DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS, LA 70118-3651

June 5, 2023

Regulatory Division
Special Projects and Policy Team

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Subject #: MVN-2022-01005-MS

PUBLIC NOTICE

Public Notice Purpose: Pursuant to Section 10 of the Rivers and Harbors Act of March 3, 1899 (30 Stat. 1151; 33 USC 403) and Section 404 of the Clean Water Act (86 Stat. 816; 33 USC 1344), the U.S. Army Corps of Engineers, New Orleans District, Regulatory Division is soliciting comments from all interested parties on the development, utilization and long-term management of a proposed mitigation bank. The purpose of this mitigation bank is to provide compensatory mitigation for unavoidable impacts to wetland resources, including other waters of the United States, that result from projects authorized through the Department of the Army permit program.

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CYPRESS COASTAL MITIGATION BANK IN TANGIPAHOA AND ST. TAMMANY PARISHES

NAME OF APPLICANT: Delta Land Services, LLC, Mr. Daniel Bollich, PWS, CWB, CF, CERP, 1090 Cinclare Drive, Port Allen, Louisiana 70767.

LOCATION OF WORK: The 2,040.8-acre proposed site is located in Sections 23, 24, 25, 35, and 36, Township 7 South, Range 9 East and Sections 17, 19, 20 and 30, Township 7 South, Range 10 East approximately 5 miles west of Madisonville, Louisiana. The site is centered on the point 30.41076° N, -90.24797° W, located in Hydrologic Unit Codes 0807025 and 08090201, as shown in the attached prospectus.

CHARACTER OF WORK: Site restoration shall be accomplished through hydrological restoration and afforestation of the native vegetative community. This includes removal of undesirable vegetative species, preparation and replanting of appropriate species in order to generate bottomland hardwood and cypress swamp credits that could be used as compensation for unavoidable impacts to wetlands associated with Department of the Army (DA) permits authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Hydrological restoration shall be accomplished through creation and improvement of gaps to the existing spoil banks that

currently hinder surface hydrology as well as tidal flow. Additional details of the mitigation plan are included in the attached prospectus.

The U.S. Army Corps of Engineers is soliciting written comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties. The comment period will close **30 days** from the date of this public notice advertisement. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons thereof, are being solicited from anyone having interest in this prospectus. Letters must reference the applicant's name and the subject number, be addressed and mailed to the above address, ATTENTION: REGULATORY DIVISION.

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

Martin S. Mayer
Chief, Regulatory Division

Enclosures

PROSPECTUS FOR THE PROPOSED CYPRESS COASTAL MITIGATION BANK MVN-2022-01005

ST. TAMMANY AND TANGIPAHOA PARISHES, LOUISIANA

May 5, 2023

PREPARED BY:

DELTA LAND SERVICES, LLC
1090 CINCLARE DRIVE
PORT ALLEN, LOUISIANA 70767

LIST OF ATTACHMENTS

Attachment A Figures

Attachment B Tables

1. Introduction and Site Location

Delta Land Services, LLC (DLS) has prepared this prospectus in accordance with 33 CFR § 332.8(d)(2) to establish and operate the Cypress Coastal Mitigation Bank (Bank). The Bank is an approximately 2,040.8-acre[1] tract of land proposed to provide compensatory mitigation for unavoidable impacts to "Waters of the United States" authorized through the issuance of Department of the Army (DA) Permits by the U.S. Army Corps of Engineers (USACE) New Orleans District (CEMVN) pursuant to Sections 9 and 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972. Additionally, the Bank may provide compensatory mitigation for unavoidable impacts to coastal wetland resources under the Louisiana Coastal Resources Program (LCRP)[2] per the provisions of LAC 43:724 and RS 49:214.22 (8).

DLS will be the sponsor of the Bank and will construct, operate, monitor, and manage the Bank. DLS will protect the Bank project area by granting the conservation servitude as described in Section 7.4. As part of the evaluation of this project, DLS obtained the services of Intracoastal Consultants LLC and Delta Science LLC. Intracoastal Consultants is a civil engineering consulting firm with a focus on water resources along the Gulf coast which include planning, design, and administration of coastal restoration, flood protection, and drainage projects. Delta Science is owned by Dr. John Lopez. Dr. Lopez previously served as the Executive Director and the Director of the Coast and Community Program for the Pontchartrain Conservancy (formerly the Lake Pontchartrain Basin Foundation) from 2005 to 2021. Prior to that, Dr. Lopez was the Project Manager for Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) and the Louisiana Coastal Area Program (LCA) for the USACE Coastal Restoration Branch from 2001 to 2005.

In preparation of the prospectus, the DLS Team performed a Data Gap Analysis (DGA) for the project area utilizing a combination of publicly available data, site visits, and preliminary survey data of existing channels, ditches, and drainage structures within the Bank. Information obtained within the DGA was used to assess existing drainage patterns by creating flow arrow maps from LiDAR and evaluating low lying areas within the system. Through the DGA, the DLS Team developed and executed a comprehensive Data Collection Plan (DCP) which included additional topographic and bathymetric survey data within the Bank, interior and bounding drainages/canals, and Bedico Creek, Light Detection and Ranging (LiDAR) flown with Unmanned Aerial Systems (UAS) within the Bank, updated aerial photography of the site, and deployment of seven (7) water level gauges within the site for over two (2) months. The data collected for the project

[1] The acreage is considered approximate pending the finalization and signature of the Bank survey by a Professional Land Surveyor.
[2] The Office of Coastal Management (OCM) of the Louisiana Department of Natural Resources (LDNR) is the agency responsible for implementing the LCRP under the authority of the Louisiana State and Local Coastal Resources Management Act of 1978, as amended (Act 361, La. R.S. 49:214.21 et seq).

was further analyzed by the DLS Team to develop the preliminary hydrologic restoration plan for the Bank described in Section 4.1.1. Engineering analysis included during this phase of the project include:

- Water surface elevation (WSE) calculations utilizing locally collected hydrodynamic data with regional USGS and CRMS stations through a series of regression models between the two datasets to hindcast long term WSE data to the project site. The WSE calculations provided mean sea level (MSL), mean higher high water (MHHW), and mean lower low water (MLLW) at the Bank. Additionally, graphs were developed to assess the seasonality of water levels and the hydroperiod at the site. This information was used to establish boundary conditions for the project and determine that the exterior channels at the Bank are tidally influenced during dry periods and low flow rainfall events.
- The hydrodynamic data collected was also used to evaluate water levels within the exterior drainage features and the interior drainage features of the Bank. This data shows levels of impoundment within the existing swamp habitat and the need for hydrologic restoration within the Bank.
- UAS photogrammetry and LiDAR data collected was used to evaluate vegetation heights throughout the Bank. Vegetation heights were then compared to quality control transects collected by topographic surveys crews throughout the interior swamp of the Bank, which confirmed that low vegetation heights were typically found in low lying areas (sloughs and depressions). This analysis was used to conceptually layout drainage features such as channels, culverts, and gaping of spoil banks.

The Bank is located in the Mississippi Alluvial Plain and the Southern Coastal Plain Level III Ecoregions, and the Inland Swamps, Gulf Coast Flatwoods, and Deltaic Coastal Marshes and Barrier Islands Level IV Ecoregions (73n, 75a, and 73o); the Mississippi Delta Cotton and Feed Grains as well as the Atlantic and Gulf Coast Lowland Forest Crop land resource regions (LRR O and LRR T); the Southern Mississippi River Alluvium and Gulf Coast Marsh Major Land Resource Areas (MLRA 131A and 152A; Natural Resources Conservation Service [NRCS] 2006).

The Bank is in Tangipahoa and St. Tammany Parishes south of Louisiana Highway 22 (LA 22) approximately 5 miles West of Madisonville, Louisiana, in Sections 23, 24, 25, 35 and 36 of Township 7 South, Range 9 East and Sections 17, 19, 20 and 30 of Township 07 South, Range 10 East (Figures A1 and A2). The approximate site center is located at Latitude 30.410761° and Longitude -90.247970°[1]. The site is located entirely within the Louisiana Coastal Zone

Boundary and a portion of it is adjacent to the approximately 28,000-acre Joyce Wildlife Management Area (WMA) managed by the Louisiana Department of Wildlife and Fisheries (LDWF).

To get to the site, proceed from the intersection of Interstate Highway 12 (I-12) and Louisiana Highway 445 (LA 445), proceed south on LA 445 to its intersection with LA22. Turn left on LA 22 and proceed east for approximately 5.5 miles before turning right onto Pine Island Road which bisects the project area.

The Bank lies within the Tangipahoa Subregion and Liberty Bayou-Tchefuncta Subregion as defined by United States Geological Survey (USGS) Hydrologic Unit Codes (HUC) 08070205 and (HUC) 08090201. Natural elevations on the site range from 0 feet to 5 feet[3] with a majority, approximately 1,969.4 acres, of the Bank being in the 0 to 3-foot range (Figure A3). Of the remaining 71.4 acres, 68.4 acres is in the 3 to 5-foot range and 3.0 acres is above 5 feet. The 3.0 acres exceeding 5-feet are mostly anthropogenic features such as spoil, access roads and a camp site. The entirety of the Bank is in a flood zone per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM; Figure A4). The Bank is separated into a 1,587.2-acre northern tract (North Tract) and a 453.6-acres southern tract (South Tract) by an east-west canal traversing (Figure A5). This canal is locally known as the "High Bridge Canal (HBC)". Furthermore, each tract is separated into 10 units, 6 in the north tract and 4 in the south tract. The purpose of this separation is to assist in credit valuing, construction phasing, monitoring phases and administrative tracking of credit transactions within the Bank (Figure A6).

2. Project Goals and Objectives

Most of the site currently exists as forested swamp, emergent\scrub-shrub swamp, pine forests (i.e. pine islands), mixed pine-hardwood forests and freshwater emergent marsh. The mixed pine-hardwood forests and the pine islands are pine-dominant and have been historically utilized for the purpose of pine timber and pulpwood production. The swamps within much of the Bank area have been in a declining and/or stagnant state due to prolonged ponding and hydrologic disconnection from natural flow patterns in addition to historic logging of swamps without regard to regeneration and sustainability of the forests. Portions of the site have declined due to historic spikes in salinities attributed to the historic operation of Mississippi River Gulf Outlet Canal (MRGO). Additionally, invasive woody species are prevalent on the Bank. Given historic issues and the current hydrology impediments, the Bank site appears highly stressed and converting from a woody swamp to floatant and herbaceous wetlands. The goal of the Bank is the re-establishment[4] and enhancement[5] of

[3] All elevations are in mean sea level (MSL), North American Vertical Datum of 1988 (NAVD) Geoid 18.

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

coastal cypress-tupelo swamp (Swamp) and bottomland hardwood (BLH) in the form of bottomland hardwood and spruce pine-hardwood flatwoods forested wetland ecosystems as described by the LDWF Natural Heritage Program (LNHP 2009) (Table B1, Figure A7 et sequence).

The Natural Communities of Louisiana published in 2009 by the LDWF and the LNHP program define various natural communities of Louisiana. Bald cypress (*Taxodium distichum*)[6] swamps are forested, alluvial swamps growing on intermittently exposed soils. The soils are inundated or saturated by surface water or groundwater on a nearly permanent basis throughout the growing season except during periods of extreme drought. Bayous commonly intersect these wetlands. There is a low floristic diversity. Bald cypress is the dominant overstory species. Many aquatic food webs depend on the input of allochthonous material in the form of leaf litter or other organic debris that the wetland forest provides. Net primary productivity of swamp forests seems to be increased by periodic flooding or increased water flow and decreased by slow water movement or stagnation.

Spruce pine-hardwood flatwoods are natural mixed forest community indigenous to the western Florida parishes in southeast Louisiana. The wetlands variation of this community occupies poorly drained flats, depressional areas and small drainages that lie in a mosaic with higher, nonwetland areas. Hardwoods usually dominate the forest composition, but spruce pine (*Pinus glabra*) can dominate areas within the stand with loblolly pine (*Pinus taeda*) also present at some level. The topography is flat to gently undulating and several inches of water may occur on the surface during winter months with soil saturation continuing into the spring (LNHP 2009 and USACE 2017).

Regarding the credit type, USACE (2017) classifies hardwood flatwoods, which include spruce pine-hardwood flatwoods, as in-kind habitats with BLH. Therefore, the proposed credit types associated with this Bank will be Swamp and BLH. All Swamp and BLH credit acres (i.e. re-establishment and enhancement) are below 5 feet in elevation and therefore eligible for LDNR credit use (i.e. LDNR-Swamp and LDNR-BLH).

Access trails and herbaceous areas will be maintained as non-mitigation acreage within the Bank. The purposes of these features are to provide edge habitat for the benefit of wildlife and to facilitate monitoring/maintenance activities associated with Bank establishment, long-term management and continued recreational use of the property.

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[5]Enhancement is defined in 33 CFR § 332.2 as the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s) Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

[6] This and all subsequent scientific nomenclature is from the NRCS PLANTS Database https://plants.usda.gov/home (Accessed April 1, 2023).

As a result of silvicultural operations on the site dating back to the 1950s, access roads, canals, and spoil deposits were mechanically developed to facilitate the movement of timber. The elevated roads and spoil placement areas have hindered the natural sheet flow of the site. A lack of culverts and channels between roads has resulted in longer inundation periods following high water events. As the site has progressed under an altered hydrologic regime, desired species such as bald cypress have struggled to regenerate, providing a path for invasive species such as Chinese tallow (*Triadica sebifera*) and giant cutgrass (*Zizaniopsis miliacea*) to become the dominant vegetation. The degradation of the site is evident – areas that were once healthy bald cypress-tupelo stands now function in an extremely limited capacity as herbaceous and scrub-shrub wetlands.

In addition to the lack of surface connectivity, the existing channels along the roadways have become ineffective as storm debris, fallen trees, and other organic matter have effectively eliminated water flow. Much of north tract and some areas within the south tract now stay inundated for much of the year with little opportunity for exchange. This has not only driven a habitat change but also limits the site's ability to store stormwater from upstream areas. The areas north of the site along LA 22 between Bedico and Madisonville, LA have experienced a high rate of commercial and residential development in the past 30 years. The runoff from these areas naturally feeds downstream, through the Bank, and eventually into Lake Pontchartrain. However, since the Bank now stays inundated for better parts of the year, floodwater storage capacity has been significantly reduced, resulting in more backwater and longer flood periods for the surrounding communities.

The primary goal of the Bank is to restore greater hydrologic ingress and egress of semi-impounded swamp areas by means of gapping and removal of spoil from mostly continuous spoil banks; installation of additional culverts within the existing access road system; creation of natural tidal channels within the swamp; and cleaning out existing drainages along access roads. Canopy cover will be restored within swamp areas of sparse cover by means of artificial regeneration of swamp species. BLH and hardwood flatwoods will be restored within existing pine islands and mixed pine-hardwood stands through artificial regeneration with more resilient hardwood species that are more adapted to the current and anticipated hydrology within these areas. Woody invasive species control will be conducted throughout the bank as invasive species such as Chinese tallowtree are prevalent within many areas of the bank, especially in the shrub and mid-story strata.

Through intense hydrology restoration means, DLS will enhance wetland functions on the bank site, providing habitat for wildlife and improving the overall

stormwater drainage of the area. The restoration[7] and protection of forested wetland habitat, will provide additional wetland functions and values that are not currently realized under existing conditions and land use. The cessation of intensive silvicultural activities and reforestation[8] with native wetland tree species will provide localized improvement to upstream and downstream waters. Wildlife habitat will improve for resident biota and nearctic-neotropical migrating bird species (e.g., staging, resting, feeding, escape cover, etc.) through reforestation with native wetland tree and shrub species. Holcombe et al. (2015) described spruce pine-hardwood flatwoods as being important habitat for 29 species of greatest conservation need which include 1 species of crustacean, 3 species of amphibians, 5 species of reptiles, 11 species of birds, and 9 species of mammals.

Specifically, the project objectives are to improve and protect the physical, chemical, and biological functions of a forested wetland system as follows:

- Restoring and protecting historic and self-sustaining surface hydrology within the 2,040.8.0-acre Bank through hydrological restoration activities such as degrading spoil banks and the establishment of interior tidal creeks;
- The re-establishment of 2.0 acres of non-wetland spoil banks to bald cypress swamp community through the degradation of the spoil to wetland elevations and subsequent artificial regeneration of swamp species;
- The enhancement of 361.4 acres of Swamp through hydrologic improvement, control of invasive woody species, and interplanting of appropriate swamp tree species;
- The enhancement of 1,023.5 acres of Swamp through hydrologic improvement and control of invasive species;
- The enhancement of 233.7 acres of Swamp through the planting of appropriate swamp tree species and control of invasive woody species;
- The enhancement of 125.7 acres of pine stands to BLH wetland communities through the removal of invasive woody species, interplanting with resilient native hardwood species, and the reforestation of native species;
- The enhancement of 133.9 acres of mature, managed pine stands to native BLH forest through the removal of mature, commercial pine stems, reforestation with native species; the protection of suitable natural regeneration;

[7] Restoration is defined in 33 CFR §332.2 as the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.
[8] The SAF (2018) defines reforestation as the reestablishment of forest cover either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting) —note reforestation usually maintains the same forest type and is done promptly after the previous stand or forest was removed —synonym regeneration".

