The False River Watershed Council

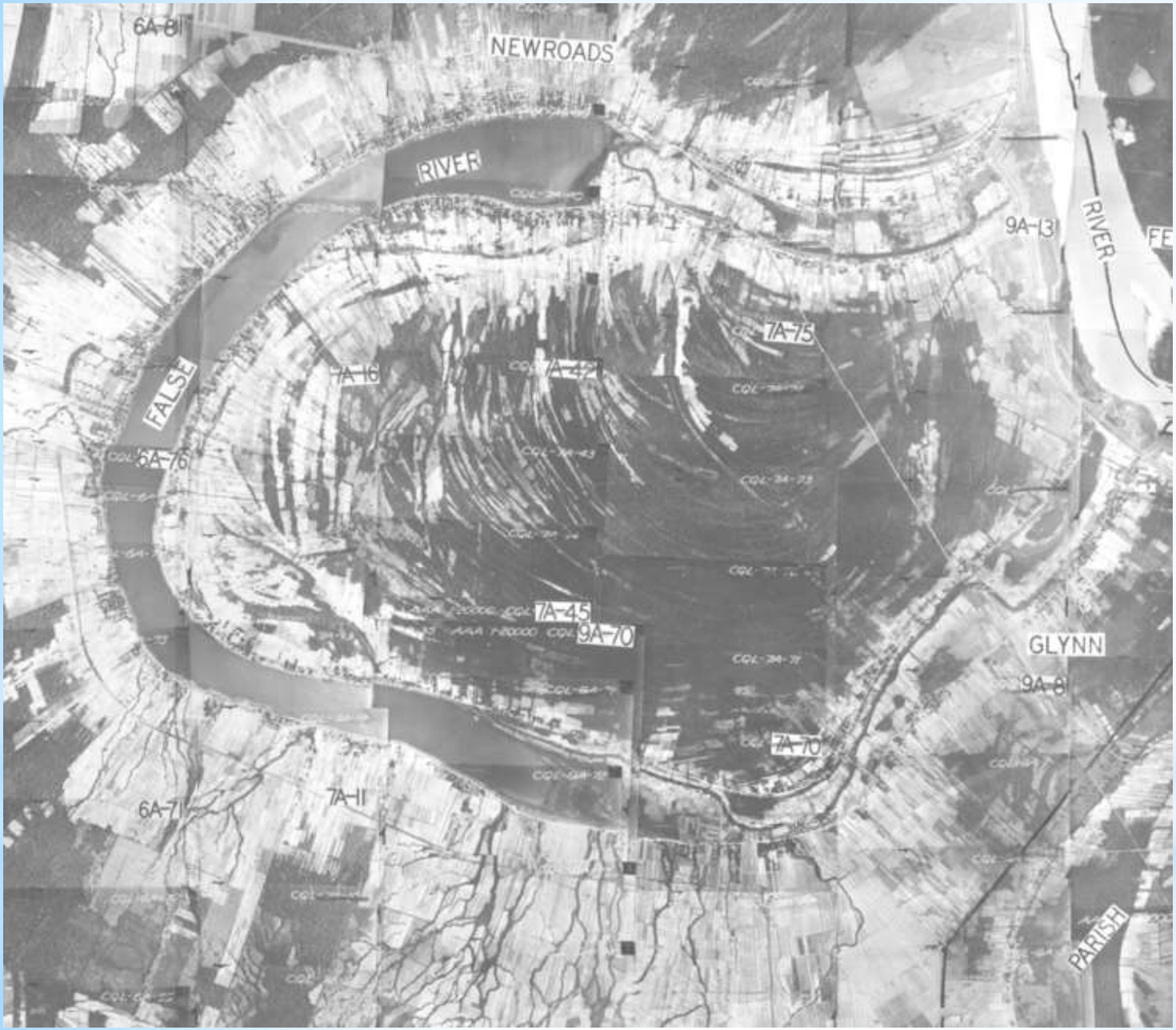
Presents

FALSE RIVER ECOSYSTEM RESTORATION PROJECT

January 22, 2014
Cottonport Community Center
New Roads, Louisiana

1906

(Source: GEC, 2012)

