More than 170 bird species, or about 40 percent of the birds listed by the Louisiana Ornithological Society as occurring in Louisiana, have been observed in and immediately adjacent to the floodway. Some of those species are identified as species of special management concern by the USFWS (1995). Species of concern include all species listed as threatened or endangered; species that are candidates for listing; species that are on the Blue List (a list of species that the National Audubon Society believes are experiencing a population decline); species for which widespread, documented declines have occurred within the southeast region; and species that have received legitimate attention over their status within the southeast region. Some species of concern that are found in the study are the American bittern, wood stork, Mississippi kite, swallow-tailed kite, bald eagle, yellow-billed cuckoo, chuck will's-widow,

whip-por-will, red-headed woodpecker, eastern wood peewee, wood thrush, loggerhead shrike, hooded warbler, golden-winged warbler, ovenbird, Kentucky warbler, and painted bunting.

The floodway is also an important wintering area for waterfowl in the Mississippi Flyway (USFWS, 1981). The forested wetlands and the shallow margins of permanent water bodies provide excellent feeding and resting areas for significant numbers of American coots and dabbling ducks, such as mallard, wood duck, and northern pintail. Diving ducks, such as lesser scaup and red-breasted mergansers are most common on the larger lakes and streams in the floodway. Other game birds in the study area include American woodcock and common snipe.

The principal big game animal in the floodway and adjacent lands is the white-tailed deer. The relative abundance of deer is greatest in the mid/late stage succession bottomland hardwood forest and least in the cypress-tupelo-gum cover types. However, seasonal variation in habitat preference has been noted (Evans, 1976). Important small game mammals include fox squirrel, gray squirrel, swamp rabbit, eastern cottontail, and raccoon.

Wildlife species of commercial importance include fur animals such as otter, mink, nutria, muskrat, raccoon, and beaver. In recent years, the low prices paid to trappers for pelts have reduced the importance of this industry. The American alligator is commercially harvested in Louisiana, with the harvest strictly controlled by the Louisiana Department of Wildlife and Fisheries (LDWF). Tags, which must be affixed to the alligators when harvested, are issued by the LDWF, based on the carrying capacity of the harvest area. Within the floodway, one tag is issued per 1,280 acres of permanently-flooded swamp habitat and one tag per 100 acres of lake habitat. Overall, the floodway is relatively poor alligator habitat compared to coastal marshes and cypress/tupelo swamps outside the floodway.

Wildlife in the Atchafalaya Basin Floodway must cope with flooding that occasionally covers most of the land within the floodway. Since the Atchafalaya River is now constrained by a levee system, floodwaters rise higher than they did when the river was unhindered by a continuous levee system. In the Bayou Sorrel area, only the highest ground along the major waterways and the confined dredged material disposal areas developed by the USACE are exposed during high water. Some species such as gray squirrels survive the floods by remaining in the trees, while others such as whitetail deer and swamp rabbits, must find exposed ground in order to survive. Although the confined dredged material disposal areas are not normally considered prime wildlife habitats, these areas do provide a very valuable place for animals to escape floodwaters. During low to moderate water levels in the floodway, only scattered animal signs such as droppings, burrows, tracks, and sightings, are seen in these disposal areas. However, during high water periods, abundant animal signs are evident as the animals become concentrated on the disposal areas.

5.2.16.2. No Action. No significant change in the extent of forested area is expected in the Bayou Sorrel area. Nearly all of the forested areas around Bayou Sorrel are subject to flooding which makes these areas unsuitable for development. Some small tracts of higher ground along Highway 75 will likely be cleared over time and developed for residential use, pasture, or

crawfish ponds. Some harvesting of timber is expected in areas outside of the Atchafalaya Basin Floodway. An area just to the north of Bayou Sorrel has recently been harvested. Areas where timber harvest occurs would likely be allowed to grow back into forest due to potential for flooding. Areas within the floodway are not likely to be harvested due to lack of vehicular access, which makes logging an expensive proposition.

The USACE would continue to use existing dredged material disposal areas for deposition of material dredged during annual maintenance of the GIWW south of the Bayou Sorrel lock. A new disposal area was created in the late 1990's (Site O on Plate 1). That area, along with other existing disposal areas, should be sufficient for disposal of dredged material until about 2025 when it is predicted that another large disposal area would be developed (Site T on Plate 1).

5.2.16.3. Plan 1. The floodgate would be located within the existing lock entrance channel, but the levees necessary to tie the floodwall into the EABPL would extend through a wooded portion of the existing lock grounds. Approximately 5.3 acres of disturbed bottomland hardwood forest would be converted to mowed levee. The levee construction would result in the loss of 3.7 Average Annual Habitat Units (AAHUs), according to the model used for habitat assessment and mitigation planning.

The float-in floodgate would be constructed at a graving site located along the west bank of the East Access Channel. The preliminary location shown for the graving site is about 3,000 feet south of the existing lock. Approximately 18 acres of land would be needed for the graving site. Nearly all of this area is an existing dredged material disposal area that is filled to capacity. It is presently dominated by young black willow, sycamore, and scrub/shrub woodland. The exact location of the graving site could vary from this location, depending on further engineering investigations. If this site were to be used, approximately 6 AAHUs would be lost.

Modifications necessary to bring existing Atchafalaya Basin, Louisiana project features, including the Bayou Sorrel lock, up to the necessary level of flood protection to pass the project flood are features of the Atchafalaya Basin, Louisiana project and are part of the comprehensive flood control MR&T project, authorized by the Flood Control Act of 1928, as amended. Such modifications were later confirmed in the 1982 feasibility study report and final EIS prepared for the Atchafalaya Basin Floodway System, Louisiana project, which is also part of the MR&T project. The Atchafalaya Basin Floodway System, Louisiana project was authorized by the Supplemental Appropriations Act of 1985 (Public Law 99-88) and the Water Resources Development Act of 1986 (Public Law 99-662). A mitigation plan for impacts associated with this plan has not been developed since the upgrading of the Bayou Sorrel lock has been previously covered under the Atchafalaya Basin Floodway System, Louisiana, project authority.

#### 5.2.16.4. Plans 2 and 3.

5.2.16.4.1. *Habitat Changes Expected.* Lock and channel construction and dredged material disposal would directly affect 240.4 acres of land. Of the 240.4 acres, 143.7 acres are existing dredged material disposal areas that are in various stages of regeneration. Large black willows

dominate some, while small, young willows and sycamores dominate others. About 45.1 acres out of the 240.4 acres are considered disturbed bottomland hardwood forest along the west bank of the East Access Channel. The forest has been disturbed by altered hydrology (impoundment by artificial ridges) and minor amounts of dredged material disposal. The remaining 51.6 acres is disturbed bottomland hardwood forest in various stages of regeneration on the Government-owned property on the east side of the East Access Channel.

The total land impact area of 240.4 acres would be converted to 88.9 acres of new channel; 27.6 acres of new lock grounds; 113.4 acres of dredged material disposal area; and 10.5 acres of forest with an altered hydrology (isolated from river flow). These areas would be adversely affected because the dredged material would kill the forests that are regenerating on these areas. As part of the project mitigation plan, about 46 acres of these disposal areas would be planted with desirable tree species, including oaks, sugarberries, and hickories, and managed for maximum habitat value. Over time, these areas would provide a higher habitat value than if they had not been used for disposal and planted.

