

JOINT PUBLIC NOTICE

November 21, 2016

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Corps of Engineers
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Project Manager
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Permit Application Number
MVN-2015-00703-MG

Project Manager
Elizabeth Hill
WQC Application Number
WQC # 161114-02

Interested parties are hereby notified that a prospectus and permit application has been received by the New Orleans District of the U.S. Army Corps of Engineers pursuant to: [X] 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).

Application has also been made to the Louisiana Department of Environmental Quality, for a Water Quality Certification (WQC) in accordance with statutory authority contained in Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A(3) and provisions of Section 401 of the Clean Water Act (P.L.95-17).

WILLOW LAKE WETLAND MITIGATION BANK, CAMERON PARISH

NAME OF APPLICANT: ecoGENESIS, L.L.C., Attn: Pamela Fetterman, 4152 Independence Court, C-7, Sarasota, Florida, 34234.

LOCATION OF WORK: The project area is located in Cameron Parish within Sections 15 and 22, Township 12 South, Range 8 West. The approximate site center is Latitude 30.002364 N, 93.172175 W. The project is located within the Chenier Plain of Louisiana and within the Lower Calcasieu Basin, Hydrologic Unit 08070206.

CHARACTER OF WORK: ecoGENESIS, L.L.C. proposes to fill or plug drains and furrows, degrade hydrologic impediments, plant site appropriate wetland vegetation, and restore the natural elevations of the site. These activities are to be conducted for the purpose of enhancing and restoring traditional surface hydrology in the construction of a wetland mitigation bank.

The comment period for the Department of the Army Permit and the Louisiana Department of Environmental Quality WQC will close **30 days** from the date of this joint public notice. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons thereof, are being solicited from anyone having interest in this permit and/or this WQC request and must be mailed so as to be received before or by the last day of the comment period. Letters concerning the Corps of Engineers permit application must reference the applicant's name and the Permit Application Number, and be mailed to the Corps of Engineers

at the address above, **ATTENTION: REGULATORY BRANCH**. Similar letters concerning the **Water Quality Certification must reference the applicant's name and the WQC Application number and be mailed to the Louisiana Department of Environmental Quality at the address above.**

The application for this proposed project is on file with the Louisiana Department of Environmental Quality and may be examined during weekdays between 8:00 a.m. and 4:30 p.m. Copies may be obtained upon payment of costs of reproduction.

Corps of Engineers Permit Criteria

The decision whether to issue a permit will be based on an evaluation of the probable impacts, 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 which 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, considerations of property ownership and, in general, the needs and welfare of the people.

The U.S. Army 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 U.S. Army Corps of Engineers to determine whether to make, 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 other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an 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.

The New Orleans District is unaware of properties listed on the National Register of Historic Places near the proposed work. The possibility exists that the proposed work may damage or destroy presently unknown archeological, scientific, prehistorical, historical sites, or data. Issuance of this public notice solicits input from the State Archeologist and State Historic Preservation Officer regarding potential impacts to cultural resources.

Our initial finding is that the proposed work would neither affect any species listed as endangered by the U.S. Departments of Interior or Commerce, 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 Magnuson-Stevens Fishery Conservation and Management Act. The applicant's proposal would result in the destruction or alteration of N/A acre(s) 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. Also, a certification that the proposed activity will not violate applicable water quality standards will be required from the Department of Environmental Quality, 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.

The applicant has certified that the proposed activity described in the application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. The Department of the Army permit will not be issued unless the applicant received approval or a waiver of the Coastal Use Permit by the Department of Natural Resources.

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

Martin S. Mayer
Chief, Regulatory Branch

Enclosure

REVISED PROSPECTUS

Willow Lake Wetland Mitigation Bank

Cameron Parish, Louisiana

November 1, 2016



Prepared for:



US Army Corps of Engineers

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Sponsor

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Revised Prospectus for the Proposed Willow Lake Wetland Mitigation Bank

Cameron Parish, Louisiana

November 1, 2016

Sponsor:

Willow Lake Holdings, LLC

Agent(s):

EcoGENESIS, LLC

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Sarasota, FL 34234



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1.0 INTRODUCTION

EcoGENESIS, LLC in collaboration with Pan American Engineers, LLC and on behalf of the mitigation bank Sponsor (Willow Lake Holdings, LLC) submits this complete prospectus to the United States Army Corps of Engineers (USACE) New Orleans District, the Interagency Review Team (IRT), and the Louisiana Department of Natural Resources (LDNR) for evaluation of the ± 394 acre Willow Lake Mitigation Bank (WLMB) site for wetland mitigation banking purposes. This prospectus was prepared to meet the requirements of 33CFR 332.8(d) (i) through (vii), and initiates the prospectus phase of the mitigation bank evaluation process outlined in 33 CFR 332.8(d)(2) through (5). This prospectus also contains the information and elements outlined by New Orleans District (CEMVN) mitigation bank policy and guidance as promulgated through the “Prospectus Checklist” and template, as most recently available and downloaded on May 16, 2016 from the USACE RIBBITS website (USACE, 2016). This prospectus submittal is also designed to meet the requirements of the LDNR Coastal Use Permitting (CUP) process for Mitigation Banks.

The WLMB site is proposed as compensatory offset for wetland impacts to aquatic resources regulated by the USACE under Section 404 of the Clean Water Act, Sections 9 and 10 of the Rivers and Harbors Act of 1899, the Louisiana State and Local Coastal Resources Management Act of 1978, and other applicable Federal and/or state rule requirements such as the National Environmental Policy Act (NEPA) requiring environmental offsets to wetlands and other protected or regulated habitats.

1.1 Site Location

The WLMB site is a ± 394 acre tract located in Sections 15 & 22, Township 12S and Range 8W in northern Cameron Parish, Louisiana (**Figure 1**). The WLMB is located just northeast of Calcasieu Lake and southeast of Lake Charles, LA. The approximate coordinates of the site are 30.002364, -93.172175. The northeast corner of the site is located approximately 0.56 miles southwest of the intersection of La Highway 384 and Tans Road, west of Eric Road where the public road ends and becomes a private roadway that dead ends into the site.

The total property owned and controlled by the Sponsor is ±394 acres, of which ±375.2 acres are proposed to be developed as a wetland mitigation bank and encumbered by a conservation servitude. The proposed bank currently consists of approximately ±329.5 acres of improved (including wet) pasture, and ±16 acres of marsh. The improved pasture conditions have been maintained by drainage of the northern part of the site through French drains into an existing ditched, natural stream feature (hereafter referred to as the Parish maintained ditch), leeving and pumping. Most the WLMB site is below elevation 5.0, NAVD88 and is located within the Louisiana Coastal Zone. The WLMB location is also depicted on a composite of 2015 USGS 7.5-minute quadrangle maps Lake Charles SW and Sweet Lake (**Figure 2**).

The WLMB lies within the Chenier Plain of Louisiana and within the Lower Calcasieu USGS 8-digit hydrologic cataloguing unit (8080206) and greater Western Gulf Coastal Plain Level III ecoregion.

Within this larger Level III ecoregion, the WLMB occurs within the Northern Humid Gulf Coastal Prairie Level IV ecoregion, with the southern portion of the site within the Texas Louisiana Gulf Coastal Marshes and Prairie Level IV ecoregion (Daigle et al, 2006). This area is characterized by low, flat land formed from the deposition and re-deposition of Mississippi River sediments, and is characterized by discontinuous, long, linear ridges called “cheniers”, representing former tidal shorelines, that subdivide the coastal prairie into lower wetland areas called “coves”. **Table 1** below presents the current acreages of existing habitat types:

Table 1. Existing habitat types within the WLMB (pre-restoration).

Existing Habitat Type	Acres
Upland Pasture	116.1
Spoil, Levees and Unimproved Road	7.35
Wet Pasture (Section 404 Wetlands)	213.42
Jurisdictional Section 404 Waters	22.36
Brackish Marsh	15.95
TOTAL AREA	375.2

2.0 PROJECT GOALS AND OBJECTIVES

2.1 Project Goals

The WLMB proposes to rehabilitate, enhance and restore the following wetland habitat types and acreages, as outlined below in **Table 2**:

Table 2. Proposed habitat types for the WLMB (post-restoration).

Proposed Habitat Type	Mitigation Method	Acres
Bottomland Hardwood	Rehabilitation	53.19
Bottomland Hardwood	Re-establishment	50.73
Wet Coastal Prairie	Rehabilitation	49.09
Wet Coastal Prairie	Re-establishment	2.53
Mesic Coastal Prairie Non-Hydric Inclusion (Upland Buffer)	N/A	55.64
Freshwater/Intermediate Marsh	Rehabilitation	102.17
Freshwater/Intermediate Marsh	Re-establishment	7.68
Levee Impact Area (Restored)	N/A	14.91
Brackish Marsh (Section 10 Tidal)	Enhancement	15.95
Jurisdictional Section 404 Waters	No Mitigation	18.27
Non-Mitigation	N/A	5.02
TOTAL AREA		375.2

Figure 15 presents the proposed habitat and mitigation types/methods. Please note that the acreages presented in **Tables 1** and **2** only encompass the proposed bank area, and not the entire property owned and controlled by the Sponsor.

In sum, hydrologic restoration of the site will be achieved through the removal of drainage impediments such as French drains, levees and spoil, and backfilling of internal ditching not required to be maintained for offsite drainage onto and through the WLMB. Vegetative restoration and enhancement will be achieved through re-planting of appropriate bottomland hardwood species, and recruitment and elective re-planting of desirable, native freshwater/intermediate marsh species, coastal wet and mesic prairie species, and removal of nuisance and exotic species. The exotics Chinese tallow and McCartney rose are colonizing the upland buffer pimple mounds. The upland buffer pimple mound restoration will remove nuisance and exotic species and re-plant with native coastal prairie grasses and forbs.

2.2 Project Objectives

Implementation of the site restoration plan conceptually detailed in Section 4.1 using the mitigation methods outlined above is intended to result in increased wetland and aquatic habitat hydrological, ecological, and wildlife functions. These increased functions are defined in terms of the following project objectives outlined below:

- Increase flood storage and attenuation (hydrological function) through removal of spoil along the main drain and backfilling of internal ditching.
- Increased improvement in water quality functions and values through removal of cattle, re-establishment of overland flow (hydrological function) and uptake of nutrients from vegetative re-established, rehabilitated and enhanced, targeted wetland community types, resulting in improved water quality discharges into coastal, inland water bodies such as Willow and Sweet Lake bordering the site and ultimately, the Gulf of Mexico.
- Restoration of self-sustaining, bottomland hardwood floodplain, wet and mesic coastal prairie, and coastal freshwater/intermediate marsh hydrology with appropriate hydroperiod stages and durations for the targeted herbaceous wetland community types, and/or frequency of flooding for the targeted bottomland hardwood forested community types.
- Restoration of bottomland hardwood, mesic and wet coastal prairie, coastal freshwater/intermediate marsh native species assemblages resulting in increased vegetative and wildlife species richness and diversity (ecological function).
- Improved fish and wildlife habitat functions and values to the WLMB site and utilization through the re-establishment, rehabilitation and enhancement of native wetland community types, to adjacent, forested private lands, and to coastal marshlands and Waters of the United States into which the site discharges. The restoration of pimple mounds will also provide important areas of upland refugia for endangered and

threatened species for nesting and breeding, or during more extreme weather conditions and/or events. Threatened and endangered species likely to utilize the site post-restoration, or that currently utilize the site are discussed in greater detail in Section 3.3.

- Improvement in wildlife species movement (corridor function) and in nesting/spawning/breeding/feeding and loafing habitat through the restoration of hydrologic connectivity to coastal marshlands and Waters of the United States within and immediately south of the WLMB site. Restored habitats will provide high-quality habitats for endangered and threatened species which utilize these habitats, as discussed in further detail in Section 3.3
- Increased wildlife species diversity and richness through targeted habitat restoration and long-term management. With re-establishment of native, desirable vegetative species assemblages and hydrology appropriate for the targeted wetland habitat types, increased wildlife species diversity and richness is expected through time.

3.0 ECOLOGICAL SUITABILITY OF THE SITE

3.1 Historical Ecological Characteristics of the Site

The site, prior to agricultural conversion, was most likely a combination of coastal prairie or bottomland hardwoods in the northern portion of the site and coastal prairie grading into freshwater, then intermediate then brackish marsh in the southern portion of the site. Remnant mound features characteristic of coastal prairie habitats are present throughout the site, and in the earliest aerial imagery we could obtain (**Figure 3**). These features become more numerous and defined in the southern half of the site. Properties to the west and east also contain pimple mound features. The WLMB is just south of a natural chenier ridge, demarcated at its crest (10 ft., NAVD) by the presence of Louisiana Route 384 (**Figure 2**). The ridge slope topography still appears to be present and relatively unaltered, with the northeastern portion of the site occupying the approximate lower half of the chenier ridge slope at an estimated elevation of 5 ft., NAVD and sloping gently across the site to sea level at the very southern portion (**Figure 2**). The southern portion of the site appears, in its unaltered state, to have been a combination of wet coastal prairie and/or freshwater-marsh between the pimple mounds, pimple mounds with mesic coastal prairie, and intermediate to brackish marsh bordering inland coastal waters within the southernmost quarter of the site.

Through historical aerial research, by 1977 (**Figure 4**) the northern portion of the property appears to have been converted into some type of agricultural use, most likely improved pasture, and a pad in the current location of the pump station was also present. A leveed block appears adjacent to the pump station, indicating that this may have been farmed for rice or used for aquaculture production (crayfish). By 1998 (**Figure 5**), the presence of small levees throughout the southern part of the site and a smaller, more circuitous bounding levee indicates that the southern portion was used for commodity crop (rice) production. By 1998, most of the

properties to the east also appear in some form of agriculture, and the majority of the surrounding, low-density residential development existing today was present.

Since 1935, several significant regional and local alterations have affected drainage and tidal flow to coastal waters immediately south of the WLMB site. The 1935 quad map indicates a continuous marsh between Willow Lake and the southern boundary of the site. Prior to these alternations, the WLMB would have historically drained via overland sheet flow and poorly defined drainage ways into the coastal marshlands bordering Willow and Sweet Lake and ultimately into the Gulf of Mexico. Regionally, the completion of the Gulf Intracoastal Waterway in 1949 resulted in re-direction of tidal waters as well as the ability of more saline water to penetrate further inland. Coastal subsidence and increasing open water has also resulted in increasing loss of coastal marshlands and increasing areas of open water. Additional construction of water control dikes and structures by LDNR through the Coastal Wetlands Planning, Protection and Restoration (CWPPRA) program has also resulted in alterations to tidal flow locally and regionally.

The earliest USGS quadrangle maps available from 1932 and 1935 confirm that the major drainage feature running through the central part of the site from northeast to southwest (labeled as Parish maintained ditch on **Figure 2**) existed since at least 1932, and appears to be a natural, intermittent stream that drained areas from neighboring northeastern properties through the WLMB southwesterly into coastal marshlands bordering Willow Lake (**Figure 6**).

A “relief” ditch located along the northern property boundary was dug at some time between 1932 and 1942, and first appears on the 1942 USGS Quad maps (**Figure 7**). This relief ditch intercepts a portion of the runoff generated from off-site properties to the northeast and conveys it in a westerly direction. This relief ditch also captures off-site runoff generated from the neighboring northern properties, which presumably once flowed via overland sheet flow onto the WLMB. It is also apparent from the 1942 map that approximately ±200 acres of off-site properties located along the northeastern boundary drained via overland sheet flow onto the WLMB.

By 1955, two additional ditches appear on the USGS Quad maps (**Figure 8**). These ditches are partially located on the WLMB and connect to the Parish-maintained ditched stream feature. One of the ditches added on the 1955 map appears to provide further relief to the Parish maintained on-site ditch/stream by conveying a portion of the water generated from the neighboring northeast properties in a western direction, thence in a southern direction toward the marshes bordering Willow Lake. The southern leg of this ditch also intercepts runoff generated from the neighboring western properties. The second ditch added on the 1955 map traverses the center of the site in a west-east direction, thence in a northwest–northeast diagonal direction along the eastern side of the WLMB, thence in a ditch running in a west-east direction onto the neighboring eastern properties. The direction of flow from this second relief ditch cannot be concluded from the 1955 map and existing, 2002 LiDAR topographic data alone. Review of both the USGS quad maps and historic aerials also indicate that up until 1955 this area was largely rural with little or few single-family residential homes.

Between 1955 and 1998, a significant increase in residential development along Highway 384 and the addition of subdivisions along Tans Road to the east and McRain Road to the west have occurred. An aquaculture (crayfish) facility, also present in 1998, is directly adjacent to the WLMB site along the northwestern boundary, as evidenced by a series of levees and presence of standing water on the 1998 historic aerial (**Figure 5**) and USGS quad map. An Increase in development generally results in higher rates of runoff; however, the drainage patterns of the WLMB do not significantly change from that illustrated on the 1955 and 1975 USGS Quad maps. Existing elevated roads/trails on the site appear to have been constructed between 1955 and 1977 (**Figure 4**), with the spoil deposited alongside the road and associated ditches.

Additional significant site alterations affecting hydrology occurred sometime between 1975 and 2005 with the construction of a larger, man-made levee located near and generally along the southern boundary of the WLMB, therefore requiring the entire southern half of the site to be pumped to create positive drainage. In addition to pre-existing levees constructed prior to 1975, this additional levee prevents waters from the south from inundating the site and obstructs natural overland drainage of the WLMB into the coastal marshlands still present in a natural, albeit subsiding state at the very south end of the WLMB site. These marshlands historically extended to Willow Lake. A larger pump was also likely installed to control inundation and maintain optimal conditions for improved pasture grasses and cattle grazing. The pump discharges into a canal along the western boundary of the site that the Parish maintained stream/ditch also discharges into. This canal discharges directly into coastal waters within and due south of the WLMB site. If this levee and pre-existing levees built prior to 1975 were not present and the site was no longer pumped, the WLMB would be subject to inundation from coastal waters located to the south.

Background permit research with the USACE revealed that the southern and eastern boundary levees were constructed without a permit. Per request of the USACE, we determined the area that would have been impacted by construction of the southern levee to be that area of the levee and borrow ditch footprint, plus an area that may have experienced minor hydrologic impacts between the southern boundary levee and pre-existing levees constructed prior to wetlands regulation that are present on the 1975 aerial. These pre-existing levees are a rectangular levee labeled "A", and a circuitous rice levee labeled "B" on the 1975 aerial (**Figure 4**). We determined this area based on the premise that the pre-existing levees had already altered hydrology, detaining southerly overland runoff flow from the north and altering regular inundation from the marshland to south north of the location of these historic levees.

