



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

December 23, 2013

REPLY TO
ATTENTION OF:

Operations Division
Regulatory Branch
Project Manager
Stephen D. Pfeffer
(504) 862-2227

SUBJECT: MVN-2013-02798-MS

PUBLIC NOTICE

Interested parties are hereby notified that an application has been received by the District engineer for a Department of the Army permit to authorize the following pursuant to () Section 10 of the Rivers and Harbors Act of March 3, 1899 (30 Stat. 1151; 33 USC 403); and/or (X) Section 404 of the Clean Water Act (86 Stat. 816; 33 USC 1344).

PROPOSED LAUREL VALLEY COASTAL MITIGATION BANK IN LAFOURCHE PARISH

NAME OF APPLICANT: Delta Land Services, LLC, 1090 Cinclare Drive, Port Allen, Louisiana 70767.

LOCATION OF WORK: The project area is located in Sections 19, 20, 29, 30 of Township 14 South, Range 17 East in Lafourche Parish approximately 4 miles north of LA Highway 1 in Thibodaux, Louisiana. The approximate site center is Latitude 29.834172° North and Longitude 90.764177° West.

CHARACTER OF WORK: The Sponsor proposes to establish a wetland mitigation bank to include the cumulative re-establishment and rehabilitation of 286.9 acres of bottomland hardwoods and baldcypress swamp. The Sponsor proposes to restore the hydrology at the project area by degrading interior levees, creating gaps in external levees, and cessation of pumping the project area. The Sponsor will reforest the site with an assemblage of species indicative of bottomland hardwood and baldcypress swamp wetland forests in this area. Additional details of the proposed restoration plan are attached for review in the mitigation banking prospectus.

The comment period will close **30 days** from the date of this public notice advertisement. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons therefore, are being solicited from anyone having interest in this permit request.

Letters must reference the applicant's name and the subject number, be addressed and mailed to the above address, ATTENTION: REGULATORY BRANCH.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

No properties listed in the National Register of Historic Places are near the proposed work. The possibility exists that the proposed work may damage or destroy presently unknown archeological, scientific, pre-historical or historical sites or data. Copies of this notice are being sent to the State Archeologist and the State Historic Preservation Officer.

Our initial finding is that the proposed work would neither affect any species listed as endangered by the U.S. Department of Interior nor affect any habitat designated as critical to the survival and recovery of any endangered species.

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnus-Stevens Fishery Conservation and Management Act. The applicant's proposal would result in the alteration of 0 acres of EFH utilized by various life stages of red drum and penaeid shrimp. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

If the proposed work involves deposits of dredged or fill material into navigable waters, the evaluation of the probable impacts will include the application of guidelines established by the Administrator of the Environmental Protection Agency and certification that the proposed activity will not violate applicable water quality standards will be required from the Louisiana Department of Environmental Quality, Office of Water Resources, before a permit is issued.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

You are requested to communicate the information contained in this notice to any other parties whom you deem likely to have interest in the matter.

Martin S. Mayer
Chief, Regulatory Branch

**PROSPECTUS FOR THE PROPOSED
LAUREL VALLEY
COASTAL MITIGATION BANK
LAFOURCHE PARISH, LOUISIANA**



NOVEMBER 7, 2013

PREPARED BY:

**DELTA LAND SERVICES, LLC
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W W W . D E L T A L A N D - S E R V I C E S . C O M

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1.0 INTRODUCTION

Delta Land Services, LLC (DLS) has prepared this prospectus in accordance with 33 CFR § 332.8(d) (2)¹ to establish and operate the proposed Laurel Valley Coastal Mitigation Bank (LVCMB). The LVCMB is a 539.8-acre proposed mitigation bank to provide compensatory mitigation for unavoidable impacts to “Waters of the United States²” if determined appropriate per 33 CFR § 332.3 (1)(a) and 33 CFR § 332.3 (1)(b)³. Additionally, the LVCMB may provide compensatory mitigation for unavoidable impacts to coastal wetland resources under the Louisiana Coastal Resources Program (LCRP)⁴ per the provisions of LAC 43:724 and RS 49:214.22 (8)⁵. The LVCMB is approximately 3.5 miles northeast of Thibodaux, Louisiana (Figure 1). The LVCMB is located on the United States Geological Survey (USGS) 7.5-minute quadrangle “Thibodaux LA” (Figure 2).

1.1 Regional Description and Site Location

The LVCMB is located within the Mississippi Delta Cotton and Feed Grains Land Resource Region (O) and the Southern Mississippi River Alluvium Major Land Resource Area (MLRA 131A) (NRCS 2006). The LVCMB is also located in the Mississippi Alluvial Plains Level III Ecoregion (73) and the Inland Swamps (73n) and Southern Holocene Meander Belts (73k) Level IV Ecoregions. The site is located within the Louisiana Coastal Zone Boundary and adjacent to the Louisiana Coastal Wetlands Conservation Plan (LCWCP)⁶ Boundary (Figure 3).

¹ 33 CFR § 332.8(d)(2) summarizes the information regarding a proposed mitigation bank at a sufficient level of detail to support informed public and IRT comment. Information included (but not limited to) in a prospectus are the objectives, establishment, operation, service area, general need, technical feasibility, ownership, long-term management, sponsor qualifications, ecological suitability, and water rights.

² 33 CFR § 328 defines waters of the United States as it applies to the jurisdictional limits of the authority of the Corps of Engineers under the Clean Water Act. Waters of the United States include those waters listed in 33 CFR § 328(a). The lateral limits of jurisdiction in those waters may be divided into three categories (i.e., territorial seas, tidal waters, and non-tidal waters, which are further described in 33 CFR § 328.4 (a), (b), and (c).

³ 33 CFR § 332.3 (1)(a) and 33 CFR § 332.3 (1)(b) described general compensatory mitigation requirements; resource types and location of compensatory mitigation; and watershed approach.

⁴ The Office of Coastal Management (OCM) of the Louisiana Department of Natural Resources (LDNR) is the agency responsible for implementing the LCRP under the authority of the Louisiana State and Local Coastal Resources Management Act of 1978, as amended (Act 361, La. R.S. 49:214.21 et seq).

⁵ RS 49:214.22 (8) was added by Act 548 of the 2006 Louisiana Legislative Session to “support sustainable development in the coastal zone that accounts for potential impacts from hurricanes and other natural disasters and avoids environmental degradation resulting from damage to infrastructure caused by natural disasters”.

⁶ The LCWCP program was enacted under the federal Coastal Wetlands Planning, Protection, and Restoration Act (Public Law 101-646, Title III-CWPPRA) by agreement with the Federal resource agencies. The goal and requirement of the Plan is to achieve no net loss of wetland value in the coastal areas of Louisiana as a result of development activities.

The LVCMB is located in Sections 19, 20, 29, 30 of Township 14 South, Range 17 East in Lafourche Parish approximately 4 miles north of LA Highway 1 in Thibodaux, Louisiana. The site is traversed by the Laurel Valley Road (Figures 1 and 2). The approximate site center is Latitude 29.834172° North and Longitude 90.764177° West. Natural topography within the LVCMB is generally flat with some natural levee and backswamp topography. Typical slopes are less than 1%, however, artificial features such as levees, spoil banks, and drainage ditches are prominent within the delineation area and exhibit slopes in excess of 60%. Natural elevation ranges from zero feet to approximately four feet North American Vertical Datum (NAVD). Levees and spoil banks do occur within the LVCMB which exceed five feet NAVD (Figure 4).

The LVCMB is a mosaic of forested areas and open lands which are currently utilized for livestock, hay, crawfish and sugarcane (*Saccharum officinarum*)⁷ production. The perimeter of the site is a levee in excess of five feet NAVD and an associated borrow canal which was constructed sometime in the 19th century as part of effort to maintain agricultural production as the LVCMB is part of the historic Laurel Valley Sugar Plantation (Laurel Valley Plantation). The LVCMB is currently comprised of 196.4 acres of existing bottomland hardwood wetlands, 193.9 acres of existing palustrine emergent wetlands, 96.0 acres of non-wet pasture, 19.6 acres of existing canals, 17.9 acres of existing levee, 8.9 acres of non-wet bottomland hardwood forest, and 7.1 of existing pipeline right-of-way (ROW) (Figure 5). The Coastal Wetland Forest Science Working Group (CWFSWG 2005) identified the forested wetlands within the Barataria basin as coastal wetland forests within the South Delta Coastal Area Region.

1.2 Sponsorship and Ownership

DLS will be the sponsor of the proposed LVCMB and will construct, operate, monitor and manage the bank. The LVCMB is owned by Laurel Valley Plantation, Inc. (Owner). The Owner will protect the property by granting the conservation servitude as described in Section 6.4.

1.3 Driving Directions to the Site

From the intersection of LA Hwy 20 and LA Hwy 308 in Thibodaux, proceed south on LA Hwy 308 for approximately 2.1 miles. Turn left onto Laurel Valley Road and proceed approximately 3.4 miles to the entrance located on the left. This is the entry point into the LVCMB. This is entry point is a private road and public access is restricted from this point forward.

⁷ The aforementioned and all subsequent plant scientific nomenclature is from NRCS 2013¹.

2.0 PROJECT GOALS AND OBJECTIVES

The goal of the LVCMB is the re-establishment⁸, rehabilitation⁹ and protection of bottomland hardwood and southern baldcypress/tupelo swamp (swamp) forested wetland ecosystems within the alluvial plain of the Mississippi River (Figure 6). Features proposed as non-mitigation credit acreage within the LVCMB include wildlife openings and access trails. The purposes of these features are to facilitate monitoring/maintenance activities associated with bank establishment and long-term management and continued recreational use of the property.

The restoration¹⁰ of bottomland hardwood and cypress swamp within the 539.8-acre LVCMB will provide additional wetland functions and values that are not currently realized under existing conditions and land use. Localized and downstream water quality will increase by removing livestock, afforestation¹¹ with native wetland tree species, and increasing surface-water retention time for vegetative nutrient uptake and sedimentation.

Table 1 summarizes the existing habitat and the proposed habitats following restoration and is depicted on Figures 5 and 6, respectively. Specifically, the project objectives are to improve and protect the physical, chemical and biological functions of a forested wetland system as follows:

- Restoration and protection of historic and self-sustaining surface hydrology within the 539.8-acre LVCMB through hydrology restoration activities such as backfilling artificial drainages;
- Restoration of native bottomland hardwood and cypress swamp (286.9 acres) communities through hydrology restoration and afforestation of native species;
- Improvement of water quality by means of livestock removal and reduction of non-point source runoff through hydrology restoration activities;

⁸ Re-establishment is defined in 33 CFR 332.2 as *the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.*

⁹ Rehabilitated is defined in 33 CFR 332.2 as *the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.*

¹⁰ Restoration is defined in 33 CFR 332.2 as *the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.*

¹¹ The SAF (2011) defines afforestation as “the establishment of a forest or stand in an area where the preceding vegetation or land use was not forest whereas reforestation is the re-establishment of forest cover either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting) —note reforestation usually maintains the same forest type and is done promptly after the previous stand or forest was removed —synonym regeneration”.

- Restoration of forested habitat for aquatic fauna through afforestation of a diversity of indigenous species and control of invasive/noxious species;
- Afforestation and protection of nonforested land located next to larger, contiguous forested habitat for breeding birds in accordance with existing bird conservation plans;
- Protecting existing bottomland hardwood (196.4 acres) stands through the elimination of livestock ranging and inclusion of these stands in the 539.8-acre perpetual conservation servitude;
- Ensuring long-term viability and sustainability of the LVCMB through active and adaptive management including, but not limited to, invasive species control, appropriate monitoring, and long-term maintenance;
- Establishing financial assurances to achievement of long-term success criteria;
- Providing long-term protection utilizing a perpetual term conservation servitude on the 539.8-acre LVCMB and provide sufficient long-term funds to cover annual expenditures associated with maintenance and management of the LVCMB; and
- Implementing a project consistent with the strategies and goals to improve the watershed as identified in the Lafourche Parish Code of Ordinances Section 19:401 A and the Barataria-Terrebonne National Estuary Program (BTNEP) Comprehensive Conservation Plan.
- Implementing a project in accordance with recommendations per the Conservation, Protection and Utilization of Louisiana's Coastal Wetland Forest (CWFSWG 2005).

3.0 ECOLOGICAL SUITABILITY OF THE SITE

3.1 Historical Ecological Characteristics of the Site

The historical land use of the project area was agricultural land primarily used for the production of sugarcane. The surrounding land use was historically forested wetlands. The sugar plantation and mill complex Laurel Valley Plantation was established in 1832. The sugar mill operation continued until 1926 however sugarcane production continued at Laurel Valley Plantation and it along with cattle production remains the predominant agricultural activity. It is unknown when the tracts within the area proposed for the LVCMB were initially cleared for agriculture but reviews of the 1940 aerial photographs reveal that the site had been cleared but had started to revert to a shrub/forested community. The perimeter spoil/levee and the associated canal system are evident on the 1940 aerial. This trend continued until through 1980. By 1983, the areas designated as "PC" were cleared. By 1989, aerial imagery revealed the LVCMB exists as it does today (Figures 7-15).

The historical hydrology of the site prior to the conversion to agricultural land was primarily surface water flooding from the surrounding area given the sites physiographic

position on a lower natural levee and backswamp. The first artificial drainage system, a drainage wheel, was installed in 1867 at Laurel Valley¹². A Menge pump, which is a patent propeller drainage machine, first appeared around 1890 and was replaced by a centrifugal pump around 1920¹².

3.2 Current Ecological Characteristics of the Site

The property within the LVCMB consists of cleared tracts utilized for cattle/pasture, crawfish and sugarcane production with the remainder comprised of forest, some of which is utilized by cattle for grazing and shade. The surrounding land use is tidally-influenced bottomland hardwood and swamp with only the southern boundary of the project area being adjacent to agricultural lands used for the production of sugarcane and cattle (Figure 16). An improved parish road, the Laurel Valley Road, traverses the site along a natural ridge. The entire LVCMB is bounded by a perimeter levee which isolates the site from the surrounding bottomland hardwoods and swamp. Hydrology within this levee system is influenced by a pumping system operated by the Owner. Soils, vegetation and hydrology are described in more detail in the following sections.

3.2.1 Soils

Soils mapped within the project area are listed as Cancienne silt loam (Cm), Cancienne silty clay loam (Co), Fausse-Schriever association (FA); Schriever silty clay loam (Sh), and Schriever clay, occasionally flooded (Sr) (Figure 17). The FA and Sh series consist of very deep, very poorly drained, and very slowly permeable soils formed in clayey alluvium. These soil formations are typically found on the lower parts of natural levees and in low, ponded backswamp areas of the lower Mississippi River alluvial plain. The Cm series soils are level to gently undulating somewhat poorly drained mineral soils that are moderately slowly permeable and typically found on high and intermediate positions of natural levees in the same region. Eighty-nine percent of the LVCMB is mapped as potentially having hydric components (NRCS 2013² and 2013³). However, all soils observed during the field delineation exhibited indicators indicative of hydric soils. The results of these observations are contained within the wetland delineation report submitted to the CEMVN on June 19, 2013.

3.2.2 Vegetation

The LVCMB consists of a combination of improved pasture, croplands, and forests. Vegetation in the pasture areas is managed to support production of livestock. Nonwetland pastures were comprised of dominant species such as Vasey's grass (*Paspalum urvillei*), Bermuda grass (*Cynodon dactylon*), perennial ryegrass (*Lolium perenne*), and Virginia buttonweed (*Diodia virginiana*) while the wetter pasture (emergent wetlands) produced dominant species such as barnyardgrass (*Echinochloa*

¹² and ¹² Historic drainage information taken from Laurel Valley Sugar Plantation: Drainage Plant (1867, 1890-1920, 1920) drawings from the Library of Congress Historic American Engineering Record, National Park Service, delineated by Richard Howard and Margaret Mook.

crus-galli), pale spikerush (*Eleocharis macrostachya*) and common rush (*Juncus effusus*). Active cattle grazing occurs in all of the pastures. Two types of agricultural areas exist on the project site; crawfish ponds and a small area of sugarcane. The crawfish ponds exhibited alligatorweed (*Alternanthera philoxeroides*) as the dominant species while the agricultural fields along Laurel Valley Road cultivated and used to produce sugarcane. Scattered trees (i.e. legacy trees) exist within the pasture and crawfish ponds but not within the sugarcane area. These includes species such as baldcypress (*Taxodium distichum*), willow oak (*Quercus phellos*), and eastern cottonwood (*Populus deltoides*).

The forested wetlands on site were dominated by red maple (*Acer rubrum var. drummondii*), water oak (*Quercus nigra*), boxelder (*Acer negundo*), American elm (*Ulmus americana*), and sugarberry (*Celtis laevigata*) with typical herbaceous vegetation consisting of poison ivy (*Toxicodendron radicans*), dwarf palmetto (*Sabal minor*), lizard's tail (*Saururus cernuus*), and greenbrier (*Smilax rotundifolia*). The nonwetland forested were dominated by Drummond red maple, water oak, boxelder, sweetgum (*Liquidambar styraciflua*) and American elm (Table 2). These forested areas are utilized by cattle for foraging and shade. Many of these forests are utilized by cattle and exhibit little to no understory or midstory vegetation due to browsing. Forested areas outside of the perimeter levee system consisted of bottomland hardwoods and swamps consisting of species such as baldcypress, water tupelo (*Nyssa aquatica*), Nuttall oak (*Quercus texana*), overcup oak (*Quercus lyrata*), American elm and palmetto (*Sabal minor*).

3.2.3 Hydrology

Hydrology is primarily driven from high water tables and precipitation. Surface hydrology is altered by drainage through an active pumping system which is operated by the landowner in conjunction with the ongoing agricultural operations of the Laurel Valley Plantation. Some of the lands utilized as pasture contain drainage laterals throughout the fields which are designed to expedite the movement of surface water out of the pasture areas and into the perimeter canal. This water from this canal is pumped from the study area into La Peans Canal which traverses the adjacent swamps and discharges into Grand Bayou, Bayou Boeuf and Lac des Allemandes. The pump is an essential facet of maintaining agricultural operations on low-lying portions of the plantation and is typical of systems found in use throughout Louisiana. Historical records indicate that pumping was in use on the Laurel Valley Plantation as early as 1867. The pump currently in use is operated by the landowner and neither the pump nor the associated levee system is within any local, state or federal drainage or flood protection system. The current contributing drainage area is confined within the existing perimeter levee system (Figure 18). The potential contributing drainage area would include portions of the surrounding forests (Figure 19).

The surrounding forests outside of the perimeter levee system are subject to fluctuating flooding that is influenced by tidal amplitude. According to adjacent Louisiana Office of Coastal Protection and Restoration Coastwide Reference Monitoring

System (CRMS) stations 0206 and 0218, the Adjusted Water Elevation to Datum in the surrounding area averaged 1.6 feet NAVD over a period from September 26, 2008 to October 5, 2010. During this period the water ranged from a high of 3.6 feet NAVD (Station 0218) to a low of -0.4 feet NAVD (Station 0206). On June 5, 2013, DLS personnel observed water marks at approximately 30 inches above the ground elevation on trees outside of the perimeter levee system.

3.2.4 Jurisdictional Wetland Status and Wetland Conservation Determination

On June 19, 2013, DLS submitted a request a Wetland Data Report for a Preliminary Jurisdictional Determination (PJD) for an approximate 806.0-acre tract that encompasses the entire LVCMB. The CEMVN issued a PJD on October 9, 2013 (MVN-2013-01589-SK). The results of the PJD shows approximately 122.8 acres of non-wetlands, 196.3 acres of forested wetlands, 195.5 acres of emergent wetlands, and 26.3 acres of other waters occurring within the LVCMB. A CPA-026 determination was made in 1992 by the NRCS (then the Soil Conservation Service [SCS]). The cleared areas described in Section 3.2 were identified as either “Prior-Converted [PC]” or “Wetlands Farmed under Natural Conditions [WFC]”.

3.3 General Need for the Project in this Area

The LVCMB is in the upper reach of the Barataria-Terrebonne estuary complex. The Barataria-Terrebonne National Estuary Program (BTNEP) was established in 1990 by the State of Louisiana and the EPA for the purpose of preserving, protecting and restoring this estuary complex. BTNEP in conjunction with local stakeholders developed the Comprehensive Conservation and Management Plan (CCMP) which outlined 12 goals to accomplish this objective. The restoration of the LVCMB is in solidarity with four of these goals which are 1) preservation and restoration of wetlands, 2) support for diverse, natural biological communities; 3) to develop and meet water quality standards which protect estuary resources; and 4) to work in conjunction with natural processes (Moore and River 1996).

The restoration and protection of the LVCMB accommodates four of the Ecological Management Action plans outlined in the CCMP, which are as follows:

- Action Plan EM-1: Hydrologic Restoration
- Action Plan EM-11: Reduction of Agricultural Pollution
- Action Plan EM-15: Protection of Habitat for Migratory and Resident Birds
- Action Plan EM-16: Reduction of Impacts from Exotic Vegetation.

The restoration and protection of the LVCMB supports the stated purposes of the Lafourche Parish Coastal Zone Management as follows:

- Recognize the value in natural coastal ecosystems;

- Protect, restore and enhance the coastal zone as a natural storm barrier, flood control system and water infiltration system;
- Protect, restore and enhance the coastal zone as a habitat for wildlife, an aquatic resource, an aesthetic resource, a parish, state and national resource, and a historic cultural resource; and to
- Protect, restore and enhance the coastal zone as a legacy to future generations

The restoration and protection of the LVCMB supports the recommendation of the CWFSWG 2005 as follows:

- Place priority on conserving, restoring and managing coastal wetland forests to ensure their functions and ecosystem services will be available to citizens;
- Actively pursue restoration of degraded wetland forests;
- Enhance wetland forest ecosystem functions and values as part of hydrologic management decisions;
- Establish and maintaining long-term monitoring of coastal wetland forest conditions which supplement other monitoring programs such as the Coastal Reference Monitoring System (CRMS) and the Forest Inventory Analysis; and
- Insuring mitigation of impacts on coastal wetland forests are of similar resource type and occur within a proper watershed approach.

The restoration of forests near extant tracts of bottomland hardwoods will provide benefit to various species of wildlife such as Nearctic-Neotropical migrant birds and resident birds. DeMay et al. (2007) list swamp forests within the BTNEP basins as important to migratory species such as yellow-crowned night herons (*Nyctanassa violacea*), Acadian flycatchers (*Empidonax virescens*), northern parulas (*Setophaga americana*), hooded warblers (*Setophaga citrina*), prothonotary warblers (*Protonotaria citrea*), and yellow-throated warblers (*Setophaga dominica*) and nonmigratory species such as great blue herons (*Ardea herodias*), wood ducks (*Aix sponsa*), red-shouldered hawks (*Buteo lineatus*), barred owls (*Strix varia*) and pileated woodpeckers (*Dryocopus pileatus*). Common winter migrants include yellow-bellied sapsuckers (*Sphyrapicus varius*), eastern phoebes (*Sayornis phoebe*), and yellow-rumped warblers (*Setophaga coronata*). Bottomland hardwoods within the BTNEP basins are important habitat for migratory passerine birds such as yellow-billed cuckoos (*Coccyzus americanus*), summer tanagers (*Piranga rubra*), red-eyed vireos (*Vireo olivaceus*) and great-crested flycatchers (*Myiarchus crinitus*). Resident birds of these habitats include eastern screech-owls (*Myiarchus crinitus*), northern cardinals (*Cardinalis cardinalis*), blue jays (*Cyanocitta cristata*) and Carolina chickadees (*Poecile carolinensis*) while winter inhabitants included sharp-shinned hawks (*Accipiter striatus*), American woodcocks (*Scolopax minor*), hermit thrushes (*Catharus guttatus*), ruby-crowned kinglets (*Regulus calendula*), blue-headed vireos (*Vireo solitarius*), and white-throated sparrows (*Zonotrichia albicollis*).