During project construction, and during maintenance dredging after the project is completed, dredged material would be deposited in open water areas and existing channels that would no longer be necessary for navigation. These areas comprise about 132.5 acres and include existing borrow pits east of the existing lock (52 acres), the old lock chamber (10.1 acres), the old forebay and tailbay channels (62.3 acres), and the blocked-off section of the East Access Channel (8.1 acres). As part of the project mitigation plan, to be discussed later, these areas, except for the borrow pits, would be reforested with desirable tree species such as oaks, sugarberries, and hickories, as they become filled to capacity. Some areas would be filled within 5 years after project construction, while others would take about 35 years to fill.

All of the soils in the areas to be disturbed consist of alluvial sediments ranging from clay to fine sand-sized particles. The 143.7 acres of existing disposal areas to be dredged consist of thick layers of mostly silt and fine sand dredged from the nearby navigation channel. This material has already been reworked and would have a similar texture and structure when re-dredged and deposited in other disposal sites. The natural soils in the remaining 96.7 acres would be dredged and deposited into different sites thereby becoming dredged material. Many of the characteristics that define these soils would be lost during the dredging process. However, since all of the soil in this area, even below the depth of dredging, is composed of alluvial material and organic matter, the dredged sediments would still be capable of supporting native vegetation.

Plate 1 shows the various areas that would be directly affected by project construction. Each area with a letter designation was assessed for its habitat value. Projections were made for the habitat value of each of these areas for both the future with-project and future without-project conditions. Each area designated with a number is an existing area of water that would be filled with dredged material and managed.

Under the USACE's existing maintenance dredging program new dredged material disposal areas are developed in the Atchafalaya Basin Floodway as needed to contain material dredged

during annual maintenance dredging. About 280 acres of forested land within the Atchafalaya Basin Floodway, much of which is existing dredged material disposal area, would experience a difference in the amount of time it would take to reach its capacity for containing dredged material. Under the future without project condition, dredged material from annual maintenance dredging would continue to be placed in existing dredged material disposal areas, and new dredged material disposal areas would be constructed as necessary. With a new lock in place dredged material from maintenance dredging would be placed in the old lock chamber and old connecting channels for about 35 years after completion of the project. So, with this plan, existing disposal areas would not be used during maintenance dredging, and no new disposal areas would be developed for about 35 years after project completion. Benefits in terms of preserved habitat accrue since these areas would be adversely affected under the no-action plan, whereas there would be no adverse affect on these areas for many years under this plan.

5.2.16.4.2. *Mitigation Plan.* Mitigation planning for a lock replacement project began by determining the extent of impact the project would have on the landscape of the area. After the footprint of the project was determined, options to avoid and minimize impacts were investigated. Most of the potential for avoiding and minimizing impacts, as well as compensating for unavoidable impacts, was determined to lie in the plan for dredged material disposal. Local interests and the USFWS suggested using existing borrow pits in the area for dredged material disposal to lessen the need for disposing material on forested lands. The dredged material disposal plan includes using two borrow pits, and a canal connecting them, for dredged material disposal. Those pits would be sufficient to contain all of the material dredged from the new lock's tailbay channel (the channel extending north from the new lock).

A decision was also made to utilize existing disposal areas to the maximum extent practicable for material dredged during project construction so as to avoid impacts to undisturbed forested lands. All of the material that would be dredged from the new lock's entrance channel would be deposited in existing dredged material disposal areas. After the new lock becomes operational and connecting channels are dredged, the East Access Channel would be realigned along the west side of the new lock's forebay channel so that the strong current often found in the East Access Channel would not interfere with vessels entering and exiting the south end of the new lock. Material from the realigned East Access Channel would be deposited in the old lock's tailbay and forebay channels. By doing so, impacts to forested areas would be avoided.

To quantify impacts to forested areas and determine the amount of mitigation required to compensate for the impacts, a model developed by the State of Louisiana for wetlands mitigation planning was used. The model is called simply the Habitat Assessment Model (HAM). There are separate methods to assess the values of bottomland hardwood forest and cypress swamp. The model characterizes habitats on a score of 0.0 to 1.0, based on a number of variables including tree size, species composition, understory cover, herbaceous cover, hydrology, tract size, and amount of human disturbance. A habitat with a score of 0.0 is considered worthless, while a score of 1.0 is considered optimal. The model provides outputs in terms of habitat units (HUs). Total HUs for an area are determined by multiplying the habitat value of the area by the number of acres. As an example, 10 acres of habitat with a habitat value of 0.5 would provide

5 HUs. Existing habitat values were determined for each distinct forested area that would be affected by the lock replacement project. Predictions of what these areas would be like under both the future with and without project conditions over the 50-year economic life of the project were also made to determine the average annual habitats units (AAHUs) that each area would provide.

Field data for the variables in the HAM were collected by biologists from the USACE and the USFWS. These variables were input to the HAM computer programs and existing conditions were determined. The biologists made predictions about the future conditions of all lands affected by project construction and maintenance.

After extensive analyses, it was determined that reforesting project lands could mitigate unavoidable direct project impacts to forested lands. The model showed that the project would produce a direct loss of 70.10 AAHUs. Without any compensatory mitigation, this plan would also produce a gain of 49.73 AAHUs by avoiding the impacts associated with the annual maintenance dredging program that would occur under the future without project condition. This gain of 49.73 AAHUs has no cost associated with it. Compensatory mitigation plans were developed for the remaining 20.37 AAHUs of impact.

The compensatory mitigation planning focused on the property associated with the Bayou Sorrel lock that is currently owned by the Government and the lands that would be purchased in fee for project construction. Discussions with local government representatives and other Federal and state agencies revealed that opportunities for fish and wildlife mitigation in the general area of Bayou Sorrel do not exist because nearly all of the land is already wooded. The relatively small amounts of developed lands that could be reforested for mitigation credits are highly prized for residential development and not available for mitigation planning. The belief of the project team is that all reasonable efforts should be made to mitigate for project impacts on the Government-owned property at Bayou Sorrel, since it should be incumbent upon the Government to manage its own property for suitable fish and wildlife habitat.

The mitigation plan developed for this plan includes the reforestation of available Government-owned lands associated with the Bayou Sorrel lock. The plan involves preparation of the land where necessary (bulldozing of undesirable trees), planting with desirable seedlings, monitoring, replanting as necessary, reduction of competing undesirable vegetation. This is the minimal amount of effort necessary for reestablishment of a desirable forest habitat. There is no land purchase necessary for the mitigation plan since all of the property is either owned or would be purchased by the Government for project construction.

The proposed mitigation plan makes use of all property that would be available for reforestation. Some of the property would be reforested commensurate with project construction, while some property would be reforested as areas are filled with dredged material from maintenance dredging operations. The total amount of land to be reforested under the mitigation plan is 126.3 acres. About 45.8 acres would be reforested during project construction, while the remaining 80.5 acres would be reforested as areas become available for planting. The compensatory mitigation plan

provides 22.60 AAHUs of mitigation credit. This amount of mitigation credit completely compensates for the 20.37 AAHUs of impact associated with this plan. The last increment of mitigation provides 4.76 AAHUs. It is included in the mitigation plan because, without it, the plan would not fully compensate for project impacts. Tables 7 and 8 provide summaries of the analyses. A more detailed description of the mitigation plan is contained in the Environmental Appendix. The mitigation plan fully compensates for adverse impacts associated with this plan, as identified by the HAM. However, the wetland functional values of lands to be impacted by this plan are not fully captured by the HAM and are therefore not fully compensated by the reforestation plan. The loss of wetland function can be mitigated by implementation of a plan to improve water quality in the swamp to the west of the existing dredged material disposal sites. The existing dredged material disposal areas block overbank flows from the East Access Channel into the swamp to the west during high water in the Atchafalaya Basin Floodway. This lack of overbank flow causes a slack water situation where low dissolved oxygen levels adversely affect vegetation and fishery production. About 1,000 acres of swamp is affected by the low oxygen conditions caused by the disposal areas.

