Response to the Implications of Human Interference by Re-engineering the Maurepas Swamp

Presented By : Avinash Mehta, P.E.
David Peters, P.E.

CDM

Overview

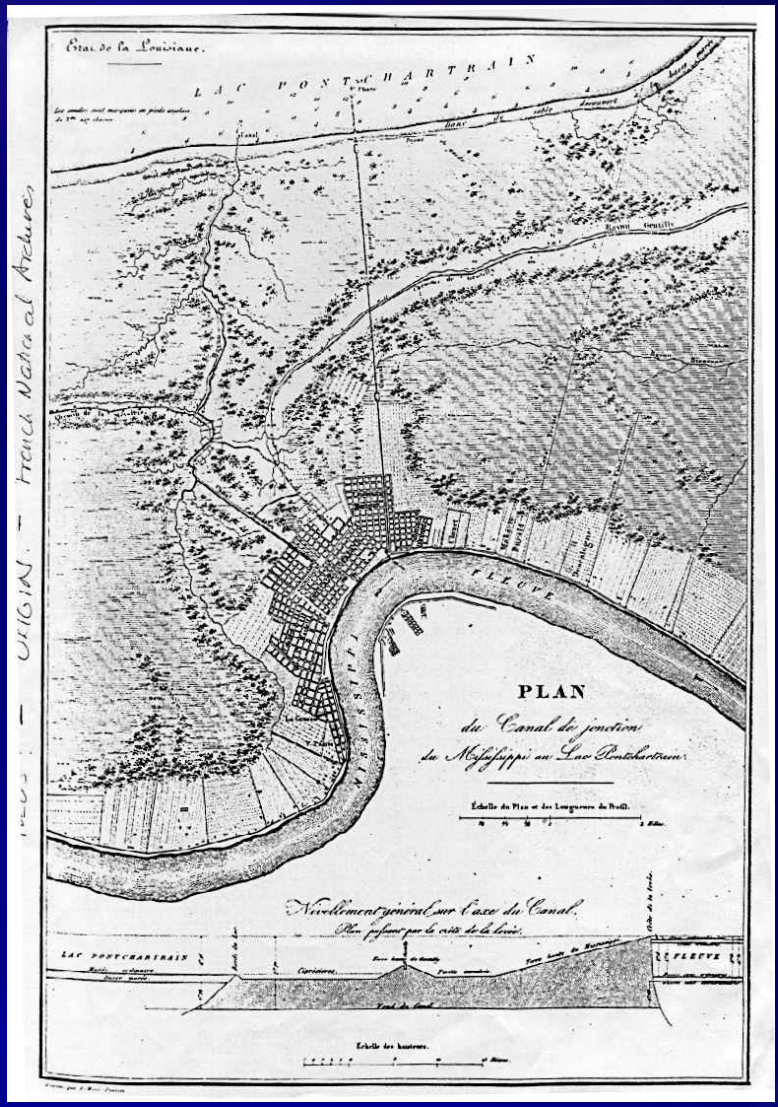
- History of Human Interference in Maurepas Swamps
- Implications of Engineered Projects including levee system, drainage canals and infrastructure
- Components of Project Design

History

- Land clearing and settlement of natural levees and ridges from 1718 to 1844
- Construction of artificial levees along the Mississippi River from 1844 to 1900
- Deforestation of virgin forests by commercial logging from 1890 to 1938
- Dredging and armoring of estuaries from 1930 to 1974
- Increases in water pollution from 1950 to 2002

Land clearing and settlement of natural levees and ridges from 1718 to 1844

- Transition from primitive early settlements to an agrarian economy.
- Logging was most opportunistic due to land clearing.
- Original footprint now replaced with industrial corridor including petrochemical and shipping facilities



Construction of Artificial Levees along the Mississippi River from 1844 to 1900

- Small Local Artificial Levees were constructed within a few years of settlement
- Plantation based economic threat escalated the construction of more continuous and more institutionalized levees
- Crevasses built during this period

Deforestation of virgin forests by commercial logging from 1890 to 1938

- Confluence of railroads and new logging technology (such as pull boats) within the Lake Pontchartrain Basin
- Economic incentive to supply the lumber needs

Dredging and armoring of estuaries from 1930 to 1974

- Extensive network of canals dredged through the wetlands during this period.