The Partners in Flight (PIF) Bird Conservation Plan for the Mississippi Alluvial Valley recommends increasing the interior area of forested fragments to increase habitat for forest-dwelling, or silvicolous, bird species (Twedt et al. 1999). The planting of

densely-spaced seedlings in areas within largely forested landscapes encourage the recruitment of breeding populations of thamnisc and silvicolous bird species (Twedt et al. 2010). Swallow-tailed kites (*Elanoides forficatus*) are a particular species of concern which would benefit through increased forested wetland acreage within the Barataria-Terrebonne basins as these species requires vast amounts of bottomland hardwood and swamp forest (DeMay et al 2007). Large expanses of bottomland hardwoods are vital for the management of Mallards (*Anas platyrhynchos*), wood ducks (*Aix sponsa*) and American woodcock (*Scolopax minor*) (North American Waterfowl Management Plan 2004, Kelly and Rau 2006). The Mississippi Museum of Natural Science (MMNS 2005) purports that old-growth bottomland hardwood forests are critical habitat for 11 of the 18 species of bats known to the Southeast. Two of these species, the Southeastern myotis (*Myotis austroriparius*) and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) prefer large, hollow trees in mature bottomland hardwood and swamp habitats, respectively (LMRJV 2007; Taylor 2006).

Restoration of the site is consistent with the Coastal Protection and Restoration Authority of Louisiana (CPRA) Louisiana's Comprehensive Master Plan for a Sustainable Coast (Master Plan) in that the project will restore natural hydrologic patterns by conveying freshwater, tidal flow into areas that have been cut off by anthropogenic features. Some of the natural ridges on which portions of the pasture are situated will be afforested. The increase in forested wetlands, particularly freshwater swamp, can potentially reduce the effects of tropical storm surges and wind speed through attenuation and abatement thereby protecting the valuable agricultural lands and historic properties, such as the features associated with the Laurel Valley Plantation. The project would provide ecosystem services in the form of nutrient uptake and provide increased habitat for alligators (*Alligator mississippiensis*) (CPRA Master Plan 2012). Protection of this coastal forested site with a conservation servitude is consistent with the goals of the Coastal Forest Conservation Initiative (CFCI) administered by the Office of Coastal Protection and Restoration (OCPR) (Louisiana Department of Natural Resources [LDNR] Office of Coastal Management [OCM] 2010).

4.0 ESTABLISHMENT OF THE MITIGATION BANK

The LVPCMB will be established per 33 CFR §332.8(d)(2) (ii) and is the technical feasibility per 33 CFR §332.8(d)(2) (iv). Sufficient water rights to support the long-term sustainability of the mitigation bank are insured per 33 CFR §332.8(d)(2)(vii)(A). Overall, the approximately 539.8-acre proposed LVCMB will be protected by a perpetual conservation servitude, will be retired from agricultural production in 2014, and reforested with bottomland hardwoods and baldcypress during the winter of 2014.

4.1 Site Restoration Plan

The proposed mitigation work plan involves the cessation of cattle production, afforestation, surface hydrology restoration, and the implementation of effective short-term, interim, and long-term management strategies. The LVCMB will re-establish 98.3

acres of bottomland hardwood (BLH) and baldcypress forest and will rehabilitate 193.9 acres of BLH and baldcypress swamp habitat by planting selected tree species as described by the Louisiana Natural Heritage (LNH 2009), Lester et al. (2005), and Barrow et al. (2005) (Figure 6). Areas above 2.0 feet NAVD will be restored to a combination of a sugarberry-American elm-green ash (Type 2) and a sweetgum-water oak (Type 3) bottomland hardwood. Areas between 1.2 and 2.0 feet NAVD will be restored as a mosaic of an overcup-water hickory (Type 1) bottomland hardwood. Areas below 1.2 feet NAVD will be restored to baldcypress swamp. Approximately 8.9 acres of existing nonwetland forest will be re-established/enhanced through hydrology restoration and supplemental planting with desirable hardwood species to increase diversity and resilience in anticipation of the restored hydrologic regime.

All livestock and interior fencing will be removed from the LVCMB prior to site preparation activities in late summer and early fall. Site preparation for planting will be accomplished by applying herbicide as needed, cultivating the soil surface, and sub-soiling (ripping) at equidistant intervals to a depth of approximately 18 inches (Allen et al. 2001). Site preparation will include the removal and control of any invasive species through herbicide treatments, mechanized clearing, cutting, shredding, or a combination thereof.

Preparation efforts within the 8.9 acres of re-established/enhanced forested stands will consist of herbicide treatment of invasive and noxious tree species through individual stem treatments, specifically Chinese tallow (*Triadica sebifera*) and boxelder. Approximately one half of all Drummond red maple stems will be removed to allow greater sunlight infiltration to benefit the supplemental plantings (Table 2).

Afforestation and supplemental planting activities will include the planting of native bottomland hardwood and baldcypress swamp species during the first planting season (December 15 through March 15) following site preparation. The species selected will be site-appropriate in terms of habitat design, soil-moisture regime, and species richness. Ten or more species may be represented in the planting assemblage to insure adequate species richness (Twedt and Best 2004). The distribution of stems will create a mosaic of hard and soft mast species that will provide seasonally available forages for a wide range of indigenous wildlife.

The afforestation effort will integrate the utilization of fast-growing soft mast species with slower-growing hard mast species to allow for greater vertical structural diversity, which is necessary habitat for forest breeding birds of highest conservation importance (Twedt et al. 1999). This will create an scrub-shrub habitat to form early in succession which will be juxtaposed to mature forest thus allowing more thannic species to be present with higher nest success rates (i.e., source habitat). Additionally, the presence of adjacent habitat types creates ecotones (transition zones) that increase the nesting success of silvicolous bird species such as Acadian flycatchers (*Empidonax vireescens*) as these species are not forced deeper into the forest interior (NRCS 2005) such as when there is a drastic shift from one habitat type to another (i.e forested area to grassland). The integration of rapid growth early successional species mimics early

successional seral stages that provide nursery habitat for late successional forest species which exhibit increased growth in partial cover and dappled sunlight exposure (Twedt and Portwood 2003, Gardiner and Hodges 1998). The early successional community creates abiotic and biotic environmental conditions that promote seedling emergence and survival of late successional species (Harper et al. 1965, Twedt and Portwood 2003). The supplemental planting effort within the restoration/enhancement areas will integrate more flood tolerant, hard mast species which will increase the stand diversity (i.e. species richness) thereby allowing it to be more adapted to the anticipated hydrologic regime compared to the existing species composition.

Hard mast species should account for at least 50 to 70 percent of all bottomland hardwood afforestation plantings with the remaining percentage accounted for by soft mast tree species. Hard mast species should account for 100% percent of all bottomland hardwood supplemental planting given the amount of softmast currently present. The exact species and quantities for planting will be determined by the availability of such species from commercial nurseries providing localized ecotype seedlings. Planting densities will be at approximately 538 stems per acre within restored areas and approximately 100 stems per acre within the interplanted area (Tables 3 and 4). Seedlings will be mixed upon planting so that areas are not comprised of a single species (Twedt and Best 2004). A zone approximately 300 feet in width along the current forestland-cropland interface may be planted all with heavier seeded species due to the anticipated natural recruitment of light-seeded hardwood species within this area. Twedt (2004) documented that natural regeneration within this zone is sufficient without incorporating artificial regeneration methods.

The hydrology restoration will likely result in greater depths of inundation of the baldcypress re-establishment areas near 0 feet NAVD based on analysis of CRMS water level date in relation to the existing elevations of the site as depicted by Light Detection and Ranging Data (LiDAR) elevation data. An approximately 27-acre area of baldcypress rehabilitation was identified which had elevations of approximately 0 feet NAVD. To enhance the survivability of plantings within this area and achieve resilience, containerized Root Production Method® (RPM) seedlings will be incorporated with the bare-root seedlings in this area of baldcypress rehabilitation. The RPM seedlings are in approximate 3-trade gallon containers and average from 36 to 60 inches in height compared to the approximate 18 to 24-inch height of the bare-root seedlings. RPM trees were originally utilized for the purpose of afforesting or reforesting floodplain sites along the Mississippi River subject to frequent flooding of long duration which had greater depth than average bare-root seedling heights (Dalrymple 2006). The planting rate will remain at 538 stems per acre with 11% of the plant material comprised of RPM seedlings. The species composition will remain as specified in Table 3. During the seedling mixing process, bare-root seedlings of the appropriate species having greater heights will be selected for planting within this area. The CWFSWG 2005 recommends planted seedlings should have at least 12 inches of crown and must be tall enough for at least 50% of the crown to remain above the high water level during the growing season.

The re-establishment of a forested ecosystem will increase organic matter deposition, decrease soil bulk density, increase hydraulic conductivity, increase soil saturation potential, and increase the formation of redoximorphic features (Collins and Kuehl 2001). Soil organic carbon is critical to soil reduction which will increase as soil organic material increases from the deposition of leaf litter, coarse woody debris, and decaying root material (Collins and Kuehl 2001).

Hydrology restoration will include constructing six gaps in the existing perimeter levee, plugging drains where necessary and the cessation of pumping activity. The gaps will provide natural ingress and egress of water in equilibrium with the water levels of the adjacent, tidally-influenced forested areas. These gaps will be spanned which will allow the remaining perimeter levee to be used for access while allowing unimpeded water flow through the gap. In order to maintain water levels for site preparation and planting, all hydrology restoration will be completed after the planting is completed as CWFSWG (2005) stated that artificial regeneration is impractical when water levels exceed two feet. The Sponsor anticipates that hydrology work will occur within the growing season following planting (i.e. planting and hydrology work will occur in Year 0). Hydrology restoration will re-establish wetland hydrology to 286.8 acres of afforested and existing forested areas (i.e. re-established areas) that were historically wetland as well as increase the duration of surface water retention and soil saturation; reduce nonpoint source runoff, and improve water quality through nutrient immobilization (uptake) by vegetation. The Sponsor anticipates no long-term structural management requirements will be needed to assure sustained hydrology. The re-establishment of a forested wetland plant community will reduce runoff by canopy and leaf litter interception of rainfall and increased stem density will reduce surface water sheet flow velocities. The result is a reduction in erosion runoff and an increase in soil infiltration (Richardson et al. 2001). As an adaptation to expected increase in flood levels following restoration, all species selected for planting have flood tolerance classes ranging from constant inundation for up to one year (Class I) to long-term seasonal flooding (Class III) as purported by Shankman (1996)¹³.

The Sponsor will maintain the site following construction and throughout the initial, interim and long-term monitoring periods. The Sponsor will use all prudent efforts, physical, chemical, or mechanical, to eliminate existing noxious and/or invasive vegetation present such as Chinese tallowtree (*Triadica sebifera*) on the site during site preparation activities. Following completion of construction activities, the LVCMB will be monitored and inspected annually for invasive species colonization and biotic and abiotic factors which may affect tree growth. This includes insect infestations and climate affects. Monitoring will determine if adaptive management measures, such as replanting, short-term irrigation, etc., need to be considered. The Sponsor anticipates that invasive species control measures will be implemented as-needed over the first 5

¹³ Flood tolerance classes are constant inundation for up to one year (Class I); constant inundation for a large part of the growing season (Class II); long-term seasonal flooding (Class III); and occasional seasonal flooding (Class IV).

years following construction and again at Year 10. The Sponsor will continue to monitor the Bank through annual inspections to document the following:

- the effectiveness of control efforts;
- the extent and degree of invasive species present;
- the extent and degree of any herbivory or insect damage;
- the extent and degree of adverse climate impacts (i.e. drought), and
- the condition and functionality of any hydrological structures (i.e. plugs or other fill).

Following such monitoring, invasive species control will be implemented as necessary, and hydrological structures will be replaced if determined necessary. The boundaries will be inspected and it is anticipated that boundary maintenance, such as signage or marking paint, will take place at Year 10 and Year 15.

A 30-foot access road totaling 6.1 acres, as measured from tree row to tree row, will be maintained through the LVCMB. The access road will be maintained at natural grade (i.e. non-elevated) and follow natural ridges as to not interfere with hydrological flow. The road surface will be maintained with an herbaceous cover and will have no ditches or other type of drainage associated with it. Mowing will be conducted at frequent intervals on the road and any rutting which may occur will be smoothed utilizing a box blade or similar implement. Five wildlife openings totaling 5.9 acres will be maintained as open space or planted as food plots for wildlife. Wildlife openings will be prepared by light disking for seedbed preparation, seeding by a small drill or seed spreader, and harrowing for seed coverage. This will be accomplished utilizing a small tractor or all-terrain vehicle (ATV). No wetland credit will be generated by acreage encompassed by access roads and wildlife openings. However, these areas will be protected under the conservation servitude described in Section 6.4. The current locations of the wildlife openings do not result in major breaks or fragmentation. The Lower Mississippi Valley Joint Venture (LMVJV 2007) encourages gaps and open canopies anywhere from 10-30% in order to maintain desired forest conditions (DFC) with the goal of providing optimal habitat conditions for priority wildlife species such as migratory song birds. The openings combined with the access trail/road as currently proposed represent approximately 2.4% of the total anticipated forested area which will result from this project. Loeb (2013) purports that unfragmented, contiguous forest with small openings and linear corridors maintained for flight corridors are important components in maintaining and sustaining bat populations.

4.2 Technical Feasibility

The construction work required to complete restoration is routine in nature and feasible, consisting primarily of altering the improved drainage system in order to return the site to its pre-agricultural hydrologic conditions to the extent practicable and implementing the appropriate vegetative plantings of native forested wetland species. The mapped soil types are historically supportive of the native forested communities which are proposed for restoration. The soils are hydric indicating the site formed under

hydric conditions and therefore historically supported wetlands. The concept and feasibility of afforestation of agricultural lands associated with the establishment of the LVCMB have received much support in recent years. The restoration of agricultural lands has been successfully performed in numerous wetland restoration projects and is a proven method in establishing wetland mitigation banks. The adjacent and surrounding land use is primarily tidally-influenced, wetland forest (79%) which has a low probability of being developed and therefore reducing the risk of potential negative influences coming to bear on the LVCMB due to development activity (Figure 16).

4.3 Current Site Risks

There are two pipeline rights-of-way (ROW) that traverses the project area and this acreage has been excluded from the credit acreage but will be within the conservation servitude boundary. Although these specific areas will not be subordinate to the conservation servitude while the pipelines are operational, they will be protected by the conservation servitude in the event these servitudes are terminated.

According to the Louisiana Department of Natural Resources Strategic Online Natural Resources Information System (SONRIS), there is one oil and gas well (Serial Number 220924) located within the LVCMB project area and one oil and gas well (Serial Number 214990) located adjacent to the LVCMB project area. According to SONRIS, one well (Serial Number 220924) was plugged and abandoned on October 16, 1997 and one well (Serial Number 214990) was plugged and abandoned on November 10, 1992.

The Laurel Valley Plantation was listed on the National Register of Historic Places (NRHP) by the National Park Service (NPS) on March 24, 1978 (NPS Reference Number 78001426)¹⁴. However, the historic features associated with the plantation's sugar mill complex such as the mill ruins, out buildings and other standing or remnant structures are not within the boundary of the LVCMB. Therefore, the construction (i.e. afforestation and hydrology restoration) and maintenance of the LVCMB will not disturb or adversely affect these features.

The LVCMB has been field surveyed and the final survey is being prepared by Mr. Cletus Langlois (Registered Professional Land Surveyor License No. 4723). A title opinion is currently being prepared in order to verify the existence any mortgages, liens or other such encumbrances. The survey and title opinion will be submitted with the Draft Mitigation Banking Instrument (MBI).

¹⁴ Information obtained from the National Park Services National Register of Historic Places website through the available URL <http://www.nps.gov/NR/research/>.

4.4 Long-Term Sustainability of the Site and Water Rights

Long-term viability and sustainability of the LVCMB will be ensured through active and adaptive management including, but not limited to, invasive species control, appropriate monitoring and long-term maintenance. With regard to water rights, Article 490 of the Louisiana Civil Code treats water resources under the theory of absolute ownership and rule of capture provided that such capture does not result in harm to neighboring properties. The LVCMB will depend primarily on surface water from the surrounding wetland forest and precipitation. As such, long-term hydrology maintenance will not depend on the utilization of water captured from irrigation wells; therefore, sufficient water rights are ensured for such purposes. The Sponsor does not foresee any adverse impacts on neighboring properties as a result of this project.

The CWFSWG (2005) indicated that chronic soil salinity levels of four parts per thousand (ppt) would have negative affect on baldcypress and two ppt would have a negative affect on water tupelo. Given the sites location in the northern portion of tidally-influenced coastal forests and the lack of any extensive canal systems within the surrounding landscape that may facilitate saltwater conveyance, the Sponsor does not anticipate any negative effects from saltwater intrusion in the foreseeable future.

5.0 PROPOSED GEOGRAPHIC SERVICE AREA¹⁵

The LVCMB is located within the 2,448-square mile East Central Louisiana Coastal Basin Subregion (USGS Hydrologic Unit Code [HUC] 08090301) and the 47.4-square mile Grand Bayou watershed (USGS Hydrologic Unit Code [HUC] 080903010202). DLS proposes that the East Central Louisiana Coastal Basin Subregion (USGS HUC 08090301) serve as the primary service area for the LVCMB and the West Central Louisiana Coastal Subregion (USGS HUC 08090302) and the Lower Grand Subregion (USGS HUC 08070300) serve as the secondary service area (Figure 19). Although the service area is comprised of two river basins as defined by the Louisiana Department of Environmental Quality (LDEQ), the Barataria and Terrebonne basins; the service area falls within the administrative boundaries of the BTNEP area and restoration of this site would be consistent with the goals of the BTNEP Comprehensive Conservation Plan as described in Sections 2.0 and 3.3. Therefore, the Sponsor reasons the proposed service area is justifiable given that the nature of the restoration is in accordance with the goals of a defined conservation and watershed plan.

6.0 OPERATION OF THE MITIGATION BANK

The Sponsor will comply with all conditions required of a mitigation bank sponsor by the CEMVN. The LVCMB will be established and operated through mitigation bank procedures outlined in 33 CFR § 332.8. This includes, but is not limited to, review process, modifications, permit coordination, project implementation, financial assurance

¹⁵ The Service Area is defined in 33 CFR § 332.2 as the *geographic area within which impacts can be mitigated at a specific mitigation bank or in-lieu fee program, as designated in its instrument.*

determination and mechanisms, credit determination, accounting procedures, credit withdrawals, and the use of credits. Details on the operation of the LVCMB will be further described in the Draft MBI per 33 CFR § 332.8 (6).

6.1 Project Representatives

Sponsor: Delta Land Services, LLC
1090 Cinclare Drive1008
Port Allen, LA 70767
Attn: Daniel Bollich
Phone: 225.388.5146
Electronic Mail: daniel@deltaland-services.com

Landowner: Laurel Valley Plantation, Inc.
P.O. Box 702
Thibodaux, LA 70302
Attn: Jerome S. McKee

6.2 Qualifications of the Sponsor

The Sponsor is a land management and restoration company whose technical staff includes Certified Wildlife Biologists, Professional Wetland Scientists, and Certified Foresters. In addition, the Sponsor has construction specialists on staff experienced in wetland construction activities such as heavy equipment operation, vegetation establishment, herbicide application, and contractor management. The Sponsor currently owns and operates five approved wetland mitigation banks within the CEMVN and Vicksburg District (CEMVK) totaling 2,308.9 acres. These are the Bayou Conway Mitigation Bank (MVN-2010-01111), Roseland Refuge Mitigation Bank (MVK-2010-01423), Oak Land Mitigation Bank (MVK-2011-00308), Bayou Choupique Mitigation Bank (MVN-2011-00824) and the Ponderosa Ranch of Pointe Coupee Mitigation Bank (MVN-2011-03213). DLS currently has pending mitigation banks that are under review with the CEMVN, Vicksburg District (CEMVK), Galveston District (CESWG), and Fort Worth District (CESWF), which total 2,688.1 acres and include approximately 54,414.4 linear feet of proposed stream restoration. These include the proposed Danza del Rio Mitigation Bank (SWG-2011-00566), Graham Creek Mitigation Bank (SWF-2011-00309), Moss Lake Mitigation Bank (MVN-2012-02652), Bayou Thornton Mitigation Bank (MVN-2013-00011), Little Bayou Pierre Mitigation Bank (MVK-2012-00555), Phillips Creek Mitigation Bank (SWF-2012-00417) and the Bayou Fisher Mitigation Bank (MVN-2013-02342). In addition to mitigation banking, the Sponsor serves as the responsible party for the establishment and maintenance of 772.0 acres of approved Permittee-Responsible Mitigation (PRM) projects with another 2,064.5 acres pending review within the CEMVN and CESWG.

Mr. Daniel Bollich is the lead project manager for the Sponsor. Mr. Bollich is a certified Professional Wetland Scientist (PWS) through the Society of Wetland

Scientists (SWS); a Certified Wildlife Biologist (CWB) through The Wildlife Society (TWS); and a Certified Forester through the Society of American Foresters (SAF). He has over 15 years of experience in natural resource management including wetlands, wildlife and forest management. This experience includes the development of over fourteen approved banks within the CEMVN, CEMVK, CESWG, CESWF, and the Little Rock District (CESWL). Mr. Lee Walters will serve as assistant manager to the project. Mr. Walters has over 11 years of experience in natural resource management and environmental consulting including wetlands, wildlife and forest management and has been involved with the development of over 10 approved mitigation banks with the CEMVN and CEMVK. The biographies of all of the Sponsor personnel are available at <http://www.deltaland-services.com/our-team>.

6.3 Proposed Long-Term Ownership and Management Representatives

Laurel Valley Plantation, Inc. will serve as the long-term owner and the DLS will serve as the sponsor, long-term manager, and steward of the Bank. However, the Sponsor may appoint a long-term steward if such appointment is approved by the CEMVN. The anticipated long-term management will consist of monitoring, invasive species control, forest management, boundary maintenance, and site protection.

6.4 Site Protection

The Sponsor (or Long-term Steward) / Owner, or its heirs, assigns or purchasers shall be responsible for protecting lands contained within the mitigation area in perpetuity. In order to provide for such protection, the Owner shall execute a perpetual conservation servitude (pursuant to the Louisiana Conservation Servitude Act, R.S. 9:1271 *et seq.*) on all acreage identified as the LVCMB and record it in the Mortgage and Conveyances Records Office of Lafourche Parish. The conservation servitude will be held by a qualified, non-profit organization whose mission is to retain or protect the land's natural habitat, open space, scenic, educational, recreational, historical, or cultural values.

6.5 Long-Term Strategy

Long-term management will consist of monitoring, vegetation management, invasive species control, boundary maintenance (approximately 6.2 miles), site protection, and the funding of such activities. The wetland habitats will be managed to increase and maintain the biological, chemical, and physical wetland functions of the LVCMB and to provide forested habitat capable of supporting populations for priority wildlife species (e.g., native wildlife, Nearctic-Neotropical migrants). Forest health will be monitored for any detrimental effects due to herbivory from nutria (*Myocastor coypus*), feral hogs (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*) or insects such as baldcypress leafrollers (*Archips goyerana*) and forest tent caterpillars (*Malacosoma disstria*). Invasive species control will include control of nuisance invasive floral species such as Chinese tallow as well as fauna such as nutria and feral hogs. The site will be adaptively managed to provide maximum wetland function; favorable habitat conditions for native

wildlife; and for resiliency to be sustainable given projected climate conditions, tropical storms, and other potential ecological disturbances.