Ditches and canals cut through the bank to bring headwater flow into the swamp often have the undesirable effect of causing siltation in the swamp. The proposed plan is to construct a new ditch through the existing disposal areas from the East Access Channel to the swamp on the west side of the disposal areas. A silt trap would be installed in the ditch to allow sand and silt to settle out before reaching the swamp. In addition, a silt trap would be installed in an existing ditch along the upstream side of the northernmost dredged material disposal area to capture sediments before they are transported to the swamp.

## **5.2.17. Aquatic Habitats**

### **5.2.17.1. Affected Environment.**

5.2.17.1.1. *Habitat Types.* Aquatic habitats in the study area include riverine habitat, lacustrine (lake) habitat, and seasonally-flooded woodlands which provide suitable escape, feeding, spawning, and nursery habitats for a variety of aquatic organisms (Bryan et al., 1975, Lambou, 1990, and U.S. Dept of the Interior, 1974, 1975, and 1976). Many of these aquatic organisms are important from a commercial and/or recreational standpoint, and all are important components of the aquatic food web.

Riverine habitat includes the GIWW, Lower Grand River, and the East Access Channel. Those water bodies are characterized by the presence of flowing water throughout most or all of the year and high turbidity, good water quality, high dissolved oxygen levels, steep banks, and a substrate composed of sand or hard clay (USFWS, 1981).

Lacustrine habitat in the study area is provided by borrow pits along Lower Grand River and various lakes, bayous, and sparsely vegetated cypress tupelo swamps that remain flooded during low river stages. The lacustrine habitats are subject to two types of flooding – headwater

**TABLE 7**  
**BAYOU SORREL LOCK REPLACEMENT PROJECT**  
**PROJECT IMPACTS WITHOUT MITIGATION**

AREA	AREA LOCATION	EXISTING HABITAT TYPE	ACRES	FWOP AAHUs	FWP AAHUs	NET AAHUs
A	New forebay, just south and west of existing lock	BLH	2.8	2.01	0.05	-1.96
B	New forebay, isolated patch of BLH just west of existing lock	BLH - isolated	2.7	1.98	0.05	-1.93
C	New lock site	BLH - disturbed	6.0	4.56	0.04	-4.52
D	New lock site and new tailbay	BLH - disturbed	21.6	11.33	0.08	-11.25
E	New lock tailbay	Re-generating willows (borrow pits not included)	2.8	1.33	0.01	-1.32
F	New lock tailbay	Small area of mature BLH	3.0	2.50	0.06	-2.44
G	Northern end of new lock tailbay	BLH	12.7	8.53	0.20	-8.33
H	BLH in path of new lock forebay, west of existing East Access Channel	BLH with some cypress	20.3	10.63	0.43	-10.20
H <sub>1</sub>	BLH along East Access Channel between channel and disposal areas	BLH with some cypress - altered hydrology only	10.5	6.08	5.51	-0.57
I	Northernmost existing disposal area - part of new East Access Channel	BLH composed entirely of large, tall willows	12.9	4.17	0.33	-3.84
I <sub>1</sub>	Northernmost existing disposal area - to be used for disposal	BLH composed entirely of large, tall willows	24.5	7.94	6.46	-1.48
I <sub>2</sub>	Northernmost existing disposal area - to be used for disposal	BLH composed entirely of large, tall willows	24.9	8.07	6.57	-1.50
K	Northernmost part of new East Access Channel alignment	Mixed BLH - some small red maple and willows	10.2	6.53	0.21	-6.32
K <sub>1</sub>	West side of East Access Channel, north of disposal areas - to be used for disposal	Mixed BLH - some small red maple and willows	4.1	2.62	1.03	-1.59
N	Existing disposal area - part of new East Access Channel	Mostly small willows and sycamores	21.5	7.34	0.22	-7.12
N <sub>1</sub>	Existing disposal area - to be used for disposal	Mostly small willows and sycamores	17.2	5.88	4.14	-1.74
N <sub>2</sub>	Existing disposal area - to be used for disposal	Mostly small willows and sycamores	42.7	14.59	10.60	-3.99
<b>Total</b>			<b>240.4</b>	<b>106.09</b>	<b>35.99</b>	<b>-70.10</b>

AAHUs - Average Annual Habitat Units

BLH - Bottomland Hardwood Forest

**Areas of Adverse Habitat Impacts -**

Dredged Material Disposal Areas - 143.7 acres

BLH (Not In Disposal Areas) - 96.7 acres

**Resulting Habitats -**

Channels - 88.9 acres

Lock Grounds (Areas C&D) - 27.6 acres

Dredged Material Disposal - 113.4 acres

Altered Hydrology Only - 10.5 acres

**TABLE 8  
BAYOU SORREL LOCK REPLACEMENT PROJECT  
PROJECT MITIGATION**

AREA	AREA LOCATION	EXISTING HABITAT TYPE	ACRES	FWOP AAHUs	FWP AAHUs	NET AAHUs
I <sub>1</sub>	Northernmost existing disposal area - to be used for disposal and managed	BLH composed entirely of large, tall willows	24.5	6.46 <sup>1</sup>	11.22	4.76
K <sub>1</sub>	West side of East Access Channel, north of disposal areas - to be planted and managed	Mixed BLH - some small red maple and willows	4.1	1.03 <sup>1</sup>	1.89	0.86
N <sub>1</sub>	Existing disposal area - to be used for disposal and managed	Mostly small willows and sycamores	17.2	4.14 <sup>1</sup>	7.61	3.47
O (BLH)	Existing disposal area - only a small amount of capacity used so far	BLH portion of existing disposal area	50.9	14.85	25.93	11.08
O (CS to BLH)	Existing disposal area - only a small amount of capacity used so far	Cypress swamp that would convert to BLH w/o project	21.8	5.36	17.06	11.70
R & S	Existing disposal areas that would be used for disposal without the project	Mixed re-generating BLH	103.2	26.12	33.27	7.15
T (BLH)	Site of future disposal area that would be necessary without the project	BLH portion of area	52.2	37.95	46.64	8.69
T (CS to BLH)	Site of future disposal area that would be necessary without the project	Cypress swamp that would convert to BLH w/o project	52.1	42.39	53.50	11.11
1	Existing lock tailbay channel to be used for disposal and managed	Open water	14.9	0.00	4.11	4.11
2	Existing lock chamber to be used for disposal and managed	Open water and cleared land	10.1	0.00	3.12	3.12
3	Existing lock forebay channel to be used for disposal and managed	Open water	47.4	0.00	3.81	3.81
5	Existing East Access Channel to be used for disposal and managed	Open water	8.1	0.00	2.47	2.47
<b>Total</b>			<b>406.5</b>	<b>126.67</b>	<b>210.63</b>	<b>72.33</b>

AAHUs - Average Annual Habitat Units

BLH - Bottomland Hardwood Forest

CS - Cypress Swamp

<sup>1</sup> Areas I<sub>1</sub>, K<sub>1</sub>, and N<sub>1</sub> would be impacted by the project and would also be used for mitigation.

Acreage reforested during construction - 45.8

Acreage reforested over time - 80.5

AAHUs from avoidance of impacts - 49.73

AAHUs from compensatory mitigation - 22.6

flooding and backwater flooding. Headwater lakes are seasonally inundated by Atchafalaya River overflow and often function as riverine habitat during high river stages (USFWS, 1981). During high river stages, dissolved oxygen levels in these waters are generally good, but during falling river stages, water draining from adjacent swamps may depress oxygen levels below that capable of supporting commercial and recreational fish species (Bryan and Sabins, 1979 and Gelwicks, 1996).