- The protection of 42.9 acres of existing Swamp through the inclusion of these areas in the 2,040.8-acre perpetual conservation servitude that is adjacent to a large, existing conservation area (Joyce WMA);
- Ensuring long-term viability and sustainability of the Bank through active and adaptive management including, but not limited to, invasive species control, appropriate monitoring, and long-term maintenance;
- Establishing financial assurances to achievement of long-term success criteria;
- Ensuring long-term viability and sustainability by implementing specific management strategies such as
    - active and adaptive management
    - establishment of financial assurances (e.g., construction, establishment) and long-term funding mechanisms
    - initial, intermediate, and long-term monitoring
    - initial, intermediate, and long-term maintenance
    - initial, intermediate, and long-term invasive species control;
- Providing for the long-term protection through the execution of a perpetual-term conservation servitude and establishment of a long-term endowment to cover annual expenditures associated with maintenance and management of the Bank;
- Restoring forested habitat for aquatic fauna through reforestation of a diverse assemblage of indigenous forest species and control of invasive/noxious species; and
- Reforestation and protection of land surrounded by large, extant, and contiguous forested habitat.

3. Ecological Suitability of the Site/Baseline Conditions

This section describes the ecological suitability of the site to achieve the objectives of the proposed mitigation bank, including the physical, chemical, and biological characteristics of the bank site and how that site will support the planned types of aquatic resources and function, as stated in 33 CFR § 332.8(d)(2)(vii)(B). Additionally, this section provides the baseline/current site conditions on and adjacent to the proposed site.

3.1 Land Use

3.1.1 Historical Land Use

The Bank and adjacent land uses were historically forested wetlands, fresh marsh, forested uplands, and home sites (Figure A8 et sequence). An improved and maintained road system has been in place throughout the property since the 1950s for the purposes of access to facilitate silvicultural operations on the pine islands. The property has also been used for recreational hunting, fishing and outdoor purposes and was known as the “Pine Island Club”.

3.1.2 Existing/Current Land Use

The existing/current land use of the Bank is a mix of swamp, scrub-shrub swamp/emergent marsh, and pine/mixed pine-hardwood habitat. The US Fish and Wildlife Service (USFWS 2011) identifies over 92% of the Bank as Palustrine Forested (PFO) and Palustrine Scrub-Shrub (PSS) per the Cowardin classification system (Cowardin et al. 1979; Figure A9).

The land use within a one-mile buffer of the Bank boundary is dominated by woody wetlands (38.8%), emergent herbaceous wetlands (33.9%). The remaining land use consists of evergreen forest (8.6%), development (8.1%), cultivated crops (3.1%), scrub-shrub (2.7%), grassland/herbaceous (2.1%), hay/pasture (1.5%), open water (0.1%), barren land (<0.1%), and deciduous forest (<0.1%) (Figure A10).

3.2 Soils

The soils are mapped as Aa: Abita silt loam, 0 to 2 percent slopes (6.9%); Ab: Abita silt loam, 2 to 5 percent slopes (0.3%); BB: Barbary muck, 0 to 1 percent slopes, frequently flooded (51.9%); Gy: Guyton silt loam, 0 to 1 percent slopes, occasionally flooded (33.3%); MP, Maurepas muck, 0 to 1 percent slopes, frequently flooded (7.2%); and OG: Ouachita, Ochlockonee and Guyton soils, 0 to 3 percent slopes, frequently flooded (0.3%) (NRCS 2018, Figure A11). All soil Samples collected other than those taken from spoil areas meet hydric soil requirements.

3.3 Hydrology

Sections 3.3.1 through 3.3.3 provide an overview of the watershed, historical and present hydrology of the Bank. Intracoastal Consultants conducted a detailed report on the watershed and hydrology which is included within Attachment C of this prospectus.

3.3.1 Contributing Watershed

Hydrology is influenced by localized rainfall, interior roads, existing spoil banks, hardpan development, and broad depressions. The land is relatively flat and gently slopes towards any natural drainage relicts and channelized water bodies (Figure A12). Natural hydrology is significantly altered by access roads, spoil banks, impeded canals and other drainage features. The general drainage pattern is from the north to the south towards Lake Pontchartrain.

3.3.2 Historical Hydrology and Drainage Patterns

Before human intervention, the site would have had more unimpeded flow between the Bank and the surrounding water bodies. The historical hydrology of the North Tract was primarily from precipitation, local high-water tables, and overland flow from the surrounding areas. The South Tract still exhibits a more natural state of surface hydrology, but less access to flow from the northern area primary due to the HBC. The HBC and its associated spoil banks limits surface flow, especially southerly flows within the North Tract. The HBC appears on all aerial imagery DLS evaluated, the oldest being 1954. This canal also appears on topographic maps as early as 1932. This canal, like many other anthropogenic canals in this region, was likely utilized for transporting materials between Bedico Creek and Tchefuncte River. It was likely heavily utilized when bald cypress logging was prevalent within the early 20th century to transport logs through various waterways to either rail heads or directly to lumber mills.

3.3.3 Existing/Current Hydrology and Drainage Patterns

Surface hydrology in the Bank is primarily driven from direct precipitation, discharge from various defined drainages such as small creeks and surface runoff from adjacent areas to the north; and tidal influence from connections with Lake Pontchartrain through either or a combination of Bedico Creek and the Tchefuncte River. Drainage canals, roadside drainages, and natural tributaries of Bedico Creek are present throughout the site, but their ability to convey water is severely hindered by a buildup of organic matter and woody debris. Surface flow within low elevation areas have multiple areas of surface water accumulation due to existing natural and anthropogenic surface features within the Bank. Historic, natural drainage patterns within the North Tract are significantly impeded by existing built-up access roads with limited culverts and mostly uninterrupted spoil banks along the HBC with few gaps. The drainage features associated with the access roads are plugged with organic matter and woody debris, mostly from recent storms, and no longer can convey water efficiently through the site. In addition to the HBC spoil bank, there are spoil banks adjacent to a borrow canal associated with an impoundment levee for a former agricultural area which is now a managed water body along the southeastern portion of the North Tract area as well as a large levee for what appears to be a contained and managed storm or wastewater treatment area on the eastern adjacent property (Figure

A13). The existing hydrologic disconnect of the North Tract causes abnormally long periods of inundation not natural to the landscape and is not conducive to natural regeneration of natural Swamp species.

The hydrology of the South Tract is driven mostly by direct precipitation and tidal influence from Bedico Creek. The spoil deposits along the southern bank of the HBC prevent adequate ebb and flood into the South Tract causing a hydrologic disconnect between it and the HBC. The existing road system south of the HBC leads to a pine island feature within this area which has naturally higher elevations than the surrounding landscape. Currently, this road acts as a hydrologic barrier isolating the east and west sides of the South Tract. A canal extends into the South Tract from Bedico Creek and was likely an old oil exploration canal, commonly known as “key-hole canals”. This canal has elevated spoil banks on either side but is open at its eastern terminus. A small waterway, or trenasse, extends from this terminus into the interior wetlands. There are various, small isolated open water areas through the wetlands into this area (Figure A13). Like the North Tract, the hydrology of the South Tract is currently not conducive to regeneration of natural Swamp species.

The altered hydrology and increased inundation negatively affects Swamp habitats. Mature baldcypress-tupelo forests are known to be less productive and have slower rates of growth in flooded, stagnant conditions. Additionally, tree mortality increases and regeneration of swamp species, either naturally or artificially, is limited under these conditions (Harms 1973, Conner and Day 1976, Donovan et al. 1988, Conner 1994, Faulkner et al. 2009, Keim et al 2006, Shaffer et al. 2009, Keim et al. 2012, Keim et al. 2013).

3.3.4 Jurisdictional Wetlands Status

A preliminary jurisdictional determination (PJD) was issued for the much of the proposed Bank site on February 9, 2023, and is included as Attachment D. Per the PJD, all areas proposed for enhancement were mapped as wetlands and all areas proposed for re-establishment were mapped as non-wetlands. A small portion of the Bank was not delineated as it was included after the PJD issuance. However, this small area is not classified as any type of restoration, enhancement or preservation.

3.4 Vegetation

3.4.1 Historical Plant Community

Historically, the plant community consisted of two separate habitat types, the lower elevations in the South Tract of the property were cypress-tupelo swamp while the plant community in the higher elevation northern part of the property could be best described as spruce pine-hardwood flatwood. As defined by *The Natural Communities of Louisiana* published in 2009 by the LDWF and the

LNHP, spruce pine-hardwood flatwoods are natural mixed forest community indigenous to the western Florida parishes in southeast Louisiana. The wetlands variation of this community occupies poorly drained flats, depressional areas and small drainages that lie in a mosaic with higher, nonwetland areas. Hardwoods usually dominate the forest composition, but spruce pine (*Pinus glabra*) can dominate areas within the stand with loblolly pine (*Pinus taeda*) also present at some level. These forests support distinct assemblages of plants and animals associated with particular landforms, soils, and hydrologic regimes. Cypress-Tupelo Swamps are forested, alluvial swamps growing on intermittently exposed soils most commonly along rivers and streams but also occurring in backswamp depressions and swales. They generally occur on mucks and clays, and silts and sands with underlying clay layers (Alfisols, Entisols, Histosols, and Inceptisols). There is relatively low floristic diversity, and associated species may vary widely from site to site. Both spruce pine-hardwood flatwoods and cypress-tupelo swamps provide important ecosystem functions including maintenance of water quality, productive habitat for a variety of fish and wildlife species, and regulation of flooding and stream recharge.

Much of the pine habitat has been managed for timber production with the focus of management based on pine production. Based on the historical aerials, various pine stands were harvested then subsequently regenerated, either by natural and/or artificial means, with an emphasis for pine management. Over time, approximately 620 acres of pine habitat has transitioned into swamps or scrub-shrub swamp habitat within the Bank area. This is likely attributable to the impounded conditions from roads, drainage canals and spoil banks as well as effects from increased hydrologic inputs from increased runoff as the areas north of the Bank were developed. The areas on the South Tract likely suffered from increased salinity during the operational era of the MRGO resulting in much of the area to go from a forested system to a more herbaceous system (Figures A14, A10, and A15). In many of these former pine areas, pine snags or scattered live pine stems that are small diameter and apparently stunted can be found. Dead hardwood snags such as live oak, post oak and swamp chestnut oak that are not adapted for swamp-like conditions can also be observed in these areas.

3.4.2 Existing Plant Community

The Bank site is a complex of various strata consisting of tree and sapling strata, shrub strata, and herbaceous strata[9]. The strata were based on a canopy model developed utilizing an UAS equipped with a LiDAR payload. This was flown over the North Tract from May to June 2022 and over the South Tract from September to October 2022[10]. The strata were further evaluated into height classes based

[9] Strata are defined in the USACE Atlantic and Gulf Coastal Regional Supplement (USACE 2010).
[10] The UAS system consisted of an Unmanned Aerial Vehicle (UAV) with a high accuracy Global Navigation Satellite Systems (GNSS) antenna and flown utilizing Real-Time Kinematic (RTK) with realt-time corrections feed from the LSU Center for Geomatics (C4G) Networked Transport of RTCM via Internet Protocol (NTRIP) survey network. The UAV

on the height above ground measurements developed from the canopy model. Vegetation ranging from 0 to 3 feet AGH was classed as sub-shrub; vegetation ranging from 3 to 6 feet AGH was classed as low-shrub; vegetation ranging from 6 to 12 feet was classed as mid-shrub; vegetation ranging from 12 to 20 feet was classed as high-shrub; and vegetation ranging from >20 feet was classified as trees. The existing aerial extents of strata cover, strata classes, and height ranges are quantified in Table B2 and Figure A15 (et sequence.)

To determine woody species composition, DLS biologists collected information from 36 plots within the Bank area. Information such as species, diameter at breast height (DBH), and stems per plot were collected within a 1/5th acre plot. Data such as stems per acre (SPA) and basal area (BA) were calculated within the tree strata to determine relative species density, using SPA, and relative species dominance, using BA. SPA was calculated in the sapling/shrub layer and utilized to determine species density for these strata[11]. Directional photographs were collected at each data point in the four cardinal directions (north-east-south-west). This data appears in Appendix F.

Based on field observation and remote-sensing data, the site consists of five distinct habitat communities as follows: 1) pine\hardwood, 2) pine (i.e pine islands), 3) herbaceous\shrub swamp; 4) shrub swamp; and 5) forested swamp. Significant tree damage and fallen trees attributed to Hurricane Ida, which affected this area in August 2021, were observed in all forested areas but was most prevalent in the pine island and mixed pine-hardwood stands.

Dominant species in the pine\hardwoods include but are not limited to loblolly pine, slash pine (*Pinus echinata*), southern magnolia (*Magnolia grandiflora*), and Chinese tallow in the tree strata; Chinese tallow, deciduous holly (*Ilex decidua*), wax-myrtle (*Morella cerifera*), overcup oak (*Quercus lyrata*), and water oak (*Quercus nigra*) in the sapling\shrub stratum; and palmetto (*Sabal minor*), wood oats (*Chasmanthium latifolium*), sand spikerush (*Eleocharis montevidensis*), Cherokee sedge (*Carex cherokeensis*), and poison ivy (*Toxicodendron radicans*) in the herbaceous stratum. The overall stem density of species in the tree layer averages 560 stems per acre (SPA) with a BA of 140 square feet per acre. The stem density of species in the sapling\shrub layer averages 220 SPA (Table B3). The elevation of this area ranges from approximately 2 to 5 feet but does not exceed 5 feet.

carried a three return lidar-sensor The lidar dataset was subsequently classified as ground, vegetation or other and a canopy height model (CHM) was created from the data whereby each pixel contained the height above ground value of the top of the vegetation.

[11] The strata utilized for the plot sampling is based on the four-strata method defined in USACE 2010. The tree strata consist of woody plants, excluding vines, 3 inches or more in DBH, regardless of height. The sapling/shrub stratum consists of woody plants, excluding vines, less than 3 inches or more in DBH and greater than 3.28 feet in height.

Dominant species in the pine islands include but are not limited to loblolly pine, slash pine, and Chinese tallow in the tree stratum; Chinese tallow and wax-myrtle in the sapling/shrub stratum; and palmetto, muscadine (*Vitis rotundifolia*), wood oats, soft rush (*Juncus effusus*), poison ivy and sand spikerush in the herbaceous stratum. The overall stem density of species in the tree stratum averages 548 SPA with a BA of 137 square feet per acre. The stem density of species in the sapling\shrub layer averages 475 SPA (Table B4). The elevation of these habitats is approximately 0 to 3 feet.

Species in the herbaceous\shrub swamp include but are not limited to bald cypress and tupelo gum (*Nyssa aquatica*) in the tree stratum; wax-myrtle, baldcypress, red maple (*Acer rubrum*), tupelo gum and Chinese tallow in the sapling\shrub data; and giant cutgrass, swamp sawgrass (*Cladium mariscus*), broad leaf cattail (*Typha latifolia*), bull tongue (*Sagittaria platyphylla)*, sedges (*Eleocharis* and *Carex* spp) in the herbaceous stratum. This area is dominated by vegetation in the herbaceous strata or woody vegetation in the sapling\shrub-strata that is less than 6 feet in height. Species in the tree strata are sparse with the overall stem density of species in this stratum averaging 63 stems per acre with an average basal area of 8 square feet per acre. Species in the sapling\shrub stratum average 212 SPA (Table B5).

Species in the shrub swamp include but are not limited to bald cypress, water tupelo, and slash pine in the tree stratum. Species in the sapling\shrub stratum include but are not limited to wax-myrtle, red maple, bald cypress, and Chinese tallow, and delta duck potato, broad leaf cattail, and cutgrass in the herbaceous stratum. This area is dominated by woody species in the sapling\shrub strata that is between 6 and 20 feet in height with an average density of 178 SPA. The overall stem density in the tree stratum averages 181 SPA and the BA averages 31 square feet per acre (Table B6).

Species in the forested swamp include but are not limited to bald cypress, water tupelo, and slash pine in the tree stratum; bald cypress, Chinese tallowtree, deciduous holly, wax-myrtle, red maple, and water tupelo in the sapling\shrub layer; and delta duck potato, broad leaf cattail, and cutgrass in the herbaceous stratum. The tree stratum is dominated by woody stems greater than 20 feet in height. The overall stem density in the tree stratum averages 420 SPA and the BA averages 128 square feet per acre. Species in the sapling\shrub stratum average 386 SPA (Table B7). The elevations in most of the swamp habitat, regardless of stratum, ranges from 0 to 1 foot in elevation.