- The total area affected by direct and indirect impacts due to dredging and armoring for this period is estimated to be 832,600 acres

  (337,000 ha, or 14% of the basin)

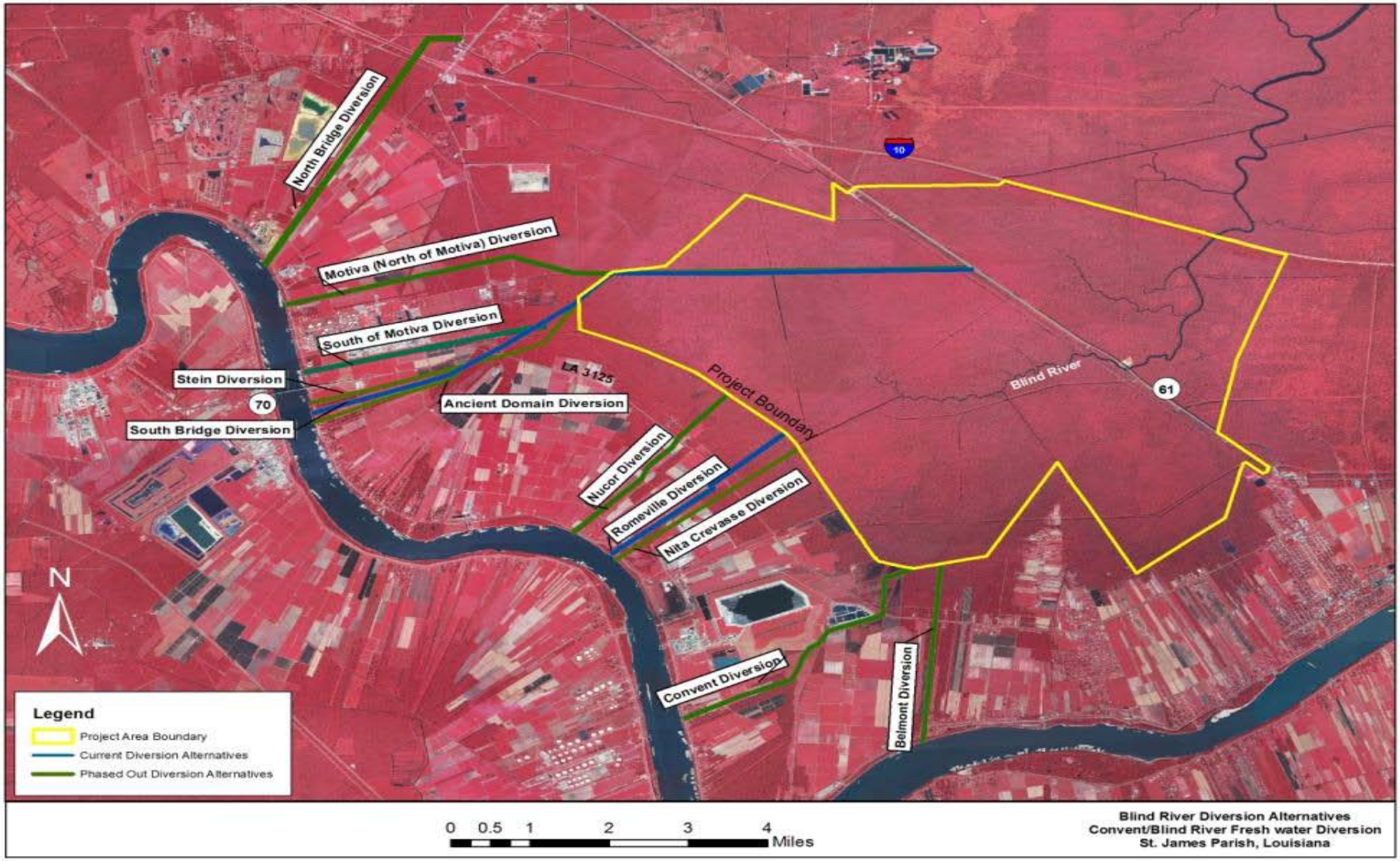
Implications of Human Interference

- Levees along the Mississippi River and its distributaries have eliminated the periodic floods that provided freshwater, sediment and nutrients to the study area.
- The lack of freshwater inflow, relative sea level rise, tropical storms, and other factors contribute to poor swamp health and ecosystem degradation
- The Maurepas Swamp is in a steady state of rapid decline and is losing much of its bald cypress and water tupelo forests

Project Opportunities

- Increasing the flow of freshwater through the swamp will provide opportunities to:
  - Prevent future cypress swamp degradation
  - Improve water quality in the Blind River
  - Restore deltaic process
  - Enhance recreational opportunities in the Maurepas Swamp and Blind River