Backwater lakes are influenced primarily by backwater flooding (waters raised indirectly by the Atchafalaya River), although precipitation during low river stages may also be an important hydrological factor. Backwater lakes receive headwater flows only during the greatest floods. During low river stages, backwater lakes in the floodway may become completely dry, depending on rainfall. In backwater lakes, water quality is generally good throughout fall, winter, and early spring, but low oxygen levels are experienced during the late spring and early summer, during high and falling river stages. Low oxygen levels in lacustrine habitat reduce the production of many commercially and recreationally important fishery species (Gelwicks, 1996). The substrate in lacustrine habitat is largely composed of detritus (dead plant material), although some headwater lakes can have a large proportion of silt and clay (U.S. Dept of the Interior, 1976). Lacustrine habitat in the borrow pits connected to Lower Grand River outside the floodway is similar to that of headwater lakes. Backwater habitat conditions prevail where borrow pits are not connected to Lower Grand River.

5.2.17.1.2. *Fishery Resources.* More than 100 species of finfish and commercially-important shellfish have been collected from the diverse habitats in the floodway (USFWS, 1981). The high production is due, in large part, to the seasonal flooding of forested wetlands. Standing crop values and species diversity are among the highest found in the southeastern United States (Bryan and Sabins, 1979; Lambou, 1990; and Sabins, 1978). More than 1,000 pounds of finfish per acre have been documented in water bodies just south of the study area (Sabins, 1978). Unpublished LDWF data shows standing crops of 300 pounds of finfish per acre in water bodies outside the floodway and south of the Bayou Sorrel lock. Recreationally-harvested finfish in the project area include largemouth bass (the most popular), white crappie, black crappie, yellow bass, warmouth, bluegill, redear sunfish, and blue catfish, channel catfish, and several other species of catfish. The commercial fishery for finfish in the floodway is of significant economic importance to the local communities, with catfishes, buffalo fishes, and freshwater drum comprising most of the commercial landings.

Standing crop data for shellfish in the floodway deal exclusively with crawfish. Crawfish are, by far, the most important commercially harvested species in the floodway. Available information indicates that standing crops greater than 1,000 pounds per acre occur during the high-water season (Thompson, 1973). During low-water conditions, the standing crop of crawfish has been measured at 375 pounds per acre. Both red swamp crawfish and white river crawfish are harvested with the same gear types. The red swamp crawfish dominates the catches in most areas. Both species of crawfish are also commercially harvested in flooded forests and fields outside of the floodway. Other species of some commercial importance in the floodway are river

shrimp and blue crab, however blue crabs do not normally venture as far north as the Bayou Sorrel vicinity.

The greatest threats to fishery resources production in the floodway are excessive sedimentation and poor water quality. Sedimentation has substantially reduced the acreage of open water habitat and cypress/tupelo swamps in the floodway. Through time, those habitats will become scarcer. Poor water quality in the floodway is a direct result of isolation from, or limited introduction of, headwater flows (riverine input) and/or insufficient primary production. Construction of spoil banks, shoaling, natural levee deposition, and construction of disposal areas in the vicinity of the Bayou Sorrel lock have isolated some floodplain forests from headwater flows.

Water quality in the study area outside of the floodway has been sampled by the Louisiana Department of Environmental Quality (1990). Water in the area only partially meets the designated use quality standards for drinking water and does not meet the designated standards for fish and wildlife propagation. Further, those waters are marginal for primary contact recreation. Suspected causes of poor water quality include pesticides, organic enrichment, pathogens, and excessive dissolved solids. Suspected sources of pollutants are non-irrigated crop production, spills, in-place contaminants, and untreated sewage discharges.

Water and sediment samples were collected in the channels near the Bayou Sorrel lock in 1996, during the early stages of this study, to determine if any contaminants are present in concentrations that would cause concern. Two samples of sediments were taken in the East Access Channel and two samples were also collected in Lower Grand River. One water sample was collected in each of these two waterways. The water sample collected from the East Access Channel had two constituents that exceeded applicable LDEQ criteria levels. The amount of mercury found in the sample was 0.21 parts per billion (ppb), which exceeds the chronic criteria level is 0.1210 ppb. The amount of heptachlor in the sample was 0.025 ppb, which exceeds the chronic criteria level of 0.0038 ppb. Laboratory detection limits for some potential contaminants were above the applicable LDEQ chronic and/or acute criteria levels. Results and discussion of the lab analyses are displayed in the Engineering Appendix.

5.2.17.2. No Action. Aquatic habitats within the Atchafalaya Basin Floodway are expected to continue a gradual conversion to vegetated land due to the natural deposition of silt, sand, and clay that occurs during high river stages. Outside of the floodway, no significant changes in aquatic habitats are expected.

5.2.17.3. Plan 1. There would be no significant change in aquatic habitats from this plan. The floodgate and connecting levees would cover about one acre of aquatic habitat. The graving site would result in the temporary conversion of something less than 18 acres of existing dredged material disposal area into a slip off of the East Access Channel. Once the floodgate is constructed, the slip would likely be refilled with material dredged during annual maintenance of the GIWW channel.

#### 5.2.17.4. Plan 2 and 3.

5.2.17.4.1. *Habitat Changes Expected.* This plan would significantly alter the location and quantity of certain aquatic habitats in the vicinity of the Bayou Sorrel lock. Approximately 52 acres of existing borrow pits (Areas X, Y, and Z on Plate 2) would be filled with material dredged from the new lock's tailbay channel. These borrow pits are connected to Lower Grand River and are used for recreational fishing. These borrow pits are privately owned and signs warn the general public to keep out. No mitigation is proposed for the conversion of these borrow pits back to terrestrial habitat. A temporary disposal easement would be obtained for the area, and the owner(s) of the property could do whatever they desire with the property (within existing laws and regulations), once the easement expires. Some of the more probable uses of the area would be to let it naturally re-vegetate and use it for hunting, or sell the material deposited there for fill and convert the area back into a borrow pit.

Approximately 80.5 acres of existing channels including the existing lock's forebay and tailbay channels, the existing lock chamber, and a portion of the East Access Channel (Areas 1, 2, 3, and 5 on Plate 2) would be converted to terrestrial areas. These are the areas that would be filled with dredged material and reforested for compensatory mitigation as discussed earlier. Not all areas would be filled with dredged material during project construction. Some areas would be filled over time as material is dredged from the GIWW during annual project maintenance.

Approximately 88.9 acres of existing wildlife habitat, including disturbed bottomland hardwood forest and dredged material disposal areas, would be converted to new channels. The new channels would provide the same type of aquatic habitat that existing channels provide. The new lock's forebay and tailbay channels would normally not have any significant current. However, the realigned East Access Channel would have significant current, like the existing channel. The net effect of the project on channels, in the long-term, is a net increase in the amount of channel and riverine habitat of 13 acres.

During the dredging of new channels and the filling of existing channels, turbidity levels would increase in the vicinity of dredging and disposal activities. The ambient water in the area is normally highly turbid due to large amounts of silt and clay in the water. The species of aquatic life found in this area are adapted to living in highly turbid waters, so no significant impacts to aquatic organisms are expected. There would be loss of benthic organisms (those living in the substrate) such as various species of insect larvae, worms, and mollusks wherever dredging occurs. These types of organisms normally repopulate suitable substrates within a short period of time. There is a likelihood that large numbers of commercially and recreationally important fish would be trapped in the existing channels and borrow pits that would be filled with dredged material. This would occur because confining dikes would be constructed to isolate these areas from adjacent waterways in order to confine the dredged material and effluent from these areas would be controlled by spillboxes. Appropriate steps would be required to prevent the waste of these fish. Procedures such as pumping the dredged material into the parts of the disposal sites farthest away from the effluent discharge and allowing the free flow of water (along with associated aquatic organisms) out of the areas for a short period of time after dredged

commences would allow most fish to escape the area without allowing dredged material to escape.