Although an eastern boundary levee was constructed as well (sometime between 1975 and 2005), the crown of this levee is at a lower elevation than that of the southern boundary levee, and is presumed to have been constructed to prevent more extreme storm events from short-circuiting the southern, larger levee and inundating the site from the southeast, and as an attempt to re-direct runoff from the adjacent property discharging onto to the site during lesser events, thereby potentially reducing the amount of pumping required. Removal of this eastern boundary levee will increase the frequency of runoff discharging to the site from the adjacent

eastern property during lesser storm events; however, it is not believed that the construction of the eastern boundary levee resulted in hydrologic impacts any more significant than what originally occurred from pre-existing site alterations from 1975. While the construction of the newer levees may prevent inundation by coastal waters from the south, the levees also result in retention of water that flows through the site from the north and northeast, and if not pumped on a regular basis, would continue to maintain conditions conducive to freshwater/intermediate marsh. It should also be noted that the pump pad and smaller, internal rectangular levee were present in 1975. Lastly, in determining the extent of impact due to construction of the unauthorized levees, these factors as well as the existing condition of the lower areas between the obvious pimple mounds as jurisdictional wetland led to the conclusion that hydrologic impacts, even with pumping, have not been sufficient enough to result in conversion of these areas to upland pasture, and cattle grazing has likely had as much if not more significant impact on vegetative structure of these areas than the construction of the unauthorized boundary levee alone.

3.2 Current Ecological Characteristics of the Site

Current ecological conditions of the WLMB are detailed in the subsections below, and demonstrate the suitability of the site for use as high-quality wetland mitigation offsets.

3.2.1 Existing Land Use and Habitat Types

The site is currently maintained as improved pasture and is actively grazed. A current aerial of the site is provided in **Figure 9**. Existing improvements on the property include a hay barn and livestock facility. These areas will not be included within the bank conservation servitude area, and are within the exclusion area depicted on **Figure 2**. Although converted to agricultural use and with many of the drainage and hydrological alterations previously described in Section 3.1, including active pumping of the southern portion of the site to maintain pasture grasses, most of the site is existing wet pasture. A wetland determination was performed by D&S Environmental Services, Inc. from which a preliminary jurisdictional determination (**Exhibit A**) was issued by the New Orleans USACE on June 5, 2015.

Surrounding land uses within a 1 mile buffer of the site are presented in **Figure 10**, as mapped by the United States Geological Survey (USGS) National Land Cover Database in 2011 and updated using current aerial imagery (NAIP, 2015) and ground-truthing conducted during several site visits in 2015 and early 2016. Most the existing land use directly adjacent to the site is agricultural, with a low-density residential outparcel to the east, and a single-family residential neighborhood bordering the WLMB site to the west and along LA 384 to the north. Within the 1 mile buffer, approximately 31.6% of the surrounding land area is within hay/pasture and cultivated crop agricultural uses, 49.1% is existing wetlands and waters (marsh, woody wetlands and open water), 18.75% is mainly low-intensity development, and 0.5% is other upland habitat types (i.e. evergreen forest, shrub/scrub) or barren land.

3.2.2 Existing Soils and Topography

Per the United States Department of Agriculture (USDA) National Resource Conservation Service (NRCS), the on-site soils consist of a combination of Allemands muck (6.0% of site), Edgerly loam (54.2% of site) and Mowata-Vidrine complex (39.8% of site) (**Figure 11**). Except for the Allemands muck, these soils are typical of coastal prairie soils, which are characterized by an impervious clay pan 6 to 18 inches below surface, resulting in perched water tables that also inhibits capillary movement of water upward (LDWF, 2016). All soil series and complexes mapped as occurring on the site by the NRCS are classified as hydric, per the 2015 National Hydric Soils List (NRCS, 2015). A brief description of each series is given below. These soils are also classified as Hydrologic Group D soils. Soils in the Hydrologic Group D have very slow infiltration rates, consisting chiefly of clayey soils.

Allemand muck (0 to 2% slopes): These soils are deep, very poorly drained soils with relatively well-developed organic O horizons from 2 to 32 inches thick underlain by impermeable mineral clay soils. The landscape position occupied by these soils are on the landward side of coastal freshwater marshes. These soils are formed from decomposed herbaceous material over alluvial sediments. These soils are almost continuously flooded unless altered by drainage features.

Edgerly loam (0 to 1% slopes): These soils consist of poorly drained and slowly permeable soils formed in loamy and clayey alluvium of late Pleistocene age. They occur on the broad flats and terraces of the Gulf Coast Prairies. These soils are typically silt loams and silty clay loams within the surface horizons underlain by clay loams, clay or silty clay in the subsurface horizons. The seasonal high water table (SHWT) is typically 18 to 30 inches bls during the winter and early spring. These soils may be subject to flooding from tidal surge caused by hurricanes or other storm events. This soil is typically used for pasture and for cultivated crops such as rice and soybeans, and crawfish production. Native vegetation prior to agricultural conversion was dominated by tall grasses and sedges.

Mowata-Vidrine complex (0 to 1% slopes): These somewhat poorly drained to poorly drained soils occur on the Gulf Coastal Prairies. The Mowata soils are level, poorly drained soils that occur in lower landscape position relative to the Vidrine soils, which are gently sloping and occur on small mounds. Typical land uses are for cultivated crops such as rice and pasture. They are particularly well suited to pasture. Native vegetation is tall prairie grasses.

Vidrine soils that compose the mounds are dark grayish brown silt loams underlain by silt at depths of 19 to 22 inches bls. A silty clay loam (clay pan) is present at depths of 60 to 80 inches bls. The SHWT is typically 1 to 2 feet bls between December and April. These mounds are generally circular and are from 50 to 120 feet in diameter and from 1 to 4 feet high in their natural state (prior to leveling).

Mowata soils, found in lower landscape position between the mounds, are characterized by a surface layer of gray silt loam overlaying a subsoil occurring approximately 60 inches bls of gray, mottled clay loams and silty clay. Mowata soils are hydric.

The mounds that are typical of Mowata-Vidrine soils are visible on the earliest aerial imagery of the WLMB site through to current aerial imagery (**Figure 9**). Generally, the site slopes to the south with the northern property located at or near the toe of slope of the chenier ridge, and occurring at elevations 4 and 5 feet, NAVD, and then slopes southerly to an elevation of 0 at the southern property boundary within the existing marshlands, as illustrated in **Figure 12** by LiDAR topography of the WLMB site available from the LSU CADGIS Research Laboratory. Based on the preliminary jurisdictional determination, site soils and topography, there is clear evidence and indication that most the site historically supported coastal prairie and associated wetland habitats including coastal wet prairie, coastal marsh, and bottomland hardwood in the north along and below the toe of slope of the chenier ridge.

3.2.3 Existing Hydrology

Drainage alternations present on the WLMB site include elevated levee roadways, ditching and associated spoil disposal, remnant French drains/subsurface stand pipes along the Parish maintained drainage ditch, which aid drainage of the pasture, remnant rice levees, a remnant L-shaped agricultural levee in the southwestern portion of the property, and a levee/borrow ditch near the southern property boundary and along the eastern property boundary. These features prevent and/or interrupt natural overland flow through the site into coastal waters and marshlands within and directly adjacent to the site along the southern property boundary. Currently, inundation caused from the marsh located directly to the south of the WLMB is prevented by this man-made levee. The current site drainage is presented in **Figure 13**.

The predominant sources of hydrology to the site include direct precipitation, off-site runoff, backwater flooding of on-site drainage canals, seasonally high perched groundwater tables (NRCS, 1995 and LDWF, 2005), and possibly tidal surge during hurricanes or other storm events. Water losses are evapotranspiration, infiltration, pumping of surface water, and surface water runoff/discharge offsite through the Parish maintained ditch and other on-site drainage ditches. Mean annual precipitation for this region is approximately 56 inches per year per the Louisiana Department of Transportation (LDOT) Development Hydraulics Manual (2011).

Through analysis of the latest LIDAR information available from the LSU CADGIS Research Laboratory (**Figure 12**), and preliminary site-specific topographic survey the site was divided into separate drainage areas internally, and off-site drainage contributing basins were delineated to the extent that existing data will allow (**Figure 14**). These estimates are preliminary, and if required will be provided at the draft mitigation banking instrument (DMBI) phase, and as part of the coastal use permitting (CUP) process.

Existing wetland hydroperiods are characterized using the water regime modifiers found in the FWS publication *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al, 1979). Approximate hydrologic regimes for on-site wet pasture wetlands were determined from on-site observation by ecoGENESIS staff during several site visits in 2015 and early 2016, background water level monitoring, and from information supplied in the wetland determination performed by D&S Environmental Services, Inc. Wet pasture wetlands located in

the northern part of the site are likely seasonally to temporarily flooded, and due to drainage features probably range in stage from saturated to slightly inundated for short periods after rainfall events and for longer periods during the winter and early spring. Hydroperiods in the southern part of the site north of the levee appear to be primarily altered by pumping, and are also likely to be seasonally to temporarily flooded and range in stage from saturated to inundation depths of typically less than 1.5 feet. Hydroperiods south of the levee are semi-permanently to permanently flooded with estimated stages of 0.5 to up to 5 feet of water within existing open water areas during extreme high tide or storm events.

The Sponsor has installed background water level monitors at the WLMB site, including within the marsh located south of the levee, the locations of which are pictured on **Figure 13**. Data from the background water level monitoring will be incorporated into the final design, and will also be used to determine if the existing marsh to the south is experiencing regular tidal fluctuation. The existing marsh area was identified as brackish marsh by D&S Environmental Services, Inc. based on the species composition that was present in 2015 during the wetland determination fieldwork. For the purposes of this prospectus, and until further data is available, the existing coastal marsh is identified as existing brackish marsh.

3.2.4 Existing Vegetative Composition

Upland pasture areas of the site are dominated by species such as Bermuda grass (*Cynodon dactylon*), smut grass (*Sporobolus indicus*), Yankeeweed (*Eupatorium compositifolium*), southern dewberry (*Rubus trivialis*), St. Augustine grass (*Stenotaphrum secundatum*), Simpler's-Joy (*Verbena hastata*) and curly dock (*Rumex crispus*), with McCartney rose (*Rosa bracteata*) common on the higher pimple mounds. Wet pasture areas of the site are dominated by species typical of wet pastures such as lamp rush (*Juncus effusus*), torpedo grass (*Panicum repens*), Gulf cordgrass (*Spartina spartinae*), coastal salt grass (*Distichlis spicata*), little-headed spike-rush (*Eleocharis parvula*), black needle rush (*Juncus roemerianus*), sedges (*Carex* spp), alligator weed (*Alternanthera philoxeroides*), and many-flowered marsh pennywort (*Hydrocotyle umbellata*). The brackish marsh is characterized by marsh-millet (*Zizaniopsis miliacea*), broad-leaf cat-tail (*Typha latifolia*), three-square (*Schoenoplectus pungens*), common reed (*Phragmites australis*), and California bulrush (*Scirpus californicus*) within the low marsh areas. High marsh and elevated pimple mounds are dominated by Chinese tallow, groundsel tree (*Baccharis halimifolia*), southern bayberry (*Morella cerifera*), marsh-hay cordgrass (*Spartina patens*) and Gulf cordgrass (*Spartina spartinae*).

3.3 General Need for the Project in this Area

Development of the WLMB will provide high quality compensatory mitigation credits to offset unavoidable impacts to bottomland hardwood, wet coastal prairie, coastal freshwater/intermediate and brackish marsh impacts within the approximately 1, 270 square mile Calcasieu-Memotau watershed and Chenier Plain of Louisiana. Regionally, this area is experiencing some of the highest demand for wetland mitigation in the New Orleans District due to infrastructure improvements and development in the Lake Charles area, and burgeoning

oil and gas development associated with large chemical and LNG facilities and associated pipelines. Additionally, the unique location of the site between two Level IV ecoregions in such a high-demand area allows for an ability to restore a greater diversity of habitats, including those, such as coastal prairie, that are rare and endemic.

The Calcasieu River Basin is also a critical basin to the restoration and maintenance of Louisiana fisheries, and Cameron Parish marshlands provide critical wintering grounds for migratory birds and waterfowl. Within the Calcasieu Basin, the LDEQ has identified that 71% of these sub segments do not have sufficient water quality to fully support the fish and wildlife propagation designated use (LDEQ, 2004). The following water quality parameters were identified by the LDEQ as potential culprits: metals, nutrients, fecal coliform, organic enrichment, low concentrations of dissolved oxygen, dissolved and suspended solids, and turbidity. Suspected sources of water quality degradation include the following: septic systems, agricultural and silvicultural activities, urban stormwater runoff, and dredging (LDEQ, 2004). **Table 3** below identifies inventoried threats and sources of threats for the Calcasieu Basin, as re-printed from the December, 2005 LA CWCS.

Restoration of habitats on the WLMB site will help to substantially improve water quality discharges into coastal waters by: 1) Removing cattle and agricultural sources of nutrients directly discharging into coastal waters via existing on-site drainage ditches; 2) Increased natural water quality treatment by restoring overland flow of surface water from the north and east flowing onto and through the site as both sheet flow and floodwaters from the unnamed tributary (Parish maintained ditch) and relief ditch along the northern property boundary; 3) Restoration of a more natural flooding regime by removal of spoil banks along the Parish maintained unnamed tributary and relief ditch along the northern property boundary; and finally, 3) Increased retention times through removal of on-site agricultural drainage ditches discharging directly into coastal waters. The above outlined benefits to water quality from the restoration of the site will also help advance LDEQ and LDWF watershed goals for the Calcasieu Basin, as well as state-wide goals to increase natural resiliency to storm events and climate change through restoration of marshlands.

Table 3. Water quality threats and sources of threats to the Calcasieu Basin (LDEQ, 2004)

Source of Threat	Threat							
	Altered Composition/Structure	Altered Water Quality	Habitat Destruction or Conversion	Habitat Fragmentation	Modification of Water Levels; Changes in Natural Flow Patterns	Salinity Alteration	Sedimentation	Toxins/Contaminants
Channelization of rivers or streams	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Commercial/industrial development	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Construction of ditches, drainage or diversion systems	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Construction of navigable waterways	XXX	XXX		XXX	XXX	XXX	XXX	XXX
Conversion to agriculture or other forest types							XXX	
Development/maintenance of pipelines, roads or utilities	XXX	XXX		XXX	XXX	XXX	XXX	XXX
Industrial discharge	XXX	XXX		XXX	XXX	XXX	XXX	XXX
Operation of drainage or diversion systems	XXX	XXX		XXX	XXX	XXX	XXX	XXX
Residential development	XXX	XXX		XXX	XXX	XXX	XXX	XXX

The restoration will also provide high-quality critical nesting/feeding/resting/loafing habitat for migrating birds and waterfowl, as well as potential habitat for the following species of conservation concern identified by the LDWF: old prairie crawfish, paddlefish, western sand darter, bigscale logperch, sandbank pocketbook mussel, southern creekmussel, alligator snapping turtle, Mississippi diamond-backed terrapin and the re-introduced whooping crane.

3.4 Technical Feasibility

The technical feasibility of the proposed restoration meeting project goals and objectives and ecological performance measures is high given the fact that the proposed work is within an area of historically and currently occurring coastal prairie and freshwater/intermediate and brackish marsh wetlands, and thus exhibits the correct landscape position and topography for the proposed habitat types. The northern portion of the site is also within the lower slopes of a natural chenier ridge, which would have likely been forested prior to site conversion, and in the current condition existing forested bottomland hardwood wetlands exist adjacent to the property to the east. The site soils are also appropriate for wetlands restoration, and most the bank area exhibits currently hydric soils, as confirmed by D&S Environmental Services, Inc. when performing fieldwork for the wetland determination and the subsequent preliminary approval of the Jurisdictional Determination by the CEMVN. No significant excavation or alteration of natural grades are required, and the extent of earthwork needed to achieve hydrologic

restoration is limited to the cessation of pumping, removal of features such as levees and roadways above natural grade, and backfilling of ditches. Site work will consist of minor earth work using conventional equipment and methods. Thus, the proposed restoration plan outlined below is expected to result in the physical, chemical and biological conditions appropriate to the habitat types proposed.

4.0 ESTABLISHMENT OF THE MITIGATION BANK

The following section addresses how the bank will be established, including a proposed conceptual restoration plan, the general need for a mitigation banking project in this area, long-term protection and management, and any associated risks with implementation of the proposed conceptual restoration plan. The acreage of mitigation methods and habitat types proposed to be restored to the WLMB are depicted on **Figure 15**, and were also previously presented in **Table 2**.

4.1 Site Restoration Plan

The site restoration plan presented in the subsections below outlines the hydrologic and vegetative work that will be performed to restore and enhance proposed bottomland hardwood, coastal prairie and freshwater/intermediate and brackish marsh habitats in the post-restoration condition.

4.1.1 Hydrologic Restoration

A graphic representation of proposed actions to restore and enhance hydrology is provided in **Figure 16**. Hydrologic restoration to the proposed bottomland hardwood area in the northern portion of the site will be accomplished through removal of spoil banks along the Parish-maintained ditch and associated ditches required to be maintained for off-site drainage (activity "2" on **Figure 16**), and removal of standpipe drainage features that drain the pasture into the Parish drainage ditch. A typical cross-section for spoil removal is provided as Section 2-2 on **Figure 17-A**.

Hydrology to the proposed coastal wet prairie and freshwater/intermediate marsh areas will be restored by discontinuation of pumping, and removing the southern and eastern property boundary levee and internal levees (refer to typical section 1-1 on **Figure 17-A**). Accompanying ditches associated with the boundary levees and any internal levees will be backfilled to the elevation of the adjacent natural ground. By removing these levees and ceasing regular pumping, inundation of the southern portion of the WLMB will occur more frequently, likely resulting in seasonally to semi-permanently inundated conditions and higher water level stages in the far southern portion of the property. Based on preliminary survey and water level monitoring data, the average water surface elevations for the period of record from April 15, 2016 until May 10, 2016 from Piezometer #3 (located within the brackish marsh enhancement area to the south) was 1.55 ft., NAVD88 (refer to **Figure 13** for piezometer location). Natural ground elevations between the pimple mounds located to the north of the levee within the southern half of the property are approximately -0.5 ft., NAVD88 (on average). The current

elevation of the top of the levee ranges from 2.6 to 8.7 ft., NAVD88. Thus, the removal of the southern levee will allow for inundation depths ranging from a maximum depth of approximately 2 feet at the southern boundary and decreasing north through the property. The existing stormwater pump and pad will also be removed since pumping will no longer be necessary, as natural drainage patterns will be restored.

The existing east-west roadway that provides access to the WLMB site will be maintained for site access and be outfitted with low water crossings so that overland flow is not inhibited. The existing north-south roadway in the southern section of the property will be maintained to the point that the road turns due west. The east-west section of the roadway will be removed. All associated ditching will be backfilled and leveled (refer to Typical Sections 3-3 and 4-4, on **Figure 17-B**). Any remaining roads, as well as a designated 10-foot-wide boundary buffer/trail and trail to the southern portion of the property are designated as non-mitigation area (refer to **Figure 15**). Existing French/stand-pipe drains that collect surface water runoff and discharge it into the Parish maintained ditch/unnamed stream will be removed. Removal of drainage ditches and features designed to drain the site, as well as removal of hydrologic impediments will result in the restoration of natural overland flow and drainage patterns on the WLMB, as well as the restoration of freshwater/intermediate marsh hydroperiods.

The proposed hydrologic restoration work will also require work within Wetlands and Waters of the United States. Concurrent with this prospectus submittal, a Coastal Use Permit (CUP) application is also being submitted to LDNR for joint review and public noticing.

4.1.2 Vegetative Restoration

Vegetative restoration of the proposed habitat types will be accomplished through both planting of appropriate and desirable wetland species, natural recruitment, and control of nuisance and exotic invasive species. Vegetative restoration activities will be conducted during the appropriate season post construction and hydrologic restoration for the habitat type being restored. Additional details for each proposed habitat type is presented below.