3.5 General Need for the Project in this Area

In addition to providing compensation for impacts associated with local commercial and residential developments, the proposed Bank will serve to

mitigate for potential wetland impacts[12] associated with industrial facilities, renewable energy facilities, flood control projects, and linear projects such as electrical lines, telecommunication lines, pipelines, roadways and levees in the Lake Pontchartrain basin. In terms of current mitigation credit availability, there is currently a lack of coastal swamp and bottomland hardwood credits within the Pontchartrain Basin.

Development of wetland restoration sites such as this proposed Bank in an area of increasing development, urbanization and infrastructure needs will provide an important resource regarding storm water retention, flood storage and resilience to natural disasters such as tropical storms and hurricanes. Major soil resource concerns exist in this area due to the generally unconsolidated nature of loess sediments from which the landscape is formed. These concerns include water erosion, maintenance of organic matter content and productivity, and management of soil moisture. Water erosion is a hazard in sloping areas that are bare due to timber harvest operations. Though many of the soils in this region remain wet or have a high-water table for some or most of the year, forested wetland restoration projects such as the proposed Bank serve to increase the amount of precipitation interception and increase flood/storm water retention time. These functions serve to reduce potential erosion hazards and aid in the accumulation and maintenance of soil organic matter (carbon sequestration).

Per the Comprehensive Habitat Management Plan for the Lake Pontchartrain Basin developed by the Lake Pontchartrain Basin Foundation (now the Pontchartrain Conservancy), un-intended impoundments from activities such as canals, berms, logging ditches, roads, etc. have altered natural hydrologic flows resulting in diminished habitat conditions such as interior swamps having low water circulation which contributes to low nutrient and sediment deficit and disruption of the natural movement of organisms that are otherwise influenced by unimpeded flow of water. The hydrologic restoration plan proposed for the Bank is in accordance with the restoration strategy identified in the management plan which is the reduction impediments to overland flow using culverts or gapping of banks or berms (LPBF 2006).

The primary threat to hardwood flatwoods and reduction of the historic range of this community type has been changes of land use, primarily conversion of this community to agriculture or pine plantation (LHNP 2009). The rapid commercial and residential developments along the Interstate 12 corridor and conversion to commercial pine plantation represents the greatest loss of hardwood flatwood habitat. Other threats include the construction of roads, pipeline and utility corridors, invasive and exotic species, physical damage from timber harvesting, and chemical contamination (LHNP 2009; Holcomb et al. 2015). The proposed bank will develop and promote long-term maintenance of healthy flatwoods by

[12] Impacts as used in this report are those in which are determined to be unavoidable impacts to waters of the United States per 33 CFR §332.1 (a) through (c)

restoring and maintaining natural species composition; and removing and controlling invasive species (LHNP 2009).

The restoration[13], enhancement and protection of BLH forest, specifically a hardwood flatwood, within the 2,040.8-acre Bank will provide additional wetland functions and values that are not currently realized under existing conditions and land use. The cessation of intensive silvicultural activities and reforestation[14] with native wetland tree species will provide localized improvement to upstream and downstream waters. Wildlife habitat will improve for resident biota and nearctic-neotropical migrating bird species (e.g., staging, resting, feeding, escape cover, etc.) through reforestation with native wetland tree and shrub species. Holcombe et al. (2015) described spruce pine-hardwood flatwoods as being important habitat for 29 species of greatest conservation need which include 1 species of crustacean, 3 species of amphibians, 5 species of reptiles, 11 species of birds, and 9 species of mammals.

The restoration of coastal swamp and bottomland hardwood wetland forests will provide additional wetland functions and values not currently realized under the existing conditions and land use (e.g. outdoor recreational experiences, Nearctic-Neotropical bird habitat, threatened and endangered species habitat and habitat for other aquatic fauna). Localized and downstream water quality will improve by reconnecting natural drainage patterns and decreasing localized ponding. Wildlife habitat will improve for resident biota and Nearctic-Neotropical migrating bird species (e.g., staging, resting, feeding, escape cover, etc.) through revegetation of native wetland tree and shrub species.

Both BLH and Swamp habitat will be enhanced and restored by planting selected tree species described in LNHP (2009) and Holcombe et al. (2015). Additionally, restoring the hydrologic connection to High Bridge Canal and the surrounding waterbodies, removing and controlling of Chinese tallow and planting native seedlings in areas will increase overall forested wetland productivity not currently realized.

The restoration and enhancement of 1,880.2 acres of BLH and Swamp forested habitat is important for providing flood storage capacity and storm protection for the heavily developed communities north of the Bank site given the site is approximately 3 miles from Lake Pontchartrain. Doyle et al (1995) and Middleton (2009) noted the resiliency of baldcypress as compared to other species to high

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

[14] The SAF (2018) defines reforestation as the reestablishment of forest cover either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting) —note reforestation usually maintains the same forest type and is done promptly after the previous stand or forest was removed —synonym regeneration.

winds associated with hurricanes. The protection of the Bank will continue to benefit native wildlife and migrating Nearctic-Neotropical birds especially given its proximity of the Gulf Coast.

4. Establishment of a Mitigation Bank

This section describes how the mitigation bank will be established (33 CFR § 332.8(d)(2)(ii)); the technical feasibility of the proposed mitigation bank (33 CFR § 332.8(d)(2)(iv)); and the assurance of sufficient water rights to support the long-term sustainability of the mitigation bank (33 CFR § 332.8(d)(2)(vii)(A)).

4.1 Site Restoration Plan

This Bank will provide approximately 2.0 acres of restored Swamp, 1,618.6 acres of enhanced coastal Swamp, 259.6 acres of enhanced coastal BLH, and 42.9 acres of protected coastal Swamp to compensate for unavoidable wetland impacts within the Lake Pontchartrain Basin watershed. To accomplish this task, the Sponsor shall complete the following soils/hydrologic and habitat work. It is likely that construction will be conducted in one or more phases in the units described in Section 1.1.

4.1.1 Soils/Hydrologic Work

The hydrologic restoration plan for Bank consists of a series of improvements to reduce existing impoundment by creating and improving hydraulic connectivity of existing drainage features within interior portions of the swamp, as well as enhancing tidal connectivity within the exterior channels of the Bank and through the restoration of tidal creeks throughout the bank. The DLS Team determined that tidal creeks are needed as research indicates that the hydrologic efficiency diminishes, and productivity decreases the further the distance from the gap due to variations in the topography of the interior swamp (Conner and Day 1992[a]; Conner and Day 1992[b]).

As a part of the final hydrologic restoration plan, the DLS Team will perform a 2-dimensional (2D) numerical model of the project to further evaluate the benefits of the proposed improvement. The 2D model will allow the DLS Team to optimize the proposed improvements based on the project's overall benefits while minimizing the direct impacts to existing wetlands.

Restored surface hydrology will mimic natural drainage features, distribute surface water, and increase percolation. In essence, restoration of natural drainage patterns and landscape will re-establish sheet flow, increase surface water distribution, improve soil water retention, and naturally reattach historic drainage patterns to remnant depressional surface features. As it exists now, the project area is severely impacted by elevated roads and spoil banks with inadequate connectivity on either side. Channels parallel with the main access

road (Pine Island Road) designed to allow water to flow through the property are severely clogged with storm debris, emergent vegetation and flotant, preventing the adequate ebb and flood of tidal activity as well as downstream drainage from rain and high-water events.

Generally, the hydrologic restoration for the site proposes to increase connectivity between upstream impounded areas and the outfalls at the HBC and the eastern tidal connection leading to the Tchefuncte River. Measures will include cleaning of existing channels, creation of new channels, installation of culverts, and clearing or creation of gaps in existing spoil banks. Overland flow paths and existing berm gaps were assessed using the available USGS LiDAR Digital Elevation Model (DEM). On-site topographic and bathymetric survey datasets were collected to supplement the DEM. This information along with an evaluation of the existing habitat was used to develop alignments for proposed interior channels that connect low-lying areas to outfalls. To ensure adequate conveyance, culverts will be installed across access roads, and existing spoil will be gapped to ensure that overland flow paths can flow to interior channels and outfalls.

The sponsor estimates approximately 16 spoil bank gaps will be created, and 18 existing gaps will be cleaned and widened to better connect the hydrology on the site. The sponsor estimates the new gaps will involve the excavation of approximately 640 cubic yards of earthen material and the clearing and widening of existing gaps will involve the excavation of approximately 170 cubic yards of material. The interior channels will result in the total excavation of approximately 35,439 feet of channel and 28,454 cubic yards of material. Approximately 41,691 feet of existing drainage channels will be cleaned. This will mostly involve the removal of woody debris and unconsolidated material from these channels. The excavated material will be utilized in the most beneficial and least impactful means practical. This would involve placing material on remaining, non-wetland spoil bank and placing thin layers of material in existing, shallow waters or in thin layers in within wetlands close to the excavation site in order that the finished grade remains wetland and does not result in a blockage of natural flows. Any material thinly placed in such wetlands may be planted with the appropriate species as described in Section 4.1.2. Within Unit N-5, 2.0 acres of Swamp will be re-established through the degradation of non-wetland spoil to wetland grade.

Along with the channel creation and maintenance, 8 existing culverts will be cleared out or replaced if deemed necessary upon construction. Six (6) new 36” to 48” culverts will be installed to better connect waterways through and around the interior elevated roads (Figure A7). These culvert sizes are an estimate and will be finalized pending the results of the 2D hydrologic modeling.

Any canal or spoil bank gap clean out work will utilize the adjacent spoil banks as deposit sites for material, resulting in no impacts to the surrounding wetlands. The restoration work proposed will improve the hydrologic conditions on the site,

allowing for water to ebb and flood naturally with the surrounding water ways. The proposed work will allow for water to drain naturally during high water storm events in previously impounded areas, instead of ponding for extended periods of time. The proposed hydrology restoration work will be completed in its entirety within each unit before the initiation of the proposed plantings for that Unit.

4.1.2 Vegetative Work

Approximately 361.4 acres of swamp will benefit through hydrologic restoration activities described in Section 4.1.1 and planted with native bald cypress where appropriate. These areas are identified as Swamp Enhancement 1 on Table B1 and Figure A7. Approximately 233.7 acres of swamp will be enhanced through planting only for the long-term goal of re-establishing a forest canopy and subsequent forest productivity. These areas are identified as Swamp Enhancement 3 on Table B1 and Figure A7. The 2.0 acres of swamp re-establishment identified in Section 4.1.1 will be replanted with appropriate swamp species following the degradation of the non-wetland spoil (Table B8).

Enhancement activity within the pine island habitat will involve interplanting with an appropriate mix of BLH species. Hurricane Ida, which passed west of this site in August 2021, downed many pines within this habitat resulting in several openings within the canopy. The residual standing pine will be left in place as the hydrologic condition of these sites are not favorable for the natural regeneration of pine. The residual pine that remains will provide adequate shade for the development of the more desirable and resilient hardwood species as well as keep the potential lower for the regeneration of invasive Chinese tallow. Once adequate regeneration has been established, residual pine will be assessed to determine if any thinning or deadening of the residuals will be necessary. The pine stems which either die naturally or are deadened will remain on site and serve as standing deadwood (i.e. snags). However, if dense pine areas require additional thinning to facilitate better growing conditions for target species, some of these stems may be removed utilizing mechanized harvesting equipment. These enhancement areas are identified as BLH Enhancement 1 on Table B1 and Figure A7.

Enhancement activity within the pine\hardwood habitat will consist of the removal of mature pine stems from the canopy layer through a combination of mechanical harvest and removal, felling in place, or deadening in place. This activity will be conducted in a manner as to minimize further site disturbance with care being taken to avoid damage to residual, desirable native trees such as those described for the pine\hardwood community described in Section 3.4.2. Trees that are felled in place will serve as downed woody material (DWM) in the form of fine woody material (FWM), coarse woody material (CWM), and large logs. Trees killed and left standing will serve as snags which will eventually become DWM. The ecosystem services that deadwood within the southeastern bottomland hardwoods provide for various species of insects, reptiles,

amphibians, birds and mammals as well as inorganic Nitrogen retention are described in Evans (2012) and Baily et al. (2006). This enhancement area is identified as BLH Enhancement 2 on Table B1 and Figure A7.

Reforestation activities within the BLH Enhancement 1 and 2 areas will include the interplanting of native BLH species during the first planting season (December 15 through March 15) following site preparation. Within BLH Enhancement 2, the estimated residual density of hardwoods is approximately 160 stems per acre once the mature pine and any invasive trees\saplings\shrubs are removed, felled and/or deadened. Therefore, it is anticipated that a range of approximately 250 to 436 stems per acre will be interplanted to keep the initial, desirable stem density at a high-level post-construction. As these densities are based on limited plot data, this will be monitored during construction and may be adjusted to keep the initial density at an acceptable level. The residual basal area will also factor into the specific planting densities within the BLH enhancement areas as this metric reflects the size and amount of occupancy of the residual trees.

The BLH enhancement areas will be interplanted with an appropriate mix of BLH species (Table B8). Given the existence of soft mast tree species present, plantings should consist of hard mast species[15]. This is based on previous experience with reforestation efforts in similar landscape and soil conditions and the presence of seed-producing soft mast species present both within the proposed bank and surrounding forest. The distribution of species across the Bank landscape will create a mosaic of hard and soft mast species to provide seasonally available forages for a wide range of indigenous and migratory wildlife. Chinese tallow, Chinese privet (*Ligustrum sinense*) and other invasive tree or shrub species will be removed during site preparation in the enhancement areas and individual stems treated within the preservation areas.

4.1.3 Inclusions and Forested Upland Ridge Habitat

In addition, 42.9 acres of existing swamp will be protected as hydric inclusion and approximately 10.8 acres of existing spoil will remain in place and serve as upland forested and shrub ridge habitat throughout the Bank.

4.1.4 Other Areas and Considerations

Existing access roads, trails, wildlife openings, and camp areas will remain within the Bank area but will continue to be utilized and managed for their current use and purpose. Additionally, the landowner intends to reserve approximately 4.0 acres of areas within the Bank as a reserved area for any future use which is not related to restoration including but not limited to wildlife opening, building areas,

[15] For this report, hardmast species consist of native, heavy-seeded species of Quercus spp. and Carya spp.

camp area, mineral exploration sites, etc. These areas consist of two (2) 2-acre sites within Units N-1 and N-5 (Figures A7a and A7e).

A Coastwide Reference Monitoring Station (CRMS) site, CRMS0103, exists within Units S-2 and S-4 of the Bank. The CRMS station consists of a water level monitoring station, wooden access platforms, a sediment elevation station, and various sites for soil and vegetation monitoring. Care will be utilized in these areas so that the restoration activity does not impact or disrupt the use of the station by the Coastal Wetland Protection and Restoration Authority (CPRA) or its contractors. DLS will coordinate with the CRPA regarding the restoration of the area around these monitoring sites to ensure no disruption to the operation of the site (Figures A7h and A7j).

4.2 Technical Feasibility

The construction work required to develop the proposed Bank is based on experience and currently accepted restoration methods and is technically feasible. The construction work will consist of 1) site preparation, 2) gapping of existing spoil, 3) reconstruction and establishment of tidal creeks, 4) removal of pine and invasive woody species, species control and maintenance 5) reforestation of appropriate woody species, and 6) continued invasive species control measures. The relatively low landscape position and the current excessive ponding of water indicate that soil work will be required for successful restoration of natural wetland hydrology. The existence of forested wetlands within and adjacent to the Bank also suggests a high potential for successful restoration. Once natural drainage modifications are complete and functioning, a more natural, historic water regime will be restored.

This type of project is similar in nature to the Hydrologic Restoration and Vegetative Planting in the Lac des Allemands Swamp project in St. James Parish. The project was approved on the 10th Priority Project List (PPL 10) of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) in 2001. The project is being carried out by the Environmental Protection Agency (EPA) and the CPRA. The project is identified as state project BA-34-2. The project's goals are to restore hydrology of a semi-impounded 2,395-acre impounded swamp by breaching semi-continuous spoil banks to reduce the duration of rain-driven flood events. The excavation of spoil was completed in December 2017 and plantings were completed by February 2018.

Regarding the potential for swamp restoration via artificial regeneration, this potential has been documented as feasible through the efforts of the Pontchartrain Conservancy, formerly the Lake Pontchartrain Basin Foundation. Dr. Lopez compiled a synopsis of swamp reforestation efforts that have occurred in the Lake Pontchartrain Basin which were done by the Pontchartrain Conservancy as well as under the CWPPRA. Dr. Lopez was involved in many aspects of swamp reforestation demonstrations and studies with the

Pontchartrain Conservancy and CWPPRA. His synopsis of reforestation efforts is included as Attachment G of this prospectus.