Management and maintenance should encourage the development of snags and coarse woody debris (cwd). Snags and cwd serve as microhabitat for various insects, beetles and termites which are an important food source for Nearctic-Neotropicals. Snags are also beneficial to various species of cavity-nesting birds such as downy woodpeckers (*Picoides pubescens*), hairy woodpeckers (*Picoides villosus*), red-bellied woodpeckers (*Melanerpes carolinus*) and white-breasted nuthatches (*Sitta canadensis*). The encouragement of habitat which supports these bird species is beneficial for long-term forest health as studies show these species are beneficial in slowing the spread of emerald ash borers (*Agrilus planipennis*), an invasive species which could pose a risk to ash (*Fraxinus* spp.) species in the near future (Koenig et al. 2013). Deadwood is an important component for various wetland functions such as nutrient cycling and provides habitat for various species of invertebrates, amphibians, and reptiles (Brinson et al. 1995, NRCS 2003). Loeb (2013) states that snags, particularly those large in size and located in clusters, are important in provide roosting habitat for various tree bats such as southern myotis and Rafinesque big-eared bat.

A long-term management plan will be included with the mitigation banking instrument which will detail long-term management needs, costs and identify a funding mechanism in accordance with 33 CFR § 332.7 (d). The Sponsor (or Long-term Steward) and the Owner (or its heirs, assigns or purchasers) shall be responsible for protecting lands contained within the LVCMB in perpetuity.

An interest-bearing long-term management account will be established to insure adequate funding is available to cover the costs of these activities in the future. In the CEMVN, this is currently required in the form of an escrow account. However, the Sponsor is currently working with the National Fish and Wildlife Foundation (NFWF) on the establishment of a long-term endowment for such purposes and is working with the CEMVN on the approval of such an endowment.

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TABLES

Table 1. Baseline Conditions and Proposed Mitigation Habitat Types at the Proposed Laurel Valley Coastal Mitigation Bank in Lafourche Parish, Louisiana.

Baseline Condition	Proposed Mitigation Habitat and Type	Acres
Non-wetland Pasture	Type 2 and 3 Bottomland Hardwood Re-establishment (>2.0 feet NAVD)	69.7
Wetland Pasture	Type 1 Bottomland Hardwood Rehabilitation (1.2 to 2.0 feet NAVD)	49.1
Non-wetland Crawfish Pond (levees)	Type 1 Bottomland Hardwood/ Baldcypress Swamp Re-establishment (<1.2 feet NAVD)	14.3
Wetland Pasture or Crawfish Pond	Type 1 Bottomland Hardwood/ Baldcypress Swamp Rehabilitation (<1.2 feet NAVD)	144.8
Non-wetland Forest	Bottomland Hardwood Hydrology Re-establishment/ Species Composition Enhancement	8.9
Wetland Forest	Hydric Inclusion	196.4
	<i>Total Restoration and Enhancement Credit Acreage</i>	<i>286.8</i>
	<i>Total Inclusion Acreage</i>	<i>196.4</i>
Pasture	Perimeter Levee	17.9
Pasture	Canal	19.6
Pasture	Pipeline Rights-of-way	7.1
Pasture	Access Roads	6.1
Pasture	Wildlife Openings	5.9
	<i>Total Non-mitigation Acreage</i>	<i>56.6</i>
	Total Conservation Servitude Acreage	539.8

Table 2. Pre- and Post-Restoration Species Composition of Proposed Bottomland Hardwood Hydrology Re-establishment/ Species Composition Enhancement (Existing Nonwetland Forested Area) at the Proposed Laurel Valley Coastal Mitigation Bank in Lafourche Parish, Louisiana.

Pre-Restoration (Existing Condition)

Common Name	Scientific Name	Indicator ¹	Stems Per Acre	Relative Density	Total Basal Area (sq.ft/ac)	Relative Dominance	QMD ²
water oak	<i>Quercus nigra</i>	FAC	30	16%	24	22%	10
red maple	<i>Acer rubrum var. drummondii</i>	OBL ³	58	32%	17	16%	7
sweetgum	<i>Liquidambar styraciflua</i>	FAC	30	16%	44	40%	13
boxelder	<i>Acer negundo</i>	FAC	28	15%	6	6%	5
American elm	<i>Ulmus americana</i>	FAC	28	15%	15	14%	6
sugarberry	<i>Celtis laevigata</i>	FACW	2	1%	0	0%	1
swamp dogwood	<i>Cornus drummondii</i>	FAC	2	1%	0	0%	1
mayhaw	<i>Crataegus opaca</i>	OBL	2	1%	0	0%	1
redbay	<i>Persea borbonia</i>	FACW	2	1%	1	1%	2
Chinese tallow	<i>Triadica sebifera</i>	FAC	2	1%	0	0%	1
Total			184	100%	108	100%	

Post Restoration Following Treatment⁴

Common Name	Scientific Name	Indicator ¹	Stems Per Acre	Relative Density	Total Basal Area (sq.ft/ac)	Relative Dominance	QMD ²
water oak	<i>Quercus nigra</i>	FAC	30	24%	24	26%	10
red maple	<i>Acer rubrum var. drummondii</i>	OBL ³	29	23%	9	9%	7
sweetgum	<i>Liquidambar styraciflua</i>	FAC	30	24%	44	47%	13
American elm	<i>Ulmus americana</i>	FAC	28	22%	15	16%	6
sugarberry	<i>Celtis laevigata</i>	FACW	2	2%	0	0%	1
roughleaf dogwood	<i>Cornus drummondii</i>	FAC	2	2%	0	0%	1
mayhaw	<i>Crataegus opaca</i>	OBL	2	2%	0	0%	1
redbay	<i>Persea borbonia</i>	FACW	2	2%	1	1%	2
Total			125	100%	93	100%	

¹ Indicator status from 2013 National Wetland Plant List (Lichvar and Körtész 2009)

² Quadratic Mean Diameter: The Diameter at Breast Height (inches) of the average basal area

³ Indicator status from 1988 National Wetland Plant List, Region 2

⁴ This stand will be planted with hard mast species at a rate of 100 stems per acre following treatment.

Table 3. Planting Composition of Proposed Re-established and Rehabilitated Baldcypress Swamp and Bottomland Hardwood Forest at the Proposed Laurel Valley Coastal Mitigation Bank in Lafourche Parish, Louisiana¹.

Type 1 Bottomland Hardwood/ Baldcypress Swamp Species Hard and Soft Mast Species			
Common Name	Scientific Name	Indicator Status²	Composition³
baldcypress	<i>Taxodium distichum</i>	OBL	30-40%
swamp tupelo	<i>Nyssa biflora</i>	OBL	10-20%
overcup oak	<i>Quercus lyrata</i>	OBL	<20-30%
Nuttall oak	<i>Quercus texana</i>	FACW	<20-30%
Drummond red maple	<i>Acer rubrum</i> var. <i>drummondii</i>	OBL ⁴	<10%
mayhaw	<i>Crataegus opaca</i>	OBL	<10%
buttonbush	<i>Cephalanthus occidentalis</i>	OBL	<10%
Carolina ash	<i>Fraxinus caroliniana</i>	OBL	<10%
eastern swampprivet	<i>Forestiera acuminata</i>	OBL	<10%
pumpkin ash	<i>Fraxinus profunda</i>	OBL	<10%
Type 1 Bottomland Hardwood Hard Mast Species (approximately 40 to 70%)			
Common Name	Scientific Name	Indicator Status	Composition
overcup oak	<i>Quercus lyrata</i>	OBL	5-15%
Nuttall oak	<i>Quercus texana</i>	FACW	5-15%
willow oak	<i>Quercus phellos</i>	FACW	5-15%
water hickory	<i>Carya aquatica</i>	OBL	5-15%
Type 1 Bottomland Hardwood Soft Mast Species (approximately 30 to 60%)			
Common Name	Scientific Name	Indicator Status	Composition
baldcypress	<i>Taxodium distichum</i>	OBL	45-55%
Drummond red maple	<i>Acer rubrum</i> var. <i>drummondii</i>	OBL ⁴	≤10%
mayhaw	<i>Crataegus opaca</i>	OBL	≤10%
eastern swampprivet	<i>Forestiera acuminata</i>	OBL	≤10%
green ash	<i>Fraxinus pennsylvanica</i>	FACW	≤10%
redbay	<i>Persea borbonia</i>	FACW	≤10%
Type 2 and 3 Bottomland Hardwood Hard Mast Species (approximately 40 to 70%)			
Common Name	Scientific Name	Indicator Status	Composition
cow oak	<i>Quercus michauxii</i>	FACW	10-20%
willow oak	<i>Quercus phellos</i>	FACW	10-20%
Nuttall oak	<i>Quercus texana</i>	FACW	10-20%
Delta post oak	<i>Quercus similis</i>	FACW	10-20%
water oak	<i>Quercus nigra</i>	FAC	≤10%
Type 2 and 3 Bottomland Hardwood Soft Mast Species (approximately 30 to 60%)			
Common Name	Scientific Name	Indicator Status	Composition
sugarberry	<i>Celtis laevigata</i>	FACW	≤10%
green ash	<i>Fraxinus pennsylvanica</i>	FACW	≤10%
sweetgum	<i>Liquidambar styraciflua</i>	FAC	≤10%
red mulberry	<i>Morus rubra</i>	FACU ⁵	≤10%
American sycamore	<i>Platanus occidentalis</i>	FACW	≤10%
redbay	<i>Persea borbonia</i>	FACW	≤10%
eastern cottonwood	<i>Populus deltoides</i>	FAC	≤10%
American elm	<i>Ulmus americana</i>	FAC	≤10%

¹ All species selected have flood tolerances of Class I, II, or III as described in Shankman 1996.

² Indicator status from 2013 National Wetland Plant List (Lichvar and Kortsz 2009)

³ Exact species and quantities to be determined by seedling availability from commercial sources providing seedlings grown from localized ecotypes.

⁴ Indicator status from 1988 National Wetland Plant List, Region 2

⁵ These species are designated as UPL on the 2013 National Wetland Plant List but were FAC species on the 1988 National Wetland Plant List for Region 2. These species were previously listed as FAC on the 1988 National Wetland Plants List for Region 2. Although potentially upland species, these are native to the site and will provide increased habitat value given the goals of the project. The occurrence of the species at the specified composition will not affect the targeted plant community from being classified as a hydrophytic plant community in accordance with the methodology prescribed in the Atlantic and Gulf Coastal Plain Regional Supplement (USACE 2010).

Table 4. Planting Composition of Proposed Re-established/Enhanced Bottomland Hardwood Forest Post Treatment at the Proposed Laurel Valley Coastal Mitigation Bank in Lafourche Parish, Louisiana¹.

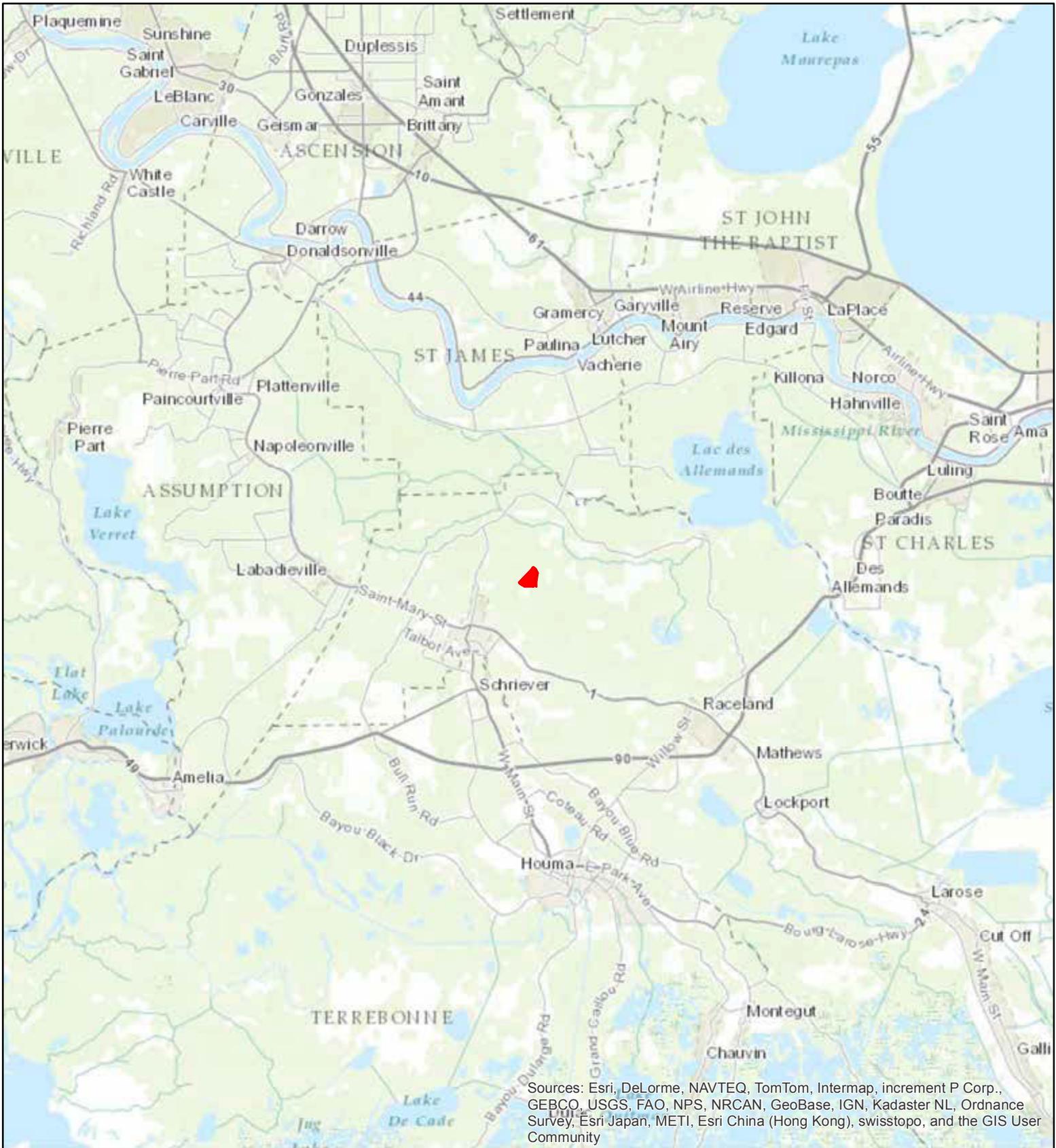
Bottomland Hardwood Hard Mast Species (approximately 100%)			
Common Name	Scientific Name	Indicator Status²	Composition³
overcup oak	<i>Quercus lyrata</i>	OBL	25-35%
Nuttall oak	<i>Quercus texana</i>	FACW	25-35%
willow oak	<i>Quercus phellos</i>	FACW	25-35%
water hickory	<i>Carya aquatica</i>	OBL	15-25%

¹ All species selected have flood tolerances of Class I, II, or III as described in Shankman 1996.

² Indicator status from 2013 National Wetland Plant List (Lichvar and Kortesz 2009)

³ Exact species and quantities to be determined by seedling availability from commercial sources providing seedlings grown from localized ecotypes.

FIGURES



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Legend

 Laurel Valley Coastal Mitigation Bank


 5 2.5 0 5

 Miles

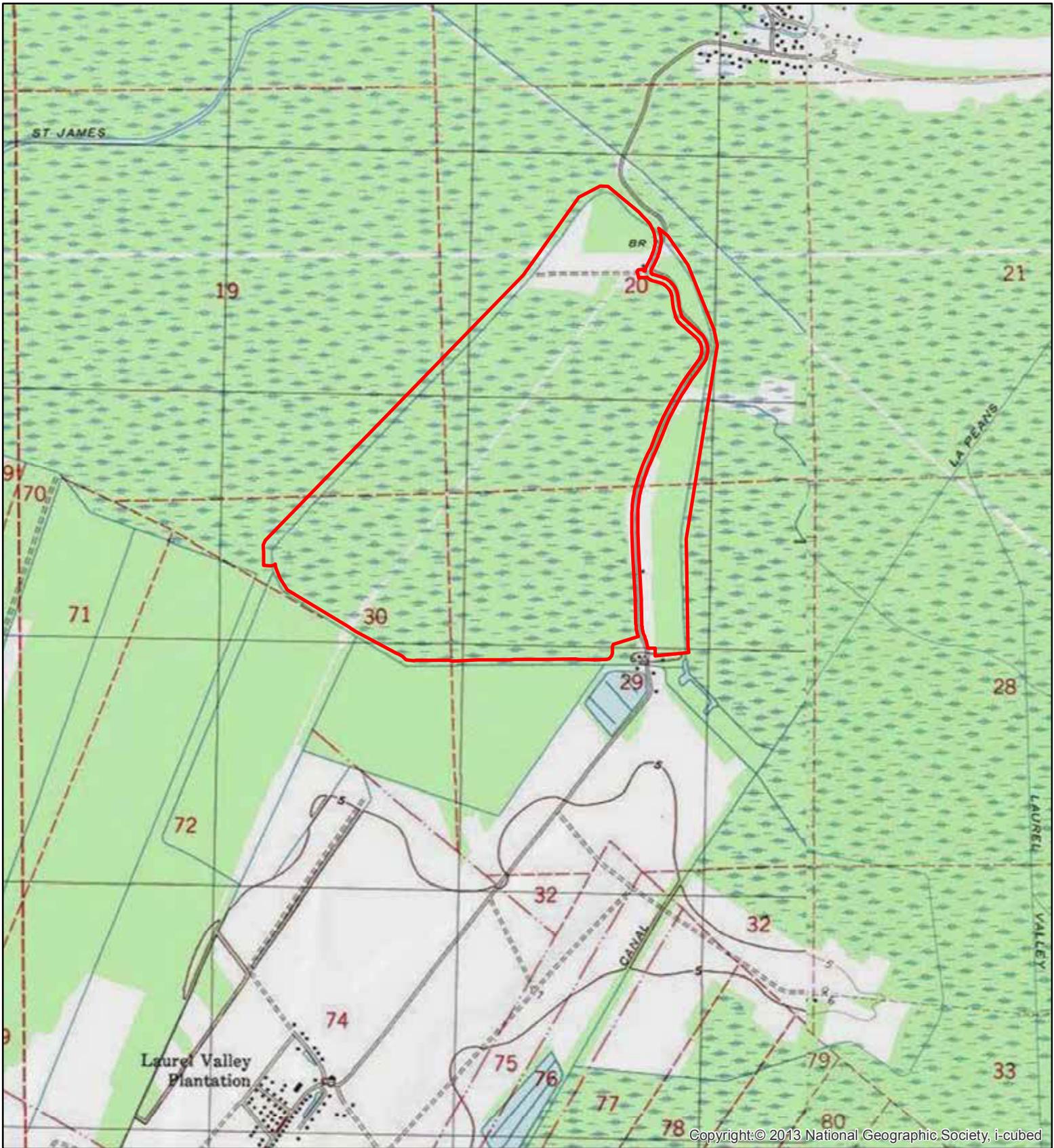
**Laurel Valley
Coastal Mitigation Bank**

Vicinity Map

Lafourche Parish, Louisiana

Created : LJW/AM10.1	
Approved : ---	
Date : 09/27/2013	
Map No. : F01_Vicinity Map	

FIGURE 1



Copyright: © 2013 National Geographic Society, i-cubed

Legend

Laurel Valley Coastal Mitigation Bank



2,000 1,000 0 2,000



Feet

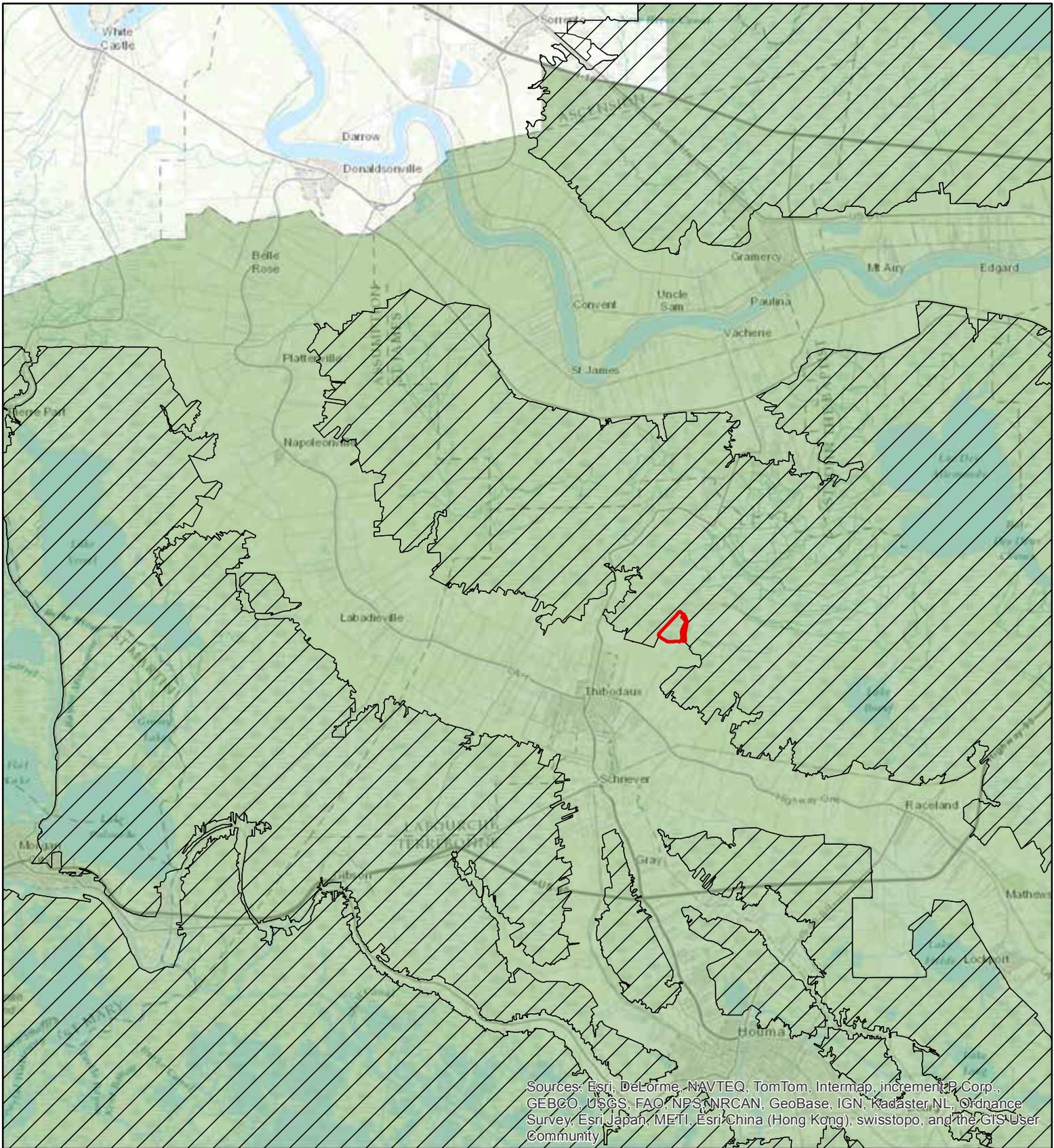
**Laurel Valley
Coastal Mitigation Bank**

USGS 7.5-Minute Quadrangle

Lafourche Parish, Louisiana

Created : LJW/AM10.1	
Approved : ---	
Date : 09/27/2013	
Map No. : F02_USGS 7.5 Minute Quad	

FIGURE 2



Legend

-  Laurel Valley Coastal Mitigation Bank
-  Coastal Wetlands Conservation Plan Boundary
-  Coastal Zone Boundary