Initial Array of Alternatives

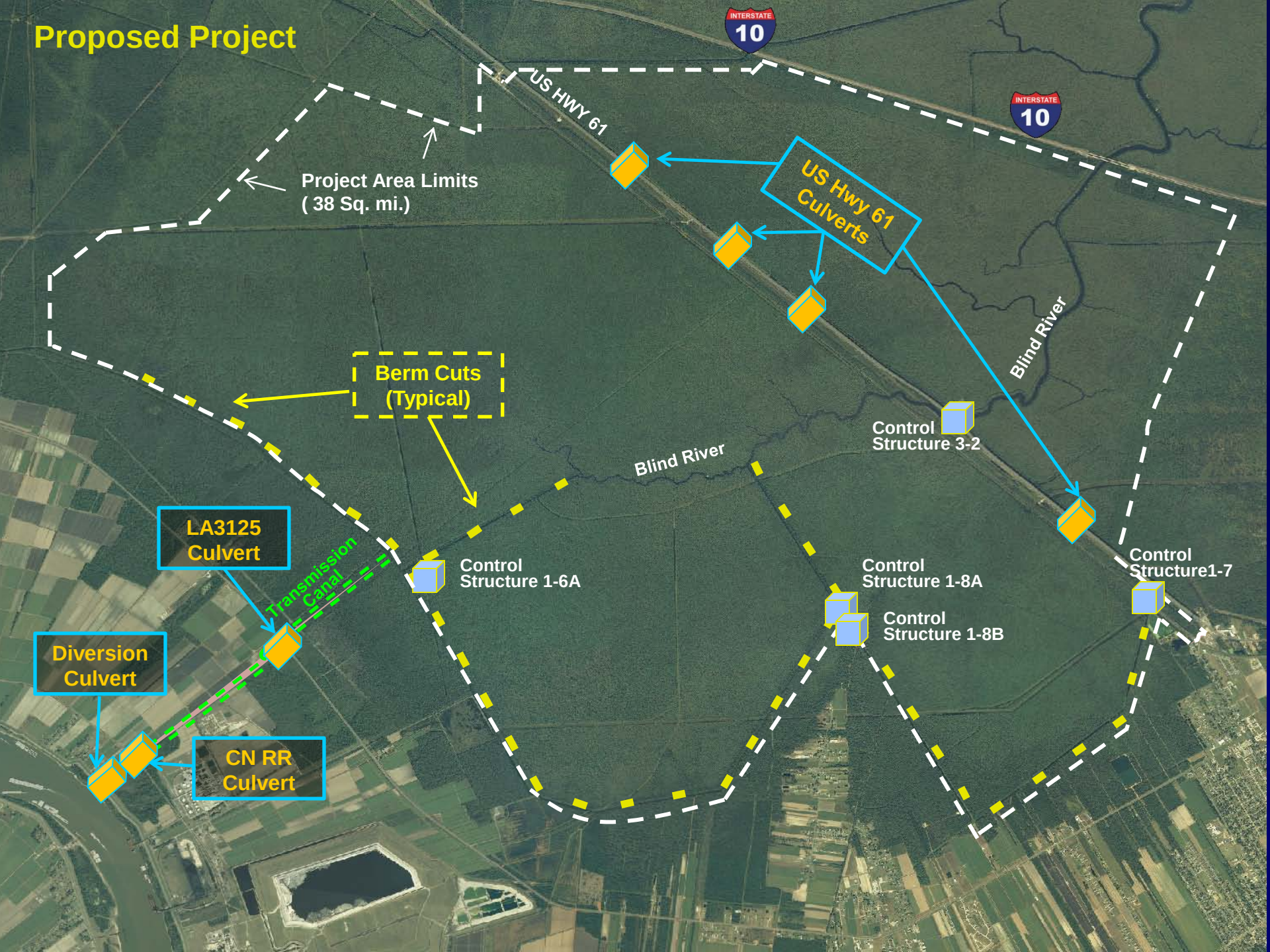


Project Design

A 3,000 cfs Diversion at Romeville was chosen as the selected plan

This alternative includes:

- **a gated culvert system**
- **a transmission canal along the Romeville alignment,**
- **restores and improves the 160 existing berm cuts**
- **30 new 500-foot wide berm cuts**
- **up to 6 control structures at strategic locations in the swamp**
- **4 new culverts under U.S. HWY 61 Corridor**


Proposed Project
INTERSTATE 10
US HWY 61
INTERSTATE 10
Project Area Limits
(38 Sq. mi.)
US Hwy 61 Culverts
Blind River
Berm Cuts
(Typical)
Control
Structure 3-2
Blind River
LA3125
Culvert
Transmission
Canal
Control
Structure 1-6A
Control
Structure 1-8A
Control
Structure 1-8B
Control
Structure1-7
Diversion
Culvert
CN RR
Culvert