To further affirm the suitability of plantings on-site, DLS performed test planting of 78 bald cypress seedlings on March 25, 2022, at the Bank in four different locations (Figure 17 et sequence). Of the 78 seedlings, 19 were bare-root seedlings with tree protectors installed on each (BRS-P); 20 were bareroot seedlings with no protectors (BRS); 25 were trade gallon trees with protectors installed on each (1TGC-P); and 14 were trade gallons with no protectors (1TGC). The heights were measured at planting. On October 7, 2022, about 6.5 months after planting, DLS assessed the plantings. Of the 78 stems, 76 living stems were located (97%), 1 was dead and 1 was not located. The heights were measured, and the average height growth was 4 inches. Differentiated by seedling type, the protected stems (BRS-P and 1TGC-P) had 7 inches of growth whereas the unprotected stems had 1 to 2 inches of height growth. Therefore, the protected stems showed over 4x more height growth than unprotected stems. The average height of all the living seedlings is 46 inches (3.8 feet) with the average of the protected seedlings being 49 inches (4.1 feet) and the unprotected being 44 inches (3.6 feet). The trade gallon seedlings were 7 inches taller than the bareroot stems regardless of protection (43 inches vs 50 inches) however the trade gallon seedlings were about 8 inches taller than the bareroot seedlings when they were planted. However, the change in height growth was the same for the protected bareroot and the trade-gallon.

The results of the data are contained within Table B9. While the data from this test planting is limited, the first monitoring revealed promising results in the ability for planting seedlings to survive and grow regardless of the type of seedling utilized (containerized or bare-root). Greater height growth was observed in protected seedlings vs. non-protected seedlings.

4.3 Current Site Risks

The Sponsor does not foresee any adverse impacts to the mitigation site resulting from the continued existence and operation of the neighboring land uses. Much of the land use and cover type surrounding the Bank exists as palustrine forested wetlands. These areas have remained in this land use over the past 78 years as evidenced in the historical and recent aerial photographic records. There are risks associated with tropical storm systems as there have been several throughout the years. However, by replanting species that have greater resilience to such systems, we anticipate the future conditions to be better adapted to such events in the long-term. In the interim (i.e. between construction and long-term success), the site will be monitored in the aftermath of any storm which may affect the project to document post-event conditions and the develop remediation or adaptive management plans if necessary.

Herbivory and depredation are a potential issue regarding reforestation efforts. Species known to browse or uproot species such as white-tailed deer, nutria and

feral hogs are present on the site. However, action to keep these species in check such as hunting, trapping and existing bounty programs (i.e. nutria) will be utilized to keep such species in check. The area does have a seemingly high population of American alligator which are known predators of herbivores, such as nutria and feral hogs. Additionally, continued monitoring of the plantings will evaluate the degree of any herbivory, determine if it is an issue, and devise adaptive management to deal with the situation.

Salinity is a concern for reforestation of freshwater swamps. Salinity conditions will be monitored as part of the Bank's monitoring program which will be defined in the Mitigation Banking Instrument (MBI). However, it has been documented that since the closure of MRGO in 2009 and completion of the Inner Harbor Navigation Canal (IHNC) Surge Barrier in 2011 by the USACE, the salinity conditions have become more favorable for reforestation. Dr. Lopez conducted discrete salinity evaluations of surface water and soil porewater salinity within the Bank and found that surface salinity ranged from 0.04 parts per thousand (ppt) to 0.42 ppt and soil porewater salinity ranged from 0.3 ppt to 1.59 ppt. These values are within the tolerable range to support the regeneration of bald cypress and other forested swamp species. Dr. Lopez describes the salinity sampling results and provides a synopsis of the salinity regime of the Lake Pontchartrain Basin before and after the closure of the MRGO with Attachment H.

The initial construction effort will present challenges for equipment access and material placement in the remote areas of the site, and over time maintenance of the channels along the interior of the property will be necessary to ensure that adequate conveyance is maintained. This maintenance is not limited to the extreme tropical events that bring vegetation, sediment, and debris; routine maintenance will be needed to clear sedimentation and vegetation growth along the flow paths. To assess the efficacy of the restoration methods, long-term water level monitoring may be employed. Monitoring across the site at key locations will provide indications of sedimentation or other restrictions. Additionally, following construction over subsequent years of monitoring, adaptive management measures may be employed, as needed to augment the project and ensure continued success. These measures could be needed if environmental factors (e.g., sea level rise or increased runoff from contributory areas) alter the hydrologic regime in the future.

4.4 Long-Term Sustainability of the Site

Long-term viability and sustainability of the Bank will be ensured through active and adaptive management including, but not limited to, invasive species control with emphasis on Chinese tallowtree, appropriate monitoring, and long-term maintenance. No long-term structural management will be required because there are no water control structures to operate. Passive structures such as open culverts will be utilized for the long-term maintenance of adequate hydrology. These will require infrequent maintenance which will be accounted for

in the long-term endowment established for the Bank. The routine maintenance of the tidal creek channels and roadside drains will be accounted for in the long-term endowment established for the Bank.

Article 490 of the Louisiana Civil Code treats water resources under the theory of absolute ownership and rule of capture provided that such capture does not result in harm to neighboring properties. The proposed Bank will depend primarily on precipitation, tidal cycles drive by Lake Pontchartrain; runoff from surrounding areas, locally high-water tables, and potential overbank/backwater flooding of surrounding creeks. As such, long-term hydrology maintenance will not depend on the utilization of water captured from irrigation wells or any other artificial source; therefore, sufficient water rights are ensured for such purposes. The Sponsor does not foresee any adverse impacts on neighboring properties resulting from this project.

5. Proposed Service Area

The Pontchartrain Basin will serve as the service area for the Bank (Figure 18). The use of credits outside of the defined service area will be handled on a case specific basis by the CEMVN and will be specified as such in the subsequent MBI.

This Basin is comprised of the Amite Subbasin (USGS HUC 08070202), the Tickfaw Subbasin (USGS HUC 08070203), the Lake Maurepas Subbasin (USGS HUC 08070204), the Tangipahoa Subbasin (USGS HUC 08070205), the Liberty Bayou-Tchefuncte Subbasin (USGS HUC 08090201), the Lake Pontchartrain Subbasin (USGS HUC 08090202), and the Eastern Louisiana Coastal Subbasin (USGS HUC 08090203). Some of Louisiana's most densely populated areas are contained within the Lake Pontchartrain River Basin. These include the cities of Hammond, Baton Rouge, and New Orleans. Also, within the Bank's service area are towns such as Clinton, Kentwood, Amite, Denham Springs, Gonzales, Covington, and Mandeville. These communities and their surrounding municipalities provide a high likelihood for residential and commercial expansion. Major industrial areas exist along the Mississippi River from Baton Rouge to New Orleans and large transportation corridors such as U.S. Highway 190 (US 90), Interstate Highway 10 (I-10), I-12, and Interstate Highway 55 (I-55) traverse this basin. Therefore, it is likely that unavoidable impacts associated with this infrastructure such as pipelines, utilities, and transportation development could be compensated for by the proposed Bank. The Bank restoration site would consolidate the mitigation for these types of impacts within a single, strategic location. The Bank will provide the most benefit to the watershed through the restoration and protection of a larger block of sensitive habitat and offsetting any cumulative effect of smaller, spatially fragmented projects.

6. Operation of the Mitigation Bank

This section describes how the proposed Bank will be operated (33 CFR § 332.8(d)(2)(ii)) and provides details on the proposed ownership arrangements and long-term management strategy for the mitigation bank (33 CFR § 332.8(d)(2)(v.)).

6.1 Project Representatives

Sponsor:	Delta Land Services, LLC 1090 Cinclare Drive Port Allen, LA 70767 Attn: Daniel Bollich Phone: 225-388-5146 daniel@deltaland-services.com
Landowner:	Little Creek Oil & Gas, LLC 1001 Ochsner Boulevard, Suite 100 Covington, LA 70433 Attn: Brett Henry Phone: 985-801-4300 brettH@llog.com

6.2 Qualifications of the Sponsor

Per 33 CFR § 332.8(d)(2)(vi.), this section describes the Sponsor's, Landowner's and Agent's qualifications to successfully complete all work associated with establishment and operation of the proposed Bank.

DLS will serve as the Sponsor of the Bank and is a land management and restoration company whose technical staff includes Certified Wildlife Biologists, Professional Wetland Scientists, Certified Ecological Restoration Practitioners, and Certified Foresters. In addition, DLS has construction specialists experienced in wetland construction activities such as heavy equipment operation, vegetation establishment, herbicide application, and contractor management. The biographies of DLS personnel are available at www.deltaland-services.com.

DLS currently manages 38 approved wetland mitigation bank sites within four USACE Districts totaling 22,166 acres which include approximately 46,000 linear feet of stream restoration. These Districts include Vicksburg (MVK), New Orleans (MVN), Fort Worth (SWF), and Galveston (SWG). In addition to the banks referenced above, DLS serves as the responsible party for the establishment and maintenance of 4,212 acres of wetlands and over 8,200 linear feet of stream on 36 approved PRM areas within the MVN, MVK and SWG Districts.

6.3 Proposed Long-Term Management

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

6.4 Site Protection

To provide conservation protection, DLS shall execute a perpetual conservation servitude (pursuant to the Louisiana Conservation Servitude Act, R.S. 9:1271 *et seq*.) on all acreage identified as the Bank and record it in the Mortgage and Conveyances Records Office of Tangipahoa Parish. DLS will utilize a not-for-profit conservation group as the entity that will hold the servitude.

6.5 Long-Term Strategy

Long-term management will consist of monitoring, vegetation management, invasive species control, boundary maintenance, culvert and channel maintenance, site protection, and the funding of such activities. The forest will be managed to maintain or increase the biological, chemical, and physical wetland functions and to achieve and maintain the desired forest conditions, which will provide forested habitat capable of supporting populations for priority wildlife species. The desired forest conditions are defined by the LMVJV (2007). A long-term management plan will be included with the MBI, which will detail long-term management needs, costs and identify a funding mechanism in accordance with 33 CFR § 332.7 (d). The Sponsor (or Long-term Steward) and the Owner (or its heirs, assigns or purchasers) shall be responsible protecting lands contained within the Bank in perpetuity.

7. References

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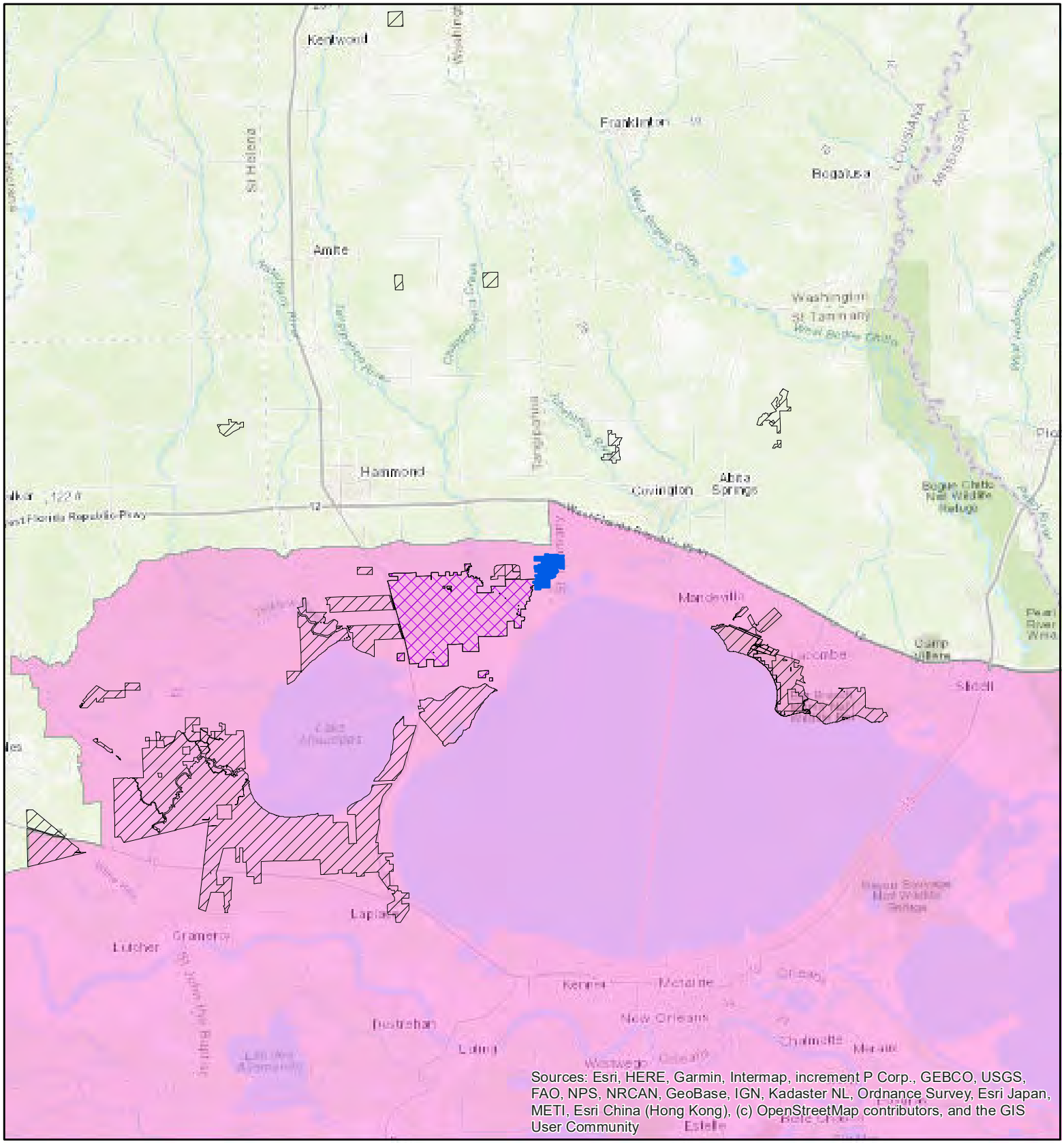
Attachment A: Figures



Bank Boundary (2040.8 acres)
Joyce Wildlife Management Area
Mitigation Banks, Refuges, State Parks and WMAs
Louisiana Coastal Zone Boundary

N

0 4.5 9 18

Miles

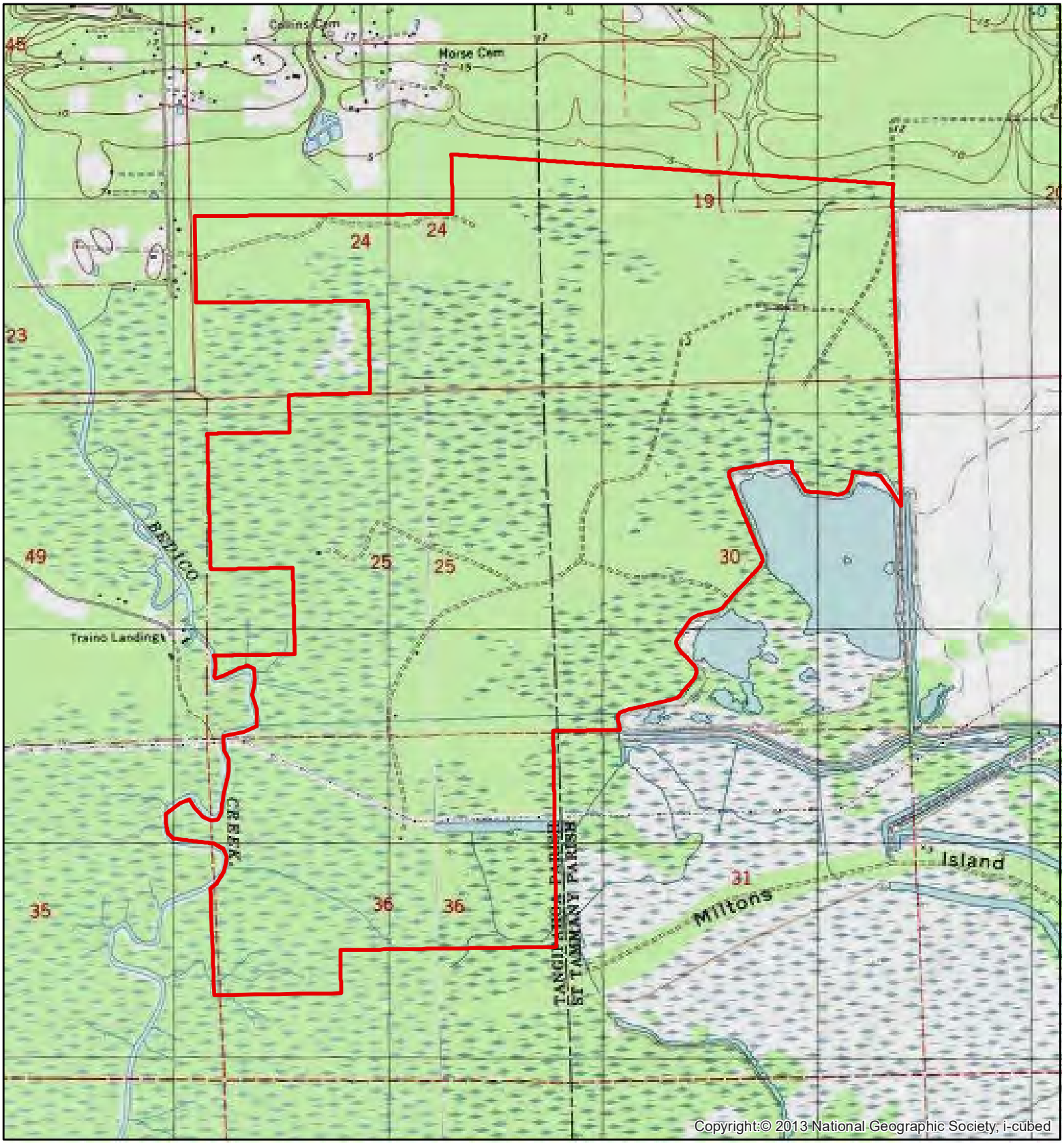
CYPRESS COASTAL MITIGATION BANK

VICINITY MAP

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F01_VicinityMap	

FIGURE A1



Bank Boundary (2040.8 acres)