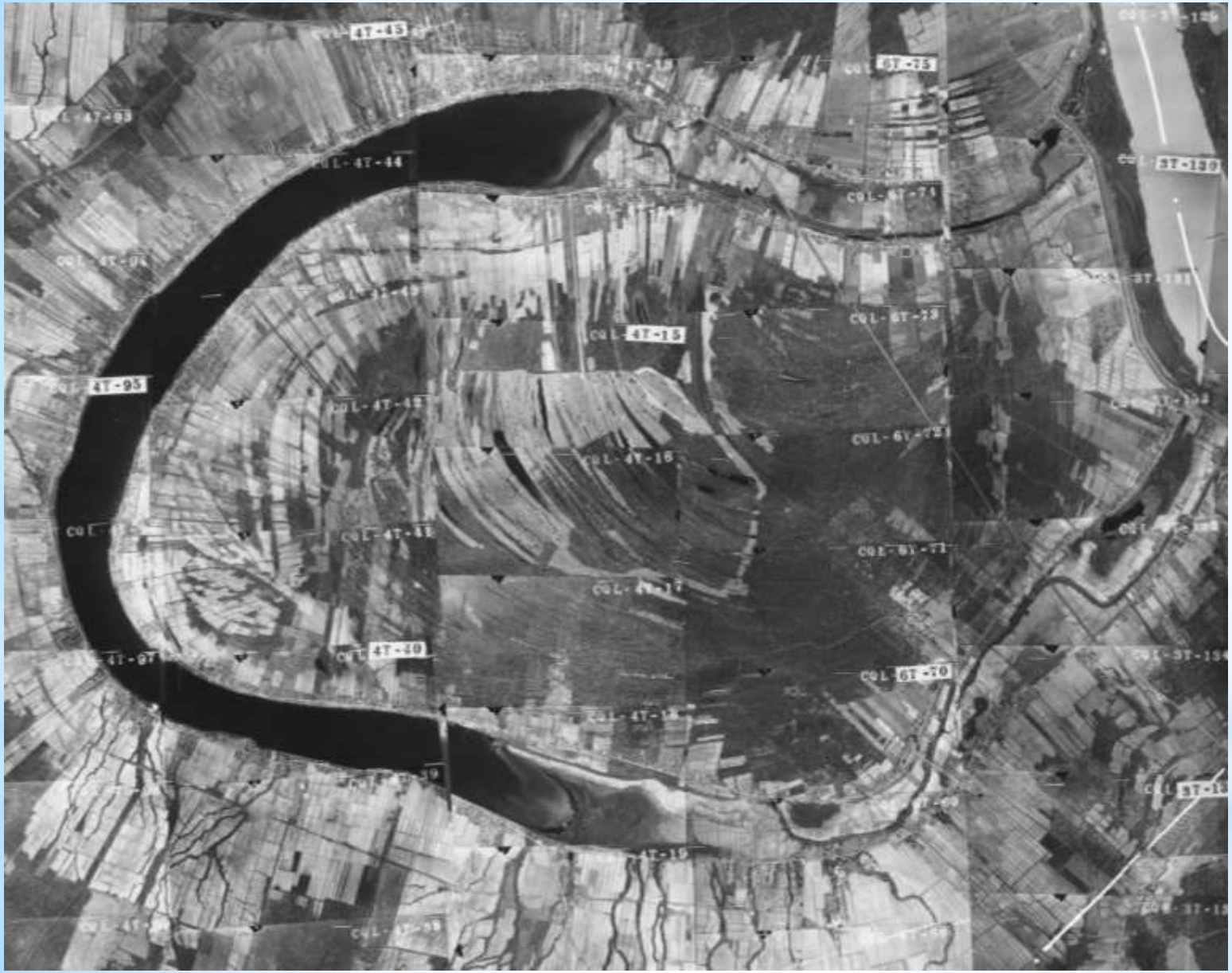


1940s

(Source: GEC, 2012)

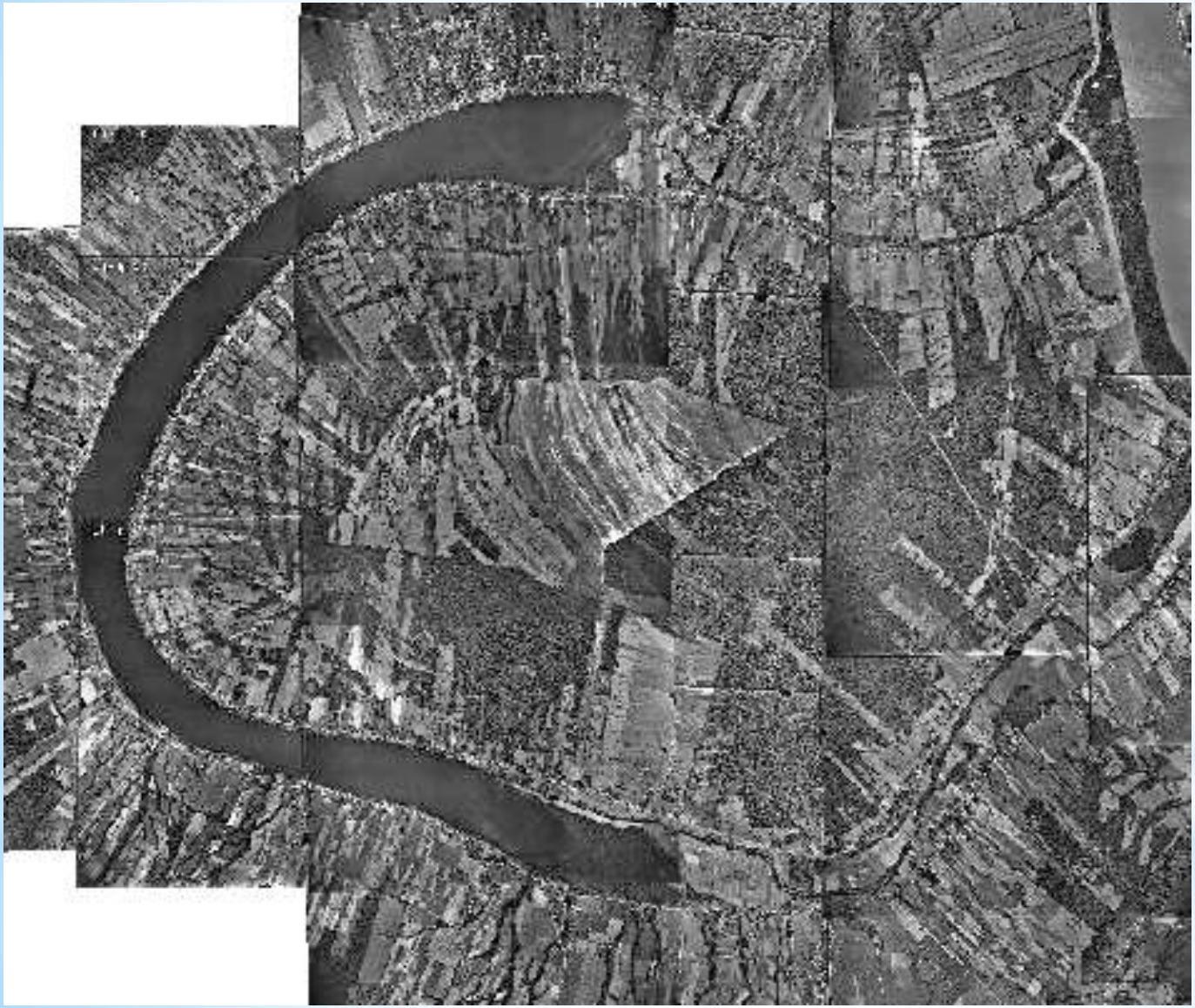
1952

(Source: GEC, 2012)



1959

Source: GEC, 2012)

