



FINAL PROSPECTUS

GRAND SWAMP MITIGATION BANK POINTE COUPEE PARISH, LOUISIANA

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

Prepared and Submitted by
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**GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA**
May 23, 2013

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FINAL PROSPECTUS
Fourth Louisiana Resource, LLC
Grand Swamp Mitigation Bank
Pointe Coupee Parish, Louisiana

1.0 INTRODUCTION

Fourth Louisiana Resource, LLC (4LR) submits this Final Prospectus to the U.S. Army Corps of Engineers – New Orleans District (CEMVN) and Interagency Review Team (IRT) to initiate evaluation of the proposed Grand Swamp Mitigation Bank (GSMB) in accordance with 33 CFR 332.8(d)(2). The details pertaining to the use of this site as a mitigation bank will be specified in the subsequent Mitigation Banking Instrument (MBI).

Bank Sponsor and Owner

4LR is the Sponsor of the GSMB. The land is owned in fee title by 4LR, which will also assume long-term ownership and management of the GSMB.

Site Location

The GSMB is approximately 254.8 acres and will provide 177.1 acres of re-established bottomland hardwood forested wetland ecosystem, 5.8 acres of re-established baldcypress/tupelo swamp ecosystem, and 8.8 acres of rehabilitated baldcypress/tupelo swamp ecosystem. 51.0 acres of bottomland hardwood forest will be restored to upland buffer and designated as a non-hydric inclusion. The site is located in Section 101, Township 5S, Range 10W, of Pointe Coupee Parish, Louisiana (Figure 1). The GSMB is contained entirely within the area known as “The Island,” south of New Roads, Louisiana in the Lower Grand Watershed, HUC 08070300.

Driving Directions

- From US Highway 190, turn **north** onto LA Highway 413 (Bayou Poydras Road)
- In 4.8 miles, turn **left** onto LA Highway 416
- In 0.2 miles, turn **right** onto Highway 413
- In 0.5 miles, turn **left** onto Highway 414
- In 2.5 miles, turn **right** onto Woodview lane
- From this point, arrangements must be made with the landowner to reach the site

2.0 GOALS AND OBJECTIVES

The goal of the GSMB is the re-establishment of bottomland hardwood forest and the re-establishment and rehabilitation of baldcypress/tupelo swamp in the Lower Grand Watershed, HUC 08070300. Table 1 shows the current and proposed habitat types.

Table 1: Current Habitat Types, Land Use, and Proposed Mitigation Type

Present Habitat Type	Proposed Habitat Type	Current Land Use	Mitigation Type	Acreage
Non-Wetland Pasture	Bottomland Hardwood	Cattle Grazing	Re-Establishment	177.1
Other U.S. Waters	Baldcypress/Tupelo Swamp	Drainage	Re-Establishment	5.8
Emergent Wetlands	Baldcypress/Tupelo Swamp	Cattle Grazing	Rehabilitation	8.8
Non-Wetland	Non-Wetland/Roads	Roads and Rights-of-Way	Non-Mitigation	12.1
Non-Wetland Pasture	Bottomland Hardwood	Cattle Grazing	Non-Hydric Inclusion	51.0
Total Wetlands	---	---	---	254.8
Total	---	---	---	254.8

2.1 Aquatic Function Improvements

Below are proposed actions anticipated to improve aquatic functions:

- The removal of interior ditching and culverts to restore natural sheet flow across the property
- Removal of hay and livestock production from the property to increase water quality downstream of the site
- Soil preparation and vegetative plantings to restore natural vegetation across the property
- Restoration of surface hydrology through the re-establishment of natural sheet flow to restore the historic wetland functions and values of the project site
- Long-term maintenance to prevent colonization by noxious and invasive species, erosion along interfaces of drainageways, and trespass vandalism
- Vegetative plantings as well as the restoration of the historic hydroperiod across the property to create improved wildlife habitat
- Hydrologic restoration to increase the retention time of surface water and saturation, reducing nonpoint source runoff and increasing water quality through increased nutrient uptake by hydrophytic vegetation

3.0 ECOLOGICAL SUITABILITY OF THE SITE

3.1 Historical Site Conditions

The GSMB historically contained bottomland hardwood habitat with hydric soils. Topographically, the site exhibits the ridges and swales typically formed by the meandering of the Mississippi River.

Examination of historical photographs shows that the majority of the GSMB site has been kept in a pastoral state since at least 1941. Since that time, the property has been used primarily for cattle grazing. Although cattle pasture dominates the project area, emergent and scrub-shrub wetland habitat persists in the central portion of the project area as well as along overgrown fencerows and property boundaries around the perimeter of the project area.

Locally, the higher elevation areas were converted to agricultural use first. A canal system built in the 1970s and 1980s by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) drained the surrounding area, opening up more land for agriculture. As it stands currently, the GSMB and much of the surrounding area has now been converted to agricultural land.

3.2 Current Site Conditions and Characteristics

The years of cattle grazing has severely impacted the GSMB site beyond the removal of native vegetation. As a result of efforts to facilitate drainage and enhance pasture grass growth, the natural hydrology of the GSMB lands is currently impaired. Water from within the project area currently drains via sheet flow into man-made drainage ditches, which then flow into drainage canals offsite. These canals drain to the south and eventually into the False River. Additionally, many years of cattle production on the site's pastures has resulted in the formation of a compacted upper region in the soil.

Current Vegetation

Typical dominant vegetation in the cattle pasture includes sugarberry (*Celtis laevigata*), water oak (*Quercus nigra*), sweet pecan (*Carya illinoinensis*), bahiagrass (*Paspalum notatum*), bermudagrass (*Cynodon dactylon*), dewberry (*Rubus spp.*), broomsedge bluestem (*Andropogon virginicus*), and Carolina geranium (*Geranium carolinianum*).

The typical dominant vegetation in the scrub/shrub and emergent wetlands includes drummond red maple (*Acer rubrum* var. *Drummondii*), green ash (*Fraxinus pennsylvanicum*), Chinese tallow tree (*Triadica sebifera*), common rush (*Juncus effusus*), savannah-panicgrass (*Phanopyrum gymnocarpon*), dotted smartweed (*Polygonum punctatum*), marsh elder (*Iva annua*), brazilian vervain (*Verbena brasiliensis*), sedges (*Carex spp.*), curly dock (*Rumex crispus*), and wax myrtle (*Morella cerifera*).

Current Soils

The GSMB is underlain entirely with Dundee-Alligator complex, undulating (De) soils (NRCS 2012) (Figure 2). The Alligator soils are mapped as hydric by the NRCS (2011) while the Dundee soils can be partially hydric in specific instances. The distribution of these soils on site will be further detailed in the subsequent Draft Mitigation Banking Instrument, according to the soil sampling grid outlined in Figure 10. The Sponsor will perform these samples in a grid-like fashion at an initial spacing of 100 feet, decreasing the spacing as necessary to accurately define the higher elevation areas (+26.0 feet MSL) that are anticipated to be underlain with Dundee soils. This defined area, currently estimated at 51.0 acres, shall be classified as a non-hydric inclusion.

The Dundee-Alligator series consists of very deep, poorly drained, and slowly permeable soils that formed in clayey alluvium. They are found in back swamps and sloughs on floodplains as well as in low terraces of the Mississippi River and its tributaries. These soils have a high shrink-swell capacity, expanding significantly when wet and developing large cracks in the upper portion when dry (SCS 1974).

Property Constraints

The GSMB includes a cumulative 12.1 acres of roads and rights-of-way that are not included in the total mitigation acreage. Specifically, the 12.1 non-mitigation acres are composed of three at-grade access roads without roadside ditching, two pipeline rights-of-way, and one utility right-of-way. The locations and identities of these are detailed in Figure 9.

The GSMB is otherwise free of encumbrances. In addition, the GSMB and adjacent property is within unincorporated land and is absent of zoning regulations. The site is connected to and surrounded by natural and man-made tributaries and forested wetland areas that create buffers to anthropogenic effects from land use alterations.

Preliminary Jurisdictional Determination

The Preliminary Jurisdictional Determination from CEMVN was issued on August 24, 2012. A copy has been included in the Appendix B.

Water Rights

Louisiana Civil Code, Article 490, treats water resources under the theory of absolute ownership and rule of capture, provided that capture does not result in harm to neighbors. All culverts are slated to be removed. Should it be deemed necessary to retain any of these features, they would be passively maintained unless hydrologic monitoring reports reveal a need for maintenance. Should this occur, appropriate action will be taken with IRT approval.