N

0 1,000 2,000 4,000

Feet

Note: USGS 7.5-minute Quadrangle "Pontchatourla NE, LA" and "Madisonville, LA"

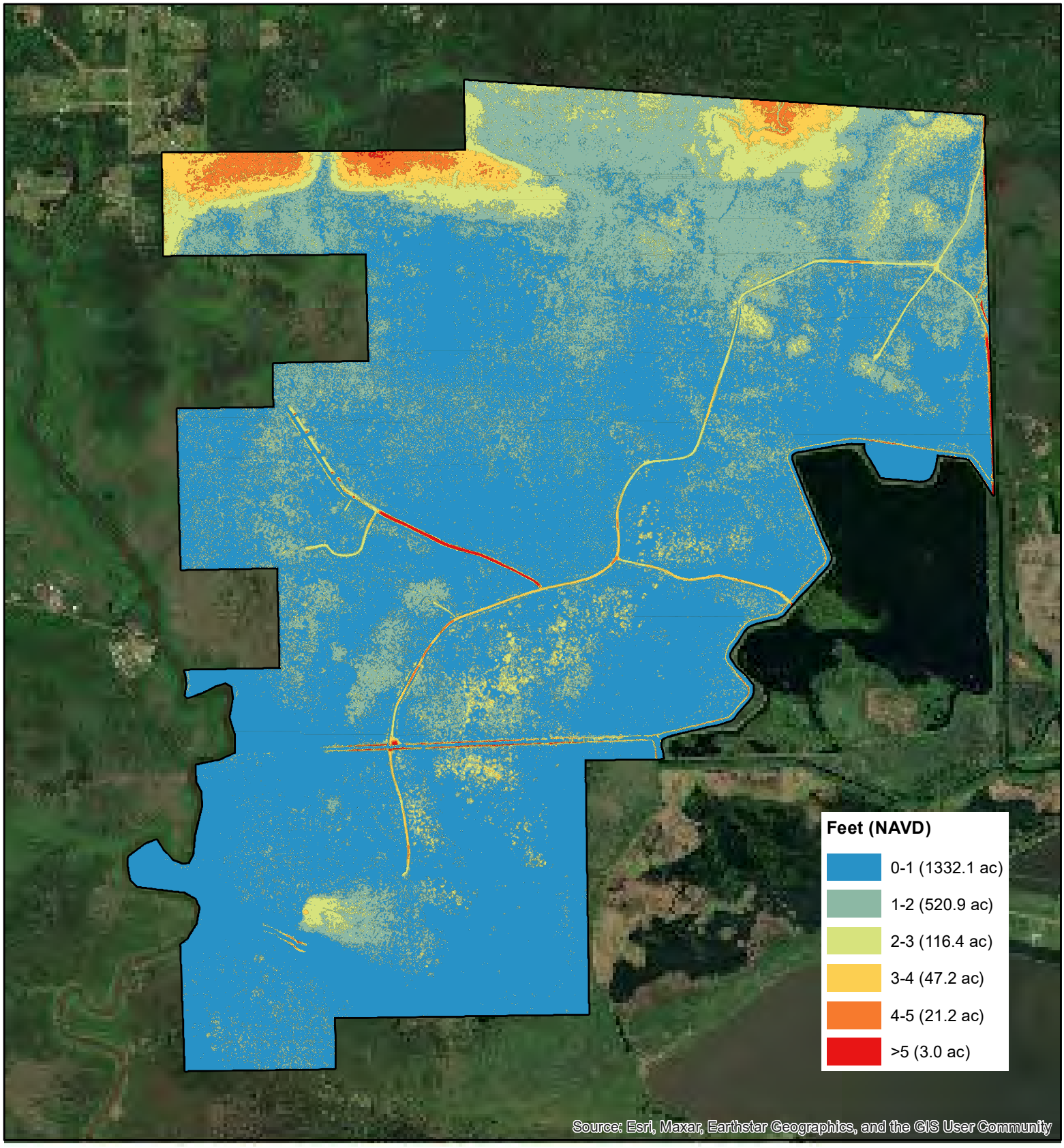
CYPRESS COASTAL MITIGATION BANK

USGS 7.5-MINUTE QUADRANGLE MAP

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F02_QuadMap	

FIGURE A2



Bank Boundary (2040.8 acres)

N

0 850 1,700 3,400

Feet

Note: Elevations are based on USGS Light Detection and Ranging (LIDAR) Digital Elevation Model (DEM).

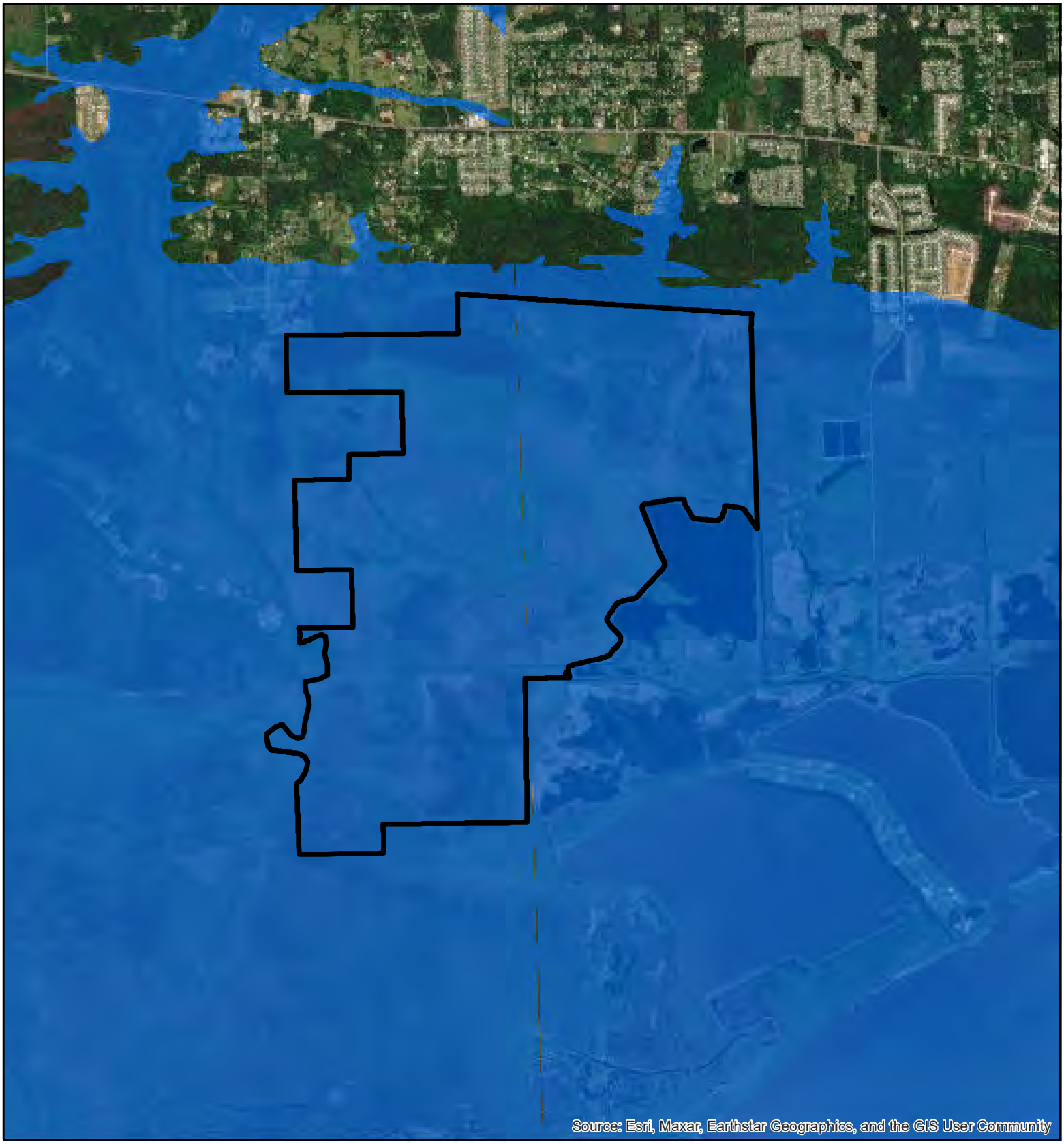
CYPRESS COASTAL MITIGATION BANK

ELEVATION MAP

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F03_ElevationMap	

FIGURE A3



Bank Boundary (2040.8 acres)
FEMA FIRM- Designated Flood Zones

0 1,500 3,000 6,000
Feet

Note: Flood Zones depicted are designated as either Zones A or V

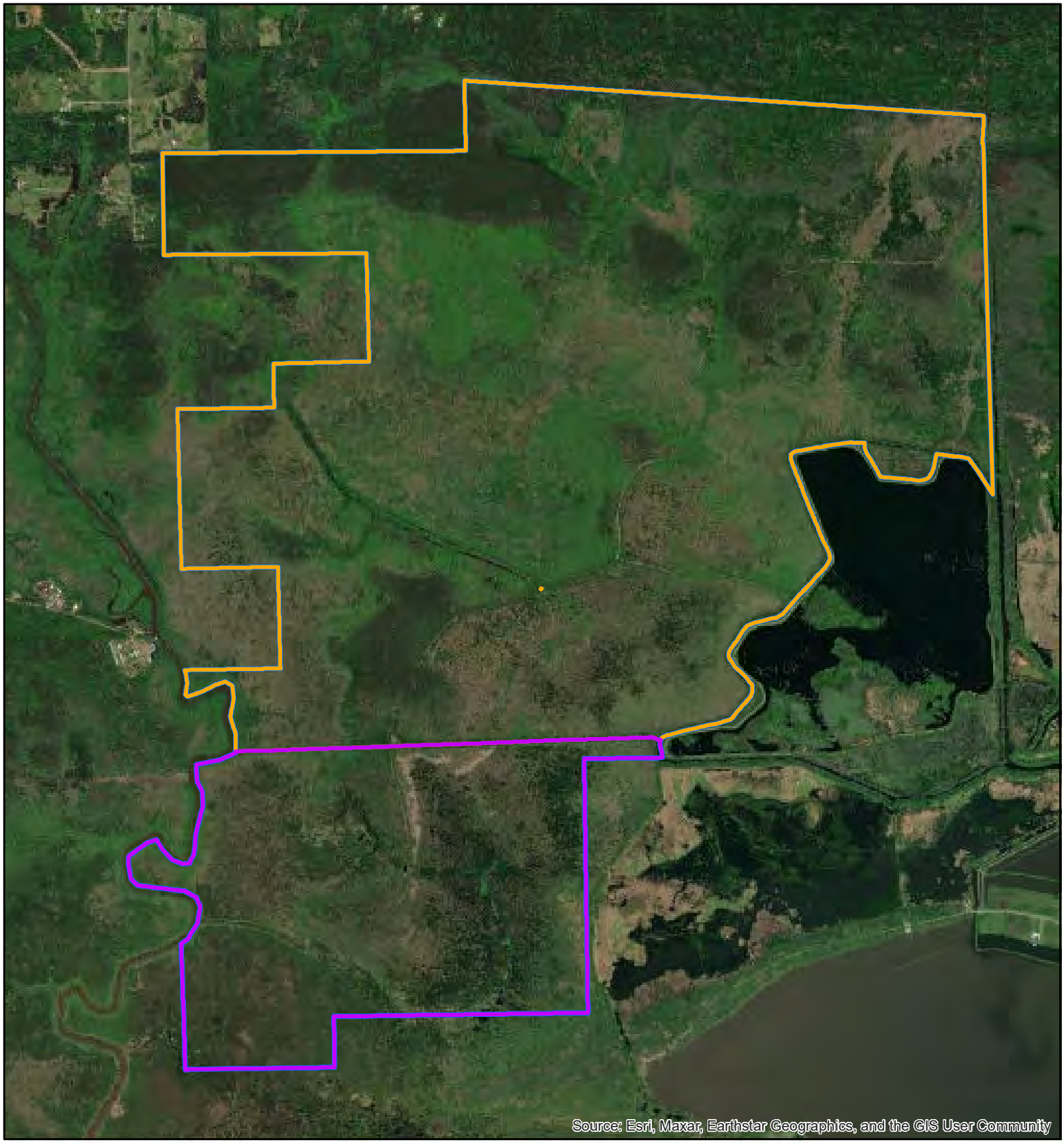
CYPRESS COASTAL MITIGATION BANK

FLOOD ZONE MAP

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F04_FEMA	

FIGURE A4



Bank Boundary (2040.8 acres)
North Tract (1587.2 ac)
South Tract (453.6 ac)

0 850 1,700 3,400
Feet

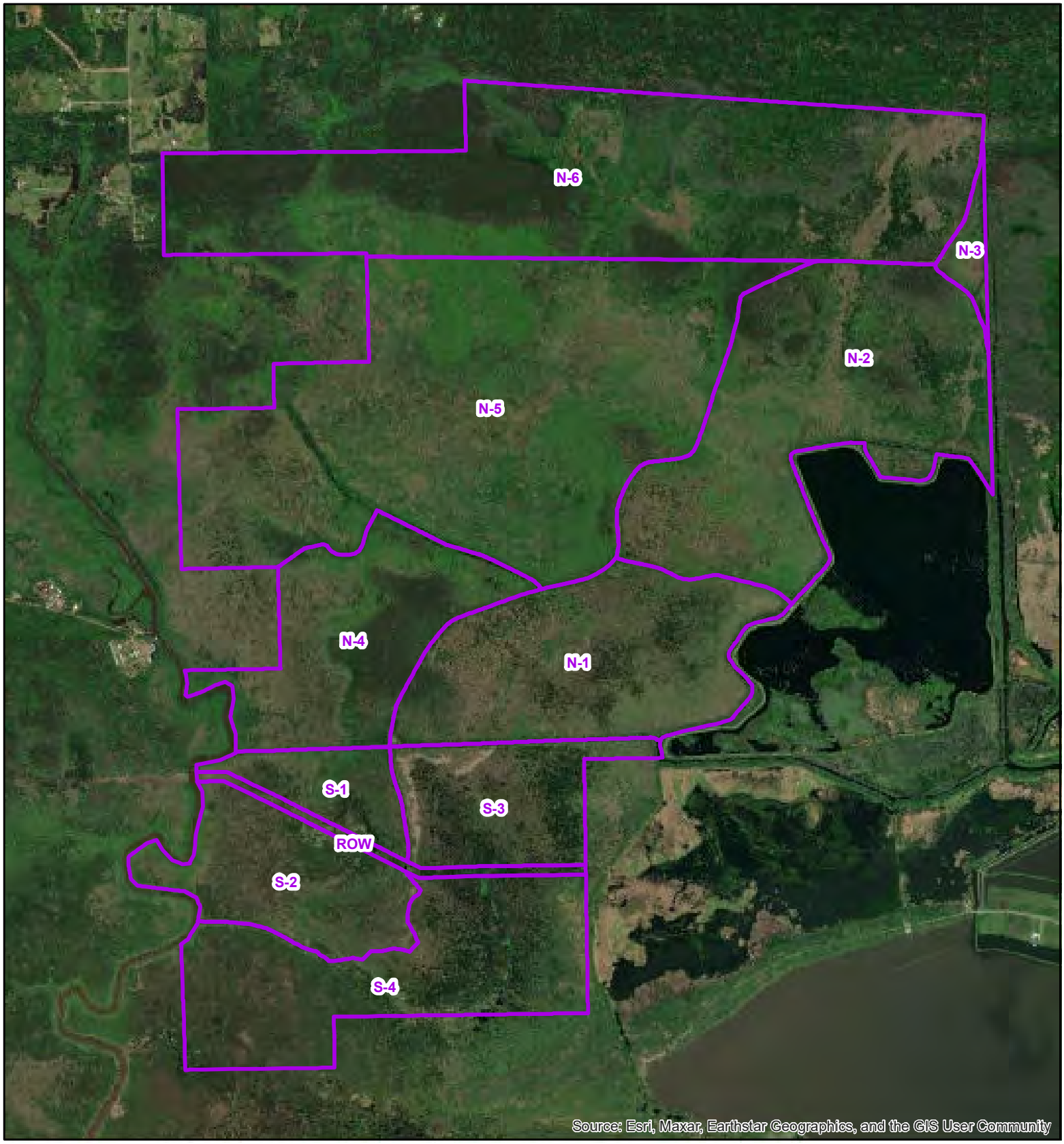
CYPRESS COASTAL MITIGATION BANK

BANK TRACTS

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F05_BankTracts	

FIGURE A5



- N-1 (197.2 acres)
- N-2 (282.4 acres)
- N-3 (14.8 acres)
- N-4 (151.3 acres)
- N-5 (503.9 acres)
- N-6 (437.6 acres)
- ROW (15.3 acres)
- S-1 (44.9 acres)
- S-2 (108.3 acres)
- S-3 (94 acres)
- S-4 (191.1 acres)

