June 2012

INTERIM DRAFT

FEASIBILITY REPORT
AND ENVIRONMENTAL ASSESSMENT

FALSE RIVER AQUATIC ECOSYSTEM RESTORATION
POINTE COUPEE PARISH, LOUISIANA

VOLUME I of III

Prepared for

U.S. Army Corps of Engineers
New Orleans District
New Orleans, Louisiana

Prepared by

Gulf Engineers & Consultants
Environmental Resources
Baton Rouge, Louisiana

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Contract No. W912P8-09-D-0004
Task Order No. 0027
GEC Project No. 0027.3160010.027

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DISCLAIMER

As is customary with all USACE products, this information is considered preliminary as it has not been through the requisite review channels (Agency Technical Review, Alternative Formulation Briefing, Public Review, and Civil Works Review Board) leading to a signed Chief's Report. This Interim Draft has not been reviewed by the non-Federal Sponsors. Additionally, due to budget restraints, items that are outstanding include the Water Quality Certification (WQC), State Historic Preservation Officer (SHPO) coordination, Public Notice, U.S. Fish and Wildlife Service Coordination Act Report (CAR), Legal Review, updated Sponsor's Letter of Intent, updated Fact Sheet, and MCACES.

ORGANIZATION OF REPORT

This Interim Draft**,** *Feasibility Report and Environmental Assessment, False River Aquatic Ecosystem Restoration, Pointe Coupee Parish, Louisiana* contains the following major sections, published in three volumes.

CONTINUING AUTHORITIES PROJECT FACT SHEET

False River Aquatic Ecosystem Restoration Project - New Orleans District - U.S. Army Corps of Engineers

False River Ecosystem Restoration, Pointe Coupee Parish, Louisiana

PROJECT AUTHORITY: The project was authorized by Section 206, Water Resources Development Act of 1996.

PROJECT SPONSORS: The project sponsor is the Pointe Coupee Parish Police Jury and the Louisiana Department of Natural Resources.

PROJECT LOCATION: False River is located 25 miles northwest of Baton Rouge, La. in Pointe Coupee Parish. The town of New Roads, La. is located on the west side of the lake.

PROJECT PURPOSE: This proposed action would enhance and restore the False River ecosystem by enhancing fisheries and wildlife habitat, addressing sedimentation and associated water quality issues in False River.

PROJECT FEATURES: The proposed action includes drainage lateral reconfiguration to reduce erosion and improve quality of runoff entering False River and excavation in False River for aquatic ecosystem restoration.

PROJECT BUDGET/SCHEDULE: The Project Restoration Plan (PRP) was completed in August 2002 and submitted to the Corps' Mississippi Valley Division for approval.

PROJECT COST:	PRP
Estimated Federal Cost	$10,000
Estimated Non-Federal Cost	$0
Total Estimated Cost	$10,000

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This is an Integrated Feasibility Report and Environmental Assessment (FR/EA) for the False River (Lake) Aquatic Ecosystem Restoration. The U.S. Army Corps of Engineers (USACE, Corps), New Orleans District (CEMVN), initiated an aquatic ecosystem restoration project for False River in Pointe Coupee Parish, Louisiana. Pointe Coupee Parish (Parish) and the Louisiana Department of Natural Resources (LDNR) (hereafter referred to as the non-Federal sponsors) have expressed interest in becoming the non-Federal sponsors. This proposed aquatic ecosystem restoration project would restore degraded portions of the Lake ecosystem and restore ecosystem functions. The Parish and LDNR have developed complimentary plans to improve conditions in the Lake and are developing a 15-member council to manage False River and its watershed. This council would be composed of state agencies, a Parish Police Jury (Council) member, Parish Sheriff, Louisiana State Senators and Representatives from the area, and a member for New Roads. This False River Aquatic Ecosystem Restoration Study has been undertaken through the USACE Continuing Authorities Program (CAP). The Feasibility Study is under the authority of Section 206 of the Water Resources Development Act (WRDA) of 1996, P.L. 104-303, as amended.

There are opportunities to restore aquatic habitat functions that have been lost in False River for many aquatic species and to improve water quality. Lost functions could be restored in the shallow Lake flats to improve habitat for fish, invertebrates, reptiles, amphibians, waterfowl, wading birds and other species that use aquatic resources.

The purpose of this proposed project is to restore the ecosystem function of False River by improving water quality and restoring fisheries and wildlife habitat. The quality of the fisheries in the Lake began to decline in the 1980s and has not improved. The main issues facing the False River ecosystem are the loss of native aquatic vegetation, increased turbidity, invasion of exotic vegetation, periods of low dissolved oxygen, and excessive water temperatures. Shallow areas on the ends of the Lake where the bottom is shallow and relatively flat are referred to as the flats. Generally, a loss of fishery habitat for most life stages of desirable fishes has been observed, particularly in the north and south flats. Land use changes within the watershed are believed to have caused some of these aquatic losses. Edge habitat has been lost throughout the Lake due to development.

The USACE completed a Project Restoration Plan (December 13, 2002) identified potential alternatives that would provide ecosystem functions similar to functions that have been lost in the False River watershed. The Project Development Team (PDT) concluded from preliminary investigations that there is an opportunity to develop a cost-effective restoration plan that would be acceptable to the False River community and would be consistent with the ecosystem restoration mission of the USACE.

The study area is the False River watershed, encompassing approximately 56 square miles. False River is an approximately 3,212-acre, depending upon pool stage, oxbow lake formed from an abandoned meander loop of the Mississippi River in southeastern Louisiana. The Lake was formed around 1722 when a meander loop was naturally cut off from the main channel of the Mississippi River. The USACE constructed mainline levees by the 1930s, completely separating the Lake from the river.

Eight management measures were developed and evaluated to develop restoration alternatives. These measures included: (1) Reduce Non-Point Source Pollution with Best Management Practices, (2) Stabilize Channels, (3) Dredge Accumulated Sediments with Upland Disposal, (4) Dredge Accumulated Sediments with Island/Edge Creation, (5) Dredge Accumulated Sediment with Deepwater Disposal, (6) Dredge Accumulated Sediment with Confined Lake Disposal, (7) Water Level Management, and (8) Vegetation Planting.

The management measures were evaluated for effectiveness in providing benefits under the project objectives and planning constraints. Three management measures were retained for further study:

Management Measures		Screening Result
M1	Manage Non-Point Source Pollution	Eliminated because it would not improve areas with poor substrate and would not reduce excessive temperatures, may be difficult to implement under the USACE process with such widespread landowner involvement and is proposed by LDNR/LDWF
M2	Stabilize Erosive Channels	Eliminated because it would not improve areas with poor substrate and would not reduce excessive temperatures and is proposed by LDNR/LDWF
M3	**Dredge Flats with Upland Disposal**	**Retained for further study**
M4	**Dredge Flats with Island/Edge Material Disposal**	**Retained for further study**
M5	Dredge Flats with Material Disposal within Deeper Portions of the Lake	Eliminated due to difficulty in determining whether this disposal method would create any long-term adverse impacts
M6	Dredge Flats with Confined Lake Disposal	Eliminated due to costly confined disposal costs
M7	Lake Water Level Management	Eliminated due to cost of geotechnical investigation and proposed by LDNR/LDWF
M8	**Vegetative Plantings**	**Retained for further study**

Seven alternatives were developed from the three measures retained for further study. The alternatives were developed considering all possible combinations of the two disposal plans (upland and island/edge creation) and two flats (north and south).

These alternatives were evaluated for cost, environmental benefits, and cost-effectiveness. Habitat Suitability Indices (HSI) for largemouth bass, bluegill, and great egret were used to evaluate the Lake portions of the alternatives. Wetland Value Assessment (WVA) was used to evaluate the island/edge creation. The outputs are expressed in Average Annual Habitat Units (AAHUs). The annualized costs and benefits were evaluated for cost-effectiveness with the IWR Planning Suite. The results of the analysis were:

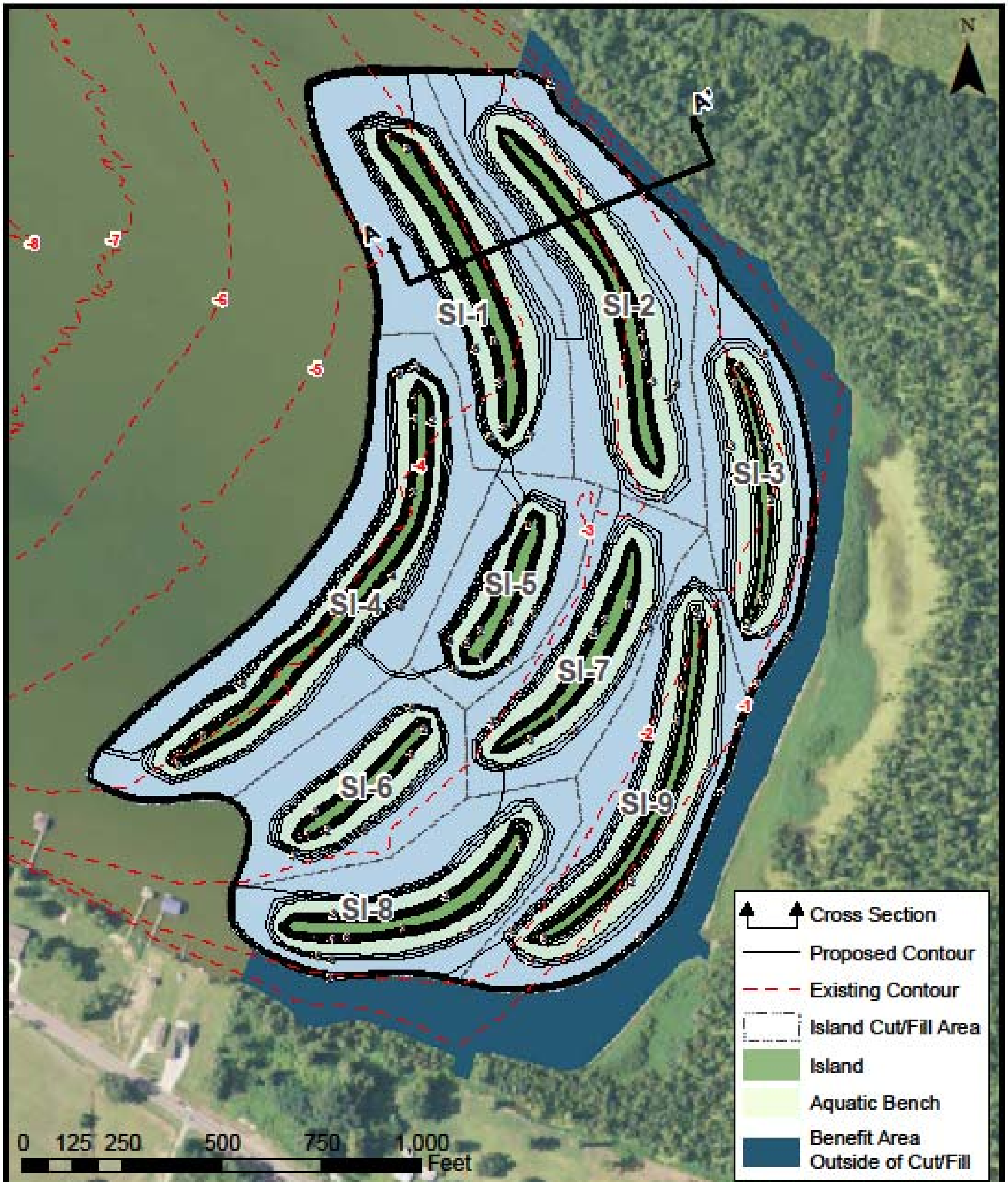
	Alternative	Annualized Cost	Output (AAHUs)	Cost-effective
1	No-Action Plan	$ 0	0.0	Best Buy
2	Dredge North Flats with Island/Edge Disposal and Plantings	180,920	43.9	Yes
3	Dredge South Flats with Island/Edge Disposal and Plantings	256,608	106.2	Best Buy
4	Dredge North and South Flats with Island/Edge Disposal and Plantings	388,770	150.0	Best Buy
5	Dredge North Flats with Upland Disposal	280,915	26.6	No
6	Dredge South Flats with Upland Disposal	449,901	64.2	No
7	Dredge North and South Flats with Upland Disposal	570,300	90.7	No

The AAHUs for the alternatives ranged from 0.0 for the No-Action Alternative to 150.0 for Alternative 4, the dredge north and south flats with island/edge disposal and plantings). Upland disposal alternatives were not cost-effective. The No-Action and Island/Edge Disposal alternatives were cost-effective; with the No-Action, south flats, and the combined flats (north and south) alternatives were determined to be Best Buys.

Alternative 4 would be the National Ecosystem Restoration (NER) Plan, which provides the greatest output per cost. The long-term effects of No-Action would be the continued degraded aquatic habitat in the north and south flats. The quality of Lake habitat would continue to be poor, with excessive temperatures, periods of high turbidity, and low dissolved oxygen. These areas would not provide quality habitat for fish and wildlife.

Alternative 4 was selected as the Tentatively Selected Plan (TSP) and the non-Federal sponsors have indicated interest in supporting this plan. The TSP is estimated to cost approximately $7,841,711 (in 2010 dollars) with an annualized cost of $388,770 (50 -ear evaluation).

The TSP would dredge approximately 353,000 cy of lake sediment to create an 85-acre island/edge ecosystem complex. Twelve islands (9 acres) would be constructed to create 19,400 linear feet (lf) (5,470 lf - north, 13,940 lf - south) of quality riparian edge habitat, and improve approximately 5,300 lf (1,100 lf - north, 4,200 lf - south) of existing riparian edge habitat. Native vegetation would be planted on the islands and in the edge habitat. The TSP would provide ideal habitat for all forms of fish and wildlife including largemouth bass, redear sunfish, bluegill, Neotropical migrants, migratory waterfowl, amphibians, and reptiles. There would be a net gain of approximately 150 AAHUs. The Lake islands would create ideal feeding and nesting habitat for the great egret. The shallow and vegetated areas would provide feeding habitat for the egret, other wading birds, and Neotropical migrants. Most benefits for the two fish species involved the reduction in excessive temperatures, improved cover and structure, reduction in turbidity, and improved dissolved oxygen levels. Water quality would be improved by reducing excessive temperatures/ turbidity, and increasing dissolved oxygen levels. The TSP would create recreational opportunities and improve aesthetics. These beneficial effects would be long term; there would be no significant adverse or cumulative effects. There would be minor, short-term adverse effects. Depictions of the TSP are as follows:

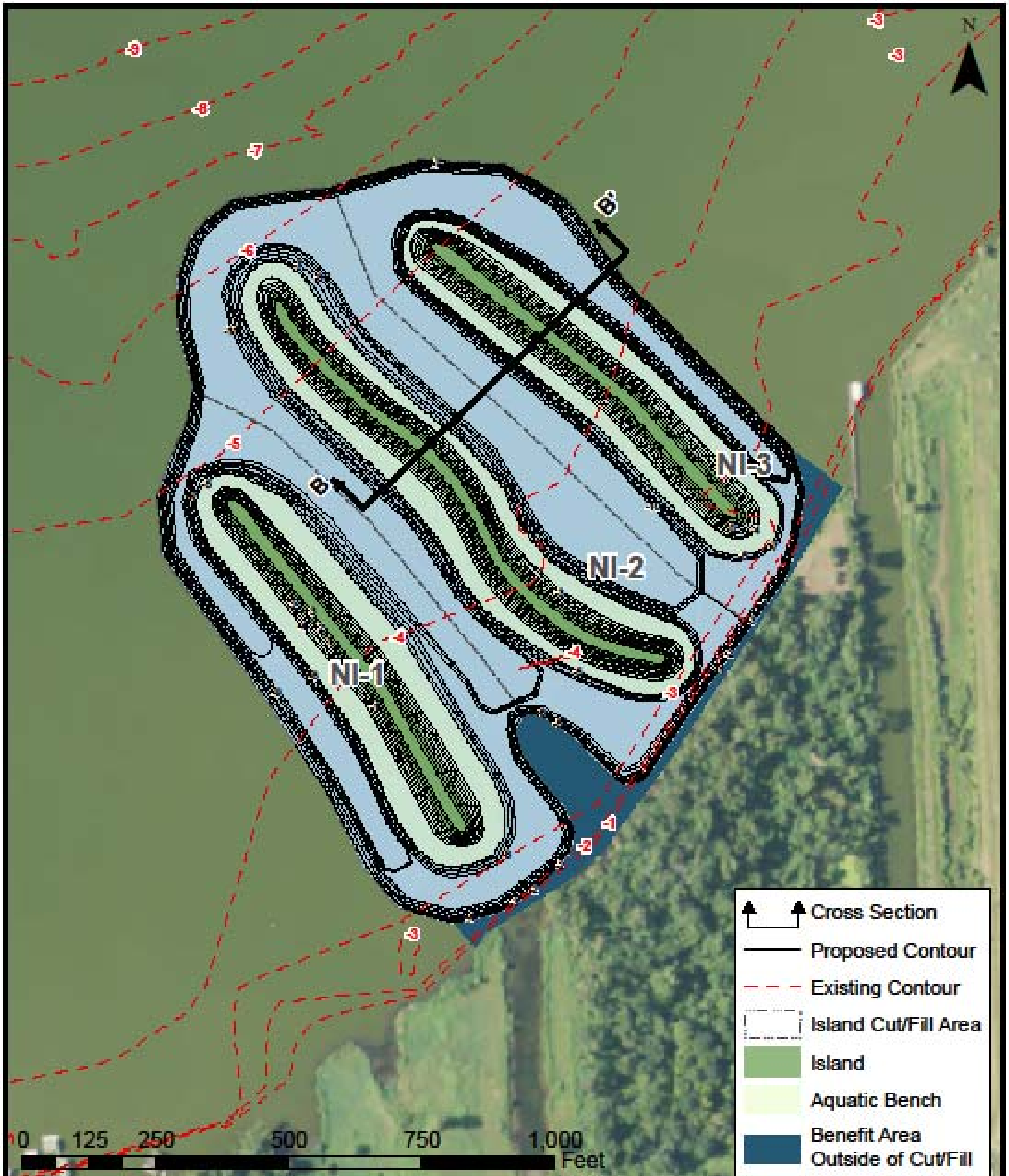


PROPOSED SOUTH END

False River Ecosystem Restoration

Data Source: NAIP 2010

GEC
Figure: 1
Date: December 2011
Scale: 1:4,000
Source: GEC/NAIP
Map ID: 273160010-2868

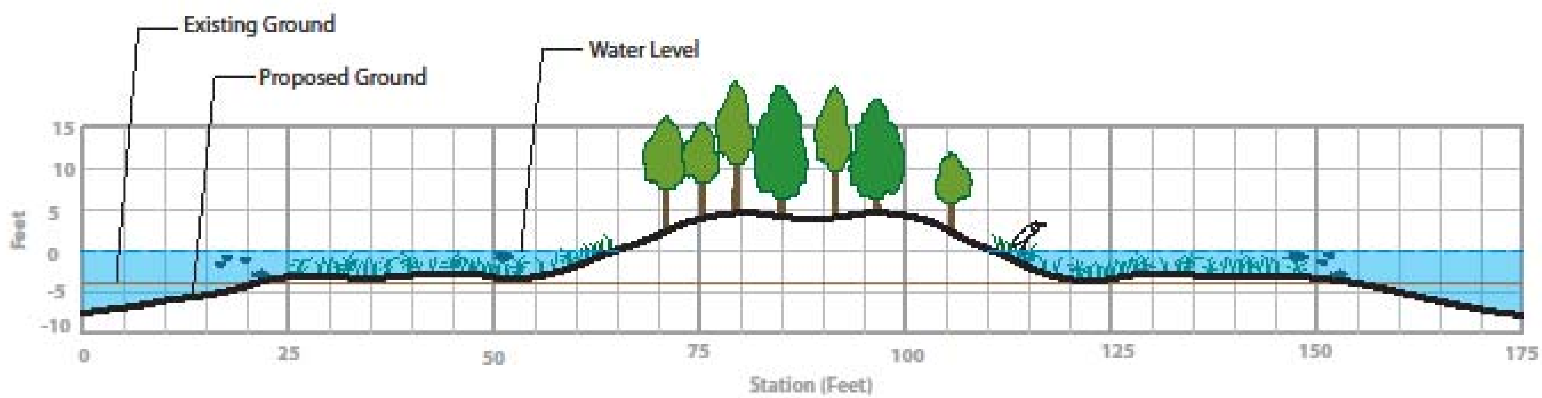


PROPOSED NORTH END

False River Ecosystem Restoration

Data Source: NAIP 2010

Figure: 2
Date: December 2011
Scale: 1:3,000
Source: GEC/NAIP
Map ID: 273160010-2871



TYPICAL CROSS SECTION

False River Ecosystem Restoration
Pointe Coupee Parish, Louisiana

GEC
Figure:
Date: December 2011
Scale: See Drawing
Source: GEC
Map ID: 273160010-2885

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FEASIBILITY REPORT
AND ENVIRONMENTAL ASSESSMENT
FALSE RIVER AQUATIC ECOSYSTEM RESTORATION
POINTE COUPEE PARISH, LOUISIANA

1.0 STUDY INFORMATION

This is an Integrated Feasibility Report and Environmental Assessment (FR/EA) for the False River (Lake) Aquatic Ecosystem Restoration (Figure 1-1). The U.S. Army Corps of Engineers (USACE, Corps), New Orleans District (CEMVN), initiated an aquatic ecosystem restoration project for False River, a lake in Pointe Coupee Parish, Louisiana. Pointe Coupee Parish (Parish) and the Louisiana Department of Natural Resources (LDNR) (hereafter referred to as the non-Federal sponsors) have expressed interest in becoming the non-Federal sponsors (Appendix B). This proposed aquatic ecosystem restoration project would restore degraded portions of the Lake ecosystem and restore lost ecosystem functions. The Parish and LDNR have developed complimentary plans to improve conditions in the Lake.

The design and planning process (ER 1105-2-100 Planning Guidance) of this project, the USACE has conducted this Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) to identify and analyze the effects of alternatives that meet the purpose and need of the ecosystem restoration project (ER 200-2-2, NEPA Guidance). This document presents information regarding environmental conditions in the project area, evaluates impacts to environmental resources by alternative plans, and recommends a plan. Sections within this document required for NEPA compliance are denoted by a "*".

1.1 STUDY AUTHORITY

The False River Aquatic Ecosystem Restoration Study has been undertaken through the USACE Continuing Authorities Program (CAP). The Feasibility Study is under the authority of Section 206 of the Water Resources Development Act (WRDA) of 1996, P.L. 104-303, as amended. Total construction costs for projects developed under this authority are to be cost-shared with the project sponsor (65 percent Federal and 35 percent non-Federal). Upon signing the Project Participation Agreement (PPA), the non-Federal sponsor assumes responsibility for their share of the project costs. All lands, easements, rights of ways, relocations, and disposal areas (LERRDs) required to support the project, for construction and operation and maintenance (O&M), must be provided by the non-Federal sponsor. Upon completion of project construction, O&M operations are the sole responsibility (100 percent) of the non-Federal sponsor.

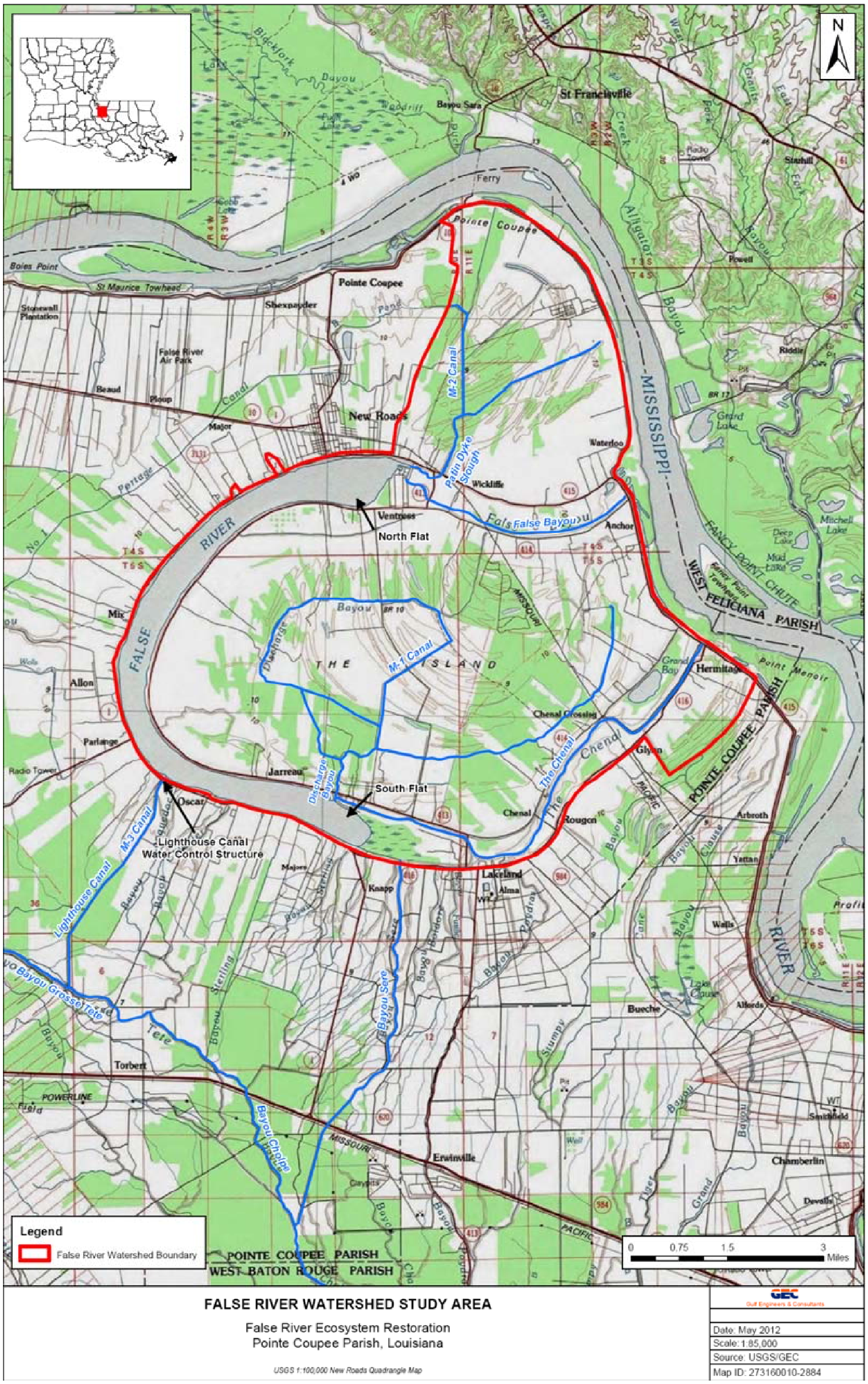

Figure 1-1. False River Watershed Study Area

1.2 STUDY PURPOSE AND SCOPE *

The purpose of this proposed project is to restore the ecosystem function of False River by improving water quality and restoring fisheries and wildlife habitat (Figure 1-1). The quality of the fisheries of the Lake began to decline in the 1980s and has not improved. The main issues facing the False River ecosystem are the loss of native aquatic vegetation, increased turbidity, invasion of exotic vegetation, periods of low dissolved oxygen, and excessive water temperatures. Shallow areas on the ends of the Lake where the bottom is shallow and relatively flat are referred to as the flats. Generally, a loss of fishery habitat for most life stages of desirable fishes has been observed, particularly in the north and south flats. Land use changes within the watershed are believed to have caused some of these aquatic losses. Edge habitat has been lost throughout the Lake due to development.

This FR/EA determines the existing and future without-project conditions, develops management measures, formulates a range of alternatives from these measures, assesses the effects of the alternatives, presents a rationale for the selection of the recommended plan, and develops cost estimates and environmental documentation required for the implementation of this plan as a Federal project. The alternative plans developed for this project must meet planning, economic, and environmental criteria. The alternative plans were evaluated using the Institute of Water Resources (IWR) Planning Suite software, which evaluates the ecosystem benefit for cost-effectiveness and incremental cost analysis. The FR portion provides planning, engineering, and construction details of the recommended plan to allow engineering design and construction to proceed subsequent to the approval of this document.

1.3 STUDY AREA*

The study area is the False River watershed, encompassing approximately 56 square miles in southeastern Louisiana (Figure 1-1). False River is an approximately 3,212-acre, depending upon pool stage, oxbow lake formed from an abandoned meander loop of the Mississippi River. The Lake was formed around 1722 when a meander loop was naturally cut off from the main channel of the Mississippi River (USACE 2001). The USACE constructed mainline Mississippi River levees by the 1930s, completely separating the Lake from the river. The area between the Lake and the existing Mississippi River is referred to as the *Island*. Bayou Sere and the Lighthouse Canal are the only drains for False River (Figure 1-1). The main tributaries include Patin Dyke Slough, False Bayou, Discharge Bayou/M-1 Canal, and the Chenal.

The project area is bounded on the north and east by the Mississippi River levees and the south and west by the western bank of False River. False River is located approximately 23 miles from Baton Rouge, 96 miles from New Orleans, and 44 miles from Lafayette, Louisiana. Land use in the drainage area is primarily rural, with forests, cattle pasture, and minor areas of residential buildings, particularly along the shoreline. Historically, False River has been heavily used for water-related recreational activities, including enjoyment of the lake aesthetics, boating, sailing, fishing, and water skiing. False River also provides storage for storm water and reduces flood damages.

1.4 HISTORY OF INVESTIGATION

This investigation was initiated by a letter from the Parish, dated June 26, 2001, requesting assistance from the CEMVN in resolving the problems in False River (Appendix B). The CEMVN responded by conducting a Preliminary Restoration Plan (PRP). The PRP is a limited reconnaissance study for Section 206 studies to determine if there is a Federal interest to continue the investigation into the feasibility phase. The PRP (Appendix C) was completed in December 2002 and recommended further study.

This feasibility phase was initiated by the CEMVN in 2002. Field investigations and data gathering were initiated. However, Section 206 funds were not available and the work essentially ceased around 2003. In September 2009, limited funds were available for data collection only. Data collection was completed in August 2011 (Appendix A).

Funds to complete the majority of the remaining planning portion of the feasibility study became available in October 2011 and this FR/EA was completed in May 2012. This report was considered interim because several items remained to be completed. These items include: Coordination Act Report (CAR), Agency Technical Review (ATR), public review, Water Quality Certification (WQC), real estate plan, and State Historic Preservation Office (SHPO) coordination, legal review, sponsor's letter-of-intent, Micro Computer-Aided Cost Estimating System II (MCACES II or MII), and updated Fact Sheet.

1.5 PRIOR AND EXISTING PROJECTS

Bayou Grosse Tete Watershed, Pointe Coupee Parish, Louisiana, Watershed Plan and Environmental Impact Statement for Watershed Protection, Flood Prevention, and Drainage, 1976, Upper Delta Soil and Water Conservation District (Louisiana), U.S. Department of Agriculture Soil Conservation Service, Alexandria, Louisiana

This project addressed floodwater damage and inadequate drainage in the Bayou Grosse Tete Watershed. The project provided watershed protection, flood prevention, and drainage with approximately 115 miles of channel work (102 miles of enlargement by excavation, 1 mile of clearing and shaping, 9 miles of clearing only, and 3 miles of new channel excavation) with appurtenant structures (pipe drops) and one grade stabilization structure.

Choctaw Bayou Watershed, West Baton Rouge, Pointe Coupee, and Iberville Parishes, Louisiana, Watershed Plan and Environmental Impact Statement for Watershed Protection, Flood Prevention, and Drainage, 1976, Upper Delta Soil and Water Conservation District (Louisiana), U.S. Department of Agriculture, U.S. Soil Conservation Service, Alexandria, Louisiana

This project addressed floodwater damage and inadequate drainage in the Choctaw Bayou Watershed. The project provided watershed protection, flood prevention, and drainage with 92 miles of channel work (including clearing on 22 miles and excavation on 70 miles) with appurtenant structures and two stop-log weirs.

Upper Pointe Coupee Loop Area and Public Law 566, Johnson Bayou Watershed Project, Pointe Coupee Parish, Louisiana, Final Joint Environmental Impact Statement for Watershed Protection, Flood Prevention, and Drainage, 1976, Upper Delta Soil and Water Conservation District (Louisiana), U.S. Army Engineer District, New Orleans, Louisiana, U.S. Department of Agriculture, U.S. Soil Conservation Service, Alexandria, Louisiana

Johnson Bayou Watershed Project, Pointe Coupee Parish, Louisiana, Final Watershed Plan for Watershed Protection, Flood Prevention, and Drainage, 1976, Upper Delta Soil and Water Conservation District (Louisiana), U.S. Department of Agriculture, U.S. Soil Conservation Service, Alexandria, Louisiana

This project addressed floodwater damage and inadequate drainage in the Johnson Bayou Watershed. The project provided watershed protection, flood prevention, and drainage with 89 miles of channel work (including 8 miles of channel clearing, 81 miles of channel excavation, and 5 miles of new channel construction) with appurtenant structures and ten weirs. The USACE portion of the project involved the construction of a 1,500 cfs pumping station on a levee setback, 1,600 feet of inlet channel, 1,600 feet of discharge channel, and degrading of a portion of the existing east Atchafalaya River levee.

Wetland Reserve Program

The Wetlands Reserve Program (WRP) offers landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA Natural Resources Conservation Service (NRCS) provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on each acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection (USDA-NRCS 2012). A new 141-acre WRP permanent easement has been established on the Island. This is the only WRP within the False River Watershed (Darren Boudreaux, USDA/NRCS, pers. comm. 5/22/2012).

Mitigation Banks

Mitigation plans have been established to reforest existing pasturelands and restore surface hydrologic conditions to promote a self-sustaining forested wetland community comprised of bottomland hardwood and swamp species. A 248.5-acre Permittee Responsible Mitigation Area was established on the Island in 2011 (Delta Land Services, LLC 2011). An additional 323.8-acre Forested Wetland Mitigation Bank that would be located north of the Permittee Responsible Mitigation Area (MVN 2011-03213 MB) is currently under review (USACE 2012).

Lakes District 1977-1983 Restoration Efforts

In 1977, a restoration effort was initiated by the USEPA, the State of Louisiana, and the City/Parish to dredge the University lakes in Baton Rouge, Louisiana to remove phosphorus-laden sediments, increase retention times in the lakes, and increase water depths in an effort to improve oxygen levels. The poor oxygen conditions were due to the decomposition of organics in the sediments. In an effort to reduce fecal coliform levels in the lakes, damaged and broken septic lines in the Lakes District were repaired. Four of the six lakes (University, City Park, Campus, and College lakes) had limited dredging, and the remaining restoration efforts were completed by 1983. Dredging was hindered by numerous cypress stumps and trees in the lakes. Although the restoration was considered successful, post-restoration water quality data indicated that it would be necessary to expand or re-evaluate efforts to improve water quality. Despite these local efforts, the lakes are currently in poor condition and require further action to maximize environmental outputs.

Lakes District 2009 Aquatic Ecosystem Restoration Report

The CEMVN completed a restoration report (USACE 2009) for the University Lakes District, as a follow up evaluation of the 1977-1983 effort described above. After the 1983 restoration effort, the lakes continued to become more eutrophic due to the nutrient loading and shallowness of the lake system. The previous effort was hampered by an abundance of cypress stumps and trees. This restoration study recommended the draining four of the lakes and re-contouring the lake bottoms with earth-based equipment. The draining would allow for the consolidation and oxidation of the accumulated nutrient load. The average depths of the lake would be at least five feet and the bottom material would be placed along the banks to create ideal fisheries habitat, including aquatic benches and sloped edge habitat. Siphon-drain trickle tubes would be installed to reduce the nutrient loading in the lakes and native vegetation would be planted. The water level management plan recommended a minor drawdown of six inches ever year and a larger drawdown of two feet every three to five years. This project was expected to create approximately 122 average annual habitat units at a cost of about $21.1 million.

Blackwater Conservation Area
The Blackwater Conservation Area (known during the USACE feasibility study as Comite River at Hooper Road) was a Section 206 CAP project completed in 2001 by the CEMVN, City of Baton Rouge/East Baton Rouge Parish, and the Parks and Recreation Commission for East Baton Rouge Parish (BREC) (USACE 2000). This project restored an abandoned dirt pit into a wilderness park with 8.5 acres of lakes. This project created 35.4 average annual habitat units at a total project cost of $1 million. http://www.mvn.usace.army.mil/prj/cap/blackwater/

Upper Terrebonne Basin (UTB) Water Quality Improvement Project
A non-point source reduction project has been initiated by a partnership between the USEPA and LDEQ, Iberville, Pointe Coupee, and West Baton Rouge Parishes (LDNR 2007, Tri-Parish Partnership 2009, www.utbwatershed.com). This project's goals are to reduce non-point source pollution and improve water quality for the portions of Pointe Coupee, Iberville, and West Baton Rouge Parishes between the Mississippi and Atchafalaya River levees. The False River watershed is included in the UTB.

1.6 PLANNING PROCESS

1.6.1 Planning Process

Plan formulation was conducted in accordance with ER 1105-2-100 of the USACE IWR Report 96-R-21, November 1996. The USACE Six Step Planning Process was followed for the development and analysis of all possible solutions. This process includes:

- Identification of Problems and Opportunities
- Inventory, Forecast, and Analysis of Conditions
- Formulation of Alternative Plans
- Evaluation of the Effects of the Alternative Plans
- Comparison of Alternative Plans
- Selection of a Recommended Plan

The formulation, evaluation, and comparison process have undergone many iterative cycles as new data and stakeholder input were received.

1.6.1.1 Identification of Problems and Opportunities

This step of the planning process involves the identification of all existing problems within the project area which in turn generates the need for solutions. It also allows for the detailed listing of all existing needs and helps frame the project scope. The identification of opportunities sets the stage for any potential improvements that could be implemented.

1.6.1.2 Inventory, Forecast, and Analysis of Conditions

This part of the planning process helps specify a detailed description of existing conditions within the project area, along with predictions of how the area will change over time without any implementations. This forecast is the expected outcome of the No-Action plan or the future without project (FWOP). This helps to quantify the need for action and specifies any future problems that may develop.

1.6.1.3 Formulation of Alternative Plans

In this step, all practicable management measures are developed and evaluated. Management measures that are carried forth are then used to develop an array of alternatives with the goal of solving any existing and future problems that were previously specified. Each alternative is determined on the basis of the potential benefits it could produce within the project area.

1.6.1.4 Evaluation of the Effects of the Alternative Plans

For the next step in the planning process, the results of all proposed alternatives are evaluated based on predetermined criteria. This helps qualify and quantify the effectiveness of each alternative and sets up the means of comparison to be utilized in the next step. The initial evaluation can lead to the screening out and modification of some alternatives, and the creation of new solutions. This can be an iterative process that cycles back to the plan formulation process.

1.6.1.5 Comparison of Alternative Plans

For ecosystem restoration, Cost-effectiveness/Incremental Cost Analysis (CE/ICA, IWR-Plan) is used to compare alternatives. The average annual benefits and costs are inputs to this analysis and the alternatives are incrementally evaluated. The results for each alternative are whether or not it is cost-effective. Some cost-effective alternatives may be determined to be a Best Buy, offering more benefits per cost.

1.6.1.6 Selection of a Recommended Plan (Tentatively Selected Plan)

The USACE can support the National Ecosystem Restoration (NER) Plan; this is the plan that reasonably maximizes ecosystem restoration benefits compared to cost, consistent with the Federal objective. The non-Federal sponsor can select any cost-effective plan, not necessarily a Best Buy plan; this would be the Locally Preferred Plan (LPP). The USACE could consider the LPP as the TSP as long as it is cost-effective and permits the USACE to accomplish its mission.

2.0 PROBLEM, NEEDS, AND OPPORTUNITIES*

2.1 National Objectives

The national or Federal objective is to contribute to the nation's ecosystems through ecosystem restoration, with contributions measured by changes in the amounts and values of habitat. Ecosystem restoration is one of the primary missions of the USACE and the objective in ecosystem restoration planning is to contribute to national ecosystem restoration (NER). Contributions to national ecosystem restoration (NER outputs) are increases in the net quantity and/or quality of desired ecosystem resources. Measurement of NER is based on changes in ecological resource quality as a function of improvement in habitat quality and/or quantity and expressed quantitatively in physical units or indexes, but not in monetary units.

2.2 Public Concerns

Public support exists from many factions around False River, in the Parish, within the region and nationally. Residents around False River are concerned about the health of the Lake and its fisheries. Regional interests include people who have, and would, use False River for recreation. False River is the focus and a main economic driver for the economy of the Parish. State and Federal agencies interested in the False River watershed include: Atchafalaya Basin Program (ABP) of the Louisiana Department of Natural Resources (LDNR), U.S. Geological Survey (USGS), U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), Louisiana Department of Wildlife and Fisheries (LDWF), and the Louisiana Department of Environmental Quality (LDEQ). The False River Civic Association (FRCA) has expressed great interest in the health and well-being of False River. The Upper Terrebonne Basin Water Quality Improvement Project (www.utbwatershed.com) has been initiated by the LDEQ, USEPA, Iberville, Pointe Coupee, and West Baton Rouge Parishes. LDNR and LDWF have initiated a multi-faceted project to provide watershed-wide restoration to the False River System (LNDR/LDWF 2012 a, b, http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=924).

A number of public concerns were identified during the course of the study. Initial concerns were expressed in the study authorization. Additional input was received through coordination with the sponsors and coordination with other agencies. A discussion of public involvement is included in Section 7 (Public Involvement, Review, and Consultation) of this report. Public concerns related to the establishment of planning objectives and planning constraints in include:

- Poor water quality and noticeable siltation.
- Declining water quality has resulted in negative impacts to fish, wildlife, and aquatic vegetation.
- Adverse impact on the fish population has resulted in a marked decline in species richness and diversity.

2.3 Problems

Historically, the False River Project area was part of the Mississippi River. Over time, shifts in the river caused a section of the river channel to be abandoned, resulting in the formation of False River, an oxbow lake. The locals call the land east of the Lake the Island. Historically, the

Island was characterized as bottomland hardwood and swamp habitat. Prior to 1966, a canal (M-1) was dug to drain the ridge and swale areas of the *Island* (Figure 2-1). By the mid 1970s, several thousand acres of the forested land on the Island were cleared for agriculture. These land use changes have resulted in the loss of habitat for all forms of wildlife. Land clearing and drainage projects resulted in lost habitat for wading birds, waterfowl, invertebrates, and Neotropical migratory birds.

By the 1980s, 50 miles of drainage canals were dug or improved on the Island to provide better drainage for the agricultural lands. These canals drain to False River through two canals, the M-2 on the north end and the M-1 in the south end. In the mid 1980s, the area was converted into row crops and shortly thereafter into pasture. It is believed that sediments from these canals have entered the Lake, causing a decrease in Lake depths and bottom consistency.

The Lake is highly valued for the fish and wildlife habitat it provides. In the early 1990s, False River was considered the most productive trophy bass Lake in the state of Louisiana, and many bass tournaments were held in the Lake. In 1991, it was designated as one of the state's original trophy largemouth bass lakes; the Lake's largemouth bass management plan included a slot limit and banned the use of gill nets, trammel nets, and seines. The trophy status was rescinded in March 1998 and largemouth bass regulations were altered to manage for a lake of special concern. Efforts to remove the net ban are currently underway (LDWF press release Feb. 2, 2012).

Water quality and fish and wildlife habitat has been declining in the Lake for a number of years. It is believed that the decline in water quality can be directly attributed to an increase in sedimentation, deposition of organic matter and nutrient loading in the Lake. In the last USEPA-approved Integrated Report of Water Quality in Louisiana (2010), False River was listed as impaired for Fish and Wildlife Propagation. Suspected causes include introduction of non-native aquatic plants and high pH, with unknown sources.

Physical changes in the Lake, primarily increased turbidity and silt deposition, water fluctuations during the spawning season, the disappearance of almost all submerged aquatic plants, and at least one outbreak of largemouth bass virus, have severely reduced recruitment of largemouth bass. In addition, the population of undesirable fish species has increased.

The loss of aquatic vegetation was believed to be related to changes in land use. Many residents reported increased turbidity in the inflow channels. This land use change may have increased the turbidity and dropped sediment into the flats that subsequently degraded fisheries habitat. Additionally, since the flats have additional sediment and lack of aquatic plant, the turbidity could be increased by the wind, as well as during additional rainfall.

2.4 Need

It is necessary to restore the lost ecosystem function to provide habitat for fish, invertebrates, and other wildlife, including wading birds, waterfowl, and Neotropical migratory birds. Additionally, the public would benefit from a restored ecosystem by increased recreational and economic opportunities. A restored ecosystem would attract tourists from the region and provide economic input into an economically depressed parish.