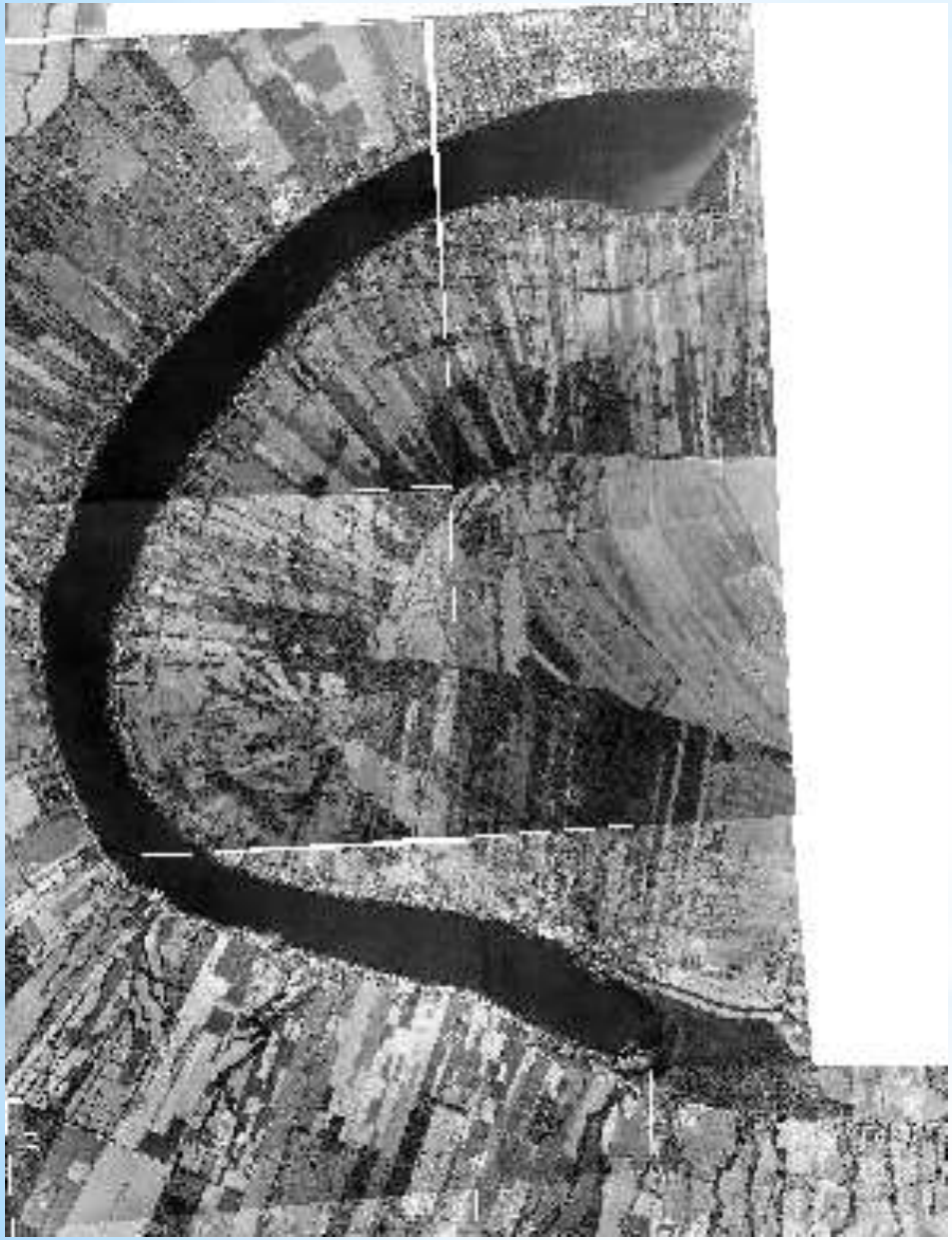


1966

(Source: GEC, 2012)

1972

(Source: GEC, 2012)