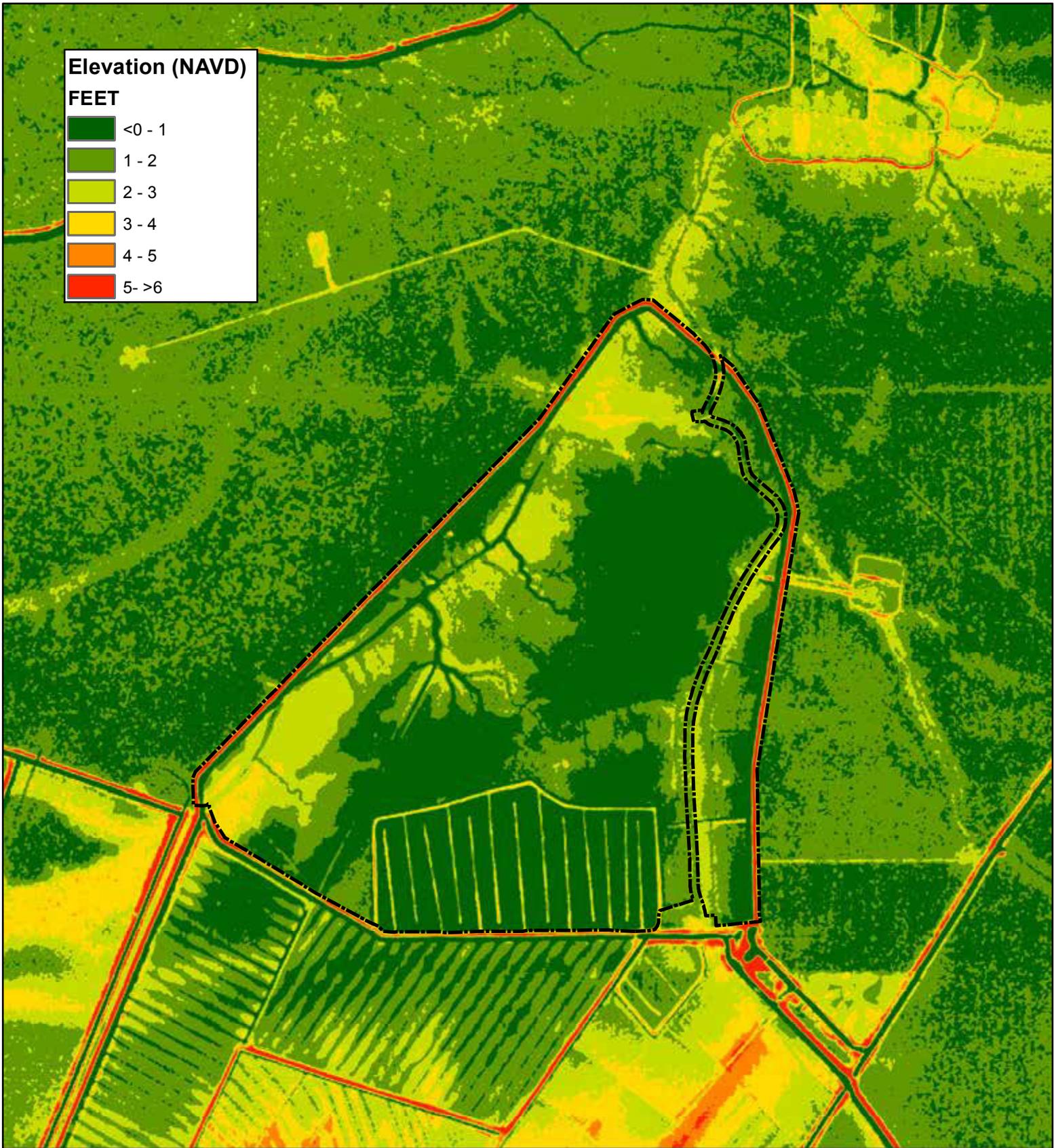


Miles

**Laurel Valley
Coastal Mitigation Bank
Coastal Zone and Coastal
Wetlands Conservation
Plan Boundary
Lafourche Parish, Louisiana**

Created : LJW/AM10.1	
Approved : ---	
Date : 09/30/2013	
Map No. : F03_Coastal Boundaries	

FIGURE 3



Elevation (NAVD)
FEET

	<0 - 1
	1 - 2
	2 - 3
	3 - 4
	4 - 5
	5 - >6

Legend

Laurel Valley Coastal Mitigation Bank

1,500 750 0 1,500

Feet

**Laurel Valley
Coastal Mitigation Bank**

LIDAR Digital Elevation Model

Lafourche Parish, Louisiana

Created : LJV/AM10.1	
Approved : ---	
Date : 09/30/2013	
Map No. : F04_LIDAR DEM	

FIGURE 4

Legend

-  Laurel Valley Coastal Mitigation Bank
-  Pasture/Agriculture Field
-  Perimeter Levee
-  Non-wet Forest
-  Canal
-  BLH Wetland
-  Pipeline Right-of-Way
-  Discharge Pump

Existing forested wetland

Existing agriculture field

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



1,000 500 0 1,000



Feet

**Laurel Valley Coastal Mitigation Bank
Existing Conditions**

Lafourche Parish, Louisiana

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F05_Existing Conditions



FIGURE 5



Legend

Laurel Valley Coastal Mitigation Bank (539.8 Acres)

Credit Acreage

- Hydric Inclusion (196.4 Acres)
- Type 1 BLH/Baldcypress Swamp Rehabilitation (Appx <1.2 NAVD) (144.8 Acres)
- Type 2-3 BLH Re-establishment (Appx >2.0 NAVD) (69.7 Acres)
- Type 1 BLH Rehabilitation (Appx 1.2-2.0 NAVD) (49.1 Acres)
- Type 1 BLH/Baldcypress Swamp Re-establishment (14.3 Acres)
- Enhancement (8.9 Acres)
- Baldcypress RPM Planting (27 Acres)

Non Credit Acreage

- ROW/Servitude (7.1 Acres)
- Levee (19.5 Acres)
- Canal (17.9 Acres)
- Wildlife Opening (5.9 Acres)
- Access Road (6.1 Acres)

- Proposed Gaps
- Drainage Structure to be Removed and Plugged

Aerogrid, IGN, ICP, swisstopo, and the GIS User Community



Laurel Valley Coastal Mitigation Bank Mitigation Features

Lafourche Parish, Louisiana

Created : LJW/AM10.1

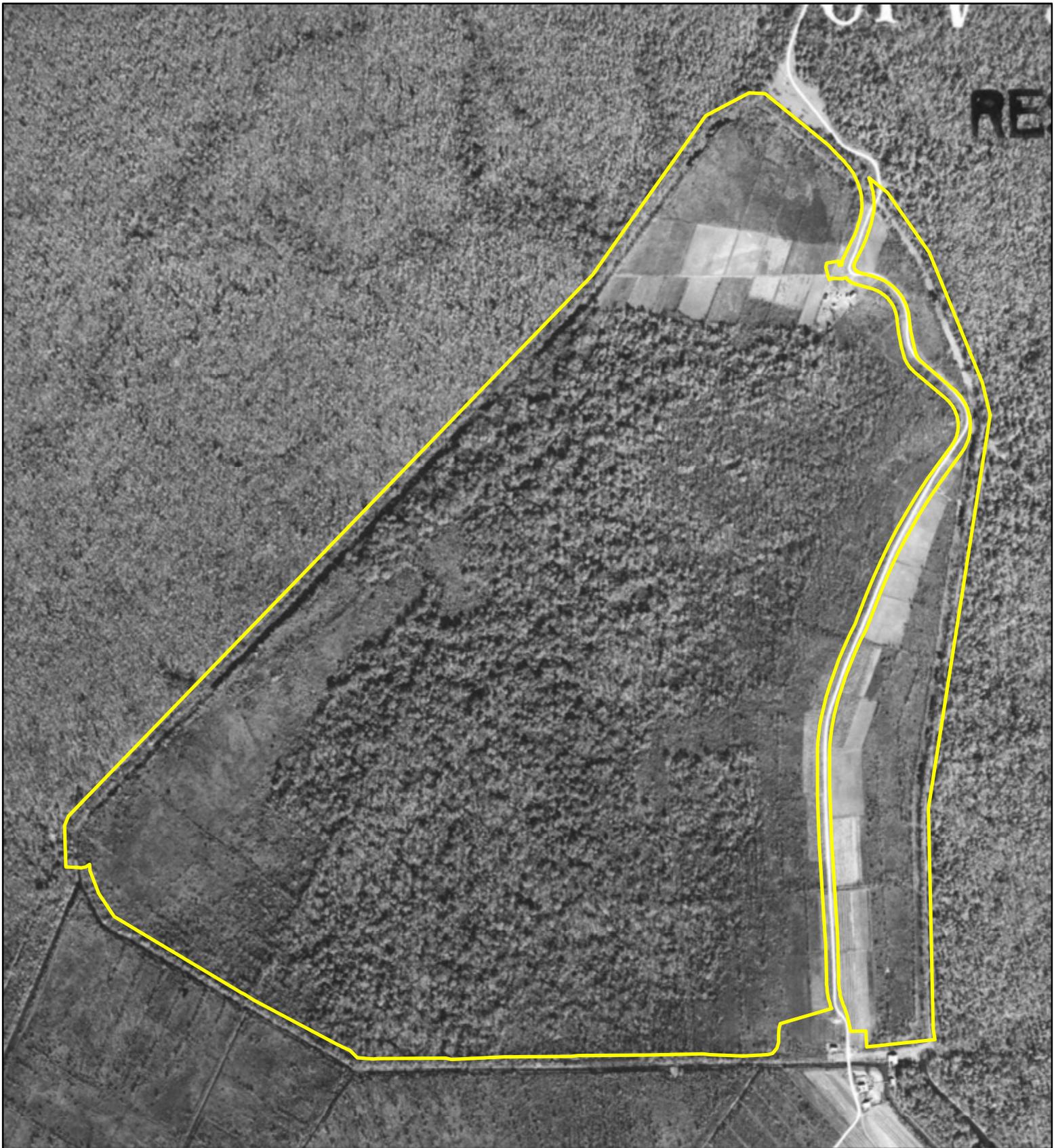
Approved : ---

Date : 10/10/2013

Map No. : F06_Mitigation Features

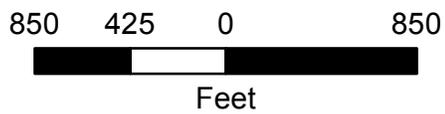


FIGURE 6



Legend

 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank
1940 Aerial Photograph**

Lafourche Parish, Louisiana

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F07_1940 Aerial



FIGURE 7



Legend

 Laurel Valley Coastal Mitigation Bank



850 425 0 850



Feet

**Laurel Valley
Coastal Mitigation Bank
1953 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F08_1953 Aerial

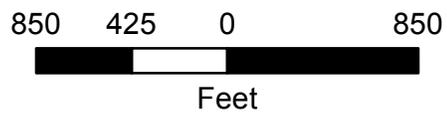


FIGURE 8



Legend

 Laurel Valley Coastal Mitigation Bank

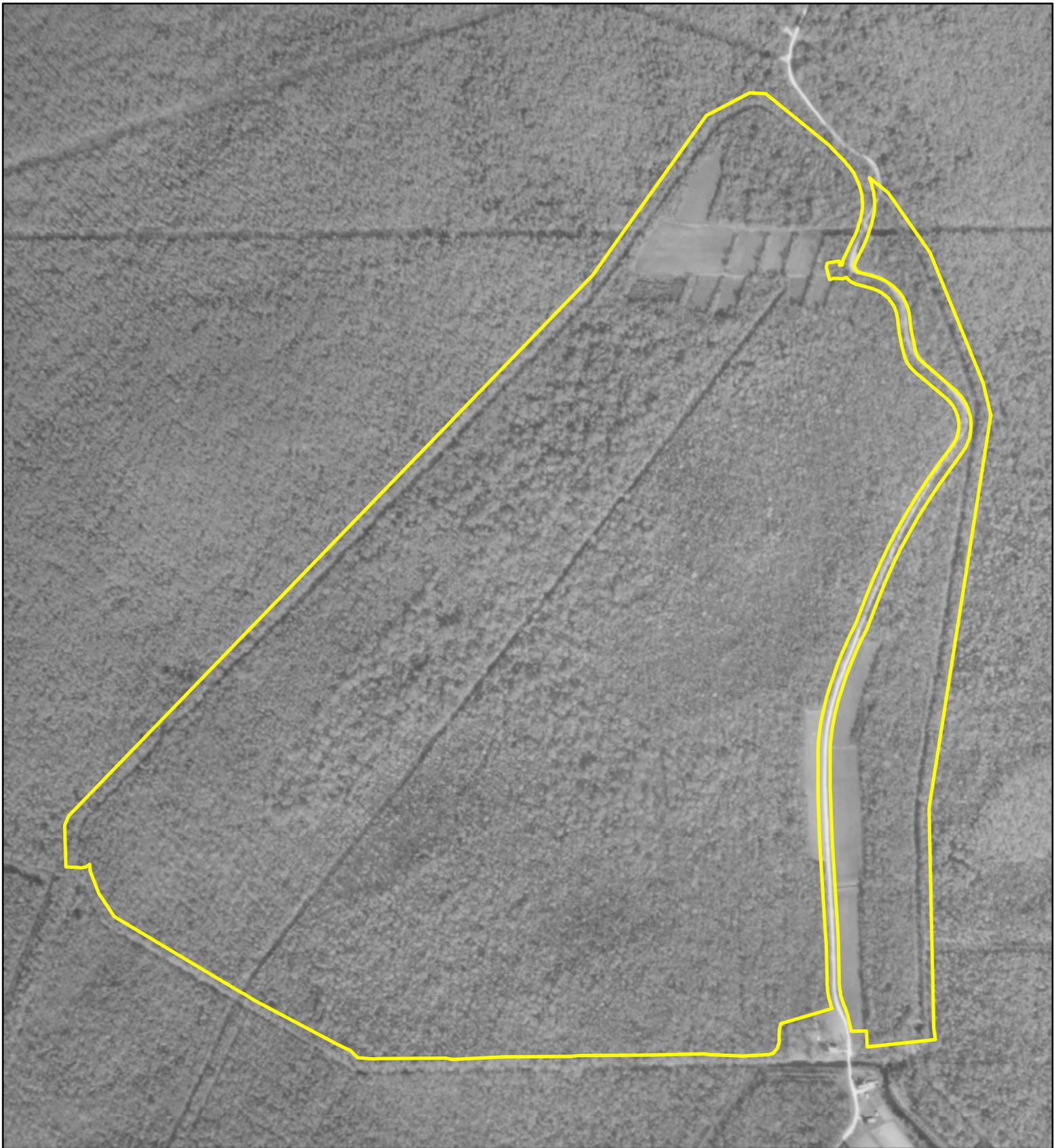


**Laurel Valley
Coastal Mitigation Bank
1957 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1
Approved : ---
Date : 09/30/2013
Map No. : F09_1957 Aerial

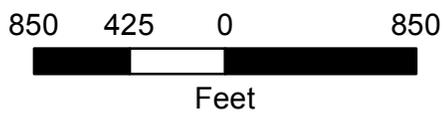


FIGURE 9



Legend

 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank
1977 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

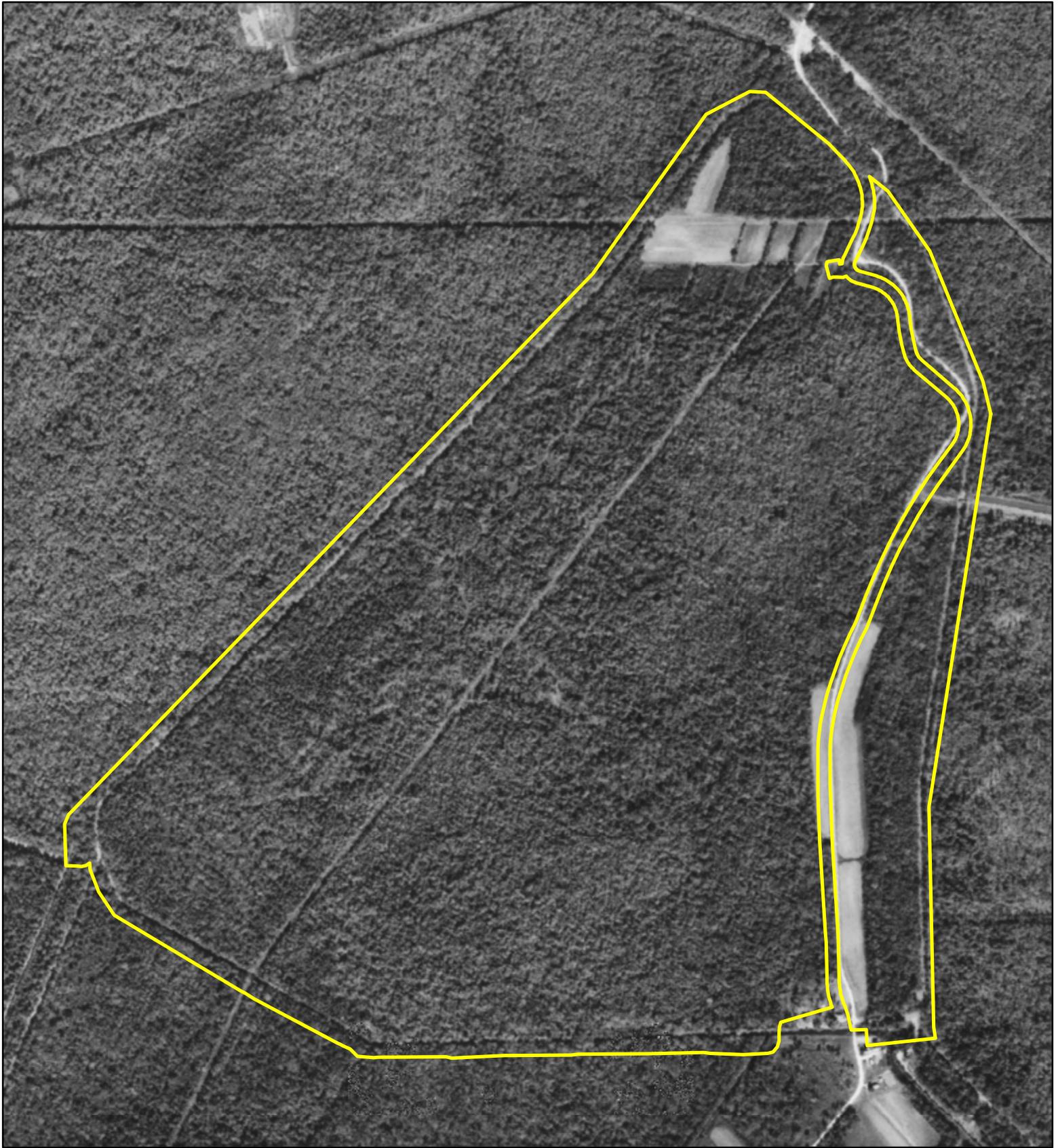
Approved : ---

Date : 09/30/2013

Map No. : F10_1977 Aerial



FIGURE 10



Legend

 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank
1980 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F11_1980 Aerial



FIGURE 11



Legend

 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank
1989 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F12_1989 Aerial



FIGURE 12



Legend

 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank
1998 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F13_1998 Aerial

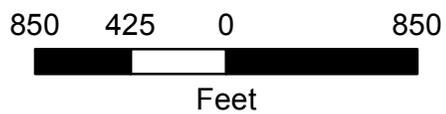


FIGURE 13



Legend

 Laurel Valley Coastal Mitigation Bank



Laurel Valley
Coastal Mitigation Bank
2004 Aerial Photograph
Lafourche Parish, Louisiana

Created : LJW/AM10.1

Approved : ---

Date : 09/30/2013

Map No. : F14_2004 Aerial



FIGURE 14



Legend

 Laurel Valley Coastal Mitigation Bank



850 425 0 850



Feet

**Laurel Valley
Coastal Mitigation Bank
2010 Aerial Photograph
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

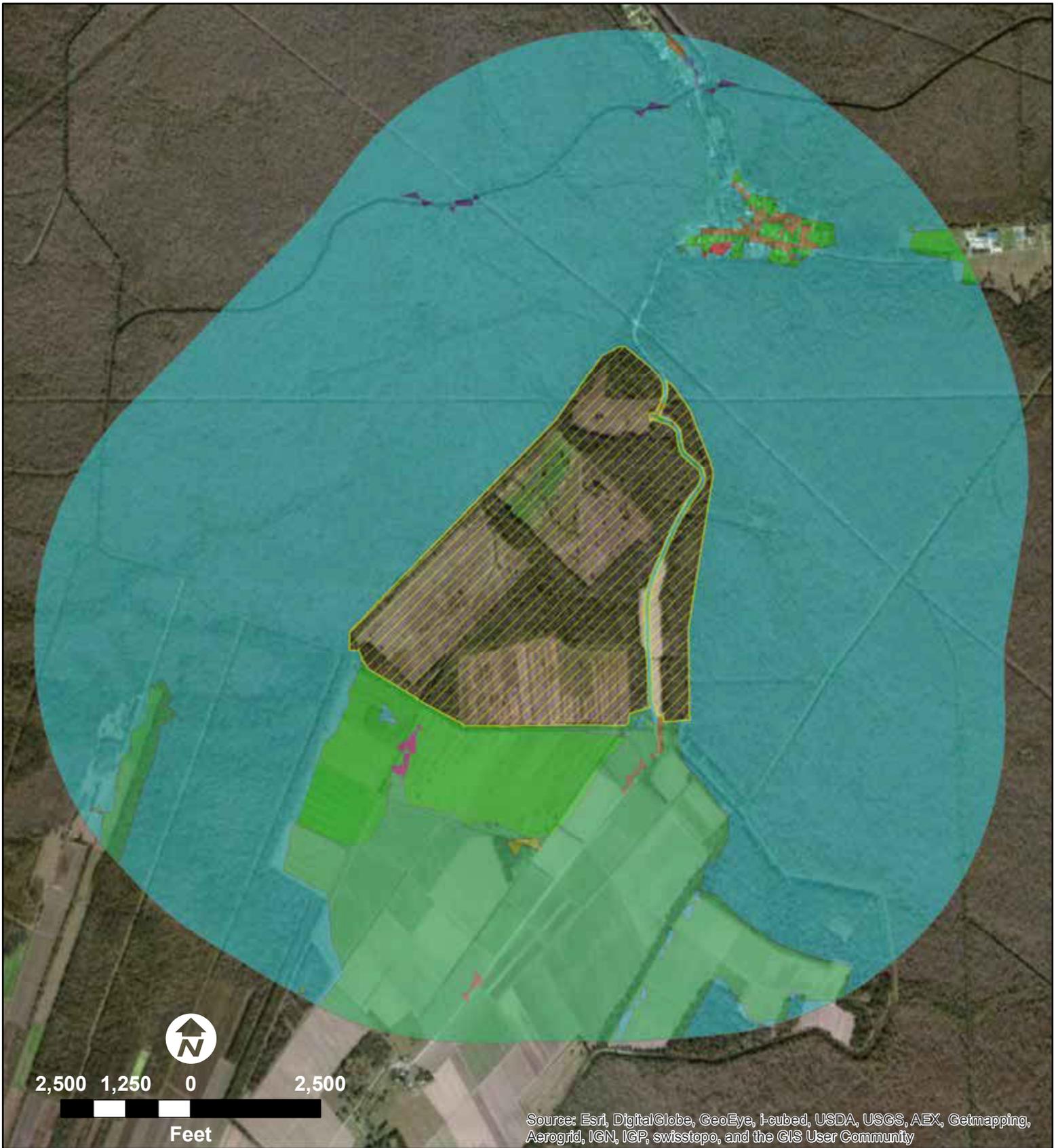
Approved : ---

Date : 09/30/2013

Map No. : F15_2010 Aerial



FIGURE 15



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Laurel Valley Coastal Mitigation Bank
- Woody Wetlands (79%)
- Cultivated Crops (15%)
- Pasture/ Hay (5%)
- Developed, Low Intensity (<1%)
- Open Water (<1%)
- Emergent Herbaceous Wetlands (<1%)
- Grassland/ Herbaceous (<1%)
- Scrub/Shrub (<1%)
- Developed, High Intensity (<1%)