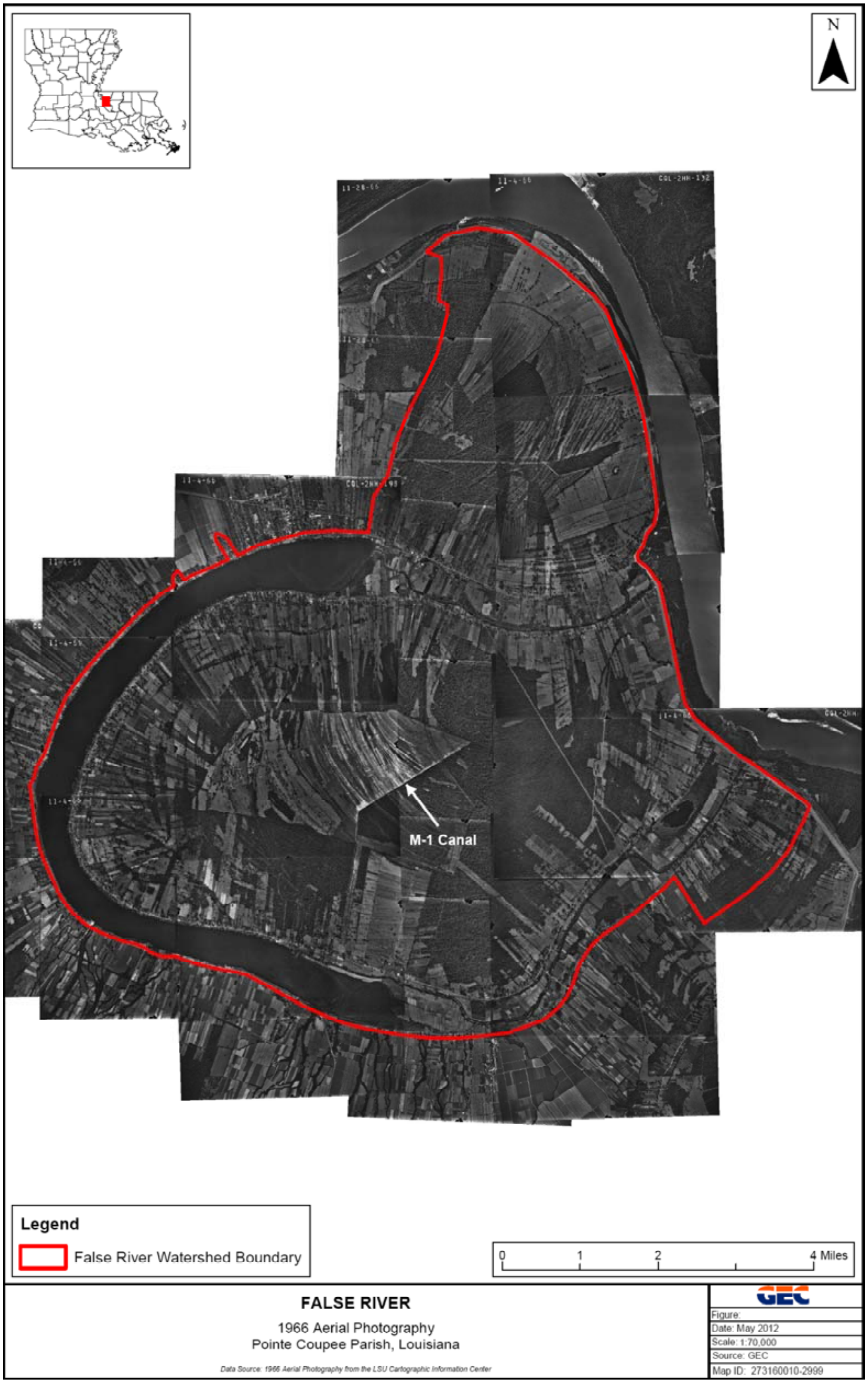

Figure 2-1. 1966 Aerial Photograph of False River Watershed

2.5 Opportunity

There are opportunities to improve water quality and restore aquatic habitat functions that have been lost in False River for many aquatic species. Lost functions could be restored in the shallow flats to create improved habitat for fish, invertebrates, reptiles, amphibians, waterfowl, wading birds and other species that use aquatic resources.

The PRP (Dec. 13, 2002, Appendix C) identified potential alternatives that would provide ecosystem functions similar to functions that have been lost in the False River watershed. The Project Development Team (PDT) concluded from preliminary investigations that there is an opportunity to develop a cost-effective restoration plan that would be acceptable to the False River community and would be consistent with the ecosystem restoration mission of the USACE.

2.6 Planning Objectives

The planning objectives were developed in accordance with ER 1105-2-100 of the USACE IWR Report 96-R-21, November 1996. The main purpose of this project would be to restore some of the aquatic ecosystem function of False River. The recommended plan will be evaluated for completeness, effectiveness, efficiency, and acceptability.

Significance of resources and effects will be derived from institutional, public or technical recognition. Institutional recognition of a resource or effect means its importance is recognized and acknowledged in the laws, plans, and policies of government and private groups. Technical recognition of a resource or an effect is based upon scientific or other a technical criterion that establishes its significance. Public recognition means some segment of the general public considers the resource or effect to be important. Public recognition may be manifested in controversy, support, or opposition expressed in any number of formal or informal ways. Another scenario considered besides the NER and Environmental Quality (EC) would include Other Social Effects (OSE). Ancillary National Economic Development (NED) or Regional Economic Development (RED) benefits could be provided by the recommended plan, but the recommended plan would be justified only on NER benefits.

Specifically, the detailed objectives include:

- **Habitat Improvement:** This involves the improvement of existing aquatic habitat within False River in a cost-effective manner. The shallow ends of the lake provide areas where lost aquatic function could be restored.

- **Water Quality Improvement:** This objective refers to the improvement of the water quality within the study area, particularly including high water column temperatures and periods of high turbidity.
- **Public Acceptability:** To appropriately satisfy the project objectives, public concerns must be met. The public is composed of the local sponsors and residents, as well as local groups that use False River on a regular basis.

- **Sustainability:** Sustainability is a critical component of the planning objectives. The restoration plan should provide for long-term ecosystem benefits.

- **Cost-Effectiveness:** To ensure that all proposed alternatives provide the most benefits for minimal cost to the Federal government and the local sponsors, they are evaluated for cost-effectiveness and incremental cost analysis (IWR-Plan). The objective is to develop an ecosystem measuring tool that will be input into the IWR plan, along with annual costs. This will allow for the selection of a cost-effective plan. Additionally, the restoration plan would be developed to minimize the O&M costs.

- **Watershed-Wide Evaluation:** A watershed-wide evaluation is used to ensure that all potential alternatives are considered that could produce environmental outputs and to fully determine the likelihood of success of the recommended plan.

- **Environmental Operating Principles (EOP):**

    - Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.

    - Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.

    - Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

    - Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.

    - Seeks ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.

    - Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.

    - Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment.

2.7 Planning Constraints

This study was conducted within the constraints of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*, published in March 1983 by the U.S. Water Resources Council, and by applicable Department of the Army regulations and other documents, which provide guidance pertaining to the implementation of these principles and guidelines. All phases of the study adhered to local and Federal laws and regulations as well. Plans will be developed on the basis of benefits and costs, both tangible and intangible, as well as associated effects on the ecological, social and economic well-being of the region. The planning constraints also include the Section 206 project limit of $5,000,000 Federal participation and to develop cost-effective alternatives to maximize the restoration of these lost ecosystem functions.

3.0 ALTERNATIVES*

3.1 Plan Formulation Rationale

The guidance for conducting civil works planning studies (ER 1105-2-100) requires the systematic development of alternative plans that contribute to the National Ecosystem Restoration Plan (NER) objective. Alternatives should be formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability.

- **Completeness:** A plan must provide, and account for, all necessary investments or other actions needed to ensure the realization of the planned restoration outputs. This may require relating the plan to other types of public or private plans if these plans are crucial to the outcome of the restoration objective. Real estate, operation and maintenance, monitoring, and sponsorship factors must be considered. Where there is uncertainty concerning the functioning of certain restoration features and an adaptive management plan has been proposed it must be accounted for in the plan.

- **Effectiveness:** An ecosystem restoration plan must make a significant contribution to address the specified restoration problems or opportunities (i.e., restore important ecosystem structure or function to some meaningful degree).

- **Efficiency:** An ecosystem restoration plan must represent a cost-effective means of addressing the restoration problem or opportunity. It must be determined that the plan's restoration outputs cannot be produced more cost-effectively by another agency or institution.

- **Acceptability:** An ecosystem restoration plan should be acceptable to state and Federal resource agencies, and local government. There should be evidence of broad-based public consensus and support for the plan. A recommended plan must be acceptable to the non-Federal cost-sharing partner. However, this does not mean that the recommended plan must be the Locally Preferred Plan (LPP).

Significance of resources and effects will be derived from institutional, public, or technical recognition. Institutional recognition of a resource or effect means its importance is recognized and acknowledged in the laws, plans, and policies of government and private groups. Technical recognition of a resource or an effect is based upon scientific or other technical criteria that establish its significance. Public recognition means some segment of the general public considers the resource or effect to be important. Public recognition may be manifest in controversy, support, or opposition expressed in any number of formal or informal ways.

3.2 Management Measures

A management measure is a feature (a structural element that requires construction or assembly on-site) or an activity (a non-structural action) that can either constitute an alternative plan by itself or, alternately, can be combined with other management measures to form an alternative plan. Management measures were developed to address planning objectives and constraints, study area problems, and capitalize on study area opportunities. A total of eight management measures were developed; these management measures can be grouped into the following categories:

3.2.1 M1 Reduce Non-Point Source Pollution with Best Management Practices

These non-structural measures represent the management of non-point source pollution that enters the Lake via overland flow and tributaries during periodic rain events. This pollution may include, but is not limited to sediments, pesticides, nutrients, and waste water from septic tanks. Typical implementation for this measure would include identifying sources of non-point source pollution and managing the watershed or pollutant sources to lower and/or eliminate introduction into the study area through Best Management Practices (BMPs). For the watershed surrounding False River, BMPs could be implemented with the goal of lowering the introduction of non-point source pollution to the Lake. These could include urban, agricultural, and forestry BMPs. Potential measures may include re-vegetating unstable areas in the surrounding watershed, the implementation of low-impact designs such as filter strips and grass swales, land leveling, creating buffer zones between the agricultural areas and the drainage areas, and the use of slow-release fertilizers aimed at reducing nutrient runoff. For the most part, implementation of these measures would concentrate on reducing the non-point source pollution from the watershed.

3.2.2 M2 Stabilize Channels

Unstable or highly-erodible drainage features, such as ditches, canals, and bayous, which drain into False River, could produce excessive quantities of sediment and cause associated pollutants to drain into the Lake. To prevent these sediments from continuously migrating from erosive areas into the Lake, drainage paths could be stabilized through natural stream design practices, bank reshaping, and vegetative plantings. Implementation of these measures on drainage canals, such as the M-1 Canal on the southern end of the lake, could reduce excessive turbidity and the continued formation of unconsolidated substrates within the shallow portions of the Lake.

3.2.3 M3 Dredge Accumulated Sediments with Upland Material Disposal

All unconsolidated material found within the northern and southern flats of False River could be dredged to improve aquatic habitat by increasing the depth in the shallow areas, consolidating the substrate, and reducing excessive temperatures. A minimum depth of five feet is stipulated for lakes within the southern U.S. (USDA-NRCS 1997). The hydraulically-dredged material would be pumped via pipes to upland disposal areas, outside the lake. The hydraulic dredging of unconsolidated material from the Lake would be a measure aimed at producing a more suitable substrate along the lake bottom within the shallow ends of the lake. This material could be beneficially used in agricultural areas near the lake and would require a return hydraulic pipeline to dewater the material. The pumped material would likely be placed in pre-constructed containment areas and allowed to settle before the remaining water is pumped from the top and returned to the lake. Due to the relatively low density of the material to be pumped, a suction head dredge was considered sufficient.

3.2.4 M4 Dredge Accumulated Sediments with Island/Edge Creation

This measure would involve mechanically (bucket) dredging portions of False River flats and placing dredged material within the lake as islands to create additional littoral and riparian habitat. The material would be dredged and placed in a manner suitable for island and edge habitat creation.

3.2.5 M5 Dredge Accumulated Sediment with Deepwater Disposal

This measure would involve the dredging of unconsolidated material from the shallow flats of the Lake, with material placement in the deeper portions of the lake. As with the upland disposal method, this would likely require hydraulic dredging with a suction-head; however, no return flow would be required. Dredged material would be pumped to, or placed in, deeper portions of the lake, thereby removing the potential for turbidity spikes and improving the substrate within shallow areas.

3.2.6 M6 Dredge Accumulated Sediment with Confined Lake Disposal

The unconsolidated material would be hydraulically dredged to a depth of 5 feet and placed in a confined disposal area(s). Rock dikes or sheet pile would be required to create the confined areas.

3.2.7 M7 Water Level Management

This non-structural measure would involve the periodic lowering or drawdown of the False River water level through the water control structure located at the Lighthouse Canal outlet. The periodic lowering of the pool stage would expose shallow portions of the lake to the atmosphere, oxidizing the bottom, consolidating the unconsolidated substrate material, and allowing for seed germination and the subsequent growth of submerged aquatic vegetation (SAV). Oxidation of the Lake bottom material would release the bound nutrients would greatly improve substrate for both emergent and submergent vegetation. Ideally the lake levels would be drawn down to expose as much of the flats as possible. The drawdown would likely occur during the fall and winter to allow drying and consolidation of the substrate to enable lake levels to be returned to normal pool stage for the spring fish spawning season. The firmer substrate and increased vegetation would greatly improve the fish spawning habitat (LDWF 2011). The vegetation would provide protection for the newly hatched fish. The consolidation of the substrate and the establishment of emergent and submergent vegetation would reduce the turbidity created by boat wakes, wind, and wave action. Water level management could also be implemented in conjunction with other management measures. A water level management plan was recommended for the University Lakes restoration (USACE 2009).

Periodic drawdowns of 2–3 feet would greatly enhance much of the entire shoreline of False River. This would allow vegetation, such as cypress trees, to be planted and survive in the 0-3 feet water depths. Root ball cypress (four-foot tall) trees could be planted in this zone during the drawdown, which would be underwater during normal pool stages. The periodic drawdown would greatly increase the vigor of these trees that would be growing in 0-3 feet of water.

3.2.8 M8 Vegetation Planting

Vegetative plantings (non-structural) could be implemented within the lake to aid in the stabilization of sediments and to facilitate the creation of additional riparian and littoral habitat. These actions could serve as stand-alone measures or be implemented in conjunction with other management measures. Trees, shrubs, emergent herbaceous and SAV could be planted in and around the lake, depending on the likely hydrologic regime.

3.3 Screening/Evaluation of Management Measures

These management measures were screened based on project objectives and constraints, effectiveness, adverse environmental impacts, and practicability. Measures were screened out if they did not partially achieve any project objectives or if there were more effective or efficient measures available. Even though each measure was evaluated against its ability to accomplish the project objectives, no measure was eliminated if a specific objective was not achieved. Consideration was given to those measures which failed to achieve any of the stated objectives, but could be combined with other measures to ensure that the objectives would be adequately met. If a measure resulted in overall, negative environmental impacts, it was screened out. The practicability of each measure was considered to ensure that each measure could be implemented with a feasible amount of effort. Based on these criteria, some measures were eliminated or modified before the next phase of alternative evaluations began.

3.3.1 M1 Reduce Non-Point Source Pollution with Best Management Practices

The reduction of non-point source pollution would have some benefit to the aquatic habitat for the entire lake; however, it would not have any direct improvement to the existing substrate problems and excessive temperatures. The substrate in the flats would continue to be soft and would continue to be redistributed by wind and wave action. Fisheries and aquatic habitat would continue to be degraded due to the soft bottom, high turbidity, low dissolved oxygen periods, and excessive temperatures. In the last USEPA-approved Integrated Report of Water Quality in Louisiana (LDEQ 2010), False River was listed as impaired for fish and wildlife propagation. Suspected causes include introduction of non-native aquatic plants and high pH; sources are unknown. According to this report, False River fully supports both primary and secondary contact recreation uses and Total Maximum Daily Load (TMDL) development for the fish and wildlife propagation impairment is a low priority.

This management measure is more closely aligned with the missions of LDNR, LDWF (LDNR/LDWF 2012 a, b), LDEQ, USEPA, the Louisiana Department of Agriculture and Forestry (LDAF), and the UTB Project. The reduction of non-point source pollution would require cooperation from many landowners and, as such, would not support the typical USACE projects that require the needed land rights to support the benefits of the project. For the above reasons, this management measure was eliminated from further study.

3.3.2 M2 Stabilize Channels

Portions of the canals on pastureland within this watershed have been fenced off from cattle through Environmental Quality Incentives Program (EQIP) and other NRCS cost-share assistance (NRCS 2012). This has reduced streambank erosion and resulted in the erosion from pastureland, although minimal, to be filtered out before reaching the canals (NRCS 2012). The cleanout record of the sediment trap on the M-1 Canal indicates that the erosion rate has been reduced almost by an order of magnitude (Jim Bello, Pointe Coupee Parish Administrator, Pers. Comm., 2012).

Year Cleaned	Cubic Yards of Sediment Removed
1999	10,000+
2006	8,000-10,000
2011	1,200

Additionally, the LDEQ does not list stream segments in False River as being impaired for turbidity. This impairment determination is based on the average turbidity; however, the turbidity exceeded the average impairment limit during certain periods. These episodic higher turbidity events are likely related to heavy rain falls, wind, and wave action. While additional channel stabilization may provide some benefits, the existing conditions in the lake would continue. Also, LDNR/LDWF (2012a, b) have plans to partner with the NRCS to perform additional bank restoration. Since conditions have improved to the point that proposed lake restoration proposed by these other measures would not be impacted and additional stabilization is proposed by others, this measure was eliminated from further study.

3.3.3 M3 Dredge Accumulated Sediments with Upland Material Disposal

Hydraulically dredging the some of the existing lake sediments in the flats to a depth of 5 feet would improve the aquatic habitat by greatly reducing excessively high temperatures, thus improving the aquatic habitat for many species, especially fishery species. The dredged material would be disposed in a nearby upland area. This measure was retained for further study.

3.3.4 M4 Dredge Accumulated Sediments with Island/Edge Creation

Mechanically dredge (bucket) some of the existing lake sediments in the flats to a depth of 5 feet would improve the aquatic habitat by greatly reducing excessively high temperatures, thus improving the aquatic habitat for many species, especially fishery species. The dredged material would be disposed of in narrow islands that would create an edge habitat. This measure was retained for further study.

3.3.5 M5 Dredge Accumulated Sediment with Deepwater Material Disposal

Hydraulically dredging some of the existing lake sediments to a depth of 5 feet would improve the aquatic habitat by greatly reducing excessively high temperatures, thus improving the aquatic habitat for many species, especially fishery species. The dredged material would be disposed of in the deeper areas (below 15 feet) in the lake below the stratified layer. The PDT determined that this disposal would mostly likely be opposed by the general public and it would be very difficult to demonstrate that this disposal would not have adverse effects on the lake. This measure was eliminated from further study.

3.3.6 M6 Dredge Accumulated Sediment with Confined Lake Material Disposal

Hydraulically dredging some of the existing lake sediments in the flats to a depth of 5 feet would improve the aquatic habitat by greatly reducing excessively high temperatures, thus improving the aquatic habitat for many species, especially fishery species. The dredged material would be disposed of in confined disposal cells to create land or aquatic habitat. These cells would likely have to be confined by rock dikes or sheet pile. Islands or recreational areas could be created. The PDT determined that the confinement costs for the disposal would be too costly to implement under the Section 206 budget constraints and would simply not be cost-effective. This measure was eliminated from further study.

3.3.7 M7 Lake Water Level Management

Lake water level management, including periodic drawdowns, would provide aquatic benefits by consolidating the substrate and reducing the resuspended sediments. This would oxidize the substrate and increase vegetative growth. This restoration is a very common technique used to restore lacustrine habitat and was recommended for University Lakes (USACE 2009). However, there were concerns by some that the drawdown could lead to structural failures around the lakes, such as bulkheads and other structures.

The USACE developed a cost estimate to examine the potential risk of structural failure due to the drawdown and this geotechnical evaluation would cost nearly $2.6 million. Since the Federal participation of the Section 206 project is $5 million, this measure was determined to not be cost-effective for the Section 206 authority. The LDNR/LDWF (2012a, b) have proposed to develop a lake water level management plan. Since this measure is not cost-effective under the USACE program and is being planned by others, this management measure was eliminated from further study.

3.3.8 M8 Vegetative Plantings

Vegetative plantings could improve aquatic habitat throughout the lake by providing structure for many aquatic organisms. Revegetation of the flats may be difficult with the existing soft substrate. Vegetative planting measures could be combined with other measures. This measure was retained for further study.

3.3.9 Management Measures Screening Summary

From the seven management measures considered, only dredging with various disposal options was retained as stand-alone measures (Table 3-1). Vegetative planting was retained in conjunction with other measures and not as a stand-alone measure.

3.4 Final Array of Alternatives

All management measures considered were deemed consistent with Federal Administration budget policy, specific USACE policies for ecosystem restoration, and Federal laws, regulations, and Executive Orders. The measures carried forward for further evaluation were assembled into alternative plans designed to address study goals and objectives.

In addition to the No-Action Alternative, M3 and M4 measures were used to develop six alternatives (Table 3-2). Measures M3, M4, and M8 from the screening process were carried forth for further evaluation and developed into alternatives. The PDT determined that the north and south flats should be evaluated separately and combined. Only the final array of alternatives was developed; the measures and solutions for the lake were limited and fairly simplistic, there was no preliminary or intermediate arrays of alternatives.

Table 3-1. Screening of Management Measures

Management Measures		Screening Result
M1	Manage Non-Point Source Pollution	Eliminated because it would not improve areas with poor substrate, and would not reduce excessive temperatures, may be difficult to implement under the USACE process with such widespread landowner involvement, and is proposed by others such as LDNR, LDWF, NRCS, LDEQ, USEPA, and UTB Watershed Project.
M2	Stabilize Erosive Channels	Eliminated because it would not improve areas with poor substrate, would not reduce excessive temperatures, and is being proposed by LDNR/LDWF and the Parish under another program.
M3	**Dredge Flats with Upland Material Disposal**	**Retained for further study**
M4	**Dredge Flats with Island/Edge Material Disposal**	**Retained for further study**
M5	Dredge Flats with Material Disposal within Deeper Portions of the Lake	Eliminated due to difficulty in determining whether this disposal method would create any long-term adverse impacts
M6	Dredge Flats with Confined Lake Material Disposal	Eliminated due to costly confined disposal costs
M7	Lake Water Level Management	Eliminated due to cost of geotechnical investigation and proposed by LDNR/LDWF
M8	**Vegetative Plantings**	**Retained for further study**

Table 3-2. Final Array of Alternatives

Alternative	Description
A1	No-Action
A2	Dredge North Flats with Island/Edge Disposal and Plantings
A3	Dredge South Flats with Island/Edge Disposal and Plantings
A4	Dredge North and South Flats with Island/Edge Disposal and Plantings
A5	Dredge North Flats with Upland Disposal
A6	Dredge South Flats with Upland Disposal
A7	Dredge North and South Flats with Upland Disposal

3.4.1 A1 - No-Action Alternative

The No-Action Alternative consists of not implementing any restoration actions in the False River watershed and is the Future without Project (FWOP) condition to which each alternative in the Final Array of Alternative will be compared. This alternative would not address any of the project objectives. Consideration of the No-Action Alternative is required by NEPA §1502.14(d) and the current Federal Principles and Guidelines (P&G §1.10.1).

3.4.2 A2 Dredge North Flats with Island/Edge Disposal and Plantings

Approximately 136,200 cy of dredged material would be placed to create three islands and approximately 13,940 linear feet of edge habitat (Figures 3-1 to 3-3; Table 3-3). This dredged material placement would occur in two lifts, separated by at least six months. This will allow the material to dewater and compact to create a sustainable final elevation. The islands would vary in length from approximately 1,600 feet to about 2,200 feet. The total area of the earthwork is about 27 acres and the expected area of the islands is about 3 acres. A buffer zone between the earthwork area and the existing lake shoreline is proposed to reduce any negative effects along the shoreline. This buffer zone would benefit from reduced water temperatures and increased structure. This buffer zone is about 1.2 acres and the existing lake shoreline that would benefit is about 1,100 linear feet. As soon as possible after the final lift, ground cover would be planted to reduce erosion. Native trees and shrubs would then be planted to establish habitat and provide shade to reduce water temperatures. Species to be planted could include: baldcypress (T*axiodium distichum*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), box elder (*Acer negundo),* sugarberry (*Celtis laevigata*), water tupelo (*Nyssa aquatica*), black willow (*Salix nigra*), buttonbush (*Cephalanthus occidentalis*), coontail, and southern naiad.

The design considered using a bucket dredge with a 100-foot boom so enough material could be dredged without creating deep areas that could develop poor water quality. The design included keeping the dredging depth to less than 7-8 feet deep (five to six feet being ideal). Based on the liquid limits of limited tests, a 70 percent volume loss due to dewatering and subsidence was conservatively used. Further geotechnical testing could reduce this volume loss estimate.

3.4.3 A3 Dredge South Flats with Island/Edge Disposal and Plantings

Approximately 217,000 cy of dredged material would be placed to create nine islands and approximately 14,000 linear feet of edge habitat (Figures 3-2 to 3-4; Table 3-3). This dredged material placement would occur in two lifts, separated by at least six months. This will allow the material to dewater and compact to create a sustainable final elevation. The islands would vary in length from approximately 400 feet to about 1,150 feet. The total area of the earthwork is about 59 acres and the expected area of the islands is about 6 acres. A buffer zone between the earthwork area and the existing lake shoreline is proposed to reduce any negative effects along the shoreline. The buffer zone would benefit from reduced water temperatures and increased structure. This buffer zone is about 8.3 acres and the existing lake shoreline that would benefit is about 4,200 linear feet. As soon as possible after the final lift, ground cover would be planted to reduce erosion. Native trees and shrubs would then be planted to establish habitat and provide shade to reduce water temperatures. Species to be planted could include: baldcypress (T*axiodium distichum*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer*

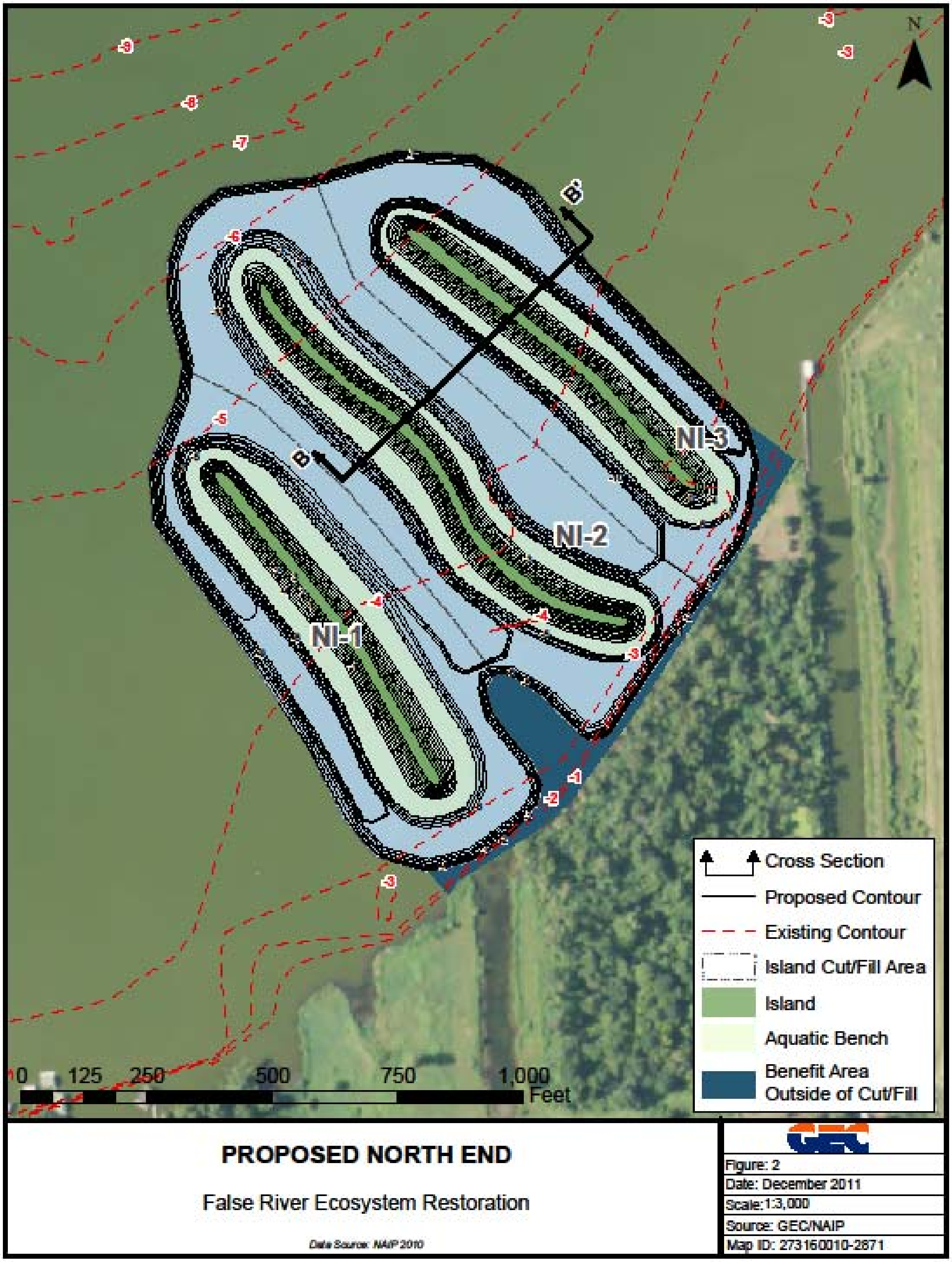

Figure 3-1. Plan View for Alternative A2
(Dredge North Flats with Island/Edge Disposal and Plantings)

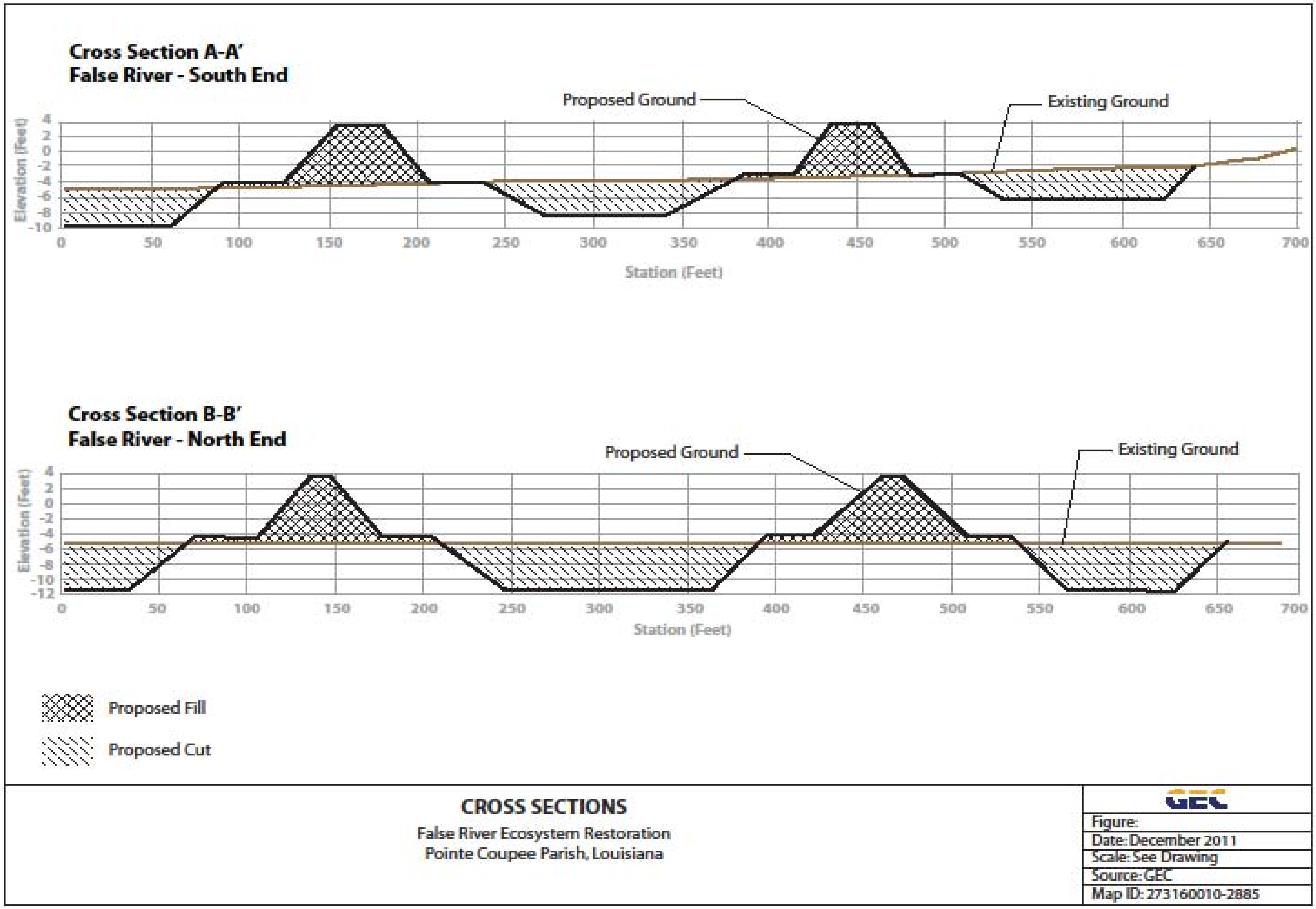

Figure 3-2. Cross Sections for Alternatives A2 – A4
(Dredge North and/or South Flats with Island/Edge Disposal and Plantings)

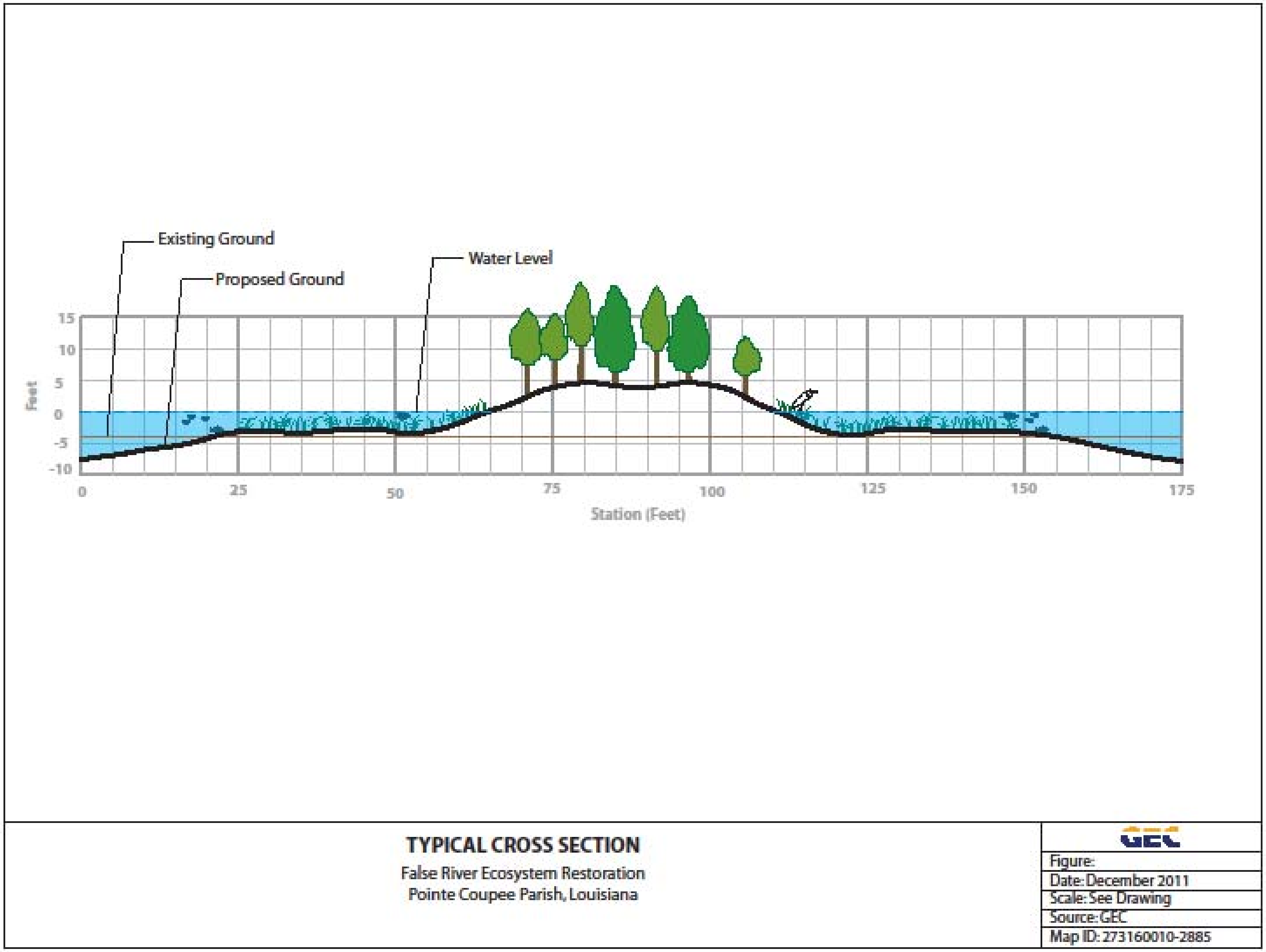

Figure 3-3. Typical Cross Section for Alternatives A2 – A4
(Dredge North and/or South Flats with Island/Edge Disposal and Plantings)

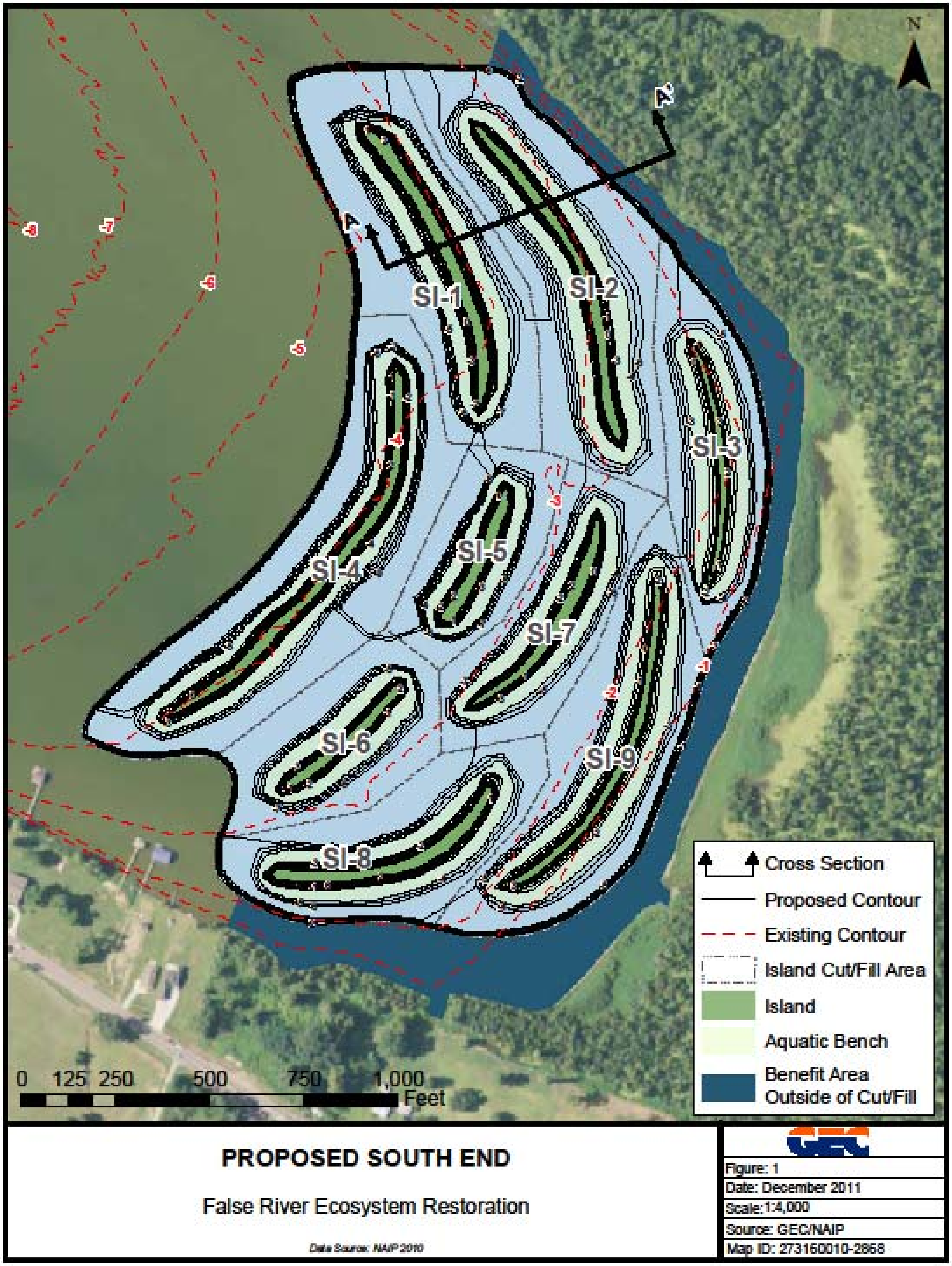

Figure 3-4. Plan View for Alternative A2
(Dredge South Flats with Island/Edge Disposal and Plantings)

Table 3-3. Summary of Earthwork for Proposed Islands in the South and North Flats

Islands	Cut (cy)	Fill (cy)	Area of Earthwork (acres)	Island Area (acres)	Island Perimeter (ft)	Island Length (ft)
South Flats						
SI-1	32,685	10,868	8.2	0.8	1,708	799
SI-2	30,221	8,390	8.8	0.8	1,962	933
SI-3	15,640	4,142	5.2	0.5	1,362	610
SI-4	43,245	12,405	10.3	1.0	2,410	1,144
SI-5	15,887	4,557	3.7	0.4	861	382
SI-6	17,611	4,111	4.6	0.4	890	387
SI-7	15,329	5,017	4.7	0.5	1,313	616
SI-8	20,883	5,644	5.7	0.7	1,437	657
SI-9	25,735	6,278	7.6	0.8	1,997	936
Sub Total	217,236	61,412	58.7	5.9	13,941	6,463
North Flats						
NI-1	39,470	11,800	8.4	0.9	1,635	792
NI-2	54,593	16,863	10.4	1.1	2,168	1,059
NI-3	42,090	12,746	7.8	0.9	1,669	807
Sub Total	136,153	41,409	26.6	2.9	5,471	2,658
Total	353,389	102,821	85.3	8.8	19,412	9,122

rubrum), box elder (*Acer negundo),* sugarberry (*Celtis laevigata*), water tupelo (*Nyssa aquatica*), black willow (*Salix nigra*), buttonbush (*Cephalanthus occidentalis*), coontail, and southern naiad.

3.4.4 A4 Dredge North and South Flats with Island/Edge Disposal with Plantings

Alternative 4 would be composed of Alternatives A1 and A2 (Figures 3-1 and 3-4; Table 3-3).

3.4.5 A5 Dredge North Flats with Upland Disposal

Approximately 40,000 cy of material would be hydraulically dredged to deepen approximately 20 acres to a minimum depth of 5 feet (Figures 3-5 to 3-7). Dredged material would be placed offsite in an upland disposal area within two miles of the dredging area. The offsite disposal area would be about 10 acres. Containment levees would have to be constructed to hold this dredged material and a water return pipe to the Lake would be necessary to dewater the disposal site. Ground cover would be planted as soon as possible after the disposal site is dewatered.