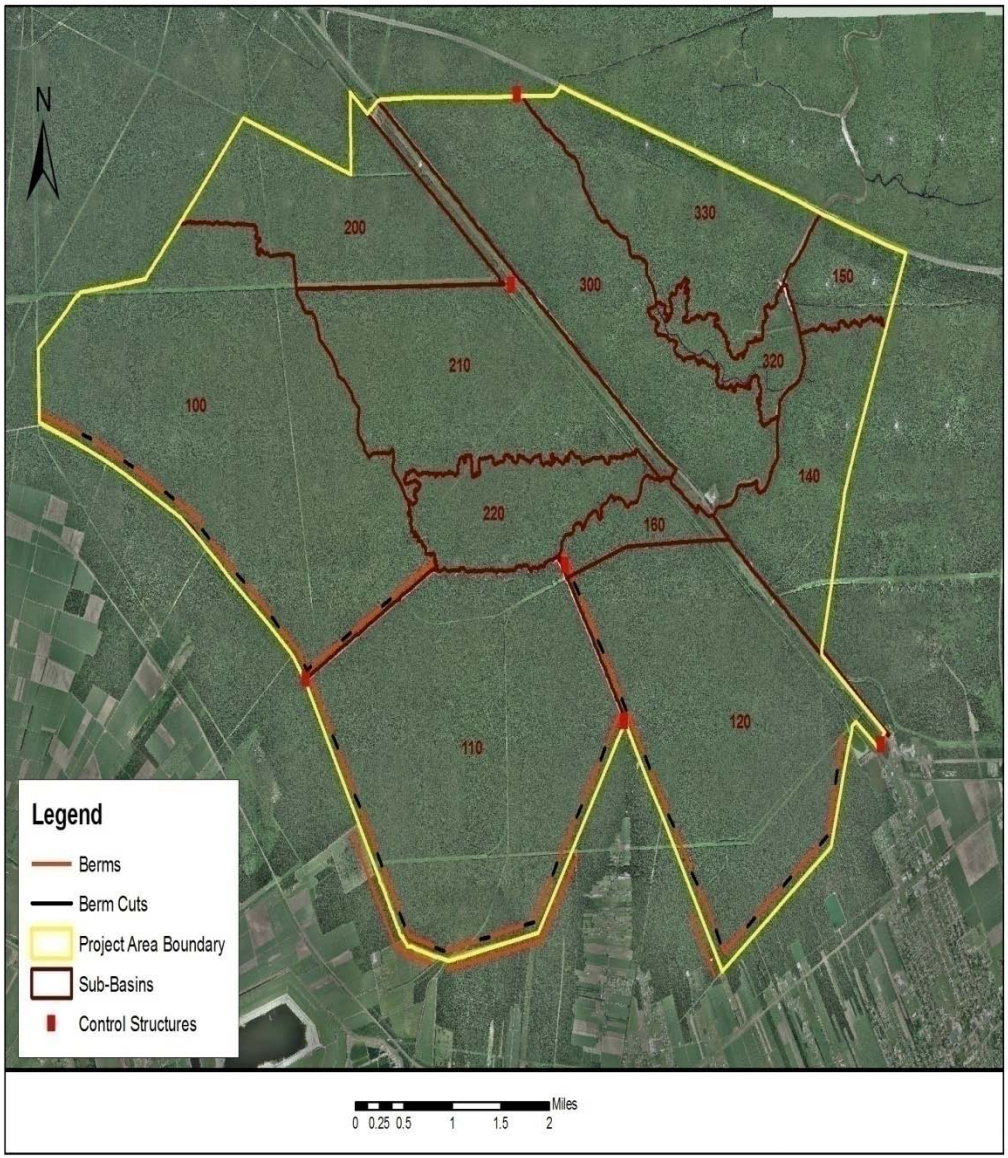
Diversion Culvert System

- Box Culverts 3 – 10’ x 10’ reinforced concrete, multi-cell box culvert
- Sluice Gates 3 – 10’ x 10’ cast iron gates with motor operators
- Trash Racks – Coarse grid
- Inlet Canal Earthen channel – 40’ bottom width, 4:1 SS, 27’ deep
- Instrumentation