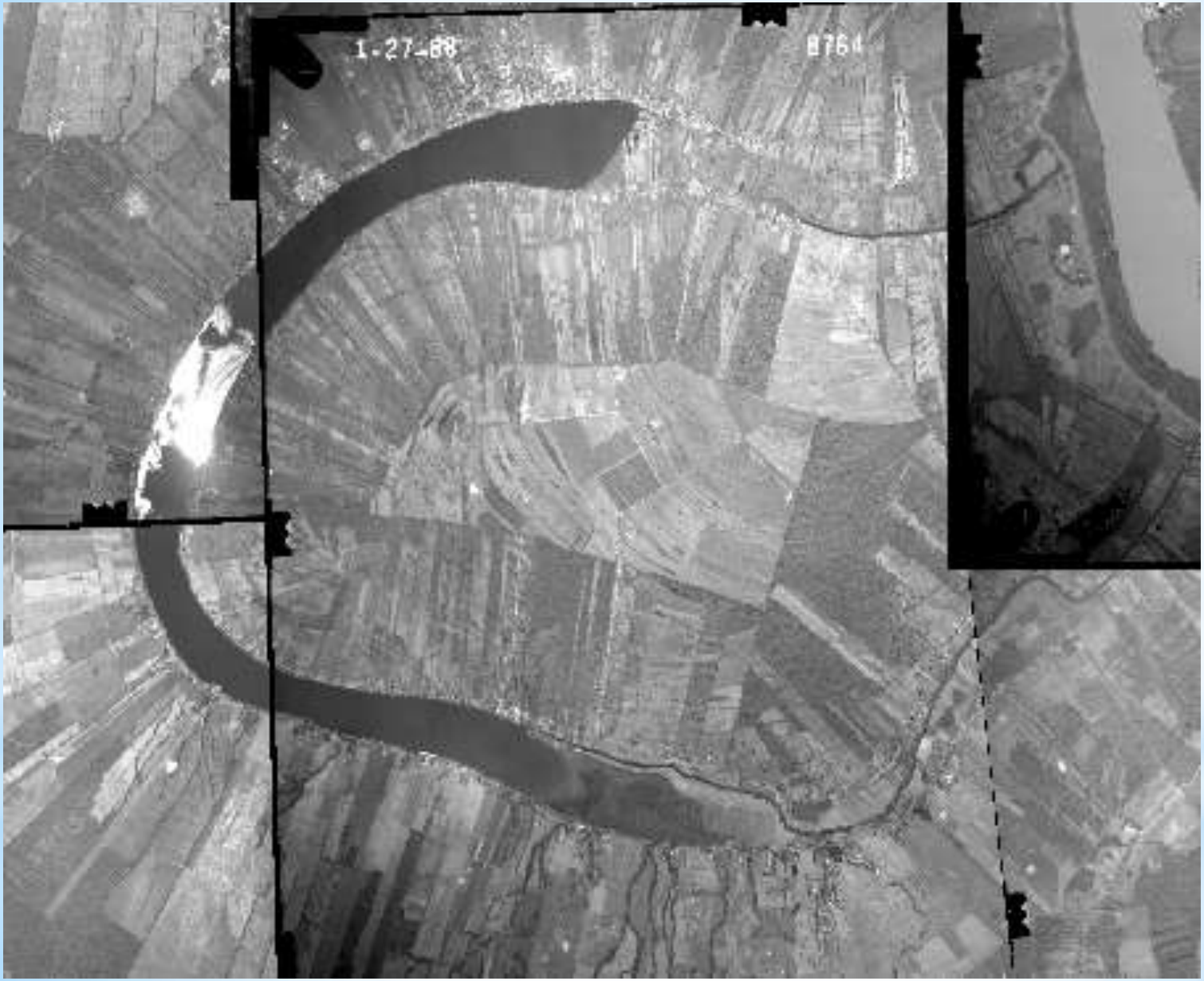


1978

(Source: GEC, 2012)

1983

(Source: GEC, 2012)



1988

(Source: GEC, 2012)

1998

(Source: GEC, 2012)

2004

(Source: Atlas GIS)

2008

(Source: GEC, 2012)

2010

(Source: GEC, 2012)

Project Objectives

The Project Addresses for the Lake and its Watershed:

* Water Quality Decline
* Sport Fisheries Decline
* Aquatic Habitat Decline
* Aquatic and Shoreline Vegetation
* Navigation in the Flats
* Sediment Erosion Control
* Lake Sedimentation

Water Quality

Project Objectives:

* Reduce the Influx of Nutrients (Nitrate, Nitrite and Phosphorus)
* Reduce the Influx of Sediments/Particulates
* Reduce the Influx of Bacteria
* Reduce Water Turbidity
* Improve Dissolved Oxygen Concentration

(Source: Atlas GIS)

Water Quality

Completed:

* Water Monitoring
* Public Outreach

Planned:

* Water Monitoring
* Nutrients Reduction
* Sediments/Particulates Reduction
* Public Outreach

Riparian Buffer

Aquatic Vegetation Planting

Decrease Non-Point Sources

(Source: NRCS and DWF)

Fisheries

Project Objectives:

* Improve Sport Fishing Success
* Decrease Rough Fish Population
* Reintroduce Commercial Fishing (2012 First Season Since 1991)
* Increase Game Fish Stocking

Commercial Fishing

(Source: The Advocate, 2013)

Fisheries

Completed:

* Game Fish Stocking
* Commercial Fishing Season

Planned:

* Game Fish Stocking
* Commercial Fishing Season

Game fish stocking

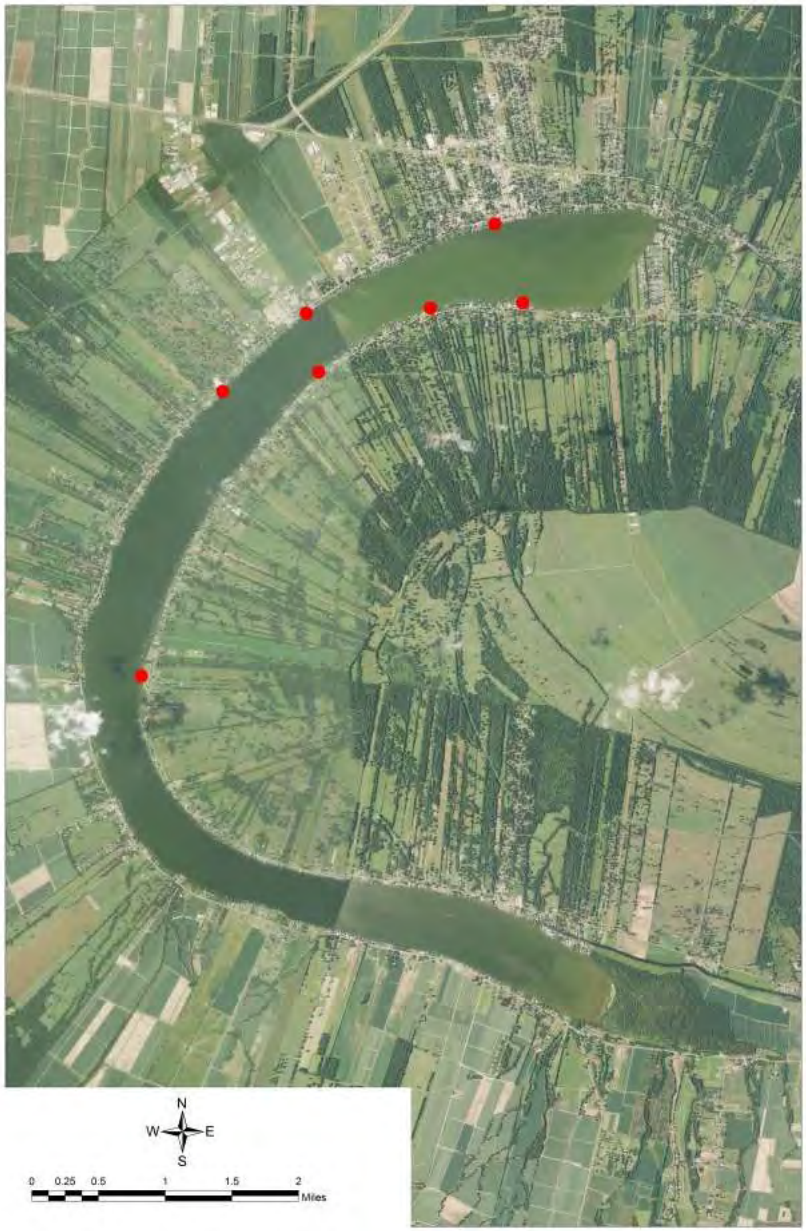
Commercial Fishing

(Source: DWF and The Advocate, 2013)

Aquatic Habitat

Project Objectives:

* Increase Areas Suitable for Fish Propagation
* Increase Areas Favorable for Hatchling and Fingerlings Survival
* Provide for a Complex and Native Aquatic Vegetation