**Laurel Valley
Coastal Mitigation Bank
Surrounding Land Use
within One Mile
Lafourche Parish, Louisiana**

Created : LJW/AM10.1

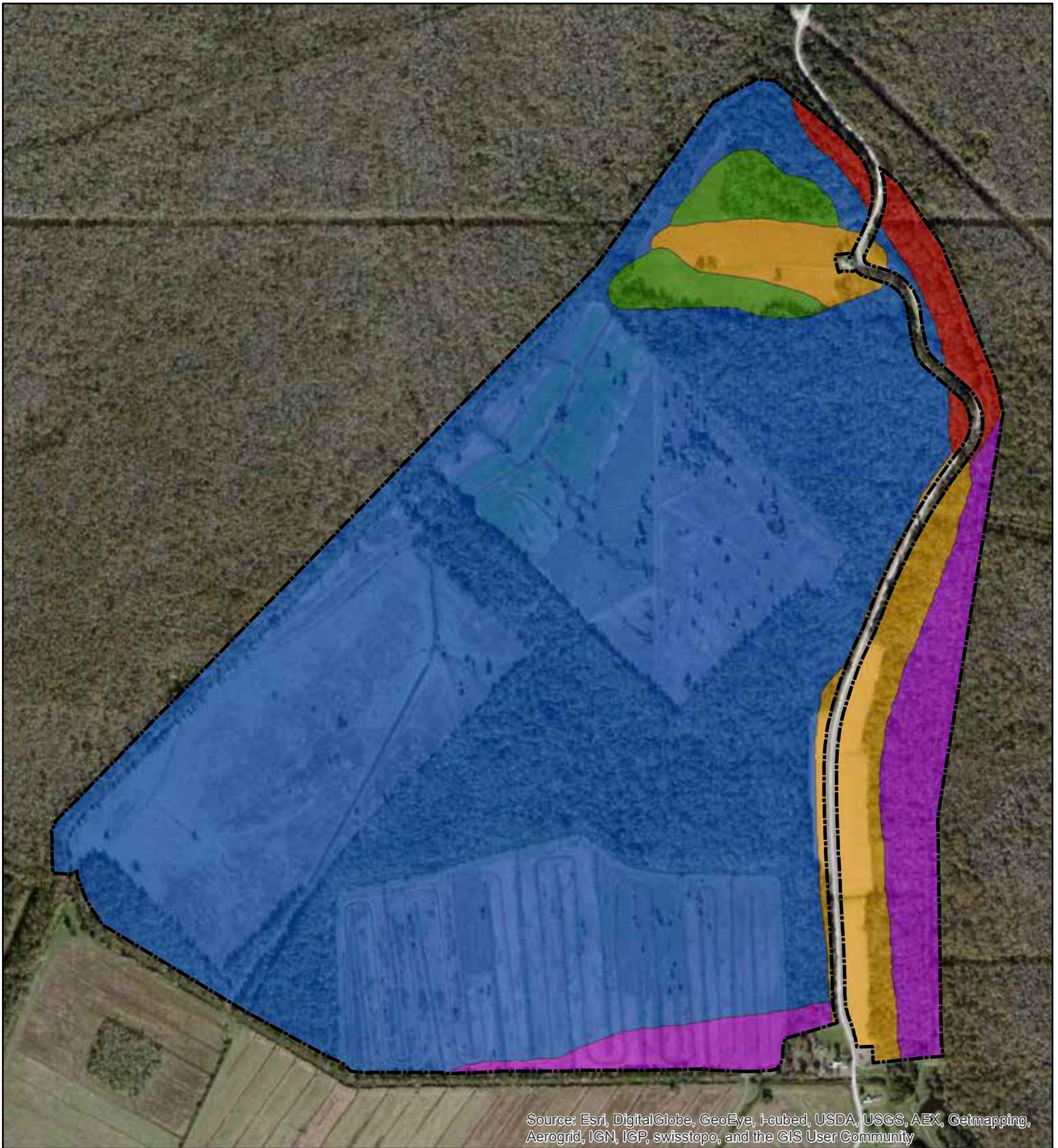
Approved : ---

Date : 11/05/2013

Map No. : F16_Land Use



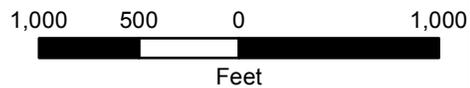
FIGURE 16



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community

Legend

-  Laurel Valley Coastal Mitigation Bank
-  FA: Fausse-Schriever association
-  BB: Barbary-Fausse Association
-  Sh: Schriever silty clay loam
-  Cm: Cancienne silt loam
-  Sr: Schriever clay, occasionally flooded
-  Co: Cancienne silty clay loam



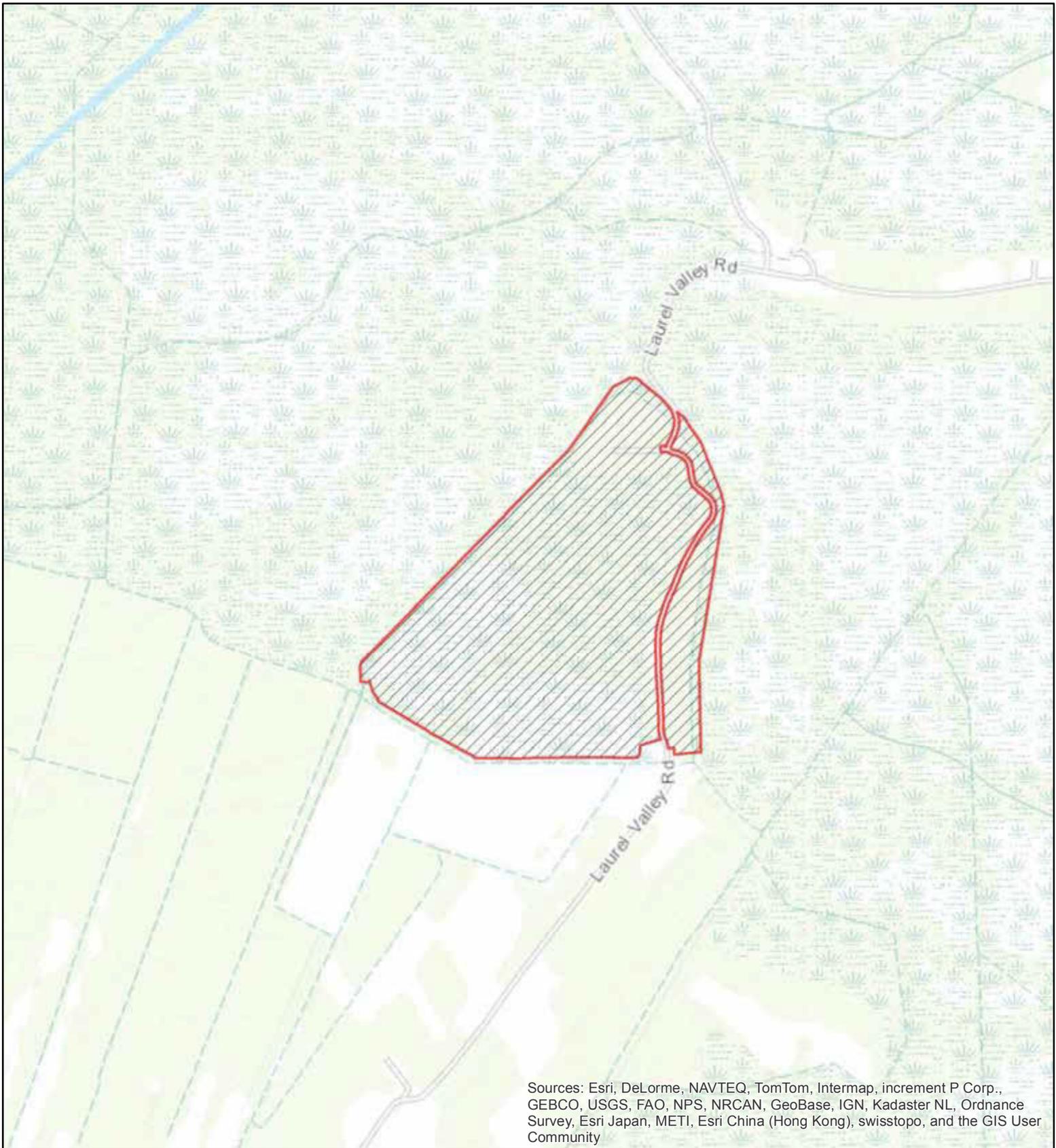
Laurel Valley Coastal Mitigation Bank

NRCS Soils Map

Lafourche Parish, Louisiana

Created : LJW/AM10.1	
Approved : ---	
Date : 10/04/2013	
Map No. : F17_NRCS Soils Map	

FIGURE 17

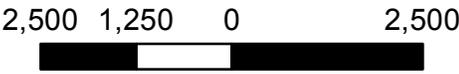


Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Legend

-  Laurel Valley Coastal Mitigation Bank
-  Existing Drainage Area





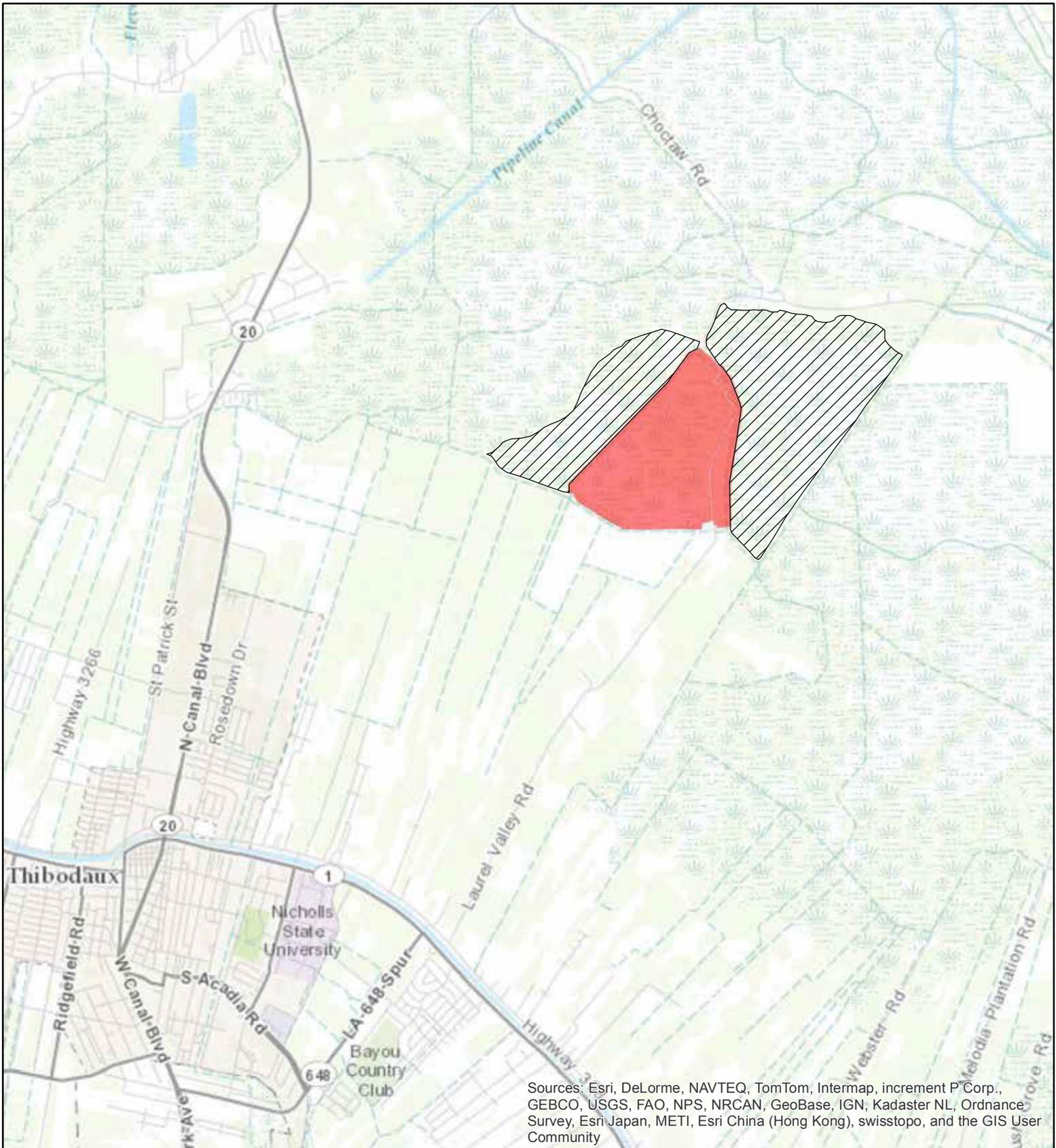
2,500 1,250 0 2,500

Feet

**Laurel Valley
Coastal Mitigation Bank
Existing Contributing
Drainage Area
Lafourche Parish, Louisiana**

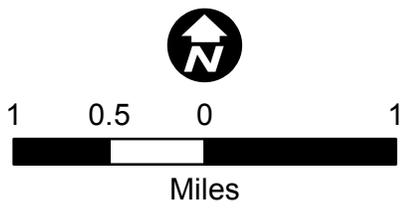
Created : LJW/AM10.1	
Approved : ---	
Date : 10/04/2013	
Map No. : F18_Existing Drainage	

FIGURE 18



Legend

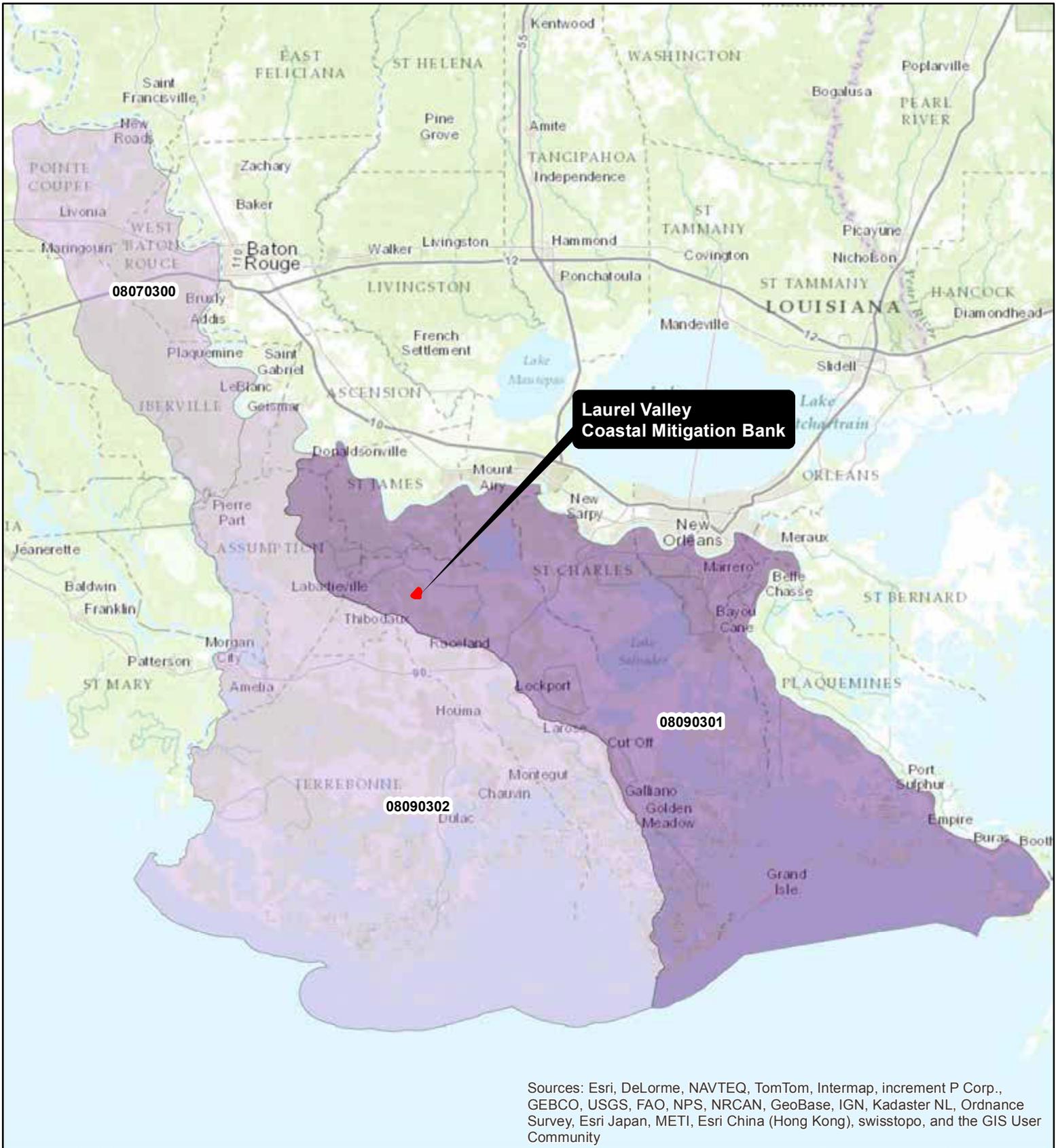
- Laurel Valley Coastal Mitigation Bank
- Contributing Drainage Area



**Laurel Valley
Coastal Mitigation Bank
Potential Contributing
Drainage Area
Lafourche Parish, Louisiana**

Created : LJW/AM10.1	
Approved : ---	
Date : 10/04/2013	
Map No. : F19_Contributing Drainage	

FIGURE 19



Legend

- Laurel Valley Coastal Mitigation Bank
- Proposed Primary Service Area
- Proposed Secondary Service Area



20 10 0 20



Miles

**Laurel Valley Coastal Mitigation Bank
Proposed Geographic Service Area
Lafourche Parish, Louisiana**

Created : LJW/AM10.1	
Approved : ---	
Date : 10/04/2013	
Map No. : F20_Service Area	

FIGURE 20

APPENDICES

APPENDIX A

PRELIMINARY JURISDICTIONAL DETERMINATION



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

OCT 09 2013

Operations Division
Surveillance and Enforcement Section

Mr. Jace M. Jarreau
Delta Land Services, LLC
1090 Cinclare Drive
Port Allen, LA 70767

Dear Mr. Jarreau:

Reference is made to your request for a U.S. Army Corps of Engineers' (Corps) jurisdictional determination on property located in Sections 20, 30, 29, 72, and 19, Township 14 South, Range 17 East, Lafourche Parish, Louisiana (enclosed map). Specifically, this property is identified as an 806-acre tract on and west of Laurel Valley Road.

A field inspection of the property was conducted on August 20, 2013. Based on the results of this investigation, and the information provided with your request, we have determined that part of the property is wetland and may be subject to Corps' jurisdiction. The approximate limits of the wetland are designated in red on the map. A Department of the Army (DA) permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into wetlands that are waters of the United States. Additionally, a DA permit under Section 404 of the Clean Water Act will be required if you propose to deposit dredged or fill material into other waters subject to Corps' jurisdiction. Other waters that may be subject to Corps' jurisdiction are indicated in blue on the map.

This delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in your request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If the property owner or tenant is a USDA farm participant, or anticipates participation in USDA programs, a certified wetland determination should be requested from the local office of the Natural Resources Conservation Service prior to starting work.

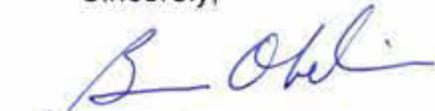
You are advised that this preliminary jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Commander has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Please be advised that this property is in the Louisiana Coastal Zone. For additional information regarding coastal use permit requirements, contact Ms. Christine Charrier,

Office of Coastal Management, Louisiana Department of Natural Resources
at (225) 342-7953.

Should there be any questions concerning these matters, please contact Mr. Michael Windham at (504) 862-1235 and reference our Account No. MVN-2013-01589-SK. If you have specific questions regarding the permit process or permit applications, please contact our Western Evaluation Section at (504) 862-1950. The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please complete the survey on our web site at <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,



for Martin S. Mayer
Chief, Regulatory Branch

Enclosures

USACE

FSV/IH Date: 8/20/13

Botanist: WINDHAM

Requestor: TARRAUM

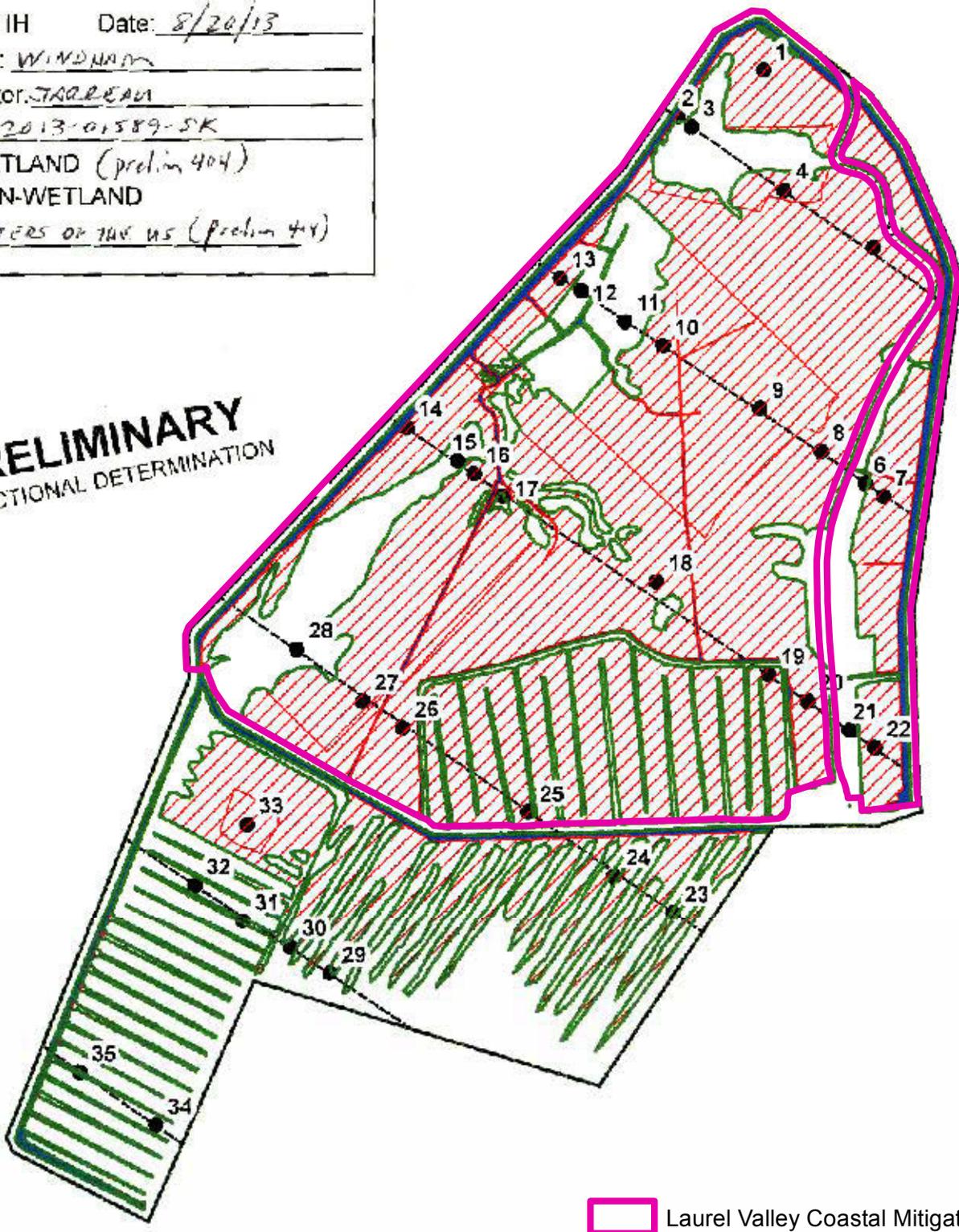
MVN-2013-01589-SK

▨ - WETLAND (prelim 404)

▭ - NON-WETLAND

▭ - WATERS OF THE US (prelim 44)

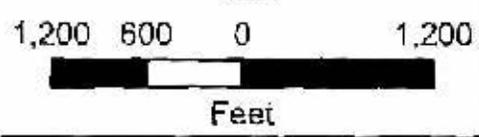
PRELIMINARY
JURISDICTIONAL DETERMINATION



▭ Laurel Valley Coastal Mitigation Bank

Legend

- ▭ Area of Interest (806.0 ac.)
- ▭ Nonwetland
- ▨ Wetland
- ▭ Other Waters
- Transects
- Data Points



Laurel Valley Property

DELINEATION MAP

Lafourche Parish, LA

Created: L.WARD/VEW

Approved: JMJ

Date: 9/05/2013

Map No.: F08 Delineation



FIGURE 6

APPENDIX B

**NRCS CPA-026 HIGHLY ERODIBLE LAND AND WETLAND
CONSERVATION DETERMINATION RECORDS**

To: Ronald J. Ventola

Date: January 28, 1993

Subject: FSA Wetland Determination

The USDA Soil Conservation Service has determined that the following described land is a prior converted cropland on fields 95, 96, 102, and 103 are prior converted. Fields nos. 93, 94, 97, 98, 99, 100 & 101 is a wetland farmed under natural conditions and a wetland in field 500.