Analyses of the water and sediment samples taken in the vicinity of the Bayou Sorrel lock in 1996 included elutriate testing to determine if any contaminants would be re-suspended by dredging operations. Elutriate tests involve the vigorous agitation of a sample of sediment mixed with a sample of water from the area. The test is designed to simulate the mixing of sediment and water by a hydraulic dredge, providing an indication of the chemical constituents likely to be released to the water column during a disposal operation. The elutriate tests indicate that no contaminants or pollutants would rise to unacceptable levels as a result of dredging operations. However, the laboratory detection limits were above the chronic and/or acute criteria levels for some of the constituents analyzed. Therefore, it is not possible to tell for certain whether or not dredging would cause concentrations of contaminants in the vicinity of dredging and disposal to exceed chronic or acute criteria levels. Results of the sampling efforts, along with an evaluation of the results, are contained in the Engineering Appendix. An evaluation of the effects of the dredging is also contained in the Section 404(b)(1) evaluation (Environmental Appendix, Section 2).

As a result of the inability to determine if dredging would cause contaminant levels to exceed criteria levels, and in response to concerns and comments submitted by the U.S. Department of the Interior on the draft EIS, dredging associated with the new lock construction would include provisions to minimize the potential for adverse impacts. Dredging specifications would require the removal of the top layer of material from the open-water areas and wetlands in the lock tailbay, forebay and lock chamber areas and deposition of this material into the designated disposal areas before dredging the deeper materials. In addition, silt curtains would be used, where feasible and practicable, when dredging from open water areas and wetland to minimize transport of suspended sediments. Also, all practicable measures would be used, such as internal dikes, to ensure the maximum retention of sediments within dredged material disposal areas.

Construction of erosion protection and installation of mooring buoys along the GIWW would temporarily increase turbidity levels in the vicinity of the activities. The GIWW and interconnecting waterways within the project area are normally highly turbid due to large amounts of silt and clay in the water, and from upstream agricultural runoff. The species of aquatic life found within the GIWW at this area are adapted to living in these conditions, thus no significant impacts to aquatic organisms are expected. Dredging the river substrate within the limits of the mooring facility would cause the loss of benthic organisms (those living in the substrate), including various species of insect larvae, worms, and mollusks. These types of organisms normally repopulate suitable substrates within a short period of time upon completion of the project activities.

Project construction would require a National Pollutant Discharge Elimination System (NPDES) permit, as provided by Section 401 of the Clean Water Act. The permitting process is administered through the Louisiana Department of Environmental Quality. Best management

practices for pollution control, such as truck wash-down racks and erosion control measures, would be integrated into the project plans and specifications.

5.2.17.4.2. *Mitigation Plan.* The following mitigation plan is part of the mitigation plan previously described in Section 5.2.16.4.2. It is repeated here to show that aquatic impacts are also being addressed through the proposed mitigation plan. The wetland functional value of lands impacted by this plan is not fully captured by the model used for analysis, and is therefore not compensated by the reforestation plan. The reforestation would occur on lands that are not seasonally inundated by river flow like the lands that are being adversely impacted by the project. The loss of wetland function can be mitigated by implementation of a plan to improve water quality in the swamp to the west of the existing dredged material disposal sites. The existing dredged material disposal areas block overbank flows from the East Access Channel into the swamp to the west during high water in the Atchafalaya Basin Floodway. This lack of overbank flow causes a slack water situation where low dissolved oxygen levels adversely affect vegetation and fishery production. About 1,000 acres of swamp is affected by the low oxygen conditions caused by the disposal areas.

Ditches and canals cut through the bank to bring headwater flow into the swamp often have the undesirable effect of causing siltation in the swamp. The proposed plan is to construct a new ditch through the existing disposal areas from the East Access Channel to the swamp on the west side of the disposal areas. A silt trap would be installed in the ditch to allow sand and silt to settle out before reaching the swamp. In addition, a silt trap would be installed in an existing ditch along the upstream side of the northernmost dredged material disposal area to capture sediments before they are transported to the swamp.

## **5.2.18. Threatened and Endangered Species**

5.2.18.1. Affected Environment. The bald eagle is Federally listed as a threatened species and is protected under the Endangered Species Act of 1973, as amended. According to the most recent data available, which is from the 2000-2001 nesting season, the closest bald eagle nest to the Bayou Sorrel lock is about 1.8 miles to the southwest. The nest is about one mile from the closest existing dredged material disposal area. There are five other productive eagle nests in the Atchafalaya Basin Floodway, but they are located more than 10 miles from the Bayou Sorrel lock. The Bayou Sorrel lock operators report that eagles sometimes perch on poles and pilings at the lock and forage in the area. The bald eagle population in the area appears to be expanding since new nests are reported nearly every year.

Bottomland hardwood forests within the Atchafalaya Basin Floodway provide habitat suitable for the threatened Louisiana black bear. Within the forested wetlands, the black bear's habitat requirements include food (primarily hard and soft mast), thick vegetation for escape cover, vegetated corridors for dispersal, large trees for den sites, and isolated areas for refuge from human disturbance. The primary threats to this species are the continued loss of bottomland hardwood forest; fragmentation of remaining forested tracts; and human-caused mortality

including collisions with vehicles and illegal killing. Section 9 of the Endangered Species Act provides for protection of threatened and endangered species and the final listing for the Louisiana black bear provides for protection to den and candidate den trees. Candidate den trees are defined as bald cypress or tupelo gum, with visible cavities, having a minimum diameter of 36 inches at a height of 4.5 feet from the ground, and occurring in and along rivers, lakes, streams, bayous, sloughs, or other water bodies.

The project area is not considered to be occupied habitat of the Louisiana black bear. Occupied habitat is defined as areas occupied by female bears with cubs. Several black bears, thought to be roaming male bears have been seen in the general vicinity of Bayou Sorrel in recent years. However, the bears did not stay in the area. In 1993, the USFWS proposed the designation of critical habitat for the Louisiana black bear, including forested lands within the floodway. Because the rule is still proposed, a conference is necessary only if the USACE determines that the proposed project would adversely modify the proposed critical habitat.

The pallid sturgeon is an endangered fish found in the Missouri, Mississippi, and Atchafalaya Rivers. The species adapted to large, free-flowing, and turbid rivers. Habitat loss through river channelization and damming has affected this species throughout its range. Up until 1990, only 2 pallid sturgeon had been recorded from Louisiana. Both of those records are not recent and have not been verified. Since 1990, many pallid sturgeon have been documented from the area around the Old River Control Structure at the head of the Atchafalaya River. Commercial fishermen operating in the floodway have reported catching large, white sturgeon, which would indicate they are pallid sturgeon, but these reports have not been verified. Although extensive sampling has been done, no evidence of spawning has been documented in Louisiana. Based on available evidence, there is a possibility that pallid sturgeon may occur in the East Access Channel near Bayou Sorrel.

5.2.18.2. No Action. The bald eagle population, as defined by the number of nests, has been increasing in Louisiana for many years and is expected to continue doing so. There are likely suitable nest trees in the Bayou Sorrel vicinity, so it would not be surprising if new nests were established in the area. The nest closest to the lock was found during the latest available survey conducted during the 2000-2001 nesting season. It is located about 2 miles southwest of the Bayou Sorrel lock.