3.3 General Watershed Characteristics

Water Sources and Losses

The primary sources of water to the GSMB are direct precipitation and channelized flow from adjacent properties to the north, east, and west, which may be allowed to saturate and inundate the site for longer durations due to high water tables associated with seasonal high water events on the Mississippi River. The average annual precipitation in the vicinity of the project area is approximately 61 inches. July is the wettest month of the year with an average precipitation of 6.8 inches, and October is the driest month of the year with an average precipitation of 3.1 inches. Average annual runoff ranges from 12 to 20 inches in this region. Evaporation exceeds rainfall seven months of the year in this region.

Surface flow from the property adjacent to the northern boundary of the GSMB is channeled onto the site via two main drainage features (Figure 11). Surface flow from the property adjacent to the eastern boundary of the site is channeled into perimeter ditching running along this boundary with an existing entry point onto the site at approximately the midpoint of the boundary. Surface flow from the property adjacent to the western boundary of the site is channeled onto the southwestern portion of the site via two drainage features. These five existing features currently allow adequate surface flow from surrounding land to enter the project site; however, the existing drainage features within the site currently limit the duration of saturation and inundation of this surface flow. Implementing the hydrologic restoration plan as described below in Section 4.1 will enable the site to accept outside surface flow for longer periods of time, while also allowing water to spread throughout the site more naturally (Figure 11).

A parish drainage canal is present west of the site. It only borders the extreme northwest corner of the site, thereby inhibiting surface flow to only a minimal extent. The remainder of the canal is separated from the site by topographical features which block surface flow from properties further to the west; therefore, the canal's existence does not represent a detrimental drainage feature to the site's overall hydrology.

Hydroperiod

The presence of hydric soils indicate that prolonged conditions of saturation, flooding, or ponding are likely to have occurred historically in the area. This site is entirely comprised of Dundee-Alligator soils, which, in this region, typically have a seasonal high water table between the surface and two feet below the surface.

3.4 Congruence with Local Action Plans

The GSMB helps further the goals of the Upper Terrebonne Basin Water Quality Improvement Project developed as part of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) legislation. As described in this prospectus, the GSMB addresses many of the same watershed issues highlighted by the project, including water quality, wildlife habitat, waterborne debris, erosion, sedimentation, flooding, and the overall environmental health of the water resources.

The GSMB also works in conjunction with the Louisiana Department of Natural Resources False River Ecosystem Restoration Project. This project calls for the modification of drainage networks to slow storm flow and increase sediment retention. The False River Restoration Project identifies mitigation banks as potential partner in these efforts. Among other improvements, the GSMB would contribute to reducing sediment runoff.

3.5 General Bank Need

There are currently three approved mitigation banks located in the proposed primary service area of the GSMB, HUC 08070300. However, the inventories at two of these banks are almost entirely exhausted, leaving all compensatory mitigation in this area to be fulfilled from a sole supplier.

In addition to providing mitigation for residential and commercial development related to continued population growth, the GSMB will provide mitigation for the continuation of oil and gas exploration and production, which have occurred historically in the proposed primary and secondary service areas. Additionally, it is anticipated that numerous pipelines will be constructed across the service areas of the GSMB in the near future as oil and gas products from Texas and Northwest Louisiana are transported to Mississippi River refineries along the I-10 corridor between Baton Rouge and New Orleans.

3.6 Technical Feasibility

The GSMB has a high degree of technical feasibility. The site operators have extensive experience developing similar projects, and the actions required to develop the GSMB are routine. Furthermore, the presence of bottomland hardwood habitat adjacent to the GSMB indicates that the site is conducive to successful restoration efforts.

4.0 BANK ESTABLISHMENT

4.1 Management Summary

Hydrologic Restoration

The primary sources of hydrology to the proposed GSMB are rainfall and high water tables associated with high water events on the Mississippi River and channelized flow from adjacent properties to the north, east, and west. Rainfall is estimated to be approximately 61.1 inches per year (NRCS 2011). As part of the restoration process, the interior ditches currently in place to move surface and subsurface water off the site will be removed or modified. These features flow primarily to the south and eventually into False River. The diversion of this water prevents ponding and saturation within the upper portions of the soil horizon. The modification of these drainage features combined with the slow infiltration and low permeability of the site's heavy clay soils will help to re-establish wetland hydrology throughout much of the proposed GSMB. Figure 2 presents the location of culverts to be removed and drainage features to be modified. Figures 4, 5 and 6 present cross-section locations and profiles.

There are two existing drainageways within the GSMB. The central drainageway currently traverses the property from northwest to southeast in the lowest elevation found on the property. The secondary drainageway, currently an emergent wetland with a small excavated channel running centrally through it, is considerably smaller and located parallel to and west of the central drainageway. The primary drainageway will be completely backfilled, and all culverts will be removed to encourage surface flow and eliminate impounding (Figure 2). The existing spoil material of the secondary drainageway will be degraded by discing, thereby restoring natural elevation. This action will further slow the movement of water through this drainage feature, resulting in increased infiltration and nutrient uptake by hydrophytic vegetation. These modifications will result in increased retention time and saturation area of surface flow from precipitation and adjacent properties to the north, east, and west.

Additionally, the 12.1 acres of road and rights of way classified as non-mitigation have no effect on pre-project or post-project surface hydrology, as they are the same elevation as the surrounding land and have no ditching associated with them.

Approximately 51.0 acres of upland buffer are present on the site at an elevation of +26.0 feet MSL or greater (Figure 2) and are cumulatively designated as a non-hydric inclusion within the GSMB. Historic aerial photography from 1941 shows that these areas closely align with what appear to be non-wetland areas in the past. In order to identify the boundaries between the upland buffer areas and the surrounding wetland restoration areas as precisely as possible, RES will implement a thorough soil sampling plan on and around the upland buffer area, using the grid overlay described in Section 3.2 and Figure 10.

In the event that the Sponsor determines, with CEMVN verification, during the establishment of this mitigation bank that the upland buffer has been restored to wetlands, the Sponsor will request an amendment to the credit calculations to reflect this net improvement.

Drainage Area

Because of the ditching and drainage features present on site, water currently moves across the site primarily through the two parallel drainage ways that transect the site (Figure 3). While the drainage area will remain the same post-project, the project will allow surface flow, currently directed to and contained within the drainageways, to cross the site via sheet flow. This alteration will lead to an increase in duration of saturation and inundation, helping to restore historic hydrologic conditions. This drainage area has been estimated based on topographic maps and HUC areas and is presented in Figure 1.

Vegetative Restoration – Bottomland Hardwood Re-Establishment

For the 177.1 acres of pasture proposed for designation as bottomland hardwood re-establishment, an appropriate combination of hard and soft mast producing bare-root stock will be planted. Two species assemblages will be selected and planted based on elevation. The specific breakdown of each assemblage to be planted will be representative of those historically common to bottomland hardwoods of the area. These species assemblages are identified in *The Natural Communities of Louisiana*. These assemblages and their planting locations will be stated in the MBI. Spacing of the proposed planting in areas designated as re-establishment will be 9 feet x 9 feet for an initial density of 538 trees per acre. Planting densities, planting success rates, escrow or bond sum release rates, and monitoring requirements will be consistent with other recently implemented CEMVN approved mitigation banks.

Vegetative Restoration – Baldcypress/Tupelo Swamp

For the 14.6 acres of emergent wetlands and “Other Waters of the United States” proposed for designation as baldcypress/tupelo swamp re-establishment and rehabilitation, restoration will include removal of invasive plant species and planting with desirable baldcypress/tupelo swamp species (bare-root stock).

Soils in the fields within the total project area will be mechanically prepared for vegetative plantings. Deep-ripping will be used to alleviate soil compaction and encourage air and water pore space for root growth.

Invasive Species Control

Invasive plant species, such as the Chinese tallow tree (*Triadica sebifera*) growing near the planted area, will be removed by shredding and/or herbicidal treatment immediately after initial planting. The percent cover of invasive plants will be monitored during short-term and long-term success monitoring, and appropriate action will be taken if needed. Currently, only a minimal amount of Chinese tallow exists on the site.

Monitoring

At a minimum, monitoring reports shall be completed in the spring (when new growth makes identification practicable) of Years 1, 3, 5, 10, 15, and prior to and following the first thinning operation. Reports will be submitted by December 31 of each monitoring year.