Oct. 2013 New Spawning Beds

(Source: DWF and GEC, 2012)

Aquatic Habitat

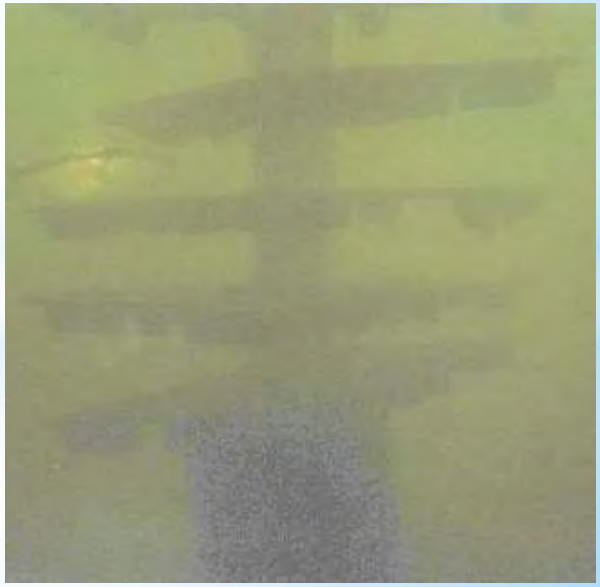
Completed:

* Seven New Spawning Beds

Spawning Beds

Planned:

* Additional Spawning Beds
* Artificial Reefs



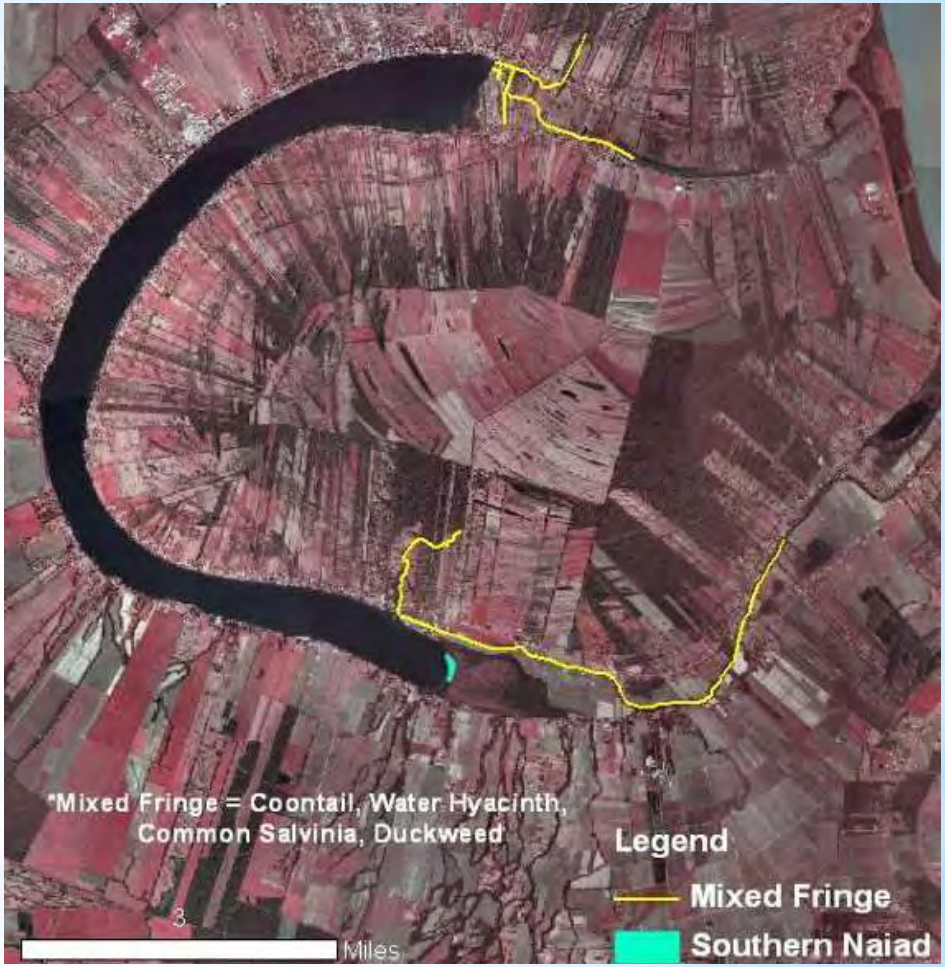
Artificial Reefs

(Source: DWF)

Aquatic & Shoreline Vegetation

Project Objectives:

* Increase Aquatic Vegetation Coverage
* Increase the Diversity of Desirable/Native Aquatic Plant
* Increase Oxygen Production
* Decrease Erosion and Re-Suspension of Sediments



(Source: DWF)

Aquatic & Shoreline Vegetation

Planned:

* Aquatic Vegetation Planting
* Shoreline Tree Planting
* Edge Habitat Planting
* Public Outreach

Aquatic Vegetation Planting

Tree Planting

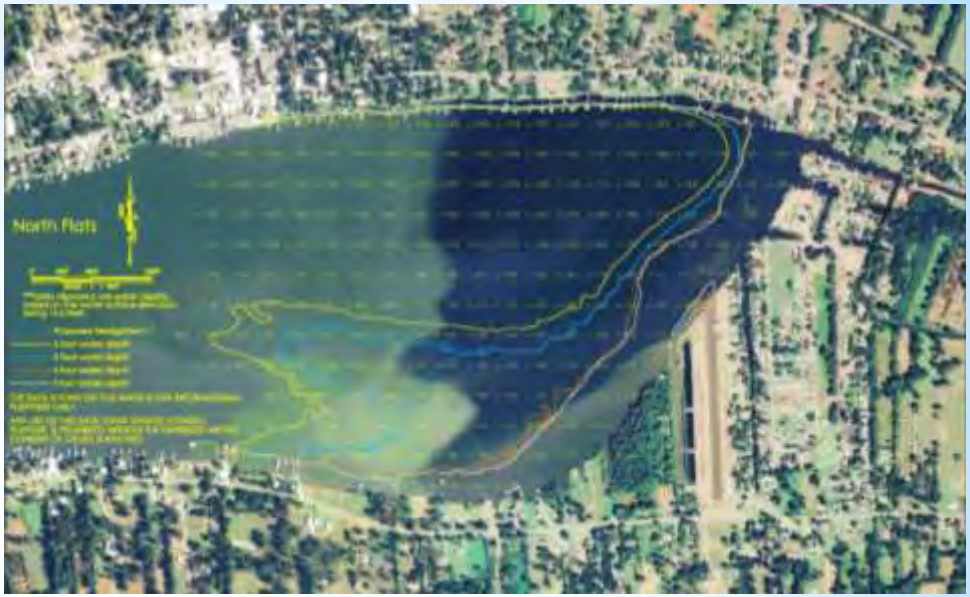
Edge Habitat Planting

(Source: DNR, DWF and Galveston Bay Foundation)