4.1.2.1 Bottomland Hardwood Re-establishment and Rehabilitation

The 103.9 acres proposed as bottomland hardwood restoration within the northern portion of the site will be planted at a minimum density of 538 trees per acre with 2-to 3 foot bare root seedlings on 9-foot centers. The forested portion will be planted with a mixture of bottomland hardwood species typical of flats, minor bottoms and lower slopes of natural ridges. **Table 4** lists hard mast and soft mast canopy and sub-canopy species chosen for the reforestation efforts. The species listed in **Table 4** were determined after local research, observing species growing on nearby properties to the north, and cross-referencing of those species listed as occurring in both bottomland hardwood habitat types, as defined by *The Natural Communities of Louisiana* electronically published by the LDWF.

Table 4. Bottomland hardwood canopy and understory species selected for restoration of the WLMB

Common Name	Scientific Name	AGCP Wetland Indicator Status
Hard Mast Species		
Nuttal Oak	<i>Quercus texana</i>	FACW
Bitter Pecan/Water Hickory	<i>Carya aquatica</i>	OBL
Water Oak	<i>Quercus nigra</i>	FAC
Overcup Oak	<i>Quercus lyrata</i>	OBL
Willow Oak	<i>Quercus phellos</i>	FACW
Cherrybark Oak	<i>Quercus pagoda</i>	FACW
Swamp Chestnut Oak	<i>Quercus michauxii</i>	FACW
Laurel Oak	<i>Quercus laurifolia</i>	FACW
Shellbark Hickory	<i>Carya laciniosa</i>	FACW
Soft Mast Species		
Green Ash	<i>Fraxinus pennsylvanica</i>	FACW
Sugarberry	<i>Celtis laevigata</i>	FACW
American Elm	<i>Ulmus americana</i>	FAC
Cedar Elm	<i>Ulmus crassifolia</i>	FAC
Common Persimmon	<i>Diospyros virginiana</i>	FAC
Sweetgum	<i>Liquidambar styraciflua</i>	FAC
Drummond Red Maple	<i>Acer rubrum var. drummondii</i>	OBL
Black gum	<i>Nyssa sylvatica</i>	FAC
Swamp or Stiff Dogwood	<i>Cornus foemina</i>	FACW
Deciduous Holly	<i>Ilex decidua</i>	FACW

4.1.2.2 Coastal Prairie Re-establishment, Rehabilitation and Non-Hydric Inclusions (Pimple Mounds)

The total 107.43 acres of coastal prairie proposed for restoration encompass both wetland and mesic (upland) communities. Existing wet pasture will be rehabilitated to wet prairie at natural, existing ground elevations that occur between pimple mounds in the central and eastern portion of the WLMB (refer to **Figure 15**). These areas will first be broadcast treated with an herbicide to kill any existing non-native pasture grasses, and then burned in the fall. In the early spring, they will be disked and then re-vegetated through a combination of natural recruitment, seeding and/or bareroot planted on 3-foot centers with species selected from the potential species outlined in **Table 5** below. Wet coastal prairie re-establishment will occur in areas of spoil removal along the Parish maintained ditch, or in areas where ditches are being backfilled, at the appropriate finished ground elevation.

Higher ground elevations that are encompassed by the pimple mounds throughout the central and southern portions of the site will be restored as non-hydric inclusions, and will provide important upland refugia habitat. Any existing woody nuisance and exotic vegetation on these mounds will be treated and removed. The mounds will then be seeded and/or planted with species selected from those proposed in **Table 6**.

Species identified in **Tables 5 and 6** as potential coastal prairie species for restoration are compiled from herbaceous species listed in the *Natural Communities of Louisiana*, the LDWF coastal prairie information sheet, and as identified through literature review as historically common or occurring within coastal prairie on the Chenier Plain of Southwestern Louisiana (Stutzenbaker, 2010, Kirman et al, 2007 and Petrides, 1988). Please note that not all species listed in **Tables 5 and 6** may be available for use in the restoration effort due to limitations in available, viable seed source. As much as possible all seed and/or bare-root stock will be locally sourced.

Table 5. Coastal wet prairie species proposed for restoration of the WLMB

Common Name	Scientific Name	AGCP Wetland Indicator Status
Coastal Love Grass	<i>Eragrostis elliottii</i>	FACW
Elliot Grass	<i>Eragrostis refracta</i>	FACW
Wiregrass	<i>Spartina patens</i>	FACW
Seahore Dropseed	<i>Sporobolus virginicus</i>	FACW
Umbrella Sedges	<i>Cyperus spp.</i>	FACW
Caric Sedges	<i>Carex spp.</i>	FACW
Beaked Sedges	<i>Rhynchospora spp.</i>	FACW
Eastern Bluestar	<i>Amsonia tabernaemontana</i>	FACW
Coastal Plain Tickseed	<i>Coreopsis gladiata</i>	FACW
Round-Leaf Goldenrod	<i>Solidago patula</i>	OBL
Purple False Glove	<i>Agalinis purpurea</i>	FACW
Dwarf Spike Rush	<i>Eleocharis parvula</i>	OBL
Broom Rosette Grass	<i>Dicanthilium scoparium</i>	FACW
Elliot's Love Grass	<i>Eragrostis elliottii</i>	FACW
Bushy Bluestem	<i>Andropogon glomeratus</i>	FACW
Egg-Leaf Indian Plantain	<i>Arnoglossum ovatum</i>	FACW
Bearded Beggar's Ticks	<i>Bidens aristosa</i>	FACW
Boneset	<i>Eupatorium perfoliatum</i>	FACW
Vernal Sneezeweed	<i>Helenium vernale</i>	FACW
Flat-topped Goldenrod	<i>Euthamia leptoccephala</i>	FACW
Tooth-ache grass	<i>Ctenium aromaticum</i>	FACW
Crimson-eyed Mallow	<i>Hibiscus moscheutos</i>	OBL

Common Name	Scientific Name	AGCP Wetland Indicator Status
Soft Rush	<i>Juncus effusus</i>	OBL
Maryland Meadow Beauty	<i>Rhexia mariana</i>	FACW
Purple Dew Drop	<i>Lobelia puberula</i>	FACW
Florida Paspalum	<i>Paspalum floridanum</i>	FACW
Narrowleafed Blue-eyed	<i>Sisyrinchium augustifolium</i>	FACW
Seaside Goldenrod	<i>Solidago sempervirens</i>	FACW
Thin Leaf MT. Mint	<i>Pycnanthemum tenuifolium</i>	FACW
Anglestem Blackseed	<i>Rhynchospora caduca</i>	OBL

Table 6. Mesic coastal prairie (Non-hydric Inclusions) species proposed for restoration to the WLMB.

Common Name	Scientific Name	AGCP Wetland Indicator Status
Brownseed Paspalum	<i>Paspalum plicatum</i>	FAC
Little Bluestem	<i>Schizachyrium scoparium</i>	FACU
Big Bluestem	<i>Andropogon gerardii</i>	FAC
Three-awn Grass	<i>Artistida longespica</i>	FACU
Switch Grass	<i>Panicum virgatum</i>	FAC
Indian grass	<i>Sorghastrum nutans</i>	FACU
Small dropseed	<i>Sporobolus neglectus</i>	UPL
Tall Redtop	<i>Tridens flavus</i>	FACU
Caric Sedge	<i>Carex spp.</i>	FAC
Fringe-Leaf Wild Petunia	<i>Ruellia humilis</i>	FACU
Star Tickseed	<i>Coreopsis pubescens</i>	FAC
Flat Top Goldenrod	<i>Solidago rigida</i>	FACU
Beach Purple False	<i>Agalinis fasciculata</i>	FAC
Winter Bent Grass	<i>Agrostis hyemalis</i>	FAC
Showy Daisy Fleabane	<i>Erigeron philadelphicus</i>	FAC
Fleabane	<i>Erigeron strigosus</i>	FAC
Three Awn Grass	<i>Aristida purpurascens</i>	UPL
Button Snakeroot	<i>Erngium yuccifolium</i>	FAC
American Blue Hearts	<i>Buchnera americana</i>	FAC
Roundleaf Boneset	<i>Eupatorium rotundifloium</i>	FAC
Plains Tickseed	<i>Coreopsis tinctoria</i>	FAC
Elliot's Bluestem	<i>Andropogon gyrans</i>	FACU
Tall Tickseed	<i>Coreopsis tripteris</i>	FAC

Common Name	Scientific Name	AGCP Wetland Indicator Status
Broomsedge	<i>Andropogon virginicus</i>	FAC
Blazing Star	<i>Liatris spicata</i>	FAC
Giant Ironweed	<i>Veronia gigantea</i>	FAC
Switchgrass	<i>Panicum virgatum</i>	FAC
Coastal Muhly Grass	<i>Muhlenbergia capillaris</i>	FAC
Brownseed Paspalum	<i>Paspalum plicatum</i>	FAC
Spreading Blue-eyed Grass	<i>Sisyrinchium rosulatum</i>	FAC
Roughleaf Goldenrod	<i>Solidago rugosa</i>	FAC
Helmet Flower	<i>Scutellaria intergrifolia</i>	FAC
Rice Button Aster	<i>Symphyotrichum dumusom</i>	FAC
Common Spiderwort	<i>Tradescantia ohiensis</i>	FAC
Eastern Gamma	<i>Trispsacum</i>	FAC
Lowland Mint	<i>Pycnanthemum muticum</i>	FAC
Smooth Beardtongue	<i>Penstemon digitalis</i>	FAC
Beardtounge	<i>Penstemon laxiflorus</i>	FAC
Whiteleaf Mt. Mint	<i>Pycnanthemum albescens</i>	FAC
Common Self-heal	<i>Prunella vulgaris</i>	FAC

4.1.2.3 Freshwater and Intermediate Marsh Rehabilitation

A total of 124.6 acres of freshwater and intermediate marsh will be rehabilitated from existing wet pasture wetlands occurring in the southern portion of the WLMB (refer to **Figure 15**). The ground elevations between pimple mounds in these areas, and even some of the pimple mounds occur between ground elevations of 0.0 and 1.0ft NAVD88. Potential species proposed for restoration are provided in **Table 7**. The species proposed in **Table 7** encompass a range of inundation depths and hydroperiods (duration of inundation) that are expected to occur, and are classified into shallow and deep marsh species. Intermediate marsh species with more salt tolerance will be planted to the very south. Shallow marsh species are those emergent and floating aquatic species that tolerate depths of inundation from 0.5 to 1.5 feet and seasonally flooded water regimes, and deep marsh species are those emergent, floating and submersed aquatic species that tolerate depths of inundation from 1.5 to 3.0 feet and seasonally to semi-permanently flooded water regimes. Areas will be planted using either bare-root stock for species that transplant well or nursery plugs on 3-foot centers. Due to both latent, currently existing and adjacent seed sources, species such as *Rhynchospora* spp., *Carex* spp., *Cyperus* spp. and *Juncus* spp. are expected to quickly naturally recruit.

Table 7. Freshwater and intermediate marsh species proposed for restoration to the WLMB.

Willow Lake Mitigation Bank Revised Prospectus

Common Name	Scientific Name	AGCP Wetland Indicator Status	Shallow Marsh	Deep Marsh	Salt Tolerance ppt
Big Cordgrass	<i>Spartina cynosuroides</i>	OBL	X		0-10
Gulf Cordgrass	<i>Spartina spartineae</i>	OBL	X		I
Wiregrass	<i>Spartina patens</i>	FACW	X		R
Duckpotato	<i>Sagittaria lancifolia</i>	OBL	X	X	0-3.5
Bulltongue	<i>Sagittaria falcata</i>	NL	X	X	0-3.5
Coastal Water Hyssop	<i>Bacopa monnieri</i>	OBL	X		0-0.5
Spikesedge	<i>Eleocharis spp.</i>	R	X		R
Three-Cornered Grass	<i>Scirpus olneyi</i>	NL	X	X	0-3.5
Giant Bulrush	<i>Scirpus californicus</i>	NL	X		0-3.5
Common Threesquare	<i>Scirpus americanus</i>	FACW	X	X	0-3.5
Deer Pea	<i>Vigna luteola</i>	FACW	X		0-10
Seashore Paspalum	<i>Paspalum vaginatum</i>	OBL	X		0-3.5
Switch Grass	<i>Panicum virgatum</i>	FAC	X		0-3.5
Bearded Sprangletop	<i>Leptochloa fascicularis</i>	NL	X	X	0-5
Camphor-weed	<i>Pluchea camphorata</i>	OBL	X		0-10
Water Millet	<i>Echinonchloa walteri</i>	OBL	X		0-3.5
Southern Naiad	<i>Najas guadalupensis</i>	OBL	X		0-0.5
Wild Celery	<i>Vallisneria americana</i>	OBL		X	3.5
Baby Pondweed	<i>Potamogeton pusillus</i>	OBL	X		0-3.5
Sago Pondweed	<i>Potamogeton pectinatus</i>	NL	X		0-3.5
Widgeon Grass	<i>Ruppia maritima</i>	OBL	X		0-10
Water-milfoil	<i>Myriophyllum spicatum</i>	OBL	X		0-20
Banana Water Lily	<i>Nymphaea mexicana</i>	OBL		X	0-3.5
California Bulrush	<i>Scirpus californicus</i>	NL		X	0-3.5
Soft-stem bulrush	<i>Scirpus tabernaemontani</i>	NL		X	0-3.5
Giant Foxtail'	<i>Setaria magna</i>	FAC		X	0-3.5
Sawgrass	<i>Cladium jamaicense</i>	NL		X	0-3.5
Devil-weed star	<i>Leucosyris spinosa</i>	NL		X	0-3.5
Saltmarsh Aster	<i>Aster subulatus</i>	NL		X	0-10
Prairie Mimosa	<i>Desmanthus illinoensis</i>	FAC	X		0-10
Seaside Goldenrod	<i>Solidago sempervirens</i>	FACW	X		0-10
Purple Ammannia	<i>Ammannia coccinea</i>	OBL	X		0-3.5
Saltmarsh Mallow	<i>Kosteltzyka virginica</i>	NL	X		0-10
Gulfcoast Spikerush	<i>Elocharis cellulosa</i>	OBL	X		0-3.5
Dwarf Spikerush	<i>Eleocharis parvula</i>	OBL	X		0-10
Jointed Flatsedge	<i>Cyperus articulatus</i>	OBL	X		0-3.5
Leafy Three-square	<i>Scirpus robustus</i>	NL	X	X	0-3.5
Sedges	<i>Carex spp.</i>	R	X		3.5-10

Common Name	Scientific Name	AGCP Wetland Indicator Status	Shallow Marsh	Deep Marsh	Salt Tolerance ppt
Barnyard Grass	<i>Echinochloa crusgalli</i>	FACW	X		0-3.5
Knotroot Bristle Grass	<i>Setaria geniculata</i>	NL	X		0-3.5
Fall Panicum	<i>Panicum dichotomiflorum</i>	FACW	X		0-3.5
Jointgrass	<i>Paspalum vaginatum</i>	OBL	X		0-3.5
Hedge bindweed	<i>Calystegia sepium</i>	FAC	X		0-3.5
Saltmarsh Morning Glory	<i>Ipomoea sagittata</i>	FACW	X		0-10

4.1.2.4 Brackish Marsh Enhancement

The 15.6 acres of existing brackish marsh will be enhanced through removal of encroaching shrubs such as *Baccharis halimifolia* and Chinese tallow that have colonized slightly higher pimple mounds. Pimple mound areas of removed woody vegetation will be re-planted with desirable coastal high marsh and wet prairie species *Spartina patens* and *Spartina spartinae*. These species were observed as currently occurring within the high marsh pimple mounds throughout the existing brackish marsh. The existing low brackish marsh is dominated by typical intermediate and brackish marsh wetland vegetation such *Zizaniopsis milacea* (marsh-millet), and sub-dominated by species such as *Typha latifolia* and *Schoenoplectus pungens*, as documented through sampling conducted for the wetland determination report prepared by D&S Environmental Services, and on-site observation.

4.2 Current Site Risks

The Parish maintained existing on-site drainage ditch which conveys off-site runoff generated from the neighboring northeastern properties through the WLMB in a southwesterly direction will remain on-site with the only alteration being the removal of the spoil bank material located along the top banks. The Parish will continue to be responsible for maintenance of the ditch. The existing drainage right of way agreement does not provide for on-site spoil disposal. The Sponsor is currently in negotiation with the Parish to ensure that periodic maintenance of the ditch will not result in deposition of spoil onto restored bank lands.

The WLMB has no existing pipeline or oil and gas easements or leases. The Parish currently maintains an existing drainage easement over the ditched unnamed tributary running through the center of the WLMB (i.e. Parish drainage ditch). A privately owned outparcel and an existing roadway right-of-way occur on the Sponsor owned property within the area identified on the figures as "Area Excluded from the Conservation Servitude". As indicated by this note, this area is not included within the WLMB bank property and will not be included within the conservation servitude.

There is no immediate threat of conversion of the property to a more intensive land use, or of more intensive residential or commercial development adjacent or within proximity of the WLMB. Such development is unlikely due to low land elevations, and existing coastal marsh borders the site to the west and south. Adjacent, existing agricultural land uses for pasture and aquaculture are expected to remain into the foreseeable future. The WLMB is within unincorporated land and no current zoning regulations exist. The proposed use of the WLMB for wetland restoration and conservation purposes is consistent with existing, adjacent land uses.

4.3 Long-Term Sustainability of the Site

The proposed hydrologic restoration activities are self-sustaining, and do not require the use of any water control structures to achieve hydrologic restoration targets. Minimal maintenance and management will be required to maintain vegetative structure, and proposed long-term management activities are outlined below.

Two existing ditches will need to remain for offsite drainage purposes, since offsite surface water is directed onto and flows through the WLMB. One man-made drainage ditch running east-west that conveys drainage from the east onto the WLMB and the unnamed Parish-maintained ditch/stream will remain. As previously stated, the east-west entrance roadway that provides site access is also proposed to remain to just past the Parish-maintained ditch, as well as the existing north-south roadway to provide access to the southern portion of the site (refer to **Figures 15 and 16**).

Two current culvert crossings exist on the bank site for the Parish maintained ditch. The one in the center of the site along the existing E-W road that will be maintained will be replaced with either a low water crossing or with grating. The other culvert crossing is located at the property boundary where the Parish maintained ditch enters the WLMB. This culvert crossing is the only existing access to the northernmost portion of the site. This culvert will be replaced with either suitably sized box culverts, or bridged with an open span to maintain site access, and prevent further erosion. However, these existing culverts are not required for hydrologic restoration or rehydration of the site, but only for site access purposes. All other existing culverts within the WLMB property boundary will be removed (refer to **Figure 16**).

The restored coastal prairie marsh will require periodic fire to maintain the prairie vegetative community structure and prevent encroachment of woody species on the higher pimple mounds. An ecological burn management plan for the coastal prairie will be developed and submitted with the draft MBI. This management plan will include burning on 1 to 3 year cycles, as practicable, to maintain prairie vegetative communities and control encroachment of woody vegetation. During the operations phase of the bank, periodic treatment of nuisance and exotic species will be conducted to ensure that restored and enhanced habitats will meet stipulated performance measures in the MBI.