4.2 Proposed Service Area

The GSMB is located in the Lower Grand Watershed, HUC 08070300. Accordingly, 4LR proposes HUC 08070300 as the Primary Service Area of the GSMB. The West-Central Louisiana Coastal Watershed, HUC 08090302, is proposed as the Secondary Service Area of the GSMB (Figure 1).

5.0 OPERATIONS

5.1 Future Ownership and Long-Term Management

Sponsor/Operations Manager/Long-Term Management

Fourth Louisiana Resource, LLC
412 N. Fourth Street, Suite 300
Baton Rouge, Louisiana 70802
(225) 372-6161
Frankie@res.us
POC: Frankie Savoy

Landowner/Long-Term Ownership

Fourth Louisiana Resource, LLC
412 N. Fourth Street, Suite 300
Baton Rouge, Louisiana 70802
(225) 372-6161
Frankie@res.us
POC: Frankie Savoy

Agent

Fourth Louisiana Resource, LLC
412 N. Fourth Street, Suite 300
Baton Rouge, Louisiana 70802
(225) 372-6161
Frankie@res.us
POC: Frankie Savoy

5.2 Perpetual Site Protection Mechanism

The GSMB will be protected in perpetuity by conservation servitude pursuant to Louisiana Revised Statute 9:1271 et seq. The servitude will be held by a conservation-oriented 501(c)(3) organization to be determined. The servitude will inure and run with the property title.

The servitude will prohibit activities such as clear cutting, fill discharges, cattle grazing, or other commercial surface development that would diminish the quality or quantity of restored wetlands.

5.3 Long-Term Management Strategy

The Sponsor will ensure the long-term success and sustainability of the GSMB through mechanisms including vegetative and hydrologic maintenance as necessary, site monitoring, invasive species management, establishment of financial assurances, and protection in perpetuity by conservation servitude. A long-term management plan will be included in the MBI.

5.4 Sponsor Qualifications

4LR is a wholly owned subsidiary of Resource Environmental Solutions, LLC (RES). RES will be the entity responsible for bank land management and administration. RES has over 17,000 acres of approved wetland and stream mitigation in the United States with another 4,000 currently under development. The company operates 27 distinct mitigation banks and works in more than 10 U.S. Army Corps of Engineers districts across the country. RES has a profile at www.res.us.

6.0 CONCLUSION

In summary, the GSMB has the potential to restore 191.7 acres of forested wetlands, including 177.1 acres of re-established bottomland hardwood forested wetland ecosystem, 5.8 acres of re-established baldcypress/tupelo swamp ecosystem, and 8.8 acres of rehabilitated baldcypress/tupelo swamp ecosystem. The Sponsor has determined through the thorough examination of historical evidence that the GSMB has a high probability of regaining its original characteristics and functions. Through actions such as restoring the natural sheet flow, restoring natural vegetation, and improving water quality downstream, the implementation of the GSMB would improve local aquatic resources and habitats while also contributing to the local action plans.

7.0 REFERENCES

Code of Federal Regulations, Title 33, Parts 325 and 332 and Title 40, Part 230, as published on pages 19594-19704 in the Federal Register dated 10 April 2008.

False River Ecosystem Restoration Status Update and Alternative Action Plan, 2012, Accessed October, 2012.
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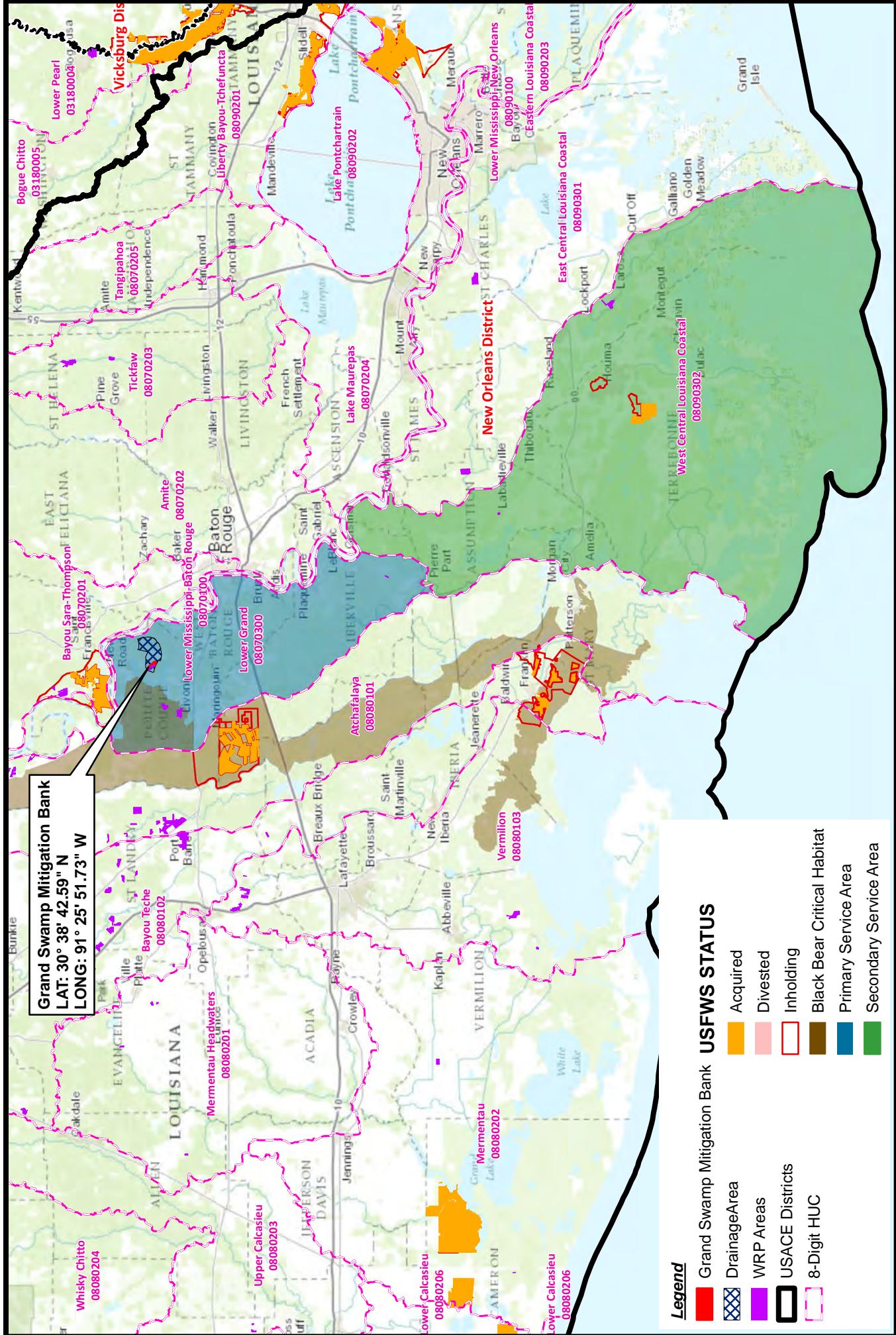
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APPENDIX A

FIGURES



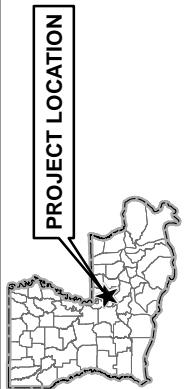
PROJECT LOCATION



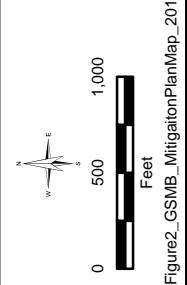
FIGURE 1
SERVICE AREA & DRAINAGE AREA MAP