Navigation

Project Objectives:

* Decrease sediment re-suspension
* Increase boater Safety



Completed:

* Expanded No-Wake Zones in the Flats

(Source: Chustz Surveying)

Sediment Erosion Control

Project Objectives:

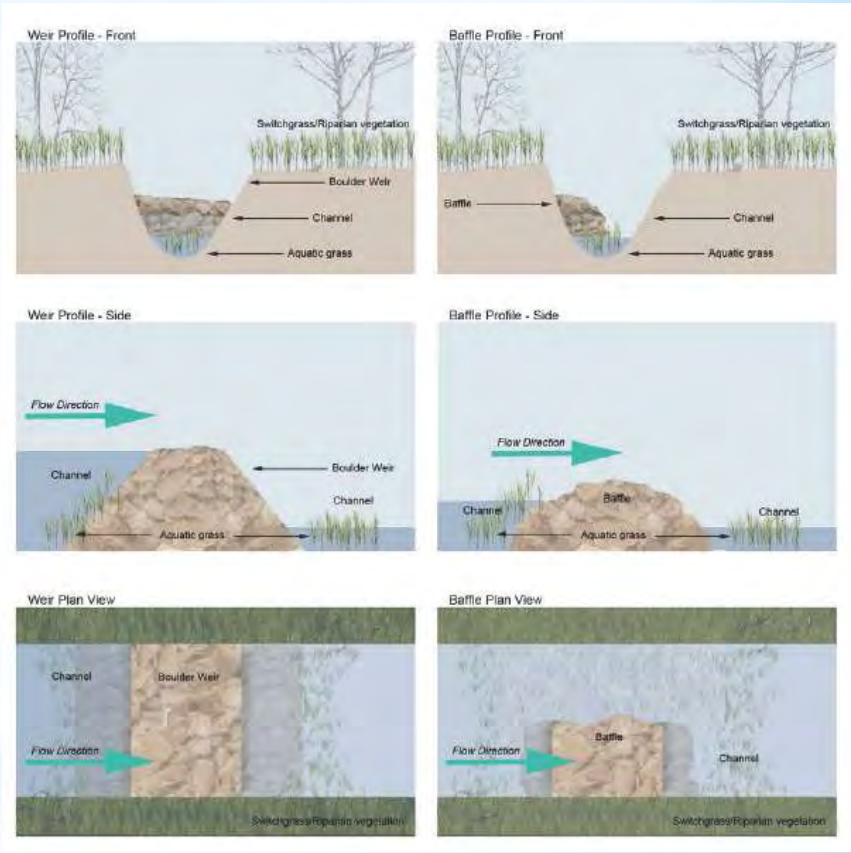
* Decrease Influx of Sediment from Agricultural Areas
* Decrease Influx of Sediment from Construction Sites
* Decrease Sediments/Particulate Influx from Storm Sewers
* Increase Maintenance/Inspection of Drainage Channels
* Increase Maintenance/Inspection of Sediment Traps

Sediment Erosion Control

Completed:

* Best Management Practices for the Sediment Trap
* Best Management Practices for Channel Maintenance
* Erosion Control Ordinance
* M-1 Drainage Network Study
* Preliminary M-1 Drainage Network Modification Design

Preliminary M-1 Drainage Network Modification Design



(Source: GEC, 2012 and C.H. Fenstermaker and Associates, 2013)

Sediment Erosion Control

Planned:

* Sediment Trap Inspection/Maintenance
* Channel Inspection/Maintenance
* M-2 Drainage Network Study
* Final Drainage Network Modification Design
* Drainage Network Hydromodification Implementation
* Public Outreach

Channel Lining/Baffles

Rock Weir

Culverts

Two-Stage Ditch

(Source: MN River Basin, Cape Cod Watershed, Ohio State Univ., and Coastal Site Design)

Preliminary M-1 Drainage Network Modification Design

(Source: GEC, 2012, and Coastal Site Design)