The outlook for the Louisiana black bear is less optimistic. Bears require large areas of undeveloped land and often run into conflicts with humans. Bears are killed both accidentally and purposefully in several ways including collisions with vehicles, incidents with agricultural equipment, and shootings. The wooded habitats in the vicinity of Bayou Sorrel appear to be suitable habitat for bear colonization, so there is a possibility that the area may be inhabited in the future if the population increases.

It is difficult to predict the future status of pallid sturgeon in Louisiana. Nearly all of the sturgeon captured in Louisiana are large individuals. This would indicate that spawning is not occurring. However, since sturgeon are difficult to capture, there may be populations of smaller

individuals that have escaped detection. There are no documented captures of sturgeon in the vicinity of Bayou Sorrel, but there is always a possibility that the species may be found in the area.

5.2.18.3. Plan 1. Endangered species consultation was not undertaken for this plan. Consultation for the lock replacements plans was undertaken and determinations were made that the lock replacement plans would not affect bald eagles. The plans were found to not likely cause adverse impacts to Louisiana black bears or pallid sturgeon. Since this plan would involve considerably less disturbance of habitats, those determinations are applicable for this plan as well.

5.2.18.4. Plans 2 and 3. The closest nest to the proposed construction area is a little more than one mile away. According to guidelines of the USFWS, a minimum distance of 1,500 feet is required between eagle nests and most construction activities. The distance between the proposed construction activities and the eagle nest is sufficient to prevent any adverse impacts.

While eagles are occasionally seen perching and foraging near the lock, there is no reason to believe that they rely on this area for foraging. A biological assessment was not prepared for bald eagles since no nests occur in the vicinity and no adverse impacts to the species are anticipated. Consultation with the USFWS was conducted after a new eagle nest was documented about two miles southwest of the Bayou Sorrel lock. The USFWS agreed with the USACE determination that the proposed action would not likely adversely affect bald eagles by correspondence of August 2, 2002.

Biological assessments were prepared to evaluate the potential for the lock replacement plan to impact the Louisiana black bear and the pallid sturgeon. The biological assessments are reproduced in the Environmental Appendix, Section 3. The conclusion of both assessments is that the proposed project is not likely to adversely affect the listed species. By letter of October 23, 2000, the USFWS concurred with the conclusion of the biological assessments and included additional reasons for the determination that no listed species would be adversely affected. Additionally, up-to-date documentation of USFWS concurrence that the proposed action is not likely to adversely affect threatened or endangered species is contained in the final Fish and Wildlife Coordination Act Report contained in the Environmental Appendix, Section 12. Documentation that the project would not affect threatened or endangered species under the purview of the National Marine Fisheries Service is also provided in the Environmental Appendix, Section 3.

## **5.2.19. Recreation**

5.2.19.1. Affected Environment. The recreation study area encompasses a 20-mile radius from the project site and includes portions of Iberville, Iberia, Assumption, St. Martin and St. Mary Parishes. These parishes are contained within regions 2, 3, and 4 of the Louisiana State Comprehensive Outdoor Recreation Plan (SCORP). Major water bodies located in the study area include Bayou Sorrel, Bayou Maringouin, Bayou Pigeon, Lake Verret, Lake Palourde, and the

Atchafalaya River. Many other small bayous and numerous open water areas occur in the area. A large portion of the Atchafalaya Basin Floodway is located in the study area. The Atchafalaya Basin Floodway is the largest river swamp in North America. It contains bottomland hardwood forests, swamps and permanent water bodies providing excellent hunting and fishing resources for the sportsman. Within the Atchafalaya Basin Floodway, below Interstate 10, is the Attakapas Wildlife Management Area, which is managed by the State of Louisiana for public outdoor recreation. Game species available to the sportsman include whitetail deer, swamp rabbit, gray and fox squirrels on the higher ground, with waterfowl found in the numerous lakes and ponds. The floodway provides an abundance of feeding and nesting areas for waterfowl and is a significant wintering area for waterfowl in the Mississippi Flyway. Sport fishing is also a major recreational activity in the area. Recreationally-harvested finfish in the area include largemouth bass, white crappie, yellow bass, warmouth, bluegill, redear sunfish, blue catfish, channel catfish and several other species of catfish. Pleasure boating is also a popular activity. Recreational crawfishermen are present in abundance throughout the basin in publicly accessible water areas.

The physical characteristics of many miles of publicly inaccessible shorelines, and the presence of numerous interior wetlands limit access to shoreline fishing. Thus, recreational fishing in the study area occurs almost entirely from boats. According to the most recent tabulation of hunting and fishing licenses, and motorboats registered within the State of Louisiana's 5-parish, 20-mile recreational study zone, 15,595 resident hunting and 47,380 resident fishing licenses were issued in 1999. In addition, 26,373 boats were registered within the study area in 1999. This large number of registered boats within a 20-mile radius of the project is an indicator as to the amount of recreational fishing that potentially occurs here.

Other recreational facilities present in the study area include Lake Fausse Point State Park, a 600-acre park that is just outside of the Atchafalaya Basin Floodway. This park showcases the unique Louisiana swampland of the area. Fishing and pleasure boating access from the park's launch is one of the prime attractions. Other day use facilities include hiking trails and picnic areas. Campers enjoy 50 tent sites with hookups. Eight bayou-side cabins are offered for rental. Also present in the study area is the Longfellow-Evangeline State Commemorative Area. This park preserves some of the French heritage history of the state. Development is centered around an eighteenth century Acadian house and its kitchen-garden. Additional attractions on the 157-acre commemorative area include a visitor's center housing a collection of agricultural, woodworking and metal working tools, a craft shop, picnic area, amphitheater, and a boat launch. Other recreationally-oriented features in the area include private camps, public boat launching ramps in the proximity to the Bayou Sorrel lock, and small neighborhood parks.

5.2.19.2. No Action. With the no action plan, recreational use of the area will continue as it is at present. No significant changes in the recreational environment are expected to occur. Recreational navigation traffic will continue to experience delays due to inadequate lock capacity transiting through the Bayou Sorrel lock. Delays will be longest when the head differential between the two sides of the lock are greatest, as this will create longer locking times. However, since a boat launch is located on each side of the lock, not many small recreational boats utilize the lock. The public boat launches near the Bayou Sorrel lock will continue to be used.

5.2.19.3. Plan 1. The floodgate plan would not affect recreational fishing since no fishing occurs in the lock entrance channel where the floodgate would be located. The graving site would be built where land exists now, so no impacts would occur from it either.

5.2.19.4. Plan 2 and 3. Recreational hunting and fishing activity in the project area would experience minimal impacts associated with building the new lock since the boat launches would remain open and few people fish in the immediate vicinity of the lock. Approximately 52 acres of existing borrow pits would be filled with material dredged from the new lock's channel. These borrow pits are connected to Lower Grand River and are used for recreational fishing. However, these borrow pits are privately owned and posted signs warn the general public to keep out. Approximately 80.5 acres of existing channels including the existing lock's forebay and tailbay channels will be converted to earthen areas. These 80.5 acres of "new land" will be reforested and in time wildlife will return to these areas. The loss of the borrow pits and filled channels will have no significant effect to the overall recreational fishing success in the area. However, during construction localized turbidity within the area of work will impact fisheries in those vicinities. These impacts will be short term and temporary. Upon completion of construction, sport fisheries will return to their pre-project condition in the area. Hunting use that occurred on the land where the connecting channels would be placed will transfer to adjacent lands with minimal apparent losses to the overall hunting experience in the vicinity. The existing public boat launches in the vicinity of the proposed new lock would not be adversely affected by project construction. However, if any adverse modifications of the boat launches are later determined to be required to implement the project, the launch site will be returned to its pre-project condition after construction is complete.