GRAND SWAMP MITIGATION BANK POINTE COUPEE PARISH, LOUISIANA

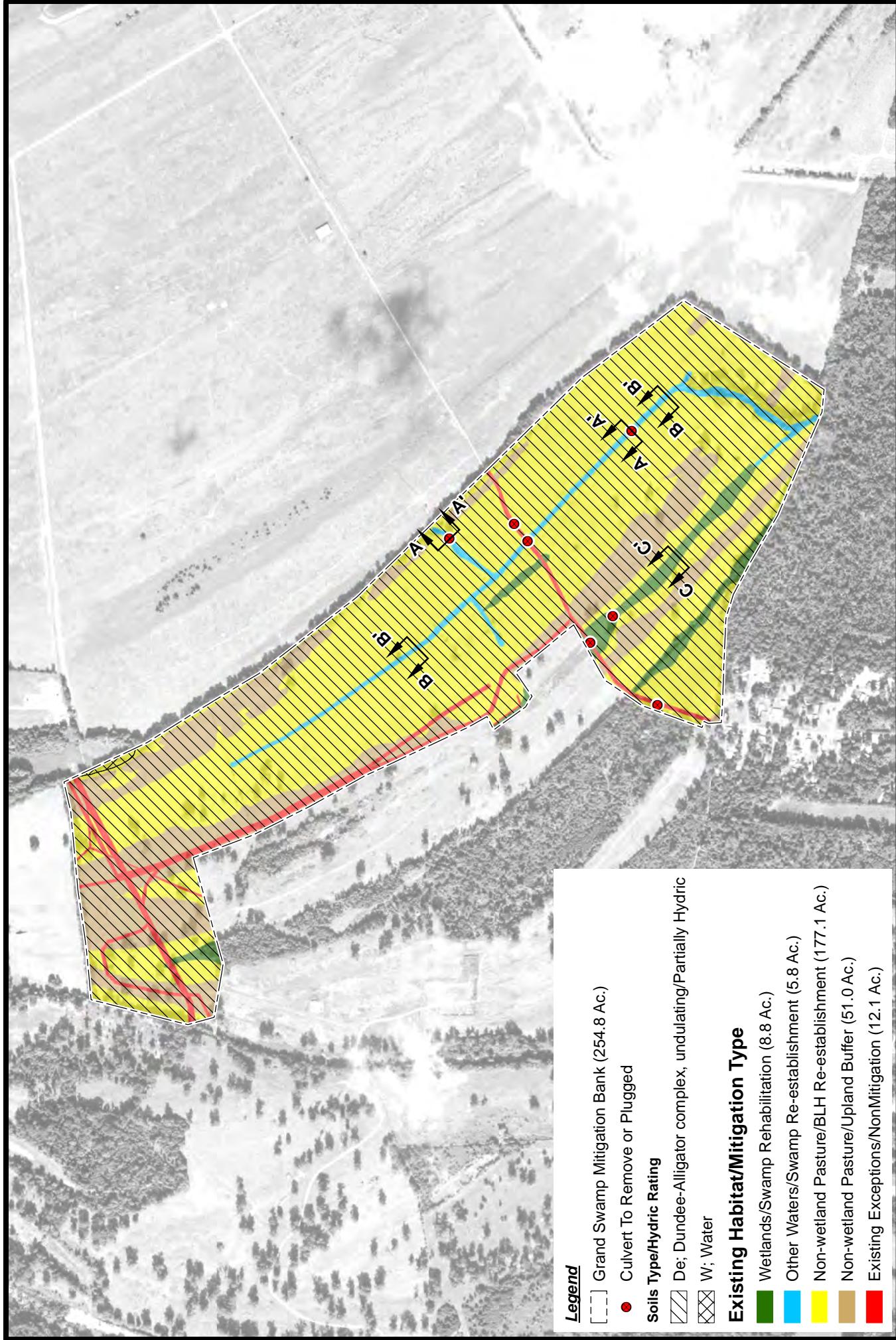
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**FIGURE 2
PROPOSED HYDROLOGIC RESTORATION PLAN,
SOILS, EXISTING HABITAT, MITIGATION TYPE,
AND CROSS-SECTION LOCATION MAP
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA**



- Legend**
- [---] Grand Swamp Mitigation Bank (254.8 Ac.)
 - Culvert To Remove or Plugged
 - Soils Type/Hydric Rating**
 - De; Dundee-Aligator complex, undulating/Partially Hydric
 - ☒ W; Water
 - Wetlands/Swamp Rehabilitation (8.8 Ac.)
 - Other Waters/Swamp Re-establishment (5.8 Ac.)
 - Non-wetland Pasture/BLH Re-establishment (177.1 Ac.)
 - Non-wetland Pasture/Upland Buffer (51.0 Ac.)
 - Existing Exceptions/NonMitigation (12.1 Ac.)
- Existing Habitat/Mitigation Type**