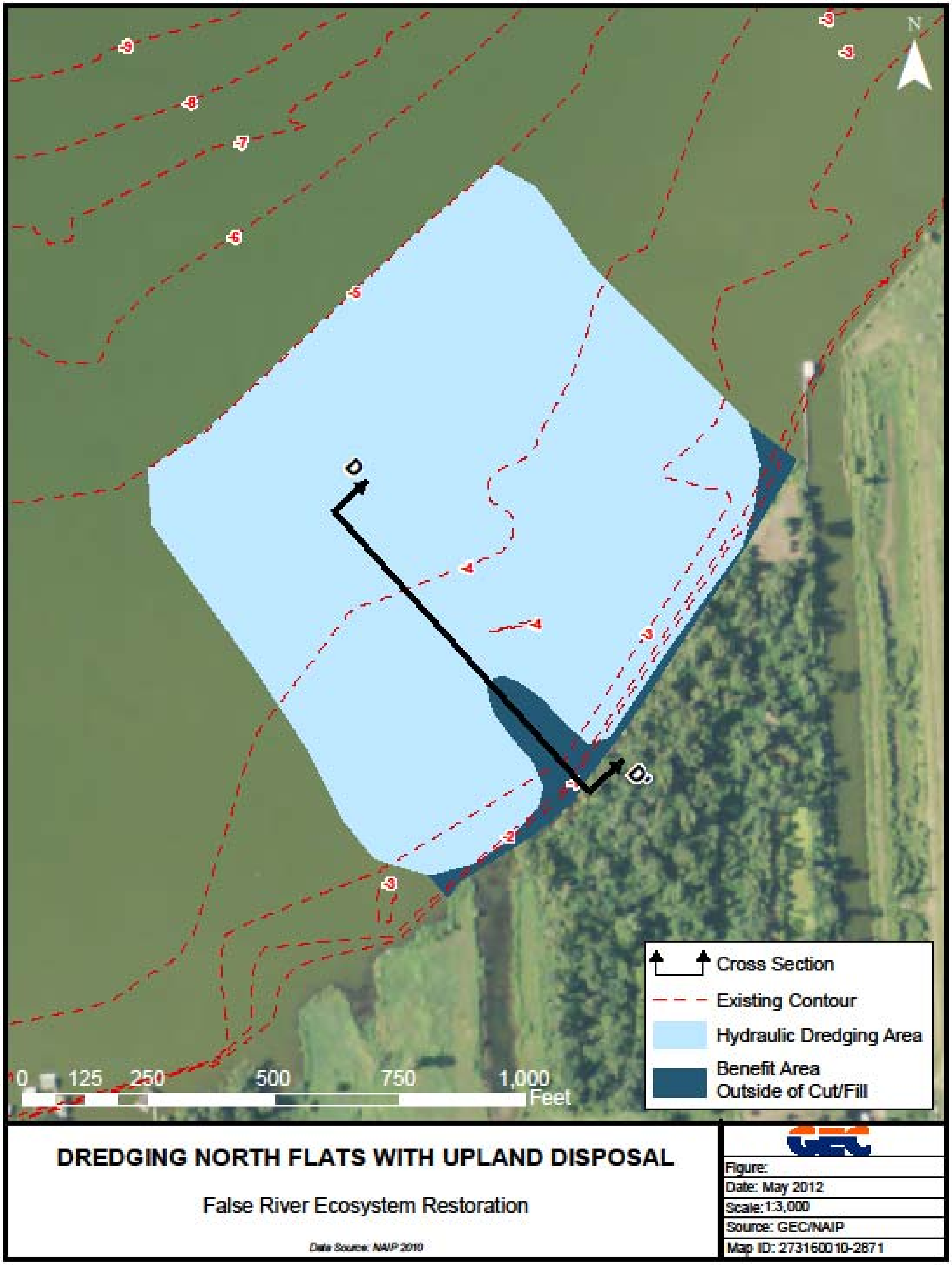

Figure 3-5. Plan View of Alternative A5
(Dredge North Flats with Upland Disposal)

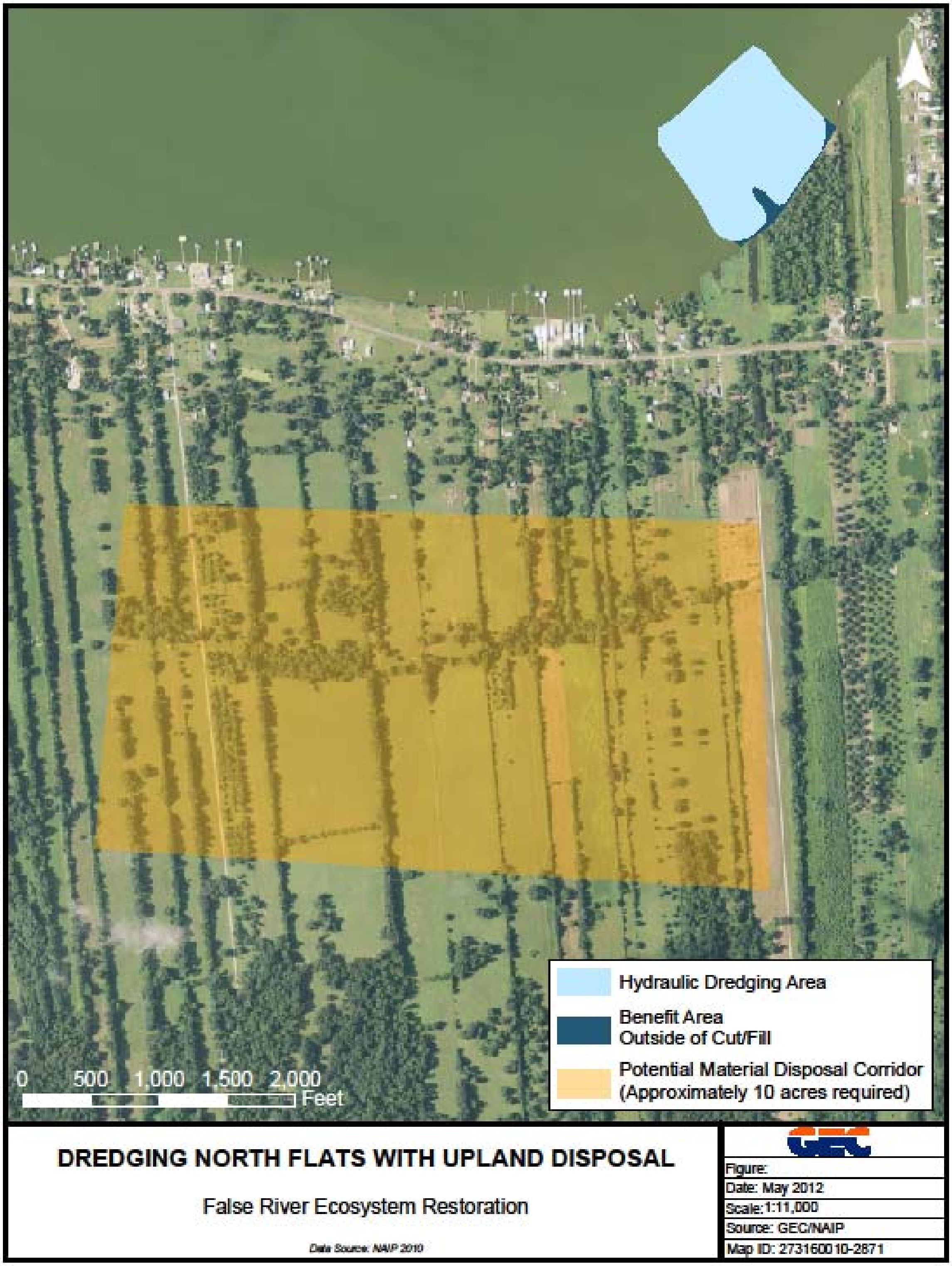

Figure 3-6. Plan View of Alternative A5
(Dredge North Flats with Upland Disposal
and Potential Material Disposal Corridor)

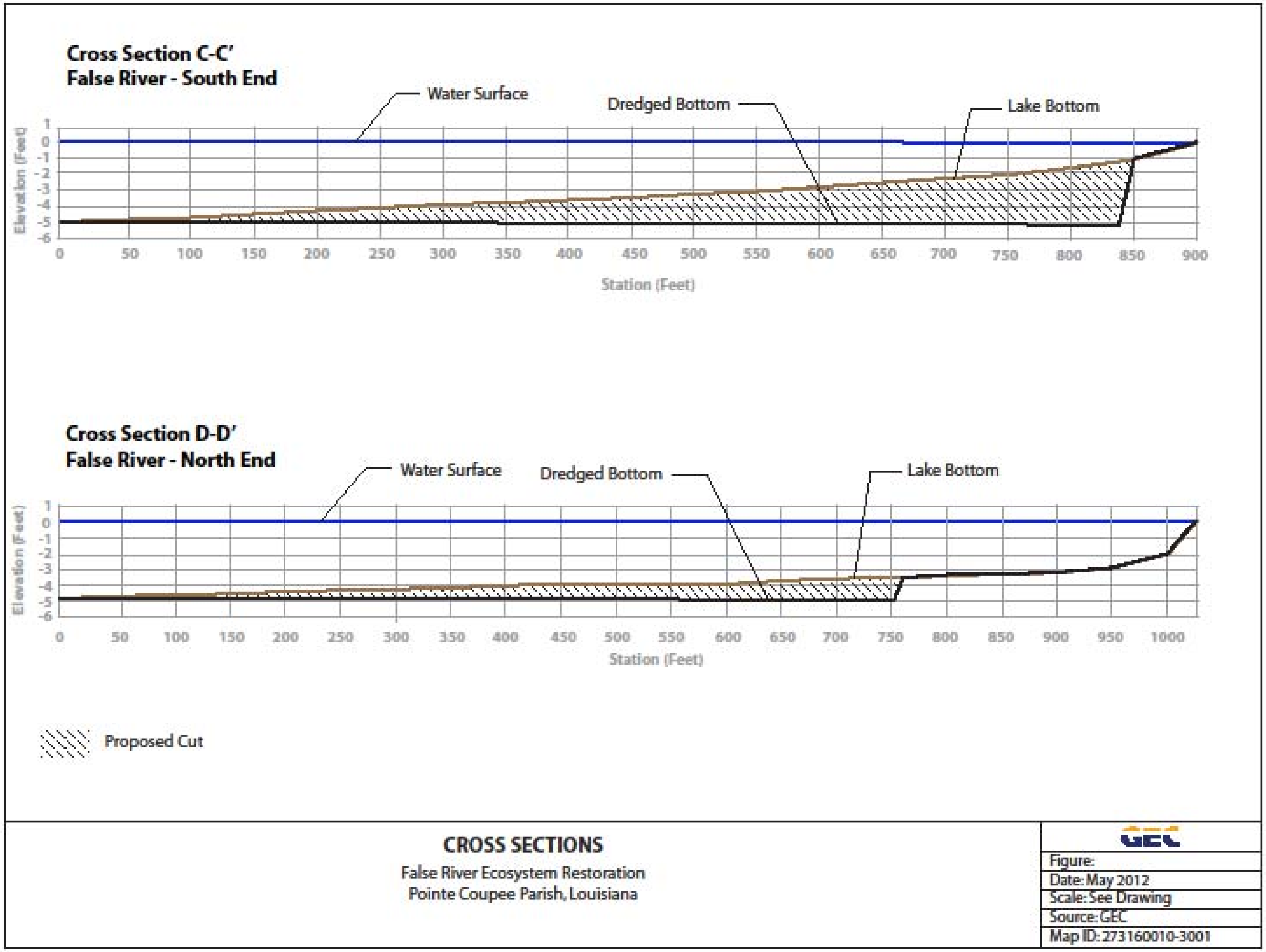

Figure 3-7. Cross Sections for Alternatives A5-A7 (Dredge North and/or South Flats with Upland Disposal)

3.4.6 A6 Dredge South Flats with Upland Disposal

Approximately 192,000 cy of material would be hydraulically dredged to deepen approximately 60 acres to a minimum depth of 5 feet (Figures 3-7 to 3-9). Dredged material would be placed offsite in an upland disposal area within two miles of the dredging area. The offsite disposal area would be about 50 acres. Containment levees would have to be constructed to hold the dredged material and a water return pipe to the Lake would be necessary to dewater the disposal site. Ground cover would be planted as soon as possible after the disposal site is dewatered.

3.4.7 A7 Dredge North and South Flats with Upland Disposal

Alternative 7 would be composed of Alternatives A5 and A6 (Figures 3-5 to 3-9).

3.5 Comparison of Alternatives

The effects of the alternatives in the final array were evaluated against the No-Action Alternative (FWOP condition) to determine the overall impact over the 50-year period of analysis (2012–2062). Alternatives were then compared to each other. Comparisons included environmental impacts to significant resources, WVA benefits, cost and contributions to project goals, planning objectives and constraints, contribution to the Federal objective, and the Principles and Guidelines four evaluation criteria (completeness, effectiveness, efficiency, and acceptability).

3.5.1 Cost Analysis

As part of the further development of the remaining alternatives, preliminary construction costs were developed to use in the Cost-effectiveness/Incremental Cost Analysis (CE/ICA) analysis. Estimated construction costs ranged from $3.6 to $11.5 million for the action alternatives (Tables 3-4 to 3-10) and the average annualized costs ranged from $180.9 to $570.3 thousand.

A Federal discount rate of 4.375 percent over a 50-year life cycle in 2010 dollars was used. Operation and maintenance costs were not required for these alternatives. The rationale and assumptions used for the development of unit costs and all cost estimates are described in Appendix F.

3.5.2 Environmental Benefits

The environmental benefits have to be quantified on an annual basis to be used in the IWR Plan. The Habitat Suitability Index (HSI) and the Wetland Value Assessment (WVA) model were selected to quantify the environmental outputs. Both models compared the Future without the Project (FWOP – No-Action Alternative) to the Future with the Project (FWP Alternatives A2 – A7). The HSI models were used to evaluate the benefits associated with the lake habitat (Alternative 2–7) and the WVA model was used to evaluate the island habitat (Alternatives A2 – A4).

The WVA model is a complete ecological model that evaluates all components of the ecosystem. The HSI models used to evaluate the benefits to the lake habitat are species specific. The HSI models for largemouth bass (USFWS 1982a), bluegill (USFWS 1982b), and great egret (USFWS 1984) were used. Since the HSI models are only for single species, the combination of these three species was considered to represent the components of the lake

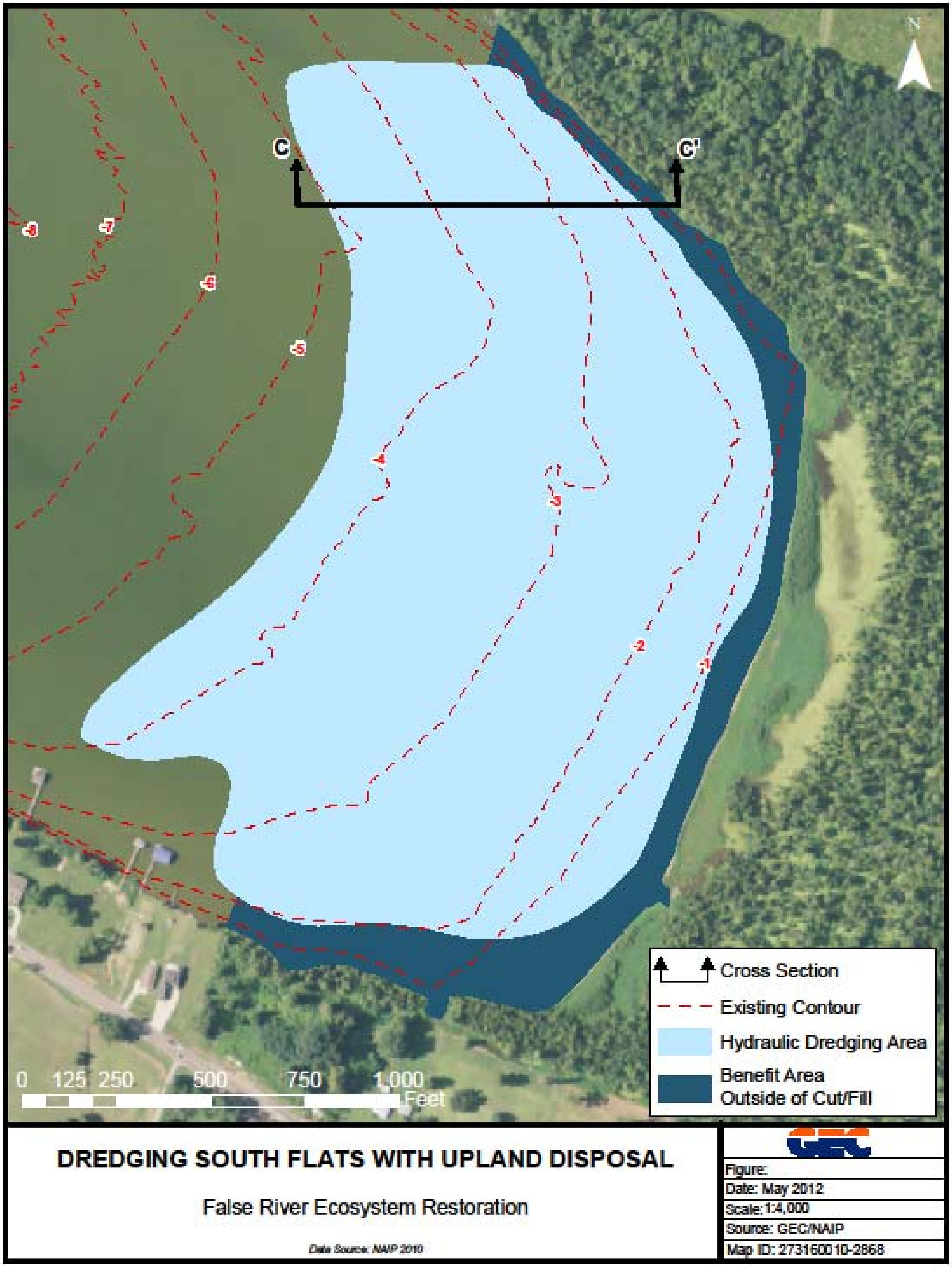

Figure 3-8. Plan View of Alternative A6
(Dredge South Flats with Upland Disposal)

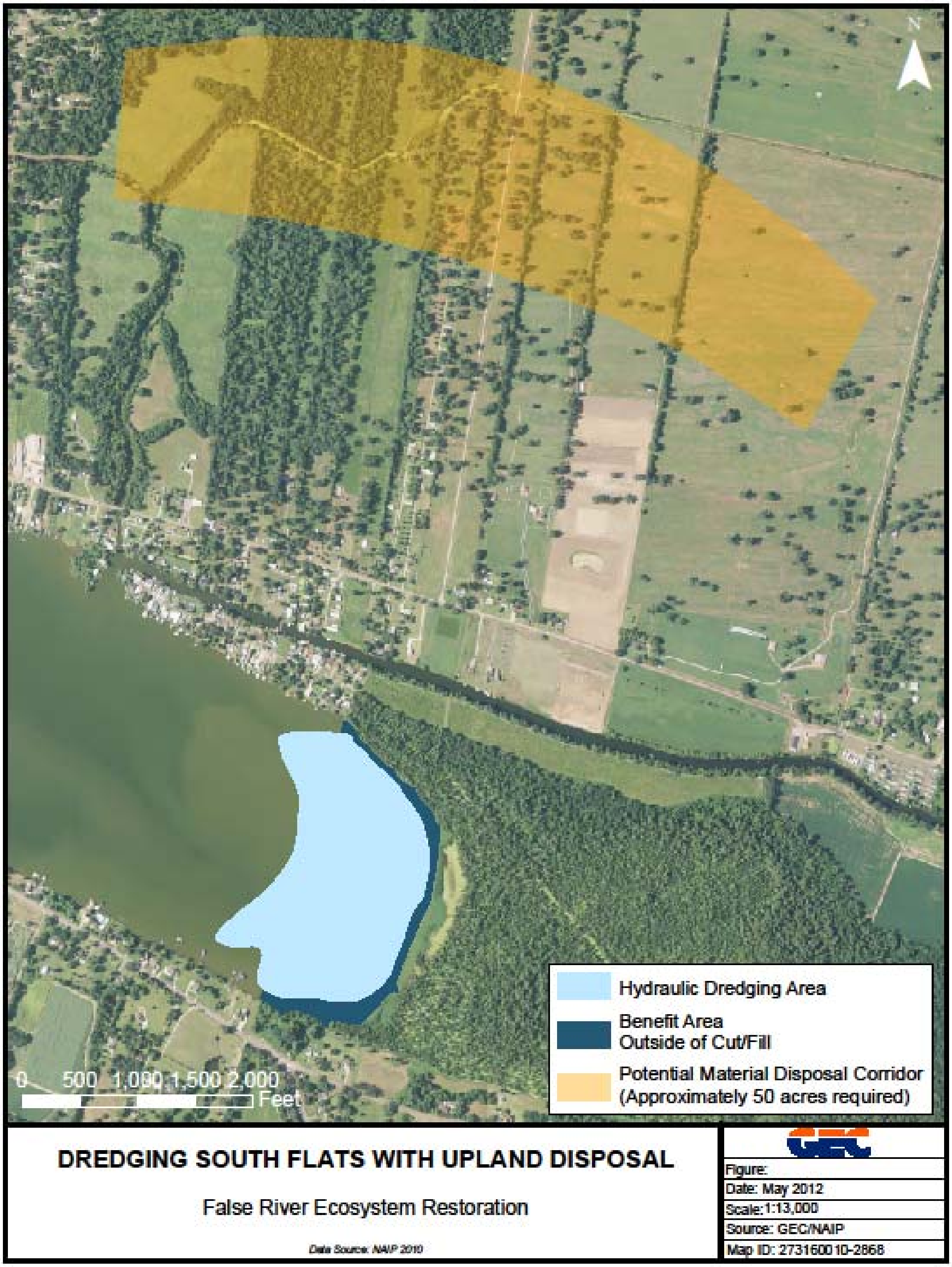

Figure 3-9. Plan View of Alternative A6
(Dredge South Flats with Upland Disposal
and Potential Material Disposal Corridor)

Table 3-4. Summary of Proposed Alternative Costs

Alternative		Total Project Cost	Average Annualized Cost
A1	No-Action	$ 0	$ 0
A2	Dredge North Flats with Island/Edge Disposal and Plantings	3,649,252	180,920
A3	Dredge South Flats with Island/Edge Disposal and Plantings	5,175,925	256,608
A4	Dredge North and South Flats with Island/Edge Disposal and Plantings	7,841,711	388,770
A5	Dredge North Flats with Upland Disposal	5,666,217	280,915
A6	Dredge South Flats with Upland Disposal	9,074,765	449,901
A7	Dredge North and South Flats with Upland Disposal	11,503,271	570,300

Table 3-5. Estimated Construction Costs for Alternative 2
(Dredge North Flats with Island/Edge Disposal and Plantings)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mechanical Dredging Mob/Demob	ls	1	$ 231,200.00	$231,200
Earthwork				
Mechanical Dredging (3.5 CY Bucket)	cy	136,200	11.20	1,525,440
Erosion Protection				
Seeding (Islands)	acre	3	217.00	651
Turbidity Curtain	lf	1,500	39.00	58,500
Vegetative Plantings				
Seedlings (Islands)	acre	3	365.00	1,095
Nutria Control	acre	3	1,510.00	4,530
Subtotal				**$1,821,416**
Surveying	ls	1	35,000.00	35,000
Preconstruction Engineering and Design	%		12%	218,570
Construction Management	%		9%	163,927
Land Costs (Staging)	acre	1	$36,000.00	36,000
Construction Costs Subtotal				**$2,274,913**
Construction Contingency Cost (35%)			35%	796,220
Study Costs				500,000
Total Project Cost				**$3,571,133**
Interest During Construction (1 year)				78,119
Total Estimated Cost				**$3,649,252**
Annualized Cost (50 yr, 4.375% Interest)				180,920
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$180,920**

Estimates are in 2010 Dollars
Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period
Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

Table 3-6. Estimated Construction Costs for Alternative A3 (Dredge South Flats with Island/Edge Disposal with Plantings)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mechanical Dredging Mob/Demob	ls	1	$ 231,200.00	$231,200
Earthwork				
Mechanical Dredging (3.5 CY Bucket)	cy	217,300	11.20	2,433,760
Erosion Protection				
Seeding (Islands)	acre	6	217.00	1,302
Turbidity Curtain	lf	1,500	39.00	58,500
Vegetative Plantings				
Seedlings (Islands)	acre	6	365.00	2,190
Nutria Control	acre	6	1,510.00	9,060
Subtotal				**$2,736,012**
Surveying	ls	1	35,000.00	35,000
Preconstruction Engineering and Design	%		12%	328,321
Construction Management	%		9%	246,241
Land Costs (Staging)	acre	1	36,000.00	36,000
Construction Costs Subtotal				**$3,381,575**
Construction Contingency Cost (35%)			35%	1,183,551
Study Costs				500,000
Total Project Cost				**$5,065,126**
Interest During Construction (1 year)				110,800
Total Estimated Cost				**$5,175,925**
Annualized Cost (50 yr, 4.375% Interest)				256,608
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$256,608**

Estimates are in 2010 Dollars

Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period

Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

Table 3-7. Estimated Construction Costs for Alternative A4
(Dredge North and South Flats with Island/Edge Disposal with Plantings)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mechanical Dredging Mob/Demob	ls	1	$231,200.00	$231,200
			.	
Earthwork				
Mechanical Dredging (3.5 CY Bucket)	cy	353,000	11.20	3,953,600
Erosion Protection				
Seeding (Islands)	acre	9	217.00	1,953
Turbidity Curtain	lf	3,000	39.00	117,000
Vegetative Plantings				
Seedlings (Islands)	acre	9	365.00	3,285
Nutria Control	acre	9	1,510.00	13,590
Subtotal				**$4,320,628**
Surveying	ls	1	50,000.00	50,000
Preconstruction Engineering and Design	%		12%	518,475
Construction Management	%		9%	388,857
Land Costs (Staging)	acre	1	$36,000.00	36,000
Construction Costs Subtotal				**$5,313,960**
Construction Contingency Cost (35%)			35%	1,859,886
Study Costs				500,000
Total Project Cost				**$7,673,846**
Interest During Construction (1 Yr Const.)				167,865
Total Estimated Cost				**$7,841,711**
Annualized Cost (50 yr, 4.375% Interest)				388,770
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$388,770**

Estimates are in 2010 Dollars
Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period
Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

Table 3-8. Estimated Construction Costs for Alternative 5
(Dredge North Flats with Upland Disposal)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mob/Demob Dozer and Excavator	ls	1	$950.00	$950
Hydraulic Dredge Mob/Demob	ls	1	$2,000,000.00	2,000,000
Earthwork				
Hydraulic Dredging (12 " Pipe)	cy	50,000	10.00	500,000
Disposal Area				
Excavation	cy	3,100	1.85	5,735
Berm Compaction	cy	3,900	1.35	5,265
Jack & Bore (Under Roadway)				
Jack & Bore (20' Twin Pipes - 200'/Pipe)	lf	400	890.00	356,000
Erosion Protection				
Seeding (Disposal Area and Berm)	acre	11	220.00	2,420
Turbidity Curtain	lf	1,500	39.00	58,500
Silt Fencing	lf	3,500	1.90	6,650
Subtotal				**$2,935,520**
Surveying	ls	1	50,000.00	50,000
Preconstruction Engineering and Design	%		12%	352,262
Construction Management	%		9%	264,197
Land Costs (Staging)	acre	1	36,000.00	36,000
Land Costs (Disposal)	acre	11	9,000.00	99,000
Construction Costs Subtotal				**$3,736,979**
Construction Contingency Cost (35%)			35%	1,307,943
Study Costs				500,000
Total Project Cost				**$5,544,922**
Interest During Construction (1 year)				121,295
Total Estimated Cost				**$5,666,217**
Annualized Cost (50 yr, 4.375% Interest)				280,915
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$280,915**

Estimates are in 2010 Dollars

Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period

Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

Table 3-9. Estimated Construction Costs for Alternative A6 (Dredge South Flats with Upland Disposal)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mob/Demob Dozer and Excavator	ls	1	$950.00	$950
Hydraulic Dredge Mob/Demob	ls	1	$2,000,000.00	2,000,000
Earthwork				
Hydraulic Dredging (12-inch)	cy	225,000	10.00	2,250,000
Disposal Area				
Excavation	cy	6,800	1.85	12,580
Berm Compaction	cy	8,500	1.35	11,475
Jack & Bore (Under Roadway)				
Jack & Bore (20' Twin Pipes - 200'/Pipe)	lf	400	890.00	356,000
Erosion Protection				
Seeding (Disposal Area and Berm)	acre	48	220.00	10,560
Turbidity Curtain	lf	1,500	39.00	58,500
Silt Fencing	lf	7,700	1.90	14,630
Subtotal				**$4,714,695**
Surveying	ls	1	35,000.00	35,000
Preconstruction Engineering and Design	%		12%	565,763
Construction Management	%		9%	424,323
Land Costs (Staging)	acre	1	36,000.00	36,000
Land Costs (Disposal)	acre	48	9,000.00	432,000
Construction Costs Subtotal				**$6,207,781**
Construction Contingency Cost (35%)			35%	2,172,723
Study Costs				500,000
Total Project Cost				**$8,880,504**
Interest During Construction (1 year)				194,261
Total Estimated Cost				**$9,074,765**
Annualized Cost (50 yr, 4.375% Interest)				449,901
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$449,901**

Estimates are in 2010 Dollars

Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period

Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

Table 3-10. Estimated Construction Costs for Alternative A7
(Dredge North and South Flats with Upland Disposal)

Item	Unit	Estimated Quantity	Unit Price	Estimated Cost
Mobilization & Demobilization				
Mob/Demob Dozer and Excavator	ls	1	$950	$950
Hydraulic Dredge Mob/Demob	ls	1	$2,000,000.00	2,000,000
Earthwork				
Hydraulic Dredging (12 inch Pipe)	cy	275,000	10.00	2,750,000
Disposal Area				
Excavation	cy	7,500	1.85	13,875
Berm Compaction	cy	9,330	1.35	12,596
Jack & Bore (Under Roadway)				
Jack & Bore (20' Twin Pipes - 200'/Pipe)	lf	800	890.00	712,000
Erosion Protection				
Seeding (Disposal Area and Berm)	acre	59	220.00	12,980
Turbidity Curtain	lf	3,000	39.00	117,000
Silt Fencing	lf	9,000	1.90	17,100
Subtotal				**$5,636,501**
Surveying	ls	1	50,000.00	50,000
Preconstruction Engineering and Design	%		12%	676,380
Construction Management	%		9%	507,285
Land Costs (Staging)	acre	1	36,000.00	36,000
Land Costs (Disposal)	acre	59	18,000.00	1,062,000
Construction Costs Subtotal				**$7,968,166**
Construction Contingency Cost (35%)			35%	2,788,858
Study Costs				500,000
Total Project Cost				**$11,257,024**
Interest During Construction (1 year)				246,247
Total Estimated Cost				**$11,503,271**
Annualized Cost (50 yr, 4.375% Interest)				570,300
Annual Operations and Maintenance*				0
Total Average Annual Cost				**$570,300**

Estimates are in 2010 Dollars

Average Annual Cost based upon 50 yr project life, 4.375% interest, and 1 year construction period

Interest During Construction Rate = ((1.04375 ^ 2) -1) * .5

Discount Rate:	4.375	Percent
Project Life:	50	Years
Construction Period:	1	Year

habitat. The Comite River at Hooper Road, East Baton Rouge Parish, Louisiana, Section 206 Ecosystem Restoration project (now known as the Blackwater Conservation Area) used the combination of snapping turtle, slider turtle, common egret, and WVA for evaluation (USACE 2000; http://www.mvn.usace.army.mil/prj/cap/blackwater/).

WVA Model. WVA models are ecological benefit models designed to evaluate the existing, FWOP, and FWP conditions. The LDNR Habitat Assessment Model for Fresh Swamp and Bottomland Hardwoods within the Louisiana Coastal Zone (LDNR 1994) was used. This model is based upon (HSIs) that are developed by evaluating several variables at a site and predicting the future changes, with and without the project. Details concerning the model-generated input data use in the WVA model are included in Appendix D of this report. For the freshwater swamp WVA model, variables include:

V_1 - stand structure
V_2 - stand maturity
V_3 - hydrology
V_4 - size of contiguous forested area
V_5 - suitability and traversability of surrounding land uses
V_6 - disturbance

The WVA model produced Average Annual Habitat Units (AAHUs), a measure of change, for the 50-year period of analysis when comparing the FWP to the FWOP. The HSI is a unit less number bounded by 0 and 1, where 0 represents no habitat and 1 represents optimum habitat. The HSI for a particular area is multiplied by the size of the HSI area (acres) to create the Habitat Unit (HU) value (HU = HSI x size of habitat). AAHUs are calculated by dividing the total number of HUs gained or lost as a result of a proposed action by the period of analysis. The WVA calculates the benefits (FWP compared to the FWOP) for years 0, 1, 10, 25, and 50. The habitat units for each year from year 1 to year 50 are calculated. The cumulative habitat units generated for the 50-year period of analysis is divided by 50 to determine the AAHU. The 50-year period of analysis is from 2012–2062. Therefore, the WVA model accounts for tree growth and the timing of ecological restoration. For example, if the net change between the FWOP and FWP is +0.2 for 100 acres over the 50-year period of evaluation, that alternative would produce 20 AAHUs of ecological benefit.

Largemouth Bass HSI. The largemouth bass lacustrine HSI model was used (USFWS 1982a); the HSI worksheets are in Appendix D. The variables considered were:

V_2 - percent area $\leq$ 6 m depth
V_3 - percent bottom cover (adult and juvenile)
V_4 - percent bottom cover (fry)
V_5 - average total dissolved solids during growing season
V_6 - minimum dissolved oxygen
V_7 - pH range during growing season
V_8 - average water temperature during growing season (adult, juvenile)
V_9 - average water temperature during spawning and incubation
V_{10} - average water temperature during growing season (fry)
V_{11} - maximum monthly average turbidity
V_{12} - maximum salinity (adult, juvenile)
V_{13} - maximum salinity (fry)
V_{14} - maximum salinity (embryo)

V_{15} - substrate composition
V_{16} - average water level fluctuation during growing season (adult and juvenile)
V_{17} - maximum water level fluctuation during spawning
V_{18} - average water level during growing season (fry)

The HSI model then uses combinations of these variables to develop an HSI for food, cover, water quality, and reproduction. These four HSI values are then used to calculate a total HSI for largemouth bass. This total HSI value is then multiplied by the acreage to calculate the AAHUs.

Bluegill HSI. The lacustrine bluegill HSI model was used (USFWS 1982b); the worksheets are in Appendix D. The variables considered were:

V_2 - percent cover within pools
V_3 - percent cover aquatic
V_4 - percent littoral area during summer stratification
V_5 - average total dissolved solids during growing season
V_6 - maximum monthly average turbidity
V_7 - pH range during growing season
V_8 - minimum dissolved oxygen during summer
V_9 - maximum monthly average salinity during growing season
V_{10} - maximum midsummer temperature
V_{11} - average of mean weekly water temperatures
V_{12} - maximum early summer temperature
V_{13} - maximum midsummer temperature
V_{19} - reservoir drawdown during spawning
V_{20} - substrate composition

The HSI model then uses combinations of these variables to develop an HSI for food, cover, water quality, and reproduction. These four HSI values are then used to calculate a total HSI for bluegill. This total HSI value is then multiplied by the acreage to calculate the AAHUs.

Great Egret HSI. The HSI worksheets for the great egret HSI Imodel (USFWS 1984); the worksheets are in Appendix D. The variables considered were:

V_1 - percent of study area with water 10–23 cm deep
V_2 - percent of substrate in 10–23 cm covered by SAV or emergent vegetation
V_3 - percent of island covered by woody vegetation
V_4 - mean water depth in wooded wetlands
V_5 - mean height of woody vegetation
V_6 - distance to road or dwelling
V_8 - distance to human disturbance other than road or dwelling

The model then uses combinations of these variables to develop an HSI for feeding and nesting. This HSI model does not combine the feeding and nesting into a single HS; they remain as separate values. This total HSI value for each is then multiplied by the acreage to calculate the AAHUs.

Benefits Summary. The AAHUs for the alternatives ranged from 0.0 for the No-Action Alternative to 150.0 for Alternative A4 (Table 3-11; Appendix D). The upland disposal alternatives (A5-A7) did not provide any benefits for the great egret or freshwater swamp (WVA) benefits. The creation of islands would provide ideal feeding and nesting habitat for the great egret. The shallow and vegetated areas would provide feeding habitat not only for the great egret, but other wading birds as well. The majority of the benefits for the two fishery species was for the reduction in excessive temperatures, improved cover and structure, reduction in turbidity, and improved dissolved oxygen levels.

Table 3-11. Estimated AAHUs for Each Alternative

Alternative		Large-mouth Bass	Bluegill	Great Egret Feeding	Great Egret Nesting	WVA	Total Benefits (AAHUs)
A1	No-Action	0.0	0.0	0.0	0.0	0.0	0.0
A2	Dredge North Flats with Island/Edge Disposal and Plantings	5.9	21.9	12.5	1.6	2.0	43.9
A3	Dredge South Flats with Island/Edge Disposal and Plantings	14.5	53.8	30.6	3.2	4.1	106.2
A4	Dredge North and South Flats with Island/Edge Disposal and Plantings	20.4	75.7	43.0	4.8	6.1	150.0
A5	Dredge North Flats with Upland Disposal	3.7	22.9	0.0	0.0	0.0	26.6
A6	Dredge South Flats with Upland Disposal	9.0	55.2	0.0	0.0	0.0	64.2
A7	Dredge North and South Flats with Upland Disposal	12.7	78.0	0.0	0.0	0.0	90.7

3.5.3 Cost-Effectiveness and Incremental Cost Analysis

Each alternative within the final array was evaluated through a cost-effectiveness and incremental cost analysis (CE/ICA) by using the Institute of Water Resources (IWR)-Planning Suite software. The 50-year evaluation period for the project was used. The IWR software utilizes the annualized output from the WVA Model (AAHUs) and the annualized costs of each alternative to determine which proposed actions are deemed cost-effective. A summary of the costs associated with each proposed alternative are listed in Table 3-12. The complete IWR report is presented in Appendix F.

Of the alternatives considered cost-effective by this analysis, some alternatives are also designated a *Best Buy*, when the proposed alternative provides the great increase in output for the small increases in cost (incremental analysis). By default, the No-Action Alternative and the largest cost-effective alternative (i.e., the cost-effective alternative with the greatest annualized ecosystem outputs or benefits) are considered to be Best Buy alternatives. Any of the proposed alternatives found to be cost-effective during the IWR analysis may be considered for selection

Table 3-12. Summary of Proposed Alternative Costs and Benefits used in the CE/CIA

Alternative		Average Annualized Cost	Average Annual Benefits (AAHUs)
A1	No-Action	$ 0	0.0
A2	Dredge North Flats with Island/Edge Disposal and Plantings	180,920	43.9
A3	Dredge South Flats with Island/Edge Disposal and Plantings	256,608	106.2
A4	Dredge North and South Flats with Island/Edge Disposal and Plantings	388,770	150.0
A5	Dredge North Flats with Upland Disposal	280,915	26.6
A6	Dredge South Flats with Upland Disposal	449,901	64.2
A7	Dredge North and South Flats with Upland Disposal	470,300	90.7

as the TSP and ultimately as the Recommended Plan. The information use by the software is listed in Table 3-12. However, according to guidance from ER 1105-2-100, E-41 c., the NER plan will rarely not be among the Best Buy plans. The reason for such a selection should be clearly explained in the supporting documentation, as well as the potential implications for cost sharing. The background information used for the CE/ICA analysis is found in Appendix F.

The results of the IWR Planning Suite analysis on the Final Array of Alternatives are found in Table 3-13 and Figures 3-10 and 3-11. According to the analysis, the No-Action and all proposed edge creation alternatives were found to be cost-effective. Two alternatives (3 and 4) plus the No-Action were also designated as Best Buys. Based on the results of the IWR Planning Suite analysis, it was determined that all of the proposed edge creation alternatives and the No-Action Alternative within the final array of alternatives could be considered for selection as the TSP and all the hydraulic dredging alternatives were eliminated from further consideration.

3.6 Plan Selection

3.6.1 National Ecosystem Restoration Plan

For ecosystem restoration projects only cost-effective plans can be considered and the NER Plan is normally selected. The NER plan reasonably maximizes ecosystem restoration benefits compared to costs and is consistent with the Federal objective. The NER plan must be shown to be cost-effective and justified to achieve the desired level of output (ER 1105-2-100).

Based on the results of the WVA modeling, the IWR Planning Suite Analysis, and the impacts of the alternative plans, Edge Creation North and South Flats Combined (Alternative A4) was selected as the NER plan. The NER plan is also identified as the environmentally preferable plan (EPP) since it maximizes the environmental benefit.

Table 3-13. Cost-Effectiveness and Incremental Cost Analysis (IWR Plan)

Alternative		Annualized Cost	Output (AAHUs)	Cost-Effective
A1	No-Action Plan	$ 0	0	Best Buy
A2	Dredge North Flats with Island/Edge Disposal and Plantings	180,920	43.9	Yes
A3	Dredge South Flats with Island/Edge Disposal and Plantings	256,608	106.2	Best Buy
A4	Dredge North and South Flats with Island/Edge Disposal and Plantings	388,770	150.0	Best Buy
A5	Dredge North Flats with Upland Disposal	280,915	26.6	No
A6	Dredge South Flats with Upland Disposal	449,901	64.2	No
A7	Dredge North and South Flats with Upland Disposal	570,300	90.7	No

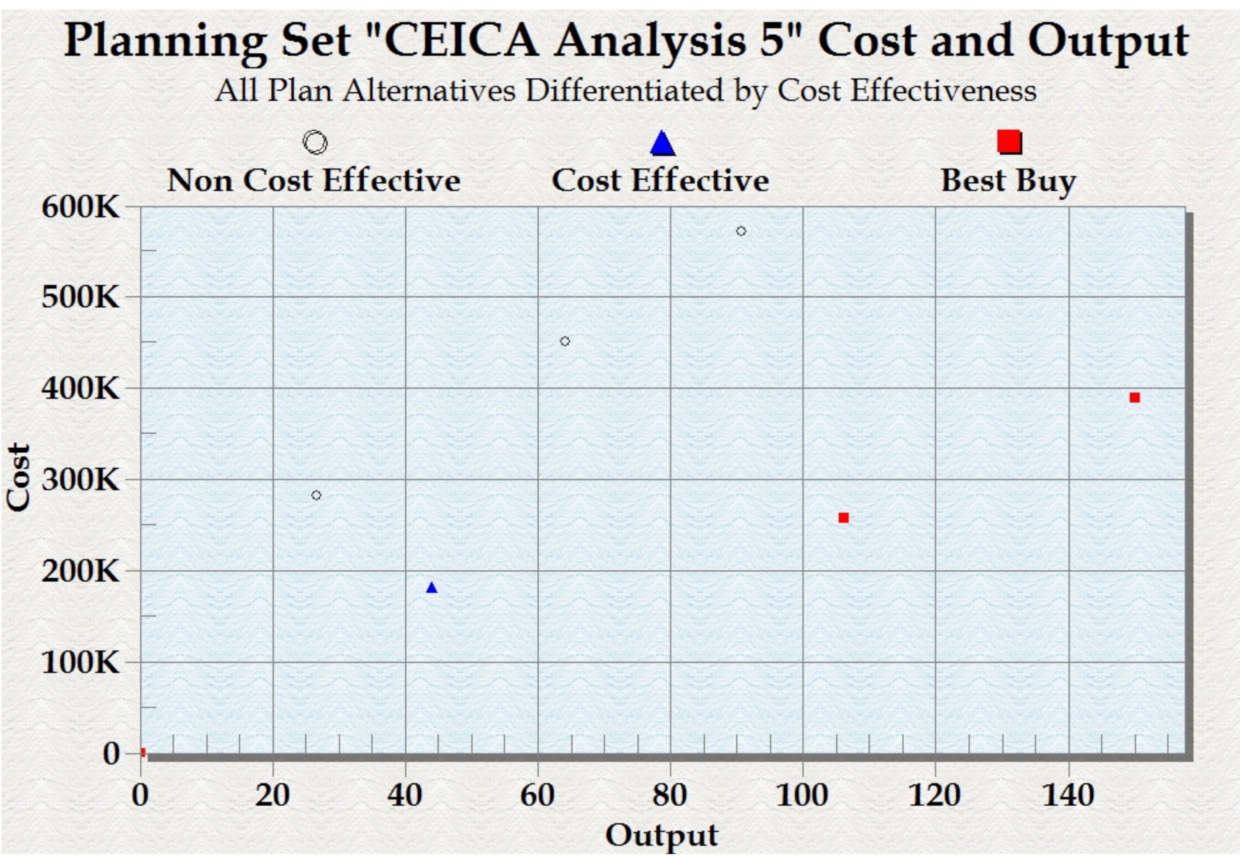

Figure 3-10. Cost-Effectiveness of Alternative Plans

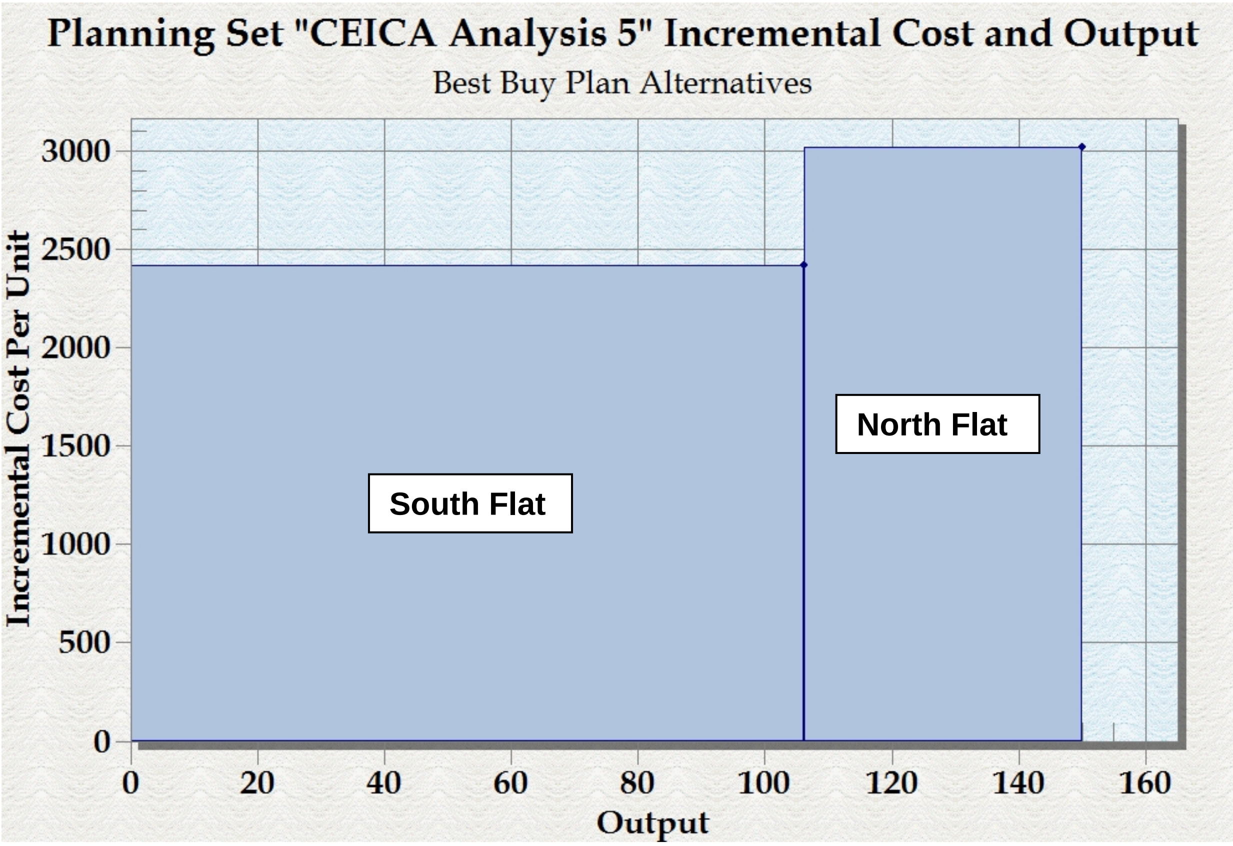

Figure 3-11. Incremental Cost and Output from Best Buy Alternatives

- **Completeness:** The NER plan is complete and accounts for all necessary investments to ensure the realization of the outputs of 150 AAHUs, creation of approximately 19,400 linear feet of quality edge habitat, and improve 5,500 linear feet of existing edge habitat. This plan would be complimentary to the LDNR/LDWF plan to restore the entire lake. Elements this LDNR/LDWF Plan include water level management, NPS management, and fisheries management. The plan would greatly enhance the False River system and be additive to these NER outputs. Additional plantings have been included and a conservative volume loss of 70 percent has been included in the analysis and plan.