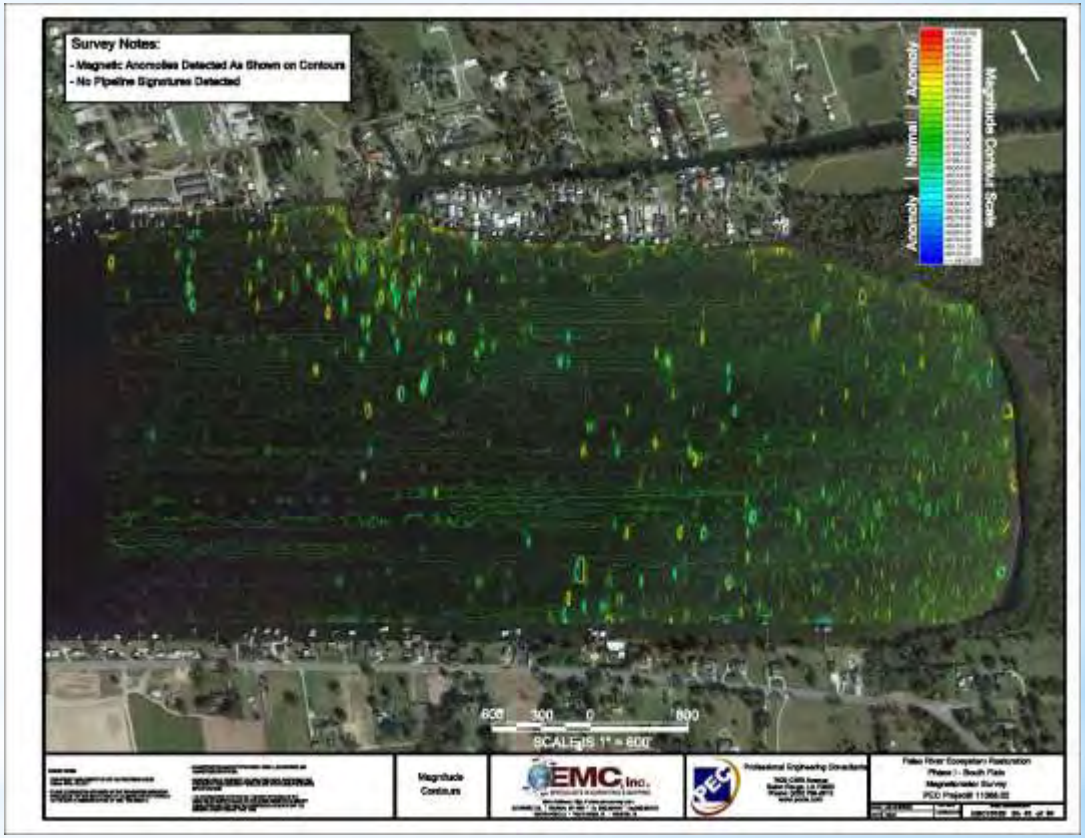
Lake Sedimentation

Completed:

* Geotechnical Study
* Magnetometer Survey
* Approval by State Lands
* Preliminary Design

Planned:

* Final Design
* Permitting
* 2 to 2.5-Foot Drawdown
* Island/Terrace Construction



Magnetometer Survey

(Source: EMC, 2013)

THE SOUTH FLATS

Project Objective:
Design a project to dredge sediments utilizing the most feasible processes, thereby, increasing the water depths, and restoring aquatic habitat.

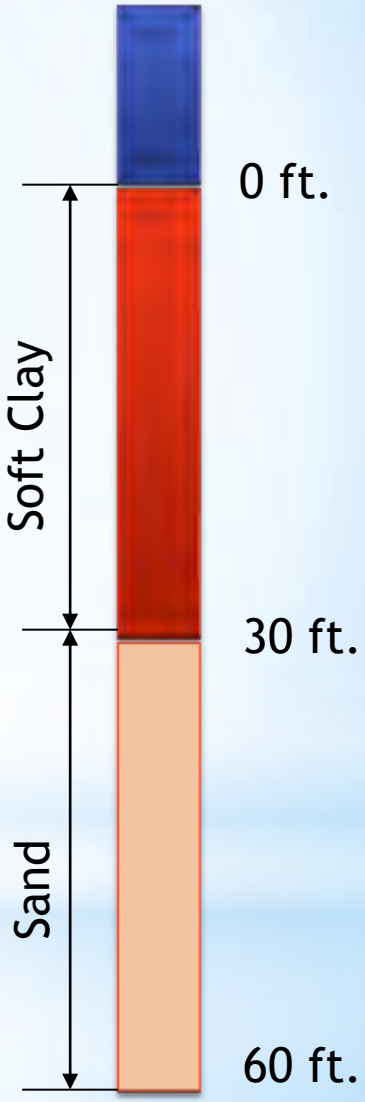
Phase I of the False River Ecosystem Restoration is concentrated on the South Flats of the lake where shallow water depths of less than 3 feet extend over an area of 100 acres.

(Source: PEC, 2014)

SUBSURFACE SOILS

Nine soil borings were drilled in the lake bottom within the project area. Four samples were taken to 15 feet below the surface and the remaining five were drilled to a depth of 60 feet.

All of the boring logs indicate an extremely soft clay layer from the surface to approximately 20 to 30 feet below the lake bottom. Beneath the clay layer are layers of medium to very dense gray silty sand with pockets of organic matter and gravel.



(Source: PEC, 2014)

MECHANICAL DREDGING WITH ISLAND CREATION

The objective of this design option is to create sustainable islands from dredged material with a final elevation of 2 to 2.5 feet above the normal pool elevation of the lake with a goal of deepening the corridor between rows of islands to a minimum of 5 feet below the normal water surface.

Increased water depths within the flats would reduce wave generated turbidity and decrease excessive shallow water temperatures.

Edge habitat surrounding the islands would create cover and structure for new spawning grounds.

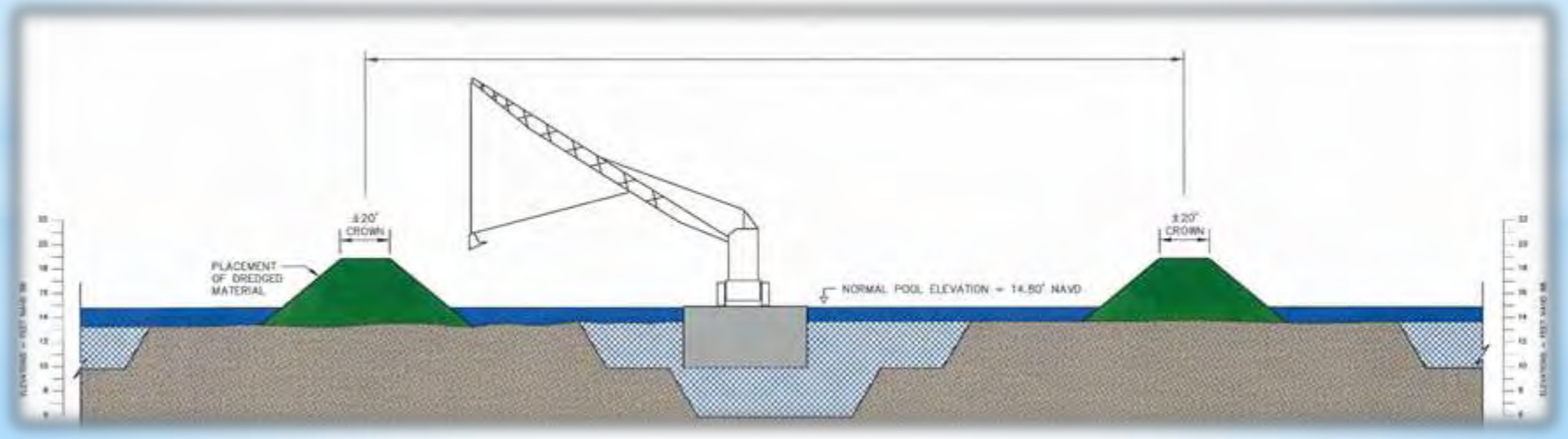
(Source: PEC, 2014)

The construction would consist of bucket dredge equipment operating from a floating barge, excavating bottom sediments with the placement of dredged material directly on the adjacent lake bottom to form rows of islands adjacent and parallel to the dredged area.