0 850 1,700 3,400

Feet

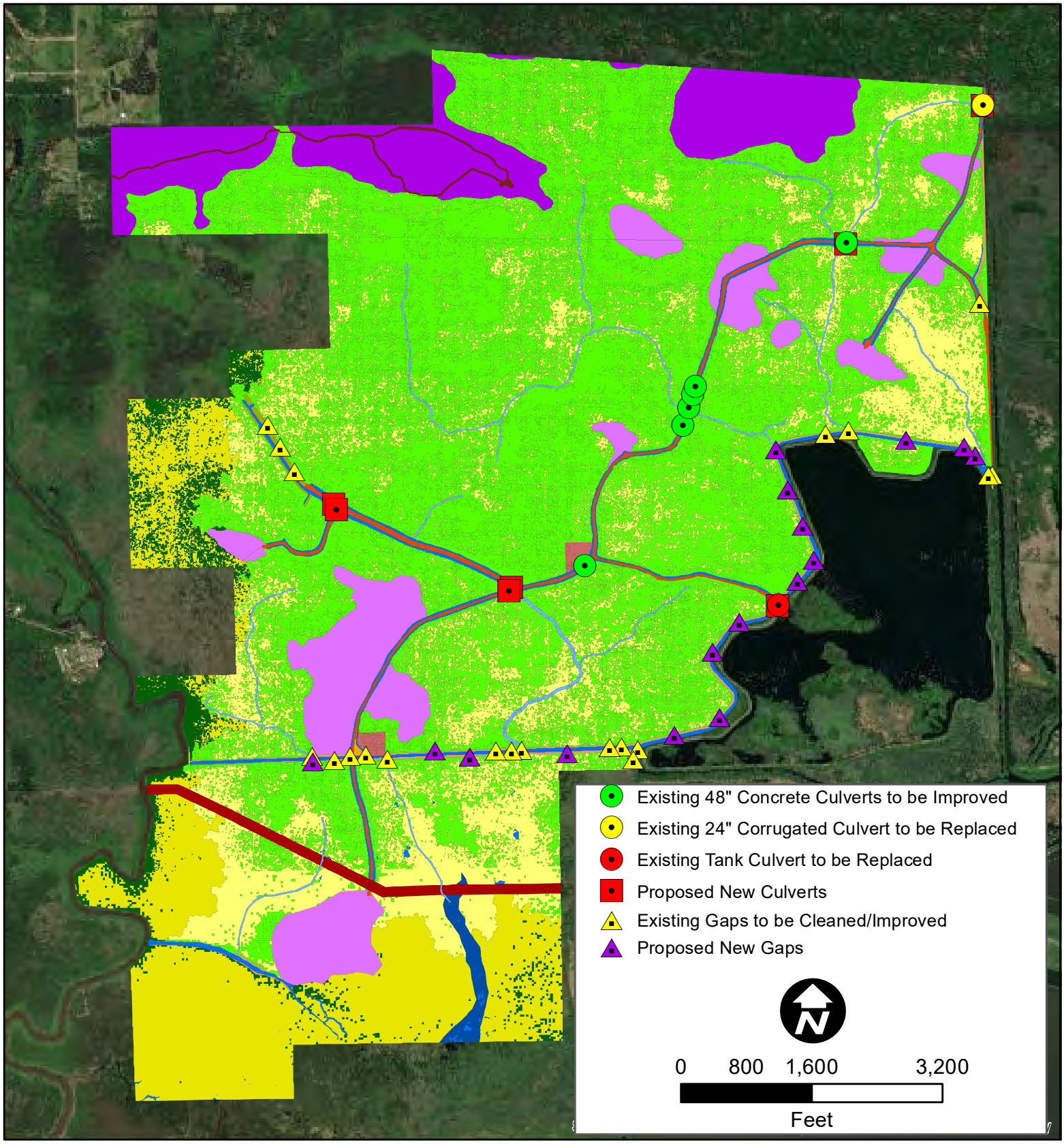
CYPRESS COASTAL MITIGATION BANK

BANK UNITS

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F06_BankUnits	

FIGURE A6



- Reserved Area (4.0 acres)
- BLH Enhancement 1 (125.7 acres)
- BLH Enhancement 2 (133.9 acres)
- Swamp Re-establishment (2.0 acres)
- Swamp Enhancement 1 (361.4 acres)
- Swamp Enhancement 2 (1,023.5 acres)
- Swamp Enhancement 3 (233.7 acres)
- Swamp Inclusion (42.9 acres)
- Tidal Creek Restoration (17.6 acres)
- Floatant (8.2 acres)
- Water (37.3 acres)
- Forested\Shrub Uplands (10.8 acres)
- Access Road (20.3 acres)
- ROW (15.2 acres)
- Trail\Wildlife Opening (4.0 acres)
- Camp Area (0.3 acres)

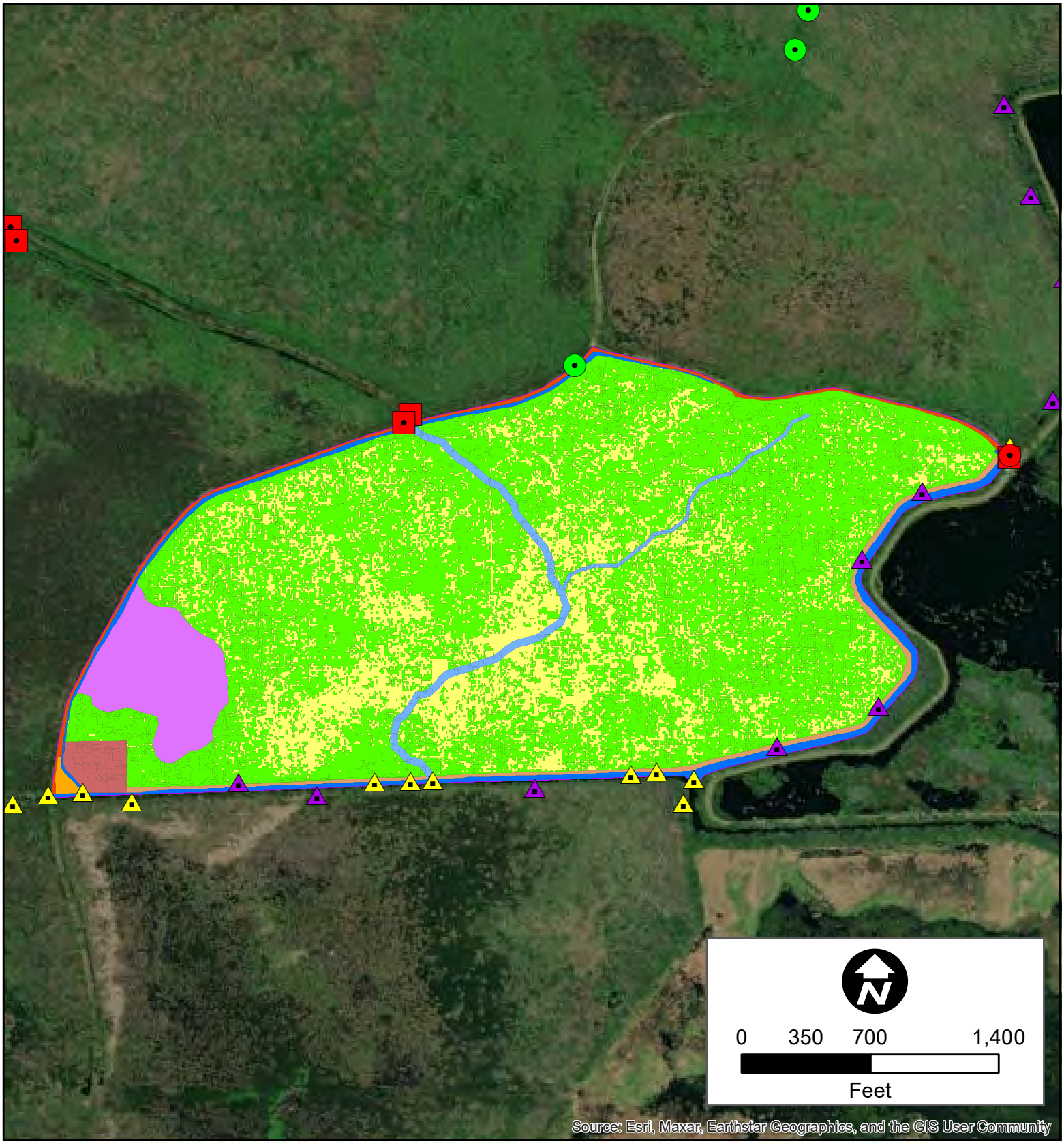
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7



- Existing 48" Concrete Culverts to be Improved
- Existing Tank Culvert to be Replaced
- Proposed New Culverts
- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- N-1 (197.2 acres)
- Reserved Area (2.0 acres)
- BLH Enhancement 1 (10.1 acres)
- Swamp Enhancement 1 (48.5 acres)
- Swamp Enhancement 2 (120.8 acres)
- Tidal Creek Restoration (3.5 acres)
- Water (6.5 acres)
- Forested\Shrub Uplands (3.0 acres)
- Access Road (2.5 acres)
- Camp Area (0.3 acres)

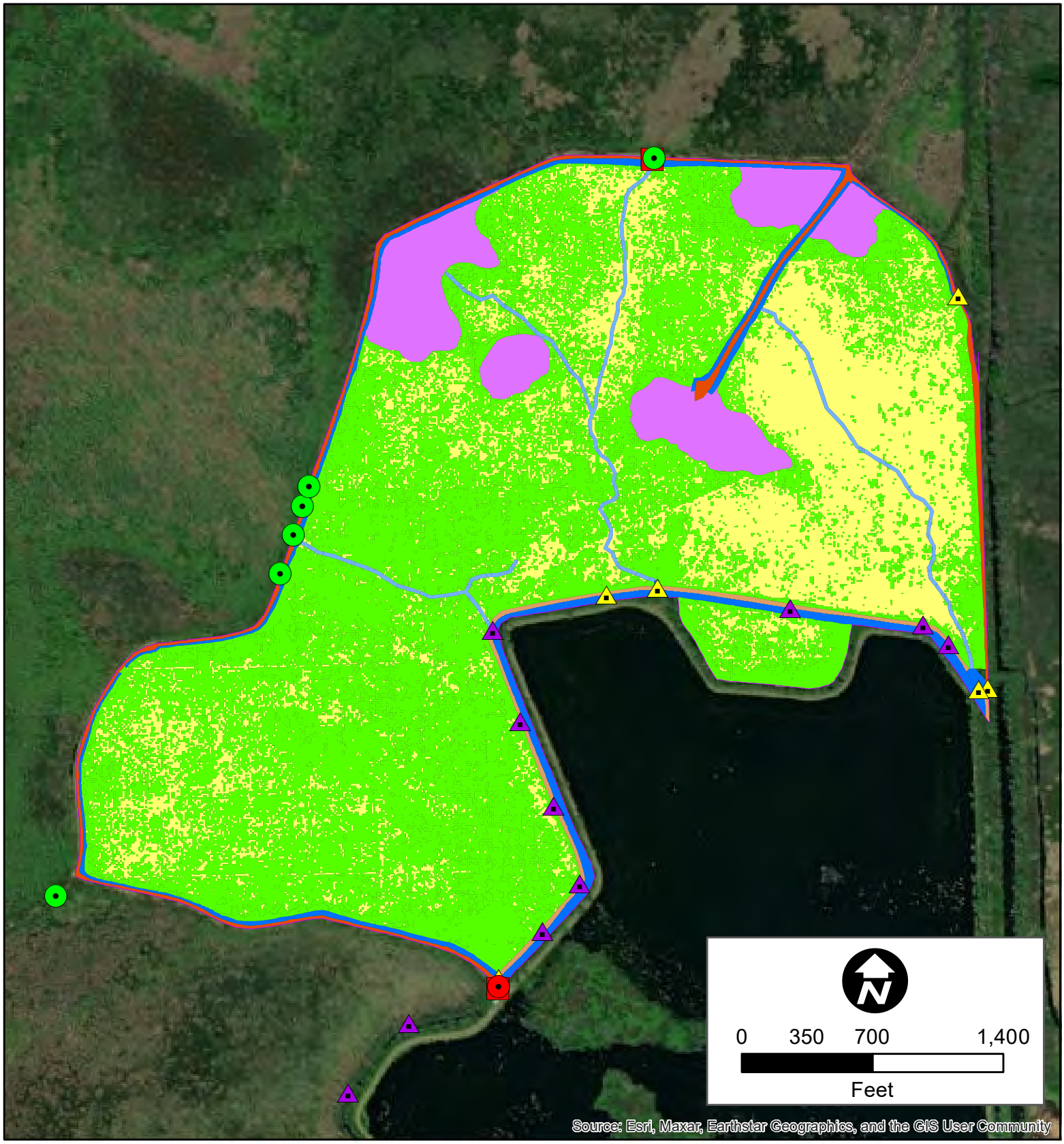
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT N-1

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7a



- Existing 48" Concrete Culverts to be Improved
- Existing Tank Culvert to be Replaced
- Proposed New Culverts
- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- Unit N-2 (282.4 ac)
- BLH Enhancement 1 (20.8 acres)
- Swamp Enhancement 1 (74.2 acres)
- Swamp Enhancement 2 (165.4 acres)
- Tidal Creek Restoration (3.5 acres)
- Water (10.2 acres)
- Forested\Shrub Uplands (2.4 acres)
- Access Road (5.9 acres)

CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT N-2

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
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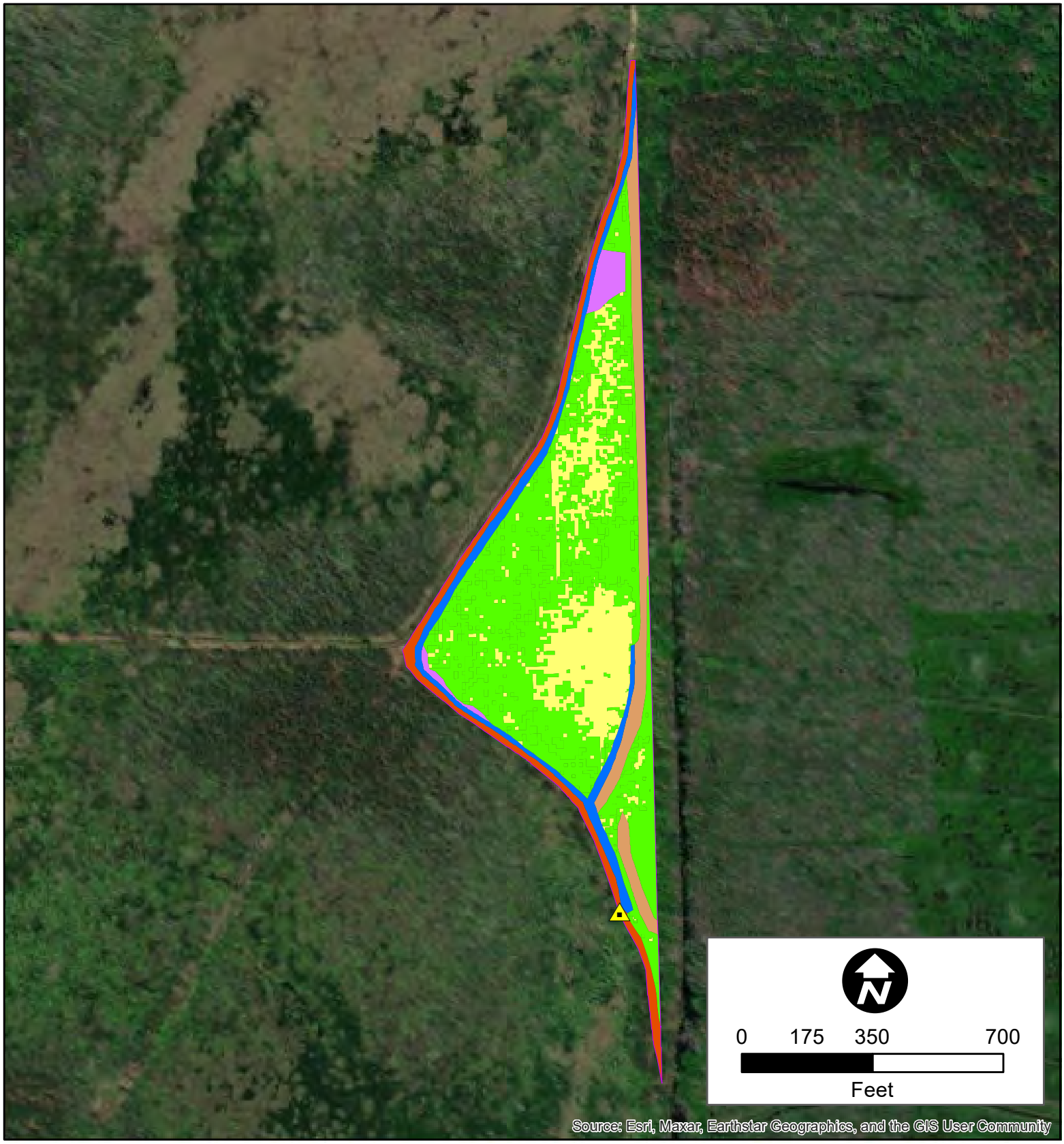
FIGURE A7b