Draft construction, maintenance and long-term financial assurances for the WLMB will be provided with the DMBI submittal, as well as estimated implementation and long-term management costs. Short-term financial assurances (construction and maintenance) will be sufficient to cover construction and maintenance costs until achievement of long-term performance standards. All financial assurances will be provided using one of the currently approved CEMVN methods. Draft financial assurance documents will be prepared using approved CEMVN templates.

5.0 PROPOSED SERVICE AREA

As previously stated, the proposed WLMB is located within the Lower Calcasieu USGS 8-digit hydrologic cataloguing unit (8080206). The proposed service area (**Figures 18A and 18B**) was determined using a watershed and ecoregion approach, as currently utilized by the CEMVN and outlined per existing CEMVN policy in the recently published Louisiana Rapid Assessment Method (LRAM) used for determining the functional value of unavoidable wetland impacts and the functional value and amount of compensatory mitigation required. When considering offsets to bottomland hardwood, baldcypress/tupelo swamp and pine flatwoods savannah, the CEMVN utilizes the Louisiana watershed basins, as defined by the LDEQ source data (LOSCO, 2004). Within the New Orleans District, there are eight LDEQ watersheds used to define the area considered to be within the same watershed for purposes of compensatory mitigation. The WLMB's location within the Lower Calcasieu is within the LDEQ-defined Calcasieu Basin Watershed comprised of the following HUC Units: 08080203 (Upper Calcasieu River), 08080204 (Whiskey Chitto River), 08080205 (West Fork Calcasieu River) and 08080206 (Lower Calcasieu River). Thus, the bank's proposed service area for offset of bottomland hardwood wetland impacts will be comprised of these four HUC units.

The CEMVN recognizes only two service areas for offset of freshwater/intermediate and brackish/saline marsh impacts, which is based on the geomorphic distinction between the Deltaic and Chenier Plains. As previously detailed in Section 1.1, the location of the WLMB is within the Chenier Plain. The Chenier Plain service area is comprised of the following HUC units: 08080202 (Mermentau), 08080203 (Upper Calcasieu), 08080205 (West Fork Calcasieu) and 08080206 (Lower Calcasieu). Thus, the bank's proposed service area for offset of marsh impacts will be comprised of these four HUC units.

For offset of coastal prairie impacts, the CEMVN defines a service area that comprises the historical range of coastal prairie habitat, and includes the following HUC units: 08080102 (Bayou Teche), 08080103 (Vermillion River), 08080201 (Mermentau Headwaters), 08080202 (Mermentau), 08080203 (Upper Calcasieu), 08080205 (West Fork Calcasieu) and 08080206 (Lower Calcasieu). Thus, the bank's proposed service area for offset of coastal prairie impacts will be comprised of these seven HUC units.

The service area in **Figures 18A and 18B** is presented based on the habitat types that will be restored and enhanced to the WLMB. As previously mentioned, the unique location of the WLMB at the boundary between two Level IV ecoregions, as well as at the southernmost extent

of the range of bottomland hardwood, provides for a rich diversity of habitat types that can be restored to the WLMB.

6.0 OPERATION OF THE MITIGATION BANK

6.1 Project Representatives

Sponsor: *Willow Lake Holdings, LLC
Attn: Danny Moran
4520 S. Sherwood Forest Blvd. #104-241
Baton Rouge, Louisiana, 70816
(225) 928-5678*

Agent(s): *ecoGENESIS, LLC
4152 Independence Ct, C-7
Sarasota, Florida, 34234
(941) 351-0300*

*Pan American Engineers, LLC
1717 Jackson Street
Alexandria, Louisiana, 71301
(318) 473-2100*

Landowner: *Willow Lake Holdings, LLC
Attn: Danny Moran
4520 S. Sherwood Forest Blvd. #104-241
Baton Rouge, Louisiana, 70816
(225) 928-5678*

6.2 Qualifications of the Sponsor

The owners of Willow Lake Holdings LLC. are principals of EcoSystem Renewal, LLC. The principals, members, and managers of Ecosystem Renewal, LLC have extensive experience in environmental services, ecological restoration, engineering, construction, silviculture, and business management. All project construction; monitoring and short-term management will be accomplished by Ecosystem Renewal LLC, with ecoGENESIS, LLC providing all permitting and technical support. EcoSystem Renewal, to date, has restored over 1,000 acres of bottomland hardwood wetlands in the form of both mitigation banks and large permittee-responsible mitigation areas, and currently has two other bottomland hardwood and stream banks in process in the USACE Galveston District. EcoSystem Renewal currently also operates the ±1,890 acre Gulf Coastal Plains Wetland Mitigation Bank (“GCPWMB”) just north of East Bay and south of Winnie, TX. The GCPWMB is the first coastal prairie and tidally influenced freshwater/intermediate and brackish marsh bank permitted and operating in the Galveston District USACE.

EcoGENESIS, LLC and individual members of ecoGENESIS provide mitigation and restoration consulting services to several mitigation providers. The Principal and founder of ecoGENESIS, Pamela Fetterman, has permitted numerous publicly and privately owned on-site and off-site mitigation areas, and worked in the public regulatory arena both reviewing and permitting mitigation banks and large-scale wetland mitigation for the past 16 years. EcoGENESIS, LLC currently provides all technical assistance in the implementation of this bank, and the Principal Scientist, Pamela Fetterman, while in the employ of another firm also previously provided design and permitting services for the GCPWMB.

6.3 Proposed Long-Term Ownership and Management Representatives

The long-term ownership will be retained with the current landowner, Willow Lake Holdings, LLC. The landowner will be the initial designated Long-Term Steward charged with long-term management and maintenance responsibility once the long-term performance measures are attained. The Long-Term Steward may be the recipient of the Long-Term Management Fund for use in addressing catastrophic or force majeure events, and for performing land management once all monitoring is completed, the bank has attained the long-term performance measures, and is transferred to the long-term management phase.

6.4 Site Protection

6.4.1 Existing Liens, Easements or Other Encumbrances

There is an existing drainage easement to Cameron Parish for maintenance of the unnamed and jurisdictional ditch through the center of the bank. A roadway right-of-way also exists on the eastern property boundary. This right-of-way is within the area designated as “Excluded from Conservation Easement” on **Figure 19**. A title opinion by a licensed and qualified attorney of law will be provided with the draft conservation servitude separately at the draft MBI phase of the review process.

6.4.2 Long-Term Protection

The mitigation bank area will be protected in perpetuity by placement of a conservation servitude approved by the CEMVN, in consultation with the IRT. **Figure 19** identifies the mitigation bank area and area to be placed under conservation servitude within the property owned by the Sponsor. Recordation and restrictions of the conservation servitude or easement will be subject to current CEMVN policy, current Louisiana Statutes, and will be drafted using the latest conservation servitude templates available on-line from RIBBITS.

The designated holder of the conservation servitude will be Conservation Force, Inc. through their Accredited Land Trust Division. Conservation Force currently holds several conservation easements on operating EcoSystem Renewal, LLC mitigation banks and large permittee-responsible mitigation areas in Texas and Louisiana. The holder of the servitude will be responsible for enforcing the servitude provisions, and works together with EcoSystem Renewal

staff to help ensure long-term compliance with the provisions of the easement and long-term sustainability of the restored wetlands.

6.5 Long-Term Strategy

Long-term management of the bank will include strategies for long-term vegetative and property management, enforcement of conservation servitude provisions, as well as remedial actions, adaptive management and contingency measures that will be included in the approved MBI. Long-term management of the WLMB will be funded by the long-term management fund.

The minimum principal amount required to fund the long-term management fund will be estimated using a long-term financial assurance cost analysis that calculates annualized long-term management costs, including burning per the burn schedule outlined in the approved burn management plan. The annualized cost-estimate determines the minimum amount per credit sale required to fund the LTMA, and will be determined in accordance with current CEMVN policy. Except for force majeure or catastrophic events, the long-term management funds will not be available for use until after verification by the CEMVN and IRT that the WLMB has attained long-term performance measures for all habitat types restored to the bank. This Long-Term Management Fund will be transferred to the designated Long-Term Steward, landowner or other appropriate third party for use in addressing any future catastrophic events or long-term land management requirements upon bank closure.

In the event of a catastrophic or force majeure event, as determined by the CEMVN and IRT, and which affects the long-term viability of the mitigation bank, the CEMVN and IRT can ensure that the appropriate corrections occur by directing the Sponsor, the designated Long-Term Steward or the designated Third Party servitude holder to implement corrections. The corrections implemented will be funded by a release of either escrow or stand by trust funds for administering the short-term (construction and maintenance), or funds from the long-term management fund. Any unspent funds will remain in the long-term management fund for long-term management of the WLMB.

All or a portion of the funds in the escrow account may be released to a third party designated by the CEMVN or IRT at the time of default to effect necessary corrections or acquire equivalent ecological value elsewhere.

7.0 REFERENCES

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Figures

Date: 7/11/2016 Time: 12:50:13 PM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry 400\MXD\Figure 01_Site Location Map_RGuidry400.mxd

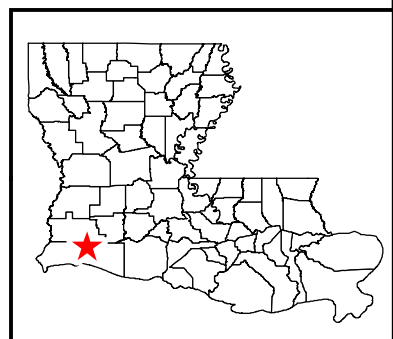
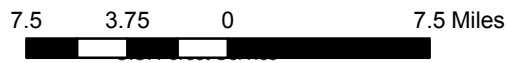


Legend

- Property Boundary
- 8-Digit HUCs
- USA Federal Lands
- Louisiana State Owned Lands

EPA Level IV Ecoregions

- 34a Northern Humid Gulf Coastal Prairies
- 34g Texas-Louisiana Coastal Marshes
- 35b Floodplains and Low Terraces
- 35f Flatwoods



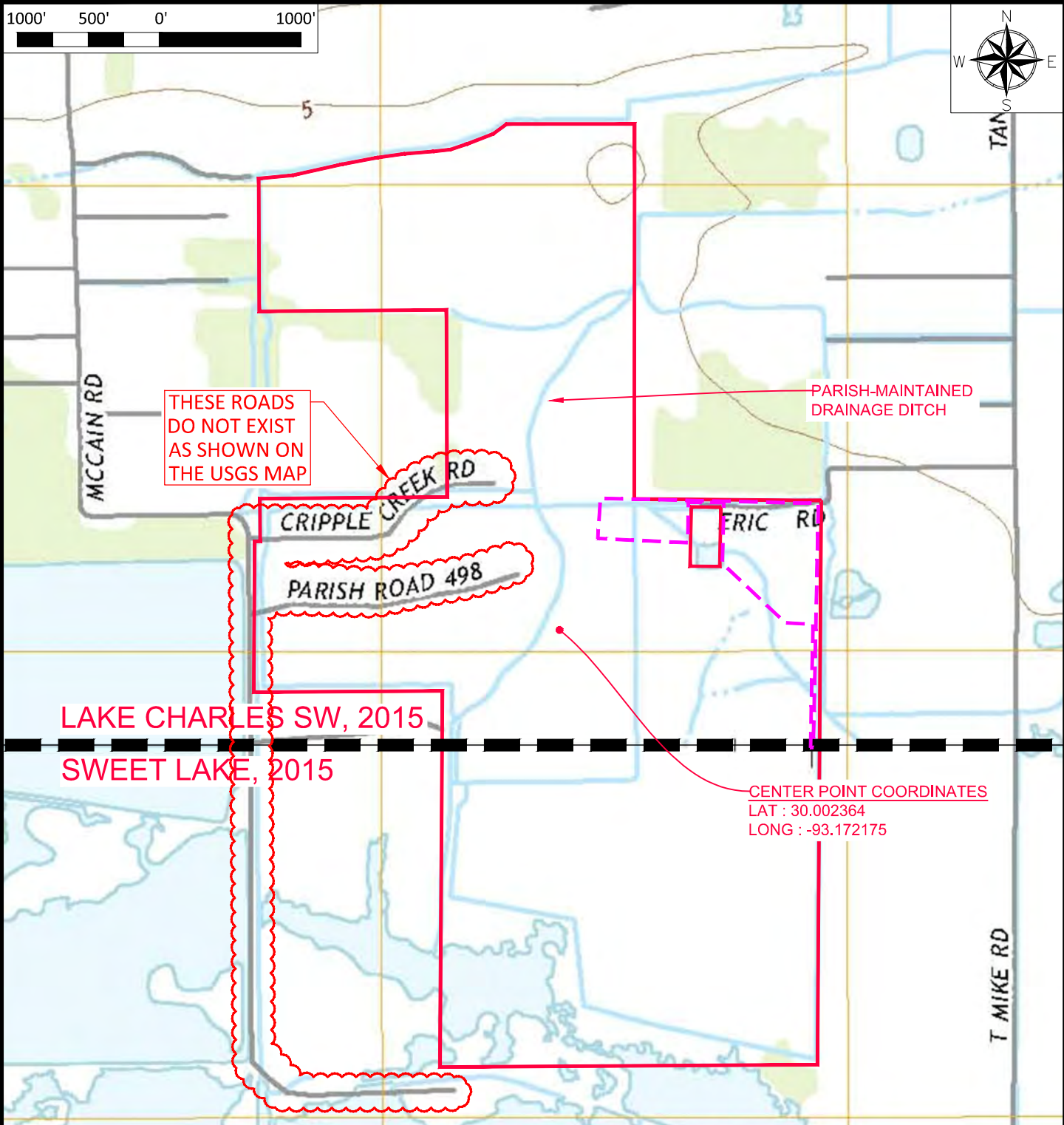
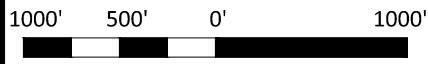
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 4152 Independence Ct, C-7
 Sarasota, FL 34234
 office: 941-351-0300
 cell: 941-321-8107

Rev	By	Description

Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

Site Location Map
 Scale: 1" = 7 miles
 Date: 07-11-16

Figure
1



THESE ROADS DO NOT EXIST AS SHOWN ON THE USGS MAP

PARISH-MAINTAINED DRAINAGE DITCH

LAKE CHARLES SW, 2015
SWEET LAKE, 2015

CENTER POINT COORDINATES
LAT : 30.002364
LONG : -93.172175

LOCATION OF PROPERTY AS SHOWN IS APPROXIMATE AS IT WAS SCALED FROM THE RESPECTIVE USGS QUADRANGLE MAPS

PAN AMERICAN ENGINEERS, LLC
P.O. BOX 89 / 1717 JACKSON STREET
ALEXANDRIA, LA 71309
(318) 473-2100

LEGEND	
	PROPERTY BOUNDARY
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	DRAINAGEWAY

ecogenesis
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Rev	By	Description

Willow Lake Mitigation Bank
Lat: 30.0023, Long: -93.1721
Sec. 15 & 22, T12S-R8W
Cameron Parish, Louisiana

USGS QUADRANGLE MAP (2015)
Scale: 1" = 1000'
Date: 07-19-16

Figure
2

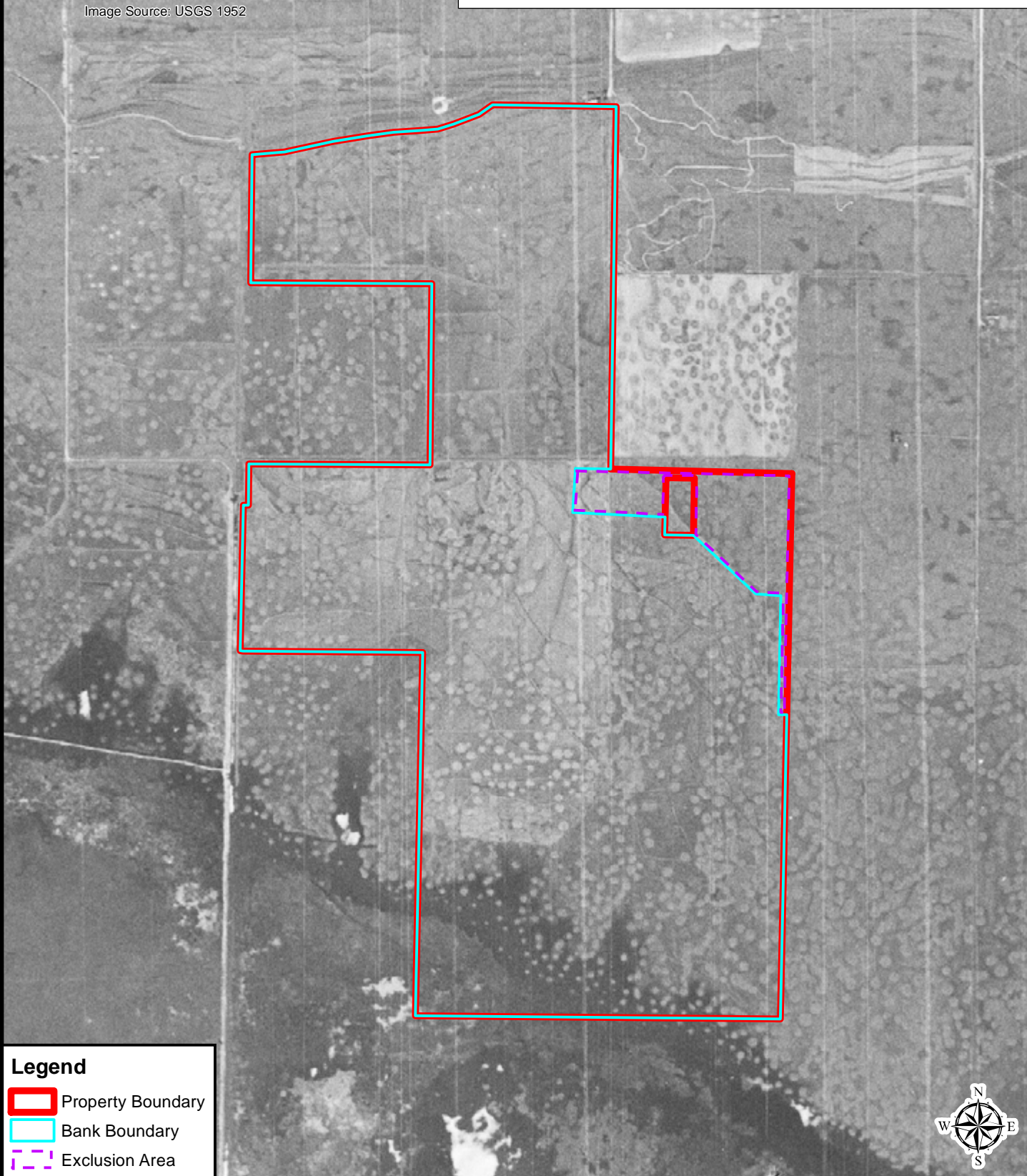
1,000 500 0 1,000 Feet






Image Source: USGS 1952

Note:

Bank Boundary is superimposed on Property Boundary for clarity.