(Farmed Wetland or Prior
Converted Cropland)

Name of Landowner/Operator: Jerry Mckee

FSA Tract Number(s): 198

Land Location Description: the tract is located 1/2 mile east of Thibodaux on Hwy 308 in T. 14 S., R. 17 E., and sections 20, 29, 30, 72.

"Prior Converted Cropland" and "Farmed Wetland" are defined by the Soil Conservation Service in accordance with Section 512.16 (pages 512-11 and 512-13) of the National Food Security Act Manual, Amendment 4, June 1990.

Wayne J. Bordelon, Jr.
SCS District Conservationist

1/28/93
Date

United States
Department of
Agriculture

Soil
Conservation
Service

P.O. Box 629
Thibodaux, La. 70302
(504) 447-3871

December 17, 1992

Jerry Mckee
Laurel Valley Plantation, Inc.
P. O. Box 709
Thibodaux, LA 70302

Dear Sir:

Attached you will find the necessary paper work for you to be in compliance with the Food Security Act of 1985. My office has sent copies to the ASCS office for their records. Please keep all copies for future use.

If I can be of further assistance, please feel free to contact me.

Sincerely,



Wayne J. Bordelon
District Conservationist

U.S.D.A.
Soil Conservation Service

SCS-CPA-026
(June 91)

170: 1 174:
1. Name and Address of Person

2. Date of Request

**HIGHLY ERODIBLE LAND AND WETLAND
CONSERVATION DETERMINATION**

3. County

4. Name of USDA Agency or Person Requesting Determination

5. Farm No. and Tract No.

SECTION I - HIGHLY ERODIBLE LAND

6. Is soil survey now available for making a highly erodible land determination? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	FIELD NO.(s)	TOTAL ACRES
7. Are there highly erodible soil map units on this farm? Yes <input type="checkbox"/> No <input type="checkbox"/>		
8. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985.		
9. List highly erodible fields that have been or will be converted for the production of agricultural commodities and, according to ASCS records, were not used for this purpose in any crop year during 1981-1985; and were not enrolled in a USDA set-aside or diversion program.		
10. This Highly Erodible Land determination was completed in the: Office <input type="checkbox"/> Field <input type="checkbox"/>		

SECTION II - WETLAND

11. Are there hydric soils on this farm? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	FIELD NO.(s)	TOTAL ACRES
12. Wetlands (W), including abandoned wetlands, or Farmed Wetlands (FW) or Farmed Wetlands Pasture (FWP). Wetlands may be farmed under natural conditions. Farmed Wetlands and Farmed Wetlands Pasture may be farmed and maintained in the same manner as they were prior to December 23, 1985, as long as they are not abandoned. 'F-500 wetland F-500, 91.2, 78, 102, 101 - 60 FC	283.70	
13. Prior Converted Cropland (PC). Wetlands that were converted prior to December 23, 1985. The use, management, drainage, and alteration of prior converted cropland (PC) are not subject to the wetland conservation provisions unless the area reverts to wetland as a result of abandonment.	272	
14. Artificial Wetlands (AW). Artificial wetlands includes irrigation-induced wetlands. These wetlands are not subject to the wetland conservation provisions.		
15. Minimal Effect Wetlands (MW). These wetlands are to be farmed according to the minimal-effect agreement signed at the time the minimal-effect determination was made.		
16. Mitigation Wetlands (MIW). Wetlands on which a person is actively mitigating a frequently cropped area or a wetland converted between December 23, 1985 and November 28, 1990.		
17. Restoration with Violation (RVW+year). A restored wetland that was in violation as a result of conversion after November 28, 1990, or the planting of an agricultural commodity or forage crop.		
18. Restoration without Violation (RSW). A restored wetland converted between December 23, 1985 and November 28, 1990, on which an agricultural commodity has not been planted.		
19. Replacement Wetlands (RPW). Wetlands which are converted for purposes other than to increase production, where the wetland values are being replaced at a second site.		
20. Good Faith Wetlands (GFW+year). Wetlands on which ASCS has determined a violation to be in good faith and the wetland has been restored.		
21. Converted Wetlands (CW). Wetlands converted after December 23, 1985 and prior to November 28, 1990. In any year that an agricultural commodity is planted on these Converted Wetlands, you will be ineligible for USDA benefits.		
22. Converted Wetland (CW+year). Wetlands converted after November 28, 1990. You will be ineligible for USDA program benefits until this wetland is restored.		
23. Converted Wetland Non-Agricultural use (CWNA). Wetlands that are converted for trees, fish production, shrubs, cranberries, vineyards or building and road construction.		
24. Converted Wetland Technical Error (CWTE). Wetlands that were converted as a result of incorrect determination by SCS.		
25. The planned alteration measures on wetlands in fields _____ are considered maintenance and are in compliance with FSA.		
26. The planned alteration measures on wetlands in fields _____ are not considered to be maintenance and if installed will cause the area to become a Converted Wetland (CW). See item 22 for information on CW+year.		
27. The wetland determination was completed in the office <input checked="" type="checkbox"/> field <input type="checkbox"/> and was delivered <input type="checkbox"/> mailed <input type="checkbox"/> to the person on _____		

28. Remarks: UN - Unnumbered field; PC - Prior Converted cropland; N - Non-hydric & non-erosive; Open ended fields may or may not be wetlands. A site specific determination is needed prior to any land use change.

29. I certify that the above determination is correct and adequate for use in determining eligibility for USDA program benefits, and that wetland hydrology, hydric soils, and hydrophytic vegetation under normal circumstances exist on all areas outlined as Wetlands, Farmed Wetlands, and Farmed Wetlands Pasture.

30. Signature of SCS District Conservationist

31. Date

Assistance and programs of the Soil Conservation Service available without regard to race, religion, color, sex, age, or handicap.

WFC 102

WFC 99

WFC 98

WFC 97

PC 95

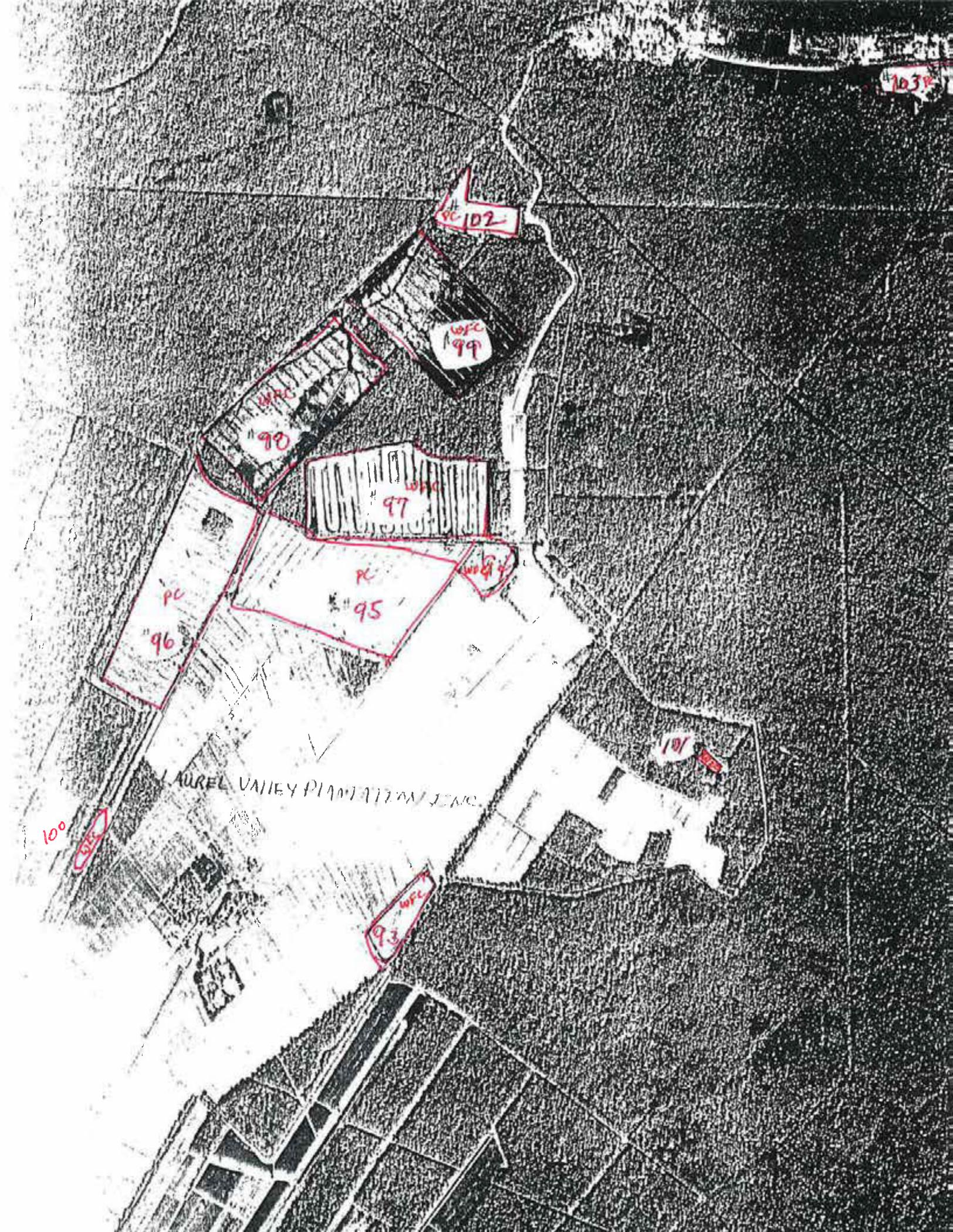
PC 96

WFC 91

LAUREL VALLEY PLANTATION, INC.

100

WFC 93



AS # 8 4/15

SCS-CPA-026 (REV)

2. DATE OF REQUEST

HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

1. NAME AND ADDRESS OF PRODUCER
Laurel Valley Pltn., Inc.
P. O. Box 702
Thibodaux, La. 70302

7/23/87

3. NAME OF USDA AGENCY OR PRODUCER REQUESTING DETERMINATION

4. FARM NO. AND TRACT NO. (S)

5. COUNTY

ASCS

F 370 T 198

Lafourche

SECTION I - HIGHLY ERODIBLE LAND

	4. FARM NO. AND TRACT NO. (S)		FIELD NO. (S)	TOTAL ACRES
	YES	NO		
6. Is a soil survey now available for making a highly erodible land determination?	<input checked="" type="checkbox"/>			
7. Are there highly erodible soil map units on this farm?		<input checked="" type="checkbox"/>		
8. a. List highly erodible tract and fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985				
b. Is an approved conservation plan being actively applied on all of these fields? If "no," list the tract and fields (from the ASCS records) on which a plan is not being applied.				
9. a. List highly erodible tract and fields that, according to ASCS records, have been or will be converted for the production of agricultural commodities, were not used for this purpose in any crop year during 1981-1985, and were not enrolled in a USDA set-aside or diversion program				
b. Is an approved conservation system being used on these fields? If "no," list the tract and fields (from the ASCS records) on which a system is not being used.				
10. Are there other fields or unnumbered areas that (1) have highly erodible map units, (2) were not used to produce an agricultural commodity in any crop year after 1980, and (3) were not enrolled in a USDA set-aside or diversion program in any crop year during 1981-1985?		<input checked="" type="checkbox"/>		

11. CERTIFICATION: The _____ (no.) conservation plan(s) was (were) approved by the _____ and conform with technical requirements of the SCS field office technical guide. Conservation systems included in the conservation plan(s) applied _____ (no.).

SECTION II - WETLAND

	4. FARM NO. AND TRACT NO. (S)		FIELD NO. (S)	TOTAL ACRES
	YES	NO		
12. Are hydric soils on this farm? If "yes," list tract and fields (from the ASCS records) or unnumbered areas (un) in which they occur.				
13. Do fields that were or will be used to produce an agricultural commodity contain wetland? If "yes," list tract and fields, outline the wetland areas within fields on the ASCS photographs, and mark with "w" for wetland, "aw" for artificial and irrigation induced wetland, "mw" for wetland on which the conversion would result in minimal effect	<input checked="" type="checkbox"/>		Cropland	
14. Are there converted wetlands on this farm that have been converted since December 23, 1985? If "yes," list the tract and fields, outline converted wetlands on the ASCS photograph(s), and mark with "cw."		<input checked="" type="checkbox"/>		
15. The wetland determination was done in the office <input checked="" type="checkbox"/> field				
16. This determination was hand delivered <input checked="" type="checkbox"/> mailed <input checked="" type="checkbox"/> to the producer on 8/31/87 (DATE)				

Any producer who does not agree with this determination may request reconsideration from the person making this determination. This request is a prerequisite for any further appeal. The request must be in writing and must set forth reasons for the request. The request must be mailed or delivered within 15 days after written notice of the determination is mailed to or otherwise made available to the producer.

17. REMARKS

Designated farm & tract has un-numbered (TM) field(s)
Un-numbered field(s) are within a hydric soil designation and may or maynot be a wetland
A site specific determination should be made prior to any land use changes

18. SIGNATURE OF SCS DISTRICT CONSERVATIONIST

Wayne J. Madala

DATE 8/31/87

2

2

MAP No.

44



1987

1987

2

APPENDIX C
HYDROLOGY RESTORATION DRAWINGS



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Application Number: 15982 **Permit Number:** P20131507 **Date Received:** 10/11/2013

Step 1 of 15 - Applicant Information

Applicant Name: Delta Land Services, **Applicant Type:** COMMERCIAL/NOT INDUSTRY
Mailing Addr : 1090 Cinclare Drive
 Port Allen, LA 70767
 Daniel Bollich
Contact Info:
Phone: (225) 343-3900 **Fax:** (225) 388-5214 **Email:** daniel@deltaland-services.com

Step 2 of 15 - Agent Information

Agent Name:
Mailing Addr: , LA
Contact Info:
Phone: - **Fax:** - **Email:**

Step 3 of 15 - Permit Type

Coastal Use Permit (CUP) Solicitation of Views (SOV) Request for Determination (RFD)

Step 4 of 15 - Pre- Application Activity

a. Have you participated in a Pre- Application or Geological Review Meeting for the proposed project?

No Yes Date meeting was held:

Attendees:

(Individual or Company Rep)

(OCM Representative)

(COE Representative)

b. Have you obtained an official wetland determination from the COE for the project site?

No Yes **If Yes, Please upload a copy with your application.**

JD Number: MVN 2013- 01589- SK

c. Is this application a mitigation plan for another CUP?

No Yes OCM Permit Number:



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Step 5 of 15 - Project Information

a. Describe the project.

The project is a wetlands mitigation bank. The project involves hydrology restoration and the conversion of existing agriculture fields and pasture into bottomland hardwood and bald cypress swamp.

b. Is this application a change to an existing permit?

No

Yes

OCM Permit Number:

c. Have you previously applied for a permit or emergency authorization for all or any part of the proposed project?

No

Yes

Agency	Contact	Permit Number	Decision Status	Decision Date
OCM				
COE				
Other				

Step 6 of 15 - Project Location

a. Physical Location

Street:

City: Thibodaux

Parish: Lafourche

Zip: 70302

Water Body:

b. Latitude and Longitude

Latitude: 29 50 9.9

Longitude: -90 45 45.3

c. Section, Township, and Range

Section #: 19, 20, 29, 30

Township #: 14S

Range #: 17E

Section #:

Township #:

Range #:

d. Lot, Track, Parcel, or Subdivision Name

Lot #:

Parcel #:



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Tract #:

Subdivision Name:

e. Site Direction

From the intersection of LA Hwy 20 and LA Hwy 308 in Thibodeaux, proceed south on LA Hwy 308 for approximately 2.1 miles. Turn left onto Laurel Valley Road and proceed approximately 3.4 miles to the entrance located on the left. This is the entry point into the LVCMB. This is entry point is a private road and public access is restricted from this point forward.

Step 7 of 15 - Adjacent Landowners - See attached list

Step 8 of 15 - Project Specifics

a. Project Name and/or Title: Laurel Valley Coastal Mitigation Bank

b. Project Type: Non-Residential

c. Source of Funding PRIVATE

d. What will be done for the proposed project?

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> Bridge/Road | <input type="checkbox"/> Home Site/Driveway | <input type="checkbox"/> Pipeline/Flow Line | <input type="checkbox"/> Rip Rap/Erosion Control |
| <input type="checkbox"/> Bulkhead/Fill | <input type="checkbox"/> Levee Construction | <input type="checkbox"/> Plug/Abandon | <input type="checkbox"/> Site Clearance |
| <input type="checkbox"/> Drainage Improvements | <input type="checkbox"/> Maintenance Dredging | <input type="checkbox"/> Production Barge/Structure | <input type="checkbox"/> Subdivision |
| <input type="checkbox"/> Drill Barge/Structure | <input type="checkbox"/> Prop Washing | <input checked="" type="checkbox"/> Vegetative Plantings | <input type="checkbox"/> Wharf/Pier/Boathouse |
| <input type="checkbox"/> Drill Site | <input type="checkbox"/> Pilings | <input checked="" type="checkbox"/> Remove Structures | |
| <input type="checkbox"/> Fill | <input type="checkbox"/> Marina | <input type="checkbox"/> Major Industrial/Commercial | |
| <input checked="" type="checkbox"/> Other: | Placing gaps in existing private levee | | |

e. Why is the proposed project needed?

In order to provide compensatory mitigation for unavoidable impacts to coastal wetlands.

Step 9 of 15 - Project Status

a. Proposed start date: 01/15/2014 **Proposed completion date:** 03/15/2014



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

b. Is any of the project work in progress?

No Yes

c. Is any of the project work completed?

No Yes

Step 10 of 15 - Structures, Materials, and Methods for the Proposed Project

a. Excavations

25082 Cubic Yards 15.5 Acres

b. Fill Areas

25082 Cubic Yards 15.5 Acres

c. Fill Materials

<input type="checkbox"/> Concrete: Cubic Yards <input type="checkbox"/> Crushed Stone or Gravel: Cubic Yards <input checked="" type="checkbox"/> Excavated and Placed onsite : 25082 Cubic Yards <input type="checkbox"/> Excavated and hauled offsite: Cubic Yards <input type="checkbox"/> Other: Cubic Yards	<input type="checkbox"/> Rock: Cubic Yards <input type="checkbox"/> Sand: Cubic Yards <input type="checkbox"/> Hauled in Topsoil/Dirt: Cubic Yards
--	---

d. What equipment will be used for the proposed project?

Airboat Bulldozer/Grader Marsh Buggy



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Backhoe | <input type="checkbox"/> Dragline/Excavator | <input type="checkbox"/> Other Tracked or Wheeled Vehicles |
| <input type="checkbox"/> Barge Mounted Bucket Dredge | <input type="checkbox"/> Handjet | <input type="checkbox"/> Self Propelled Pipe Laying Barge |
| <input type="checkbox"/> Barge Mounted Drilling Rig | <input type="checkbox"/> Land Based Drilling Rig | <input type="checkbox"/> Tugboat |
| <input type="checkbox"/> Other: | | |

Step 11 of 15 - Project Alternatives

a. Total acres of wetlands and/or waterbottoms filled and/or excavated.

0 acres

b. What alternative locations, methods, and access routes were considered to avoid impact to wetlands and/or waterbottoms?

As the project consists of restoring forested coastal wetland, avoidance of wetlands was not possible.

c. What efforts were made to minimize impact to wetlands and/or waterbottoms?

Since the project will result in the restoration of forested coastal wetlands, minimization impacts to wetlands was not possible.

d. How are unavoidable impacts to vegetated wetlands to be mitigated?

Since the project will result in the restoration of forested coastal wetlands, no mitigation is being proposed.

Step 12 of 15 - Permit Type and Owners

a. Are you applying for a Coastal Use Permit?

- No Yes

b. Are you the sole landowner / oyster lease holder?

- No Yes

The applicant is an owner of the property on which the proposed described activity is to occur.

The applicant has made reasonable effort to determine the identity and current address of the owner(s) of the land on which the proposed described activity is to occur, which included, a search of the public records of the parish in which the proposed activity is to occur.



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

c. Does the project involve drilling, production and/or storage of oil and gas distributed to the following landowners / oyster lease holders. See attached list.



No



Yes

If yes, you must attach a list of all state and federal laws and rules and regulations

Step 13 of 15 - Maps and Drawing Instructions

Note: OCM Compiled Plats consist of a complete and current set of plats that have been pieced together by OCM using only the most current portions of the plat files provided by the applicant/agent. All out-of-date plats have been excluded.