#### **5.2.20. Cultural Resources including National Register Listings**

5.2.20.1. Affected Environment. Several archeological studies have been completed of the area along the GIWW and Lower Grand River (Gagliano, Weinstein, and Burden, 1975; McMakin, Maygarten, and Heinrich, 1994). R. Christopher Goodwin and Associates, Inc. was contracted to conduct a Phase I cultural resources survey and archeological inventory of the areas that could be affected by lock replacement plans (Goodwin and Associates, 2000a). Fieldwork for this survey consisted of pedestrian survey augmented by systematic shovel testing throughout the area. This investigation found no significant archeological properties. Previously recorded Site 16IV23 fell within the limits of the investigated area, and was revisited as part of this investigation. The site, which had been situated on a natural levee between an unnamed creek and Lower Grand River, has been destroyed by prior borrow activities. The Louisiana State Historic Preservation Officer has agreed with these conclusions.

The area north of the Bayou Sorrel Bridge that could be affected by bankline grading and dredging for erosion protection and mooring buoy placement was not inventoried as part of the Goodwin and Associates survey (2000a). A USACE archeologist inspected the east and west banks of the GIWW north of the Bayou Sorrel bridge on May 22, 2003. No significant cultural resources were observed in or along the bankline.

A standing structure survey of the area potentially affected by lock replacement plans identified 4 standing structures older than 50 years in age. These structures were evaluated to determine if they meet the criteria for eligibility for the National Register of Historic Places. A report prepared by Goodwin and Associates (2000a) recommended that these structures are not eligible for the National Register of Historic Places. The Louisiana State Historic Preservation Officer agreed with that recommendation.

The Bayou Sorrel lock was studied to determine if it is eligible for the National Register of Historic Places. The lock was opened for navigation in 1951. The lock is a representative of 1950's sector gate lock technology and features an earthen chamber. Although the Bayou Sorrel lock underwent a number of changes over the years, the original design remains intact. Many of the changes include minor alterations or routine maintenance, such as the repair of guide walls from damage by boats and the replacement of steel handrails with aluminum railings. The overall design of the structure is unaltered, except for the addition of one dolphin and guide wall. The replacement of the sector gates and timber guide walls are regarded as routine maintenance. The Bayou Sorrel lock operates as originally designed. Therefore, the lock retains a high degree of integrity from its period of significance. A report prepared by R. Christopher Goodwin (2000b) recommends that Bayou Sorrel lock is eligible for the National Register of Historic Places. The New Orleans District and the State Historic Preservation Officer have agreed with this recommendation.

5.2.20.2. No Action. Without construction of a replacement lock, the Bayou Sorrel lock will continue to be operated and maintained as necessary. Therefore, there would be no adverse impacts to this significant cultural resource or any other significant cultural resources.

5.2.20.3. Plan 1. The only significant cultural resource in the area – the Bayou Sorrel lock, would not be affected by this plan.

5.2.20.4. Plans 2 and 3. This project would have an adverse impact on one historic property eligible for the National Register of Historic Places - the Bayou Sorrel lock. The existing Bayou Sorrel lock would be filled-in after the lock machinery is removed. These changes would destroy the lock's historic integrity. Mitigation for the adverse impact on the historic property would consist of documentation of the Bayou Sorrel lock to the standards of the Historic American Engineering Record (Level 2) following National Park Service guidelines. Documentation of the State Historic Preservation Officer's concurrence with this mitigation plan is included in the Environmental Appendix, Section 9. A Memorandum of Agreement will be developed in consultation with the Louisiana State Historic Preservation Officer for the lock mitigation during post-feasibility level planning for the lock replacement project.

The Louisiana State Historic Preservation Officer has agreed that no impacts to cultural resources would occur from installing the erosion protection and mooring buoys north of the Bayou Sorrel Bridge. Documentation is included in the Environmental Appendix, Section 9.

### **5.3. SECONDARY/CUMULATIVE EFFECTS**

#### **5.3.1. Navigation and Bank Erosion.**

5.3.1.1. Plan 1 and 2 would have no secondary or cumulative effects, since they involve only an upgrading of an existing flood protection system. A new, improved lock at Bayou Sorrel (Plan 3) would improve shipping on the GIWW system since the existing Bayou Sorrel lock is an impediment to the free flow of commerce. To understand how a new lock could affect the system, the different routes in the system must first be understood. The GIWW essentially splits at Morgan City into two channels. One channel leads north and follows along the EABPL, passing through the EABPL at Bayou Sorrel, and continues north, intersecting the Mississippi River at the Port Allen lock near Baton Rouge (the Morgan City to Port Allen Alternate Route). The other channel (the main GIWW Channel) leads east, passing mainly through coastal marshes, and enters the Mississippi River at New Orleans, either through the Harvey lock or Algiers lock.

5.3.1.2. The Atchafalaya River navigation channel also leads north from Morgan City. Vessels may take that channel to the vicinity of Old River and then either continue up the Red River or pass through the Old River lock into the Mississippi River. The channel is not heavily used, mainly because of the dangerous currents in the Atchafalaya River, but also because of difficulties negotiating bridges crossing the waterway. Barge industry personnel have reported that the delay at Bayou Sorrel would have to be 24 hours or more before they would consider using the Atchafalaya River Route. Therefore, the Atchafalaya River is not considered a viable alternative to the Morgan City to Port Allen Alternate Route.

5.3.1.3. The majority of the cargoes passing through the Bayou Sorrel lock are oil and gas products and other chemicals. These products are transported between refineries and destination points located along the Mississippi River and points to the west near Lake Charles, Louisiana and in Texas. During times when delays are long at Bayou Sorrel, some vessel operators take the GIWW between Morgan City and New Orleans, or much less likely, take the Atchafalaya River to the Old River lock. The percentage of vessels that switch routes is not known, but it is considered likely that only a very small percentage of the vessel operators change their routes when delays at Bayou Sorrel are long. This is because it is considerably cheaper for a vessel to wait for a lock to open than for it to be operated at full power pushing barges through a route that takes it far out of its way. However, there are likely points along the Mississippi River between Port Allen and New Orleans where vessels heading for, or originating at these points, must pass through Morgan City. It is those vessels for which the Morgan City to Port Allen Alternate Route would become more attractive if delays at Bayou Sorrel were eliminated, therefore a very small shift in vessels from the main GIWW between Morgan City and New Orleans to the Morgan City to Port Allen Alternate Route may occur. There are numerous locations along the GIWW between Morgan City and New Orleans, especially in Terrebonne Parish, where bank erosion is causing the loss of adjacent marsh. Shifting traffic away from this stretch of the GIWW would be considered an environmental benefit.

5.3.1.4. A new, improved lock at Bayou Sorrel is expected to cause an increase in the number of tows that pass through the Morgan City to Port Allen Alternate Route due to the increased efficiency of the waterway. The estimated volume of traffic, in tons of commodity, that would use the route over time, based on economic analyses, is shown in Table 9. The table shows that after the new Bayou Sorrel lock is operating, significant increases in traffic (compared to no action) do not begin to occur until after the year 2020. In addition, after the year 2020, the Port Allen lock becomes a constraint on the amount of traffic that would move through the system. Since there is no study under way, nor authorization to replace the Port Allen lock, the projections do not exceed the capacity of the existing Port Allen lock.