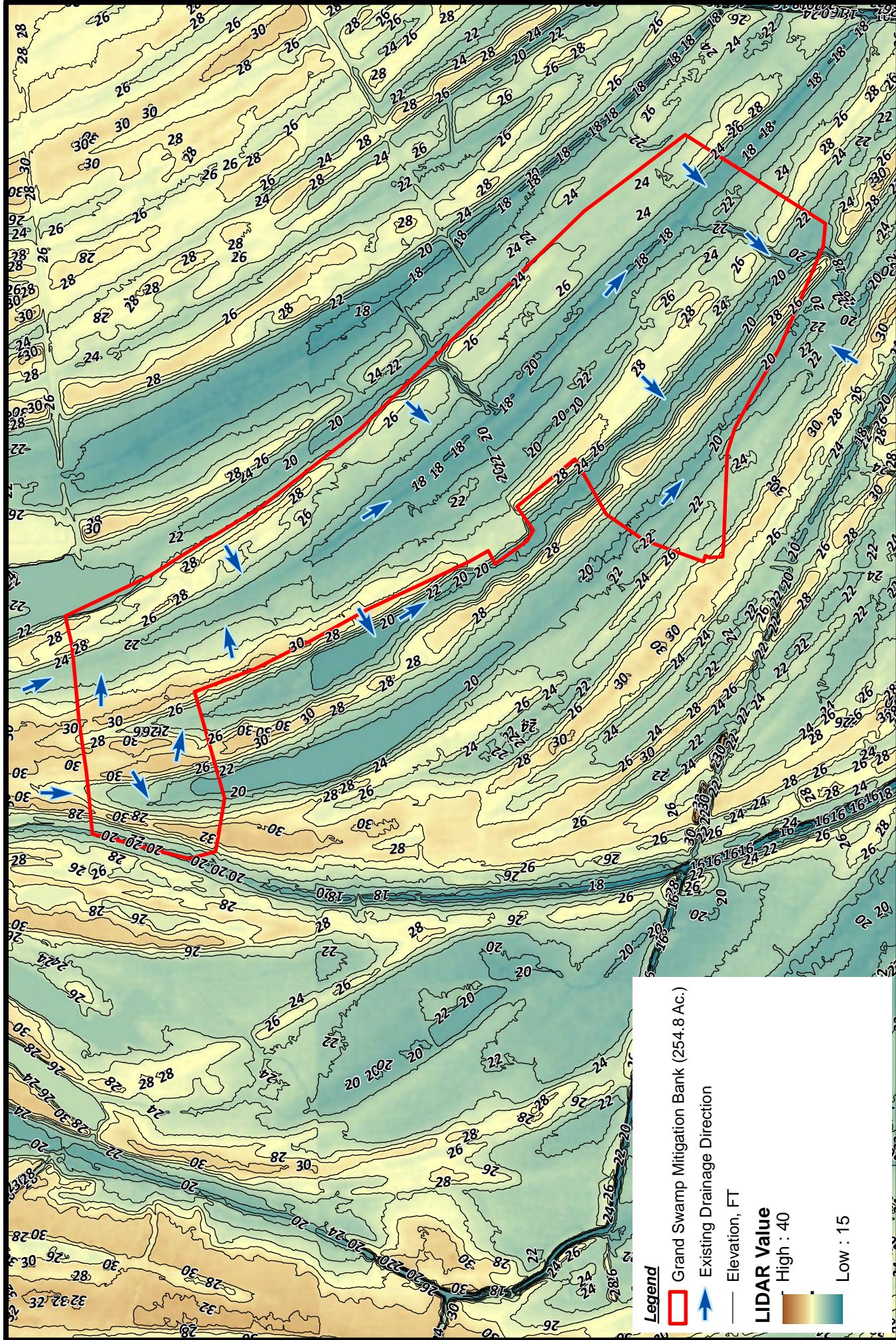
PROJECT LOCATION

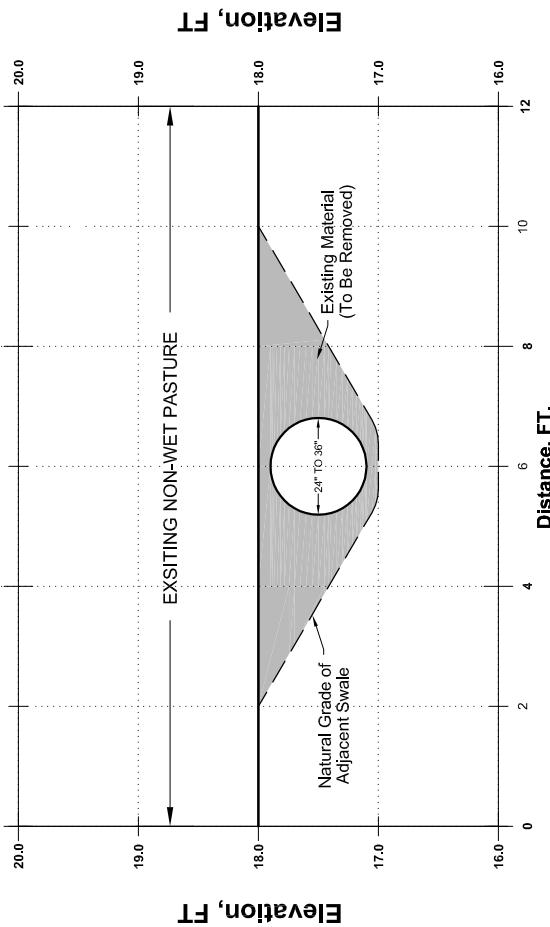


FIGURE 3

CURRENT HYDROLOGY MAP

GRAND SWAMP MITIGATION BANK POINTE COUPEE PARISH, LOUISIANA





TYPICAL CROSS-SECTION TYPICAL CULVERT

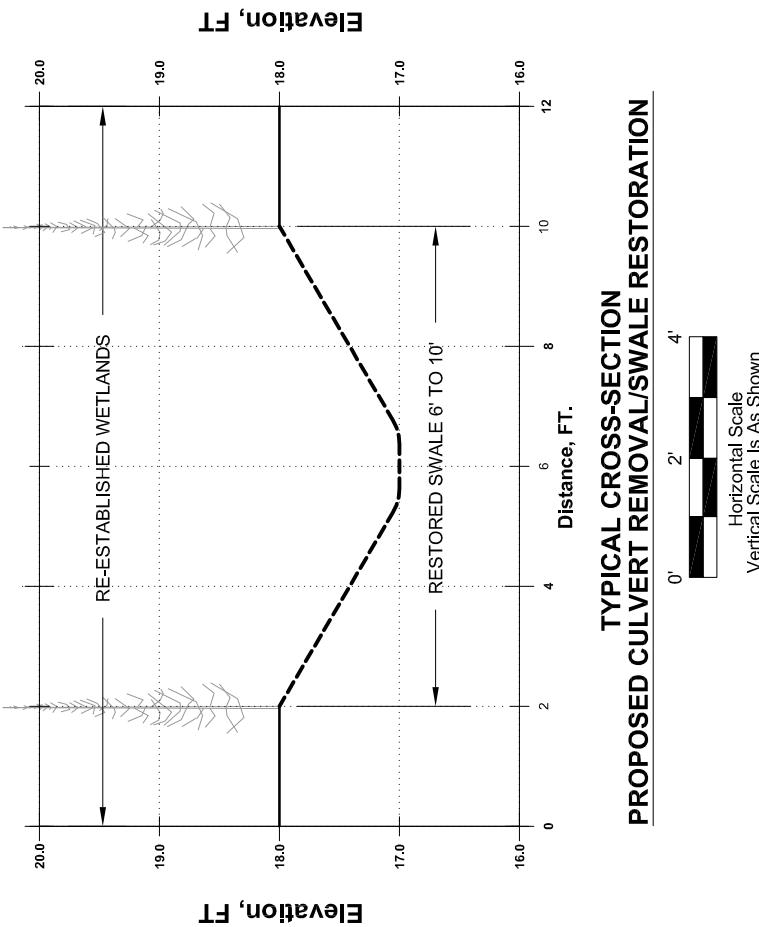
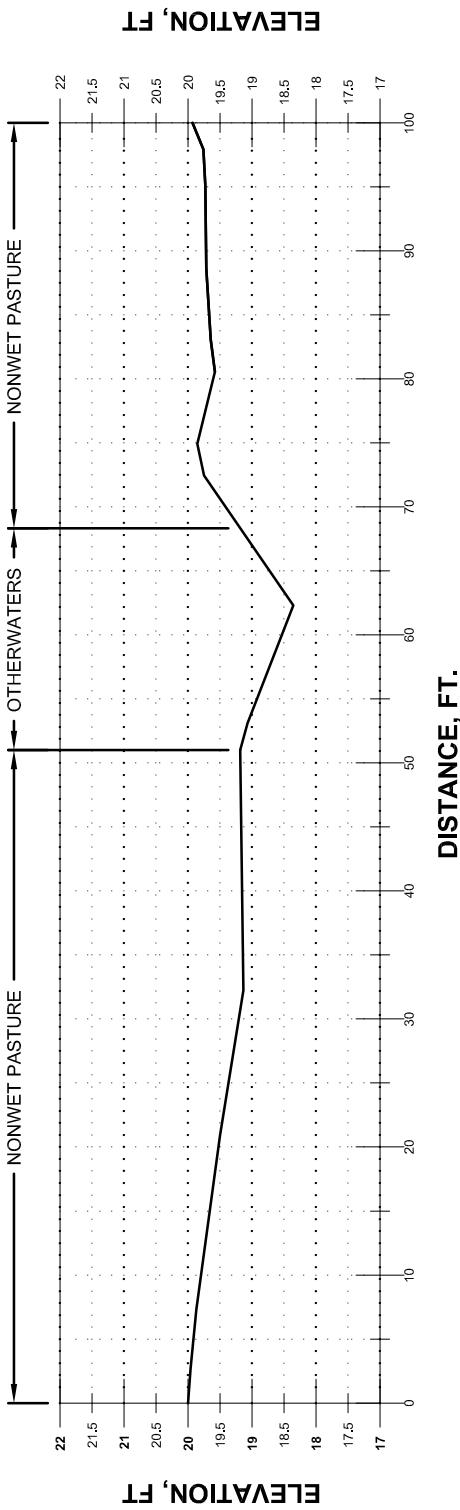
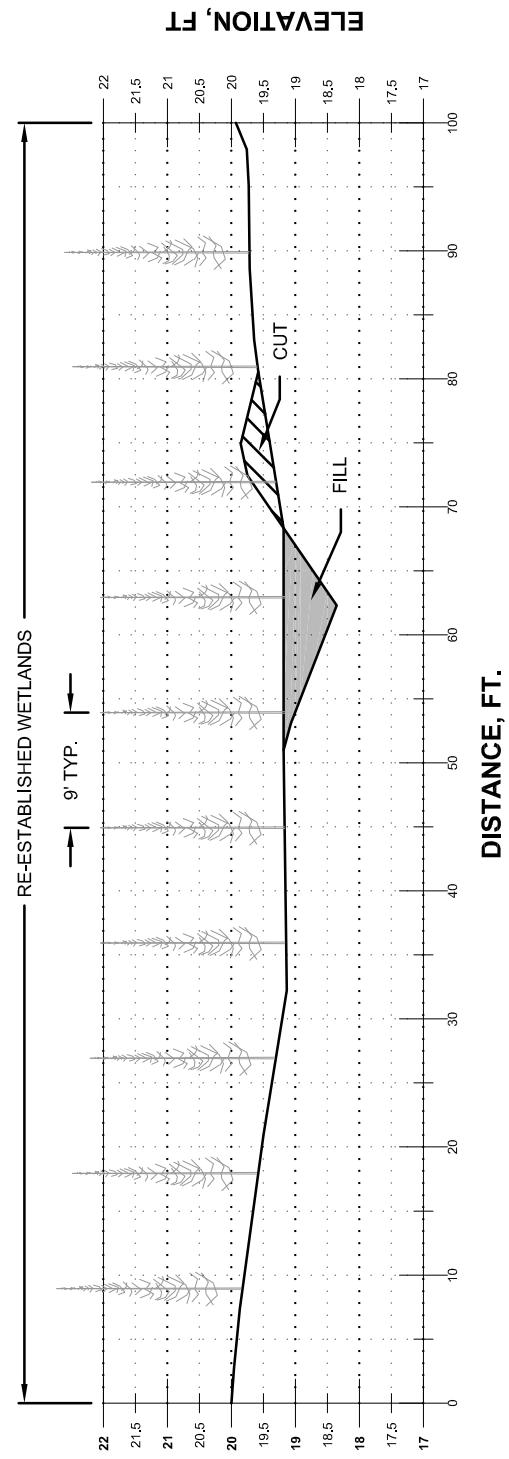