- **Effectiveness:** The NER plan would create 150 AAHUs, create or improve about 24,900 linear feet of edge habitat, and create a wetland complex for use by many forms of fish and wildlife at an approximate cost of $7.8 million. This plan is cost-effective and is considered a Best Buy.

- **Efficiency:** This NER plan is the most cost-effective plan evaluated and has been optimized to create the most habitat function for the least cost. The average project cost per AAHU is $52,278. This cost is within the price range of restoration in that mitigation banks within the CEMVN range from $40,000 to $60,000 per unit. The non-Federal sponsors do not have all the resources to accomplish this plan, but have shown an interest in providing their 35 percent cost share.

- **Acceptability:** Coordination to date has indicated a strong support by the non-Federal sponsors and the general public. The NER plan will have to be reviewed by the public, resources agencies, and the non-Federal sponsors.

3.6.1.1 Significance of Resources and Effects

Institutional – The NER plan is an effective means of carrying out the missions of the USACE, non-Federal sponsors, and the public. It would restore lost ecosystem functions that would provide for environmental quality, habitat improvement, recreational opportunities, and public benefit.

Public – The public is very supportive of this plan, particularly the residents and users of the lake. The public has been looking forward to the development of this project since the study began in 2001.

Technical – The plan is technically significant because it is based upon scientific data, and currently accepted models, and current engineering principles. The lake and restored habitat have been recognized as technically significant.

3.6.2 Regional Economic Development (RED) Benefits

Although the project is justified on the NER, there would be some economic benefits to the region and nation (NED). If the habitat is restored, the economy would be benefited by the inflow of people from the region (Baton Rouge, Lafayette, and New Orleans) coming to False River for fishing and recreation. Tax and economic revenue would be gained by the purchase of the goods and services.

3.6.3 Other Social Effects (OSE)

Point Coupee Parish residents would benefit from the restoration by the increase property values, recreational opportunities, improved aesthetics, and a more quality environment.

3.6.4 Environmental Quality (EQ)

The NER plan would create 150 AAHUs, approximately 19,400 linear feet of quality edge habitat, and improve 5,500 linear feet of existing edge habitat. The NER plan is consistent with the Environmental Operating Principles.

3.6.5 Tentatively Selected Plan (TSP)/Recommended Plan

The Tentatively Selected Plan (TSP) was selected for recommendation from among the alternatives considered for this project. The TSP must be shown to be preferable to taking No-Action (if the no-action plan is not recommended) or implementing any of the other alternatives considered during the planning process (ER 1105-2-100).

Based on the results of the WVA modeling, the IWR Planning Suite Analysis, and the impacts of the alternative plans, Alternative A4 (Dredge North and South Flats with Island/Edge Disposal and Plantings) was chosen as the TSP. This plan includes both flats in the final array and is the same as the NER and EPP. The TSP/Recommended Plan can be justified based on ecosystem benefits. This alternative provides sustainable benefits for the areas of impact with 150.0 AAHUs. The Non-Federal sponsor supports Alternative 4 (Dredge North and South Flats with Island/Edge Disposal and Plantings) as the Recommended Plan (Appendix B).

3.7 Risk and Uncertainty

Some risk and uncertainty are associated with the cost and benefits analysis process. Costs for the construction phase of each alternative were estimated, based on information gathered from construction professionals. In addition, since this is a feasibility level study, further analysis is needed for the geotechnical and chemical analysis, as well as a more thorough bathymetric survey of the project area. In an attempt to safeguard against any uncertainties, a 35 percent contingency cost was added to the total cost of construction for each alternative.

3.8 Implementation Requirements

3.8.1 Schedule

It is estimated that it would take approximately 18 months from the completion of the feasibility report to the beginning of construction and three years to turn the project over to the non-Federal sponsor (Table 3-14).

Table 3-14. Anticipated Implementation Schedule

Phase	Month
Complete Feasibility	Jun 2013
Negotiate and Execute Project Partnership Agreement	Oct 2013
Complete Plans and Specifications	Jun 2013
Complete Bid Documents and Advertise	Aug 2013
Award Bid	Dec 2013
Construction Begins	Jan 2014
Complete 1st Lift	Jun 2014
Complete 2nd Lift (after 6 month settlement)	Mar 2015
Complete Planting	Mar 2015
Turn Project over to non-Federal sponsor	Jun 2016

3.8.2 Implementation Responsibilities

Once the USACE and the non-Federal sponsor execute the Project Partnership Agreement (PPA), the development of the plans and specification phase would begin. Some temporary staging areas would be needed by the construction contractor. The rest of the project area is over State of Louisiana waterbottoms. The advertisement of the construction contract would follow and the construction contract awarded. After construction, the USACE' acceptance from the contractor and notice of construction completion of the project (or a functional portion of the project) to the non-Federal sponsor would proceed or be concurrent with the delivery of an O&M manual and as-built drawings. The estimated schedule for project construction is shown in Table 3-13. The non-Federal sponsor will, prior to implementation, agree to perform all of the local cooperation requirements and non-Federal obligations. Local cooperation requirements and Non-Federal sponsor obligations include, but are not necessarily limited to:

a. Provide a minimum of 35 percent of total project costs as further specified below:

   (1) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that the Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project;

   (2) Provide, during construction, any additional funds necessary to make its total contribution equal to 35 percent of the total project costs allocated to the project;

b. Provide the non-Federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation, that are in excess of 1 percent of the total amount authorized to be appropriated for the project;

c. Not use funds provided by a Federal agency under any other Federal program, to satisfy, in whole or in part, the non-Federal share of the cost of the project unless the Federal agency that provides the funds determines that the funds are authorized to be used to carry out the study or project;

d. Not use project or lands, easements, and rights-of-way required for the project as a wetlands bank or mitigation credit for any other project;

e. For as long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the project, or functional portions of the project, including mitigation, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations and any specific directions prescribed by the Federal Government;

f. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor, now or hereafter, owns or controls for access to the project for the purpose of inspecting, operating, maintaining, repairing, replacing, rehabilitating, or completing the project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Federal Government shall relieve the non-Federal sponsor of responsibility to meet the non-Federal sponsor's obligations, or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance;

g. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the United States or its contractors;

h. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the initial construction, periodic nourishment, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

i. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the initial construction, periodic nourishment, operation, or maintenance of the project;

j. Agree that, as between the Federal Government and the non-Federal sponsor, the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, and repair the project in a manner that would not cause liability to arise under CERCLA;

k. Prevent obstructions of or encroachments on the project (including prescribing and enforcing regulations to prevent such obstruction or encroachments) which might reduce ecosystem restoration benefits, hinder operation and maintenance, or interfere with the project's proper function, such as any new developments on project lands or the addition of facilities which would degrade the benefits of the project;

l. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as would properly reflect total costs of construction of the project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

m. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5), and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

n. Comply with all applicable Federal and state laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army," and all applicable Federal labor standards and requirements, including but not limited to 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying, and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq*.); and

o. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way necessary for the initial construction, periodic nourishment, operation, and maintenance of the project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

3.8.3 Cost Sharing

Following the feasibility phase, the cost share for the planning, design and construction of the project will be 65 percent Federal and 35 percent non-Federal. The non-Federal sponsor must provide all lands, easements, rights-of-way, utility or public facility relocations, and disposal areas (LERRDs) required for the project. Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) of the project would be a 100 percent non-Federal sponsor responsibility.

3.8.4 Environmental Commitments

The USACE, non-Federal sponsor, and all contractors would commit to following all laws and executive orders, and to avoid and minimize adverse impacts to the environment by the following:

- Employ necessary Best Management Practices (BMPs) to reduce erosion and sedimentation during construction. The Plans and Specifications would include such BMPs and erosion control measures, as necessary. The Contractor would be required to develop a Storm Water Pollution Prevention Plan (SWPPP) that would be coordinated through the Louisiana Department of Environmental Quality (LDEQ).

- The Contractor would be made aware of any practices or measures that need to be compliant with the Endangered Species Act (ESA). The Contractor would be made aware of any practices or measures to protect cultural resources.

- The USACE and the non-Federal sponsor agree to maintain coordination with the U.S. Fish and Wildlife Service (USFWS) and the LDEQ to ensure compliance with all laws and executive orders.

- The Contractor would be prohibited from dumping oil, fuel, or other hazardous substances and would require that all appropriate sanitation measures are followed. The Contractor would develop a Spill Prevention Control and Countermeasure plan (SPCC).

3.8.5 Views of Non-Federal sponsor

The Parish, by its letter of support dated June 26, 2001 (Appendix B), has expressed the desire to be the non-Federal sponsor for implementing the False River Ecosystem Restoration project. The LDNR has indicated interest in becoming a partner as well (Appendix B). It is anticipated that LDNR and Parish would sponsor this project construction in accordance with the items of local cooperation that are set forth in the recommendations chapter of this report.

3.8.6 Financial Requirements

It is expected that the Pointe Coupee Parish Police Jury will have the capacity to provide the required local cooperation for the Recommended Plan. A financial plan has been provided to financially participate (Appendix B). A standard cost share percentage of 65 percent Federal and 35 percent non-Federal would be applied to the total cost of the project. The 35 percent share of the project cost includes the State of Louisiana's responsibility for providing all LERRDs. The non-Federal sponsor would be required to contribute 100 percent of the OMRR&R.

4.0 AFFECTED ENVIRONMENT*

This section forms the baseline for determining the environmental effects of the proposed action and reasonable alternatives.

4.1 ENVIRONMENTAL SETTING OF THE STUDY AREA

4.1.1 Location

False River is located in Pointe Coupee Parish, in southeastern Louisiana. The southern end of the lake is located approximately 23 miles northwest of Baton Rouge, Louisiana.

4.1.2 Climate

The climate in the False River area is subtropical. The mean annual temperature in New Roads is 66.8ºF, with an annual average low temperature of 56.6ºF and an annual average high temperature of 77.1ºF (U.S. Climate Data 2012). The predominant influence on the climate in the area is the maritime tropical air mass associated with the Gulf of Mexico. Major rainstorms in the study area are associated with tropical disturbances in summer and early fall, with frontal activity and extratropical cyclones in late fall, winter, and spring. Convective thunderstorms produce intense but localized rain in late spring and summer. The mean annual precipitation in New Roads is 61.1 inches; the maximum precipitation generally occurs during the winter and early spring and the minimum precipitation occasionally occurs during the summer (U.S. Climate Data 2012).

4.1.3 Geomorphic and Physiographic Setting

False River is located in the southeast portion of Pointe Coupee Parish (Figure 1-1). Between 1713 and 1722, this approximately 11-mile long oxbow lake was formed when the Mississippi River changed its course. False River is located west of the Mississippi River between river miles 257.5 and 260. Louisiana is within the Gulf portion of the Coastal Plain, one of the principal natural regions, or physiographic provinces, of the United States. Louisiana can be divided into three main geographic land areas, the East Gulf Coastal Plain, the Mississippi Alluvial Plain, and the West Gulf Coastal Plain. False River lies within the Mississippi Alluvial Plain.

Largely a low-lying and swampy area, the Mississippi Alluvial Plain has an average width of about 80 km (about 50 mi) and slopes gently southward from 35 m (115 ft) on the Louisiana-Arkansas border to sea level at South Pass, one of the delta’s main channels at the mouth of the Mississippi River. Near New Orleans, parts of the plain lie below sea level. Historically, water shaped the land in this area. The ridges and swales, levees, oxbows, and terraces of the Valley resulted from meanderings and floods of the Mississippi River.

4.1.3.1 Stratigraphy

The Mississippi Alluvial Valley consists of a broad sequence of late Tertiary (66–1.65 million years before present [Ma]) and Quaternary (1.65 Ma to present) sediments deposited by the Mississippi River, which dip very slightly to the south (i.e., the principal direction of riverine flow). The earliest sedimentary formations present in the stratigraphic record for the Mississippi Alluvial Valley belong to the Trinity Group, an assemblage of sand, gravel, clay, limestone, and evaporite deposits that formed in a shallow, restrictive marine environment in the early Cretaceous Period (144–66 Ma)(McFarland 2004). The Trinity Group is overlain by the Goodland Formation, a sandy limestone formation with occasional intervals of calcareous sandstone, deposited during a period of sea level transgression. The overlying Kiamichi Formation, a layer of closely-packed oyster shells embedded in a marl matrix, indicates that sea level retreated at the end of the early Cretaceous Period.

Late Cretaceous formations belong to the Gulfian Series, an assemblage of nearshore and open marine formations that reflect the extensive sea level transgression that occurred throughout Central North America as a result of oceanic displacement caused by increased seafloor spreading at the Mid-Atlantic Ridge (Guccione 1993). Early formations within this group include the Woodbine and Tokio formations, whose coarse gravel and sand with volcanic ash layers reflect deposition in a coastal nearshore environment during a period of increased volcanism. Later formations within this series, including the Brownstone Marl, Ozan, Annona Chalk, Marlbrook Marl, Nacatoch Sand, and Arkadelphia Marl, are typified by fossiliferous chalk and clay marls with occasional intervals of fine sand, reflecting deposition in a shallow continental shelf environment (McFarland 2004).

Tertiary deposits reflect an interval of sea level regression, beginning with the Midway Group, a sequence of calcareous and clay shales with occasional intervals of sandstone, representing the transition from an open marine to a coastal nearshore environment (McFarland 2004). Continued regression is reflected in the overlying Wilcox Group, a thick series of non-marine sands, silts, clays, and gravel. Subsequent sea level fluctuations are evident in the overlying Claiborne and Jackson Groups which contain marine and non-marine sands, silts, and silty clays. By the end of the Tertiary Period, the sea level had retreated to the point at which all of the area encompassed by the state of Louisiana was exposed above water, and the development of the proto-Mississippi River system within the Mississippi River Alluvial Valley became the dominant geologic influence in the study area. Quaternary sediments within the Mississippi Valley consist of unconsolidated sequences of sand, silt, clay, loess (glacial till), and alluvium deposited by the actions of the proto-Mississippi River system as it responded to sea level fluctuations associated with historic ice age events (Guccione 1993).

4.1.3.2 Recent Geologic History

The current topography in the Mississippi River Alluvial Valley began development during the Quaternary Period as a result of deposition of river sediments, Aeolian sand dune formation, and loess deposition in various parts of the valley (Guccione 1993). The proto-Mississippi river first formed in a wide, shallow valley and deposited sand and gravel in a series of channels that migrated laterally across the valley. Sea level lowstand intervals from ice ages in the Pleistocene Epoch (1.65-0.01 Ma) resulted in an increased coastal gradient that caused the river to entrench more deeply into the underlying Tertiary sediments along the west margin of the valley. The end of these ice ages brought about an increase in eustatic sea level and a lowering of the coastal gradient; the proto-Mississippi River system ceased its entrenchment and began depositing thick sand and loess deposits that were transported down the river system as the glaciers retreated. The river system subsequently eroded some of this sandy alluvium as a result of small-scale relative sea level fluctuations, forming newer and lower floodplains within the river valley. The older and higher floodplain surfaces that have been left are terraces. This entrenchment has occurred several times and there are several terraces; the highest terrace is always the oldest terrace.

During drought periods, wind-blown sand and dust were transported a short distance from the channel and deposited as aeolian sand dunes. The dust was lighter and could be blown greater distances (Guccione 1993).

The eustatic sea level rise at the end of the most recent ice age caused the proto-Mississippi River and its associated tributaries to switch from a braided river system (typical of environments with a higher gradient) to the meandering river system that exists today. Rivers within a meandering system migrate laterally by eroding the outside of river bends and depositing point bars on the inside of the river bends. Abundant oxbow lakes mark old positions of the channel that have been abandoned when the river cut through a narrow piece of land separating two meander bends (Guccione 1993).

4.1.3.3 Geomorphology

The dominant geomorphology of a meandering river system environment is that of the meander belt. Common landforms in this regime are natural levees, crevasse splays, point bars, floodplains, abandoned channels, abandoned courses, and backswamps/flood basins (Saucier 1994). A LiDAR map of the False River Watershed is presented in Figure 4-1.

Meander Belts - A river develops a meandering regime under the following conditions:

- The river has a high suspended load/bed load ratio;
- The river passes through a region with a low geographic gradient;
- The river is bordered by cohesive banks;
- The river has a relatively steady annual discharge rate; and
- The river is responding to a relatively constant base level.

A meandering regime is characterized by a sinuous river channel in which broad loops (or meanders) migrate laterally over time as a result of differential current velocities within the channel. Sediments within this regime are deposited in a series of active and abandoned channel environments and proximal overbank deposits. Because the highest rates of sedimentation occur near the active channel, the dominant feature within such a regime is the meander belt, an alluvial ridge that lies at a higher elevation than the adjacent floodplain. The formation of successive meander belts over time results in the formation of numerous interbelt lowlands and depressions (Saucier 1994).

Natural Levees - Natural levees form adjacent to stream and river systems as the result of sediment deposition in low-velocity, off-axis currents within the systems. Levees consist of interbedded sand, silty sand, silt, and mud, and may rise as much as 16 feet above average river level.

Crevasse Splays - Crevasse splays are discrete *mini-deltas* or thin lobate sediment deposits that form adjacent to unusually large or persistent crevasses. These splays typically form on the distal side of a natural levee and extend into the floodplain beyond the levee complex. Crevasse splays generally fill after a short period of time and form slight topographic features with coarser sediment than the surrounding floodplain deposits. Anastomosing channels are present from a large, natural crevasse that formed along the south side of False River when it was the active course of the river (Saucier 1994).

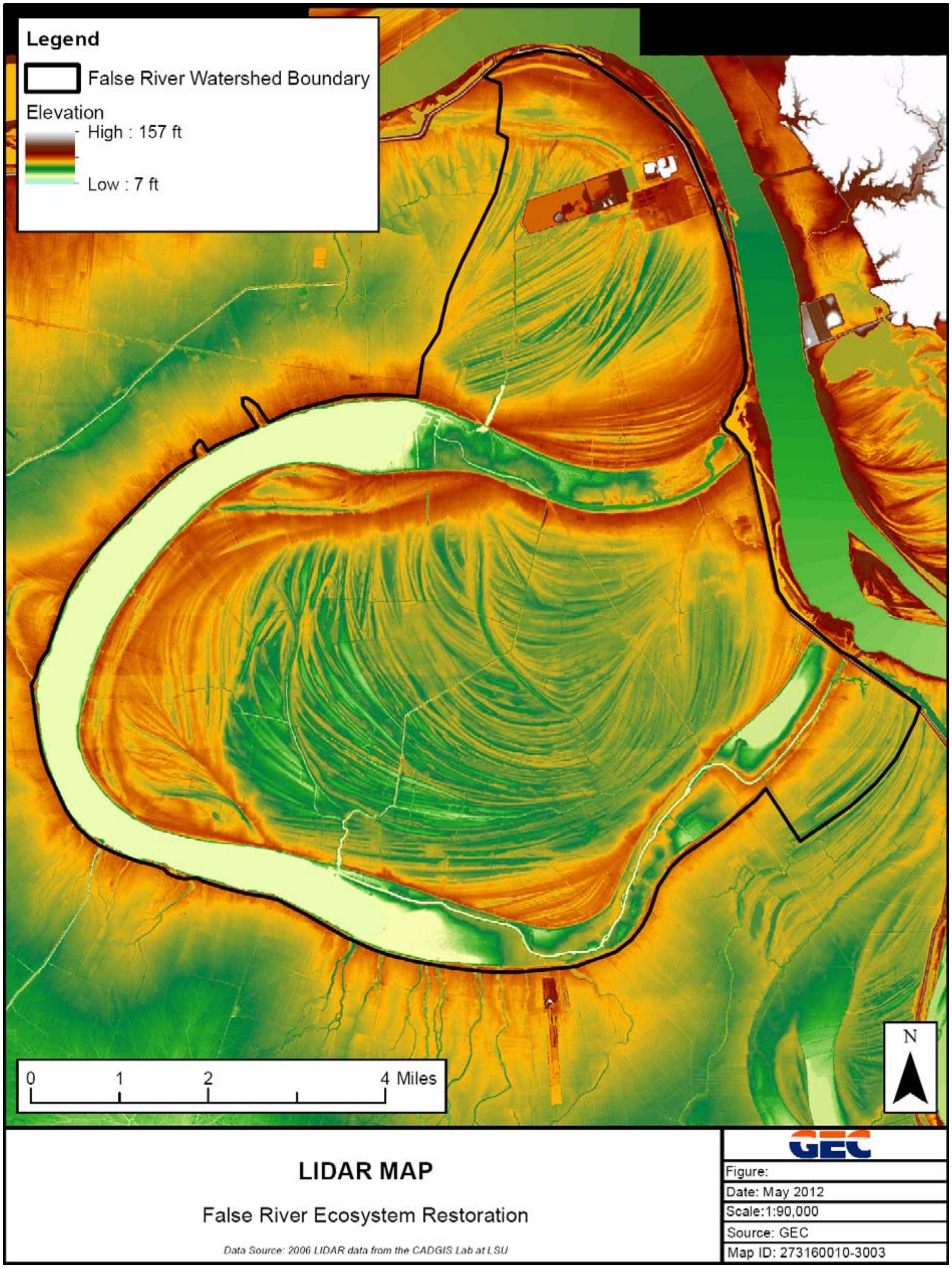

Figure 4-1. LiDAR Map of the False River Watershed

Point Bars - Point bars form on the inside banks of meandering river systems due to waning current velocities. Point bars consist primarily of sand and silt with occasional gravel and exhibit a lower topographic relief than natural levees. Below the mouth of the Red River, the amount of point bars associated with the Mississippi River meander belts become noticeably and progressively smaller. This is in part due to the downstream decrease in the grain size and quantity of bed load of the river and the lesser age of the channels.

Floodplains - Floodplains are flat areas adjacent to stream/river systems that are separated from the river systems by natural levees. Floodplains are periodically inundated with water by river flooding. They typically consist of fine clay, clay, and silt, and may be quite laterally extensive.

Abandoned Channels - Abandoned channels form in meandering river systems when expanding meanders intersect each other. The river then moves through the breach in the meanders, abandoning the former arc-shaped channel. Following channel abandonment, sand bars typically form at the upper and lower ends of the abandoned segment, creating an oxbow lake. Although they are cut off from the river, oxbow lakes may receive overflow from the river during high water periods. Sediment transported in overflow water accumulates in these oxbows, eventually filling the oxbows. The ultimate fate of an oxbow lake depends primarily on the behavior of the active river channel after it is cut off. If the river channel remains relatively nearby and there is an effective connection, the lake may fill completely and be characterized by a dense swamp forest. The filled oxbow lake still occupies a topographic low relative to its surrounding natural levee deposits and the former oxbow may ultimately become an arc-shaped swamp or a marsh surrounded by confining natural levee deposits (Saucier 1994).

Conversely, if the river channel meanders well away from the lake or occupies a new meander belt, the ox-bow lake may persist for a long time as a relatively deep water body. More typically, however, the active river channel will eventually meander back toward the abandoned channel, constructing a natural levee over and filling and obscuring some portion of the feature. Portions of the abandoned channel (or oxbow lake) not directly affected by natural levee development will persist thereafter for an unusually long period of time. This is because the natural levee ridge seals off the batture channels and forces local drainage to exit the abandoned channel via a different route, often into the flood basin flanking the meander belt. Sediment introduction into the abandoned channel is thereby sharply reduced. Immediately after a neck cutoff takes place, sand bars quickly form in the upper and lower arms of the abandoned stream bend and an oxbow lake is created. No river through-flow takes places, but the lake is not completely hydraulically isolated from the river. Small channels called batture channels form and maintain themselves through the sediment wedges in the arms and allow overflow from the oxbow lake to enter the river at low stages and floodwaters to back up into the lake during high stages. Because of this hydraulic connection, fine-grained suspended sediment (clays and silts) periodically enters and is deposited in the oxbow lake, causing it to slowly fill. As the lake shallows, the sediment wedges or plugs in the arms also expand at the expense of open water, from deposition of clays and silts rather than sands. The fine-grained channel-fill deposits constitute what engineers call *clay plugs* (Fisk 1947) and are manifest at the surface by a flat, featureless freshwater marsh or swamp.

False River no longer receives overflow water from the river during high water periods because of the levees along the river; therefore, it is likely to persist for a long time as a relatively deep water body.

Abandoned Courses - Abandoned courses represent areas through which a stream or river once flowed. These areas often contain terrace features and sediments similar to those of stream and river systems and natural levees.

Backswamps/Flood Basins - Backswamps and flood basins are typically found in low-lying areas bordering floodplains. They may also form between relict river terraces or meander belts or from sedimentation in oxbow lakes. They are typically inundated with water and consist of mud and silt with large quantities of peat or other organic matter.

Terrace Levels - Terrace levels are well-defined straight or mildly sinuous scarps caused by the truncation of earlier deposits by the lateral migration of braided channels. These terraces generally overlie coarse-grained outwash deposits caused by streams carrying large quantities of meltwater from the last glacial period. Outwash deposits are often resistant to erosion and foster the development of braided systems. The Mississippi River was the sole source of the outwash deposits of the Western Lowlands, whereas other areas in the alluvial valley area likely represent a mixture of both Mississippi and Ohio River sediments (Saucier 1994).

4.1.3.4 Bathymetry

False River has a bathymetry typical of Mississippi River oxbow lakes (Figure 4-2); with a steep outer bank and a gradually sloping inner bank (Ensminger 1998). The average depth of False River was 22.0 feet, with a depth of 20.3 feet or greater over more than 50 percent of the lake-surface area. The lake is deepest in the southwestern portion near the spillway and Lighthouse Canal (Ensminger 1998).

4.2 SIGNIFICANT RESOURCES

4.2.1 Geology

Subsurface sediments in the vicinity of the project area are typically composed of 60–100 feet of Holocene (0.1 Ma to present) sands and silts overlying Pleistocene (2.0–0.1 Ma) clays. Holocene sediments are thickest in point bar deposits on outside bends of the Mississippi River. Both sediments are typical of deltaic deposition, and represent a progradation over time from a coastal deltaic environment to a more inland coastal plain regime.

4.2.2 Soils and Waterbottoms

4.2.2.1 Soils

Soils in the False River watershed are primarily Sharkey-Tunica complex (31.2 percent) and Dundee-Alligator complex (22.8 percent), Commerce silt loams (16.8 percent) and Commerce silty clay loams (15.2 percent) (Table 4-1, Figure 4-3). Sharkey clays and silty clay loams, Bruin very fine sandy loams, and Convent silt loams are also present.

Most of the land on the Island has been classified as potentially highly erodible land; the rest of the land surrounding False River has been classified as non-highly erodible land. The area around False River is primarily prime farmland.

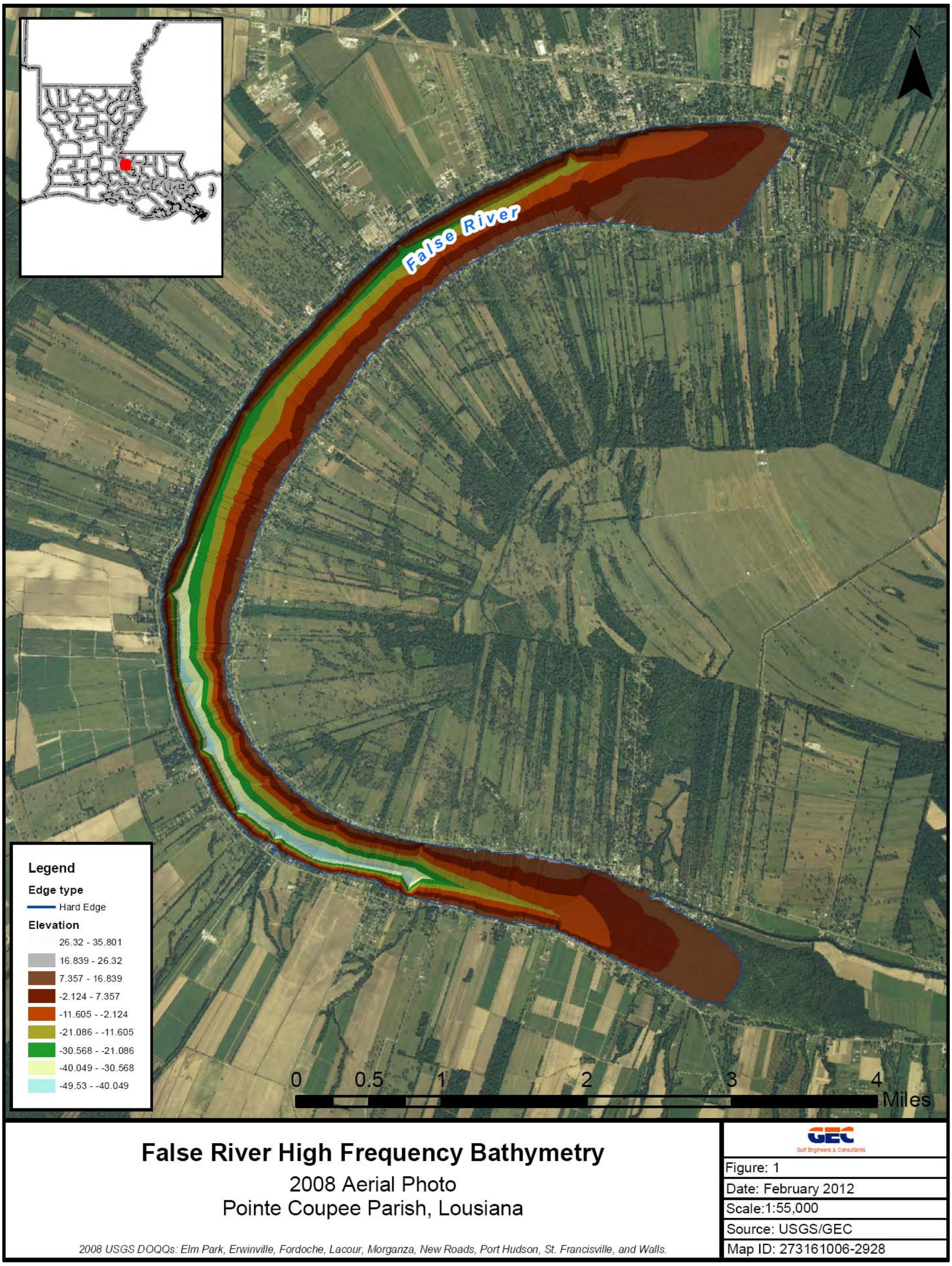

Figure 4-2 Bathymetry of False River

Table 4-1. Soils in the False River Watershed

Soil Symbol	Soil Name	Acres
All Hydric Soils		
Mh	Mhoon silty clay loam	275.1
Se	Sharkey silty clay loam	1,074.8
Sf	Sharkey clay	230.1
Sh	Sharkey clay, occasionally flooded	228.5
Partially Hydric Soils		
De	Dundee-Alligator complex, undulating	7,433.5
Sm	Sharkey-Tunica complex, gently undulating	10,195.2
Non-Hydric Soils		
Bn	Bruin very fine sandy loam	1,383.3
Br	Bruin very fine sandy loam, gently undulating	813.9
Ce	Commerce silt loam	5,478.3
Cm	Commerce silty clay loam	3,244.0
Co	Commerce silty clay loam, gently undulating	1,464.6
Cp	Commerce silty clay loam, occasionally flooded	264.9
Ct	Convent silt loam	573.7
RE	Robinsonville and Commerce soils, occasionally flooded	0.8
	Total Acreage of Land in Watershed	32,660.7
W	Water	3,488.1
	Total Acreage of Watershed	36,148.8

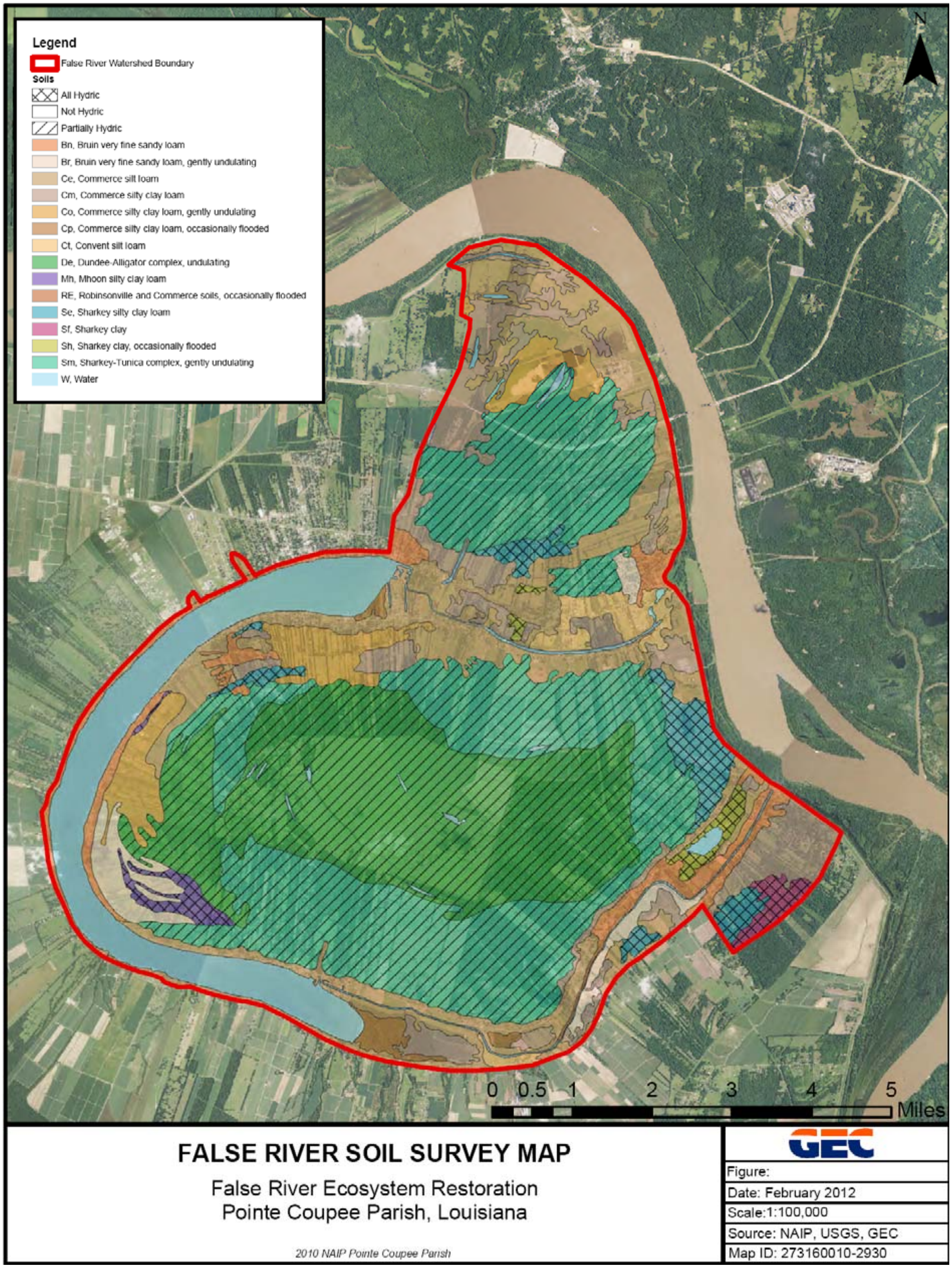

Figure 4-3. Soil Survey of False River Watershed

4.2.2.2 Waterbottoms

The USACE collected and analyzed sediment cores and grab samples during the summer of 2010 in association with the *False River Ecosystem Restoration Data Summary* (Appendix A). Six cores and eight grab samples were collected. Sediments generally consisted of clayey silt to about three feet below the sediment surface, and fine silty clay to core depth, which varied from 4 to 10 feet. All sediments were classified as fat clay, with the exception of one location on the north flat which was classified as lean clay.

Impacts to the waterbottoms by land use changes, sedimentation, and turbidity are discussed in Section 4.2.3.2.

4.2.3 Hydrology

4.2.3.1 Flow and Water Levels

The total surface area of False River is approximately 3,212 surface acres. False River has a drainage area of 62 square miles; the Lake watershed consists of primarily agricultural pasture-land (LDWF 2011). The water-surface area of False River was 3,060 acres, and the water volume was 67,300 acre-feet at normal pool stage (Ensminger 1998).

The northern end of False River primarily receives water from Patin Dyke Slough (M-2 Canal), ditches near the Cajun 2 Power Plant, and False Bayou (a batture channel at the northern end of False River). Surface water enters the southern portion of the lake through the Chenal (a batture channel at the southern end of False River), Discharge Bayou (The Outlet)/M-1 Canal, and farm drains.

Water exits False River through the False River Outfall Canal (also referred to as Lighthouse Canal, False River-Bayou Grosse Tete Canal, Rougon Canal, M-3 Canal, and FROC) and Bayou Sere. Generally, about 800 cfs (or 80 percent of the flow) exits the lake through the False River Outfall Canal and 200 cfs (or 20 percent of the outflow) exits the lake through Bayou Sere. The culverts under Louisiana Highway (LA Hwy.) 1 limit the amount of water flowing out of the False River Outfall Canal; modeling predicts that during a 100-year event, approximately 1,000 cfs would exit the lake through both Bayou Sere and the False River Outfall Canal.

The low normal pool level, coupled with storm patterns, can create high water levels that can result in a reverse flow into False River. When water builds up in Bayou Sere near False River, water flows towards the lake. Once lake levels rise and the downstream water surface lowers, the flow reverses, and water begins discharging downstream through Bayou Sere.

The lake level is controlled by a water control structure (Figure 4-4) on the False River Outfall Canal. The original water control structure, a fixed crest weir set at an elevation of 15 ft with box culverts and concrete wing walls, was constructed in 1947 (LDWF 2011a). In 1991, that structure was replaced with a sluice gate at each of the box culvert inlets (the tops of the gates were set at an elevation of 15 ft NGVD29). In 1999, risers were added to the tops of the sluice gates (the top of the gates with risers are set to maintain a normal pool elevation of 16 ft MSL) (LDWF 2011a). The water control structure currently consists of three gates positioned approximately 15 ft in front of three 8-ft by 8-ft box culverts under LA Hwy. 1. The maximum discharge rate for the spillway structure is 1,400 cfs (Ensminger 1998).

Figure 4-4. False River Control Structure Gates. False River is Behind the Photographer and LA Hwy 1 and Box Culverts are Behind These Gates

When stages in False River are near pool stage, excess storm water is discharged over the top of the gates at elevation 16 ft. During a flood event, the gates are opened to remove excess storm water. The gate configuration allows weir flow over the top of the gate and orifice flow when the gates are opened. When the gates are fully opened, the top of the gates is approximately 22 ft in elevation and the bottom of the gates would be approximately 16 ft elevation. Discharge from False River during a flood event begins as weir flow, then changes to orifice flow as the gates are opened, and finally the discharge is controlled by the box culverts.

High stages generally occur from February through April and low stages from September to December. Lake levels have varied from 13 to 22 ft, with episodic stage lowerings due to drought (Figures 4-5 to 4-8). Droughts usually occur during the summer months and generally lead to poor water quality.