F01_VicinityMap.pdf

10/25/2013 02:54:56 PM

Step 14 of 15 - Payment

The fee for this permit is: \$ 100.00

Step 15 of 15 - Payment Processed

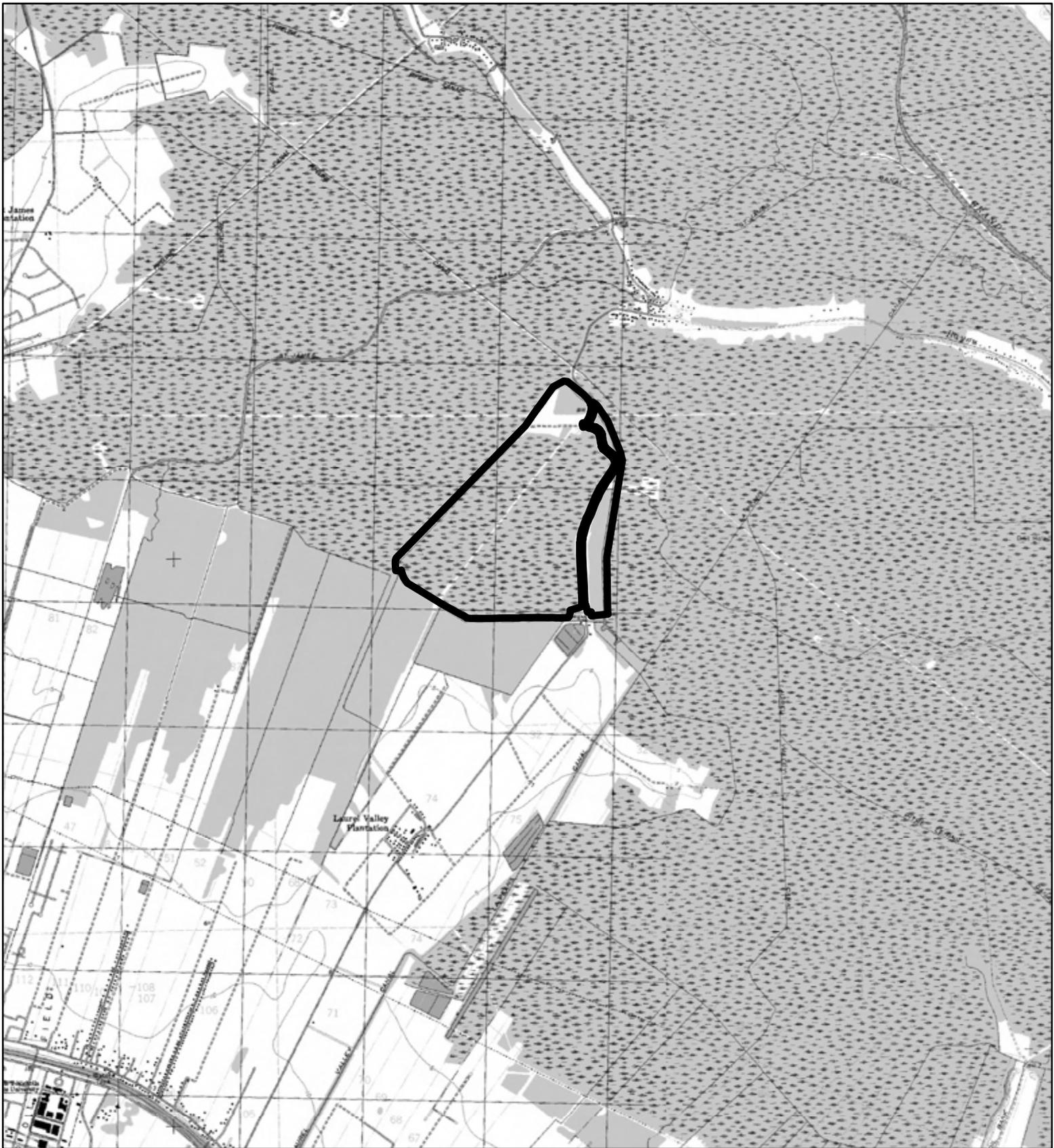
Applicant Information

Applicant Name: Delta Land Services,
Address: 1090 Cinclare Drive
Port Allen, LA 70767

To the best of my knowledge the proposed activity described in this permit application complies with, and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. If applicable, I also certify that the declarations in Step 12c, oil spill response, are complete and accurate.

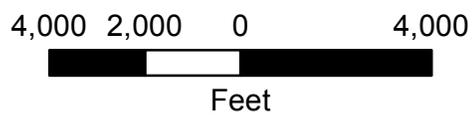
Landowners List

Landowner
Mr. Jerome S. McKee
P.O. Box 702
Thibodaux, LA 70302



Legend

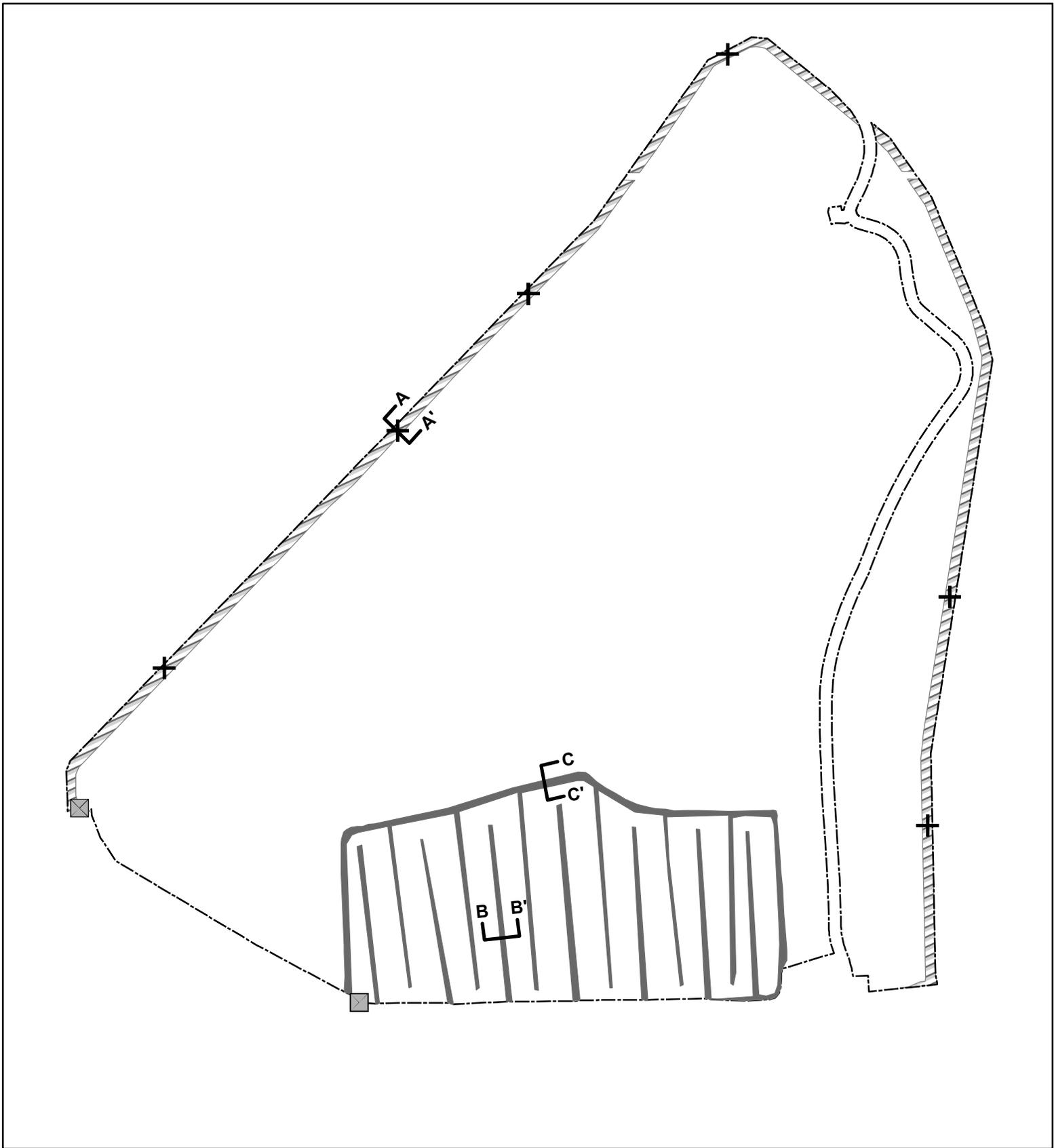
 Laurel Valley Coastal Mitigation Bank



**Laurel Valley
Coastal Mitigation Bank**
USGS 7.5-Minute Quadrangle
Lafourche Parish, Louisiana

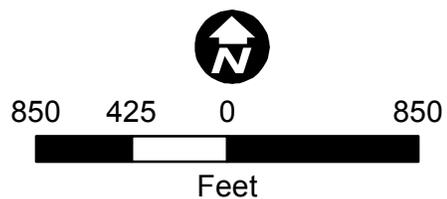
Created : LJV/AM10.1	
Approved : ---	
Date : 09/27/2013	
Map No. : FC-1_QUAD	

FIGURE FC-1



Legend

-  Laurel Valley Coastal Mitigation Bank
-  Perimeter Levee to be Gapped
-  Levees to be Degraded
-  Proposed Gaps
-  Drainage Structure to be Removed and Plugged



Laurel Valley Coastal Mitigation Bank

Plan View

Lafourche Parish, Louisiana

Created : LJW/AM10.1

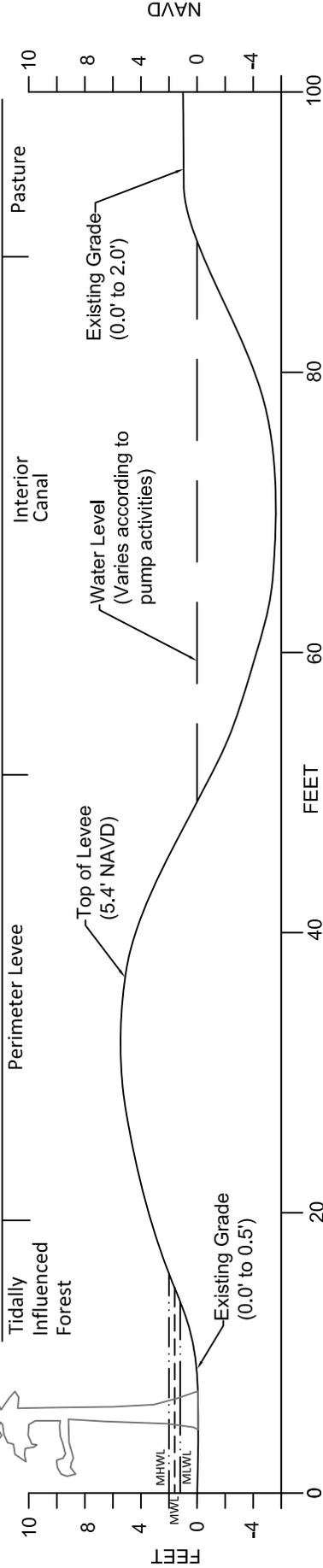
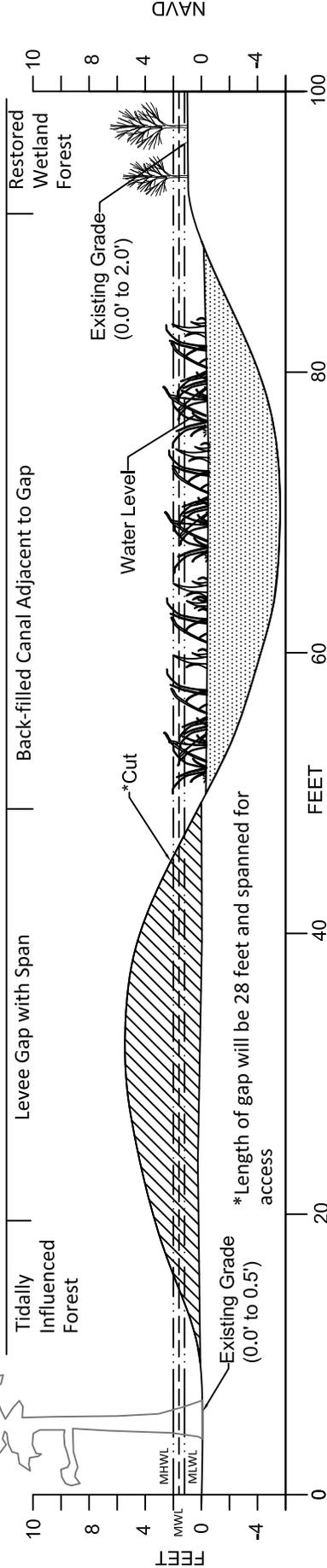
Approved : ---

Date : 11/7/2013

Map No. : FC-2_PLANVIEW



FIGURE FC-2

A**Existing Cross-Section A****A****Post Restoration Cross-Section A**

PROPOSED EXCAVATION

PROPOSED FILL

MHWL = MEDIAN HIGH WATER LEVEL IS 2.0 FEET (RANGE 1.5 TO 2.5 FEET)
 MVL = MEDIAN WATER LEVEL IS 1.6 FEET (RANGE 1.1 TO 2.0 FEET)
 MLWL = MEDIAN LOW WATER LEVEL IS 1.2 FEET (RANGE 0.6 TO 1.7 FEET)

Notes:

1. The water levels are from the Coastwide Reference Monitoring System (CRMS) stations 0206 and 0218 and based on daily records from September 2008 to October 2010.
2. The mean high water level is the average of all recorded levels above the mean water level and the mean low water level is the average of all recorded levels below the mean water level. The mean water level is the average of all recorded levels over this same period.

Proposed Laurel Valley Coastal Mitigation Bank
 Existing Condition with Proposed Restoration
 LAFOURCHE PARISH, LA

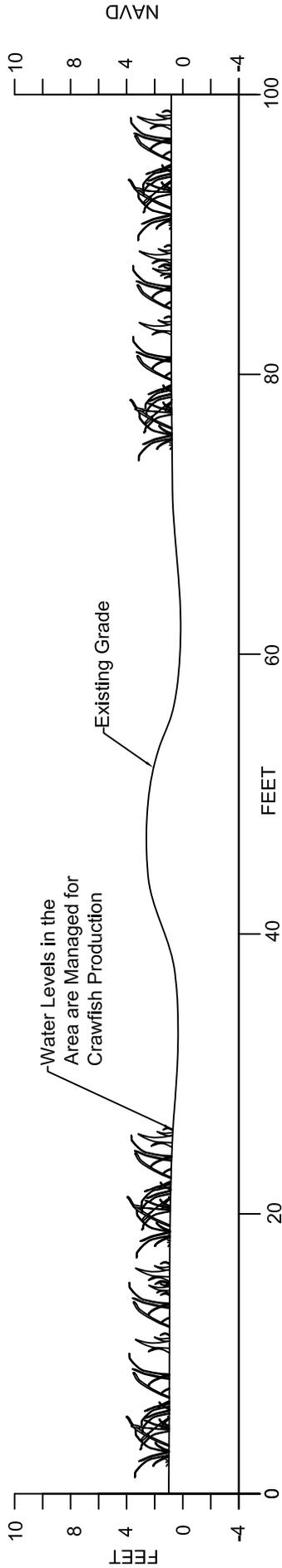
Created: TSC/AutoCAD
 Approved: LJJW
 Date: 11/7/2013
 Dwg. No.: XsectionA-C.dwg

**FIGURE C-3**

B

Existing Cross-Section B

Crawfish Pond | Agriculture Drain | Interior Levee | Agriculture Drain | Crawfish Pond

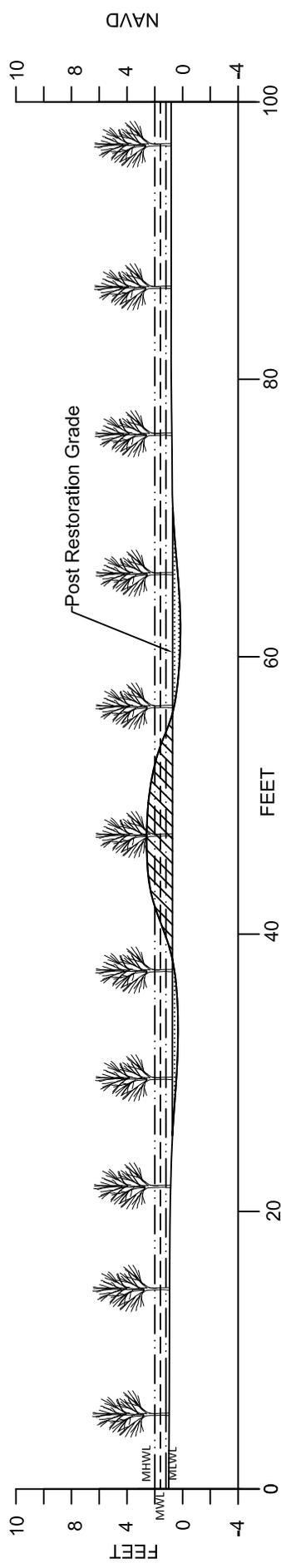


B'

B

Post Restoration Cross-Section B

Restored Wetland Forest



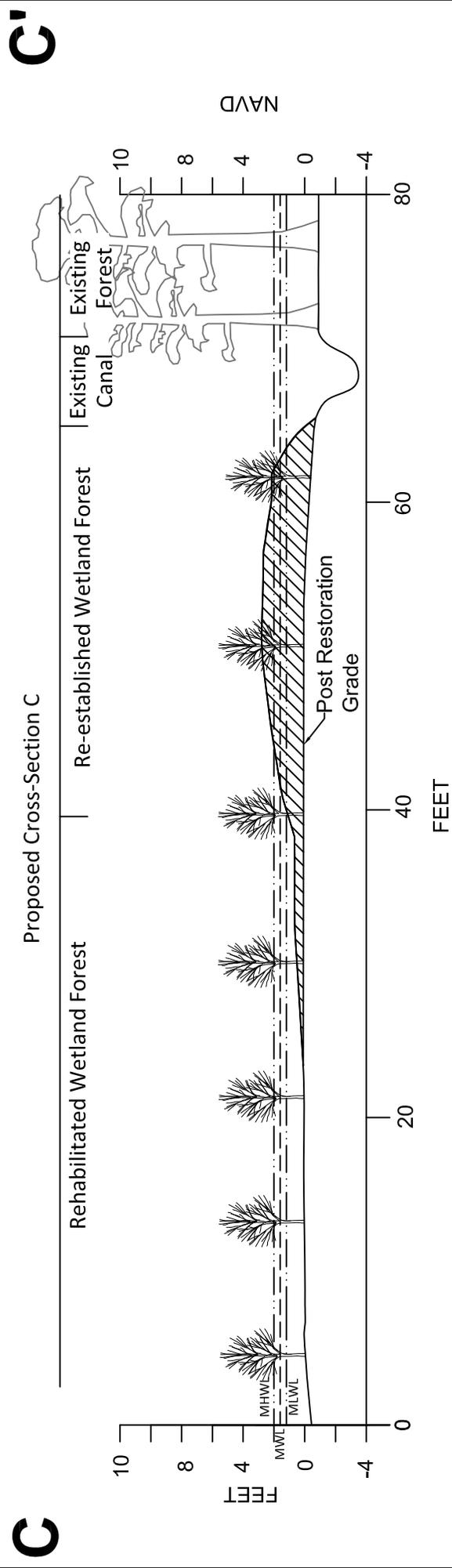
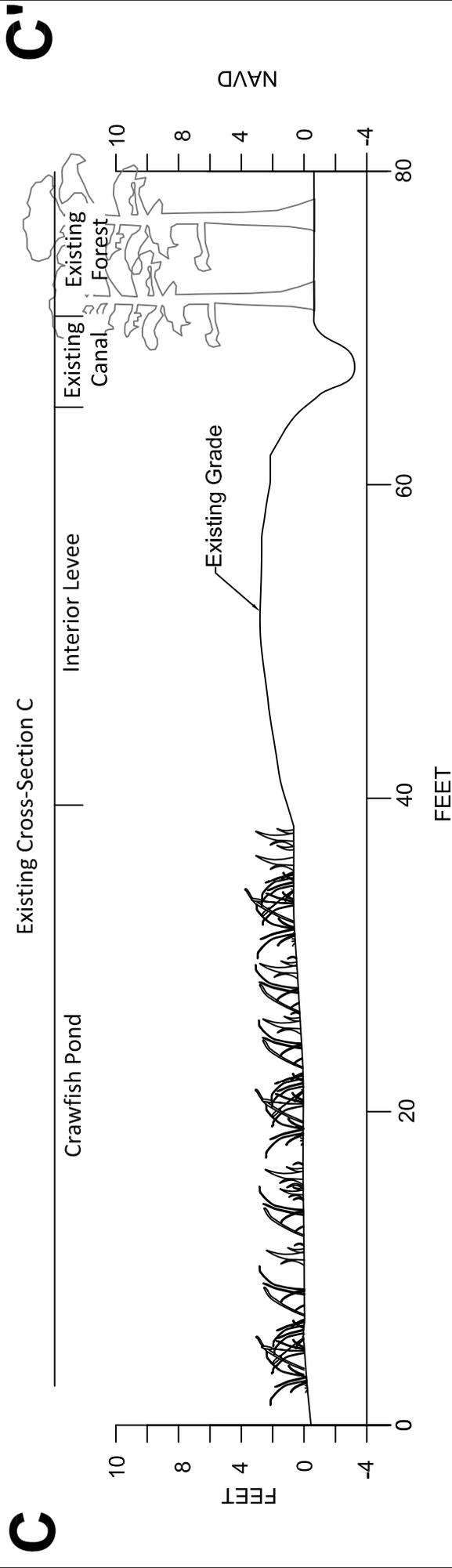
Proposed Laurel Valley Coastal Mitigation Bank
Existing Condition with Proposed Restoration
 LAFOURCHE PARISH, LA

Created:	TSC/AutoCAD
Approved:	LJW
Date:	11/7/2013
Dwg. No.:	XsectionA-C.dwg

PROPOSED EXCAVATION MHWL = MEDIAN HIGH WATER LEVEL IS 2.0 FEET (RANGE 1.5 TO 2.5 FEET)
 PROPOSED FILL MWL = MEDIAN WATER LEVEL IS 1.6 FEET (RANGE 1.1 TO 2.0 FEET)
 MLWL = MEDIAN LOW WATER LEVEL IS 1.2 FEET (RANGE 0.6 TO 1.7 FEET)

- Notes:
1. The water levels are from the Coastwide Reference Monitoring System (CRMS) stations 0206 and 0218 and based on daily records from September 2008 to October 2010.
 2. The mean high water level is the average of all recorded levels above the mean water level and the mean low water level is the average of all recorded levels below the mean water level. The mean water level is the average of all recorded levels over this same period.

FIGURE C-4



PROPOSED EXCAVATION

MHWL = MEDIAN HIGH WATER LEVEL IS 2.0 FEET (RANGE 1.5 TO 2.5 FEET)
 MWL = MEDIAN WATER LEVEL IS 1.6 FEET (RANGE 1.1 TO 2.0 FEET)
 MLWL = MEDIAN LOW WATER LEVEL IS 1.2 FEET (RANGE 0.6 TO 1.7 FEET)

Notes:
 1. The water levels are from the Coastwide Reference Monitoring System (CRMS) stations 0206 and 0218 and based on daily records from September 2008 to October 2010.
 2. The mean high water level is the average of all recorded levels above the mean water level and the mean low water level is the average of all recorded levels below the mean water level. The mean water level is the average of all recorded levels over this same period.