Existing Gaps to be Cleaned/Improved
Unit N-3 (14.8 ac)
BLH Enhancement 1 (125.7 acres)
Swamp Enhancement 1 (361.4 acres)
Swamp Enhancement 2 (1,023.5 acres)
Water (37.3 acres)
Forested\Shrub Uplands (10.8 acres)
Access Road (20.3 acres)

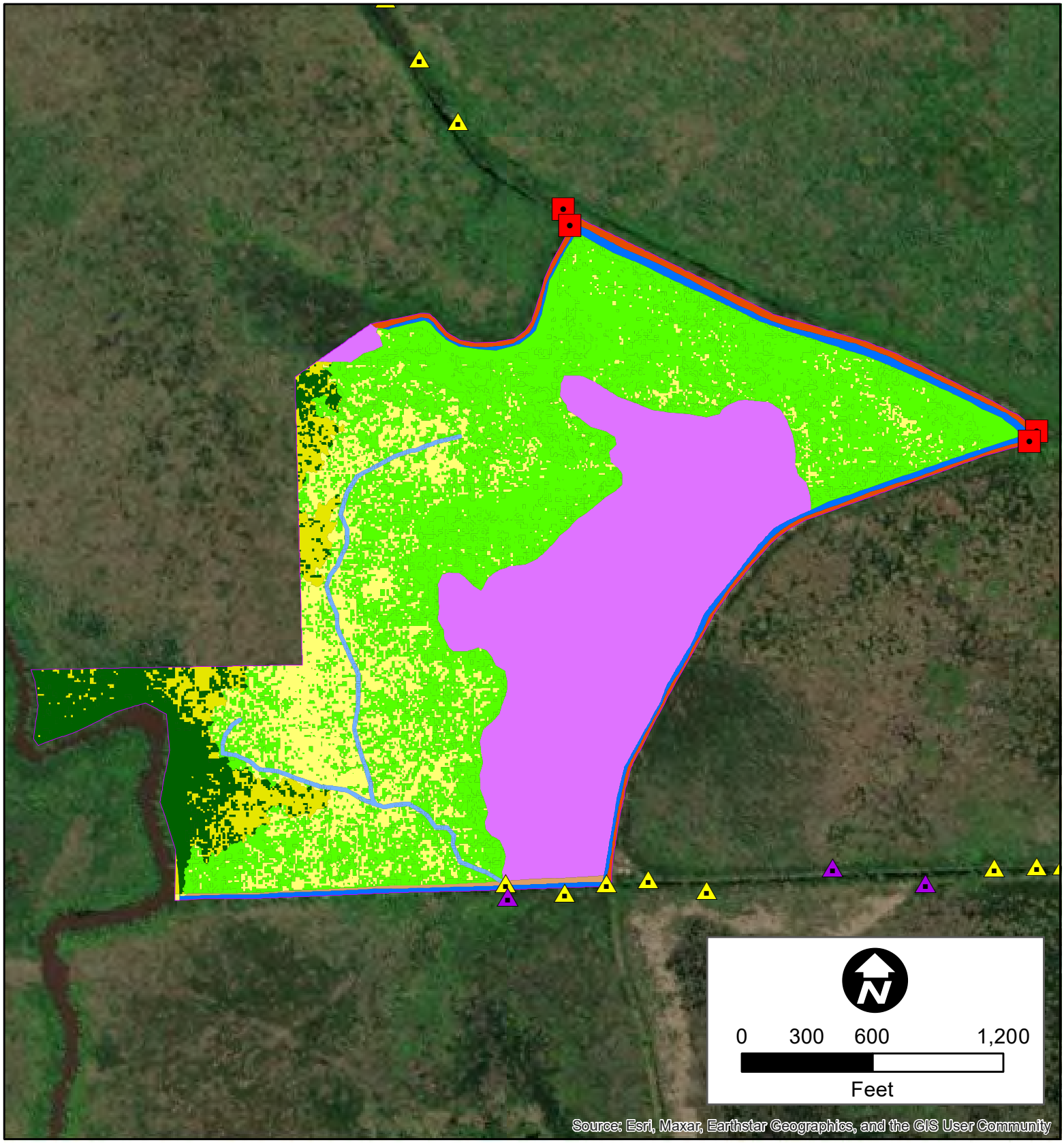
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT N-3

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7c



- Existing 48" Concrete Culverts to be Improved
- Proposed New Culverts
- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- Units N-4 (151.3 ac)
- BLH Enhancement 1 (42.8 acres)
- Swamp Enhancement 1 (21.8 acres)
- Swamp Enhancement 2 (63.2 acres)
- Swamp Enhancement 3 (5.2 acres)
- Swamp Inclusion (8.5 acres)
- Tidal Creek Restoration (1.8 acres)
- Water (4.2 acres)
- Forested\Shrub Uplands (0.6 acres)
- Access Road (3.2 acres)

CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES
UNIT N-4

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
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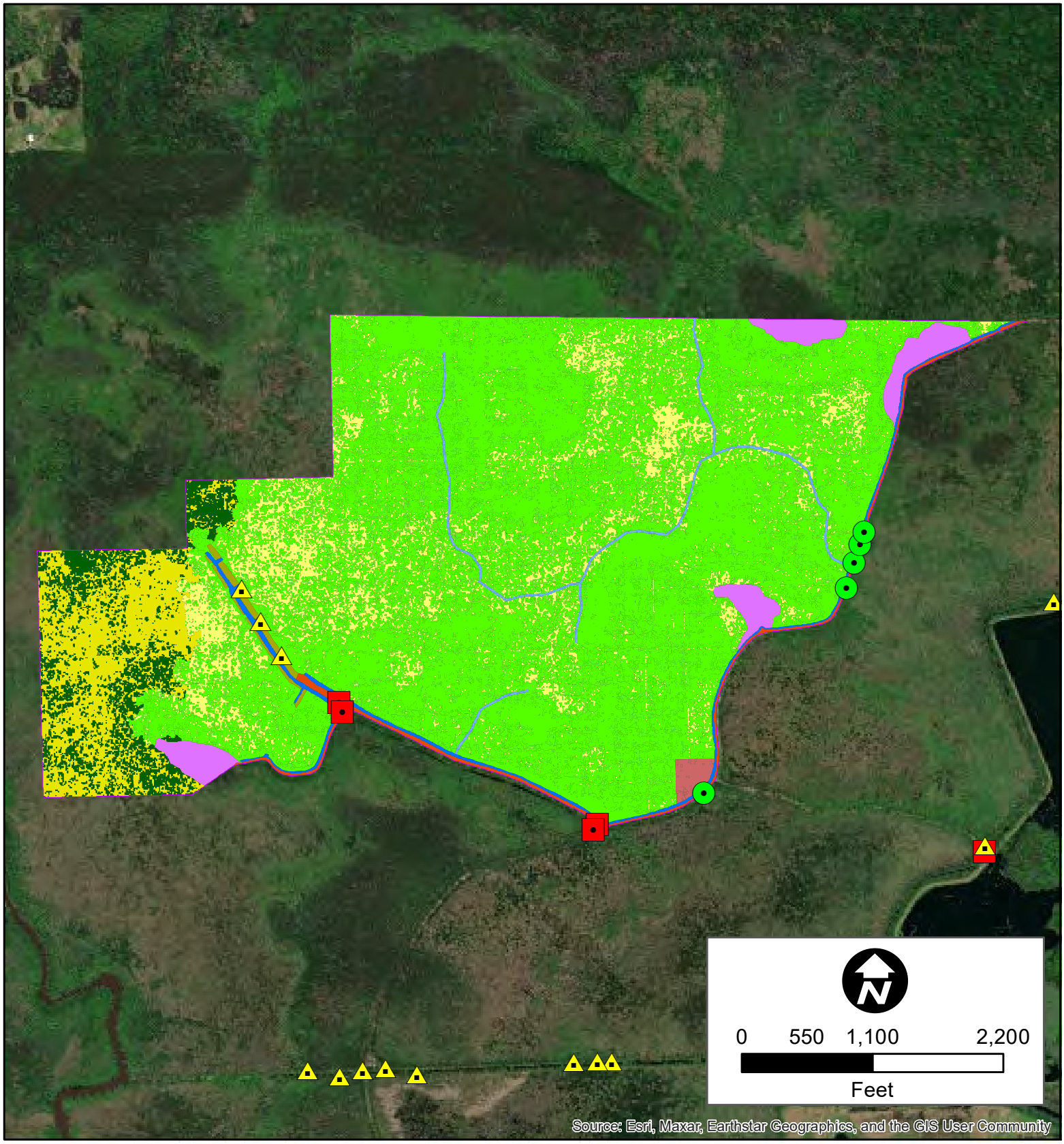
FIGURE A7d



- Existing 48" Concrete Culverts to be Improved
- Proposed New Culverts
- Existing Gaps to be Cleaned/Improved
- Unit N-5 (503.9 ac)
- Reserved Area (2.0 acres)
- BLH Enhancement 1 (13.8 acres)
- Swamp Re-establishment (2.0 acres)
- Swamp Enhancement 1 (60.6 acres)
- Swamp Enhancement 2 (352.0 acres)
- Swamp Enhancement 3 (36.4 acres)
- Swamp Inclusion (21.6 acres)
- Tidal Creek Restoration (4.1 acres)
- Water (6.2 acres)
- Access Road (2.0 acres)

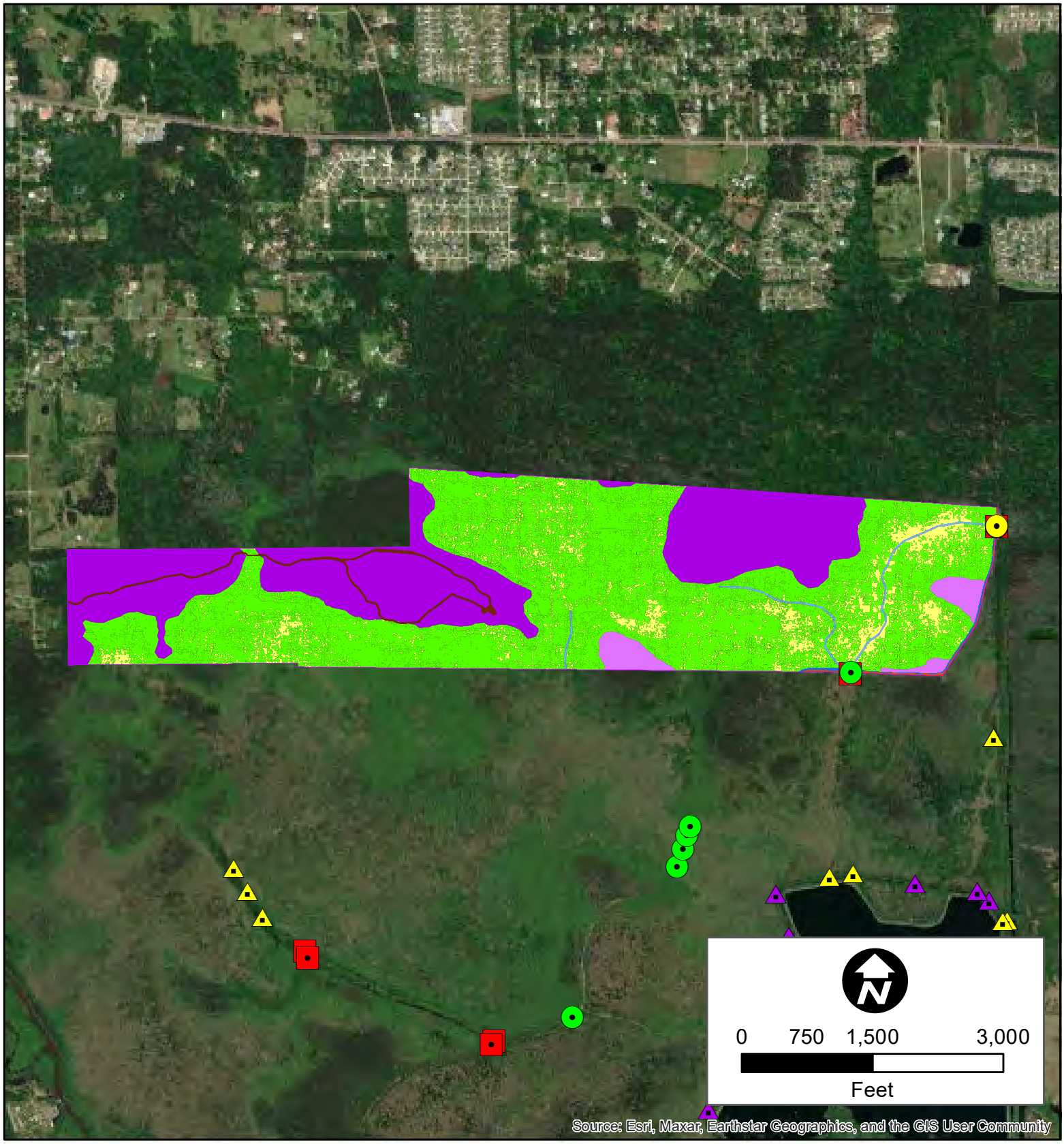
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES
UNIT N-5

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7e



- Existing 48" Concrete Culverts to be Improved
- Existing 24" Corrugated Culvert to be Replaced
- Proposed New Culverts
- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- Unit N-6 (437.6 ac)
- BLH Enhancement 1 (125.7 acres)
- BLH Enhancement 2 (133.9 acres)
- Swamp Enhancement 1 (361.4 acres)
- Swamp Enhancement 2 (1,023.5 acres)
- Tidal Creek Restoration (17.6 acres)
- Water (37.3 acres)
- Access Road (20.3 acres)
- Trail\Wildlife Opening (4.0 acres)