Transmission Canal

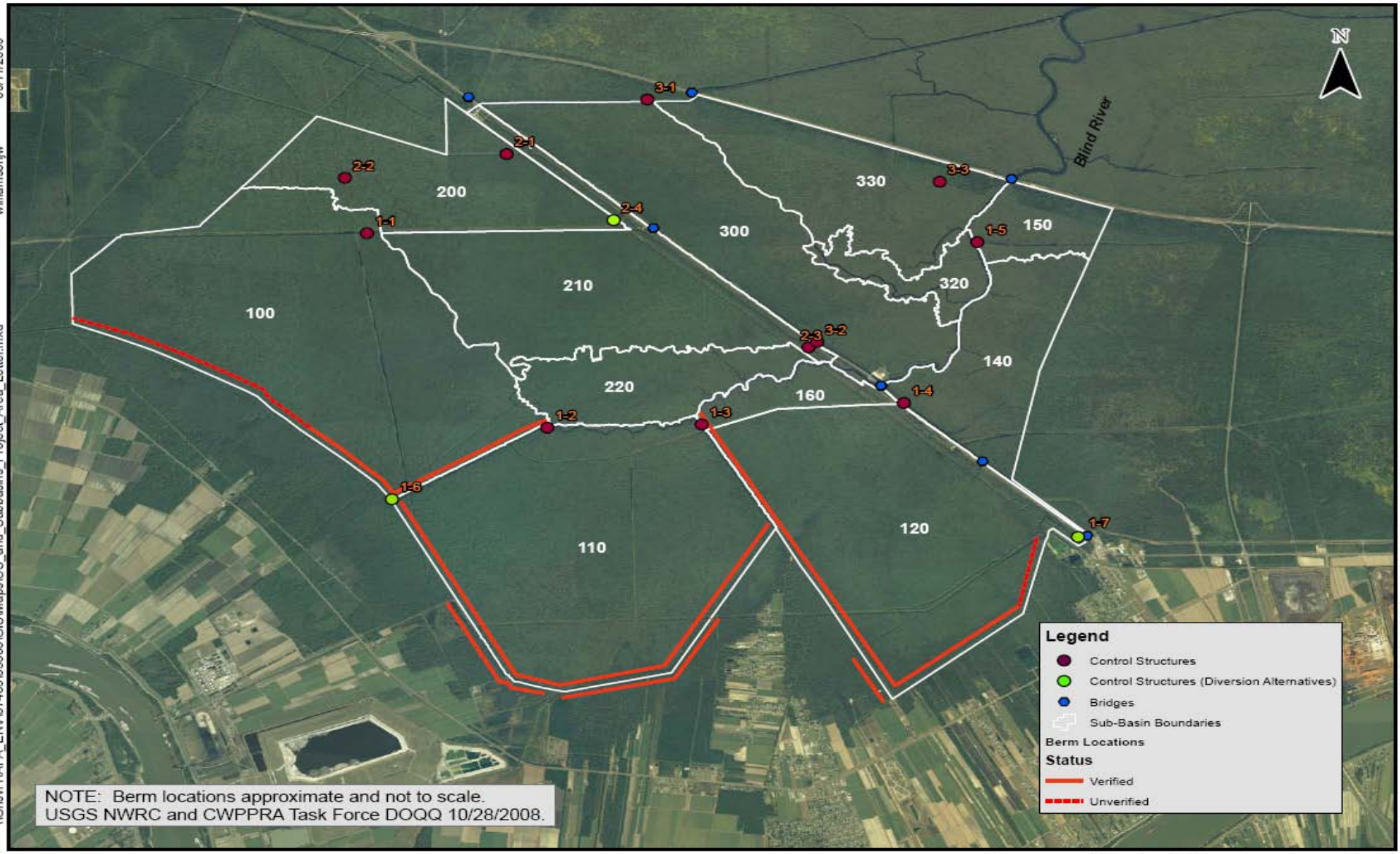
- Earthen Canal- 155’ bottom width, 4:1 SS, 12’ deep
- Berms- Earthen embankments, 12’ top width, 3:1 SS (exterior)
- Culverts at CN RR- 8 – 12’x8’ reinforced concrete multi-cell box culverts
- Culverts at LA 3125– 8 – 12’x8’ reinforced concrete multi-cell box culverts
- Instrumentation Control

Berm Gaps



- 160 Existing Berm Opening
- 30 Proposed Berm Cuts expanded to 500 ft
- Side Slopes protected with articulated concrete block mats