Table 4-2. Forested Acres in Units 1–3 from Five Years of Aerial Photography

	Unit			
Year	1	2	3	Total
1959	2,379	928	9,089	12,396
1966	2,155	1,592	8,010	11,757
1972	1,855	1,122	6,070	9,047
1988	1,718	1,689	5,439	8,846
2008	2,093	1,658	5,853	9,604

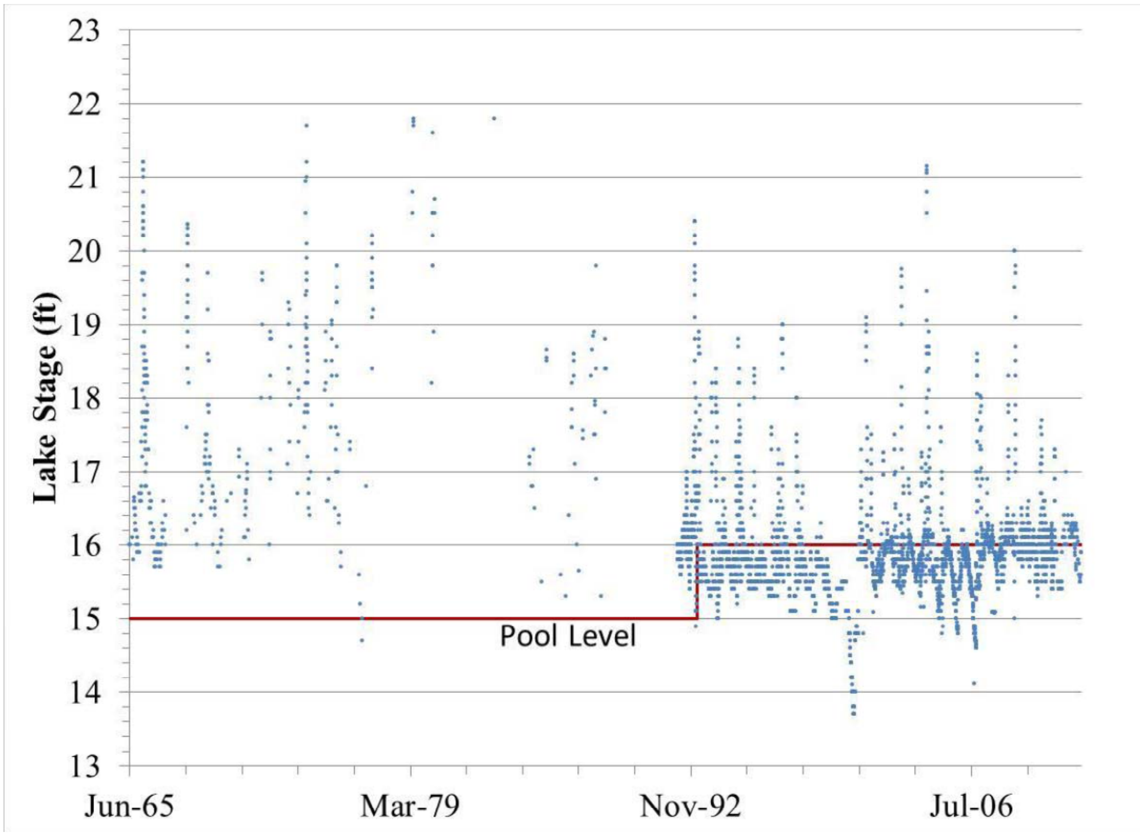

Figure 4-5. Lake Stages from 1965 – 2011 (LDNR/LDWF 2012a)

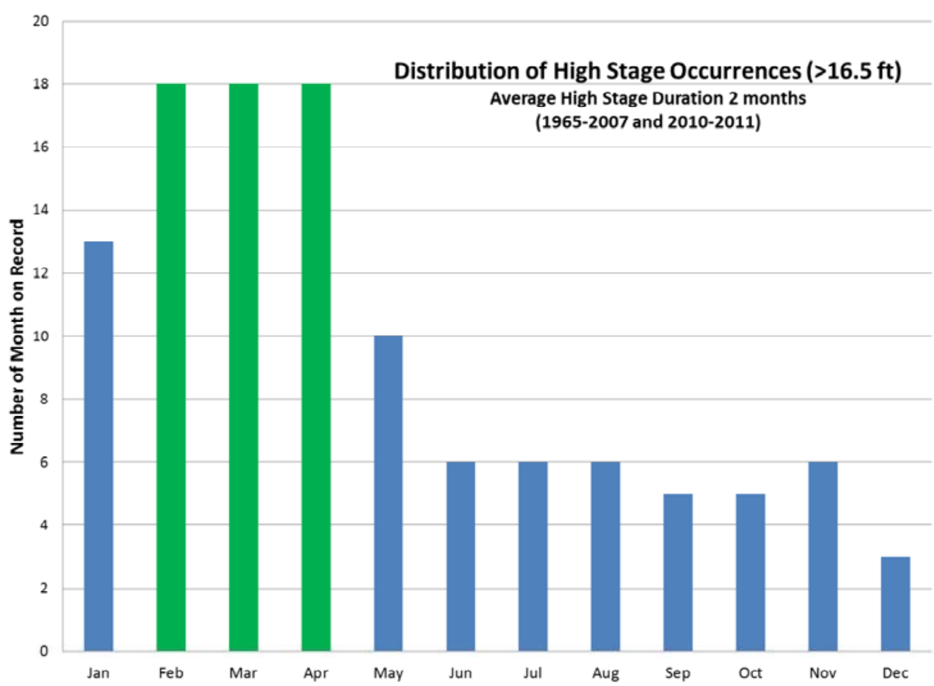

Figure 4-6. Monthly Distribution of High Water Stages (LDNR/LDWF 2012a)

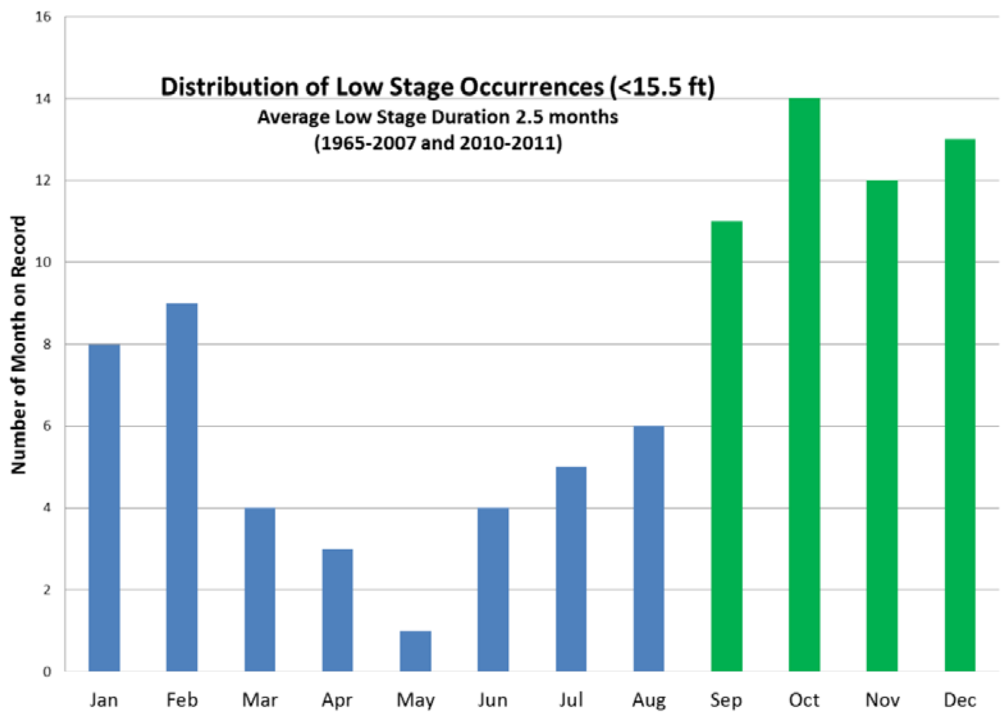

Figure 4-7. Monthly Distribution of Low Water Stages (LDNR/LDWF 2012a)

Figure 4-8. Photograph of the Shoreline of False River during the 2000 Drought (Courtesy of Jim Bello, Pointe Coupee Parish, Louisiana)

Oxbow lakes such as False River are also influenced by groundwater inflow and evaporation. The inflow rate and the volume of inflow depends on the stage of the Mississippi River and the stage of False River. High stages on the Mississippi River and low stages on False River will increase the rate of groundwater flow. Historically, during the spring months, river levels on the Mississippi River sharply increase when snow and ice melt in the Northern states. Typically during the fall, stages in the Mississippi River are low. Losses due to evaporation may be offset by groundwater inflow. Soils in the watershed are primarily silty clay loam or clay; these soils are somewhat poorly drained and have low infiltration rates. The hydrologic soil classification is Group C and D.

4.2.3.2 Sedimentation and Erosion

Existing Conditions - The term *sediment* refers to the material that settles to the bottom of a water body. Lake bottom sediments are a mixture of material that enters through the tributaries and municipal outfalls, and material generated within the lake itself, such as decaying plants, animals and shells, and fragmentary material from parent rock. The USEPA defines sediment as soil, sand, and minerals washed from land into water usually after rain (USEPA 1988c, as cited in USEPA 1993).

Sediment particles vary in chemical composition and physical characteristics, such as size and shape. Components of sediment include clay, silt, and sand-sized mineral particles, organic matter, hydrated iron, and manganese oxides. Associated characteristics of sediments include particle size, pH, and oxidation-reduction conditions (capacity to undergo chemical change). These components and associated characteristics of sediments can affect the interaction between sediment particles and contaminants.

Historical Conditions - A major issue in developing a restoration plan for False River involves evaluating the current rate of erosion, sedimentation, and turbidity. This evaluation is important to: (1) determine whether any erosion reduction alternatives are needed; and (2) determine whether the current rate of erosion, sedimentation, and turbidity would affect any restoration plans.

Coarse grain sediments appear to fall out of the water column near the mouth of Discharge Bayou (USACE 2011). The sediment sampling station near the mouth of Discharge Bayou (S1) contained some fine sandy silt; however, the other stations sampled in the south and north flats contained fine clayey silts or silty clays. The substrate of the north flats was very firm with shell. The southern flat samples contained more clay and softer; however, this is expected on the downstream flat of an oxbow. Sedimentation in most of the flats likely results from fine clay particles falling out of the water column from the incoming waters, particularly in the south flats. Excessive sediments that entered the lake during the 1980s and 1990s likely never consolidated because the lake levels are generally held constant and the flats rarely dry out. Wind and wave action can resuspend the clays in the shallow waters of the flats.

Turbidity and sedimentation are naturally occurring phenomena in many watersheds and have been observed in False River on historic aerial photography. A turbidity plume was photographed outside the mouth of Discharge Bayou and in the tip of the south flats during 1959 (Figure 4-9).

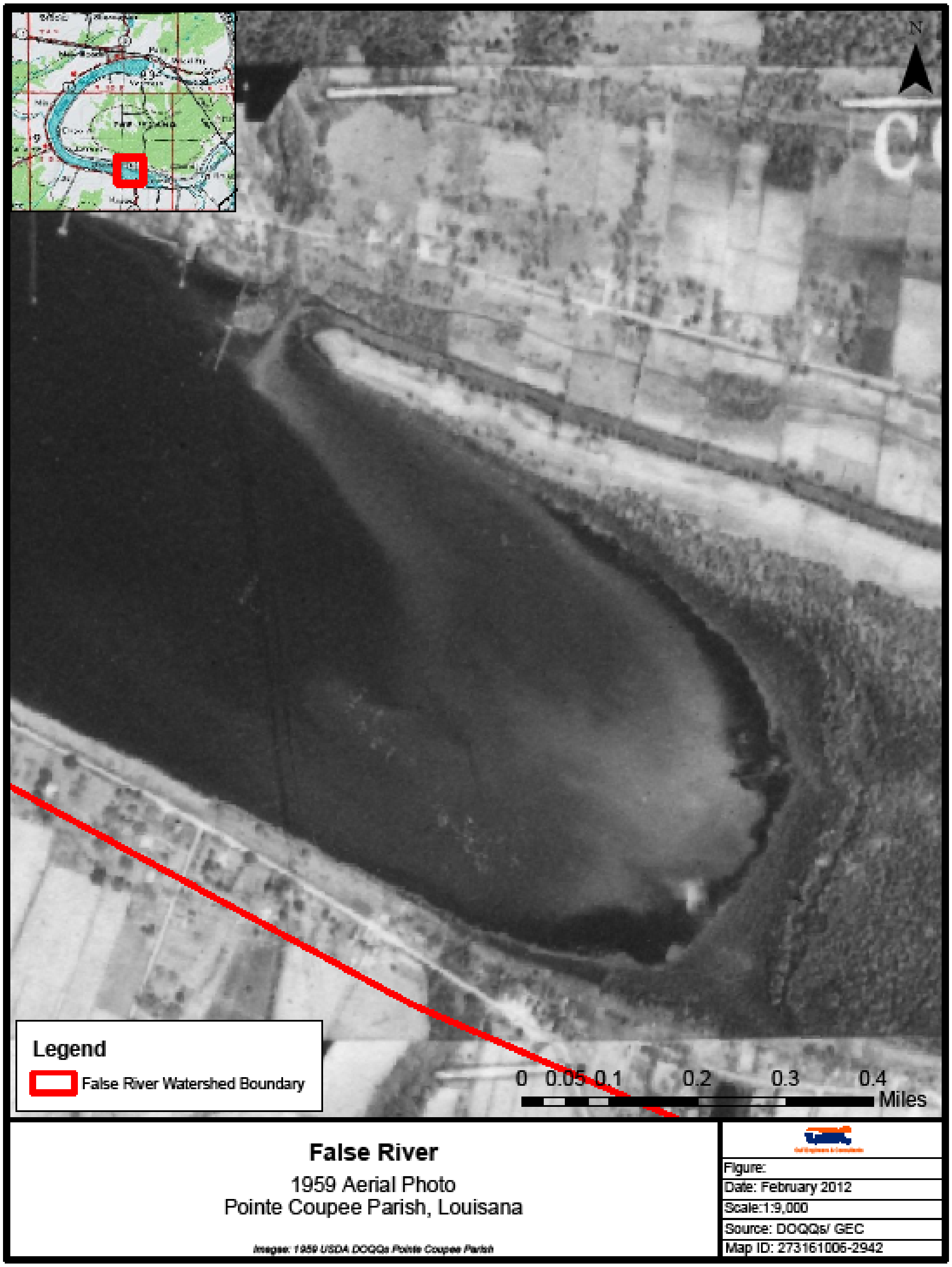

Figure 4-9. Turbidity Plume in the South End of False River in 1959

Land Use Changes - Many of the sedimentation problems in False River likely occurred due to past farming practices within the watershed (NRCS 2012). During the 1970s and 1980s, considerably more acreage in this watershed was devoted to row crop agriculture (NRCS 2012). Approximately 2,354 acres of forested habitat were lost from the 1950s (12,514 acres) to 2008 (10,160 acres)(NRCS 2012). Based on aerial photography of most of the watershed, approximately 3,550 acres of forested habitat were cleared from 1959 to 1988 (Table 4-2; Appendices P and Q). Much of this cleared acreage was planted with row crops for several years; the clearing and subsequent row cropping likely increased sediment and turbidity loads. Much of this cleared area was then converted to cattle pasture, reducing sediment and turbidity loads. The Island portion of the Bayou Grosse Tete Watershed Project was primarily constructed from 1988 to 1993.

Farming activities likely contributed larger amounts of sediment into False River than current sedimentation rates (NRCS 2012). The current land use map indicates that only about 4,719 acres are in row crops or barren land. The watershed is 36,149 acres. This accounts for only about 13 percent of the watershed. Many of these row crop farms were converted to pastureland, which undergoes considerably less erosion than cropland (NRCS 2012). Discharge Bayou/M-1 Canal drains approximately 75 percent of the entire watershed and Patin Dyke Slough drains the remaining 25 percent. The total watershed area consists of 2,300 acres of cropland, 1,700 acres of municipal areas (homes and businesses), 3,100 acres of water (False River), and the remaining 27,353 acres consist of pasture and woodland. Pasture and woodland were not separated for the NRCS report because of similar erosion rates occur on these land uses. About 75 percent of the municipal areas drain into False River via Patin Dyke Slough/M-2. Discharge Canal/M-1 drains 90 percent of the cropland acres within the watershed. The pasture and woodland areas are evenly dispersed throughout the watershed and 75 percent drain though Discharge Bayou and 25 percent drain through Patin Dyke Slough.

The Bayou Grosse Tete Watershed Project cleaned out and constructed canals and generally improved drainage, thereby creating more erosion. In 1976, an estimated 24,000 tons of sediment were being delivered to False River (NRCS 1976). Prior to the implementation of the Bayou Grosse Tete Watershed Plan, the main sources or erosion within this watershed was existing cropland (NRCS 2012). NRCS used the Revised Universal Soil Loss Equation (RUSLE2) program to estimate that about 20,760 tons of sediment per year are currently entering False River (8,760 tons/year from 2,300 acres of row crops and 12,000 tons/year from 27,353 acres of pasture and woodland). However, this number may actually be higher because RUSLE2 cannot calculate estimates for woodland, and pasture was used instead (NRCS 2012).

Restoration Efforts - In 2008, approximately 758 more acres were forested than in 1988 (Table 4-2; Figures 4-10 and 4-11). Approximately 572 additional acres of non-forested acres on the Island will be reforested though planned mitigation. This acreage includes some of the same areas that were previously cleared. An additional 141 acres have been placed in the NRCS Wetland Reserve Program (WRP). The mitigation and WRP acreage will increase the forested portion of the watershed to 10,317 acres.

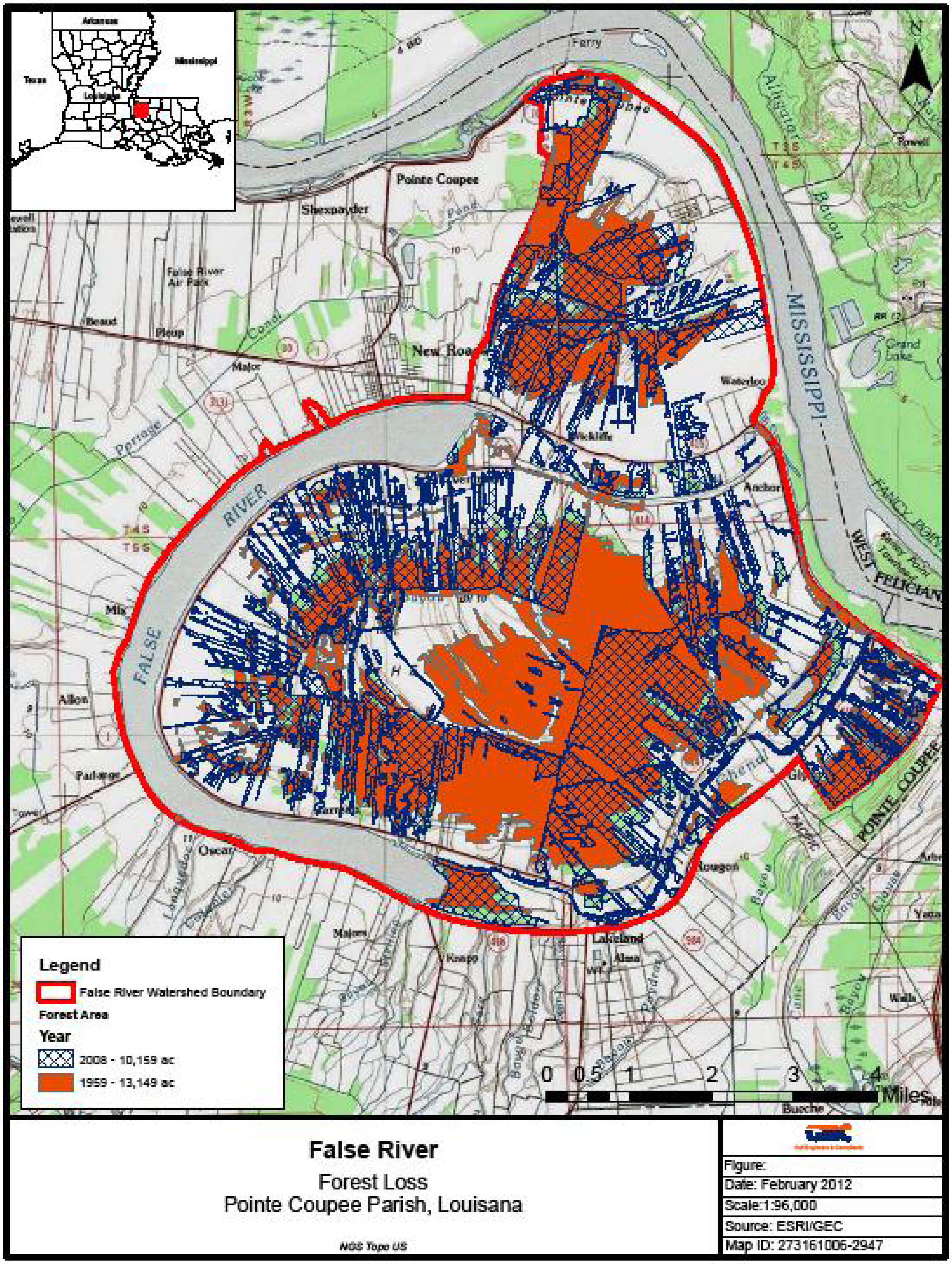

Figure 4-10. Forest Loss in the False River Watershed between 1959 and 2008

Figure 4-11. 1959 Aerial Photograph of False River Watershed

Environmental Quality Incentives Program (**EQIP**) – Some of the canals on pastureland within this watershed have been fenced from cattle through EQIP and other NRCS cost-share assistance programs (NRCS 2012; Figures 4-12 to 4-19). EQIP provides financial and technical assistance to agricultural producers to help plan and implement conservation practices that address natural resource concerns and provides opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland (NRCS 2012).

The EQIP Program and other efforts have reduced stream bank erosion, and allowed any erosion that occurs on pastureland, although minimal, to be filtered out before reaching canals within the watershed (NRCS 2012). Additional restoration and cattle fencing in the False River Watershed is proposed by LDNR/LDWF, (2012a,b) in cooperation with NRCS.

Figure 4-12. M-1 Canal Before EQIP Project Showing Erosion Created by Cattle (courtesy of NRCS, New Roads, Louisiana)

Figure 4-13. M-1 Canal before EQIP Project Showing Erosion Created by Cattle (courtesy of NRCS, New Roads, Louisiana)

Figure 4-14. M-1 Canal before EQIP Project Showing Erosion Created by Cattle (courtesy of NRCS, New Roads, Louisiana)

Figure 4-15. Post-construction Photograph of the M-1 Canal Showing the Fences and the Bank Dressing Performed by NRCS (courtesy of NRCS, New Roads, Louisiana)

Figure 4-16. Post-construction Photograph of the M-1 Canal Showing the Fences and the Bank Dressing Performed by NRCS (courtesy of NRCS, New Roads, Louisiana)

Figure 4-17. Post-construction Photograph of the M-1 Canal Showing the Fences and the Bank Dressing Performed by NRCS (courtesy of NRCS, New Roads, Louisiana)

Figure 4-18. Post-construction photograph of the M-1 Canal Showing the Fences and the Bank Dressing Performed by NRCS (courtesy of NRCS, New Roads, Louisiana)

Figure 4-19. Watering Troughs Placed near the M-1 Canal to Allow the Cattle to Drink without Creating Erosion Problems in the Canals (courtesy of NRCS, New Roads, Louisiana)

M-1 Canal Sediment Trap Cleanout. The cleanout record of the sediment trap on the M-1 Canal indicates that the erosion rate has been reduced nearly by an order of magnitude (Jim Bello, Pointe Coupee Parish, Pers. Comm.):

Year	Cubic Yards Cleaned Out
1999	10,000+
2006	8,000-10,000
2011	1,200

4.2.3.3 Water Use and Supply

Surface Water

Surface water has been abundant in Pointe Coupee Parish. Surface water use in Pointe Coupee Parish is primarily limited to domestic water supply. Pointe Coupee Parish has 22 lakes and three large rivers (Mississippi, Atchafalaya, and Red Rivers. Old River (another oxbow lake) frequently replenished by periodic overflow from the Mississippi River and has a capacity of 30 billion gallons. False River, replenished by rainfall and groundwater recharge, has a capacity of more than 20 billion gallons. The Atchafalaya River is another surface water source. Salinity concentrations increase in this river when flow is low in the Red and Black Rivers. The Intracoastal Waterway is also a source of groundwater.

Total surface withdrawals in 2005 for Pointe Coupee Parish equaled 288.48 million gallons per day (MGD). Residential, agricultural, and industrial uses are usually met by the proximity to the Mississippi River. From 1927 to 1965, the average flow of the river was about 600,000 cfs. A minimum flow of about 75,000 cfs occurred in 1939. The river water is moderately hard to very hard, calcium bicarbonate type and is suitable for various industrial processes and for agriculture irrigation.

4.2.3.4 Groundwater

Groundwater use in Pointe Coupee Parish is primarily limited to domestic water supply. False River overlies the Mississippi River Alluvial Aquifer, a Pleistocene-aged aquifer in the floodplain of the Mississippi River. Mississippi River alluvium consists of fining upward sequences of gravel, sand, silt, and clay. The aquifer is poorly to moderately well sorted, with fine-grained to medium-grained sand near the top, grading to coarse sand and gravel in the lower portions. It is confined by layers of silt and clay of varying thicknesses and extent. The Mississippi River Alluvial aquifer consists of valley trains and meander-belt deposits, two distinct components that are hydrologically closely related.

The Mississippi River Alluvial aquifer is hydraulically connected with the Mississippi River and its major streams. Recharge is accomplished by direct infiltration of rainfall in the river valley, lateral and upward movement of water from adjacent and underlying aquifers, and overbank stream flooding. The amount of recharge from rainfall depends on the thickness and permeability of the overlying silt and clay layers. Water levels fluctuate seasonally in response to precipitation trends and river stages. Water levels are generally within 30 to 40 feet of the land surface and movement is down gradient and toward rivers and streams. Natural discharge occurs by seepage of water into the Mississippi River and its streams, but some water moves into the aquifer when stream stages are above aquifer water levels. The hydraulic conductivity varies between 10 and 530 feet/day.

The maximum depths of occurrence of fresh water in the Mississippi River Alluvial Aquifer range from 20 feet to 500 feet below sea level. The range of thickness of the freshwater interval in the Mississippi River Alluvial is 50 to 500 feet. Depths of Mississippi River alluvial wells in this region range from 30 to 352 feet.

Groundwater is abundant in Pointe Coupee Parish from several alluvial and sand aquifers.

- The alluvial aquifers - geologically, Atchafalaya Aquifer and Upper Chicot Aquifer
- The 600-foot sand aquifer - Lower Chicot Aquifer
- The 800-foot, 1,000-, 1,200-, 1,500-, and 1,700-foot sand aquifers - Evangeline Aquifers
- The 2,000-, 2,400-, and 2,800-foot sand aquifers—Miocene series

The alluvial aquifers have produced as much as 4,250 gallons per minute of moderately to very hard (calcium carbonate equivalent) water in the area. In the southern part of the survey area, the aquifer produces brackish water that comes from the lower part of the aquifer. The 600-, 800-, 1,000-, and 1,200-foot sand aquifers also produce large volumes of water. The 1,200-foot sand aquifer has no brackish water due to the thickness of the sand and is very important. The water is chemically similar where the sand aquifers are hydraulically connected to alluvial aquifers. However, as the water moves toward the Mississippi syncline, it is modified to a soft (sodium bicarbonate type) water.

Total groundwater withdrawals in 2005 for Pointe Coupee Parish equaled 22.19 million gallons per day (MGD). The alluvial aquifer is primarily used for agricultural purposes, a few individual domestic wells, and some industrial purposes. Groundwater for most municipal and industrial purposes comes from deeper wells.

4.2.4 Water Quality

The shoreline of False River is highly developed with houses, camps, and businesses. The lake has a mixed usage recreational angling, hunting, water sports, and other leisure activities. Over the years, declining water quality in False River has resulted in negative impacts to fish, wildlife, and aquatic vegetation (LDWF 2011a,b). This degradation has been attributed to siltation, increased nutrient loading, and pesticides and other pollutants entering the lake through the more than 50 miles of drainage canals from adjacent pastureland and watershed drainages.

Water quality in False River is monitored and evaluated by the LDEQ in accordance with USEPA guidelines. Historically, LDEQ has monitored False River for total and fecal coliform, general chemistry (including alkalinity, ammonia, chloride, color, dissolved oxygen (DO), hardness, nitrate plus nitrite, total Kjeldahl nitrogen, pH, phosphorus, salinity, specific conductance, sulfate, total dissolved solids, total organic carbon, total suspended solids, turbidity, and temperature), selected metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) and selected organic compounds. Samples were collected and analyzed monthly from 1991 through mid-1998; and less frequently thereafter. The most recent LDEQ sampling event for which data are available was in November 2011.

In the last USEPA-approved Integrated Report of Water Quality in Louisiana (2010), False River was listed as impaired for fish and wildlife propagation. Suspected causes include introduction of non-native aquatic plants and high pH; sources are unknown. According to the 2010 report, False River fully supports both primary and secondary contact recreation uses, and Total Maximum Daily Load (TMDL) development for the fish and wildlife propagation impairment is w low priority.

The LDEQ conducted a special water quality study on False River in 2001 and 2002 in an attempt to characterize potential water quality problems that may contribute to declining lake conditions. Six sample stations were monitored monthly from October 2001 to September 2002: three in-lake stations, and three *tributary* stations. Samples were analyzed for fecal coliform, turbidity, total suspended solids, nitrate plus nitrite nitrogen, total Kjeldahl nitrogen, ammonia, total phosphorus, and total organic carbon. Water quality meters were used at each ambient lake station to gather *in-situ* data on dissolved oxygen, pH, specific conductance and temperature. The study concluded that False River is nutrient-rich with total phosphorus levels sufficient to support frequent algal blooms. Inflow points contributed to elevated bacteria concentrations, although the lake itself was not in violation of the water quality standard for fecal coliform bacteria. Data on total suspended solids and turbidity indicated that waters coming into False River contribute higher concentrations of suspended solids and turbidity than are present in ambient lake waters.

The USACE completed a *False River Ecosystem Restoration Data Summary* in August 2011 (Appendix A). As a part of the study, water and sediment samples were analyzed. Three types of water quality data were collected during this effort. The data consisted of *in situ* water quality measurements collected over a three-month period for pH, temperature, conductivity, dissolved oxygen, turbidity, and salinity; continuous water quality readings recorded by two monitoring stations installed within the lake (one on the north flat and one on the south flat) for dissolved oxygen, water depth, specific conductivity, salinity, temperature, and turbidity every hour over two months; and data resulting from the analysis of water grab samples for chlorophyll-*a* and biochemical oxygen demand. The report did not evaluate the data or present conclusions. A review of the *in situ* data collected during daytime hours indicates that pH, temperature, and turbidity water quality standards (from LAC 33:IX § 1123 for subsegment 120108) were exceeded at multiple locations and depths. The dissolved oxygen was generally high due to algal respiration; however, dissolved oxygen concentrations in Lighthouse Canal samples deeper than 15 feet were less than 1 milligram/liter (mg/L). Continuous monitoring data indicated that oxygen levels were consistently high during the monitoring period, with the exception of August 9-31 on the north flat, where oxygen levels dropped to below one mg/L and remained low. Water temperatures consistently exceeded the 32.2°C water quality standard, and turbidity exceeded the 25 nephelometric turbidity units (NTU) water quality standard at both locations. The LDEQ has not adopted standards for Biological Oxygen Demand (BOD) or chlorophyll-*a*.

Average concentrations of those constituents that have been identified as elevated (pH, temperature, and turbidity) were calculated from all of LDEQ's available observations from 1991 through 2011 and presented in Table 4-3.

Table 4-3. Average pH, Temperature and Turbidity, 1991-2011 (LDEQ 2012)

	Average	Minimum/ Maximum	Number of data points
pH	8.10	6.78/9.43	121
Temperature °C	20.75	10.0/32.73	122
Turbidity NTU	6.91	2.1/90	125

LDEQ data are presumed to be collected during working/daylight hours from the same mid-point location on False River. A cursory review of LDEQ's historical temperature and turbidity data against the continuous monitoring data reported in the USACE (2011) study shows that during summertime continuous USACE monitoring, long periods of sustained temperatures in excess of LDEQ's reported 20-year maximum occurred, and sustained periods of turbidity of up to double LDEQ's 20-year maximum occurred in both the north and south flats. *In situ* pH readings were consistent in both studies, likely because pH was measured during working/daylight hours in both evaluations. Average concentrations for temperature, turbidity, and dissolved oxygen calculated from continuous monitoring data collected hourly from July 20 through September 20, 2010 are presented in Table 4-4 and Figures 4-20 to 4-22. Average conditions observed during continuous monitoring did not exceed water quality standards.

According to LDEQ standards, False River is not impaired for turbidity. However, there are periods where the turbidity exceeds the average impairment limit (25 NTU threshold) (Table 4-4; Appendix A). Sampling stations were placed in shallow waters (1.5 feet) to measure the worst conditions of the flats. The threshold was exceeded more frequently in the north flats than in the south flats. This limit was only exceeded for short periods three times in the south flat during the sampling period. Many natural systems exceed this limit for periods of time. Short periods of turbidity exceeding 25 NTUs are generally not deleterious to fish or plants. False River doesnot appear to be impaired with the average turbidity exceeding the limit, that the turbidity events are episodic and are likely related to heavy rainfall, wind, and wave action. Water quality samples taken in M-1 Channel in February and March 1975 reported TSS levels at 125 mg/l and 30 mg/l, respectively (NRCS 1976).

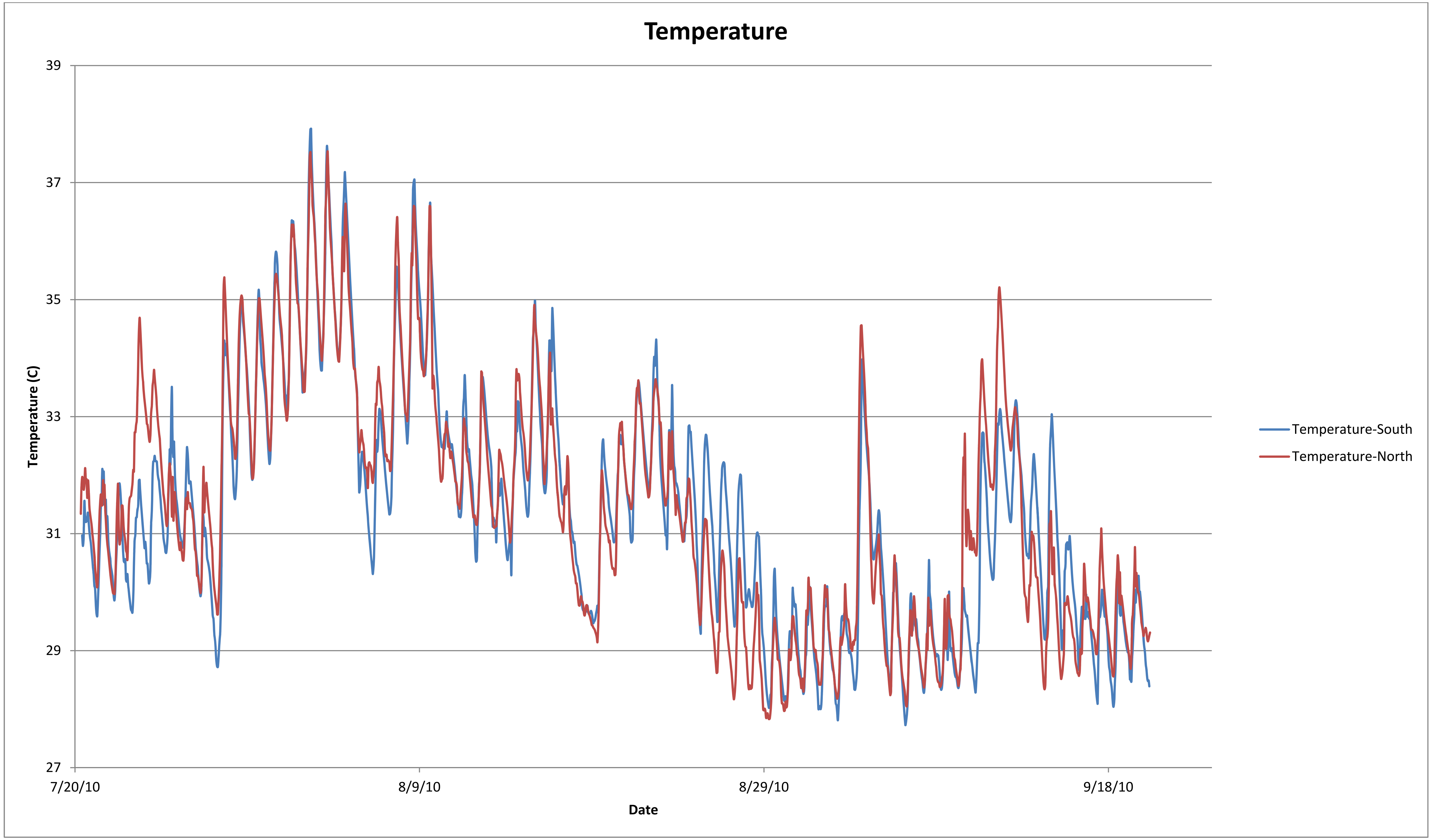

Figure 4-20. Water Temperature in North and South Flats, July-September 2010

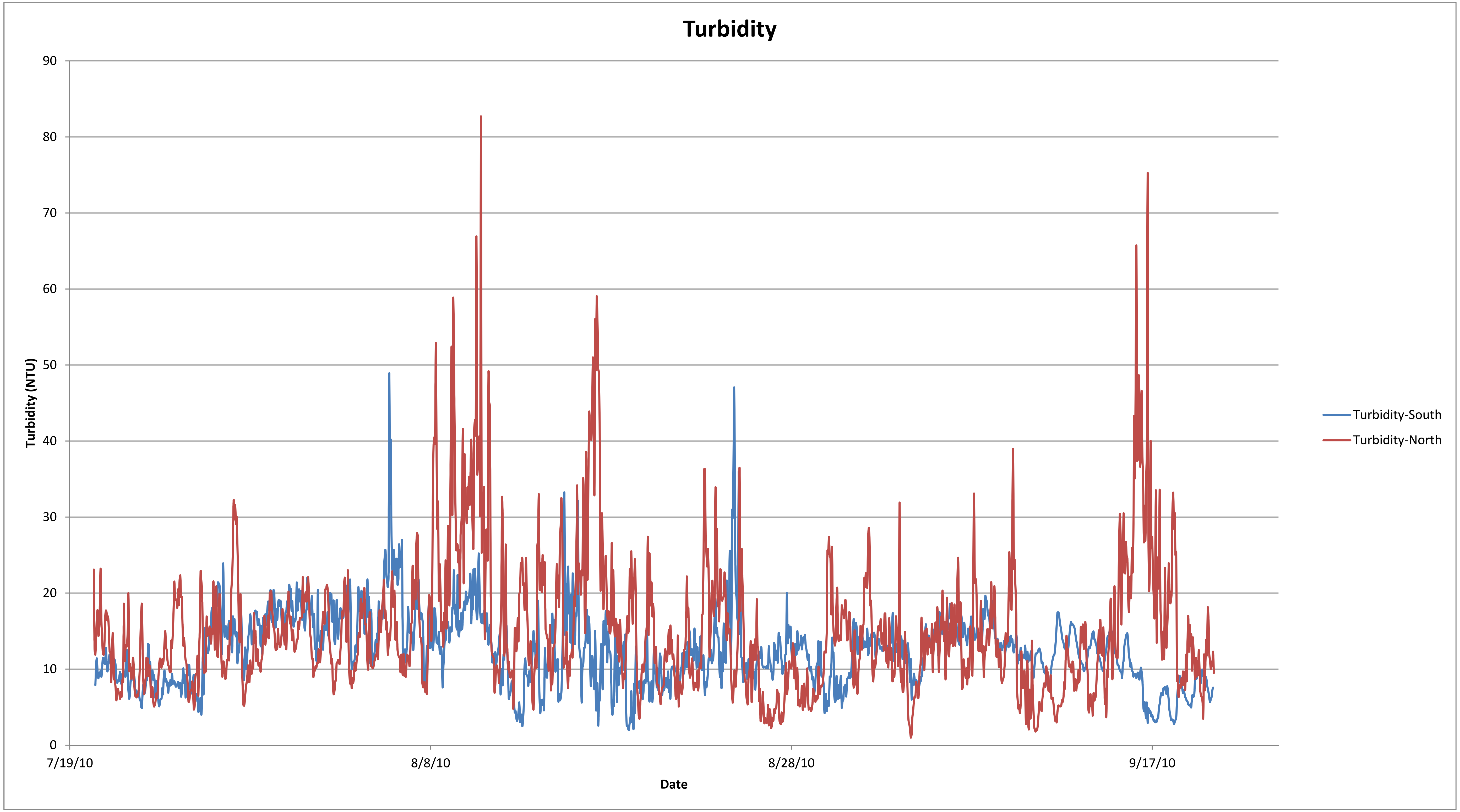

Figure 4-21. Turbidity in North and South Flats, July-September 2010

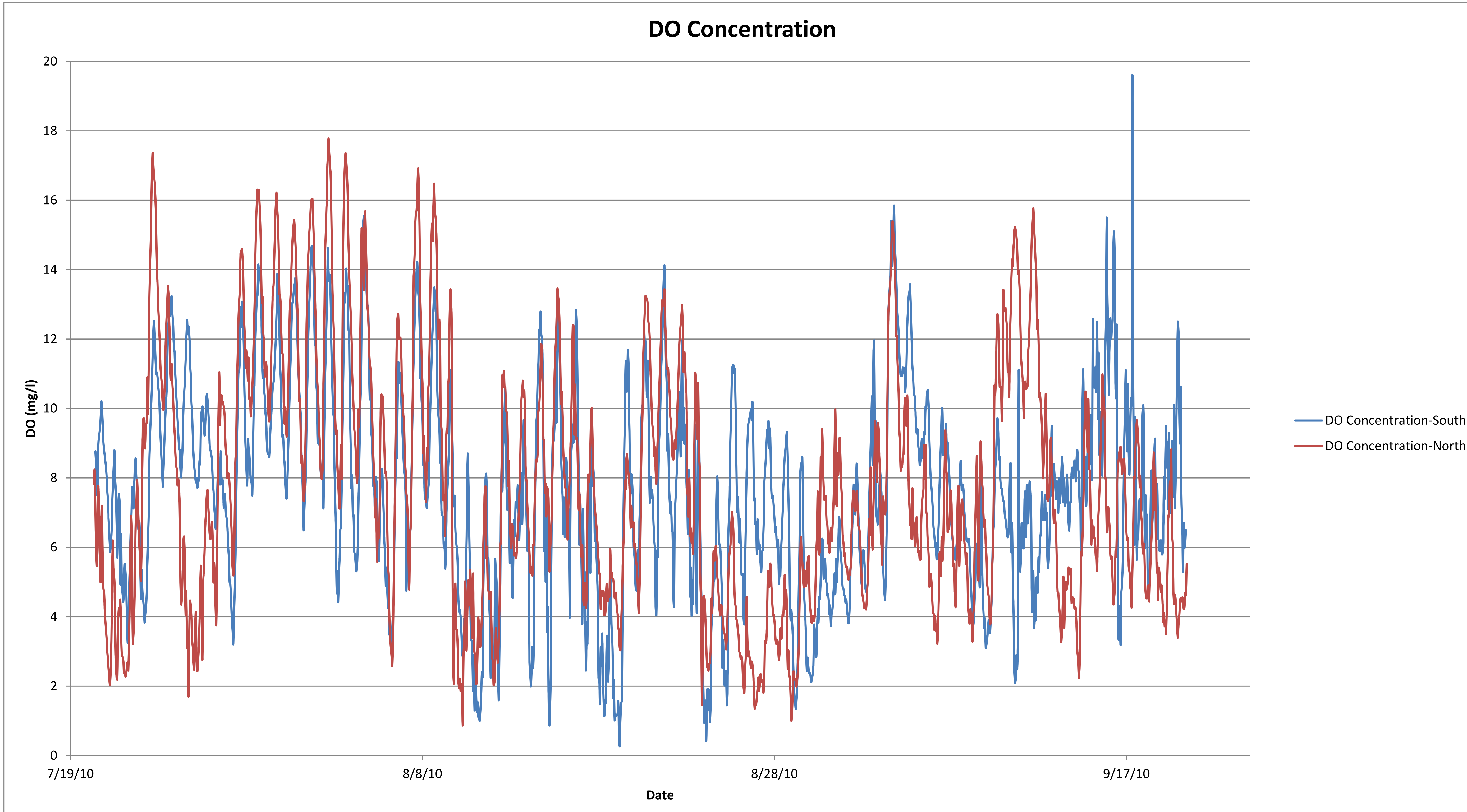

Figure 4-22. Dissolved Oxygen Concentration in North and South Flats, July-September 2010

Table 4-4. Average Temperature, Turbidity, and Dissolved Oxygen, July-September 2010 (Appendix A)

	Average	Minimum and Maximum	Number of Data Points
North Flat			
Temperature °C	31.33	27.83/37.53	1,970
Turbidity NTU	15.1	1/82.7	1,970
Dissolved Oxygen mg/L	7.46	0.88/17.78	1,970
South Flat			
Temperature °C	31.40	27.73/37.92	1,484
Turbidity NTU	11.27	1.37/48.8	1,484
Dissolved Oxygen mg/L	9.47	1/46.9	1,484

Fecal Coliforms – Sewerage repairs and extensions by the Parish and others reduced elevated fecal coliform counts in False River during the late 1990s and early 2000s (LDNR/LDWF 2012a, b; Figure 4-23). In addition, the Louisiana Department of Health and Hospitals (LDHH) now requires the update of individual waste treatment systems when a property transfer occurs. In addition, recently the Parish has made an application to LDHH to finance the expansion of sewer service around the Lake (LDNR/LDWF 2012a,b).

4.2.5 Air Quality

The Clean Air Act Amendment of 1990 directed the USEPA to establish National Ambient Air Quality Standards (NAAQS) for all regulated air pollutants. Federal air quality standards have been established for six pollutants:

- Carbon monoxide (CO);
- Nitrogen dioxide (NO_2);
- Ozone (O_3);
- Sulfur oxides (commonly measured as sulfur dioxide [SO_2]);
- Lead (Pb);
- Particulate matter no greater than 2.5 micrometers (µm) in diameter ($PM_{2.5}$); and
- Particulate matter no greater than 10 µm in diameter (PM_{10}).

The USEPA classifies air quality by Air Quality Control Region (AQCR) according to whether the region meets primary and secondary air quality standards. An AQCR, or portion of an AQCR, may be classified as attainment, nonattainment, or unclassified. Attainment indicates that air quality for one or more criteria air pollutants within the region is within NAAQS values. Nonattainment indicates that regional air quality for one or more criteria air pollutants is not within NAAQS values. Unclassified indicates that air quality within the region cannot be classified (generally because of lack of data). A region designated as unclassified is treated as an attainment region. The project area is located in the Southern Louisiana-Southeastern Texas AQCR; this AQCR is currently classified as unclassified/attainment [40 CFR 81.319 (2011)]. The USEPA approved the request for redesignation to attainment with respect to ozone for the Parish on December 20, 1996. The Parish is in attainment for all NAAQS established by the Federal government (40 FR52.975, July 1, 2011). These pollutants are known as criteria air pollutants.