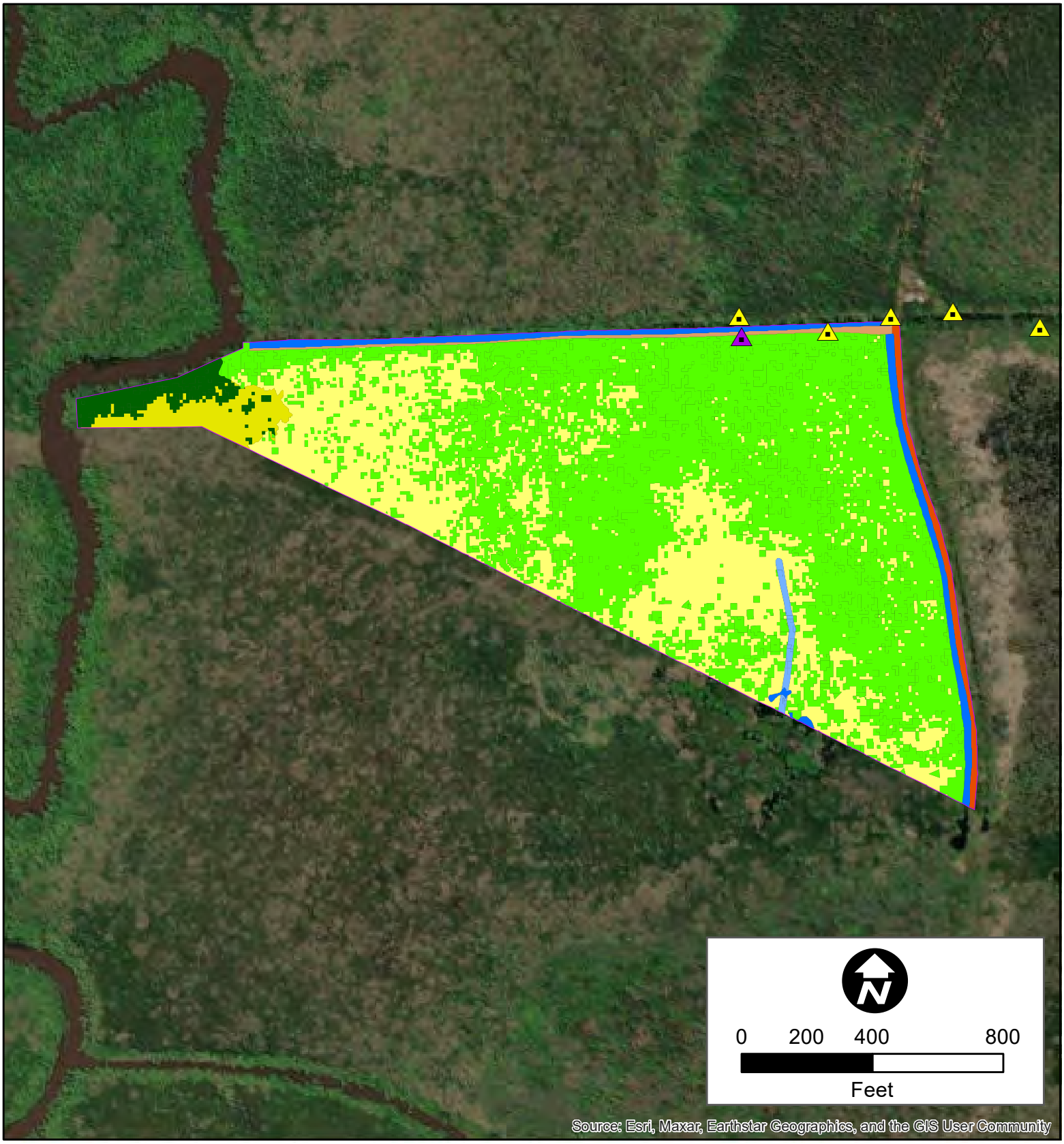
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES
UNIT N-6

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7f



- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- Unit S-1 (44.9 ac)
- Swamp Enhancement 1 (361.4 acres)
- Swamp Enhancement 2 (1,023.5 acres)
- Swamp Enhancement 3 (233.7 acres)
- Swamp Inclusion (42.9 acres)
- Tidal Creek Restoration (17.6 acres)
- Water (37.3 acres)
- Forested\Shrub Uplands (10.8 acres)
- Access Road (20.3 acres)

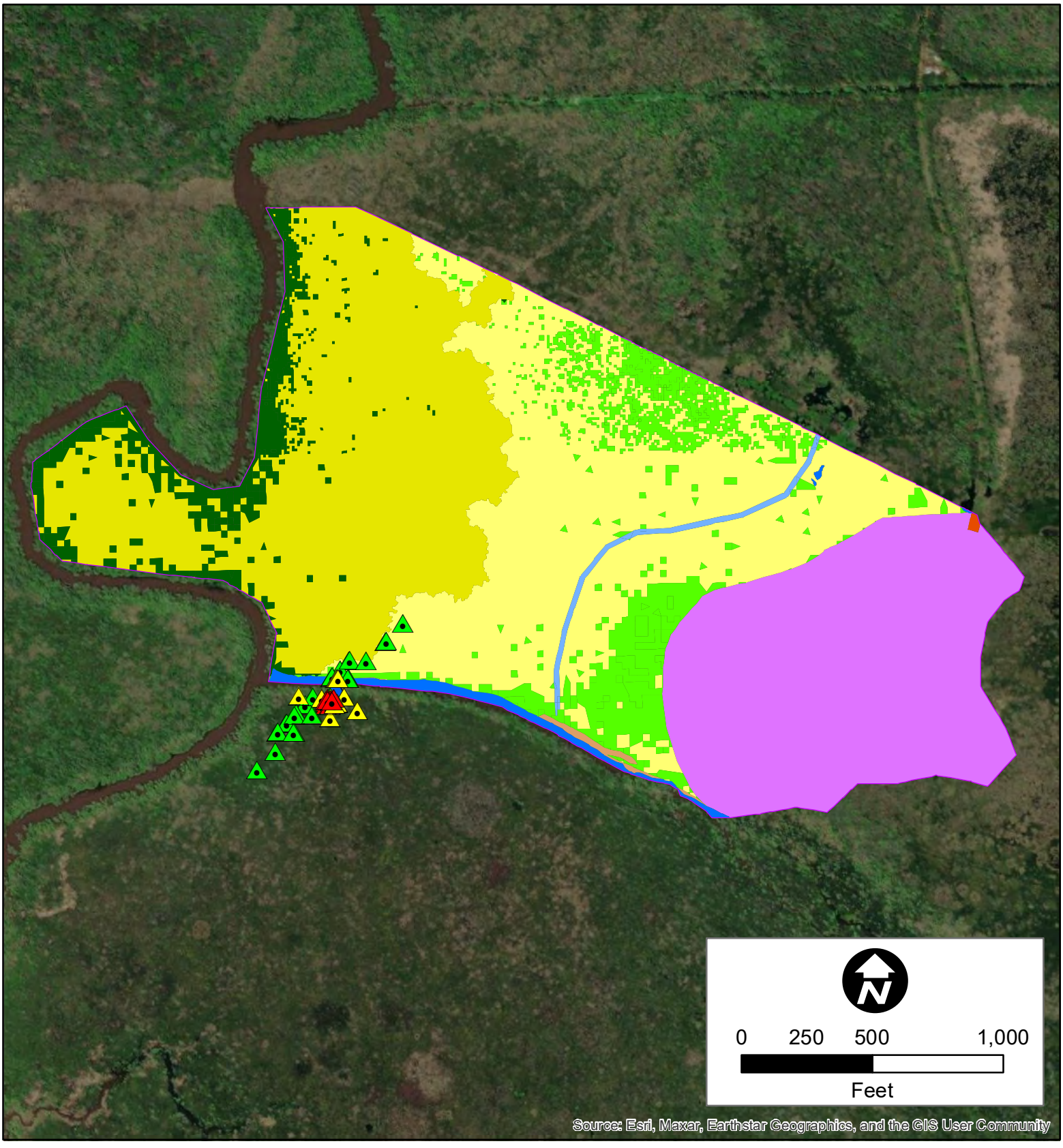
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT S-1

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7g



Unit S-2 (108.3 ac)
CRMS0103 Hydrography Stations
CRMS0103 Sediment Elevation Stations
CRMS0103 Soil Properties Stations
CRMS0103 Vegetation Stationss
BLH Enhancement 1 (26.7 acres)
Swamp Enhancement 1 (30.8 acres)
Swamp Enhancement 2 (9.8 acres)
Swamp Enhancement 3 (33.2 acres)
Swamp Inclusion (5.4 acres)
Tidal Creek Restoration (0.8 acres)
Water (1.2 acres)
Forested\Shrub Uplands (0.3 acres)
Access Road (0.1 acres)

Note: CRMS data points downloaded from CPRA Coastal Information Management System on May 4, 2023.

CYPRESS COASTAL MITIGATION BANK

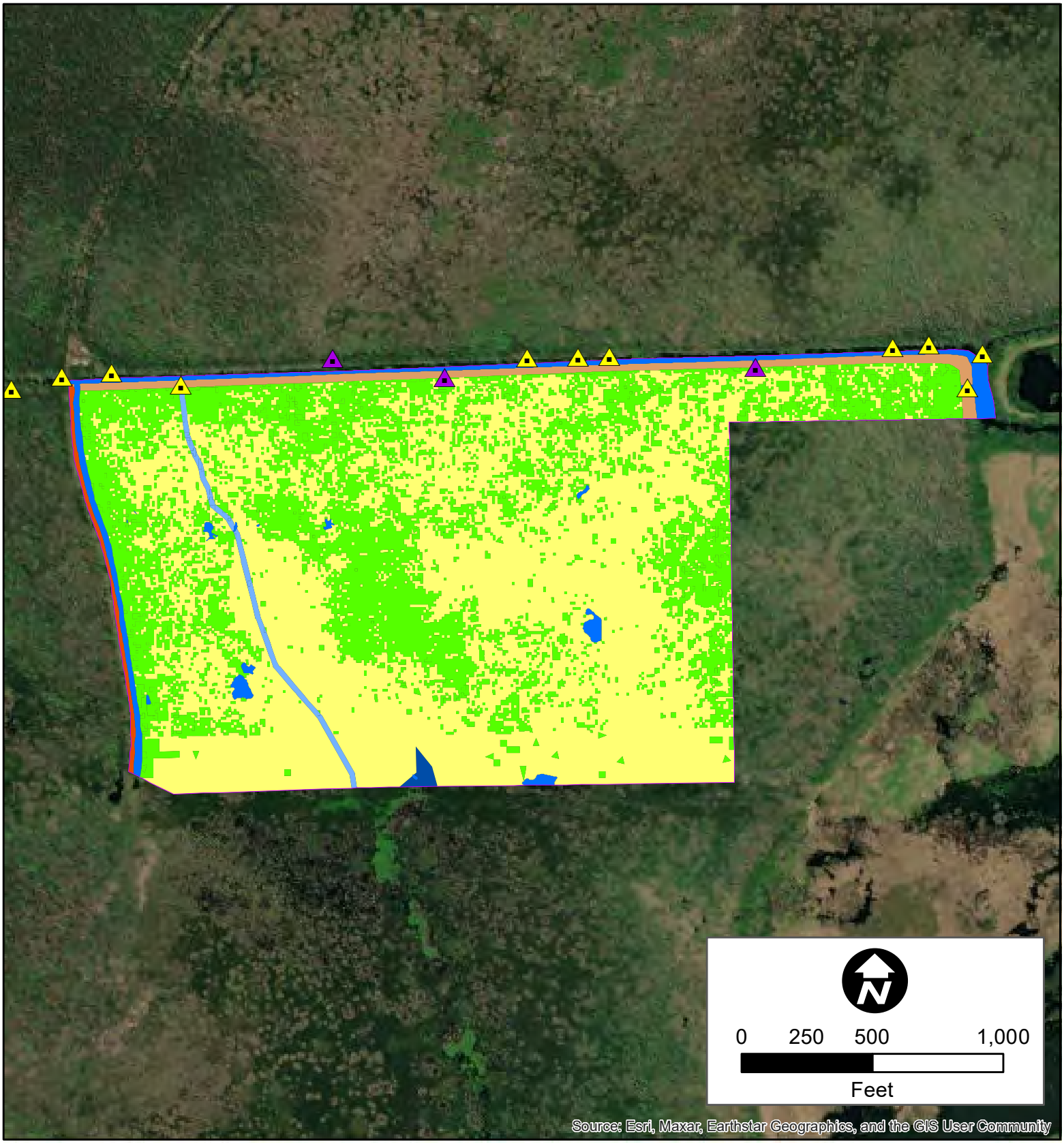
PROPOSED MITIGATION FEATURES UNIT S-2

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

DELTA LAND SERVICES

FIGURE A7h



- Existing Gaps to be Cleaned/Improved
- Proposed New Gaps
- Unit S-3 (94.0 ac)
- Swamp Enhancement 1 (54.3 acres)
- Swamp Enhancement 2 (32.8 acres)
- Tidal Creek Restoration (0.9 acres)
- Floatant (0.2 acres)
- Water (2.9 acres)
- Forested\Shrub Uplands (2.4 acres)
- Access Road (0.5 acres)

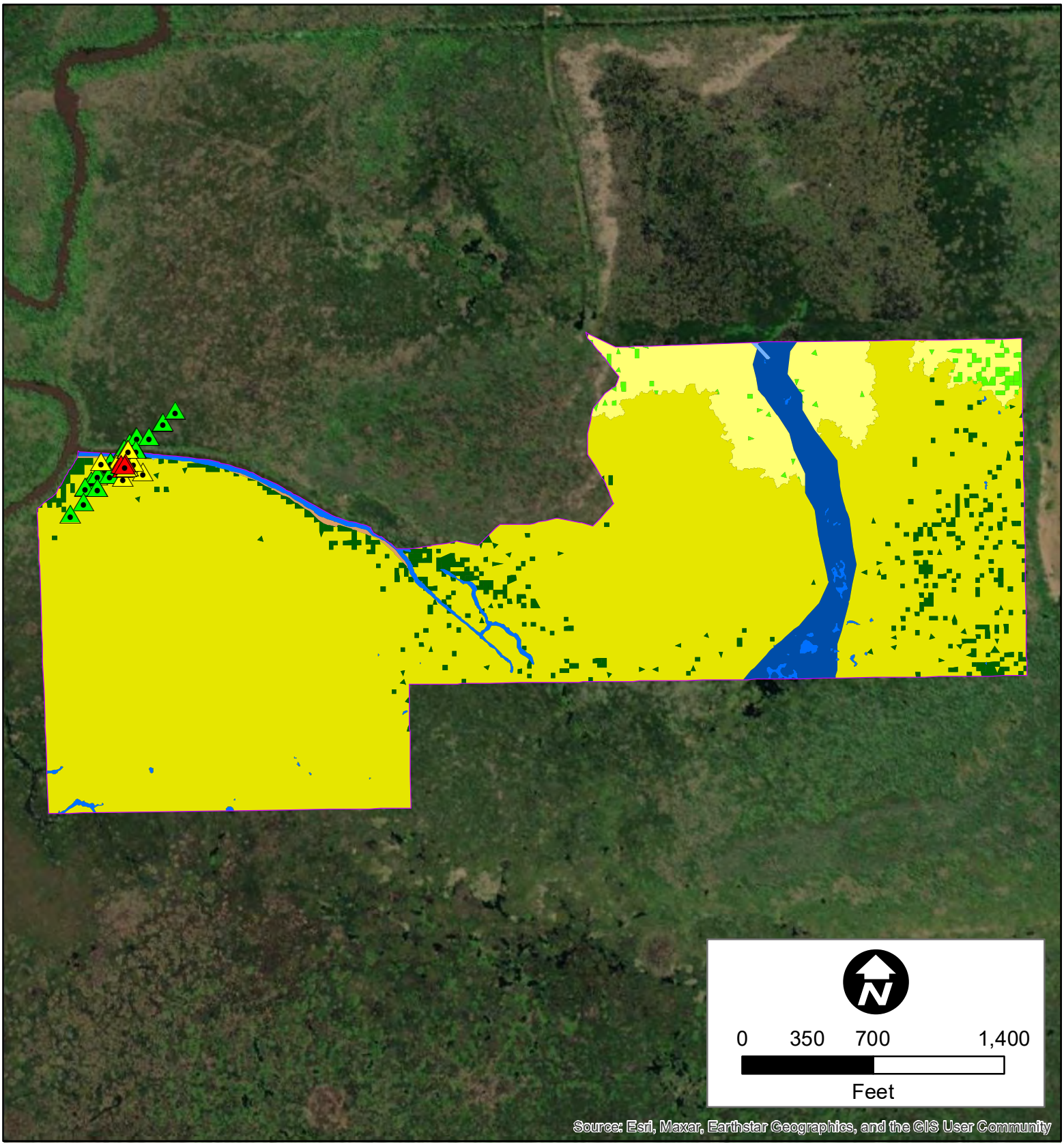
CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT S-3

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

FIGURE A7i



- Unit S-4 (191.1 ac)
- CRMS0103 Hydrography Stations
- CRMS0103 Sediment Elevation Stations
- CRMS0103 Soil Properties Stations
- CRMS0103 Vegetation Stations
- Swamp Enhancement 1 (14.9 acres)
- Swamp Enhancement 2 (1.1 acres)
- Swamp Enhancement 3 (157.7 acres)
- Swamp Inclusion (6.4 acres)
- Tidal Creek Restoration (0.1 acres)
- Floatant (8.0 acres)
- Water (2.5 acres)
- Forested\Shrub Uplands (0.4 acres)

Note: CRMS data points downloaded from CPRA Coastal Information Management System on May 4, 2023.

CYPRESS COASTAL MITIGATION BANK

PROPOSED MITIGATION FEATURES UNIT S-4

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F07_ProposedMitigationFeature	

DELTA LAND SERVICES

FIGURE A7j

Bank Boundary (2040.8 acres)
Pontchartrain Basin

0 10 20 40
Miles

CYPRESS COASTAL MITIGATION BANK

PROPOSED BANK SERVICE AREA

St Tammany and Tangipahoa Parishes, LA

Created : TSC	
Approved : DEB	
Date : 04/25/2023	
File: F05_BankTracts	

FIGURE A18