FIGURE 4
TYPICAL CROSS-SECTION A-A'
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH,
LOUISIANA



TYPICAL CROSS-SECTION B-B' EXISTING CONDITIONS

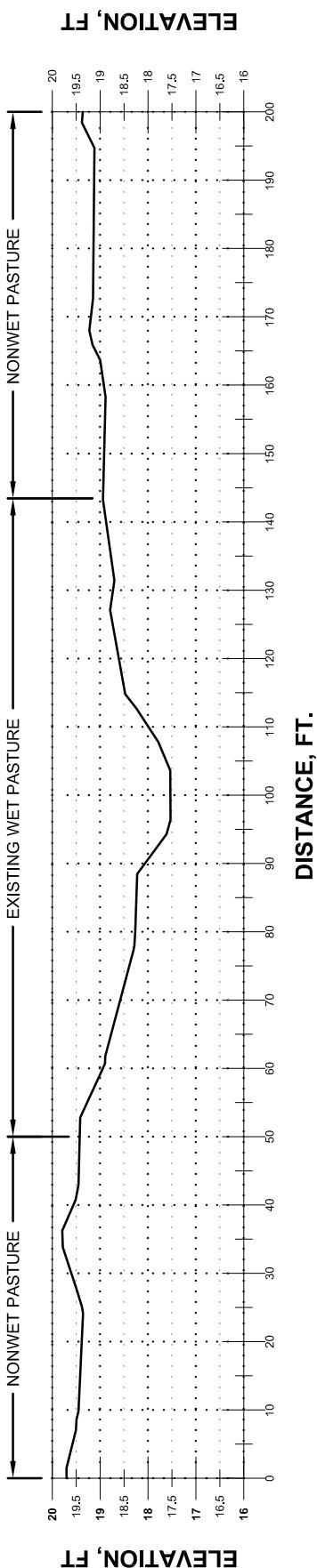


TYPICAL CROSS-SECTION B-B' PROPOSED DITCH BACKFILL

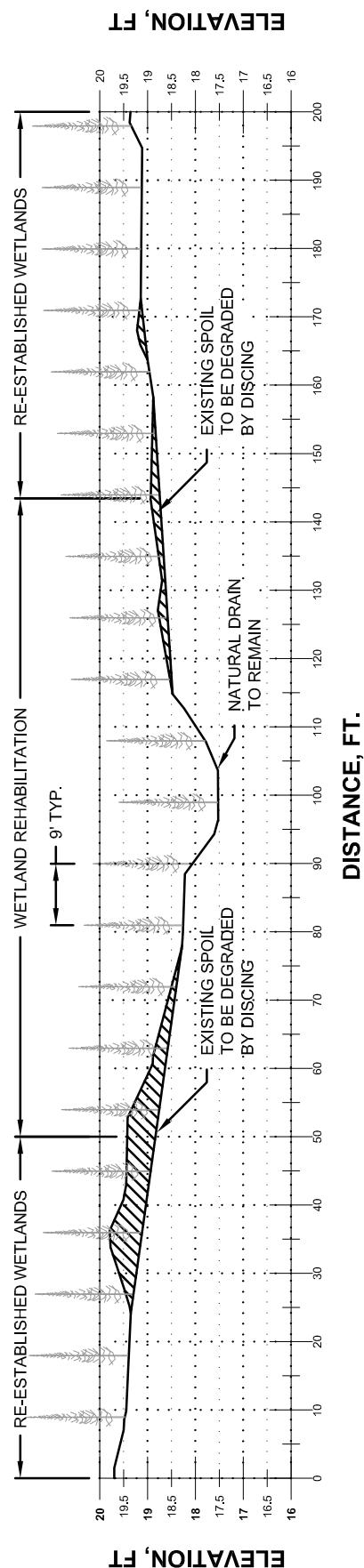
FIGURE 5

TYPICAL CROSS-SECTION B-B'
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH,
LOUISIANA

0'
15'
Horizontal Scale
Vertical Scale Is As Shown



TYPICAL CROSS-SECTION C-C' EXISTING CONDITIONS

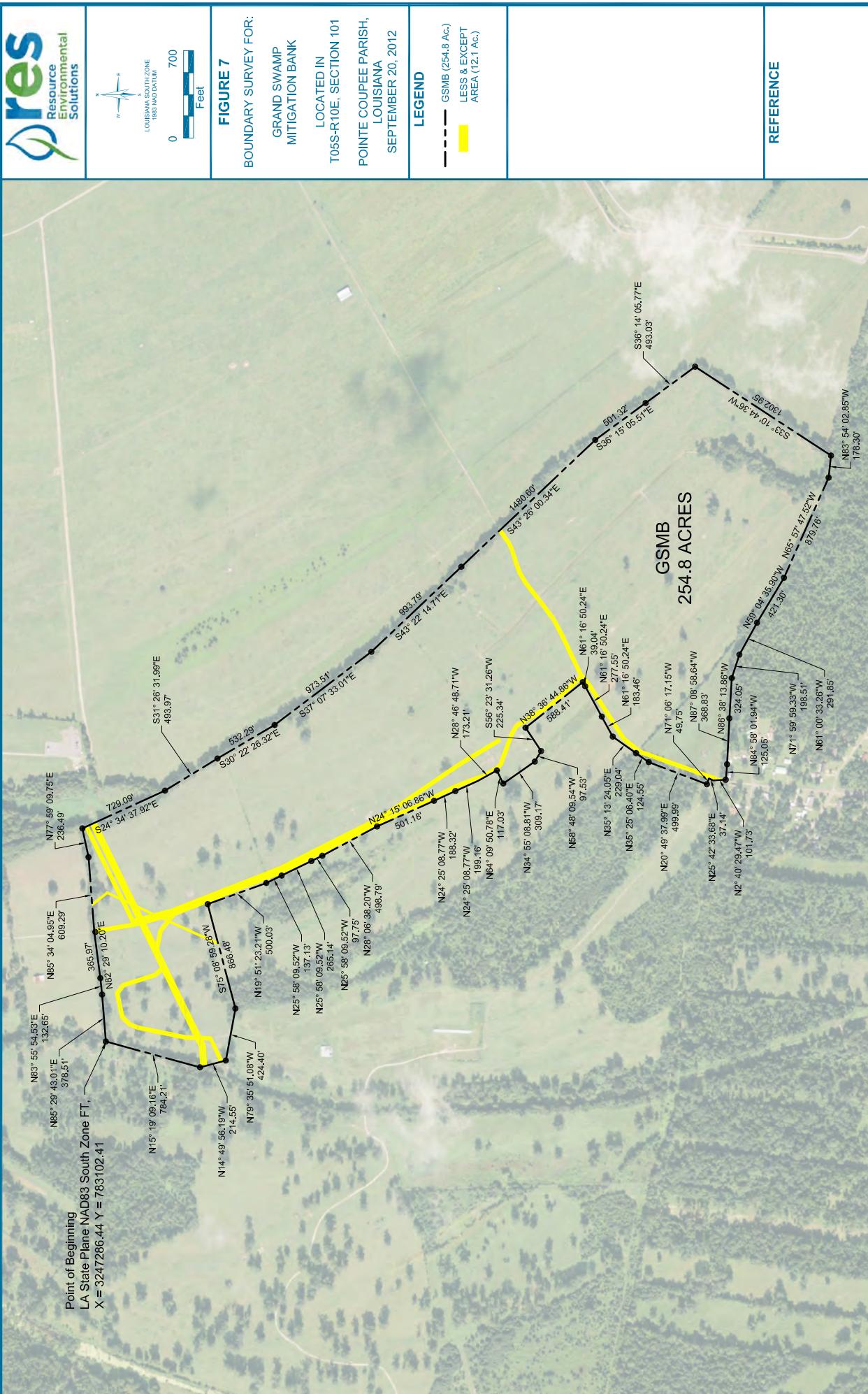


TYPICAL CROSS-SECTION C-C' PROPOSED SPOIL DEGRADATION

FIGURE 6
Horizontal Scale
Vertical Scale Is As Shown

TYPICAL CROSS-SECTION C-C'
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH,
LOUISIANA