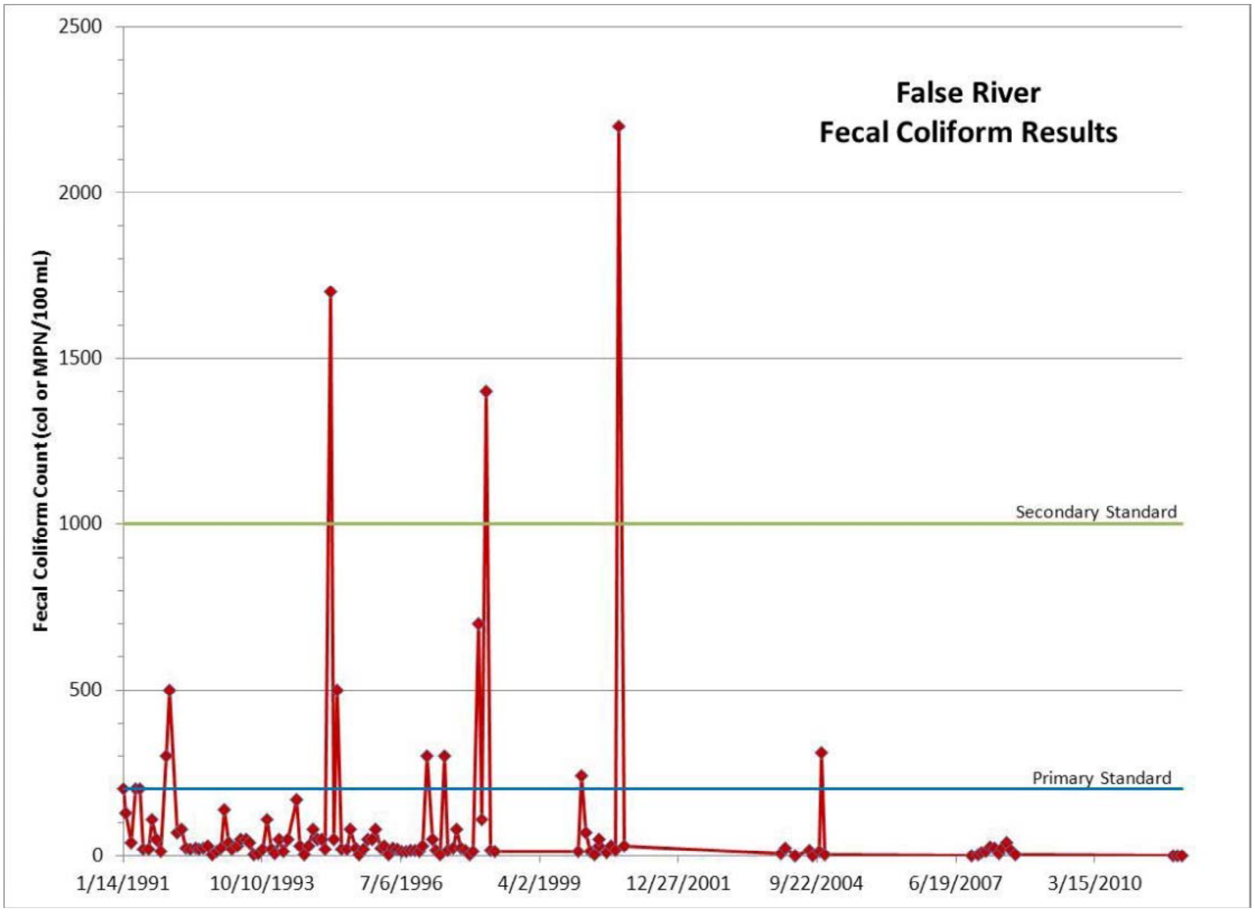

Figure 4-23. Fecal Coliform in False River [Source: LDEQ Ambient Water Quality Program, as presented in LDNR/LDWF (2012a,b)]

4.2.6 Noise

Noise is defined as unwanted sound and, in the context of protecting public health and welfare, implies potential effects on the human and natural environment. Noise is a significant concern associated with construction, dredging, and transportation activities and projects. Ambient noise levels within a given region may fluctuate over time as a result of variations in intensity and abundance of noise sources.

Noise is regulated under the Noise Control Act of 1972, as amended. The USEPA has also established noise guidelines recommending noise limits for indoor and outdoor noise activities. Under these guidelines, an average noise level over a 24-hour period of 70 A-weighted decibels (dBA) is listed as the threshold for hearing loss. An outdoor 24-hour average sound level of 55 dBA is recommended for residential areas. Additionally, the U.S. Department of Housing and Urban Development (HUD) has developed a noise abatement and control policy. According to HUD policy, noise at or below 65 dBA is acceptable in all situations, noise between 65 and 75 dBA is generally acceptable, and noise exceeding 75 dBA is unacceptable in all situations. Noise monitoring and impacts are typically evaluated by the local government.

The False River area includes the City of New Roads and several smaller towns, and the lake is surrounded by single-family residences, camps, businesses, and industry. Ambient noise in the project area is generated by a broad range of sources, both natural and anthropogenic. Natural noise sources include climatic sources such as wind, precipitation, and wave action. Potential sources of anthropogenic sound may include dredging and construction activities, industrial activities, and commercial and residential waterborne and highway traffic.

4.2.7 Vegetation

4.2.7.1 Riparian Vegetation

False River has approximately 22 miles of shoreline. Most (90 to 95 percent) of this shoreline is developed with permanent residences, seasonal residences (camps), bulkheads consisting of wooden or vinyl (sheet-pile) materials, and piers (LDWF 2011). However, a large tract of bottomland hardwood forest is located near the south flats and an isolated forest tract is present along the north flats (near Ventress, Louisiana). The largest section of riparian shoreline (consisting mainly of mixed hardwood and baldcypress) is about ½ to ¾ of a mile long, and is located along the western shoreline about 4.3 miles north of the south end of the Lake. Riparian shoreline is also present around Oscar (LDWF 2011).

4.2.7.2 Wetland Vegetation

Vegetation in forested and emergent wetland areas generally consists of species frequently found in disturbed areas. Drainways are frequently colonized by giant cutgrass (*Zizaniopsis miliacea*) and common rush (*Juncus effusus*); forested areas are dominated by black willow and Chinese tallowtree (*Triadica sebifera*).

4.2.7.3 Upland Vegetation

Existing Conditions – Existing vegetation in the pasture areas is comprised primarily of herbaceous species such as bermudagrass (*Cynodon dactylon*), spinyfruit buttercup (*Ranunculus muricatus*), southern dewberry (*Rubus trivialis*), Carolina geranium (*Geranium carolinianum*), and curly dock (*Rumex crispus*). The small forested areas between and within pasture areas are generally bottomland hardwood stands and Chinese tallowtree/black willow stands. The bottomland hardwoods are comprised of sugarberry, sweetgum (*Liquidambar styraciflua*), American elm (*Ulmus americana*), sweet pecan (*Carya illinoinensis*), box elder, Nuttall oak (*Quercus texana*), and water oak (*Q. nigra*). The Chinese tallowtree or black willows generally dominate in stands to the exclusion of other vegetation. Many of the forested tracts are currently open to livestock browsing.

Historical Conditions – Open pasture areas were historically forested and dominated by species similar to local adjacent forested areas. Ridges consist of species such as Drummond maple (*Acer rubrum* var.*drummondii*), sweetgum, American elm, sweet pecan, and box elder. Swales are dominated by baldcypress and the transitional areas are dominated by Nuttall oak. Other overstory species include live oak (*Quercus virginiana*), willow oak (*Quercus phellos*), baldcypress, green ash, water tupelo, water locust (*Gleditsia aquatica*), bitter pecan (*Carya aquatica*), and sycamore (*Platanus occidentalis*). Understory species include Japanese honeysuckle (*Lonicera japonica*), devil's walkingstick (*Aralia spinosa*), hawthorne (Crataegus *phaenopyrum*), deciduous holly (*Ilex verticillata*), buttonbush , elderberry (*Sambucus nigra*), switchcane (*Arundinaria gigantean*), swamp-privet (*Forestiera acuminate*), blackberry (*Rubus* *fruticosus*), palmetto (*Serenoa repens*), trumpetcreeper (*Campsis radicans*), greenbrier (*Smilax rotundifolia*), rattan (*Calamae* spp.), roughleaf dogwood (*Cornus drummondii*), American beautyberry (*Callicarpa americana*), and overstory species reproduction (NRCS 1976). Pastureland vegetation included common bermudagrass, bahiagrass (*Paspalum notatum*), dallisgrass (*Paspalum dilatum*), fescue grass (*Festuca* spp.), clover (*Trifolium* spp.), ryegrass (*Lolium perenne*), and small grains such as oats (*Avena sativa*) and winter wheat (*Triticum aestivum*). Fallow fields contained native vegetation, common species included Andropogons (*Andropogen* spp.), goldenrod (*Solidago* spp.), senecio (*Senecio* spp.), panic grasses (*Panicum* spp.), paspalums (*Paspalum* spp.), dock (*Rumex* spp.), sesbania (*Sesbania* spp.), doveweed (*Croton setigerus*), johnsongrass (*Sorghum halepense*), common ragweed (*Ambrosia artemisiifolia*), aster (*Aster* spp.), and sumpweed (*Iva annua*) (NRCS 1976).

4.2.7.4 Submerged Aquatic Vegetation

Existing Conditions - In September 2011, a 15-acre stand of southern naiad, representing less than 5 percent coverage of aquatic vegetation, was reported in the southern flats in water depths from 0 to 3 ft (Table 4-5; LDWF 2011a). No significant vegetation was found in the north flats. Trace amounts of water hyacinth *(Eichhornia crassipes)*, common salvinia *(Salvinia minima)*, and duckweed *(Lemna* spp*.)* were also found along the banks throughout the lake. Coontail fringed Bayou Chenal, Tee Bayou, False Bayou, and surrounding canals that are connected to False River in September 2011 (LDWF 2011a). These canals and bayous also contained large quantities of water hyacinth, common salvinia, and duckweed (LDWF 2011a).

Historical Conditions - Stands of quality submerged aquatic plants (coontail, milfoil, and naiad) were present in False River during the 1970s and early 1980s. However, according to LDWF, these quality plants gave way to poor quality plants afterward (American lotus and water hyacinth). Sedimentation and turbidity are believed to have caused these vegetative changes. A large change in the SAV was attributed to clay resuspension by Hurricane Andrew in 1992 (LDWF 2011). The SAV can likely continue to live within normal ranges of sedimentation, but cannot survive if there are excessive amounts of sedimentation. The loss of SAV reduces the structure needed for quality fish habitat and the soft substrate provides for very poor quality spawning areas (LDWF 2011). Another factor in the vegetative change could be the establishment of other types of aquatic vegetation, particularly hydrilla, water hyacinth, and American lotus. Hydrilla is a non-native, aggressive species. Once hydrilla invades an aquatic ecosystem, it drives out all native and introduced aquatic plants, creating a pure (monotypic) stand. Excessive water hyacinth growth will out- compete native vegetation and clogs waterways, impeding and impairing aquatic life. Dense populations of American Lotus can suppress the growth of beneficial native plants by shading out the lower-growing plants, creating a monotypic stand which decreases biodiversity. In addition, from 1991 to 2010 herbicides were sprayed on the aquatic vegetation to clear boat ramps, boating lanes, and piers. SAV (eel-grass, pondweed, watergrass, and Southern naiad) was planted in 2001 by the LDWF; however, by 2003 the planted SAV did not appear to survive.

4.2.7.5 Invasive Species - Vegetation

Chinese tallow

Chinese tallow is a fast-growing tree that is common in abandoned fields, pastures, waste areas, and forests. It grows in a wide range of environmental conditions, from wet to dry and from shade to full sun. Tallow can also tolerate highly saline soil conditions and is resistant to damage from pests. It reproduces only by seeds, but one plant can produce hundreds of seeds,

Table 4-5. History of SAV in False River (from LDWF 2011a)

Year	South Flats	North Flats	Along Banks in Central False River	Comments
2011	Southern naiad** (15 acres) Predominant plant species in the lake.	North flats void of any significant vegetation.	Water hyacinth* Common salvinia* Duckweed*	Coontail** fringed Bayou Chenal, Tee Bayou, False Bayou, and surrounding canals connected to False River. Water hyacinth*** Common salvinia*** Duckweed*** First evidence of submerged aquatic vegetation, besides lotus, in the lake since 2001.
2004	Lotus*** Water hyacinth* Alligatorweed* Duckweed*			None of species planted by contractor seemed to have survived. No evidence of any growth in any cage.
2003	Lotus***			None of species planted by contractor seemed to have survived. No evidence of any growth in any cage.
2002	Hyacinth* Alligatorweed*			
2001	Lotus*** Hydrilla* Coontail*			Less vegetation than previous years. Tropical Storm Allison could have silted in plants.
2000	Lotus*** Coontail** Duckweed**	Southern naiad** Coontail**	Hydrilla*** (from south flats lotus on the Hwy.1 edge of lake to about 1.5 miles WNW of south end of lake and on Hwy 413 edge from south flats lotus to about 2.2 miles WNW of south end of lake).	2 aquatic test plots of 4 species of native plants [eel-grass (water celery), pondweed, water grass, and naiad] on north end. Project was designed to replace Hydrilla. Drought conditions throughout region.
1999	Lotus***		Hydrilla*** (from south flats lotus on the Hwy.1 edge of lake to about 1.5 miles WNW of south end of lake and on Hwy 413 edge from south flats lotus to about 2.4 miles WNW of south end of lake). Southern naiad* (from the Lighthouse Canal to 2.7 miles from the north end along the shoreline).	Lack of rainfall this year.

Year	South Flats	North Flats	Along Banks in Central False River	Comments
			Pondweed* (on Hwy. 1 side about 2 miles WNW of south end of lake).	
1998	Lotus***		Hydrilla*** (from south flats lotus on the Hwy.1 edge of lake to about 1.5 miles WNW of south end of lake). Southern naiad* (3.2 miles WNW of south end of lake to 6.5 miles from the south end along the shoreline).	
1997	Lotus*** (but smaller area than 1996).		Hydrilla*** (from south flats Lotus* (on Hwy.1 edge to about 1.5 miles WNW of south end of lake).	Lake has less aquatic vegetation this year than recorded in last 14 years.
1996	Lotus*** Hydrilla* Coontail*		Hydrilla*** (from south flats lotus on the Hwy.1 edge to about 1.5 miles and at about 2.15 miles WNW of south end of lake). Coontail* Hydrilla** (between south end of lake and 0.85 mile WNW of south end of lake). Algae* Duckweed*.	Hydrilla** scattered on Bayou Chenal. Algae* Duckweed*
1995	Lotus*** Duckweed* Salvinia* Algae*		Hydrilla*** (from 0.9 to 5.4 mi from south end of lake on Hwy 1 edge) Coontail** Milfoil** Water hyacinth** Naiad** Hydrilla*** (from 0.87 to 1.08 mi above south end of lake on Hwy 415 edge) Algae** Duckweed** Salvinia** Water hyacinth**	
1994	Hydrilla*** (0.67 to 0.88 mi from south end on Hwy 1 edge) Duckweed** Salvinia** Algae** Lotus** (most of south	Shoreline almost SAV free from 1.5 mi WNW of landing to north end of lake.	Coontail*** (0.9 to 2.2 mi from south end along Hwy 1 edge) Milfoil* Hydrilla**(more hydrilla than last year) Water stargrass*	

Year	South Flats	North Flats	Along Banks in Central False River	Comments
	end, beginning 0.43 mi from south end of lake) Coontail*** Milfoil**		Naiad* From Oscar Bayou to North End very few aquatic plants seen.	
1993	Hydrilla** (found for first time in lake; large mats) Coontail*** Milfoil*** Lotus***		Hydrilla* (both sides of lake north to about 5.5 miles from south end).	Duckweed* Water hyacinth* Water stargrass* Naiad.
1992	Coontail*** Milfoil** (less than previous year). Lotus*** [stand spread to about 0.7 mile from south end of lake (6-7 acres)].			Duckweed* Water hyacinth*
1991	Milfoil***(population increased) Coontail** (less than previous year). Lotus*** (4-5 acres).		Milfoil* (along both shorelines between north and south flats)	Duckweed* Water hyacinth* Watermeal* Salvinia* Water stargrass* (also observed)
1990	Milfoil*** Coontail*** Water stargrass*** Naiad*** Lotus*** (4-5 acres)		Milfoil** (along both shorelines between north and south flats)	Duckweed* Water hyacinth* Filamentous algae* (also observed)
1988	Coontail*** Naiad*** Milfoil*** Lotus*** (3-4 acres; larger than previous year)	Heavy milfoil*** Coontail*** Naiad*** (Dense mats in shallower water)	Milfoil*** Coontail*** Naiad*** (mid-lake on island side of lake). Milfoil*** (along both shorelines) Mud plaintain** (more common than previous years)	Water hyacinth* Duckweed* (also observed)
1987	Coontail*** naiad*** milfoil*** Lotus* at southern end of lake (small area).	Coontail*** Milfoil*** Naiad*** Filamentous algae***	Milfoil** along both shorelines (less than previous year) Lotus** (adjacent to Hwy. 1 300 yd-long area) Mud plantain* (scattered patches)	Water hyacinths* Giant duckweed* Elephant ear* (also observed)
1986	Naiad*** Coontail*** filamentous algae*** Lotus* (approx. 250 ft. along Hwy. 1).	Coontail*** Naiad*** Filamentous algae***	Milfoil** (fringe both shorelines in central lake) Mud plantain* (scattered patches near shoreline throughout lake)	Water paspalum* Giant duckweed* Water hyacinth* (also observed)

Year	South Flats	North Flats	Along Banks in Central False River	Comments
1985	Naiad*** Milfoil**	Coontail*** Naiad*** Filamentous algae*** Milfoil** (upper end of east shoreline; Dense mats extended even further from shore)	Milfoil** (both sides of central portion of lake) Coontail* (along LA Hwy 1 edge) Lotus area* between Oscar Bayou and South Flats is approx. 250 yds. long	Restricted access to New Roads piers.
1984	Coontail* Najas*	Najas*** Coontail** Milfoil** Filamentous algae*** (Dense mats extended further from shore)	Milfoil*** (extending down from the North Flats, both sides of the central lake) Lotus** (between Oscar Bayou and South Flats 200 yds. long)	Bayou Chenal: Najas* Coontail* Duckweed**
1983	Coontail*** Lotus*	Najas*** Coontail and naiad** (along Hwy. 1 bank for 1.5-1.75 miles) (Dense mats mpeding boat traffic)	Coontail*** Milfoil*** (extending for 0.3-0.5 miles along upper Hwy. 413 bank) Lotus* (along Hwy.1 edge).	Chemical treatment of boat lanes and dock areas provided sufficient control to allow public use of those facilities.
1977	Milfoil***	Milfoil***		Shift in the aquatic plant community structure of the lake in the early 1970s
1971	280 acres Coontail***	440 acres Milfoil***	150 acres east and west fringe	870 vegeteted acres in lake
1966	Coontail, Milfoil, Pond weeds (*Potamogeton spp.*), Water stargrass, and Southern naiad (descending density)			
Pre-1947	Mississippi River Fluctuations controlled the vegetation of False River.			
*** heavy/dense/infestation ** moderate * light/trace/scant				

which can germinate under adverse conditions. Tallow can cause large-scale ecosystem modification and can completely replace native vegetation and reduce habitat for many forms of wildlife and livestock. There is also some concern its leaves may shed toxins that change the soil chemistry and make it difficult for other plants to grow. Over the last 30 years, the Chinese tallow has become a common tree in oil fields and bottomland forests in Louisiana.

Royal paulownia

The royal paulownia (*Paulownia tomentosa*) is an introduced ornamental tree that has become well established in North America. It is also known as princesstree, empress tree, or paulownia and has a tropical look with very large catalpa-like leaves. The tree is a prodigious seeder and grows extremely fast. Unfortunately, royal paulownia is now considered an invasive exotic tree species.

Water hyacinth

The water hyacinth is a free-floating perennial plant that is native to South America, but is now found in most of the southern United States. The water hyacinth can grow to a height of three feet and grows aggressively, forming thick floating mats. It reproduces using seeds or by the breaking off of floating clonal plants. As many as 5,000 seeds can be produced by a single plant; seeds frequently germinate when water levels are down. Large colonies of water hyacinths can interfere with small boat navigation and fishing, collect around water control structures and impede flow, and provide habitat for mosquitoes. Plant respiration and decaying plant matter can deplete dissolved oxygen levels.

American lotus

The American lotus is a native emergent aquatic herb. The American lotus can occur in a numerous freshwater habitats, including lakes, ponds, slow flowing rivers, cypress swamps, and estuaries. The large, circular leaves float on the water or can extend several feet above the surface. This species can spread rapidly in shallow water and can completely cover a one-acre pond in three to four years. Although the American lotus regularly produces seeds, it spreads mainly through thick rhizomes that grow along the pond bottom. These plants can interfere with navigation and fishing and diminish the value of areas for wildlife and waterfowl.

Hydrilla

Hydrilla is a submerged macrophyte native to Asia. Hydrilla was first discovered in the U.S. in 1960. Hydrilla has spread rapidly through portions of the U.S. and causes serious economic hardships, interferes with various water uses, displaces native aquatic plant communities, and adversely affects freshwater habitats. Hydrilla can severely interfere with navigation of both recreational and commercial craft. In addition to interfering with boating by fisherman and waterskiers in recreational waters, hydrilla interferes with swimming, displaces native vegetation communities, and can adversely impact sportfish populations.

4.2.7.6 Rare, Unique, and Imperiled Vegetative Communities

Cypress-Tupelo Swamps are the only natural community listed in Pointe Coupee Parish (LDWF-LNHP 2012). Baldcypress-Tupelo Swamps are forested, alluvial swamps growing on intermittently exposed soils. The soils are inundated or saturated by surface water or ground water on a nearly permanent basis throughout the growing season except during periods of extreme drought. Bayous commonly intersect these wetlands. There is relatively low floristic diversity; baldcypress and tupelo gum. Swamp blackgum *(Nyssa sylvatica var. biflora)*, swamp red maple*)*, black willow, pumpkin ash *(Fraxinus profunda),* Virginia willow *(Itea virginica)*, green ash, water elm *(Planera aquatic)*, water locust, and buttonbush *(Cephalanthus occidentalis)* are commonly associated. Composition of associate species can vary widely from site to site. Undergrowth is often sparse because of low light intensity and long hydroperiod (LDWF-LNHP 2012).

4.2.8 Wildlife and Habitat

4.2.8.1 Wildlife

Southern bottomland hardwoods comprise much of the forested acreage. This vegetative community is very productive, high-value habitat for game and nongame wildlife species.

Game Species

Game species in forested communities include white-tailed deer (*Odocoileus virginianus),* wild turkey (*Meleagris gallopavo),* wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), woodcock (*Scolopax minor*), gray (*Sciurus carlolensis*) and fox squirrels (*Sciurus niger*), swamp (*Sylvilagus palustris*) and cottontail rabbits (*S. floridanus*), and the black bear (*Ursus americanus*). Open land habitat (including cropland and pastureland) species include bobwhite quail (*Colinus virginianus*), mourning dove (*Zenaida macroura*), cottontail rabbit, and woodcock.

Waterfowl

False River is located within the Mississippi Flyway, considered a major transportation route for numerous species of migratory birds. Various waterfowl using the lake include mallards, wood ducks, ring-neck ducks, gadwalls, blue-winged teal (*Anas discors*), hooded merganser (*Lophodytes cucullatus*), gadwall (*A. strepera*), and assorted domestic ducks. Other bird species are found in portions of the study area, such as Neotropical migrants that stop in the area each year during migration. Belted kingfishers (*Ceryle alcyon*) and wading birds such as the great blue heron (*Ardea herodias*), snowy egret (Egretta thula), great egret (*Casmerodius albus*), little blue heron (*Egretta caeruleal*), and white ibis forage for small fish in the shallow portions of the lake as well. White pelicans frequent the lake in the winter months.

Other common mammals

Other common mammals include striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), opossum (*Didelphis marsupialis*), bobcat (*Felis rufus*), armadillo (*Dasypus bellus*), gray fox (*Sciurus carlolensis*), red bat (*Lasiurus borealis*), cotton rat (*Sigmodon hispidus*), southeastern myotis (*Myotis aystroriparius*), Southern flying squirrel, (*Glaucomys volans*), least shrew (*Cryptotis parva),* marsh rice rat (*Oryzomys palustris*), white-footed mouse (*Peromyscus leucopus*), and Eastern wood rat (*Neotoma floridana*).

Birds

The area surrounding False River provides habitat for Neotropical migrant birds. Common birds include the common crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), Eastern bluebird (*Sialia sialis*), Eastern meadowlark (*Sturnella magna*), mockingbird (*Mimus polyglottos*), red-headed woodpecker (*Melanerpes erythrocephalus*), downy woodpecker (*Picoides pubescens*), pileated woodpecker (*Dryocopus pileatus*), screech owl (*Otus asio*), barred owl (*Strix varia*), great egret, cattle egret (*Bubulcus ibis*), snowy egret, great blue heron, tricolored heron (*Egretta tricolor*), little blue heron, yellow-crowned night heron (*Nyctanassa violacea*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), blue thrasher (*Toxostoma rufum*), house sparrow (*Passer domesticus*), and belted kingfisher.

Reptiles

Common reptiles include the American alligator (*Alligator mississipiensis*), canebrake rattlesnake (*Crotalus horridus*), ground skink (*Sphenomorphus cherriei*), five-line skink (*Eumeces inexpectatus*), green anole (*Anolis carolinensis*), southern fence lizard (*Sceloporus undulates*), Eastern garter snake *(Thamnophis sirtalis)*, southern copperhead (*Agkistrodon contortrix contortrix*) western cottonmouth (*Agkistrodon piscivorus leucostoma*), broad-banded water snake (*Nerodia fasciata*), diamond-back water snake (*Nerodia rhombifer*), gray rat snake (*Elphe obsolete spiloides*), smooth softshell turtle (*Apalone mutica*), stinkpot turtle (*Sternotherus odoratus*), red-eared turtle (*Trachemys scripta elegans*), and common snapping turtle (*Chelydra serpitina*).

Amphibians

Common amphibians include small mouthed salamander (*Ambystoma texanum*), marbled salamander (*Ambystoma opacum*), dwarf salamander (*Eurycea chamberlaini*), three-toed amphiuma (*Amphiuma tridactylum*), Fowler's toad (*Anaxyrus fowleri*), green treefrog (*Hyla cinerea*), gray treefrog (*Hyla versicolor*), bullfrog (*Rana catesbiana*), southern leopard frog (*Lithobates sphenocephalus*), lesser western siren (*Siren intermedia nettingi*), central newt (*Notophthalmus viridescens*), Eastern narrow-mouthed toad (*Gastrophryne carolinensis*), bronze frog (*Rana clamitans*), upland chorus frog (*Pseudacris feriarum feriarum*), southern cricket frog (*Acris gryllus*), and spring peeper (*Pseudoacris crucifer*).

4.2.8.2 Nuisance and Invasive Species - Wildlife

Nuisance and invasive species in Pointe Coupee Parish include feral hogs, beaver, and nutria *(Myocastor coypus)*.

Feral hogs

Feral hogs are found in every parish in Louisiana and were originally introduced to North America in the 1500s by the Spanish. Feral hogs are prolific and populations can rapidly expand. Sows can have up to 10 piglets per litter and reach sexual maturity at six months of age. They have a gestation period of 115 days, allowing two litters per year. Feral hogs have virtually no natural predators, so piglet survival is nearly 100 percent. Feral hogs are omnivorous and can eat anything from vegetation to carrion, although vegetation constitutes the largest portion of their diet. If not properly managed, feral hogs have the potential to cause extensive damage to native wildlife, habitat, and agricultural resources. Some landowners consider the hog's Russian boar phenotype to be a trophy game animal and manage feral hog populations. However, feral hogs compete with white-tailed deer for resources. Land and wildlife management agencies are finding that the feral hog is an aggressive and difficult invader species that threatens natural resources and habitat. NRCS rents hog traps to landowners at an economic rate in New Roads.

Beaver

Beavers can have a positive or negative impact on the environment. Beavers construct dams that create ponds and new wetland environments. Impoundments created by beavers provide valuable wildlife habitat for furbearer and waterfowl species. However, beaver dams can also cause problems by slowing the flow of water in some areas and contributing to widespread flooding of low lying areas.

Nutria

Nutria are large rodents that are native to South America. Nutria inhabit many types of environments and can be found in 16 states. These rodents are highly prolific and reproduce year round. Nutria feed on many types of vegetation and consume about 25 percent of their body weight daily. Nutria are a primary force in accelerating wetland loss.

4.2.9 Aquatic Resources

4.2.9.1 Plankton

Phytoplankton are tiny plants that float in the water. They include single-cells, colonies of cells, and filaments (linear strings of cells) that are usually capable of photosynthesis. Many protozoa are closely related to algae, so the distinction between protozoa and algae is artificial. Floating or swimming cyanobacteria (bacterioplankton) are often considered phytoplankton. Many are photosynthetic and as large as eukaryotic algae. The most commonly encountered groups of freshwater algae are green algae, diatoms, and blue-green algae. Other types of algae found in lakes include: Euglenoids, dinoflagellates, brown algae, stoneworts/brittleworts, and desmids. Most freshwater algae do not cause problems in lakes; they provide a food source for zooplankton and tend to be rapidly consumed and rarely cause the prolonged blooms that can occur with blue-green algae.

Photosynthetic phytoplankton are eaten by protoplankton, zooplankton (small invertebrate animals that swim), aquatic insects, fishes, and other animals. Together with aquatic higher plants, they are the basis of freshwater food chains. Phytoplankton, other algae and plants, are the source of most of the oxygen in Earth's atmosphere.

Dominant phytoplankton collected in False River included *Dactylococcopsis*, *Aphanizomenon*, *Anabaena*, *Melosira*, Flagellates, *Stephanodiscus*, *Nitzshia*, and *Oscillatoria* in the spring and *Dactylococcopsis*, *Oscillatoria*, *Nitzschia*, *Cryptomonas*, and *Cyclotella* in the fall (USEPA 1977).

Zooplankton are faunal components of the plankton, and include small crustaceans such as copepods, ostracods, euphausiids, and amphipods; worms; mollusks such as pteropods and heteropods; and egg and larval stages of most benthic and nektonic animals. Zooplankton consist of two broad categories, holoplankton, (planktonic species as adults) and meroplankton (organisms that occur in the plankton during early life stages before becoming benthic or nektonic). Zooplankton are eaten by various consumers and have an important role in nutrient cycling. Zooplankton generally feed on phytoplankton and/or ingest detritus. Most zooplankton are filter feeders; suspended detritus particulate material in the water is likely a major food source. Zooplankton provide the trophic link between phytoplankton and intermediate-level consumers such as aquatic invertebrates, larval fishes, and smaller forage fishes. Most fish and other nekton are only part of the planktonic community during early stages of their life cycles.

4.2.9.2 Benthic

Benthic organisms have a variable distribution in lakes, in part due to varying requirements for feeding, growth, and reproduction. Changes in the substrate and underlying water vary seasonally due to changes in temperature, dissolved oxygen, and inputs of living and dead organic matter.

Benthos refers collectively to all aquatic organisms that live on, in, or near the bottom of water bodies. Benthic organisms generally live in close relationship with the substrate bottom; many benthic organisms are permanently attached to the bottom. Primary producers (algae, aquatic plants) living on the bottom are called phytobenthos and consumers (protozoa and benthic animals) living on or near the bottom are called zoobenthos. Benthic fauna include infauna (animals living in the substrate, including burrowing worms, crustaceans, and mollusks) and epifauna (animals living on or attached to the substrate; mainly crustaceans, as well as mollusks).

Protozoa and ostracod crustaceans occur in large numbers on and in surficial sediments. Most protozoa are attached to the substrate and within the upper 1 cm of sediment and populations of many species are highest during the summer. Other benthos include flatworms, nematodes (round worms), and aquatic worms (oligochaetes and leeches), ostracods (small crustaceans). Important malacostracean crustaceans include mysids (opossum shrimp) and decapods (freshwater crawfish and shrimps). Freshwater mollusks include gastropods (snails) and bivalves (clams and mussels). Aquatic insects include dragonflies and damselflies, mayflies, mosquitoes, and aquatic beetles.

Large invertebrate benthic organisms (macroinvertebrates) in False River include snails, crawfish, and the larvae of many aquatic insects. Benthic macroinvertebrates consume algae, coarse particulate matter (such as fallen leaves) and associated fungi and bacteria, fine suspended organic matter, and prey organisms. The benthos is an important part of the food chain, especially for fish. They also serve as indicators of pollution and declines in environmental quality.

4.2.10 Fishery Resources

4.2.10.1 Fishes

Periodic fisheries sampling in False River has been conducted by the Louisiana Department of Wildlife and Fisheries (LDWF) using rotenone, electrofishing, gillnets, and seines. Fish species reported from False River in LDWF sampling are presented in Table 4-6 (LDWF 2011b).

Historically, the LDWF has stocked game fish in False River off and on since at least 1984 (LDWF 2011). Species stocked included Florida largemouth bass (fingerlings and Phase II), striped bass, and hybrid striped bass. Nearly two million Florida-strain largemouth bass have been stocked in False River. Genetic testing indicates that 30–40 percent of the False River bass population are Florida-strain bass. Most recently, 600 Phase II (in 2011) and 2,520 fingerlings (in 2010) Florida-strain largemouth bass were stocked (LDWF 2011b).

In the early 1990s, False River was considered the most productive trophy bass lake in the State of Louisiana, and many bass tournaments were held in the lake. In 1991, it became one of the state’s original *trophy* largemouth bass lakes. False River is a short drive from the population centers of Baton Rouge, New Orleans, and Lafayette, Louisiana, and is a popular fishing lake. Populations of largemouth bass, redear sunfish, and bluegill have been steadily declining from the 1990s to present, whereas populations of rough fish such as common carp have been increasing (LDWF 2011b; Figures 4-24 to 4-27). Due to the decline in the overall bass population, the trophy management program was discontinued in 1998. In conjunction with the designation of trophy status, commercial gill nets, trammel nets, and fish seines were banned on 9/20/91.

Table 4-6. Fish Species Reported in False River (LDWF 2011; NRCS 1987)

Common Name/Family	Scientific Name
Paddlefishes (Polyodontidae)	
paddlefish	*Polyodon spathula*
Gars (Lepisosteidae)	
spotted gar	*Lepisosteus oculatus*
longnose gar	*Lepisosteus osseus*
alligator gar	*Lepisosteus spatula*
Bowfin (Amiidae)	
bowfin	*Amia calva*
Herrings (Clupeidae)	
gizzard shad	*Dorosoma cepedianum*
threadfin shad	*Dorosoma petenense*
Carps and minnows (Cyprinidae)	
common carp	*Cyprinus carpio*
grass carp	*Ctenopharyngodon idella*
golden shiner	*Notemigonus crysoleucas*
Suckers (Catostomidae)	
smallmouth buffalo	*Ictiobus bubalus*
bigmouth buffalo	*Ictiobus cyprinellus*
lake chubsucker	*Erimyzon sucetta*
North American catfishes (Ictaluridae)	
blue catfish	*Ictalurus furcatus*
channel catfish	*Ictalurus punctatus*
flathead catfish	*Pylodictis olivaris*
yellow bullhead	*Ameiurus natalis*
Temperate basses (Moronidae)	
white bass	*Morone chrysops*
yellow bass	*Morone mississippiensis*
striped bass	*Morone saxatilis*
striped bass x white bass - hybrid striped bass	*Morone saxatilis x Morone chrysops* hybrid
Sunfishes (Centrarchidae)	
green sunfish	*Lepomis cyanellus*
warmouth	*Lepomis gulosus*
orangespotted sunfish	*Lepomis humilis*
bluegill	*Lepomis macrochirus*
dollar sunfish	*Lepomis marginatus*
longear sunfish	*Lepomis megalotis*
redear sunfish	*Lepomis microlophus*
spotted sunfish	*Lepomis punctatus*
largemouth bass	*Micropterus salmoides*
spotted bass	*Micropterus punctulatus*
white crappie	*Pomoxis annularis*
black crappie	*Pomoxis nigromaculatus*
Mullets (Mugilidae)	
striped mullet	*Mugil cephalus*
Drums (Sciaenidae)	
freshwater drum	*Aplodinotus grunniens*

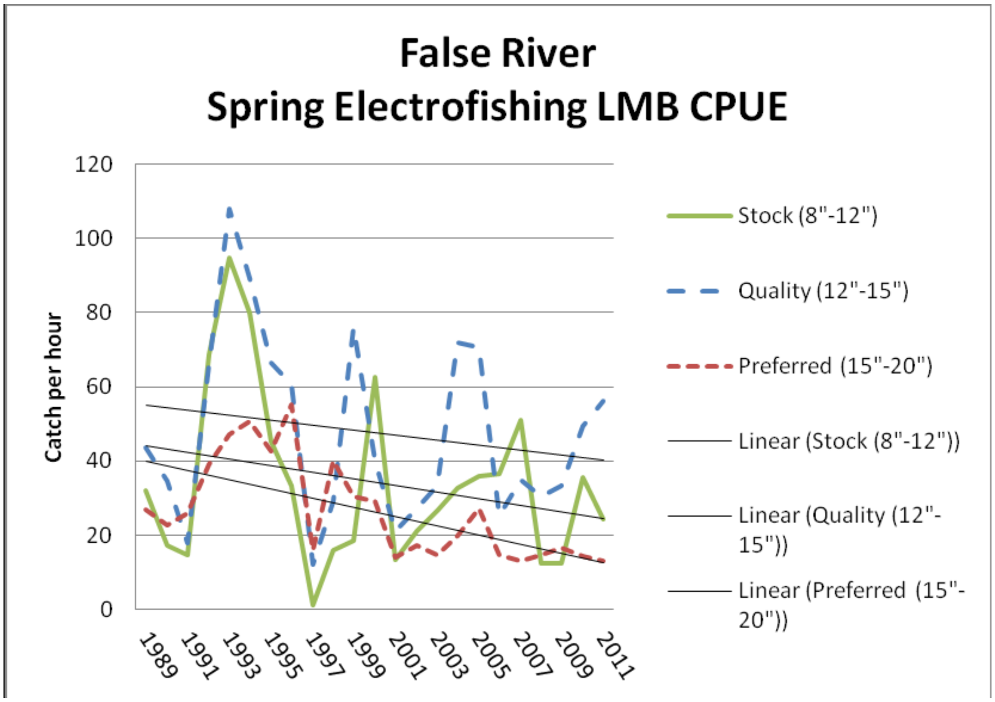

Figure 4-24. Spring Catch-Per-Unit-Effort (CPUE) Values for Largemouth Bass in False River from 1989 to 2011 (LDWF 2011b)

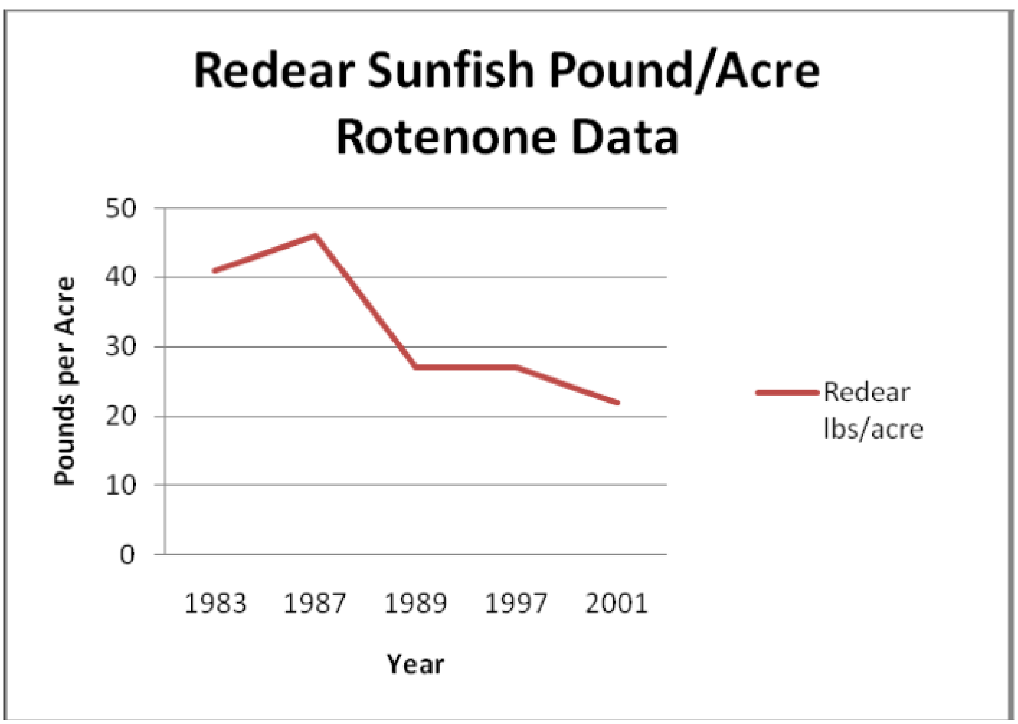

Figure 4-25. Redear Sunfish Standing Crop Estimates from Rotenone Catches in False River from 1983 to 2001 (from LDWF 2011b)

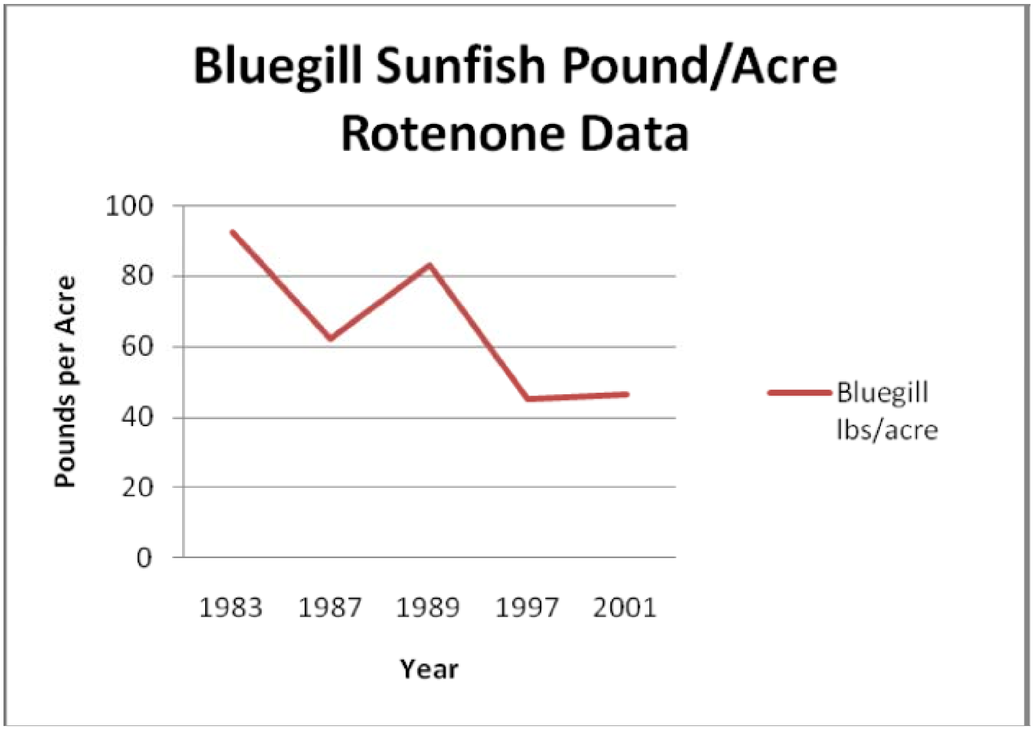

Figure 4-26. Standing Crop Estimates from Rotenone Catches for Bluegill in False River from 1983 to 2001 (from LDWF 2011b)

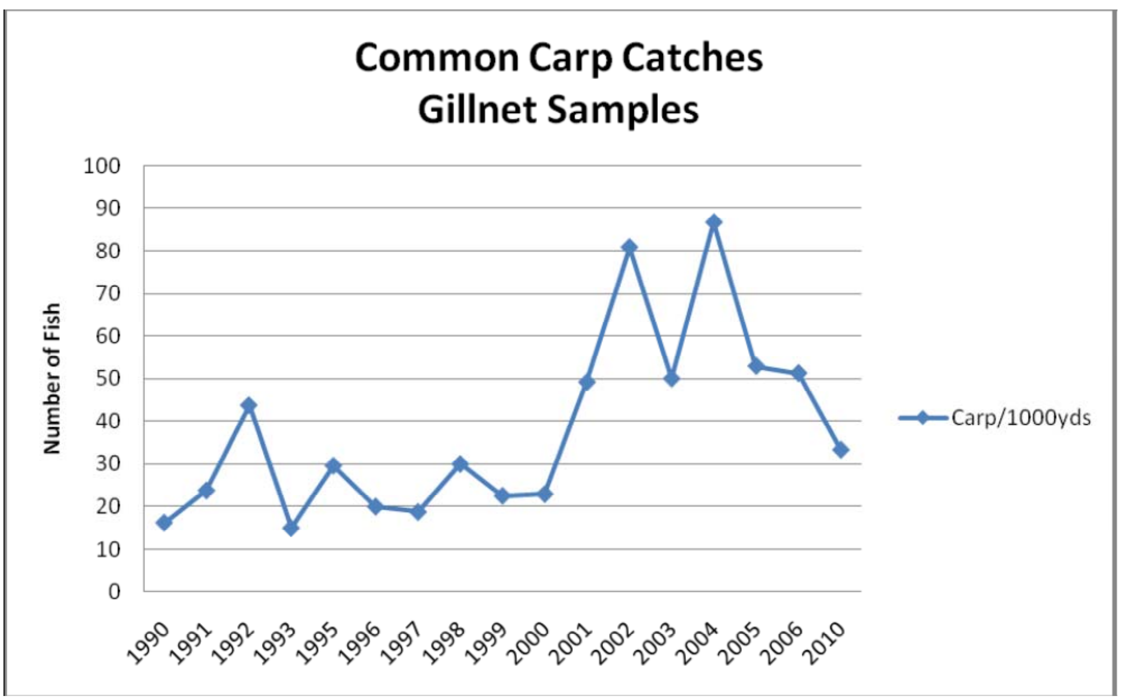

Figure 4-27. Common carp CPUE from gillnet samples in False River from 1990 to 2010. The results show an increase over time, especially since the net ban in 1991 to protect largemouth bass (from LDWF 2011b).