Legend

-  Property Boundary
-  Bank Boundary
-  Exclusion Area



Date: 7/15/2016 Time: 1:44:48 PM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry_400\MXD\Figure 03_1952 Historic Aerial_RGuidry400.mxd


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**Willow Lake
Mitigation Bank**
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

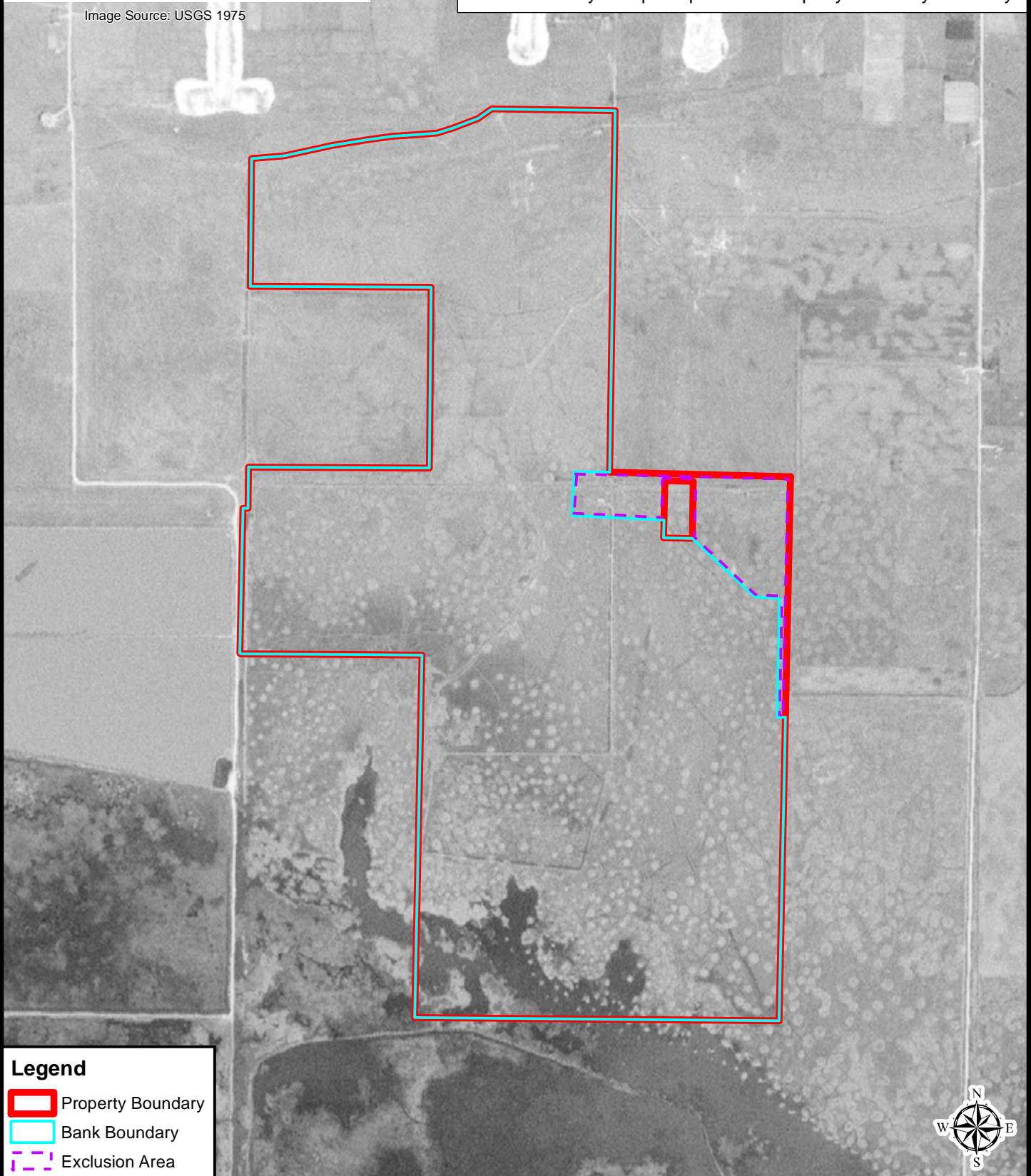
**1952
Historic Aerial**
 Scale: 1" = 1,000'
 Date: 07-15-16

Figure
3

1,000 500 0 1,000 Feet

Note:
Bank Boundary is superimposed on Property Boundary for clarity.

Image Source: USGS 1975



Legend

- Property Boundary
- Bank Boundary
- Exclusion Area



Date: 7/15/2016 Time: 1:41:55 PM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry_400\MXD\S\Figure 04_1975 Historic Aerial_RGuidry400.mxd


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Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

1975 Historic Aerial
 Scale: 1" = 1,000'
 Date: 07-15-16

Figure
4

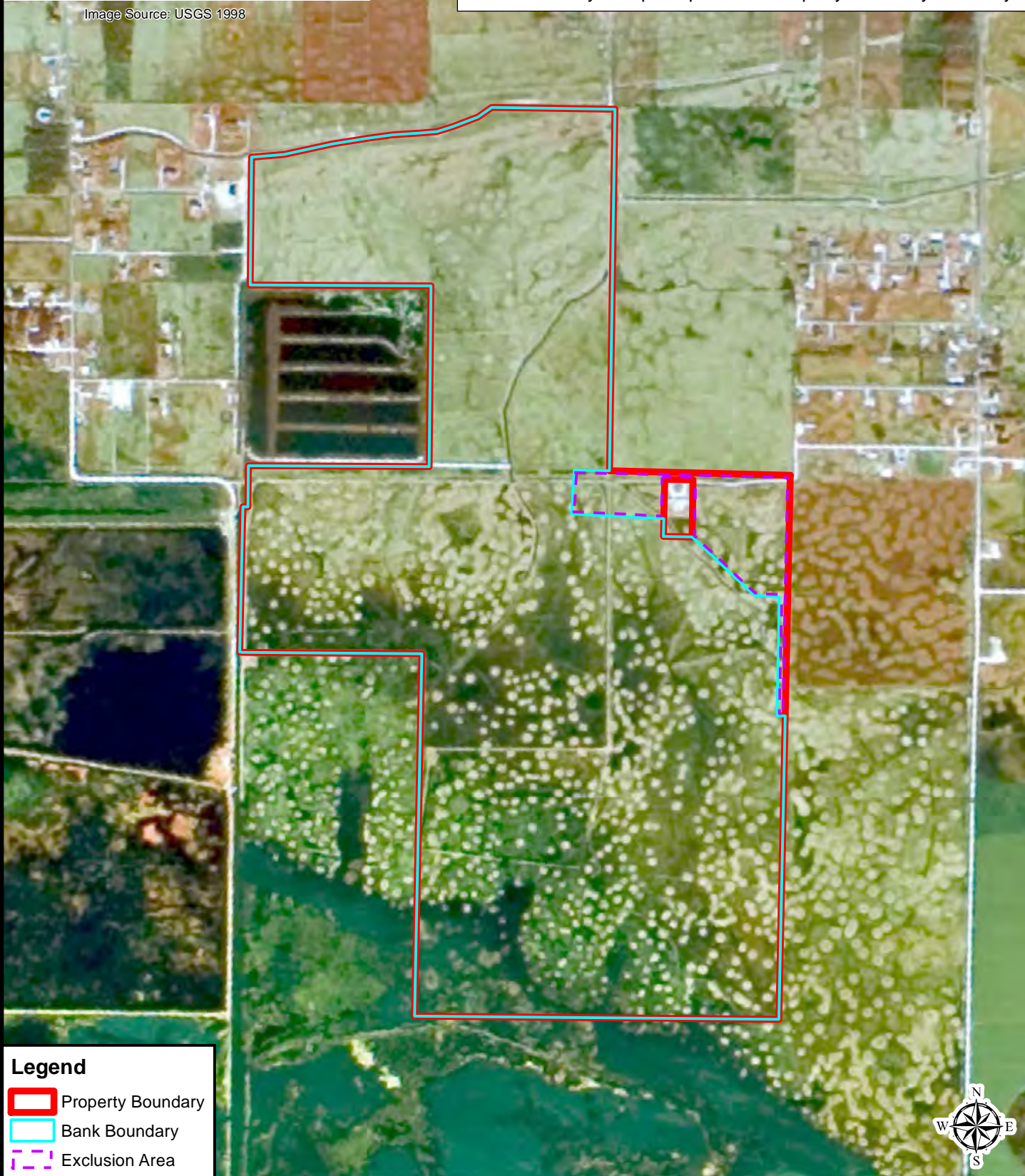
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Image Source: USGS 1998

Note:

Bank Boundary is superimposed on Property Boundary for clarity.



Legend

- Property Boundary
- Bank Boundary
- Exclusion Area



Date: 7/15/2016 Time: 4:04:27 PM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry\400\MXD\Figure 05_1998 Historic Aerial_RGuidry\400.mxd

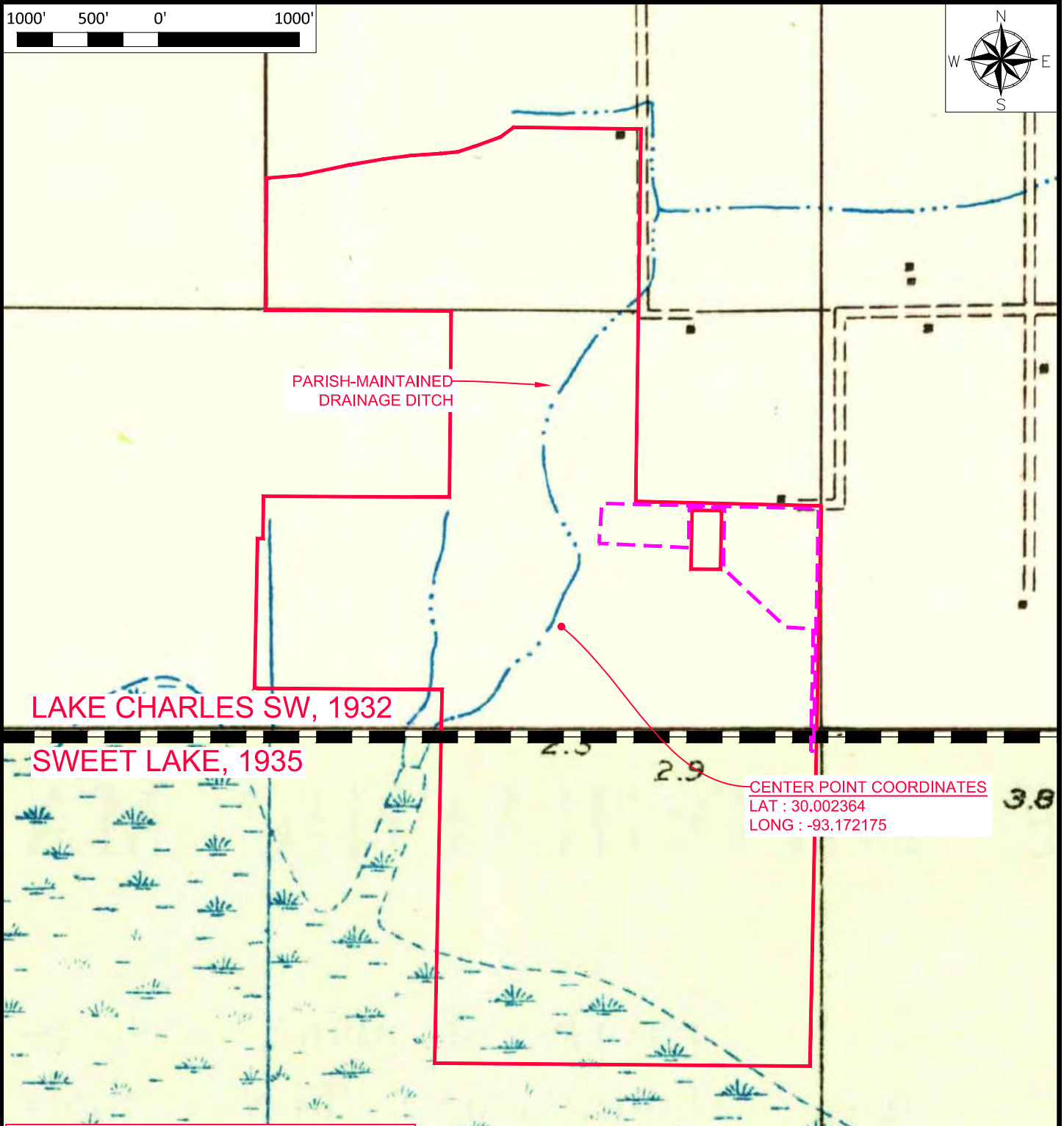
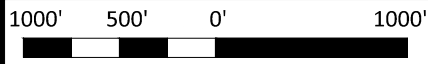

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 Sarasota, FL 34234
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 cell: 941-321-8107

Rev	By	Description

Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

1998 Historic Aerial
 Scale: 1" = 1,000'
 Date: 07-15-16

Figure
5



LOCATION OF PROPERTY AS SHOWN IS APPROXIMATE AS IT WAS SCALED FROM THE RESPECTIVE USGS QUADRANGLE MAPS

LEGEND	
	PROPERTY BOUNDARY
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	DRAINAGEWAY

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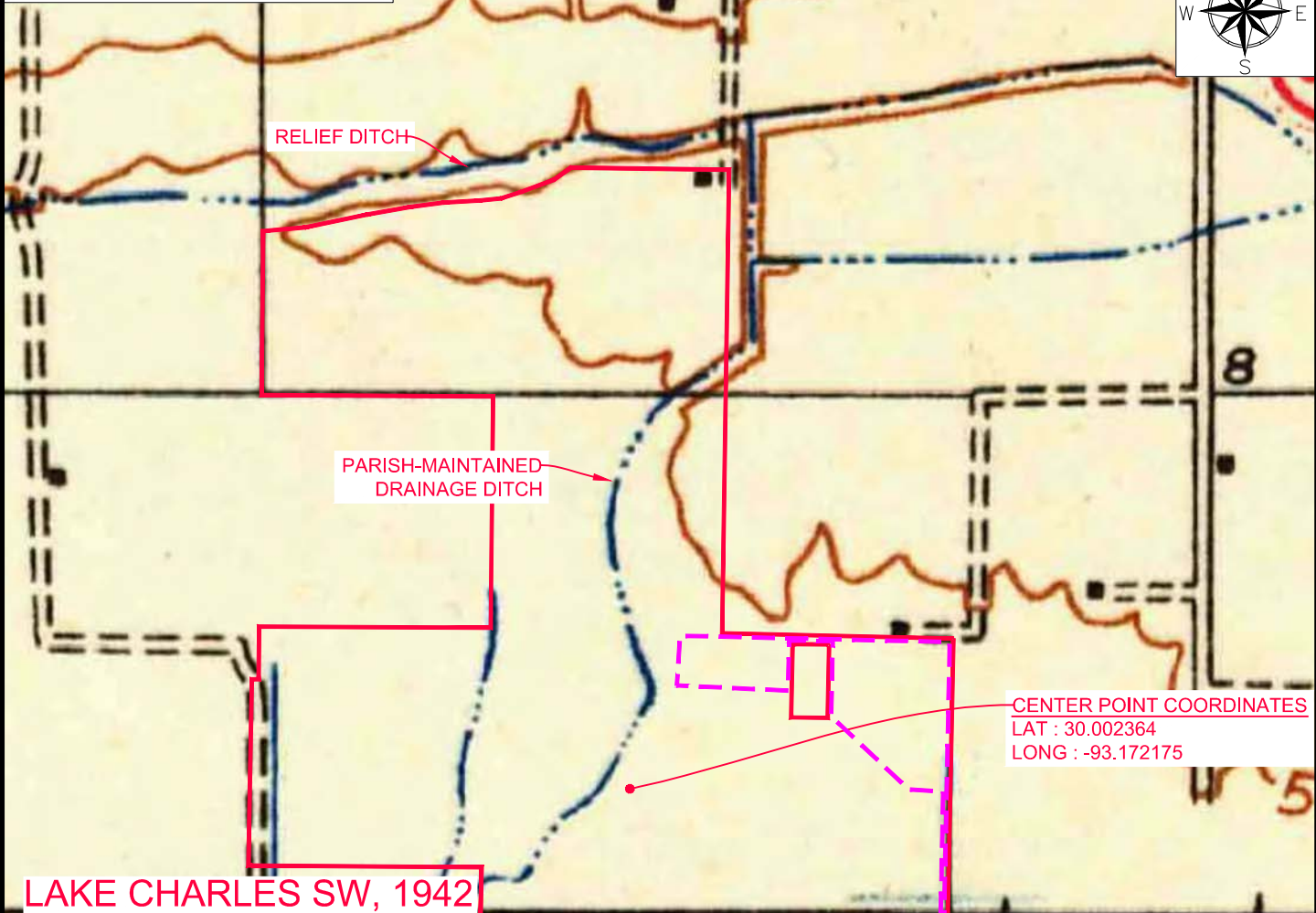
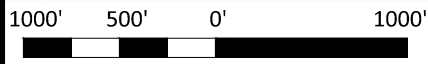
ecogenesis
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 cell: 941-321-8107

Rev	By	Description

Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

USGS QUADRANGLE MAP (1932/1935)
 Scale: 1" = 1000'
 Date: 07-19-16

Figure
6



LAKE CHARLES SW, 1942

SWEET LAKE, 1935

LOCATION OF PROPERTY AS SHOWN IS APPROXIMATE AS IT WAS SCALED FROM THE RESPECTIVE USGS QUADRANGLE MAPS

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LEGEND	
	PROPERTY BOUNDARY
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	DRAINAGEWAY

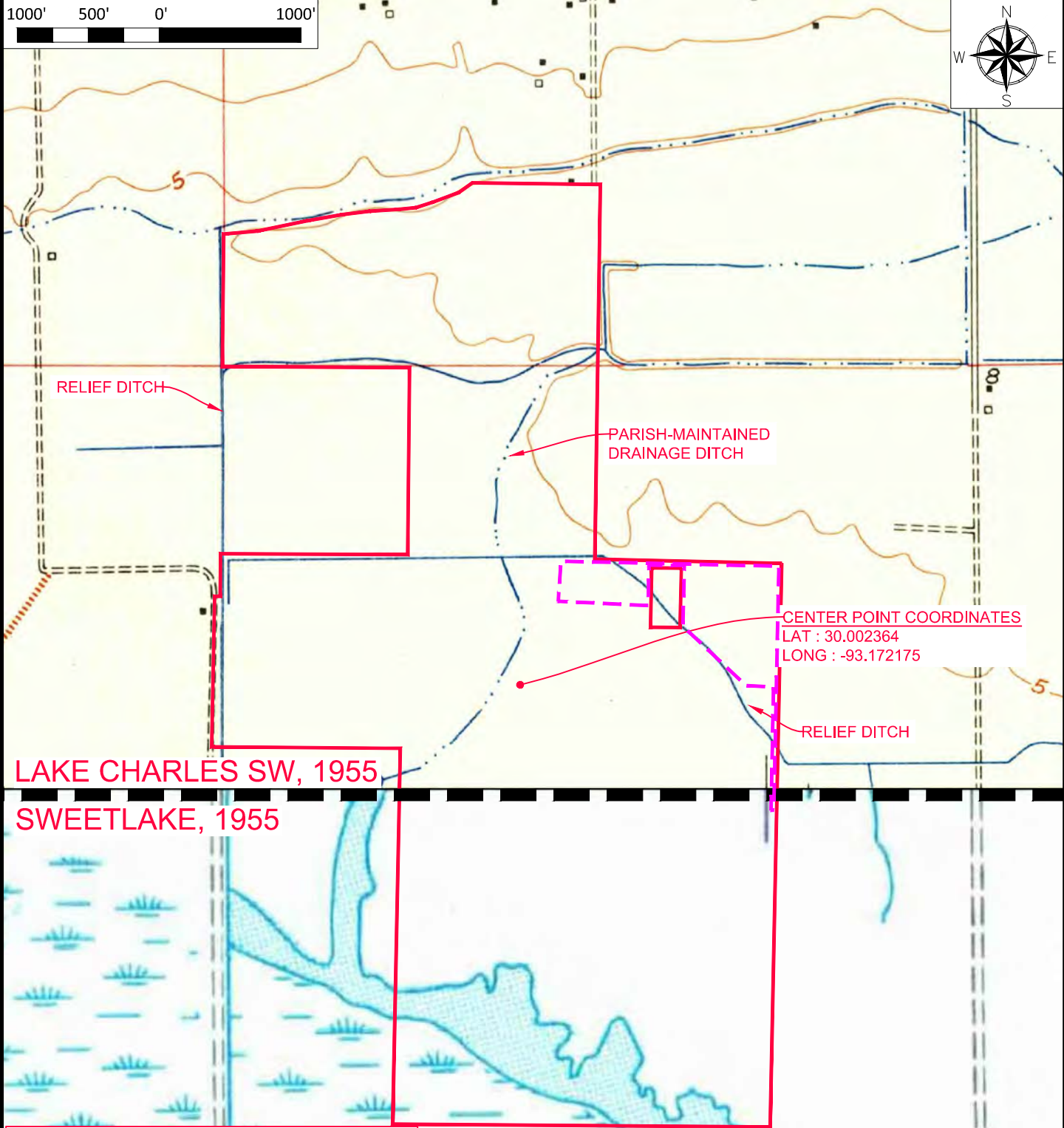
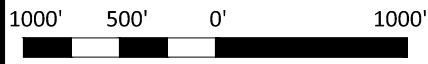
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Rev	By	Description