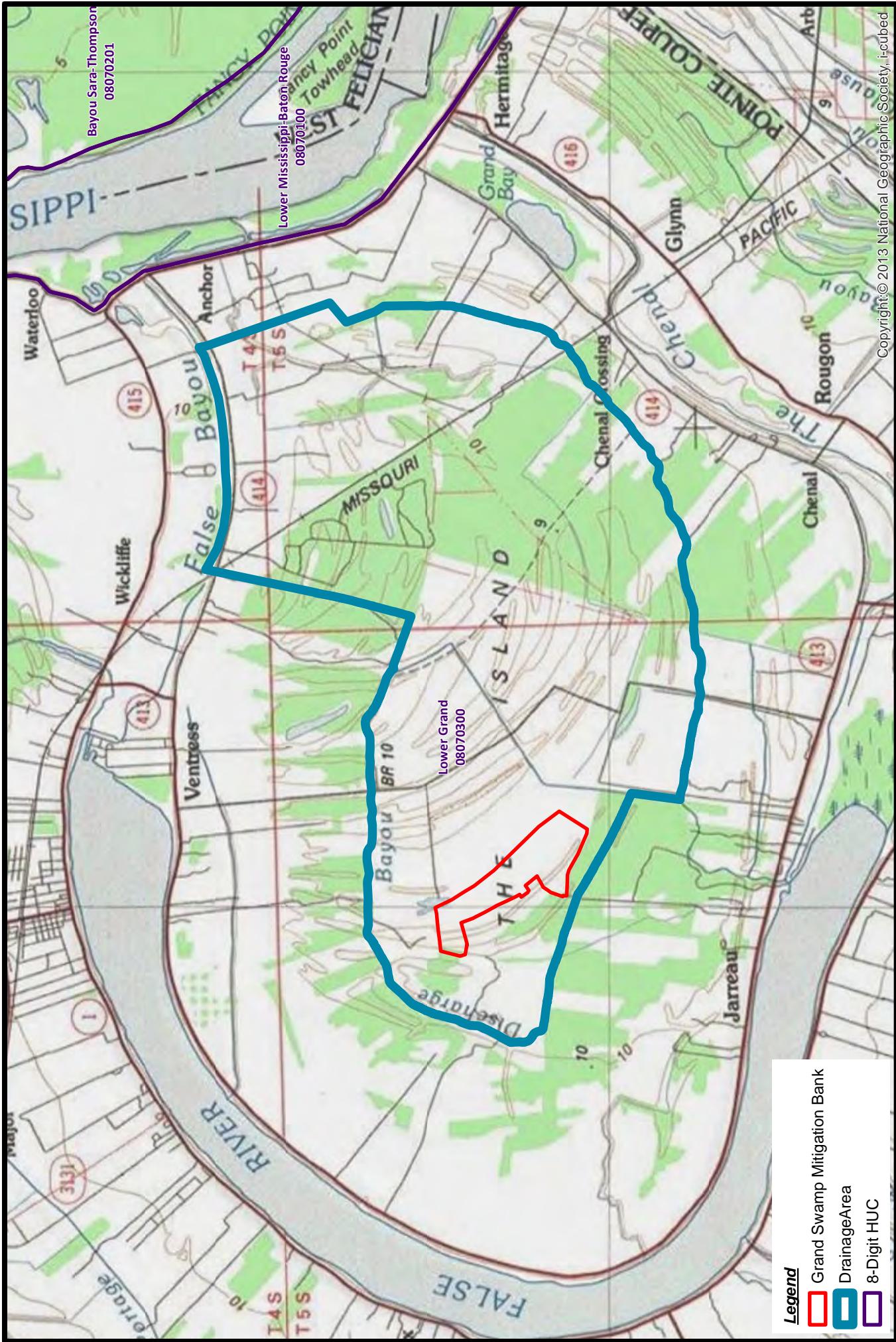


FIGURE 8
DETAILED VICINITY & DRAINAGE AREA MAP
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA

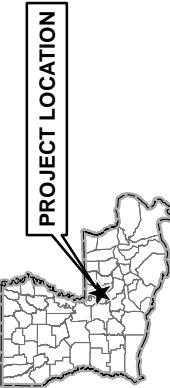
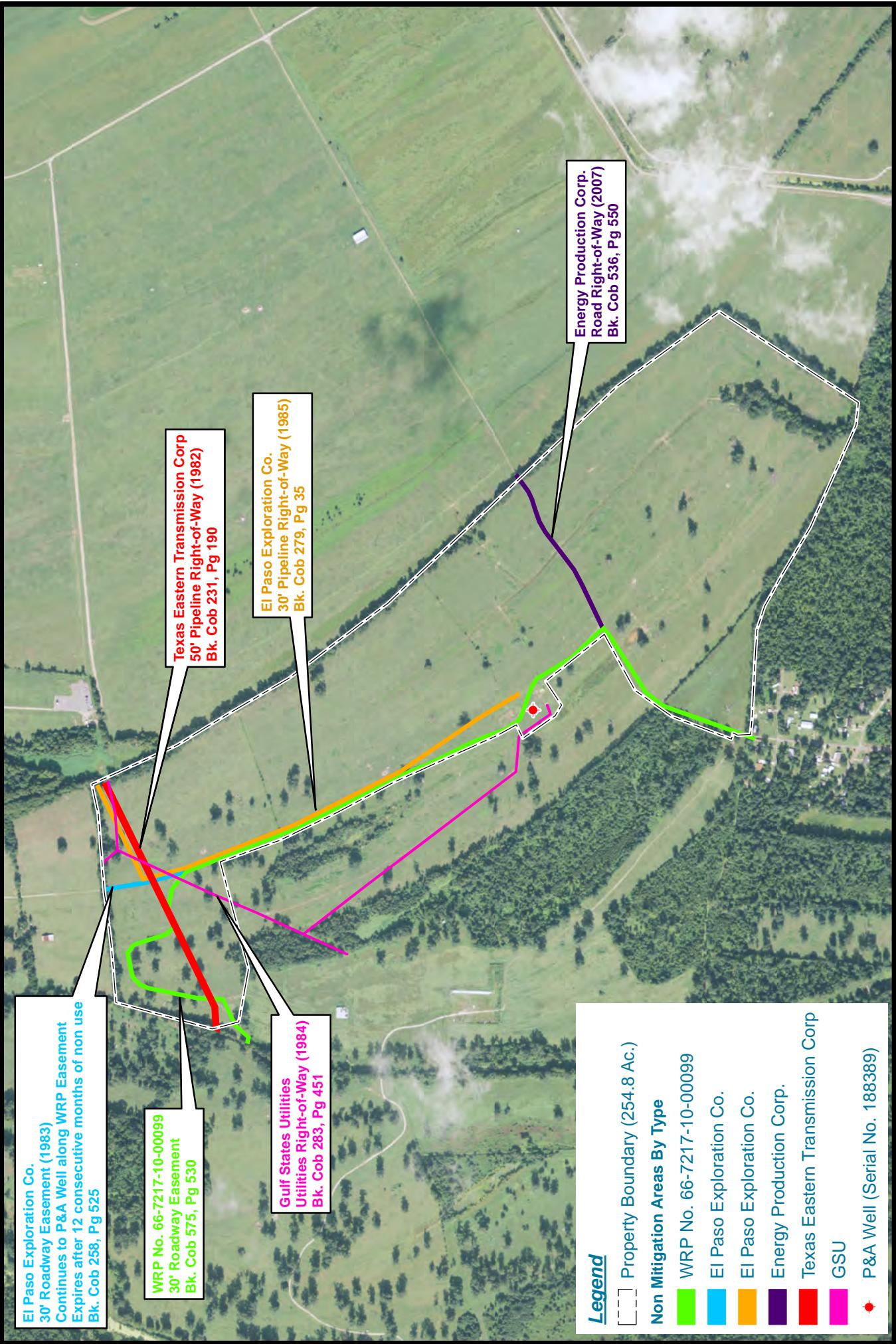


FIGURE 9

**NON-MITIGATION AREAS BY TYPE
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA**



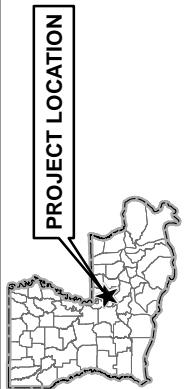
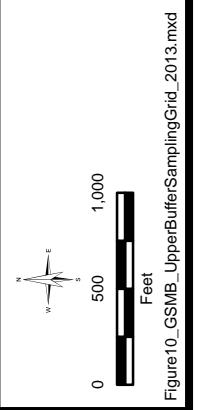


FIGURE 10
PROPOSED UPLAND BUFFER SAMPLING GRID
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA



Legend

- [---] Grand Swamp Mitigation Bank (254.8 Ac.)
- Existing Habitat/Mitigation Type**
- Non-wetland Pasture/Upland Buffer (51.0 Ac.)
- Proposed Upland Sampling Grid (100'X100')