Numerous state record fish have been caught in False River, including the ninth heaviest hybrid striped bass, sixth heaviest common carp, eighth heaviest flathead catfish, and six of the heaviest 10 freshwater drum (Louisiana Outdoor Writers Association 2012).

Although False River currently lacks significant areas of submerged aquatic vegetation, pilings from piers and other structures and numerous artificial reefs constructed of sunken Christmas trees, willow trees, tires, and rip-rap have been placed in the lake, adding structure for various fish species.

No major fish kills have been documented in False River; however, largemouth bass were reportedly killed during the summer of 2000 (LDWF 2011b). Largemouth bass virus (LMBV) was suspected at this time, but was not confirmed until subsequent sampling. In 2001, a kill of common carp was attributed to gill trematodes and bacterial infections (LDWF 2011b).

The False River water temperature exceeded 30ºC regularly during the summer months; this is poor for fisheries according to the Habitat Suitability Indices. For short periods during the summer months, dissolved oxygen levels were low (below 2–3 mg/l); this is also poor for fisheries.

4.2.10.2 Invasive Species - Fish

Although no invasive species are reported in the USGS invasive species database (USGS 2012), grass carp and common carp are present in False River (LDWF 2011).

Grass carp

Grass carp are native to eastern Asia and have spread to 45 states through accidental and intentional releases. Grass carp can consume aquatic vegetation and can compete with invertebrates and other fishes; significantly change macrophyte, phytoplankton, and invertebrate communities; interfere with the reproduction of other fish species; decrease refuges available to other species; modify preferred fish habitats; enrich and eutrophy lakes; disrupt food webs and trophic structures; and introduce non-native parasites and diseases (Mississippi River Basin Panel on Aquatic Nuisance Species 2004).

Grass carp has been documented in False River since the late 1980s. The introduction of this species was not authorized by LDWF. It has not been determined if these fish are diploid or triploid (triploid are sterile), so it is unknown whether the population is successfully reproducing in False Rivers. It is the presence of grass carp is likely contributing to the loss of aquatic vegetation in False River. At a meeting on February 12, 2012, the Louisiana Wildlife and Fisheries Commission is considering the establishment of a recurring commercial net season on False River to remove the current net ban and allow commercial fishing of rough fish such as grass and common carp.

Common carp

The common carp is a large omnivorous fish with large scales, a long dorsal fin base, and two pairs of barbels in its upper jaw. Carp were intentionally introduced into the U.S. from Europe and Asia. Although this species was popular in the early 1870s as a food fish, common carp fell into wide disfavor soon after and is now considered a nuisance fish because of its detrimental effects on shallow lakes and wetlands. Carp feeding activities disrupt shallowly rooted plants, muddy waters, and cause declines of aquatic plants. Common carp are present in False River;

carp catches in gillnet data have increased, particularly since 2000. This is likely due to the increase of soft sediments and the commercial netting ban.

4.2.11 Threatened and Endangered Species

Threatened and Endangered species that may be present in Pointe Coupee Parish are listed in Table 4-7. An analysis of potential effects on threatened and endangered species, in and around False River, is included pursuant to the requirements of the NEPA of 1969, 42 U.S.C. Section 4321, *et seq*. Additional jurisprudence includes the Endangered Species Act of 1973 (PL 93-205; 16 U.S.C. 1531 *et seq*., as amended); the Fish and Wildlife Conservation Act of 1958 (PL 85-624; 16 U.S.C. 661 *et seq*.); La. Civ. Code Ann. Art. 56, secs. 1901 to 1907; article VI of the U.S. Constitution; and the Bald and Golden Eagle Protection Act of 1940 (as amended). Threatened (T) or endangered (E) species are technically important because the status of such species provides an indication of the overall health of an ecosystem. These species are publicly important because of the desire of the public to protect them and their habitats.

Table 4-7. Rare, Threatened and Endangered Species in Pointe Coupee Parish

Common Name	Scientific Name	Federal Status	State Status
Louisiana Black Bear	*Ursus americanus luteolus*	**T**	**T**
Pallid Sturgeon	*Scaphirhynchus albus*	**E**	**E**
Paddlefish	*Polyodon spathula*		**C**
American Swallow-tailed kite	*Elanoides forficatus*		**C**
Six-banded Longhorn Beetle	*Dryobius sexnotatus*		**C**
Bald Eagle	*Haliaeetus leucocephalus*	**D**	

T=threatened, E=endangered, D=delisted, C=Species of Concern

4.2.11.1 Louisiana Black Bear

The Louisiana black bear is a subspecies of the American black bear *(Ursus americanus)*, that is found in Louisiana, south Mississippi, and east Texas. Adult black bears typically weigh 150 to 300 lbs. Louisiana black bears generally require large, relatively contiguous areas of bottomland and other hardwood forested habitat to meet survival needs, including hardwood mast trees, fruiting plants, and secluded locations for den sites to bear young.

Louisiana black bears live in three areas of Louisiana. The northernmost population is found in the Tensas River basin and the southernmost population is in the lower Atchafalaya River basin. A third population is located in the Morganza floodway system. The Louisiana black bear is listed as a Federal and state threatened species. The USFWS has designated critical habitat for the Louisiana black bear in Avoyelles, East Carroll, Catahoula, Concordia, Franklin, Iberia, Iberville, Madison, Pointe Coupee, Richland, St. Martin, St. Mary, Tensas, West Carroll, and West Feliciana Parishes in Louisiana. The western bank of False River is eastern border of extant bottomland hardwoods (from LA Hwy. 3131 to LA Hwy. 78) that were designated as critical habitat by the USFWS for the Louisiana black bear (Figure 4-28).

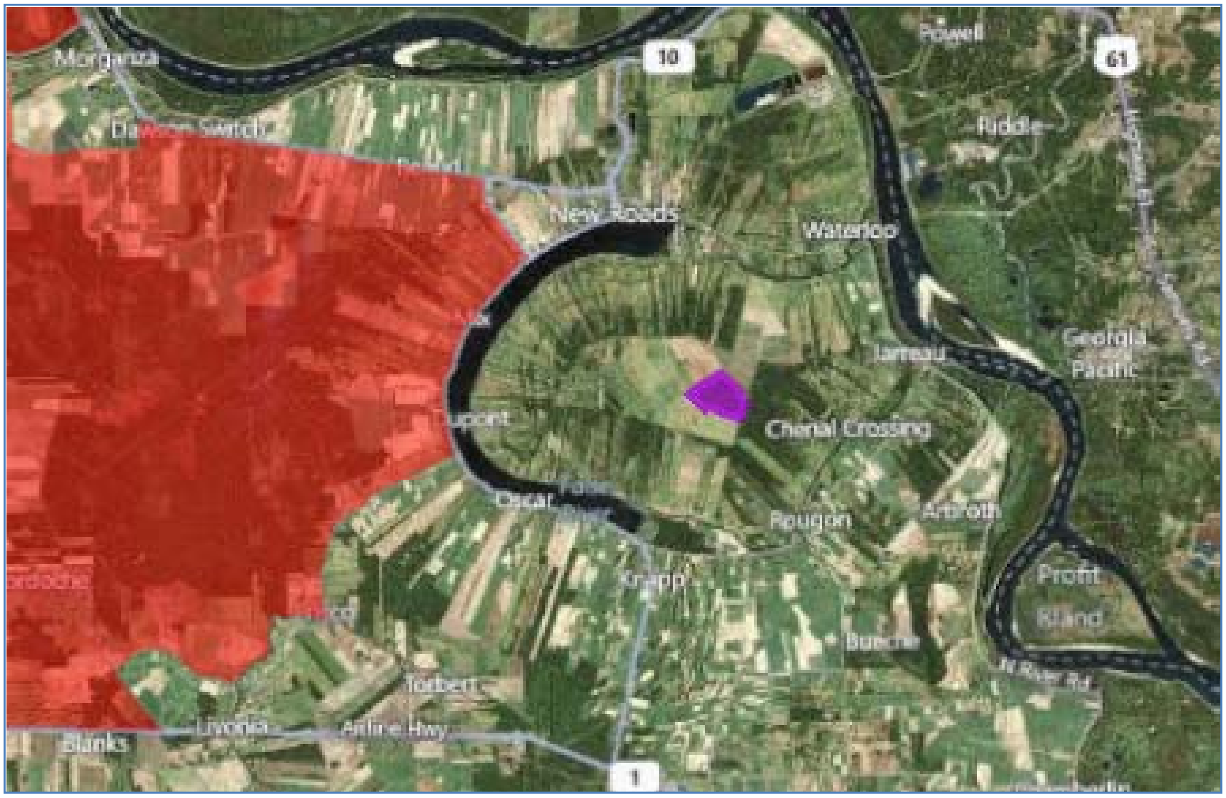

Figure 4-28. Designated Louisiana Black Bear Critical Habitat West of False River

4.2.11.2 Pallid Sturgeon

The pallid sturgeon is endemic to the Middle and Lower Mississippi, Missouri, Yellowstone Rivers, and the lower reaches of their major tributaries (USFWS 1993). The pallid sturgeon primarily lives in strong currents over firm sand or gravel in large turbid rivers. Food is primarily small fishes (including chubs and minnows) and immature aquatic insects. The detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana.

Since 1980, the most frequent pallid sturgeon occurrences are from the Atchafalaya River at the Old River Control Structure Complex and the Missouri River (USFWS 1993). The pallid sturgeon can hybridize with the shovelnose sturgeon (Carlson *et al.* 1985). Environmental degradation and loss of spawning habitat could force sharing of suitable habitat areas by these similar species and increase the chance of hybridization (USFWS 1993). Hybridization could be occurring in half of the river reaches in the pallid sturgeon's range (Keenlyne *et al.* 1992). The pallid sturgeon was listed as endangered; however, critical habitat has not been proposed or designated. False River has no current hydrologic connection to the Mississippi River, and no pallid sturgeon were reported in the False River sampling (LDWF 2011).

4.2.11.3 Paddlefish

Paddlefish are present in False River; mostly in a 2009 LDWF gillnet (LDWF 2011b). Paddlefish are found in large rivers throughout much of the Mississippi Valley and adjacent Gulf slope drainages in North America. This species is found in large, low-gradient rivers in backwater areas and also in periodically-flooded oxbow lakes. In Louisiana, paddlefish are found in numerous rivers, lakes, and bayous, including the Atchafalaya, Mississippi, Red and Mermentau River basins, Bayou Nezpique, and other freshwater areas. Although primarily a freshwater fish, paddlefish are also found in the estuarine systems of Lake Pontchartrain and Grand Lake. The paddlefish feeds primarily on zooplankton crustaceans. Paddlefish are highly mobile and have been observed to move more than 2,000 miles in a river system.

4.2.11.4 Six-banded Longhorn Beetle

The six-banded longhorn beetle is a medium-sized, 0.75 to 1 inch (1.9-2.5 cm) elongated black beetle distinctly marked with eight yellow bands and is found in the eastern half of the U.S. These beetles inhabit mature hardwood forests with large overmature trees. Preferred tree species include elm, maple, and beech. The wood-boring larvae feed until the tree has died and the bark has fallen off (Michigan Natural Features Inventory 2007). The six-banded longhorn beetle is listed as a species of special concern in Pointe Coupee Parish.

4.2.11.5 American Swallow-tailed Kite

The American swallow-tailed kite is a large black and white raptor, measuring 22 inches long with a 51 inch wingspan. In North America, the swallow-tailed kite breeds at a few scattered locations in the southeastern coastal plain, from east Texas to South Carolina. Breeding colonies favor woodlands with trees that rise well above the canopy and with ready access to wet prairies or marshes for food. The kite feeds mostly on insects and also hummingbirds, tree frogs, anole lizards, snakes, and young birds. The American swallow-tailed kite is listed as a species of concern in Pointe Coupee Parish.

4.2.11.6 Bald Eagle

The bald eagle is found in quiet coastal areas and along rivers or lakes near large tall trees. The bald eagle is currently delisted by USFWS from its Federally threatened status. However, it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. There were 284 bald eagle nests in Louisiana in 2006, the last year annual surveys of eagle nests were conducted (USFWS 2010b).

4.2.12 Cultural and Historic Resources

Preliminary archival research of GIS Layers and USGS topographic maps maintained by SHPO for the Area of Potential Effect (APE) revealed no sites or historic structures within, or directly adjacent to the APE. Further cultural resource surveys are not recommended because potential impacts are not anticipated.

4.2.13 Aesthetics

False River is an oxbow lake that supports large numbers of plants, fish, and other animals. The clarity of the water is generally good, although turbidity can be high at times. The lake area is generally rural with numerous agricultural fields. The City of New Roads and several smaller towns (Ventress, Oscar, Jarreau, Lakeland, Rougon, and Glynn) are located near False River. Numerous single-family dwellings, camps, and a few commercial businesses are located along the lakeshore. The southern end of the lake is forested.

Overall, the aesthetic value of the lake is good. The aesthetic value of the littoral zone is good, although some of the shoreline has bulkheads and piers. Turf grass, which can be perceived as pleasing is prominent around the lake as well.

4.2.14 Recreation

This resource is legally important because of the Federal Water Project Recreation Act of 1965, as amended, and the Land and Water Conservation Fund Act of 1965, as amended. Recreational resources are technically important because of the high economic value of recreational activities and their contribution to local, state, and national economies. Recreational resources are publicly important because of the high value the public places on fishing and boating, as measured by the large number of fishing licenses sold in Louisiana, and the large per-capita number of recreational boat registrations in Louisiana.

4.2.14.1 Recreational Opportunities

Recreational opportunities in the False River watershed are mixed and include recreational boating, fishing, water skiing, jet skiing, canoeing, bird watching, and hunting. There are currently six private (for pay) and public launch ramps for False River.

4.2.14.2 Parks

National

Atchafalaya National Heritage Area

False River is located within the Atchafalaya National Heritage Area. In 1997, the Louisiana Legislature designated an area stretching across 14 parishes as the Atchafalaya Trace Heritage Area. Congress designated the region as the Atchafalaya National Heritage Area in October 2006. A National Heritage Area is a place where *natural, cultural, and historic resources combine to form a cohesive, nationally important landscape* (National Park Service 2012). The heritage area is managed by the Atchafalaya Trace Commission and the Louisiana Department of Culture, Recreation and Tourism, with technical, planning, and limited financial assistance from the National Park Service. A 15-year clear, strategic direction for the heritage area is currently being developed.

The Atchafalaya National Heritage Area has four sub-regions. The Atchafalaya River's headwaters and False River are in the Upper Atchafalaya; Between Two Rivers includes Baton Rouge; the Bayou Teche Corridor contains bottomland hardwood forests, swamps, bayous, lakes, and marshes from north of Washington to Cypremort Point State Park; and the Coastal Zone is from the Gulf of Mexico east to Pointe-Aux-Chenes and north to Donaldsonville (Atchafalaya National Heritage Area 2012).

The Sherburne Wildlife Management Area (WMA) Complex

The Sherburne Wildlife Management Area (WMA) Complex, consisting of the Sherburne Wildlife Management Area, Atchafalaya National Wildlife Refuge, and Bayou Des Ourses Area is located in the Morganza Floodway system of the Atchafalaya Basin (LDWF 2012b). The complex is situated in the lower and upper portions of Pointe Coupee, St. Martin, and Iberville Parishes respectively, between the Atchafalaya River and the East Protection Guide Levee. The Sherburne WMA (LDWF), Atchafalaya National Wildlife Refuge (USFWS), and the Bayou Des Ourses Area (USACE) lands combine to form a 44,000-acre tract. The LDWF owns 11,780 acres, the USFWS owns 15,220 acres, and USACE owns the remaining 17,000 acres. The area is managed as one unit by the LDWF (LDWF 2012b).

State

The Port Hudson, Audubon, and Locust Grove State Historic Sites are within 12 miles of False River.

Port Hudson State Historic Site in East Feliciana Parish marks the location of the longest siege in American military history (Port Hudson).

Audubon State Historic Site, containing the Oakley House, where John James Audubon resided in 1821, is located northeast of False River.

Locust Grove State Historic Site in West Feliciana Parish is a small cemetery marking the remnants of Locust Grove Plantation formerly owned by the family of Jefferson Davis' sister, Anna E. Davis Smith.

City

False River Park is a municipal park north of False River and west of New Roads.

4.2.15 Socioeconomics and Human Resources

This resource is institutionally significant because of NEPA; the Estuary Protection Act; the CWA; the River and Harbors Acts; the Watershed Protection and Flood Protection Act; and the Water Resources Development Acts. Of particular relevance is the degree to which the proposed action affects public health, safety, and economic well-being; and the quality of the human environment. This resource is technically significant because the social and economic welfare of the nation can be positively or adversely impacted by the proposed action. This resource is publicly significant because of the public's concern for health, welfare, and economic and social well-being from water resources projects.

4.2.15.1 Population and Housing

The 2010 population for Pointe Coupee Parish was 22,802. This represents a population increase of approximately 0.2 percent since 2000. The ethnic composition of Pointe Coupee Parish residents was approximately 61 percent white, 36 percent African-American and 2 percent Hispanic or Latino (of any race). The State of Louisiana has an ethnic composition of approximately 63 percent white, 32 percent African-American, 4 percent Hispanic or Latino (of any race), and 2 percent Asian. Pointe Coupee Parish had 11,130 housing units with an average family size of 2.54 individuals. The State of Louisiana had 1,964,981 housing units and an average family size of 2.62 persons.

4.2.15.2 Employment and Income

The most recent year for which U.S. Census Bureau data were available for the Pointe Coupee Parish is 2010 (Table 4-8). The median household income in Pointe Coupee Parish was $41,177; the state of Louisiana had an average per capita income of $43,445. Between 2006 and 2010, approximately 20 percent of persons lived below the poverty level in Pointe Coupee Parish; the State of Louisiana had 18 percent of residents living below the poverty level. The labor force for Pointe Coupee Parish was 9,847 with approximately 6 percent unemployed. The State of Louisiana had a labor force of 2.13 million with approximately 61.7 percent unemployed. Employment in Pointe Coupee Parish was approximately 27 percent management, business, science, and arts; 16 percent service occupations; 23 percent sales and office; 18 percent natural resources, construction, and maintenance; and 16 percent production, transportation, and material moving (U.S. Census Bureau 2012).

There were 390 private non-farm establishments in Pointe Coupee Parish and 103,384 for the state. Pointe Coupee Parish had 4,294 nonfarm workers; Louisiana had 1.6 million nonfarm workers. Pointe Coupee Parish nonfarm employment increased 14 percent from 2000 to 2009; nonfarm employment in the State of Louisiana increased 3 percent during the same period.

4.2.15.3 Community Cohesion

Pointe Coupee is a rural area; however, most of the lakeshore is developed. New Roads, Oscar, Ventress, Lakeland, and Jarreau are communities on False River. False River is a main focal point for the Parish.

4.2.15.4 Environmental Justice

Executive Order 12898, issued in 1994, requires Federal agencies to evaluate environmental justice for all programs, policies, and activities. Environmental justice is defined by the EPA as *the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies*. Environmental justice ensures that equal protection from environmental and public health hazards is provided to all people regardless of race, income, culture, or social class. Additionally, environmental justice ensures that *no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of negative environmental consequences resulting from industrial, land-use planning and zoning, municipal and commercial operations, or the execution of federal, state, local, or municipal programs and policies*.

In 2010, the Pointe Coupee Parish population was 36.3 percent black, 61.4 percent white, 2.2 percent Hispanic or Latino, and 1.3 percent other races (City-Data 2011a). In 2010, the population of New Roads was 58.4 percent black, 38.8 percent white, 1.6 percent Hispanic, and 1.2 percent other races (2010 Census 2011).

In 2010, the percentage of residents living below the poverty level was 20.2 percent in Pointe Coupee Parish and 18.1 percent in the State of Louisiana (City-Data 2011a). In 2009, 26.7 percent of New Roads residents were living below the poverty level (City-Data 2012b).

Table 4-8. Socioeconomic Profile for Pointe Coupee Parish (Source: U.S. Census Bureau 2012)

Demographics	Pointe Coupee Parish	Louisiana
Population, 2011 estimate	NA	4,574,836
Population, 2010	22,802	4,533,372
Population, percent change, 2000 to 2010	0.2%	1.4%
Population, 2000	22,763	4,468,976
Persons under 5 years, percent, 2010	6.2%	6.9%
Persons under 18 years, percent, 2010	24.0%	24.7%
Persons 65 years and over, percent, 2010	15.5%	12.3%
Female persons, percent, 2010	51.5%	51.0%
White persons, percent, 2010 (a)	61.4%	62.6%
Black persons, percent, 2010 (a)	36.3%	32.0%
American Indian and Alaska Native persons, percent, 2010 (a)	0.1%	0.7%
Asian persons, percent, 2010 (a)	0.2%	1.5%
Native Hawaiian and Other Pacific Islander, percent, 2010 (a)	Z	Z
Persons reporting two or more races, percent, 2010	1.0%	1.6%
Persons of Hispanic or Latino origin, percent, 2010 (b)	2.2%	4.2%
White persons not Hispanic, percent, 2010	60.3%	60.3%
Living in same house 1 year & over, 2006-2010	91.9%	84.3%
Foreign born persons, percent, 2006-2010	1.6%	3.6%
Language other than English spoken at home, pct age 5+, 2006-2010	5.1%	8.7%
High school graduates, percent of persons age 25+, 2006-2010	75.6%	81.0%
Bachelor's degree or higher, pct of persons age 25+, 2006-2010	15.3%	20.9%
Veterans, 2006-2010	1,570	318,533
Mean travel time to work (minutes), workers age 16+, 2006-2010	30.3	25
Housing units, 2010	11,130	1,964,981
Homeownership rate, 2006-2010	79.5%	68.2%
Housing units in multi-unit structures, percent, 2006-2010	3.2%	17.8%
Median value of owner-occupied housing units, 2006-2010	$108,600	$130,000
Households, 2006-2010	8,859	1,641,165
Persons per household, 2006-2010	2.54	2.62
Per capita money income in past 12 months (2010 dollars) 2006-2010	$21,533	$23,094
Median household income 2006-2010	$41,177	$43,445
Persons below poverty level, percent, 2006-2010	20.2%	18.1%

Table 4-8 (cont'd). Socioeconomic Profile for Pointe Coupee Parish (Source: U.S. Census Bureau 2012)

Business QuickFacts	Pointe Coupee Parish	Louisiana
Private nonfarm establishments, 2009	390	103,384
Private nonfarm employment, 2009	4,294	1,639,104
Private nonfarm employment, percent change 2000-2009	13.7%	2.9%
Nonemployer establishments, 2009	1,482	313,218
Total number of firms, 2007	1,663	375,808
Black-owned firms, percent, 2007	12.3%	15.9%
American Indian- and Alaska Native-owned firms, percent, 2007	F	0.7%
Asian-owned firms, percent, 2007	F	2.8%
Native Hawaiian and Other Pacific Islander-owned firms, percent, 2007	F	0.0%
Hispanic-owned firms, percent, 2007	F	2.9%
Women-owned firms, percent, 2007	31.4%	27.4%
Manufacturers shipments, 2007 ($1000)	0	205,054,723
Merchant wholesaler sales, 2007 ($1000)	177,020	51,415,553
Retail sales, 2007 ($1000)	216,342	56,543,203
Retail sales per capita, 2007	$9,638	$12,921
Accommodation and food services sales, 2007 ($1000)	14,042	9,729,869
Building permits, 2010	45	11,343
Federal spending, 2009	191,677	52,638,645
Geography QuickFacts	Pointe Coupee Parish	Louisiana
Land area in square miles, 2010	557.35	43,203.90
Persons per square mile, 2010	40.9	104.9
FIPS Code	77	22
Metropolitan or Micropolitan Statistical Area	Baton Rouge, LA Metro Area	

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
FN: Footnote on this item for this area in place of data
NA: Not available
D: Suppressed to avoid disclosure of confidential information
X: Not applicable
S: Suppressed; does not meet publication standards
Z: Value greater than zero but less than half unit of measure shown
F: Fewer than 100 firms
Source: US Census Bureau State & County QuickFacts

4.2.15.5 Infrastructure

State and local roads, a railroad grade, overhead distribution lines, pipelines, and underground telephone lines traverse the study area. Railroads and highway infrastructure is detailed in Section 4.2.15, Traffic and Transportation. Although the parish is mostly rural and has considerable agriculture, the infrastructure is very well-developed around the lake. Infrastructure supports the residents and businesses in the area.

4.2.15.6 Business and Industry

The False River area is primarily a rural agricultural area that supports limited industrial or occupational activities. The region surrounding the lake is primarily used for agricultural production and recreational activities such as fishing, boating, and hunting.

Industry, Manufacturing, and Commercial – Industries in Pointe Coupee Parish include plastic manufacturing, aggregates, and industrial systems. Numerous commercial facilities provide boat rentals, concessions, and supplies. Many retail stores, bed and breakfasts, restaurants, and antique shops are in the Parish.

Agriculture - Pointe Coupee is one of the most diverse agricultural parishes in the state. About 165,000 acres of land are used to farm cotton, sugarcane, soybeans, corn, milo, wheat, hay, vegetables, rice, crawfish and pecans. Pointe Coupee is the top pecan-producing parish in the state. The fastest expanding crops in the parish are sugar cane and cotton; other major crops include soybeans, corn, wheat, and grain sorghum (milo)(Table 4-9). Livestock production of beef cattle is also important in the region. Three grain elevators, a pecan shelling plant, a cotton gin, a sugar mill, and several farm supply companies service the agricultural industry.

Table 4-9. 2010 Agriculture Total Acreage

Crop	Pointe Coupee Parish	Louisiana
Cotton	2,562	247,592
Corn	10,300	498,535
Sorghum	2,186	75,862
Rice	4,077	537,147
Soybeans	63,010	1,007,952
Sugarcane	35,760	421,298

Source: LSU Agricultural Center 2010 Totals.

Tourism, Hunting, and Fishing - Water sports such as boating, sailing, and water skiing are readily accessible. Outdoor recreation activities include fishing, hunting, camping, and bird watching. False River was once considered a trophy bass lake, and has held the state record for the largest bass caught. Six public and private (for pay) boat launches are accessible on False River.

Mineral and Energy Production - Pointe Coupee Parish is home to Big Cajun I (not currently in operation) and II electrical generating stations. The River Bend nuclear power plant is across the Mississippi River in St. Francisville, Louisiana. Clay, petroleum, and natural gas are extracted in the parish. The first Tuscaloosa Trend natural gas discovery was made in Pointe Coupee Parish in 1975 (Pointe Coupee Parish Chamber of Commerce 2012).

Timber Production – In 2010, Pointe Coupee Parish forestry products included 13,065 cords of pulpwood, 6,610,176 board feet of saw timber, and 1,000 Christmas trees (LSU Agriculture Center 2011).

4.2.15.7 Traffic and Transportation

This section presents information on the existing conditions for transportation routes and infrastructure that would most likely be utilized by traffic associated with potential ecosystem restoration within the project area. Three primary transportation routes are used by commercial and private traffic in the United States: waterways, railroads, and highways and roadways. All of these transportation routes are present within the False River area. The waterways within the project area include False River, canals, bayous, sloughs, and ditches. False River and some of the larger canals and bayous can have substantial recreational waterborne traffic. Six boat ramps are present in the area. The Mississippi River is approximately 3 miles north and east of False River and the Atchafalaya River is located about 15 miles west of False River. These rivers have Federal navigation channels and substantial waterborne traffic. Significant roadways within the project area are discussed below.

Main highways in the area include LA Hwy 1, which parallels the western shoreline of False River. LA Hwy 413 parallels False River on the Island side of the lake. LA Hwys 10, 78, 414, 415, 416, 420, 978, 981, 982, 984, and 3131 are also located in the False River area. Numerous local roads are also present in the area. U.S. Hwy 190 is approximately 5 miles south of False River and Interstate-10 is located approximately 12 miles south of the lake. Railroads in the area include the Kansas City Southern Railroad track north of the lake and the Union Pacific Railroad track south of the lake.

The John James Audubon Bridge on LA Hwy 10 across the Mississippi River was opened in the fall of 2011. This bridge replaces the ferry that crossed the Mississippi River between Pointe Coupee and West Feliciana Parishes. The improved transportation is expected to increase the growth and population of both parishes.

4.2.15.8 Public Facilities and Services

Public facilities and services generally serve residents and recreational visitors. A portion of the study area is serviced by a municipal sewer system. The rest have individual sewer systems; however, upgrades are required by the Louisiana Department of Health and Hospitals (DHH) upon property transfer. Additional community sewer systems are being pursued by the Parish.

4.2.15.9 Local Government Finance

Although population growth has been limited from 2000 to 2010, the construction of the John James Audubon Bridge is expected to increase the area's growth and population. This increased population likely will increase local government finances.

4.2.15.10 Tax Revenue and Property Values

As the population increases, tax revenue and property values will increase accordingly. False River is a desirable retirement and second home area, thus maintaining property values.

4.2.15.11 Community and Regional Growth

Although growth has been limited in recent years, additional growth is expected due to the opening of the Audubon Bridge.

4.2.15.12 Land Use Socioeconomics

False River has approximately 22 miles of shoreline. Land use along the False River shoreline is primarily residences, camps, and businesses. Land cover on the Island is primarily pasture/hay with grassland/herbaceous land and small areas of cultivated crops (Figure 4-28). Land use along the western shore of the lake is primarily cultivated crops, grassland/herbaceous, and pasture/hay. Within the False River watershed, the primary land use categories are pasture/hay (36.7 percent), woody wetlands (26.5 percent), cultivated crops, and open water areas (Table 4-10). Cultivated crops in the watershed are primarily sugarcane (57.5 percent); unclassified crops (42.5 percent); and corn, wheat, and soybeans (19.5 percent).

Table 4-10. 2011 Land Cover Categories in False River Watershed

Land Cover Category	Acres	Percent
Pasture / Hay	15,009.3	36.7
Woody Wetlands	10,847.4	26.5
Cultivated Crops:	4,716.1	11.5
Sugarcane	2,270.5	5.6
Unclassified Crop	1,679.4	4.1
Corn, wheat, and soybeans	771.2	1.9
Open Water	3,378.9	8.3
Developed Low Intensity	997.3	2.4
Shrub/Scrub	497.4	1.2
Emergent Herbaceous Wetlands	407.8	1.0
Developed Open Space	119.0	0.3
Developed Medium Intensity	66.5	0.2
Developed High Intensity	55.4	0.1
Grassland / Herbaceous	47.2	0.1
Barren Land	3.5	0.0
Mixed Forest	2.9	0.0
	40,869.9	

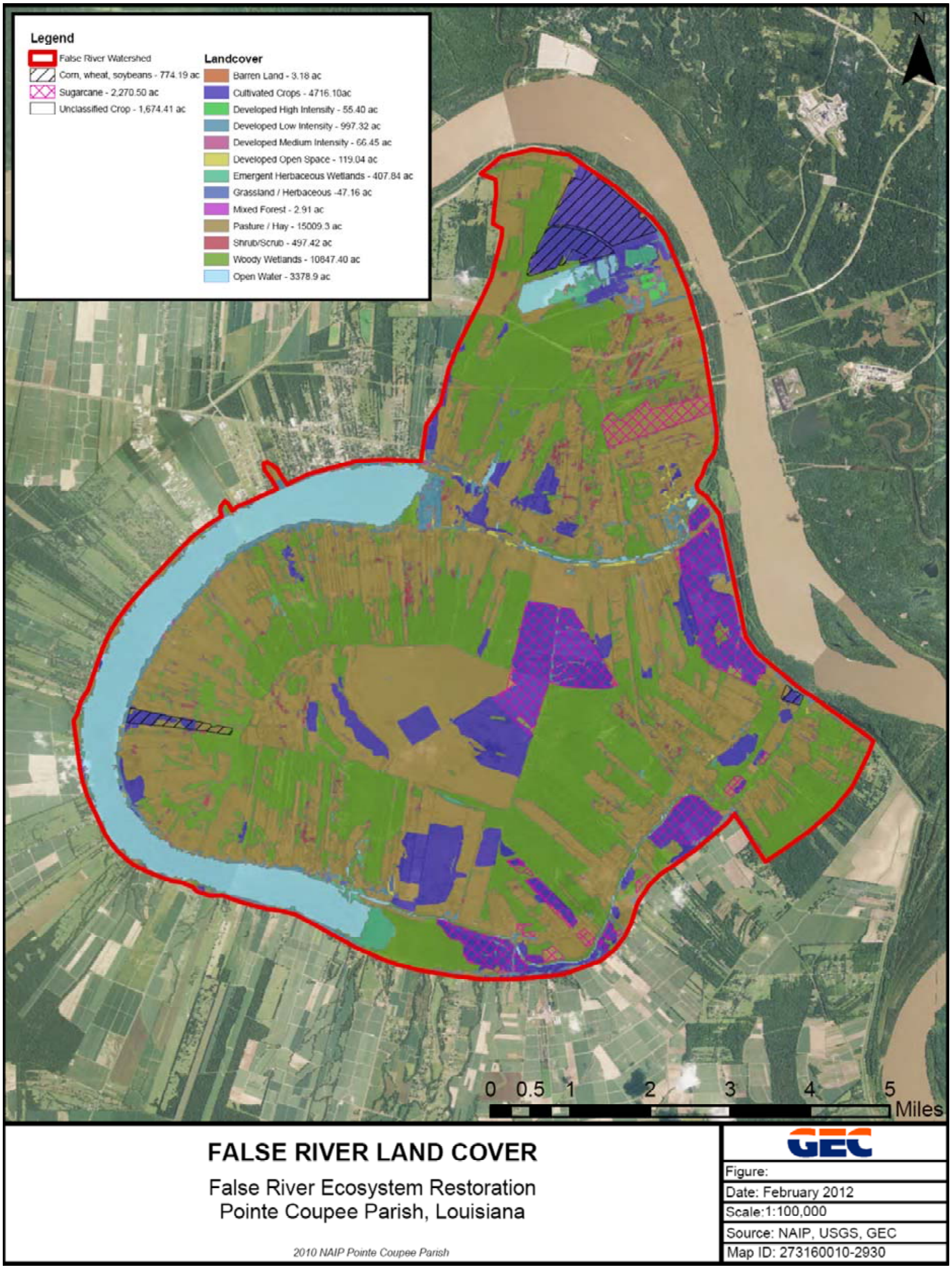

Figure 4-28. Land Cover in the False River Watershed

Historical Land Use/Land Cover- In 1976, land use in the Bayou Grosse Tete watershed (which includes the False River watershed) was reported as: cropland (41,700 acres; 30 percent), pastureland (30,800 acres; 22 percent), forest land (50,900 acres; 37 percent), and other, including roads, farms, lakes, rural nonfarm residences, towns, etc. (13,600 acres; 11 percent) (SCS EIS 1976). Major crops in 1976 included soybeans, cotton, corn, and sugarcane (SCS EIS 1976).

4.2.15.13 Navigation and Public Safety

False River is heavily used in the summer months for boating, sailing, skiing, and fishing. No-wake and slow-speed zones are established throughout the lake for safety purposes.

4.2.15.14 Man-Made Resources

Oil, Gas, Utilities, and Pipelines
There is significant oil and gas extraction and transportation in Pointe Coupee Parish and the study area.

Flood Control and Protection Levees
The mainline Mississippi and Atchafalaya River Levees protect Pointe Coupee Parish and the study area from river flooding. The Morganza Floodway hydrologically separates upper and lower Pointe Coupee Parish. During emergency flooding, the Morganza Floodway can be operated to divert excess floodwater from the Mississippi River into the Atchafalaya Basin (USACE 2012). The floodway consists of two structures (the Morganza Control Structure and the Morganza Floodway) designed to allow up to 600,000 cfs of water through the floodway to the Atchafalaya Spillway and ultimately to the Gulf of Mexico, alleviating stress on downstream Mississippi River mainline levees. The Morganza Floodway begins at Mississippi River river mile 280, extends southward to the East Atchafalaya River levee, and eventually joins the Atchafalaya River Basin Floodway near Krotz Springs, Louisiana. The Morganza Floodway was partially operated during the 1973 and 2011 high water events to relieve pressure on Old River's Low Sill Structure (USACE 2012). The State of Louisiana, Department of Public Works, and the NRCS through watershed plans have previously installed and maintained a system of channels to provide drainage improvements in the area.

4.2.15.15 Natural Resources

Commercial Fisheries – Commercial fishing was banned in False River, however the LDWF is considering lifting the net ban to help reduce the population of unwanted fish such as carp.

Forest Products – Forestry and pecans are significant natural resources in the study area.

4.2.16 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

In January 2012, a Reconnaissance Phase Hazardous, Toxic, and Radioactive Waste (HTRW) Assessment was conducted within the project area in general accordance with guidelines set forth in the USACE Regulation ER 1165-2-132, *Water Resources Policies and Authorities for Hazardous, Toxic, and Radioactive Waste Guidance for Civil Works Projects*, 26 June 1992. A summary of the results of the HTRW Assessment is presented here; the full HTRW Assessment Report is included in Appendix E.

The HTRW assessment was designed to address the existence of, or potential for, HTRW contamination on lands, including structures and submerged lands in the project area, or external HTRW contamination which could impact, or be impacted by, the project. The results of the Reconnaissance HTRW Assessment determine the level of effort to be undertaken to avoid HTRW (if found to be present) in the feasibility phase.

The Reconnaissance HTRW Assessment for the Aquatic Ecosystem Restoration Report and Environmental Assessment for False River consisted of an evaluation of existing and past land uses to determine the potential presence of HTRW. The potential impact of known HTRW sites from adjacent or nearby lands was also considered. Current and historical aerial photographs were studied and compared to assist in identifying potentially contaminated sites/structures. Land use histories of potential project sites were researched. Persons familiar with the project area and its history were interviewed about past land uses, potential contamination, and any history of HTRW problems. Federal, state, and local regulatory or response agencies records were reviewed for license/permit actions, violations, enforcement actions, and for general information regarding environmental conditions that may have impacted property. A visual survey of potential project sites was made to determine the potential for HTRW.

In the 2012 Reconnaissance HTRW Assessment of the False River project area, 59 Federal, state, and local environmental databases were reviewed to identify potential sites of environmental concern. The project area was defined as False River lake and its shore line. ASTM search distances from E 1527-05 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* were used to determine whether a site was close enough to the project area to pose a potential environmental concern. The database review determined 36 plottable sites and 15 orphan sites (identified as within the zip code of the project area, but with no address) warranted further research into the potential of these sites to have impacted environmental conditions within the project area.

In the site reconnaissance component of the HTRW assessment, a visual inspection was conducted, where possible, at sites identified as requiring further investigation from the database review. The project area was surveyed for additional potential environmental concerns that were not identified in the database review.

Interviews with public officials and local residents familiar with the project area were conducted through a combination of telephone calls and in-person interviews. Public officials were sought who had knowledge of environmental conditions in the project area. Interviewees were asked to provide knowledge of any sites, incidents, conditions, businesses, etc., that could require further investigation or remediation, either surface or subsurface, and of which project planners should be aware. Additionally, information from local residents was gathered to determine the location and condition of orphan sites.

Review of Federal, state, and local environmental databases; historical research; interviews; and site investigations determined that 40 potential sites of concern could be located within ASTM search distances of the False River shoreline. No potential sites of concern are located within the lake. Further investigation into each of the 40 sites indicated that none appear to have or have had an adverse affect on environmental conditions within the project area that need to be avoided during the feasibility phase.

In summary, existing or potential Recognized Environmental Conditions (RECs) were identified near the project, but there is a very low probability that HTRW would alter the project design, adversely affect the project area, personnel working on the project, or the public at large. No further study of HTRW is recommended for this project. If the project location or methods change, the HTRW probability may need to be re-investigated.

Sediment Quality

The USACE collected and analyzed sediment cores and grab samples during the summer of 2010 in association with the *False River Ecosystem Restoration Data Summary*. Six cores and eight grab samples were collected. Sediments were analyzed for USEPA Priority Pollutant metals plus iron, organochlorine pesticides, Polychlorinated Biphenyls (PCBs), chlorinated herbicides, grain size, specific gravity, and Atterberg Limits. Agronomic testing was conducted for pH, phosphorus, potassium, calcium, magnesium, sodium, sulfur, copper, and zinc.

No pesticides, PCBs, or herbicides were detected in the sampled sediments. All analyzed metals were detected in all samples submitted for analysis. Analyzed metals included silver, antimony, arsenic, beryllium, total chromium, iron, lead, zinc, cadmium, nickel, copper, selenium, thallium, and mercury. The LDEQ has not adopted sediment quality standards.

An evaluation of the sediment metals data against NOAA's Screening Quick Reference Tables (SQuiRTs) for Inorganic Chemicals in Freshwater Sediment indicates that concentrations of arsenic, iron, cadmium, nickel, and copper exceed SQuiRTs threshold effect level (TEL) and/or lowest effect level (LEL) concentrations in samples collected from the north and south flats. There are no SQuiRTs concentrations for selenium or thallium. The TEL and LEL are based upon chronic, long-term impacts of contamination to benthic organisms. The LEL is a level of sediment contamination that can be tolerated by the majority of benthic organisms. If a single parameter equals or exceeds the LEL, it is anticipated that material represented by that sample may have an adverse effect of some benthic resources. The TEL is the concentration below which no adverse effects are expected to occur.

Agronomic constituents analyzed during to 2010 study included pH, phosphorus, potassium, calcium, magnesium, sodium, sulfur, copper, and zinc. Average concentrations are tabulated in Table 4-11. SQuiRTs are available for copper and zinc; they were not exceeded.

Table 4-11. Average Sediment Agronomic Concentrations (Appendix A)

	Average	Minimum/Maximum	Number of data points
North Flat			
pH	7.92	7.62/8.12	8
Phosphorus mg/kg	29.64	17.32/51.02	8
Potassium mg/kg	243.3	196.8/327.9	8
Calcium mg/kg	4881	3863/6258	8
Magnesium mg/kg	725.9	585.0/977.0	8
Sodium mg/kg	44.15	35.66/67.44	8
Sulfur mg/kg	23.44	12.29/39.79	8
Copper mg/kg	1.21	1.05/1.59	8
Zinc mg/kg	3.97	2.61/6.58	8
South Flat			
pH	7.71	7.43/7.95	8
Phosphorus mg/kg	38.47	13.39/63.65	8
Potassium mg/kg	244.6	166.6/321.4	8
Calcium mg/kg	5784	3810/9446	8
Magnesium mg/kg	764.4	578.7/926.8	8
Sodium mg/kg	54.68	42.66/68.53	8
Sulfur mg/kg	38.15	22.44/53.93	8
Copper mg/kg	1.05	0.83/1.27	8
Zinc mg/kg	4.92	3.78/6.59	8

5.0 ENVIRONMENTAL CONSEQUENCES *

5.1 Evaluation

This section describes the potential environmental consequences of implementing alternative plans to reverse the trend of degradation in False River. This environmental analysis evaluates and compares, from a qualitative and quantitative perspective, the alternatives carried over for detailed analysis. Impact analysis described in this section is based on a combination of scientific and engineering analyses, professional judgment, field investigations, and previously compiled information.

The following analysis compares the No-Action Alternative (future without project conditions) to the final array of action alternatives (A2 through A7) over the 50-year period of analysis (2013 - 2063). The final array of alternatives includes three dredge flats with island/edge creation with plantings alternatives (2 through 4) and three dredge flats with upland disposal alternatives (A5 through A7, see Section 3.0 for detailed descriptions). Since the environmental consequences would be nearly the same for the north and south flats, the analysis is generally grouped by disposal type (island/edge creation and upland disposal). Some consequences are grouped by no-action and action alternatives.

Alternative A4 (Dredge North and South Flats with Island/Edge Disposal and Plantings) was the NER plan and is the Tentatively Selected Plan (TSP). The non-Federal sponsor supports the TSP.

A comparison of the direct, indirect, and cumulative impacts for alternatives to reverse the trend of habitat degradation in False River is presented herein. Direct impacts are effects caused by the proposed action that occur at the same time and place (Section 1508.8(a) of 40 CFR Parts 1500-1508). Indirect impacts are effects caused by the action that occur later in time or further removed in distance, but are still reasonably foreseeable (Section 1508.8(b) of 40 CFR Parts 1500-1508). Cumulative impacts are effects that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or entity undertakes such actions. Cumulative impacts can result from actions that individually are minor, but collectively result in significant actions taking place over time (Section 1508.7 40 CFR Parts 1500-1508). The cumulative impact analysis followed the 11-step process described in the Council of Environmental Quality 1997 report entitled Considering Cumulative Effect under the National Environmental Policy Act.

5.2 Significant Resources

5.2.1 Geology

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be minimal direct and long-term effects on geology in the project area due to the re-distribution or removal of lake-bottom sediments.

5.2.2 Soils and Waterbottoms

5.2.2.1 Soils

No-Action Alternative
There would be no direct or indirect effects.