Control Structures



CDM

0 0.45 0.9 1.8 Miles

Proposed Control Structure Locations
Small Diversion at Convent / Blind River

Cross Culverts

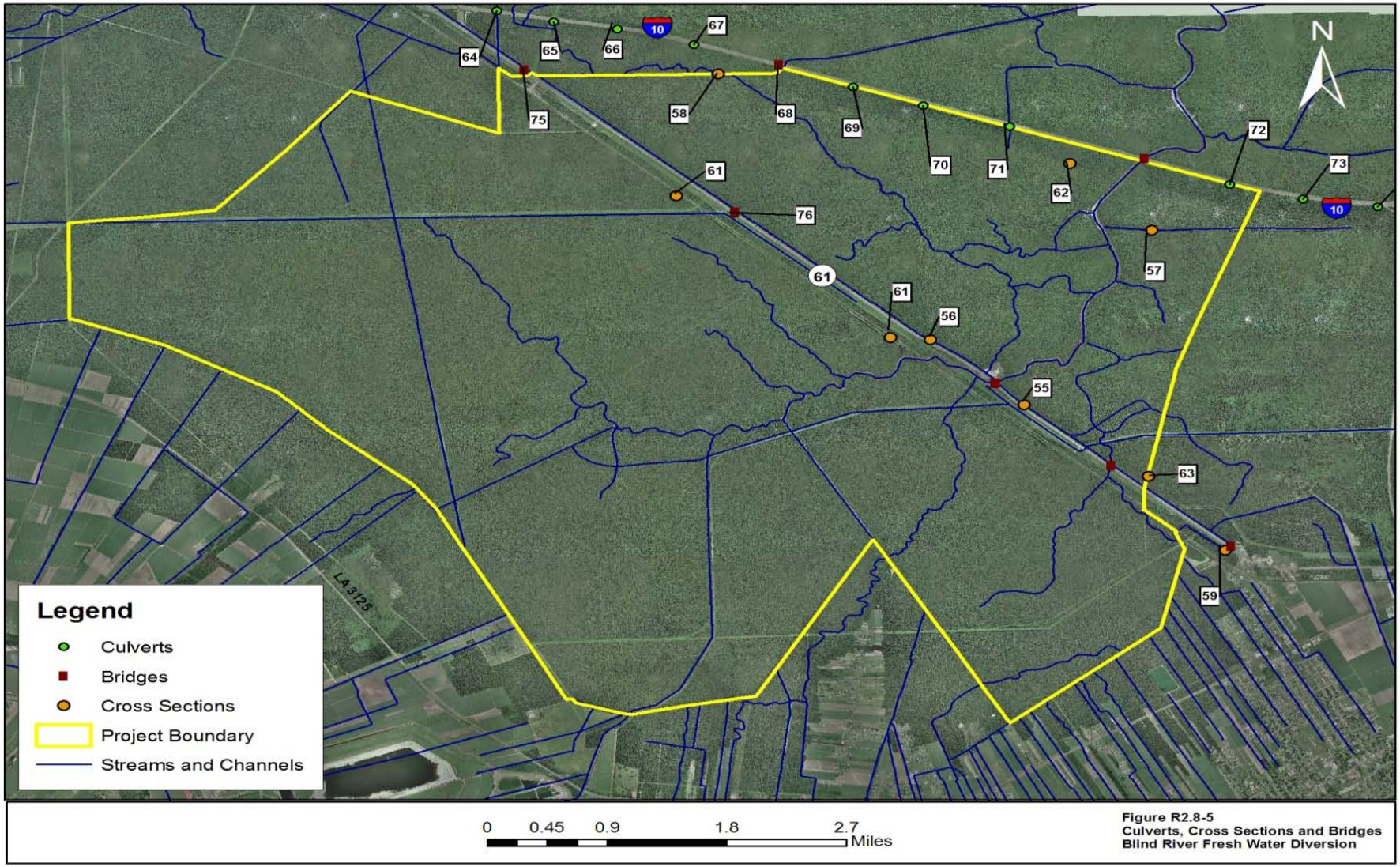


Figure R2.8-5
Culverts, Cross Sections and Bridges
Blind River Fresh Water Diversion

- **Box Culverts 3 – 6’x4’ Box Culverts at 4 locations**

Plan Selection

- Final Plan will bring freshwater, sediment, and nutrients to the swamp at strategic times during the year.
- It contributes to reversing the trend of deterioration in the southeast part of the Maurepas Swamp.
- It would improve over 21,000 acres of bald cypress-tupelo swamp that are in various stages of deterioration.
- Approximate Costs- $120,000,000

Questions