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 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

USGS QUADRANGLE MAP (1935/1942)
 Scale: 1" = 1000'
 Date: 07-19-16

Figure
7



LOCATION OF PROPERTY AS SHOWN IS APPROXIMATE AS IT WAS SCALED FROM THE RESPECTIVE USGS QUADRANGLE MAPS

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 ALEXANDRIA, LA 71309
 (318) 473-2100

LEGEND	
	PROPERTY BOUNDARY
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	DRAINAGEWAY

ecogenesis
 4152 Independence Ct, C-7
 Sarasota, FL 34234
 office: 941-351-0300
 cell: 941-321-8107

Rev	By	Description

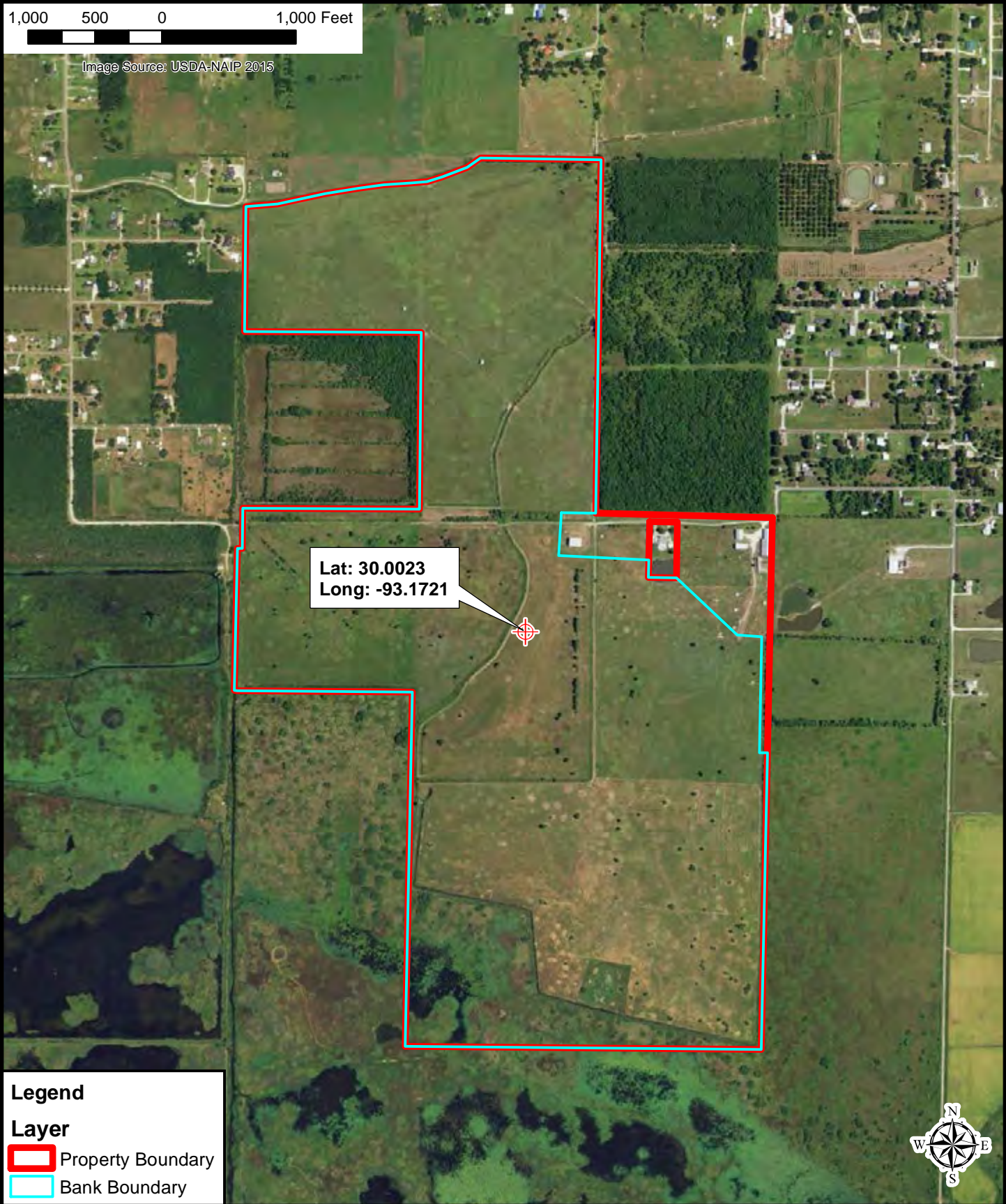
Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

USGS QUADRANGLE MAP (1955)
 Scale: 1" = 1000'
 Date: 07-19-16

Figure
8

1,000 500 0 1,000 Feet

Image Source: USDA-NAIP 2015



Legend

Layer

- Property Boundary
- Bank Boundary


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 cell: 941-321-8107

Rev	By	Description

**Willow Lake
 Mitigation Bank**
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

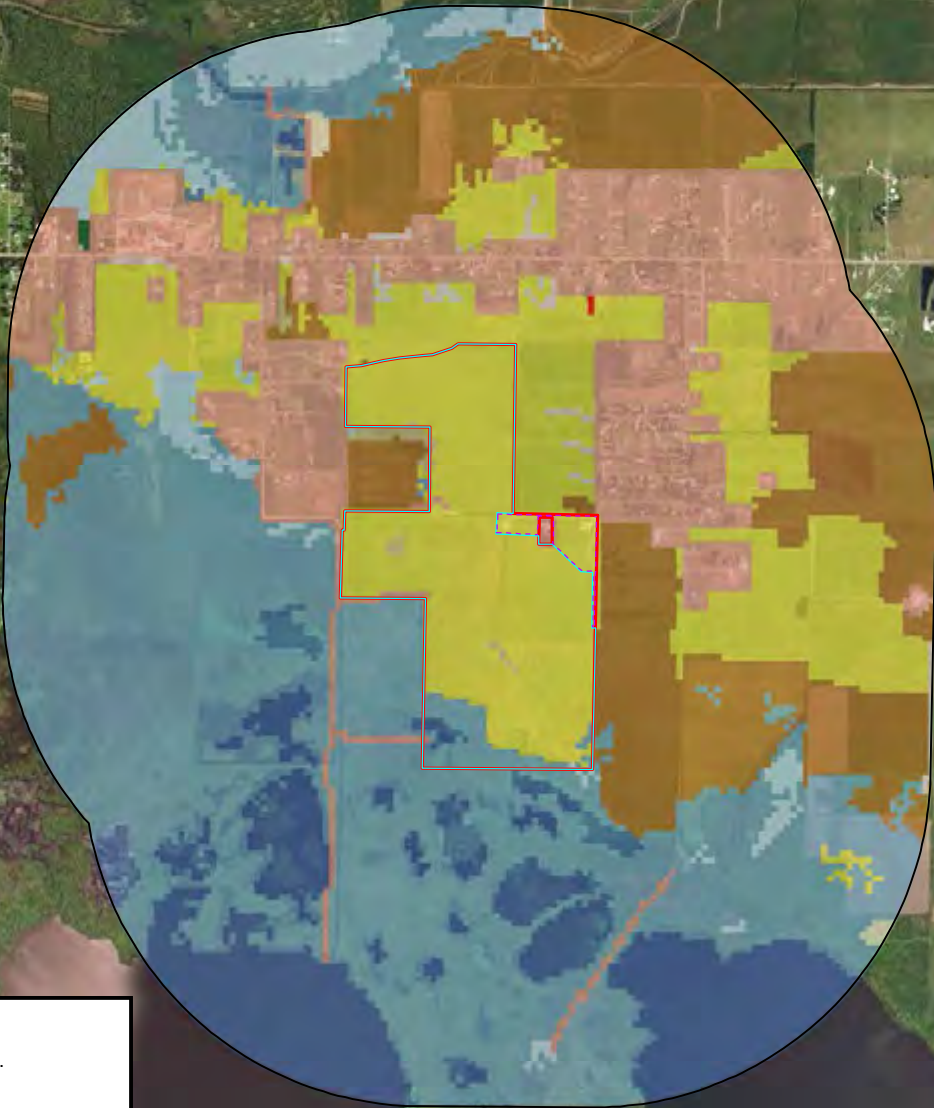
**Current
 Aerial**
 Scale: 1" = 1,000'
 Date: 07-15-16

Figure
9

3,000 1,500 0 3,000 Feet



Image Source: USDA-NAIP 2015



Legend

- Property Boundary - 395.86 Ac.
- Bank Boundary
- Exclusion Area
- One Mile Buffer - 4,397.05 Ac.

National Land Cover Database

USGS 2011-Modified for 2015 NAIP Imagery

- 11-Open Water - 11.44%
- 21-Developed, Open Space - 0.54%
- 22-Developed, Low Intensity - 18.19%
- 23-Developed, Medium Intensity - 0.02%
- 31-Barren Land - 0.07%
- 42-Evergreen Forest - 0.05%
- 52-Shrub/Scrub - 0.21%
- 71-Herbaceous - 0.18%
- 81-Hay/Pasture - 12.90%
- 82-Cultivated Crops - 18.70%
- 90-Woody Wetlands - 3.60%
- 95-Emergent Herbaceous Wetlands - 34.10%

Date: 7/15/2016 Time: 1:45:40 PM Document Path: S:\Projects\EcoSystem Renewal.LLC\RGuidry\400\MXD\S\Figure_10_Existing Land Use_RGuidry\400.mxd

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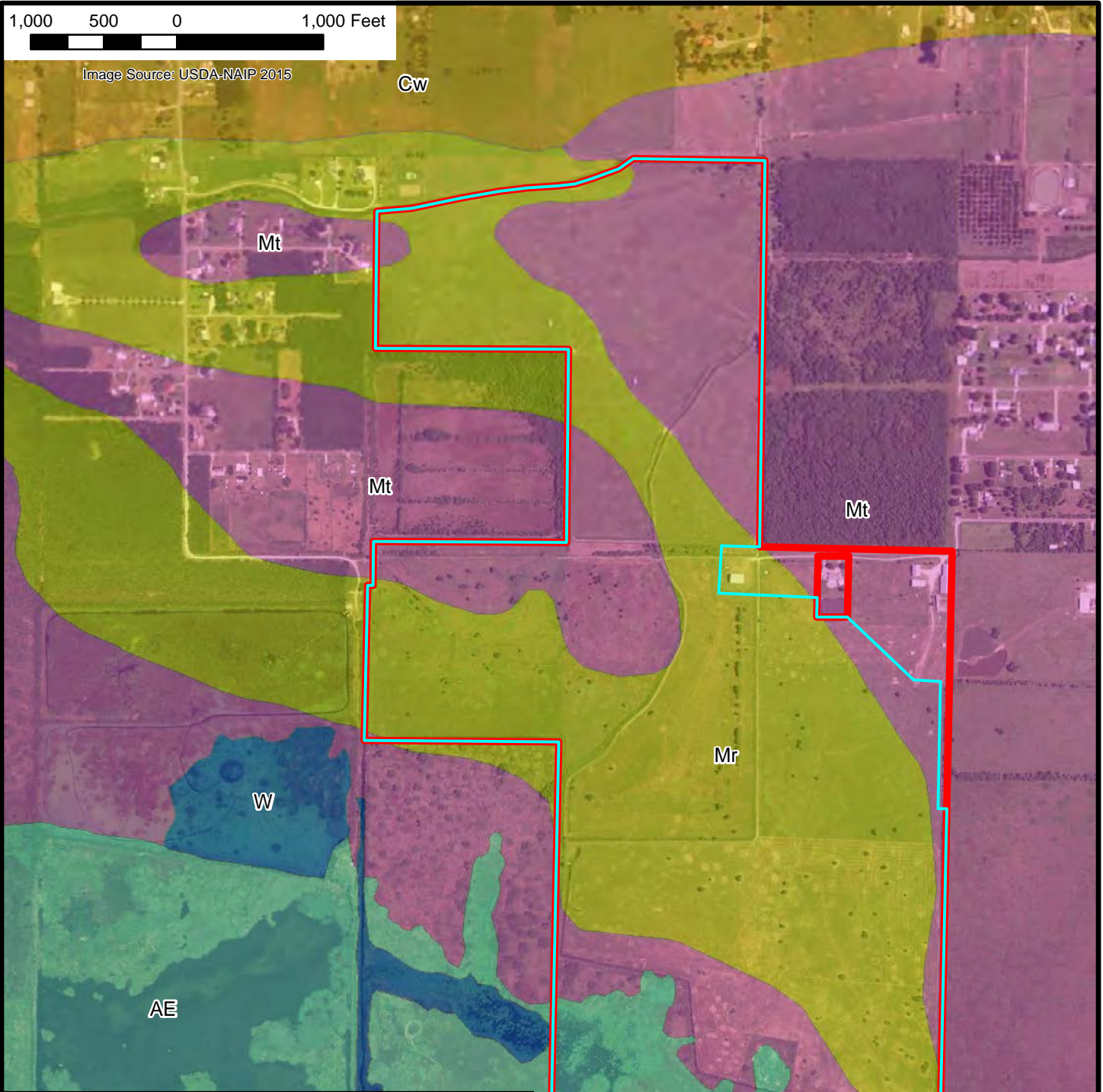
Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

Existing Land Use
 Scale: 1" = 3,000'
 Date: 07-15-16

Figure
10

1,000 500 0 1,000 Feet

Image Source: USDA-NAIP 2015



Legend

- Property Boundary
- Bank Boundary

Soils - USDA

- AE-Allemands muck, 0 to 0.2 percent slopes, very frequently flooded - Hydric
- Cw-Crowley-Vidrine complex, 0 to 1 percent slopes - Hydric
- Mr-Edgerly loam, 0 to 1 percent slopes - Hydric
- Mt-Mowata-Vidrine complex, 0 to 1 percent slopes - Hydric
- W-Water



Date: 7/16/2016 Time: 6:52:33 AM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry\400\MXDs\Figure 11_Soils_RGuidry\400.mxd

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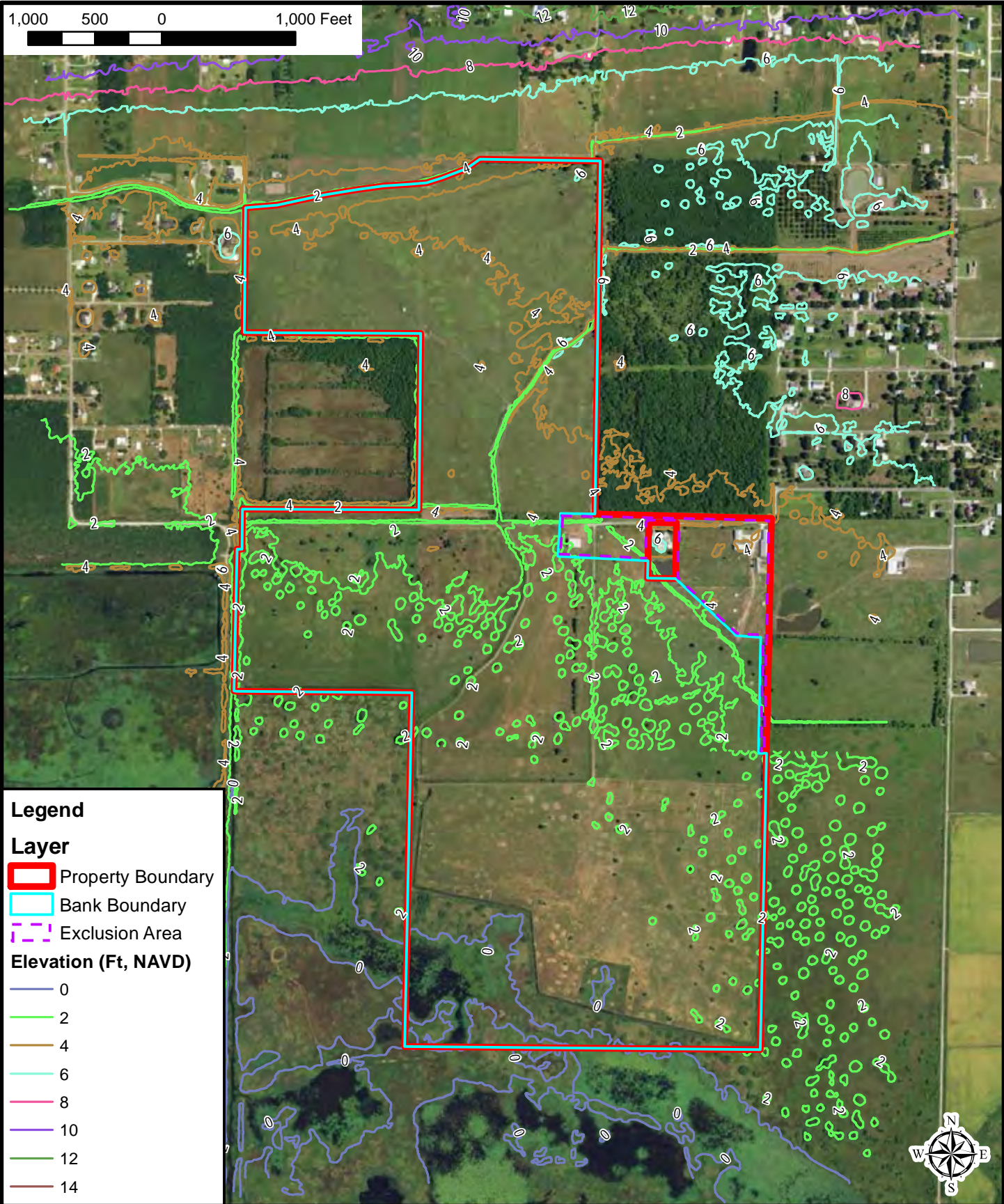
Rev	By	Description