Proposed Laurel Valley Coastal Mitigation Bank
 Existing Condition with Proposed Restoration
 LAFOURCHE PARISH, LA

Created:	TSC/AutoCAD
Approved:	LJW
Date:	11/7/2013
Dwg. No.:	XsectionA-C.dwg

FIGURE C-5

APPENDIX D
SITE PHOTOGRAPHS



Existing pasture at Laurel Valley Coastal Mitigation Bank
(June 6, 2013)



Existing pasture at Laurel Valley Coastal Mitigation Bank (June 6, 2013)



Existing wetland forest along southern boundary at Laurel Valley Coastal Mitigation Bank (October 16, 2013)



Existing nonwet forest along Laurel Valley Road at Laurel Valley Coastal Mitigation Bank (October 16, 2013)



Existing crawfish ponds at Laurel Valley Coastal Mitigation Bank
(October 16, 2013)



Cultivated Prior Converted field along Laurel Valley Road at
Laurel Valley Coastal Mitigation Bank (June 5, 2013)



Perimeter levee at Laurel Valley Coastal Mitigation Bank
(June 6, 2013)



Existing drainage pump at Laurel Valley Coastal Mitigation Bank
(October 16, 2013)



Existing pipeline right-of-way at Laurel Valley Coastal Mitigation Bank (June 4, 2013)



Tidal coastal forest adjacent to Laurel Valley Coastal Mitigation Bank (June 6, 2013)



Cattle at Laurel Valley Coastal Mitigation Bank (October 16, 2013)



Existing irrigation pump at Laurel Valley Coastal Mitigation Bank (June 4, 2013)

APPENDIX E

DRAFT MVN MODIFIED CHARLESTON METHOD

Table 2B: Proposed Restoration/Enhancement Mitigation Worksheet

Mitigation Project Name:

Laurel Valley Coastal BLH and Swamp (11-7-2013)

Mitigation Project Size (Acres) Include Wetlands:

483.2

Non-wetlands and Buffer Areas:

Mitigation Project HUC: 08090301

Mitigation Project Basin: Barataria

Impacted HUC: (HUC)

Mitigation Project in the same basin as the impact: Yes

1.0

Proximity Factor:

		Area 1	Area 2	Area 3	Area 4	Area 5
Net Improvement	Factors	Area 1	Area 2	Area 3	Area 4	Area 5
	Mitigation Type	Re-establishment II	Rehabilitation II	Re-establishment I	Rehabilitation I	Enhancement I
	Maintenance/ Management Requirement	Self-Sustaining	Self-Sustaining	Self-Sustaining	Self-Sustaining	Self-Sustaining
	Control	Conservation Servitude				
	Temporal Lag	Over 20				
	Credit Schedule	Schedule 1				
Negative Influences on the mitigation site	Kind	(Select an Option)				
	Location	(Select an Option)				
	Commercial/Residential Development	No Impact				
	Oil & gas activities	No Impact				
Size	Size	Category 1				
	Corridors	Moderate	Moderate	No Impact	No Impact	No Impact

Table 2B: Proposed Restoration/Enhancement Mitigation Worksheet

Mitigation Project Name:

Laurel Valley Coastal BLH and Swamp (11-7-2013)

Factors	Area 1	Area 2	Area 3	Area 4	Area 5
Net Improvement					
Mitigation Type * Maintenance/ Management Requirement	3.5	2.7	4.0	3.0	2.3
Control	0.4	0.4	0.4	0.4	0.4
Temporal Lag	-0.3	-0.3	-0.3	-0.3	-0.3
Credit Schedule	0.4	0.4	0.4	0.4	0.4
Kind	0.0	0.0	0.0	0.0	0.0
Location	0.0	0.0	0.0	0.0	0.0
Subtotal	4.0	3.2	4.5	3.5	2.8
Commercial/Residential Development	0.0	0.0	0.0	0.0	0.0
Oil & gas activities	0.0	0.0	0.0	0.0	0.0
Size	0.0	0.0	0.0	0.0	0.0
Utility Corridors	-0.3	-0.3	0.0	0.0	0.0
Sum of negative impacts	-0.3	-0.3	0.0	0.0	0.0
Sum of m Factors	3.8	3.0	4.5	3.5	2.8
Size of Area (Acres)	69.7	119.7	14.3	74.2	8.9
M x A =	261.4	353.1	64.4	259.7	24.9
Acres required for Permittee-responsible Mitigation project using required credits calculated in Adverse impact Worksheet.	0.0	0.0	0.0	0.0	0.0
Total Restoration/Enhancement Credits = $\sum (M \times A) =$					
Total Available including buffers					
Average Credit Per Acre =					
					963.5
					1059.8
					3.7

	Buffers	Non-hydric inclusions	Hydric Inclusions
Credits per acre (M)	0.2	0.4	0.6
Size in Acres (A)		0.0	196.4
M x A =	0.0	0.0	117.8
Credits added to bank =			96.3

Table 1: Adverse Impacts Worksheet*General Comments*

Factor	Comment
Priority Category	
Existing Habitat Condition	
Existing Hydrologic Condition	
Duration	
Dominant Impact	
Cumulative Impact	

Mitigation Project Name: Laurel Valley Coastal BLH and Swamp (11-7-2013)**Table 2B: Proposed Restoration/Enhancement Mitigation Worksheet***General Comments*

Areas 1 and 2 are BLH/ Swamp Restoration from areas currently in pasture. Areas 3 and 4 are Swamp Restoration from areas currently in for crawfish pond.

Factor	Comment	
Net Improvement	Mitigation Type	Area 5 would technically be re-establishment but it appears MCM not designed for hydrology restoration to existing nonwetland forest so enhancement factor used.
	Maintenance/ Management Requirement	Area subject to influence of natural hydrologic cycles following completion of hydrology restoration.
	Control	Perpetual conservation servitude will be used for project.
	Temporal Lag	All forested restoration so temporal lags >20 years.
	Credit Schedule	Project will be construction prior to a majority of the credits being released.
	Kind	Cannot be determined until applicants impacts are assessed.
	Location	Cannot be determined until applicants impacts are assessed.
Negative Influences on the mitigation site	Commercial/Residential Development	Less than 1% development within one mile of project perimeter.
	Oil & gas activities	No wells within project area. Wells drilled nearby were plugged and abandoned.
	Size	Project greater than 500 acres and adjacent to coastal wetland forests which will not be developed.
	Corridors	No pipeline in enhancement or crawfish pond restoration areas (Areas 3, 4, and 5)

APPENDIX F
DRAFT WETLANDS VALUE ASSESSMENT

Habitat	Acres	Net AAHUs	Management Potential
Bottomland Hardwood Re-establishment	69.7	46.03	0.66
Bottomland Hardwood Rehabilitation	49.1	32.56	0.66
Bottomland Hardwood Re-establishment/Enhancement	8.9	2.91	0.33
Baldcypress Swamp/Type 1 BLH Re-establishment	14.3	8.34	0.58
Baldcypress Swamp/ Type 1 BLH Rehabilitation	144.8	84.45	0.58

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Re-establishment

Acres: 69.7

Condition: Future With Project

Variable		TY 0		TY 1		TY 10				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 1		Class 1		Class 5	1.00			
V2	Maturity (input age or dbh, not both)	Age 0 dbh	0.00	Age 1 dbh	0.00	Age 10 dbh	0.10			
V3	Understory / Midstory	Understory % 100 Midstory % 0		Understory % 100 Midstory % 0		Understory % 50 Midstory % 50		0.60	0.60	1.00
V4	Hydrology	Class 1	0.10	Class 3	1.00	Class 3	1.00			
V5	Forest Size	Class 1		Class 1		Class 5	1.00			
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84	79	0.84	79	0.84			
	Abandoned Ag	5		5		5				
	Pasture / Hay	15		15		15				
	Active Ag	1		1		1				
	Development									
V7	Disturbance	Class 3	0.41	Class 4	1.00	Class 4	1.00			
	Type	Class 1		Class 3		Class 3				
	Distance									
		HSI =		HSI = 0.06		HSI = 0.53				

Project..... Laurel Valley Re-establishment

FWP

Variable		TY 50		TY		TY				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 5	1.00	Class		Class				
V2	Maturity (input age or dbh, not both)	Age 50 dbh	1.00	Age dbh		Age dbh				
V3	Understory / Midstory	Understory % 70 Midstory % 20	0.95	Understory % Midstory %		Understory % Midstory %		0.90		1.00
V4	Hydrology	Class 3	1.00	Class		Class				
V5	Forest Size	Class 5	1.00	Class		Class				
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84							
	Abandoned Ag	5								
	Pasture / Hay	15								
	Active Ag	1								
	Development									
V7	Disturbance	Class 4	1.00	Class		Class				
	Type	Class 3		Class		Class				
	Distance									
		HSI = 0.98		HSI =		HSI =				

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Re-establishment

Acres: 69.7

Condition: Future Without Project

Variable		TY 0		TY 1		TY 10	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Species Assoc.	Class 1		Class 1		Class 1	
V2	Maturity (input age or dbh, not both)	Age 0	0.00	Age 0	0.00	Age 0	0.00
		dbh 0		dbh 0		dbh 0	
V3	Understory / Midstory	Understory % 0		Understory % 0		Understory % 0	0.10 0.10 0.10
		Midstory % 0		Midstory % 0		Midstory % 0	0.10 0.10 0.10
V4	Hydrology	Class 1	0.10	Class 1	0.10	Class 1	0.10
V5	Forest Size	Class 1		Class 1		Class 1	
V6	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84	79	0.84	79	0.84
	Abandoned Ag Pasture / Hay	5		5		5	
	Active Ag Development	15 1		15 1		15 1	
V7	Disturbance	Class 3	0.41	Class 3	0.41	Class 3	0.41
	Type	Class 1		Class 1		Class 1	
	Distance						
		HSI =		HSI =		HSI =	

Project..... Laurel Valley Re-establishment
FWOP

Variable		TY 50		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Species Assoc.	Class 1		Class		Class	
V2	Maturity (input age or dbh, not both)	Age 0	0.00	Age		Age	
		dbh		dbh		dbh	
V3	Understory / Midstory	Understory % 0		Understory %		Understory %	0.10
		Midstory % 0		Midstory %		Midstory %	0.10
V4	Hydrology	Class 1	0.10	Class		Class	
V5	Forest Size	Class 1		Class		Class	
V6	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84				
	Abandoned Ag Pasture / Hay	5					
	Active Ag Development	15 1					
V7	Disturbance	Class 3	0.41	Class		Class	
	Type	Class 1		Class		Class	
	Distance						
		HSI =		HSI =		HSI =	

AAHU CALCULATION, Bottomland Hardwoods

Project: Laurel Valley Re-establishment

Future With Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	69.7		0.00	
1	69.7	0.06	3.92	1.96
10	69.7	0.53	37.28	185.41
50	69.7	0.98	68.42	2114.17
			Total CHUs =	2301.54
			AAHUs =	46.03

Future Without Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	69.7		0.00	
1	69.7		0.00	0.00
10	69.7		0.00	0.00
50	69.7		0.00	0.00
			Total CHUs =	0.00
			AAHUs =	0.00

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	46.03
B. Future Without Project AAHUs =	0.00
Net Change (FWP - FWOP) =	46.03

NET CHANGE IN CHUs DUE TO PROJECT	
A. Future With Project CHUs =	2301.54
B. Future Without Project CHUs =	0.00
Net Change (FWP - FWOP) =	2301.54

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Rehabilitation

Acres: 49.1

Condition: Future With Project

Variable		TY 0		TY 1		TY 10				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 1		Class 1		Class 5	1.00			
V2	Maturity (input age or dbh, not both)	Age 0 dbh	0.00	Age 1 dbh	0.00	Age 10 dbh	0.10			
V3	Understory / Midstory	Understory % 100 Midstory % 0		Understory % 100 Midstory % 0		Understory % 50 Midstory % 50		0.60	0.60	1.00
V4	Hydrology	Class 2	0.50	Class 3	1.00	Class 3	1.00			
V5	Forest Size	Class 1		Class 1		Class 5	1.00			
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84	79	0.84	79	0.84			
	Abandoned Ag	5		5		5				
	Pasture / Hay	15		15		15				
	Active Ag	1		1		1				
	Development									
V7	Disturbance	Class 3	0.41	Class 4	1.00	Class 4	1.00			
	Type	Class 1		Class 3		Class 3				
	Distance									
		HSI =		HSI = 0.06		HSI = 0.53				

Project..... Laurel Valley Rehabilitation
FWP

Variable		TY 50		TY		TY				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 5	1.00	Class		Class				
V2	Maturity (input age or dbh, not both)	Age 50 dbh	1.00	Age dbh		Age dbh				
V3	Understory / Midstory	Understory % 50 Midstory % 50	1.00	Understory % Midstory %		Understory % Midstory %		1.00		1.00
V4	Hydrology	Class 3	1.00	Class		Class				
V5	Forest Size	Class 5	1.00	Class		Class				
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84							
	Abandoned Ag	5								
	Pasture / Hay	15								
	Active Ag	1								
	Development									
V7	Disturbance	Class 4	1.00	Class		Class				
	Type	Class 3		Class		Class				
	Distance									
		HSI = 0.99		HSI =		HSI =				

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Rehabilitation

Acres: 49.1

Condition: Future Without Project

Variable		TY 0		TY 1		TY 10	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Species Assoc.	Class 1		Class 1		Class 1	
V2	Maturity (input age or dbh, not both)	Age 0	0.00	Age 0	0.00	Age 0	0.00
		dbh 0		dbh 0		dbh 0	
V3	Understory / Midstory	Understory % 0		Understory % 0		Understory % 0	0.10 0.10 0.10
		Midstory % 0		Midstory % 0		Midstory % 0	0.10 0.10 0.10
V4	Hydrology	Class 2	0.50	Class 2	0.50	Class 2	0.50
V5	Forest Size	Class 1		Class 1		Class 1	
V6	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84	79	0.84	79	0.84
	Abandoned Ag Pasture / Hay	5		5		5	
	Active Ag Development	15 1		15 1		15 1	
V7	Disturbance	Class 3	0.41	Class 3	0.41	Class 3	0.41
	Type	Class 1		Class 1		Class 1	
	Distance						
		HSI =		HSI =		HSI =	

Project..... Laurel Valley Rehabilitation
FWOP

Variable		TY 50		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Species Assoc.	Class 1		Class		Class	
V2	Maturity (input age or dbh, not both)	Age 0	0.00	Age		Age	
		dbh		dbh		dbh	
V3	Understory / Midstory	Understory % 0		Understory %		Understory %	0.10
		Midstory % 0		Midstory %		Midstory %	0.10
V4	Hydrology	Class 2	0.50	Class		Class	
V5	Forest Size	Class 1		Class		Class	
V6	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84				
	Abandoned Ag Pasture / Hay	5					
	Active Ag Development	15 1					
V7	Disturbance	Class 3	0.41	Class		Class	
	Type	Class 1		Class		Class	
	Distance						
		HSI =		HSI =		HSI =	

AAHU CALCULATION, Bottomland Hardwoods

Project: Laurel Valley Rehabilitation

Future With Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	49.1		0.00	
1	49.1	0.06	2.76	1.38
10	49.1	0.53	26.26	130.61
50	49.1	0.99	48.53	1495.94
			Total	
			CHUs =	1627.93
			AAHUs =	32.56

Future Without Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	49.1		0.00	
1	49.1		0.00	0.00
10	49.1		0.00	0.00
50	49.1		0.00	0.00
			Total	
			CHUs =	0.00
			AAHUs =	0.00

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	32.56
B. Future Without Project AAHUs =	0.00
Net Change (FWP - FWOP) =	32.56

NET CHANGE IN CHUs DUE TO PROJECT	
A. Future With Project CHUs =	1627.93
B. Future Without Project CHUs =	0.00
Net Change (FWP - FWOP) =	1627.93

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Re-Establishment/Enhancement Acres: 8.9

Condition: Future With Project

Variable		TY 0		TY 1		TY 10				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class	4	0.80	Class	4	0.80	Class	5	1.00
V2	Maturity (input age or dbh, not both)	Age			Age			Age		
		dbh	5	0.05	dbh	5	0.05	dbh	10	0.23
V3	Understory / Midstory	Understory %	5		Understory %	5		Understory %	50	0.25
		Midstory %	5	0.29	Midstory %	5	0.29	Midstory %	50	1.00
V4	Hydrology	Class	1	0.10	Class	3	1.00	Class	3	1.00
V5	Forest Size	Class	5	1.00	Class	5	1.00	Class	5	1.00
V6	Surrounding Land Use	Values %			Values %			Values %		
	Forest / marsh	79	0.84	79	0.84	79	0.84			
	Abandoned Ag	5		5		5				
	Pasture / Hay	15		15		15				
	Active Ag	1		1		1				
	Development									
V7	Disturbance	Class	4	1.00	Class	4	1.00	Class	4	1.00
	Type	Class			Class			Class		
	Distance	Class	3		Class	3		Class	3	
		HSI =	0.26		HSI =	0.35		HSI =	0.67	

Project..... Laurel Valley Re-Establishment/Enhancement
FWP

Variable		TY 50		TY		TY				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class	5	1.00	Class			Class		
V2	Maturity (input age or dbh, not both)	Age			Age			Age		
		dbh	20	1.00	dbh			dbh		
V3	Understory / Midstory	Understory %	50		Understory %			Understory %		1.00
		Midstory %	50	1.00	Midstory %			Midstory %		1.00
V4	Hydrology	Class	3	1.00	Class			Class		
V5	Forest Size	Class	5	1.00	Class			Class		
V6	Surrounding Land Use	Values %			Values %			Values %		
	Forest / marsh	79	0.84							
	Abandoned Ag	5								
	Pasture / Hay	15								
	Active Ag	1								
	Development									
V7	Disturbance	Class	4	1.00	Class			Class		
	Type	Class			Class			Class		
	Distance	Class	3		Class			Class		
		HSI =	0.99		HSI =			HSI =		

COMMUNITY HABITAT SUITABILITY MODEL

Bottomland Hardwoods

Project..... Laurel Valley Re-Establishment/Enhancement Acres: 8.9

Condition: Future Without Project

Variable		TY 0		TY 1		TY 10				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 4	0.80	Class 4	0.80	Class 4	0.80			
V2	Maturity (input age or dbh, not both)	Age dbh 5	0.05	Age dbh 5	0.05	Age dbh 10	0.23			
V3	Understory / Midstory	Understory % 5		Understory % 5		Understory % 5		0.25	0.25	0.25
		Midstory % 5	0.29	Midstory % 5	0.29	Midstory % 5	0.29	0.33	0.33	0.33
V4	Hydrology	Class 1	0.10	Class 1	0.10	Class 1	0.10			
V5	Forest Size	Class 5	1.00	Class 5	1.00	Class 5	1.00			
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84	79	0.84	79	0.84			
	Abandoned Ag Pasture / Hay	5		5		5				
	Active Ag Development	15 1		15 1		15 1				
V7	Disturbance	Class 4	1.00	Class 4	1.00	Class 4	1.00			
	Type	Class 3		Class 3		Class 3				
	Distance									
		HSI = 0.26		HSI = 0.26		HSI = 0.39				

Project..... Laurel Valley Re-Establishment/Enhancement
FWP

Variable		TY 50		TY		TY				
		Class/Value	SI	Class/Value	SI	Class/Value	SI			
V1	Species Assoc.	Class 4	0.80	Class		Class				
V2	Maturity (input age or dbh, not both)	Age dbh 16	0.73	Age dbh		Age dbh				
V3	Understory / Midstory	Understory % 5		Understory %		Understory %		0.25		
		Midstory % 5	0.29	Midstory %		Midstory %		0.33		
V4	Hydrology	Class 1	0.10	Class		Class				
V5	Forest Size	Class 5	1.00	Class		Class				
V6	Surrounding Land Use	Values %		Values %		Values %				
	Forest / marsh	79	0.84							
	Abandoned Ag Pasture / Hay	5								
	Active Ag Development	15 1								
V7	Disturbance	Class 4	1.00	Class		Class				
	Type	Class 3		Class		Class				
	Distance									
		HSI = 0.53		HSI =		HSI =				

AAHU CALCULATION, Bottomland Hardwoods

Project: Laurel Valley Re-Establishment/Enhancement

Future With Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	8.9	0.26	2.32	
1	8.9	0.35	3.16	2.74
10	8.9	0.67	5.97	41.08
50	8.9	0.99	8.80	295.48
			Total CHUs =	339.31
			AAHUs =	6.79

Future Without Project			Total HUs	Cummulative HUs
TY	Acres	x HSI		
0	8.9	0.26	2.32	
1	8.9	0.26	2.32	2.32
10	8.9	0.39	3.51	26.23
50	8.9	0.53	4.76	165.22
			Total CHUs =	193.77
			AAHUs =	3.88

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	6.79
B. Future Without Project AAHUs =	3.88
Net Change (FWP - FWOP) =	2.91

NET CHANGE IN CHUs DUE TO PROJECT	
A. Future With Project CHUs =	339.31
B. Future Without Project CHUs =	193.77
Net Change (FWP - FWOP) =	145.54

COMMUNITY HABITAT SUITABILITY MODEL

Fresh Swamp

Project.....Laurel Valley Re-establishment

Acres:

14.3

Condition: Future With Project

Variable		TY 0		TY 1		TY 10	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Stand Structure	% Cover		% Cover		% Cover	
	Overstory	0		0		60	0.60
	Scrub shrub	0		0		50	
	Herbaceous	100		100		20	
V2	Maturity (input age or species composition and dbh)	Age		Age	0.00	Age	
		Cypress %	0	Cypress %	1	Cypress %	10
		Cypress dbh		Cypress dbh		Cypress dbh	
		Tupelo et al. %		Tupelo et al. %		Tupelo et al. %	
		Tupelo et al dbh		Tupelo et al dbh		Tupelo et al dbh	
							0.10
V3	Hyrology	Class	1	Class	3	Class	3
			0.10		0.80		0.80
V4	Forest Size	Class	1	Class	1	Class	5
							1.00
V5	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84	79	0.84	79	0.84
	Abandoned Ag						
	Pasture / Hay	5		5		5	
	Active Ag Development	15		15		15	
		1		1		1	
V6	Disturbance	Class		Class		Class	
	Type	3	0.41	4	1.00	4	1.00
	Distance	Class		Class		Class	
		1		3		3	
		HSI =		HSI = 0.05		HSI = 0.40	

Project.....Laurel Valley Re-establishment

FWP

Variable		TY 50		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Stand Structure	% Cover		% Cover		% Cover	
	Overstory	70	1.00				
	Scrub shrub	35					
	Herbaceous	35					
V2	Maturity (input age or species composition and dbh)	Age		Age		Age	
		50	1.00				
		Cypress %		Cypress %		Cypress %	
		Cypress dbh		Cypress dbh		Cypress dbh	
		Tupelo et al. %		Tupelo et al. %		Tupelo et al. %	
		Tupelo et al dbh		Tupelo et al dbh		Tupelo et al dbh	
V3	Hyrology	Class	3	Class		Class	
			0.80				
V4	Forest Size	Class	5	Class		Class	
			1.00				
V5	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84				
	Abandoned Ag						
	Pasture / Hay	5					
	Active Ag Development	15					
		1					
V6	Disturbance	Class		Class		Class	
	Type	4	1.00	4	1.00	4	1.00
	Distance	Class		Class		Class	
		3		3		3	
		HSI = 0.95		HSI =		HSI =	

COMMUNITY HABITAT SUITABILITY MODEL

Fresh Swamp

Project..... Laurel Valley Re-establishment

Acres:

14.3

Condition: Future Without Project

Variable		TY 0		TY 1		TY 10	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Stand Structure	% Cover		% Cover		% Cover	
	Overstory	0		0		0	
	Scrub shrub	0		0		0	
	Herbaceous	0		0		0	
V2	Maturity (input age or species composition and dbh)	Age		Age		Age	
		0		0		0	
		Cypress %		Cypress %		Cypress %	
		Cypress dbh		Cypress dbh		Cypress dbh	
		Tupelo et al. %		Tupelo et al. %		Tupelo et al. %	
	Tupelo et al dbh		Tupelo et al dbh		Tupelo et al dbh		
V3	Hyrology	Class	1 0.10	Class	1 0.10	Class	1 0.10
V4	Forest Size	Class	1	Class	1	Class	1
V5	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84	79	0.84	79	0.84
	Abandoned Ag						
	Pasture / Hay	5		5		5	
	Active Ag Development	15		15		15	
V6	Disturbance	Class		Class		Class	
	Type	3	0.41	3	0.41	3	0.41
		Class		Class		Class	
	Distance	1		1		1	
		HSI =		HSI =		HSI =	

Project..... Laurel Valley Re-establishment

FWP

Variable		TY 50		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Stand Structure	% Cover		% Cover		% Cover	
	Overstory	0					
	Scrub shrub	0					
	Herbaceous	0					
V2	Maturity (input age or species composition and dbh)	Age		Age		Age	
		0					
		Cypress %		Cypress %		Cypress %	
		Cypress dbh		Cypress dbh		Cypress dbh	
		Tupelo et al. %		Tupelo et al. %		Tupelo et al. %	
	Tupelo et al dbh		Tupelo et al dbh		Tupelo et al dbh		
V3	Hyrology	Class	1 0.10	Class		Class	
V4	Forest Size	Class	1	Class		Class	
V5	Surrounding Land Use	Values %		Values %		Values %	
	Forest / marsh	79	0.84				
	Abandoned Ag						
	Pasture / Hay	5					
	Active Ag Development	15					
V6	Disturbance	Class		Class		Class	
	Type	3	0.41	Class		Class	
		Class		Class		Class	
	Distance	1					
		HSI =		HSI =		HSI =	