0 500 1,000
 Feet

Figure 10_GSMB_UpperBufferSamplingGrid_2013.mxd

PROJECT LOCATION

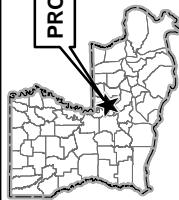
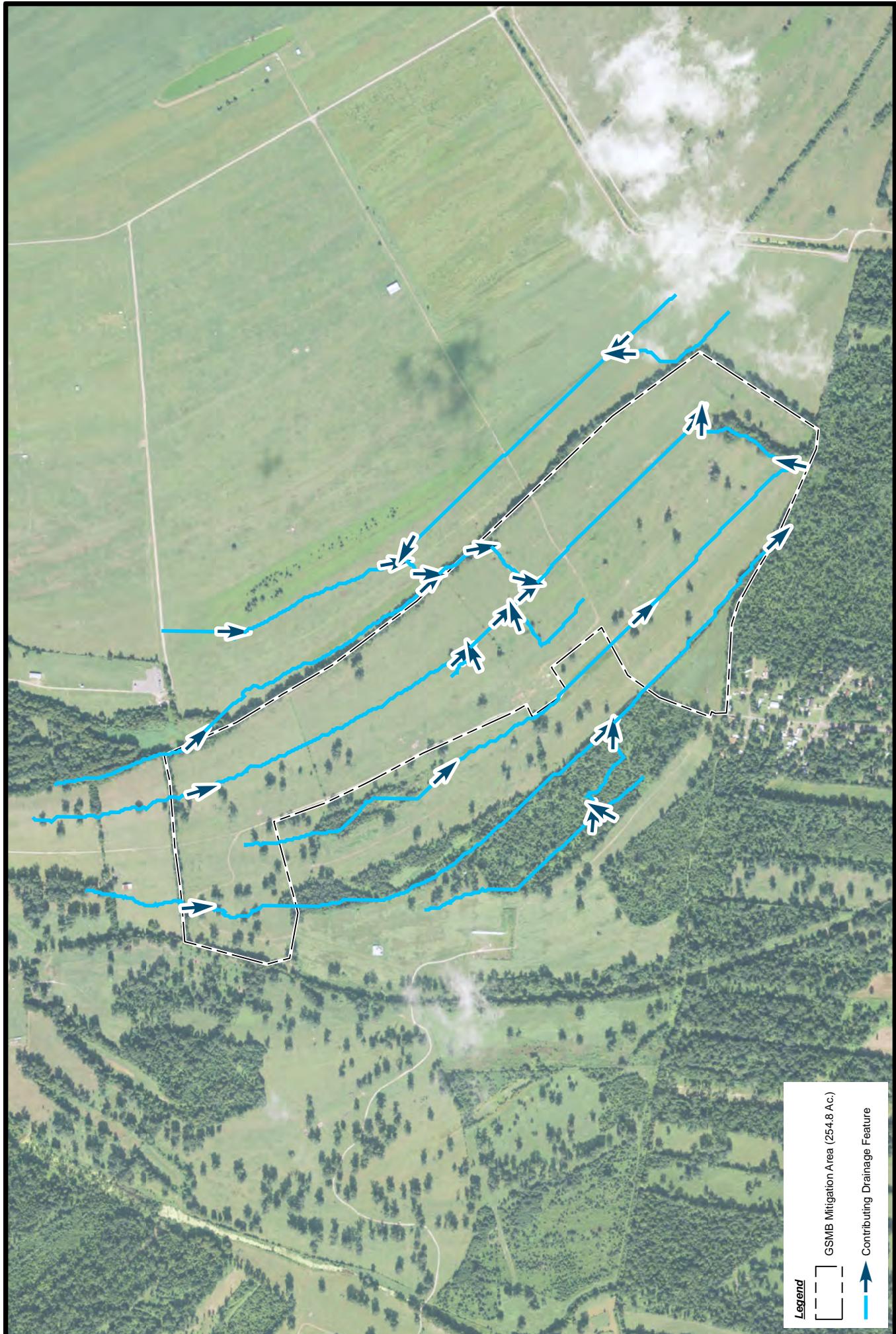


FIGURE 11
CONTRIBUTING DRAINAGE FEATURES
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA



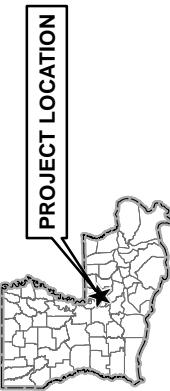
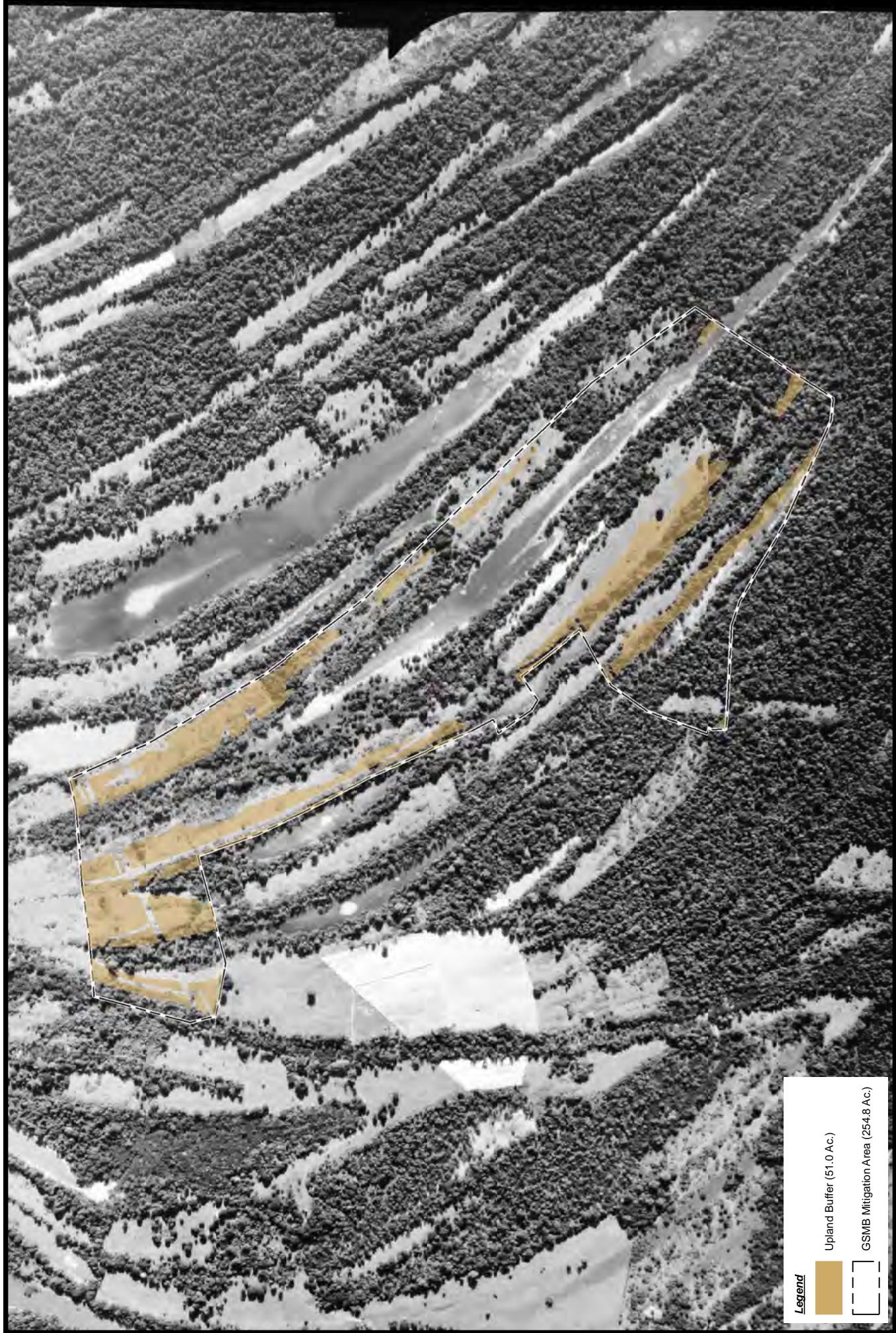


FIGURE 12
1941 AERIAL WITH UPLAND OVERLAY
GRAND SWAMP MITIGATION BANK
POINTE COUPEE PARISH, LOUISIANA



APPENDIX B

PRELIMINARY JURISDICTIONAL DETERMINATION