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 Lat: 30.0023, Long: -93.1721
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 Cameron Parish, Louisiana

Soils
 Scale: 1" = 1,000'
 Date: 07-16-16

Figure
11

1,000 500 0 1,000 Feet



Legend

Layer

- Property Boundary
- Bank Boundary
- Exclusion Area

Elevation (Ft, NAVD)

- 0
- 2
- 4
- 6
- 8
- 10
- 12
- 14

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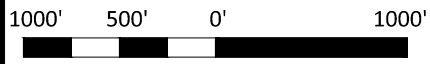
Willow Lake Mitigation Bank
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 Cameron Parish, Louisiana

Existing Topography

Scale: 1" = 1,000'
 Date: 07-11-16

Figure
12

Date: 7/11/2016 Time: 10:24:32 AM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry\400\MXDs\Figure 12_Existing Topography_RGuidry400.mxd



LEGEND	
	PROPERTY BOUNDARY
	SPOIL BANK DRAINAGE AREA
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	LEVEE
	PUMP TO DRAIN SOUTHERN PORTION OF PROPERTY
	PIEZOMETER
	DRAINAGEWAY
	SPOIL BANK
	DRAINAGE AREA
	LEVEE
	EXISTING OVERLAND FLOW DIRECTION
	DIRECTION OF DITCH FLOW
	EXISTING CULVERTS
	PIEZOMETER
	EXISTING ROAD

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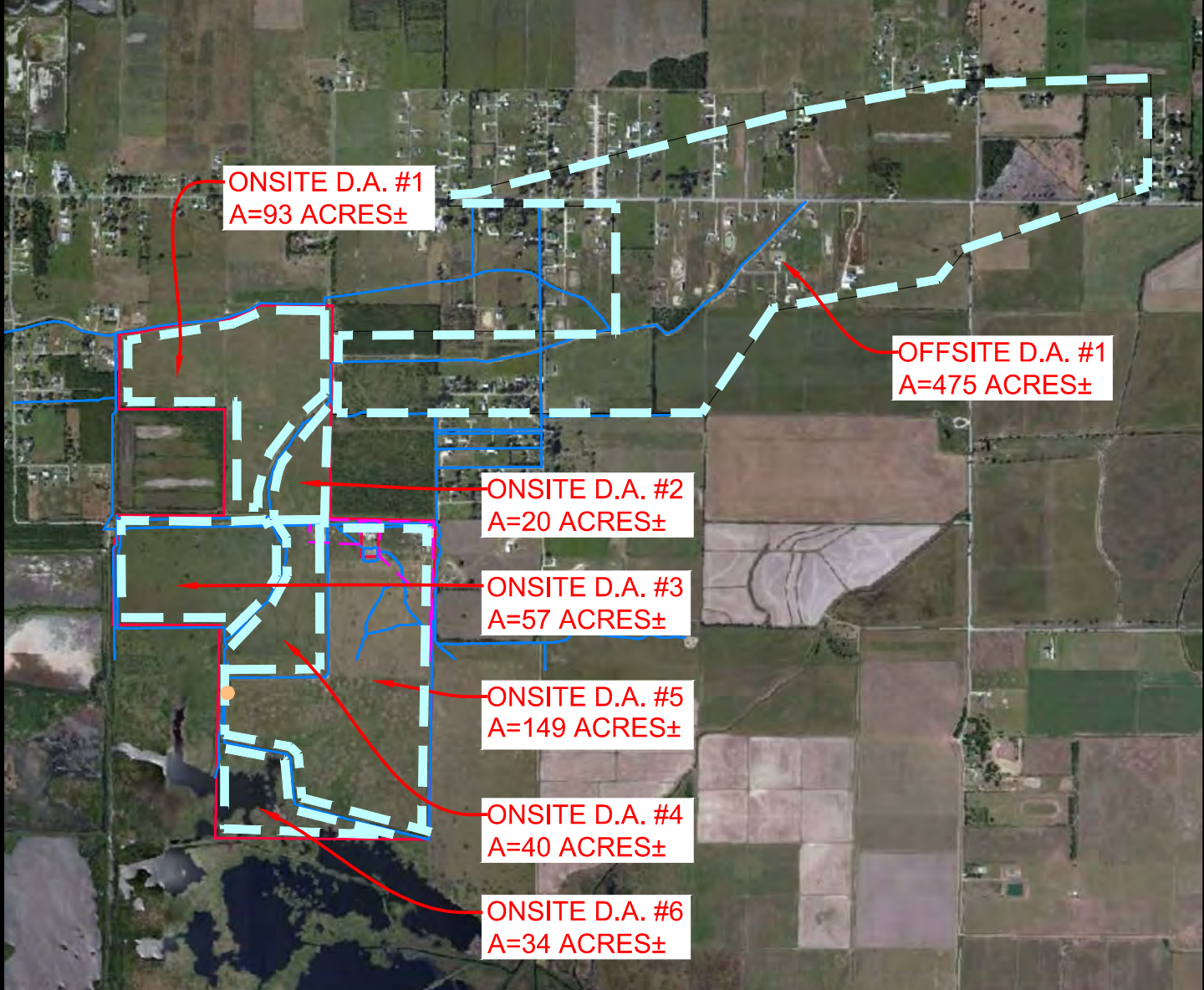
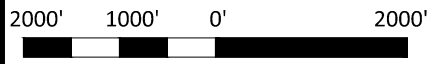
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 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
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CURRENT DRAINAGE
 Scale: 1" = 1000'
 Date: 07-19-16

Figure
13



LEGEND	
	PROPERTY BOUNDARY
	DRAINAGE AREA
	AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
	PUMP TO DRAIN SOUTHERN PORTION OF PROPERTY
	DRAINAGEWAY
	SPOIL BANK
	LEVEE
	EXISTING OVERLAND FLOW DIRECTION
	DIRECTION OF DITCH FLOW
	EXISTING CULVERTS
	PIEZOMETER
	EXISTING ROAD

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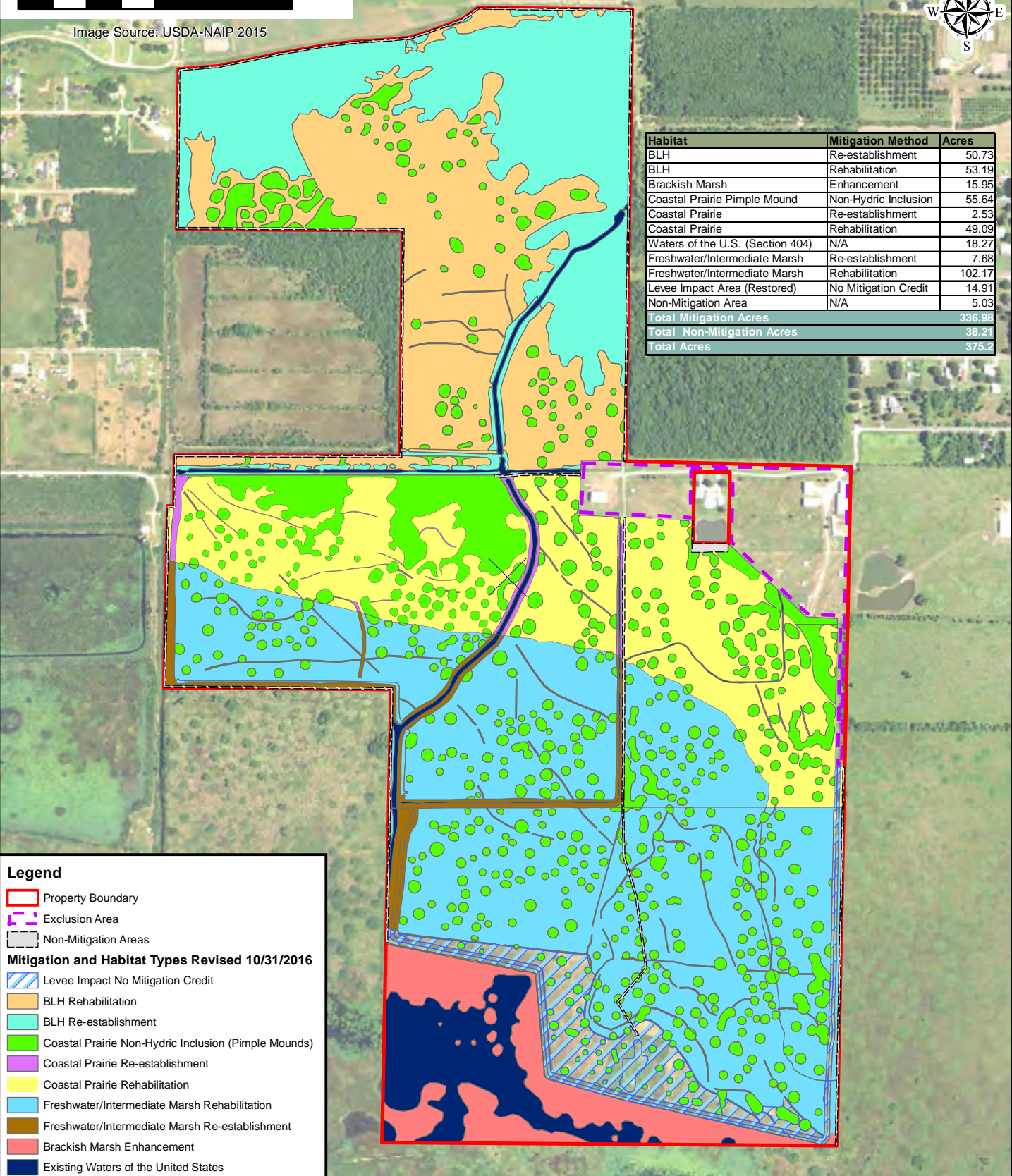
Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

CONTRIBUTING DRAINAGE AREA MAP
 Scale: 1" = 2000'
 Date: 07-19-16

Figure
14

800 400 0 800 Feet

Image Source: USDA-NAIP 2015



Habitat	Mitigation Method	Acres
BLH	Re-establishment	50.73
BLH	Rehabilitation	53.19
Brackish Marsh	Enhancement	15.95
Coastal Prairie Pimple Mound	Non-Hydric Inclusion	55.64
Coastal Prairie	Re-establishment	2.53
Coastal Prairie	Rehabilitation	49.09
Waters of the U.S. (Section 404)	N/A	18.27
Freshwater/Intermediate Marsh	Re-establishment	7.68
Freshwater/Intermediate Marsh	Rehabilitation	102.17
Levee Impact Area (Restored)	No Mitigation Credit	14.91
Non-Mitigation Area	N/A	5.03
Total Mitigation Acres		336.98
Total Non-Mitigation Acres		38.21
Total Acres		375.2

Legend

- Property Boundary
- Exclusion Area
- Non-Mitigation Areas
- Mitigation and Habitat Types Revised 10/31/2016**
- Levee Impact No Mitigation Credit
- BLH Rehabilitation
- BLH Re-establishment
- Coastal Prairie Non-Hydric Inclusion (Pimple Mounds)
- Coastal Prairie Re-establishment
- Coastal Prairie Rehabilitation
- Freshwater/Intermediate Marsh Rehabilitation
- Freshwater/Intermediate Marsh Re-establishment
- Brackish Marsh Enhancement
- Existing Waters of the United States


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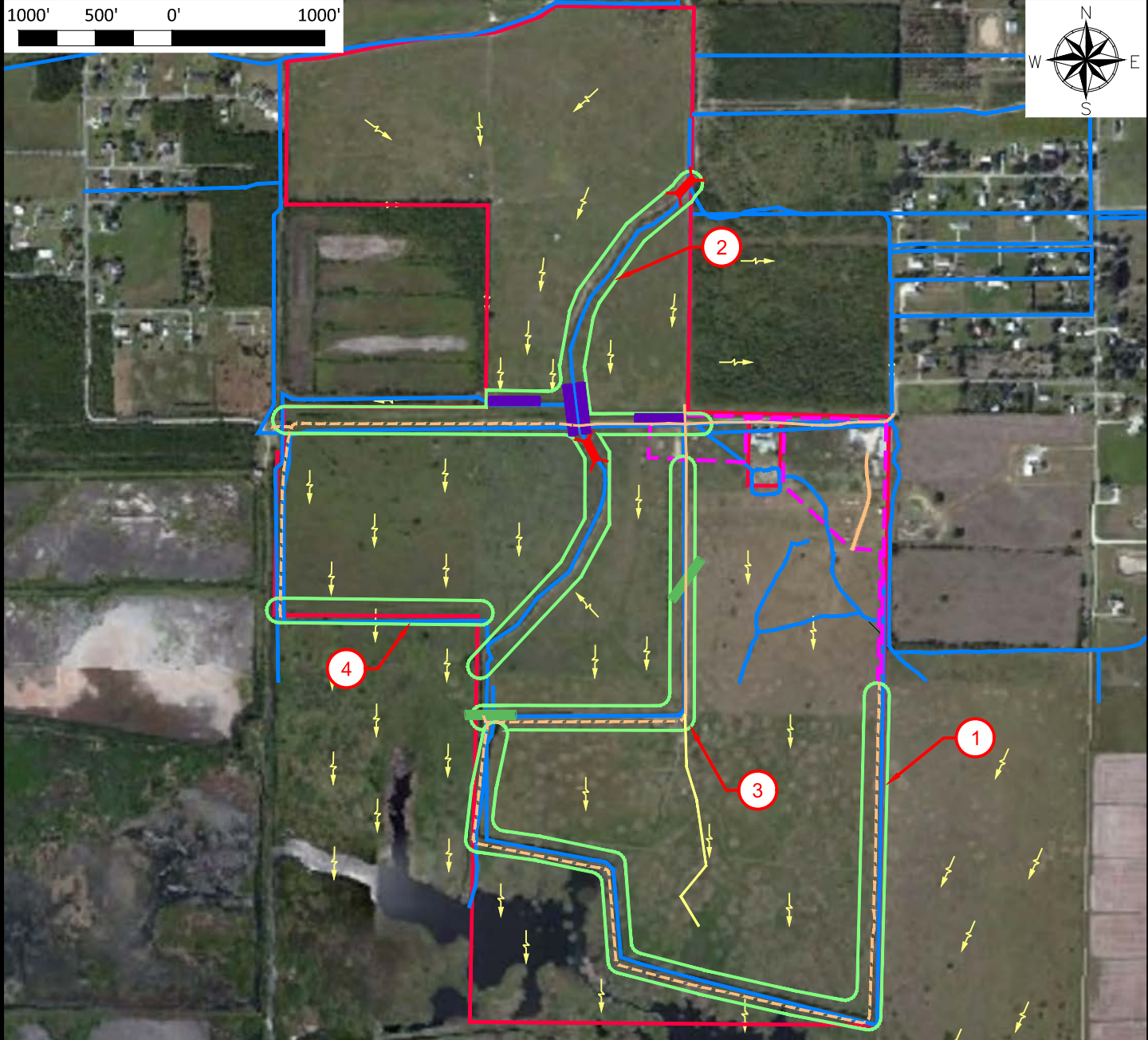
1	PJF	Add levee impact area
Rev	By	Description

**Willow Lake
 Mitigation Bank**
 Lat: 30.0023, Long: -93.1721
 Sec. 15 & 22, T12S-R8W
 Cameron Parish, Louisiana

**Mitigation
 Methods
 & Habitat Types**
 Scale: 1" = 792'
 Date: 10-31-16

Figure
15

1000' 500' 0' 1000'



LEGEND

- PROPERTY BOUNDARY
- AREA TO BE EXCLUDED FROM THE CONSERVATION SERVITUDE AREA
- EXISTING OVERLAND FLOW DIRECTION
- DRAINAGEWAY
- EXISTING CULVERTS TO BE REMOVED
- EXISTING CULVERTS TO REMAIN
- EXISTING CULVERT TO BE REPLACED WITH BRIDGE
- EXISTING ROAD TO REMAIN
- EXISTING ROAD TO BE REMOVED
- PROPOSED ATV TRAIL

- 1 REMOVE LEVEE & FILL IN DITCH
(RE: TYP. SECTION 1-1 / FIG. 17-A)
- 2 REMOVE SPOIL BANK
(RE: TYP. SECTION 2-2 / FIG. 17-A)
- 3 REMOVE SPOIL BANK & FILL IN DITCH
(RE: TYP. SECTION 3-3 / FIG. 17-B)
- 4 FILL IN DITCH
(RE: TYP. SECTION 4-4 / FIG. 17-B)

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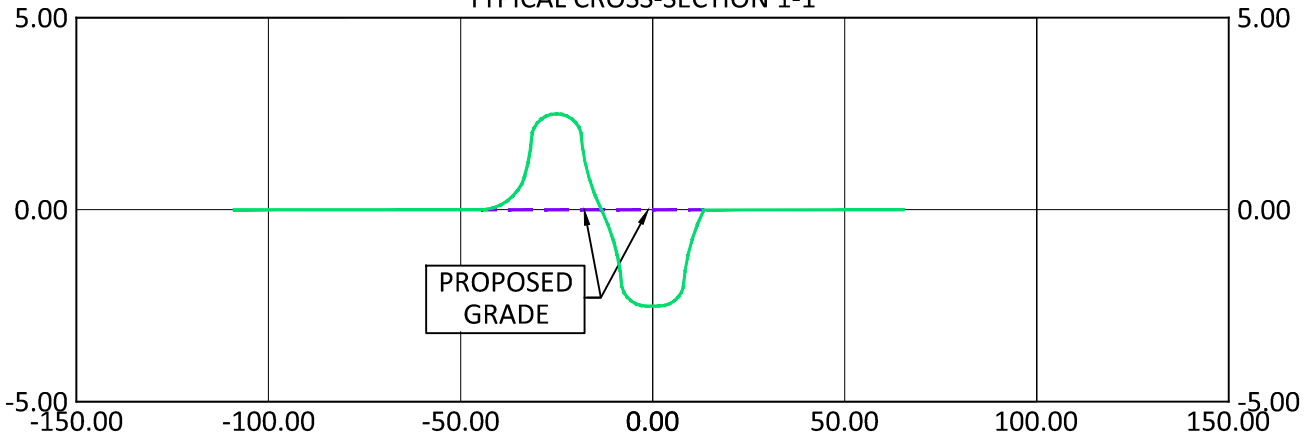
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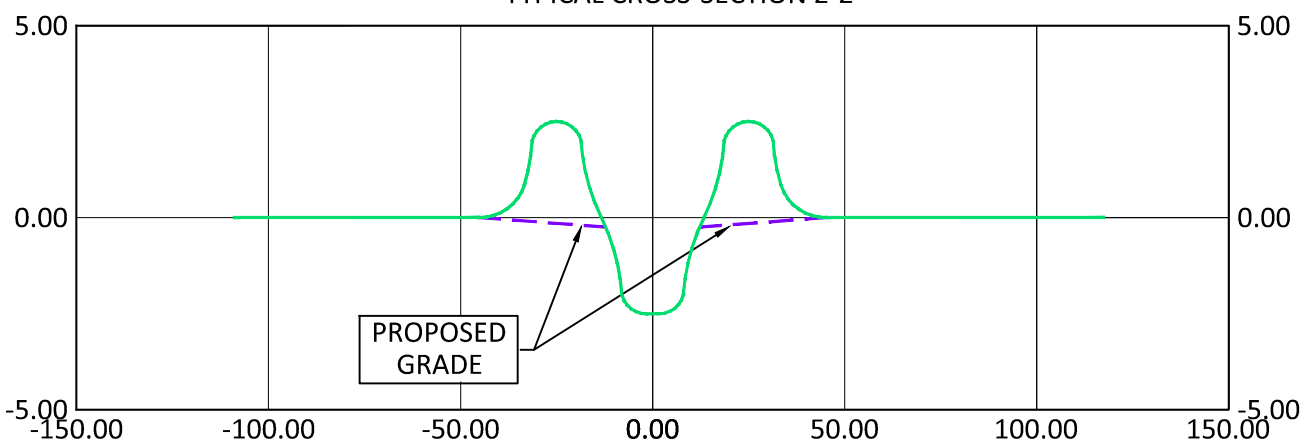
HYDROLOGIC RESTORATION PLAN
 Scale: 1" = 1000'
 Date: 09-21-16