Offset spacing of island rows is determined largely by the stability of the soils as well as the amount of material available to form the island. Based on the stability analysis, the typical offset spacing for parallel island rows is 330 feet.

In order for this type of dredging to be feasible, the final placement of dredged material must be within the radius of reach for the mechanical equipment used.

Typical Bucket Dredge and Barge



Typical Section of Island / Terrace

(Source: PEC, 2014)

MECHANICAL DREDGING WITH ISLAND CREATION

Equipment Required for Bucket Dredging:

Mechanical Dredge with 130 feet of reach

Sectional barge 50 ft. x 110 ft. (15 sections)

Lake Access, Mobilization / Demobilization Cost: > $500,000

This design option could potentially use one half of the Phase I funding to get in and out of the lake, leaving limited funds to construct the project.

(Source: PEC, 2014)

DESIGN ALTERNATIVES

Hydraulic Dredging with Land Disposal

Hydraulic dredging with land disposal is a common practice where sediments are dredged by a suction process and pumped onto nearby lands. The feasibility of using this process is limited to utilizing small dredge equipment which would limit the disposal to lands within close proximity to the dredge site.

The majority of available land in close proximity suited for this process was determined to be wetlands, whereby, the cost of mitigation would far outweigh the available funding.

Hydraulic Dredging with Deep Water Disposal

The process of hydraulic dredging with open water disposal is an alternative that is being analyzed as an additional method of removing sediment from the south flats. Sediments can be removed and deposited by pipeline in the deeper bottom areas of the lake.

(Source: PEC, 2014)

HYDRAULIC DREDGING WITH IN LAKE CONTAINMENT

Phase I Hydraulic Dredging to 5 ft. Water Depth, 100,000 Cubic Yards

In Lake Containment, 16.5 Acres, 3,350 ft. Perimeter

Hydraulic dredging with disposal in an adjacent containment dike constructed within the existing lake bottom was considered as a design alternative.

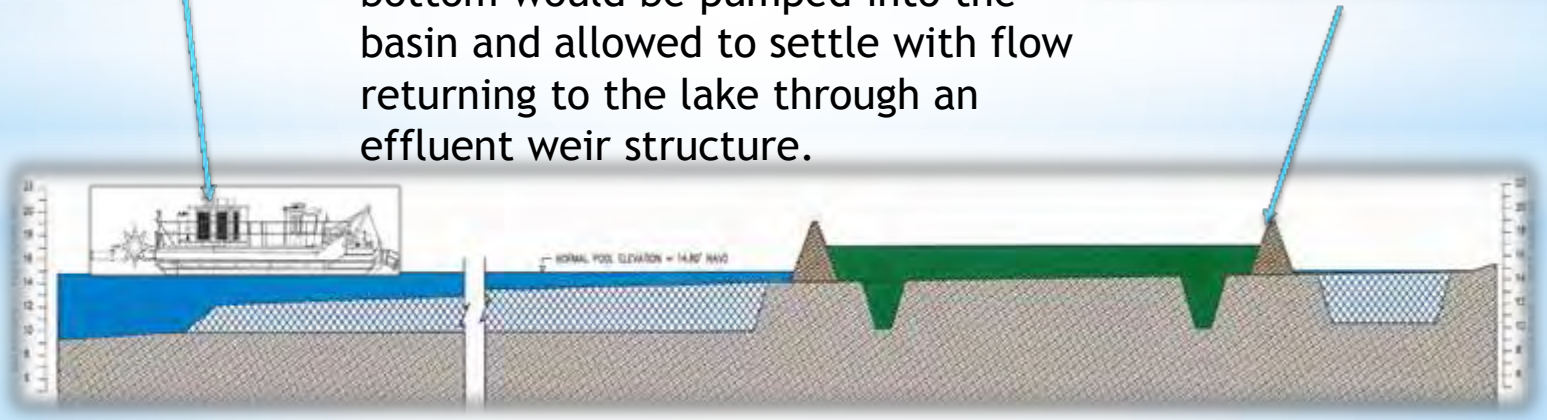
- Allows for the use of smaller construction equipment, thereby reducing the cost for access and mobilization.
- Approximately 25 acres of the south flats would be deepened to 5 feet, while creating 3,550 linear feet of edge habitat.
- Containment area could be used as storage for future phases of dredging.

(Source: PEC, 2014)

HYDRAULIC DREDGING WITH IN LAKE CONTAINMENT

Under a lake drawdown of at least 2 feet, construction of the containment dike could likely be performed with smaller marsh buggy type excavation equipment. The 3,550 linear feet of perimeter dike would be constructed in several lifts allowing for dewatering and consolidation prior to additional height being added.

Once the containment dike is consolidated, hydraulically dredged sediments from the adjacent lake bottom would be pumped into the basin and allowed to settle with flow returning to the lake through an effluent weir structure.



Typical Section of Hydraulic Dredging with In Lake Containment

(Source: PEC, 2014)

HYDRAULIC DREDGING WITH IN LAKE CONTAINMENT

Equipment Required for Dredging:

Extended Reach Marsh Buggy
8” to 10” Hydraulic Suction Dredge

Lake Access, Mobilization / Demobilization Cost: ~$150,000

Estimated Cost for Hydraulic Dredging is $5.00 per cubic yard

100,000 cubic yards of dredging, 25 acres at 5 feet depth (Phase I)

Hydraulic dredging with disposal in an adjacent in lake containment dike is an economically feasible alternative to mechanical dredging and island creation.

(Source: PEC, 2014)

Thank You for Your Commitment to False River