**TABLE 9  
BAYOU SORREL TRAFFIC ACCOMMODATED BY YEAR  
(1,000 Tons)**

Condition	1992	2000	2010	2020	2030	2040	2060
Without Project	22,554	25,817	29,170	29,287	29,438	29,927	30,649
1,200 x 75 Earthen	22,876	25,817	29,170	34,231	34,382	34,649	35,193
1,200 x 75 Concrete	22,890	26,215	30,662	34,285	34,444	34,690	35,195
1,200 x 110 Earthen	23,005	26,227	30,735	34,336	34,472	34,711	35,196
1,200 x 110 Concrete	23,005	26,227	30,735	34,339	34,475	34,713	35,196

5.3.1.5. Increased vessel traffic on the Morgan City to Port Allen Alternate Route would be expected to exacerbate erosion problems that are occurring along certain reaches of the waterway. Bank erosion is not a problem along the alternate route from Morgan City to the Bayou Sorrel lock. This reach of the waterway is within the Atchafalaya Basin Floodway. Comparison of aerial photos taken in 1978 and 1995 indicates that no discernable erosion has occurred during this time period on that reach of the waterway. This is likely because the sediment load carried by the waterway during high water events is sufficient to replace material lost through erosion.

5.3.1.6. Between Bayou Sorrel and Port Allen there are at least three locations where bank erosion is causing problems. Just north of the Bayou Sorrel bridge, where the waterway begins to turn, landowners have been complaining for years about erosion of their property. Allegedly, prop-wash from pushboats is directed toward the bank in this area as barges are guided through the turn. While this is not a serious environmental problem, residents are losing their property to the waterway. Additional vessel traffic in the waterway would only worsen the problem.

5.3.1.7. Another erosion problem area is located near the community of Indian Village, located about 7 miles north of Bayou Sorrel. Erosion along the waterway has eaten into the Highway

3066 roadway and about a 3-mile stretch of the roadway is now closed. The Louisiana Department of Transportation and Development and the USACE recently cost-shared a project to restore the highway to service. The authority for the USACE to cost share the project is the Continuing Authorities Program, specifically Section 14 of the Flood Control Act of 1946 (PL79-526).

5.3.1.8. The third problem, which is being investigated under Section 14 of the USACE's Continuing Authorities Program, is along the east bank of the GIWW/Lower Grand River, immediately north of the Bayou Sorrel lock. In that location the screen of trees between Highway 75 and the waterway is getting very thin. The concern is that as soon as the tree screen is gone, the integrity of the highway will be compromised. The alleged cause of the loss of trees in this area is the barge tows pushing up against the bank, physically destroying the trees and eroding the bank. This problem would be resolved with construction of a new lock since the northern entrance to the new lock would be north of the problem area. No vessels would tie up at this location since they would not be able to U-turn into the new lock.

5.3.1.9. These three problem areas are the only ones known to be critical, although several residents of the area complained at the public meeting on the draft EIS about erosion in other areas threatening their homes. It should be noted that even these areas are not suffering from the rapid erosion problems occurring in coastal Louisiana where erosion rates along the edges of waterways and lake shorelines of 10 to 20 feet per year are not unusual. Erosion is also likely occurring along other sections of the waterway between Bayou Sorrel and Port Allen, but comparison of aerial photographs from 1978 and 1995 indicates only a slight difference in appearance of the waterway, and only in a few isolated locations. Most of the waterway appears not to have widened during the 17-year period. However, roadways are located so close to the waterway in some locations that only a small amount of erosion could have adverse impacts. The conclusion is that erosion is not a significant problem along the waterway except in isolated locations where residential properties and roadways are being impacted. The increased traffic that would be expected on the waterway with a new lock in place would cause a commensurate increase in the erosion of the channel bank. As stated earlier in the report, it is expected that a new lock would increase vessel traffic between 5 percent, in the first 10 or so years after project construction, up to 15 to 17 percent during the long term.

**5.3.2. Increased Tow Size.** A concern that has been mentioned by the public is that a larger lock would allow larger tows to transit the waterway. Currently, tow dimensions are restricted by the width of the waterway (125 feet), the width of bridge openings, and US Coast Guard restrictions. The US Coast Guard restricts the size of tows to no larger than 1180 feet long by 55 feet wide on the GIWW system in Louisiana for safety reasons, although permits to transport larger tows are given routinely by telephone request. Other factors restricting the length of tows are the length of the lock and, to a lesser degree, the bends in the waterway. Tows that are longer than the lock are divided before entering the lock, brought through the lock in pieces, and reassembled on the other side. The Bayou Sorrel lock is the only lock in the system from Texas to Port Allen that is not 1,200 feet long. The cost of breaking the tow at Bayou Sorrel is not considered to be a significant factor in the overall cost of moving a tow through the system.

Therefore, the conclusion is that companies that would prefer to push 1,200-foot long tows are currently do so, even with the need to break the tows at the Bayou Sorrel lock. The width of tows would also not likely increase with a new lock at Bayou Sorrel because of the width restrictions of the US Coast Guard and the physical limitations of the waterway.

### **5.3.3. Cumulative Environmental Effects.**

5.3.3.1. The USACE involvement in the Atchafalaya Basin goes back officially to the 1920's in response to the Flood Control Act of 1928 (PL70-391), which authorized the MR&T project. That authority provided for construction of flood control measures, including levees and various structures to contain flood flows in the Atchafalaya Basin Floodway.

5.3.3.2. The USACE involvement in the Atchafalaya Basin was augmented by authorizations stemming out of the Atchafalaya Basin Floodway System, Louisiana, report prepared in 1982. The Supplemental Appropriations Act for FY85 (PL99-88) and the Water Resources Development Act of 1986 (PL99-662) added project features in the Atchafalaya Basin Floodway to the MR&T authority. Additional features include public access, environmental protection, developmental control, and recreational development. Some of these features have been implemented and others are currently being planned and implemented.

5.3.3.3. The Atchafalaya Basin encompasses approximately 822,000 acres. In the Lower Atchafalaya Basin (south of US Highway 190) there are 595,000 acres. Of this acreage, 445,000 are privately owned and 150,000 are owned by the state of Louisiana. The Lower Atchafalaya Basin is about 14 miles wide and 65 miles long.

5.3.3.4. The Atchafalaya River Basin has been heavily influenced by humans, but still contains vast areas of productive fish and wildlife habitats, including cypress swamps, bottomland hardwood forests, and various aquatic habitats. The construction of levees to confine the Atchafalaya River has isolated much of that river's original floodplain from the river. River stages are higher now than they once were in the floodway due to the confining of the river by levees, which can adversely affect wildlife populations. The construction of levees has allowed communities such as Bayou Sorrel to develop along the protected side of the Atchafalaya Basin Floodway levees, while other communities like Bayou Chene were abandoned after the levees were built. Levee construction and associated borrow pits for fill material cover thousands of acres of formerly productive fish and wildlife habitats.

5.3.3.5. The Atchafalaya River and its basin have been tamed for human purposes. Floodwaters are constrained within the floodway, preventing permanent habitation by humans. The MR&T project has allowed extensive colonization of the parts of the basin that lie outside of the floodway. Towns and communities, as well as agricultural lands and industries outside of the floodway are protected from river flooding. This protection has come at an expense to fish and wildlife habitats that have developed. Some of the remaining habitats outside of the floodway are suffering from chronic flooding and conversion to open water. Some of this can be attributed to the blocking-off of freshwater and sediment by the floodway levees.

5.3.3.6. The construction of a new, improved lock at Bayou Sorrel would not change the existing pattern of development either within or outside of the floodway. It is a logical step in the continuing efforts to maintain the MR&T project. The proposed action does not significantly change the existing condition, in terms of levee alignment or navigation channel alignment, and thereby does not significantly contribute to the cumulative effects of the MR&T project.