Figure
16

TYPICAL CROSS-SECTION 1-1



TYPICAL CROSS-SECTION 2-2



— EXISTING GRADE
 - - - PROPOSED GRADE



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 cell: 941-321-8107

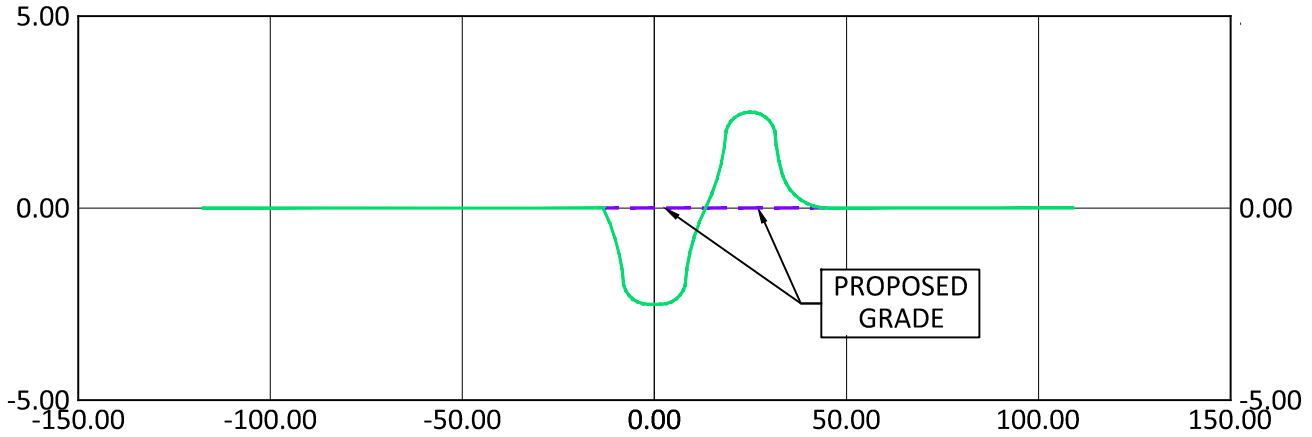
Rev	By	Description

Willow Lake Mitigation Bank
 Lat: 30.0023, Long: -93.1721
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 Cameron Parish, Louisiana

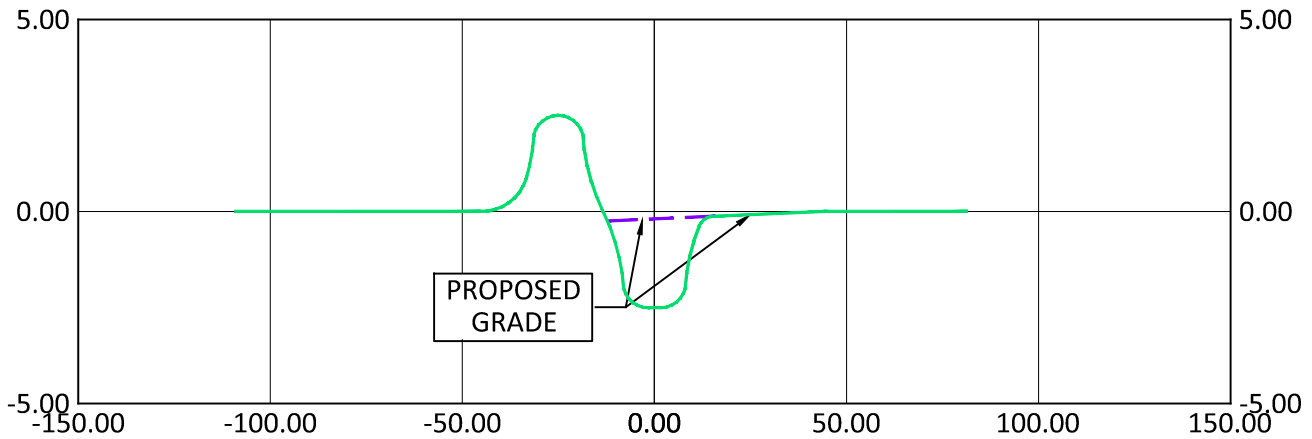
TYPICAL CROSS-SECTIONS
 1-1 - 2-2
 Scale: N.T.S.
 Date: 09-21-16

Figure
17-A

TYPICAL CROSS-SECTION 3-3



TYPICAL CROSS-SECTION 4-4



— EXISTING GRADE
 - - - PROPOSED GRADE



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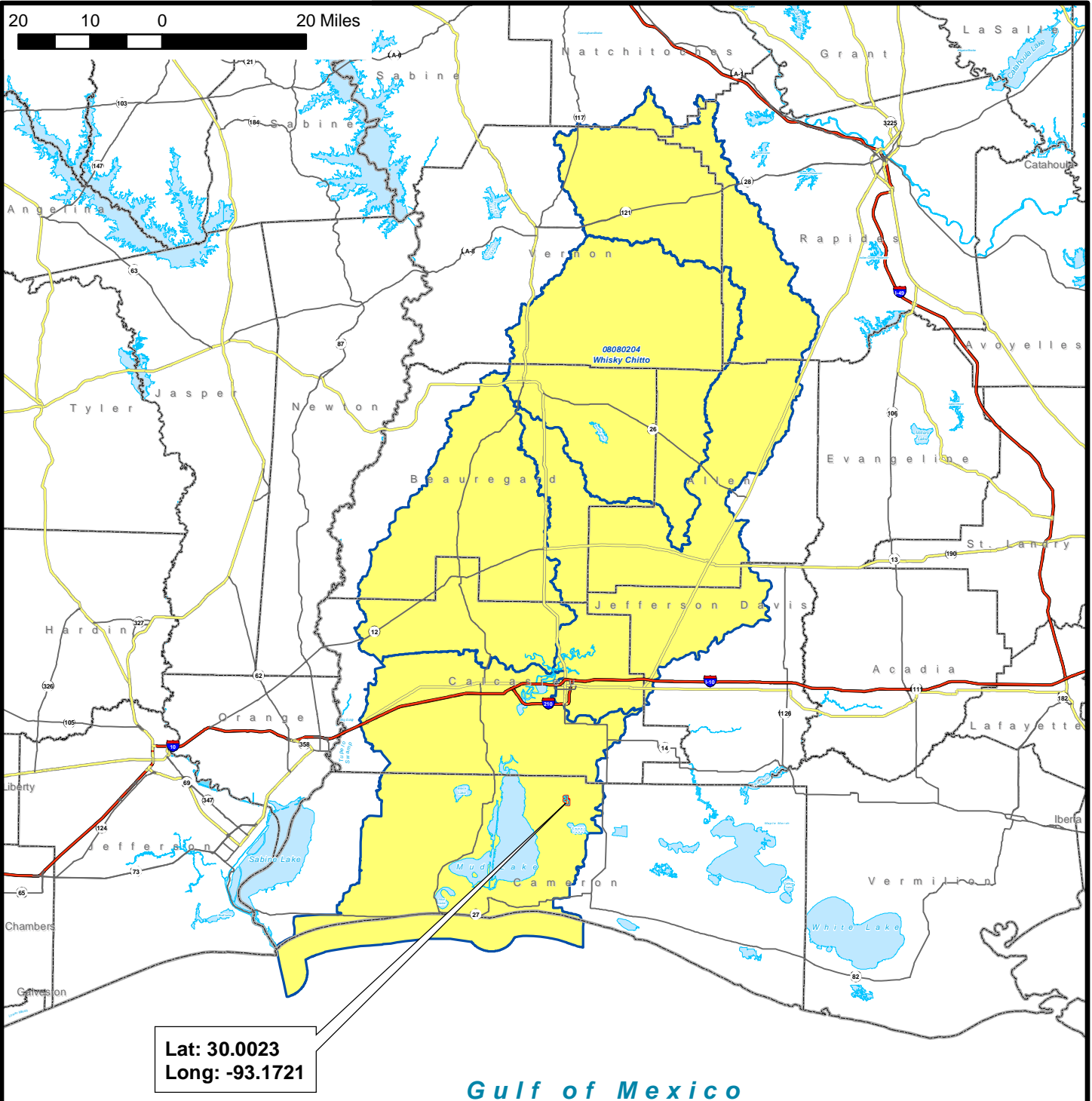
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 Cameron Parish, Louisiana

TYPICAL CROSS-SECTIONS
 3-3 - 4-4
 Scale: N.T.S.
 Date: 09-21-16

Figure
17-B



Lat: 30.0023
Long: -93.1721

Gulf of Mexico

Legend

- Property Boundary
- Bank Boundary
- BLH Service Area

ecogenesis

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Rev	By	Description

**Willow Lake
Mitigation Bank**

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Sec. 15 & 22, T12S-R8W
Cameron Parish, Louisiana

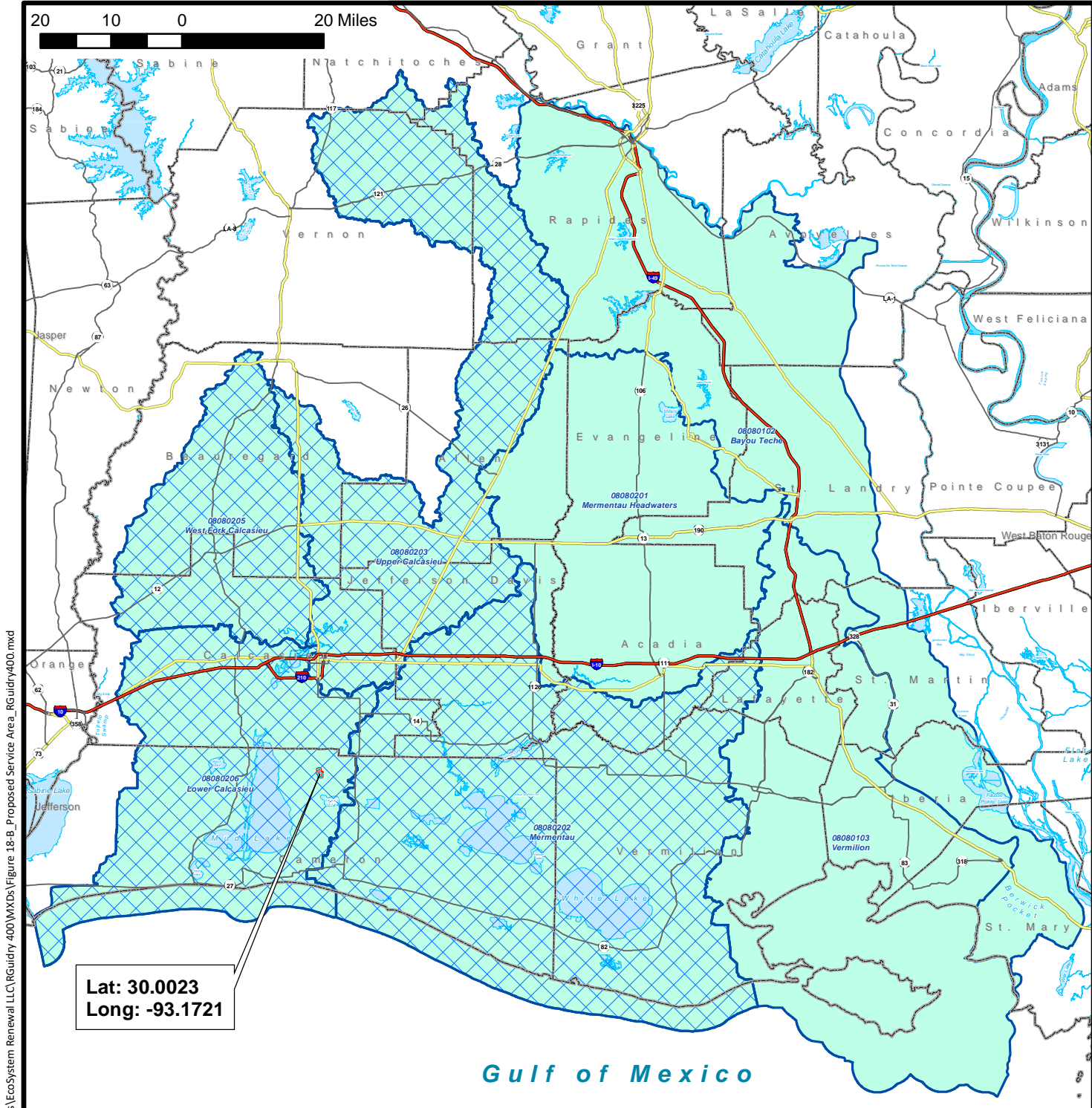
**Proposed
Service Area**

Scale: 1" = 20 miles
Date: 08-02-16

Figure

18-A





Date: 8/2/2016 Time: 3:17:48 PM Document Path: S:\Projects\EcoSystem Renewal LLC\RGuidry 400\MXD\Figure 18-B_Proposed Service Area_RGuidry400.mxd

Legend

- Property Boundary
- Bank Boundary
- Marsh Service Area
- Coastal Prairie Service Area

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 Cameron Parish, Louisiana

Proposed Service Area

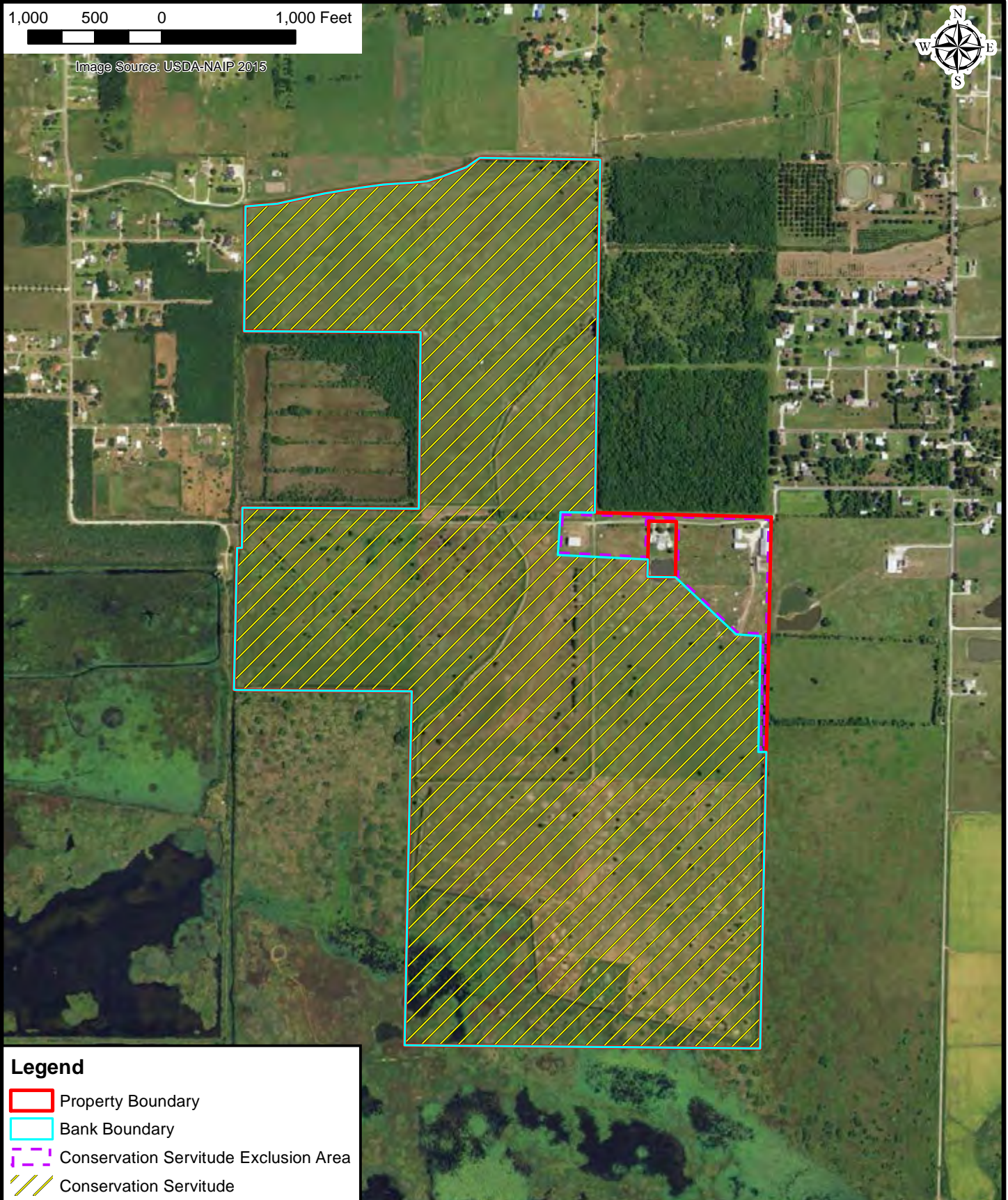
Scale: 1" = 20 miles
 Date: 08-02-16

Figure

18-B

1,000 500 0 1,000 Feet

Image Source: USDA-NAIP 2015



Legend

- Property Boundary
- Bank Boundary
- Conservation Servitude Exclusion Area
- Conservation Servitude

Date: 7/15/2016 Time: 1:47:50 PM Document Path: S:\Projects\EcoSystem Renewal.LLC\RGuidry_400\MXD\Figure_19_Conservation_Servitude_RGuidry400.mxd


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Conservation Servitude
 Scale: 1" = 1,000'
 Date: 07-15-16

Figure
19

Exhibit A

USACE

FSV / (IH)

Date: 5-15-2015

Botanist: *BTO*

Requestor: TEMPLET

MVN-2015-00703-SY

- WETLAND

- NON-WETLAND

- WATERS OF THE US / 404

- WATERS OF THE US / 10 (TIDAL)

ENVIRONMENTAL SERVICES, INC.

Project No.: 4-2015-JDM

Date: 02-19-2015

Figure No.: 2

Legend

Property Boundary (391.17 Acres)

Non-Wetlands (135.92 Acres)

Jurisdictional Wetlands (231.45 Acres)

Other Waters Of The US (23.80 Acres)

DP Data Plot

Data Plots

ERIC ROAD