Island/Edge Creation and Plantings Alternatives
These alternatives would create about nine acres of island and edge habitat from existing lake bottom. These effects would be direct and long-term.

Upland Disposal Alternatives
These alternatives would temporarily affect the soils in the upland disposal area. These effects would be short-term and conditions would return to normal in 1-2 years.

5.2.2.2 Waterbottoms

No-Action Alternative
There would be no direct or indirect effects. The substrate would remain the same, with little consolidation or improvement. Resuspension of the unconsolidated lake-bottom material would continue.

Island/Edge Creation and Plantings Alternatives
These alternatives would have direct, positive, and long-term effects on waterbottoms. About nine acres of water bottom would be converted to island habitat. The creation of islands and deepening would reduce the effects of wind and wave action on the resuspension of the unconsolidated material.

Upland Disposal Alternatives
There would be direct and long-term effects by the lake deepening. The increased depth would reduce the resuspension of unconsolidated material.

5.2.3 Hydrology

5.2.3.1 Flow and Water Levels

No-Action Alternative
There would be no direct or indirect effects; incoming flows and water levels would remain the same.

Action Alternatives
There would be no direct or indirect effects; incoming flows and water levels would remain the same.

5.2.3.2 Sedimentation and Erosion

No-Action Alternative
The No-Action Alternative is unlikely to have an effect on sediment quality in the short term. Tributaries to False River would continue to contribute suspended solids to the lake; some of

these are deposited on the lake bed. Future sediment quality is dependent on the quality of the source material, which could change with changes in watershed land uses.

Island/Edge Creation and Plantings Alternatives
Sedimentation, sediment quality, and turbidity would be to limit the portion of the lake where construction occurs. A turbidity curtain and other BMPs would be used to reduce these impacts. These effects would be minimal, direct, and short-term. During island construction activities, turbulence and runoff from the exposed bare earth would likely result in some erosion and deposition of material in adjacent waters. Impacts associated with island building would be evident during construction operations and for a short time following construction. Wind and wave activity may also contribute to erosion of the islands. Bank stabilization may be necessary to reduce erosion rates and re-deposition of sediments into the adjacent lake. BMPs to reduce erosion include installing silt fences and hay bales. Vegetation of the islands is planned and would reduce erosion and runoff. Although erosion and re-deposition of material may affect the physical characteristics of sediments, the chemical quality of the sediment is unlikely to be affected by construction.

The creation of islands and edge habitat would have positive, direct, and long-term effects on sedimentation. There would be minimal erosion associated with the islands upon construction. The erosion rate would be reduced by the BMPs and the planting of vegetation. Island/edge creation would reduce the resuspension of the lake sediments by breaking the wave fetch and deepening of open water.

Upland Disposal Alternatives
Removing the some of the existing sedimentation to the upland disposal area would have direct and long-term effects. Minimal erosion would be associated with the construction of the upland disposal areas. The erosion rate would be reduced by the BMPs and the planting of vegetation.

5.2.3.3 Water Use and Supply

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be no direct or indirect effects.

5.2.3.4 Groundwater

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be no direct or indirect effects.

5.2.4 Water Quality

No-Action Alternative
There would be no direct or indirect effects. Tributaries to False River would continue to contribute runoff and create areas with elevated levels of turbidity and suspended solids. Seasonally elevated water temperatures and low dissolved oxygen would continue to occur.

Periods of resuspension of sediments would continue, leading to degradation of water quality.

Island/Edge Creation and Plantings Alternatives
There would be temporary, direct, and indirect adverse effects, but also long-term direct positive effects on water quality.

Adverse Effects - During island construction activities, turbulence and runoff from exposed bare earth would likely result in some erosion and deposition of material in adjacent waters. Impacts associated with island building would be evident during construction operations and for a short time following construction. Wind and wave activity may also contribute to erosion of the islands. BMPs, such as silt fences, hay bales, and cover vegetation would be used to reduce erosion and runoff. These effects would be temporary, direct, and indirect. The impacts of dredging and depositing this material in the water column are unknown. There is a possibility that these metals could be released into the water column. Elutriate chemical analysis is recommended to evaluate whether water quality would be adversely impacted by sediment deposition and mixing with the water column.

Positive Effects – Once construction is completed and the vegetation has become established, the water quality within the project area would improve. The deepening and shading would greatly reduce the excessive temperatures that are occurring. The islands would break up the wave fetch and the resuspension of lakebottom materials would be greatly reduced. The deepening, reduction of water temperatures, and reduced resuspension of sediments and nutrient would also reduce the periods of low dissolved oxygen.

Upland Disposal Alternatives
There would be temporary, direct, and indirect adverse effects, but also long-term direct positive effects on water quality.

Adverse Effects - During construction activities, the hydraulic dredging would create turbidity and the returning waters from the upland disposal would carry suspended solids. These effects would be temporary, direct, and indirect. These effects would be minimized by the use of BMPs. The impacts of dredging and depositing this material in the water column are unknown. There is a possibility that these metals could be released into the water column. Elutriate chemical analysis is recommended to evaluate whether water quality would be adversely impacted by sediment deposition and mixing with the water column.

Positive Effects – Once construction is completed, the water quality within the project area would improve. The deepening would reduce the excessive temperatures and sediment resuspension that is now occurring. The deepening, reduction of water temperatures, and reduced resuspension of sediments and nutrients would also reduce the periods of low-dissolved oxygen.

5.2.5 Air Quality

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
With implementation of the proposed action, air quality in the system would have minor short-term impacts during the construction phase. The air quality impacts would be limited to those

produced by heavy equipment. Ambient air quality would be temporarily degraded, but emission controls and limited duration would minimize the effects. No long-term significant impacts to the local air quality would be anticipated. Emissions attributable to the proposed action would result in de minimis impacts to air quality in Pointe Coupee Parish.

5.2.6 Noise

No-Action Alternative
There would be no direct or indirect effects.

Island/Edge Creation and Plantings Alternatives
These alternatives would have temporary noise impacts due to the use of heavy equipment, including the dredge operation and service boats. The noise would generally be restricted to the lake itself. These impacts would be short-term and temporary, for the duration of the construction. After construction, noise levels in the area would return to normal.

Upland Disposal Alternatives
These alternatives would have temporary noise impacts due to the use of heavy equipment, including dredge operation, excavators, and bulldozers. The noise would be in the upland area as well as within the lake. These impacts would be short-term and temporary, for the duration of the construction. After construction, noise levels in the area would return to normal.

5.2.7 Vegetation

5.2.7.1 Riparian Vegetation

No-Action Alternative
There would be no direct or indirect effects, the riparian habitat around the lake would continue to provide poor habitat.

Island/Edge Creation and Plantings Alternatives
Riparian vegetation would be increased by vegetative plantings on the islands. Approximately 19,412 lf (5,471 ft north flat, 13,941 lf south flat) of quality riparian habitat would be created and the existing 5,300 lf (1,100 lf - north flat, 4,200 lf - south flat) of riparian habitat within the lake would be improved. These effects would be long-term and create beneficial habitat for fish and wildlife.

Upland Disposal Alternatives
These alternatives would have little effect on riparian vegetation, except for some improvement to the existing 5,300 lf (1,100 lf – north flat, 4,200 lf - south flat) of riparian habitat within the lake. These effects would be minor and long-term.

5.2.7.2 Wetland Vegetation

No-Action Alternative
There would be no direct or indirect effects; the wetland vegetation habitat would continue to be degraded.

Table 5-1. Air Quality Emission Analysis for Nitrous Oxide

Units	Equipment Item	Total Work Hours	Work Hours per unit	Fuel Type Gas	Fuel Type Diesel	hp	Multiplying Factor % hp	Time	Total hp hours	Annual hp hours
1	Crew Boat	880	880		D	874	0.83	0.8	510695.68	510695.68
1	3.5 CY Dragline Dredge	2000	2000		D	300	0.83	0.8	398400	398400
1	Survey Boat	100	100		D	400	0.83	0.8	26560	26560
	TOTAL GASOLINE (hp hours)									
	TOTAL DIESEL (hp hours)								935655.68	935655.68
	-	-	-							
	Nox Emission Factors (lbs/hp-hrs)	Gas	Diesel							
		0.011	0.031							
							Emissions			Tons
							Gas			0.00
							Diesel			14.50
							Subtotal			**14.50**

Table 5-2. Air Quality Emission Analysis for Volatile Organic Compounds

Units	Equipment Item	Total	Work Hours	Fuel Type		hp	Multiplying		Total	Annual
		Work	per unit	Gas	Diesel		Factor		hp hours	hp hours
		Hours					% hp	Time		
1	Crew Boat	500	500		D	874	0.83	0.8	290168	290168
1	3.5 CY Dragline Dredge	2000	2000		D	300	0.83	0.8	398400	398400
1	Survey Boat	100	100		D	400	0.83	0.8	26560	26560
									715128	715128
	VOC Emission Factors (lbs/hp hours)	Gas	Diesel							
	Exhaust	0.015	0.00247							
	Evaporation	0.000661	0				Emissions			Tons
	Crankcase	0.00485	0.0000441				Gas			0.00
	Refueling	0.00108	0				Diesel			0.90
	Total	0.021591	0.0025141				**Subtotal**			**0.90**

Island/Edge Creation and Plantings Alternatives
Wetland vegetation would be restored by the creation of nine acres of cypress/tupelo habitat The WVA analysis indicated that 6.1 AAHUs (2.0 – north flat, 4.1 – south flat) would be created. These benefits would be direct and long-term.

Upland Disposal Alternatives
There would be no direct or indirect effects, the wetland vegetation habitat would continue to be degraded.

5.2.7.3 Upland Vegetation

No-Action Alternative
There would be no direct or indirect effects.

Island/Edge Creation and Plantings Alternatives
There would be no direct or indirect effects.

Upland Disposal Alternatives
There would be minor, short-term effects on upland vegetation by the upland disposal. The upland vegetation would be destroyed, but would return to normal 1-2 years after construction. Heavily forested areas would be avoided, but some trees would likely be impacted.

5.2.7.4 Submerged Aquatic Vegetation

No-Action Alternative
There would be no direct or indirect effects on SAV. Invasive SAV would likely continue to be present. The existing stand of 15 acres of southern naiad would likely continue to have difficulty establishing because of the unconsolidated bottom.

Island/Edge Creation and Plantings Alternatives
The limited existing SAV would be covered and destroyed by the fill placement. These effects would be minor and short-term. The new islands created by the project would be revegetated with ground cover and native shrubs and trees; the shallow areas along the edges of the islands would be planted with coontail and other native, desirable species. These effects would be direct, beneficial, and long-term.

There would be long-term indirect benefits because these plants provide the basis of the food chain for invertebrates and some fishes. Greater benefits to aquatic life would be provided by a proper spatial distribution of native plants along the shoreline. These plants would help filter the lake, provide oxygen to the water, stabilize the shoreline, and provide food for living organisms, habitat, cover, and nesting sites. Abundant populations of microscopic life commonly living among the plant roots become the first critical link in the energy/nutrient cycle, or food chain that can support healthy largemouth bass and bream populations. Young fish eat the tiny organisms living among the aquatic plants. This natural process will sustain a healthy, thriving, and aquatic ecosystem.

Upland Disposal Alternatives
The limited existing aquatic vegetation would be covered and destroyed by the fill placement. The depth of five feet could prevent SAV from growing. These alternatives would have little to

no impact on the existing shoreline or SAV. These effects would be direct, minor, and long-term.

5.2.7.5 Invasive Vegetation Species

No-Action Alternative
There would be no direct or indirect effects. Invasive SAV species would likely continue to exist and the use of herbicide would be needed to control these stands.

Island/Edge Creation and Plantings Alternatives
The development of a more natural habitat and the planting of native, desirable vegetation would select against invasive species. Some herbicide control would likely still be needed, but the ability to control invasive vegetation would be improved. These effects would be direct and long-term.

Upland Disposal Alternatives
These alternatives would select against some invasive species by increasing the depth to five feet. Some herbicide control would still be needed, but the ability to control the invasive vegetation would be improved. These effects would be direct and long-term.

5.2.7.6 Rare, Unique, and Imperiled Vegetative Communities

No-Action Alternative
There would be no direct or indirect effects. The cypress/tupelo ecosystem would continue to be limited and rare.

Island/Edge Creation and Plantings Alternatives
Approximately nine acres of cypress/tupelo habitat would be created. These benefits would be direct and long-term.

Upland Disposal Alternatives
There would be no direct or indirect effects. The cypress/tupelo ecosystem would continue to be limited and rare.

5.2.8 Wildlife and Habitat

No-Action Alternative
There would be no direct or indirect effects. The populations and diversity of wildlife are directly related to the quality and diversity of the habitat. The project area will continue to provide poor wildlife habitat. Degraded water quality would continue, providing little support for the food web.

Island/Edge Creation and Plantings Alternatives
The creation of the islands, edge, and forested wetland habitat would provide major benefits to wildlife. Habitat would be provided for many forms of wildlife, including, Neotropical migrants, wading birds, waterfowl, reptiles, amphibians, and some small mammals. The islands could provide nesting habitat for wading birds, which could be ideal because it would limit access by rodents that would eat their eggs. The vegetation and aquatic features would provide a basis for the food chain for most forms of wildlife. Approximately 43 AAHUs (12.5 – north flats, 30.6 – south flats) of feeding habitat and 6.1 AAHUs (2.0 – north flats; 4.1 – south flats) of nesting habitat would be created for the great egret. Approximately 6.1 AAHUs (2.0 north, 4.1 south) of

cypress/tupelo swamp habitat would be created. These benefits would be direct, indirect, and long-term.

Upland Disposal Alternatives
There would be limited wildlife benefits with the increased water depth. Reduced excessive water temperatures would provide additional aquatic habitat for reptiles and amphibians. These benefits would be direct and long-term.

5.2.9 Aquatic Resources

5.2.9.1 Plankton

No-Action Alternative
There would be no direct or indirect effects. Phytoplankton blooms would continue and lead to periodic lower dissolved oxygen levels.

Island/Edge Creation and Plantings Alternatives
Phytoplankton populations would be negatively affected by the turbidity during construction, but effects would be short-term. Once complete and developed, the islands, edge, shade, and reduced temperatures would moderately reduce excessive plankton growth in the flats that lead to blooms and lowered dissolved oxygen. The cooler water would hold more oxygen. These benefits would be direct and long-term.

Upland Disposal Alternatives
Phytoplankton populations would be negatively affected by the turbidity during construction, but effects would be short-term. The increase in water depth to five feet would slightly reduce excessive plankton growth in the flats that lead to blooms and lowered dissolved oxygen. The cooler water would hold more oxygen. These benefits would be direct and long-term.

5.2.9.2 Benthic

No-Action Alternative
There would be no direct or indirect effects. The benthic habitat in the project area would continue to be degraded.

Island/Edge Creation and Plantings Alternatives
The existing benthos populations are low due to poor substrate conditions, but would be impacted by the construction. Benthos would be negatively affected by dredging and fill; however, the benthos will repopulate from adjacent areas. These impacts would be short-term. Upon completion of construction and vegetative growth, the benthic habitat would greatly improve by the increase in water quality and some consolidation of the substrate. Reduced temperatures would improve benthic habitat as well. It may take several years for the benthic community to respond to these improved conditions. These benefits would be direct, indirect, and long-term.

Upland Disposal Alternatives
The existing benthos populations are low due to degraded substrate conditions, but would be impacted by the construction. Benthos would be negatively affected by dredging and fill; however, the benthos will repopulate from adjacent areas. These impacts would be short-term. The benthic habitat would slightly improve by the increase in water quality and reduced

temperatures. It may take several years for the benthic community to respond to these improved conditions. These benefits would be direct, indirect, and long-term.

5.2.10 Fish Resources

No-Action Alternative
The fisheries habitat within the project area would continue to be negatively impacted by poor water quality, excessive temperatures, lack of structure, periods of low dissolved oxygen and high turbidity, and the lack of a food chain.

Island/Edge Creation and Plantings Alternatives
Adverse Effects - The existing poor fisheries habitat would be temporarily negatively impacted by the construction. Fishes within in the project area would likely relocate away from the construction activity. These direct effects would be minor and short-term.

Beneficial Effects - Fish habitat would be greatly improved after construction and particularly after the vegetation (emergent and submerged) becomes established. The water quality will be improved by the reduction of excessive temperatures, reduction of high turbidity, and improved dissolved oxygen conditions. The restored habitat would provide structure for all life stages of fish and prey species. The increase in structure would provide quality fisheries habitat. The increase in prey species would provide the basis for the food chain for all life stages of fish. The HSI analysis indicated that approximately 75.5 AAHUs (21.9 – north flats, 53.8 – south flats) would be created for bluegill and 20.4 AAHUs (5.9 – north flats; 14.5 – south flats) would be created for largemouth bass. These benefits would be direct, indirect, and long-term.

Upland Disposal Alternatives
Adverse Effects - The existing poor fisheries habitat would be temporarily negatively impacted by the construction. Fishes within the project area would likely relocate away from the construction activity. The direct effects would be minor and short-term.

Beneficial Effects - Fish habitat would be improved after construction. The water quality would be improved by the reduction of excessive temperatures and improved dissolved oxygen conditions. The HSI analysis indicated that approximately 78.0 AAHUs (22.9 – north flats, 55.2 – south flats) would be created for bluegill and 12.7 AAHUs (3.7 – north flats; 9.0 – south flats) would be created for largemouth bass. These benefits would be direct, indirect, and long-term.

5.2.11 Threatened and Endangered Species

No-Action Alternative
There would be no direct or indirect effects on any listed species.

Island/Edge Creation and Plantings Alternatives
There would be minimal direct and indirect effects on any listed species or their critical habitat on the delisted bald eagle. The forested islands would create foraging and resting areas for the bald eagle.

Upland Disposal Alternatives
There would be no direct or indirect effects.

5.2.12 Cultural Resources

No-Action Alternative No sensitive cultural resources were found within the project area; therefore there would be no direct or indirect effects on cultural resources within the project area.

Action Alternatives
No sensitive cultural resources were found within the project area; therefore there would be no direct or indirect effects on cultural resources within the project area.

5.2.13 Aesthetics

No-Action Alternative
With no proposed action, the aesthetic environment in the vicinity of False River would likely remain unchanged.

Island/Edge Creation and Plantings Alternatives
With implementation of the Dredge with Island/Edge Creation alternatives, the aesthetic quality of the False River watershed would likely increase. The islands would improve the aesthetics of the north and south flats area (depending on the alternative used) once the vegetation is established. Construction operations will have short term and temporary impacts. The equipment at the site during dredging and island creation would be unsightly, but would be removed after the completion of the work.

Upland Disposal Alternatives
With implementation of the Dredge Flats with Island/Edge Creation and Plantings alternatives, the aesthetic quality of the False River Watershed would likely be unaffected. Construction operations would have temporary impacts. The equipment at the site during earthmoving operations would be unsightly but would be removed after the completion of the work. Temporary road closures and bypass ramps could be used to maintain traffic flow in and around the project site. The upland disposal area may appear unsightly until vegetation is re-established.

5.2.14 Recreation

No-Action Alternative
There would be no direct or indirect effects. Fishing on the False River flats would likely continue to decline due, in part, to poor water quality. Excessive temperatures, turbidity, and low-dissolved oxygen contribute to the poor water quality.

Island/Edge Creation and Plantings Alternatives
Recreational opportunities for fishing, boating, wildlife viewing, and the enjoyment of nature would be increased.

Upland Disposal Alternatives
Recreational opportunities for fishing, boating, and the enjoyment of nature would be increased.

5.2.15 Socioeconomic Profile

5.2.15.1 Population and Housing

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There could be a short-term population and housing demand increase as a result of the construction activity. Improved fishing and recreational opportunities could result in a slight increase in housing demand.

5.2.15.2 Employment and Income

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
The construction would provide a short-term increase in employment and income. Improved fishing and recreational opportunities could result in increased tourism, potentially leading to an increase in employment. If fishing opportunities increase and fishing improves to the level that fishing tournaments are re-introduced to the Lake, employment and income could have a an increase. These increases would be minor and long-term.

5.2.15.3 Community Cohesion

No-Action Alternative
There would be no effect.

Action Alternatives
There would be no beneficial or adverse effects.

5.2.15.4 Environmental Justice

No-Action Alternative
No minority and/or low-income communities have been identified in the study area that would be adversely affected directly or indirectly.
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Action Alternatives
No minority and/or low-income communities have been identified in the study area that would be adversely affected directly or indirectly.

5.2.15.5 Infrastructure

No-Action Alternative
There would be no effects.

Island/Edge Creation and Plantings Alternatives
There would be minor, temporary effects on roads due to the construction activity.

Upland Disposal Alternatives

There would be minor, temporary effects on roads due to the construction activity. The hydraulic dredge effluent line would have to cross at least one existing road. Likely this would be bored underneath the road so traffic is not affected. There would be some disturbance of the existing ground associated with the effluent pipes. These effects would be short-term.

5.2.15.6 Business and Industry

No-Action Alternative
There will be no effects.

Action Alternatives
There would be minor short-term benefits due to jobs and services related to the construction. Additional goods and services may be needed to support the increased recreational opportunities once the fishery habitat is restored. These benefits would be minor and long-term.

5.2.15.7 Traffic and Transportation

No-Action Alternative
There would be no effects.

Action Alternatives
There would be minor increases in waterborne and highway traffic due to the construction. These effects would be minor and short-term.

5.2.15.8 Public Facilities and Services

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be no direct or indirect effects.

5.2.15.9 Local Government Finance

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be no direct or indirect effects.

5.2.15.10 Tax Revenue and Property Values

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be a minor increase in tax revenue for goods and services due to the construction. These benefits would be minor and short-term. There would be long-term increases in tax

revenue for goods and services to support the increased recreational opportunities. These benefits would be minor and long-term. There would likely be no effect on property values.

5.2.15.11 Community and Regional Growth

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be little to no direct or indirect effects.

5.2.15.12 Land Use Socioeconomics

No-Action Alternative
There would be no direct or indirect effects.

Island/Edge Creation and Plantings Alternatives
There would be no direct or indirect effects.

Upland Disposal Alternatives
The placement of fill at the upland disposal would temporarily disrupt the agricultural activities. These impacts would be adverse and short-term. After dewatering, the agricultural activities could resume with no long-term effects. Heavily forested areas would be avoided to reduce cost and impact. There could be some very minor impacts to forestry activities, but these effects would be minor and short-term.

5.2.15.13 Navigation and Public Safety

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be minor disruption to navigation due to work vessels related to the construction. These effects would be minor and short-term. The contractor would follow all Coast Guard requirements to protect public safety.

5.2.15.14 Man-Made Resources

No-Action Alternative
There would be no direct or indirect effects.

Island/Edge Creation and Plantings Alternatives
There would be no direct or indirect effects.

Upland Disposal Alternatives
The effluent lines would have to cross utility lines. These effluent lines would either rest on top of utility lines, or be jack and bored, to avoid disruption of utility service. The effects would be minor and short-term.

5.2.15.15 Natural Resources

No-Action Alternative
There would be no direct or indirect effects.

Action Alternatives
There would be no direct or indirect effects.

5.2.16 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

No-Action Alternative
The No-Action Alternative is not anticipated to affect or contribute to HTRW in the region.

Action Alternatives
Further investigation would be required to determine if there would be any water quality impacts due to the disturbance of the sediment. An evaluation of the sediment metals data against NOAA's Screening Quick Reference Tables (SQuiRTs) for Inorganic Chemicals in Freshwater Sediment indicates that concentrations of arsenic, iron, cadmium, nickel, and copper exceed SQuiRTs threshold effect level (TEL) and/or lowest effect level (LEL) concentrations in samples collected from both the north and south flats. There are no SQuiRTs concentrations for selenium or thallium. The TEL and LEL are based upon chronic, long-term impacts of contamination to benthic organisms. The LEL is a level of sediment contamination that can be tolerated by the majority of benthic organisms. If a single parameter equals or exceeds the LEL, it is anticipated that material represented by that sample may have an adverse effect of some benthic resources. The TEL is the concentration below which no adverse effects are expected to occur.

The SQuiRTs tables are super conservative and additional investigation will be required. In the event that any HTRW is found in dredged materials or at dredged material placement sites, it would be remediated in accordance with local, state, and Federal laws.

5.3 Cumulative Impacts

There would be no significant adverse or beneficial cumulative effects for the final array of alternatives solely due to this proposed action. For the No-Action Alternative, the lake habitat would continue to be poor and likely not further degrade or improve. The action alternatives would reverse some of the ecosystem degradation associated with the development and land clearing in the watershed, thereby providing some minor cumulative beneficial effects. The Action Alternatives would restore some habitat function that has been lost in the lake and watershed.

This proposed action, in combination with all other proposed Federal, state, and local projects could have beneficial cumulative effects on water quality, fisheries, vegetation, wildlife, and the recreational use of False River.

5.4 Irreversible and Irretrievable Commitment of Resources

For all action alternatives, the irreversible and irretrievable commitments of resources would include the dredging of the lake bottom and temporary decrease in water quality, including turbidity. All of these commitments would result in increased benefits for the project area and therefore, would be viewed as a long-term beneficial effect.

5.5 Unavoidable Adverse Environmental Effects

The unavoidable adverse impacts resulting from implementation of any one of the six proposed actions within the final array of alternatives would be the temporary impacts associated with construction, include the loss of some trees within the project footprint, noise impacts due to the operation of large equipment, and the initial loss of some habitat during the clearing phase of the construction process. These impacts are considered temporary and have no impact on the long-term environmental impacts resulting from the proposed actions.

5.6 Mitigation

The action alternatives, including the Recommended Plan, would generate a net gain in benefits; therefore, no mitigation would be required for implementation and construction of this proposed action. The Recommended Plan would result in a net gain of 150 AAHUs.

5.7 Relationship of Short-Term Uses and Long-Term Productivity

All action alternatives, including the Recommended Plan would increase the long-term productivity of the lake habitat. Short-term use of the project area would be disrupted; however effects would be temporary and minor.

5.8 Environmental Consequences Summary

Under the No-Action Alternative, the quality of the lake habitat would continue to be poor, with excessive temperatures, periods of high turbidity, and low dissolved oxygen. These areas would not provide quality habitat for fish and wildlife. The overall effect of all proposed actions within the final array of alternatives, excluding the No-Action Alternative, would be a net increase in benefits for the environmental resources within the study area with very minor short-term negative impacts. The Recommended Plan would create a net gain of 150 AAHUs for the areas of impact. The long-term effects of no Federal action would be the continued degraded aquatic habitat in the north and south flats. There are no significant adverse effects; adverse effects are minor and short-term. There would be no significant cumulative effects.

6.0 COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES

The project is compatible with Federal, state, and local objectives. The recommended alternative provides for ecosystem restoration that includes fish and wildlife habitat improvement. All the island/edge creation alternatives are cost-effective.

7.0 PUBLIC INVOLVEMENT, REVIEW, AND CONSULTATION

An informational public meeting was held at the Poydras Center in New Roads in the fall of 2002 when the project was originally begun. Over 100 people were estimated to be in attendance. The USACE process was explained to the public and the Blackwater Conservation Area, was presented as an example of a Section 206 project. That project was initiated and completed in 2 years and 11 months. A PDT field investigation was conducted on October 23, 2003.

The False River Civic Association (FRCA) hosted an open to the public meeting at 6:00 pm on September 10, 2009 at the Cottonport Community Center in New Roads, Louisiana. The USACE PDT presented the status of the False River Ecosystem Restoration Study. The Study was being restarted after several years of no funding. Mr. Robert Ariatti (USACE Project Manager) presented the Section 206 study process and the steps needed to take the project through construction. The project must be justified under the NER plan and the project would be cost-shared 65 percent Federal and 35 percent non-Federal. Over 60 people were estimated to be in attendance.

Numerous coordination meetings have been conducted between the CEMVN, FRCA, LDNR, LDWF, and the Parish. CEMVN coordinated with these partners on the status of the feasibility study on October 26, 2011, in New Roads, Louisiana. The MVN indicated that it could not support the drawdown alternative because that the geotechnical study ($2.6M), to evaluate potential structural damages, would be too costly and use over half the Federal budget. The CEMVN indicated that dredging options such as island/edge creation and upland disposal appeared to be viable alternatives from the USACE perspective. The drawdown could be accomplished in concert with these alternatives and would likely enhance them.

The LDNR and LDWF presented their plan to the public in New Roads, Louisiana on May 30, 2012 (http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=924). It was estimated that between 150 to 250 people were in attendance. Part of this presentation included the construction of islands as proposed by the CEMVN. The LDNR/LDWF plan, including the construction of islands by the CEMVN, was well-received by the public. The public is interested in seeing the island configuration and layout.

8.0 ENVIRONMENTAL COMMITMENTS

CEMVN commits to avoiding, minimizing, or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications.

Protection of Fish and Wildlife Resources
CEMVN will comply with all requirements of any consultation documents associated with this project provided under the Endangered Species Act from the USFWS and the LDWF. The Contractor will keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife.

Water Quality
The contractor will prevent oil, fuel, or other hazardous substances from entering the air or water. This will be accomplished by design and procedural controls. All wastes and refuse generated by project construction will be removed and properly disposed. The contractor will implement a spill contingency plan for hazardous, toxic, or petroleum material. Compliance with USEPA Vessel General Permits would be ensured, as applicable. A Water Quality Certification was issued for this project on XX XX, 20XX (WQC xxxxx-yy; Appendix M).

Construction Monitoring
Physical monitoring of the construction profile will be conducted to ensure the project stays in environmental compliance. The construction will be monitored to ensure that the project stays within the design template.

Cultural Resources
In the event that the contractors discover any archaeological resource during borrow area dredging, construction will be halted immediately. The discovery would then be reported to SHPO and the CEMVN.

9.0 ENVIRONMENTAL COMPLIANCE

National Environmental Policy Act Of 1969
Environmental information on the project has been compiled and this environmental assessment has been prepared and disclosed to the public. The project is in compliance with the National Environmental Policy Act (NEPA).

Endangered Species Act Of 1973
Compliance with the Threatened and Endangered Species Act is being closely coordinated with the USFWS and LDWF for those species under their respective jurisdictions. This project has been fully coordinated under the Endangered Species Act and is in full compliance.

Clean Water Act – Section 404(b)(1)
The CEMVN is responsible for administering regulations under Section 404(b)(1) of the Clean Water Act. Potential project-related impacts subject to these regulations, such as the discharge of dredged material into shallow open water areas to create wetlands have been evaluated in compliance with Section 404(b)(1) of the Clean Water Act (Appendix O). The evaluation of potential impacts to water quality indicated that, on the basis of the guidelines, the proposed disposal sites for the discharge of dredged material comply with the requirement of these guidelines, with the inclusion of appropriate and practicable methods to minimize adverse effects to the aquatic ecosystem. A Water Quality Certification was issued for this project on XX XX, 20XX (WQC xxxxx-yyy; Appendix L).

Clean Water Act Of 1972
The project is in compliance:

***Sec. 311*:** A standard spill control plan for the borrow area will be initiated prior to construction.

***Sec. 401*:** This section of the Clean Water Act requires the Water Quality Certification of all Federal licenses and permits in which there is *a discharge of fill material into navigable waters*. The certification is used to determine whether an activity, as described in the Federal license or permit, will impact established site specific water quality standards. A Water Quality Certification was issued for this project on XX XX, 20XX (WQC xxxx-yyy; Appendix L).

***Sec 404*:** Potential project-related impacts subject to these regulations have been evaluated as in compliance with Section 404 of the Clean Water Act. The USACE is responsible for administering regulations under Section 404(b)(1) of the Clean Water Act. Potential project-related impacts subject to these regulations, such as the discharge of dredged material into shallow open water areas to create wetlands have been evaluated in compliance with Section 404(b)(1) of the Clean Water Act (Appendix N). The evaluation of potential impacts to water quality indicated that, on the basis of the guidelines, the proposed disposal sites for the discharge of dredged material comply with the requirement of these guidelines, with the inclusion of appropriate and practicable methods to minimize adverse effects to the aquatic ecosystem. A Water Quality Certification was issued for this project on XX XX, 20XX (WQC xxxx-yyy; Appendix L).

Section 122 of the Rivers and Harbors Act
This project is in compliance. Section 122 of the Rivers and Harbors Act of 1970 (Public Law 91-611, 84 STAT. 1823) requires that consideration be given to possible adverse economic, social, and environmental effects. It also requires that final decisions on the project be made in

the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes; and the associated costs of eliminating or minimizing the following adverse affects: air, water and noise pollution; destruction or disruption of man-made and natural resources, aesthetic values, community cohesion, and availability of public facilities and services; adverse employment effects; tax and property value losses; injurious displacement of people, businesses and farms; and disruption of desirable community and regional growth.

Clean Air Act of 1972

The project is in compliance. Compliance with the Clean Air Act (42 U.S.C. § 7401), as required by Louisiana Administrative Code, Title 33 (LAC 33:III.1405 B), an air quality applicability determination was made for the Recommended Plan. This included consideration of the proposed action for the category of general conformity, in accordance with the Louisiana General Conformity, State Implementation Plan (LDEQ 1994). An air quality determination has been calculated, based upon direct and indirect air emissions. Generally, since no other indirect Federal action, such as licensing or subsequent actions would likely be required or related to the restoration construction actions, it is likely that indirect emissions, if they would occur, would be negligible. Therefore, the air applicability determination analysis was based upon direct emissions for estimated construction hours. Considering that total emissions for each work item separately (or even when all work items are summed) would not exceed the threshold limit applicable to VOCs for parishes where the most stringent requirement (50 tons per year in serious non-attainment parishes) is in effect (see General Conformity, State Implementation Plan, Section 1405 B.2), the Volatile Organic Compounds (VOC) emissions for the proposed construction would be classified as *de minimus* and no further action would be required.

Sec. 176**:** No permanent sources of air emissions are part of the project. No air quality permits would be required for this project.

Sec. 309**:** The project has been coordinated with the public and agencies.

Federal Water Project Recreation Act

There are no cost-shared recreation features proposed for this project.

National Historic Preservation Act of 1966

The Recommended Plan is in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and 36CFR 800. Federal agencies are required to identify and consider potential effects that their undertakings might have on any significant historic property, district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. Additionally, a Federal agency shall consult with any tribe that attaches religious and cultural significance to such properties. Agencies shall afford the SHPO and tribes a reasonable opportunity to comment before decisions are made. Accordingly, the proposed action has been coordinated with the SHPO and tribes. The coordination letter received from the SHPO is included in Appendix J.

Rivers and Harbors Act of 1899

The proposed work would not permanently obstruct navigable waters of the United States. Minor obstructions to navigation would occur during construction.

Anadromous Fish Conservation Act
Anadromous fish species are not likely to be affected. The project has been coordinated with the USFWS, and is in compliance.

Migratory Bird Treaty Act and Migratory Bird Conservation Act
Migratory birds may be temporarily affected by project activities. These effects are extremely minor and short-term. The project would have an overall beneficial effect on migratory birds.

Louisiana State Rare, Threatened, and Endangered Species, and Natural Communities
The CEMVN reviewed the database maintained by the Louisiana Natural Heritage Program (LNHP) that provides the most recent listing and locations for rare, threatened and endangered species of plants and animals and natural communities within the State of Louisiana. The proposed action is not likely to adversely affect any rare, threatened or endangered species, or unique natural communities. The proposed action would increase the extent of bald cypress-tupelo swamp within portions of the study area, which are identified as rare natural communities for certain regions of the state.

U.S. Fish and Wildlife Coordination Act Report
The USACE and the USFWS have formally committed to work together to conserve, protect, and restore fish and wildlife resources while ensuring environmental sustainability of our Nation's water resources under the January 22, 2003, Partnership Agreement for Water Resources and Fish and Wildlife. The comments and suggestions from the Coordination Act Report (CAR, Appendix I) have been incorporated into this report and Recommended Plan.

E.O. 11990, Protection of Wetlands
Wetlands would be benefit from this project. This project would be in compliance with the goals of this Executive Order.

E.O. 11988, Flood Plain Management
No activities associated with the project would take place within a floodplain; therefore, this project would be in compliance with the goals of this Executive Order.

E.O. 12898, Environmental Justice
Concern with environmental justice issues can be traced to Title VI, Section 601 of the Civil Rights Act of 1964 (Public Law 88-352):

> *No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*

On February 11, 1994, President Clinton issued Executive Order 12898 regarding Federal actions to address environmental justice issues in minority populations and low-income populations:

> *To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high*

and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

Executive Order 12898 is designed to focus Federal attention on the environmental and human health conditions in minority communities and low-income communities. The order is also intended to promote non-discrimination in Federal programs substantially affecting human health and the environment, and to provide minority communities and low income communities access to public information on, and an opportunity for public participation in, matters relating to human health or environmental planning, regulations, and enforcement. Potential Environmental Justice issues have been considered throughout the entire study process, and would continue to be considered through project implementation. As part of the NEPA process, a scoping input request was provided to the public and interested parties. Comments did not identify any potential environmental justice issues. The USACE is committed to ensuring that any potential environmental justice issues are addressed as the study proceeds. The proposed ecosystem restoration measures would equally impact all potential users in the area. There would be no potential environmental justice issues from implementing the Recommended Plan. The project would not result in adverse human health or environmental effects, nor would it affect subsistence consumption of fish or wildlife. The project would be in compliance.

E.O. 13112, Invasive Species

The project would have minor effects on managing invasive species. This project is in compliance with this E.O.

E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

Migratory birds are of great ecological and economic value to the United States and to other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of Americans who study, watch, feed, or hunt these birds throughout the United States and other countries. This order requires that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern. In addition, each Federal agency shall restore and enhance the habitat of migratory birds, as practicable. The project would enhance migratory bird habitat and would be in compliance with this E.O.

10.0 CONCLUSIONS AND RECOMMENDATION

10.1 Areas of Controversy and Unresolved Issues

There are diverse interests in False River because it serves many functions. The lake has become a retirement area because it offers an aesthetic viewshed. Additionally, the lake is used by many for recreational fishing and boating. The lake also serves as a detention area for the False River Watershed. The Louisiana Wildlife and Fisheries Commission issued a Notice of Intent (NOI), February 22, 2012, to lift the commercial fishing ban in the lake. The main purpose of this NOI is to remove undesirable fisheries in the lake. House Concurrent Resolution No. 168 (Appendix B), which was passed by the 2011 Louisiana Legislature, urged and requested that the Louisiana Department of Natural Resources assume the role of the lead local sponsor for this project in conjunction with the Pointe Coupee Parish Police Jury. House Concurrent Resolution No. 123 (Appendix B), which was passed on May 14, 2012 by the 2012 Louisiana Legislature, establishes a False River Watershed Council to expedite this restoration effort and manage the False River Watershed. It is proposed that this council would be comprised of 15 representatives as follows:

(1) The commissioner of the Department of Agriculture and Forestry or his designee within the department.
(2) The secretary of the Department of Environmental Quality or his designee within the department.
(3) The secretary of the Department of Health and Hospitals or his designee within the department.
(4) The secretary of the Department of Natural Resources or his designee within the department, who will serve as vice chair of the council.
(5) The secretary of the Department of Wildlife and Fisheries or his designee within the department, whom shall serve as chair of the council.
(6) The state senator from Senate District 17.
(7) The state representative from House District 18.
(8) Two members to be selected by the senator from Senate District 17.
(9) Two members appointed by the representative from House District 18.
(10) Two members appointed by the Pointe Coupee Parish Police Jury.
(11) One member appointed by the Pointe Coupee Parish Sheriff.
(12) One member appointed by the mayor of the city of New Roads.

Additionally, the council would contact the following Federal resource agencies to solicit their views and input at the appropriate times:

(1) United States Army Corps of Engineers.
(2) United States Fish and Wildlife Service.
(3) United States Geological Survey.
(4) National Resources Conservation Service.
(5) United States Department of Agriculture.
(6) National Oceanographic and Atmospheric Administration.
(7) United States Environmental Protection Agency.

Historically, the main area of controversy has been the management of the lake levels. Some would like to keep the lake at 16 feet to maintain depth for navigation aesthetics. Others have expressed interest in lower water levels to reduce the risk of flooding. In 2011, the Louisiana Department of Wildlife and Fisheries expressed interest in conducting a drawdown of the lake to consolidate and oxidize the substrate, stimulate growth of vegetations, and improve the fisheries habitat. The drawdown of a lake is a common and effective practice used to restore lake health and improve the fisheries habitat. Many people expressed concern that this drawdown would cause geotechnical and structural problems with houses, docks, and piers surrounding the lake. Some were concerned about the view of mud flats in the lake for extended periods of time. Due to this controversy, the LDWF has postponed the drawdown effort at this time.

10.2 Conclusions

Alternative 4 was selected as the Tentatively Selected Plan (TSP) and the non-Federal sponsors have indicated interest in supporting this plan. The TSP would:

- Be supported by the non-Federal sponsors
- Be the NER plan and would be cost-effective and is a Best Buy
- Create long-term beneficial habitat for fish and wildlife
- Dredge approximately 353,000 cy of lake sediment to create island/edge habitat
- Create 12 lake islands (9 acres)
- Create a net gain of 150 AAHUs
- Create an 85-acre lake ecosystem complex
- Create approximately 19,400 lf (5,470 lf – north flat, 13,940 lf – south flat) of quality riparian edge habitat
- Improve approximately 5,300 lf (1,100 lf – north flat, 4,200 lf – south flat) of existing riparian edge habitat
- Would plant native vegetation on the islands and in the edge habitat
- Create ideal feeding and nesting habitat for the great egret and other wading birds
- Provide ideal habitat for all forms of fish and wildlife including largemouth bass, redear sunfish, bluegill, Neotropical migrants, migratory waterfowl, amphibians, and reptiles
- Improve water quality by reducing excessive temperatures, turbidity, and increasing dissolved oxygen levels
- Create recreational opportunities and improve aesthetics
- There are no significant adverse effects
- The adverse effects are minor and short-term
- There would be no significant cumulative effects
- Cost approximately $7,841,711 (in 2010 dollars) and have an annualized cost of $388,770 (50 year evaluation)

10.3 Recommendations

I recommend that the TSP (Alternative 4) be constructed under the authority of Section 206 of the Water Resources Development Act (WRDA) of 1996, P.L. 104-303, as amended to create long-term beneficial habitat for fish and wildlife. Alternative 4 includes the creation of 12 lake islands (9 acres) from 353,000 cubic yards of lake sediment. This plan would create approximately 150 AAHUs and restore an 85-acre lake ecosystem complex. It would create approximately 19,400 linear feet (lf) (5,470 lf – north flat, 13,940 lf – south flat) of quality riparian edge habitat and improve approximately 5,300 lf (1,100 lf – north flat, 4,200 lf – south flat) of existing riparian edge habitat. Native vegetation would be planted on the islands and in the edge habitat. This plan would provide ideal habitat for all forms of fish and wildlife including largemouth bass, redear sunfish, bluegill, Neotropical migrants, migratory waterfowl, amphibians, and reptiles. Water quality would be improved by reducing excessive temperatures, turbidity, and increasing dissolved oxygen levels. It would create recreational opportunities and improve aesthetics. The TSP would cost approximately $7,841,711 (in 2010 dollars) and have an annualized cost of $388,770 (50 year evaluation).

This project would be cost-shared by the non-Federal sponsor, the State of Louisiana at 35 percent non-Federal and 65 percent Federal. The Non-Federal Sponsor shall, prior to implementation, agree to perform the items of local cooperation as stated in Section 3.8.2 (Implementation Responsibilities). The recommendations contained herein reflect the information available at this time, price levels as specified in this FR/EA, and current departmental policies governing the formulation of the project. They do not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher levels of review within the Executive Branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for implementation funding.

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ACRONYMS

ABP	Atchafalaya Basin Program (in LDNR)
AAHU	Average Annual Habitat Unit
BMP	Best Management Practice
CAP	Continuing Authorities Program
CAR	Coordination Act Report
CE/ICA	Cost Effectiveness and Incremental Cost Analysis
CEMVN	New Orleans District, U.S. Army Corps of Engineers
CFR	Code of Federal Regulations
CPUE	Catch per Unit Effort
EA	Environmental Assessment
EQ	Environmental Quality
ER	Engineering Regulation
FR/EA	Feasibility Report and Environmental Assessment
FWOP	Future Without Project
FWP	Future With Project
FRCA	False River Civic Association
HSI	Habitat Suitability Index
HTRW	Hazardous, Toxic, Radioactive Waste
IWR	Institute for Water Resources
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LERRDs	Lands, Easements, Rights-of-Way, Relocations, and Disposal Areas
LPP	Locally Preferred Plan
NED	National Economic Development
NER	National Ecosystem Restoration
NEPA	National Environmental Policy Act
NPS	Non-Point Source Pollution
NRCS	Natural Resources Conservation Service
O&M	Operations and Maintenance
OSE	Other Social Effects
PDT	Project Delivery Team
PPA	Project Participation Agreement
PRP	Project Restoration Plan
RED	Regional Economic Development
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Officer
TSP	Tentatively Selected Plan
WVA	Wetland Value Assessment
WQC	Water Quality Certification
WRDA	Water Resources Development Act
WRP	Wetland Reserve Program
USACE	U.S. Army Corps of Engineers

USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTB	Upper Terrebonne Basin
VOC	Volatile Organic Compounds