# JOINT APPLICATION AND NOTIFICATION
# U.S. ARMY CORPS OF ENGINEERS
# MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
# MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY/OFFICE OF POLLUTION CONTROL


Applicant: Cure Land Company, LLC - Mike Cure

Agent: Ecological Asset Management, LLC - Mitch Tinsley
Mailing Address: 803 Highway 90
Bay St Louis MS, 39520
Phone Number: (228) 324-9093
Email Address:
mitch@ecologicalasset.com


Date Submitted:

05/02/2022

DMR Permit Number:
DMR22-000323

**Historic DMR Permit Numbers:**

DMR22-000323

**DMR File Number:**
22-000286

**Project Location:**

0
Bay St. Louis, MS
Hancock County

Latitude: 30.2442
Longitude: -89.4414

Do you still need to enter a Project Location?
How will you identify the project location:

**Project Information:**

Project Name or Title: Bayou Caddy Boat Yard Expansion

Project Description: The purpose of this project is to fill +/- 4.98 acres of high marsh wetlands and scrub-shrub wetland to expand an existing boat yard operation on the subject property. Currently the facility capacity of the existing boat yard size is inadequate to meet the demand for the dry-docking of large vessels for routine inspection, maintenance, emergency repairs and protection during severe weather events, in the MS Gulf Coast region. The proposed project location houses the largest boat lift in Hancock County; said lift has a weight capacity of 70 tons and an inside width of 24 feet. This lift is essential for a multitude of commercial fisheries (finfish, shrimp, oyster, etc), local businesses and residents alike to bring large commercial and private vessels ashore for inspection, maintenance and/or land-based transit. Provided specifications account for the projected growth of the MS Gulf Coast and all future storage requirements. The proposed design considers the minimum necessary area needed for proper and safe turning radius of semi-trucks, which will be used to load and unload large vessels and deliver materials / equipment to the boat yard (See Figure 6 Minimum Turning Radius Requirement for Interstate Semitrailers). Ample area for the ingress and egress of large transit vehicles serves to alleviate risk of harm to individuals utilizing the sites lift or storage facilities. Upon submittal of a Request for Cultural Resources Assessment with MS Department of Archives and History (MDAH) proposed project area, on November 4, 2021, it was determined that a cultural resource survey Phase 1 would be required (Appendix C-1). A CRS Phase 1 survey and report was performed on the proposed expansion area on February 1, 2022, by TerraXplorations, Inc. The report as specified in the Summary and Recommendations Section has suggested the project as proposed should be cleared of all cultural resource concerns and no further archaeological studies are recommended. This final report and its findings will be submitted to the USACE Project Manager once assigned will be forwarded to MDAH for review. Upon completion of the field survey on March 24, 2020, it was determined that no known species listed as threatened and/or endangered will be impacted by the proposed project, nor is the habitat within the range of the proposed development suitable for any of the countys vulnerable species. See EA for additional details.

Project Purpose and Need: The purpose of this project is to fill +/- 4.98-acres of a scrub shrub wetlands and high marsh

wetlands in order to expand an existing boat yard with a lift capable of bringing large vessels ashore. This project does not support any secondary or future development.

Intended Use: Commercial

Will the Proposed Project have a Public Benefit?: Yes
Increased tax base:
Increased employment:
National security benefits:
Improved habitat:
Other:

Does Project area contain any marsh Vegetation?: Yes

What measures will be taken to reduce detrimental off-site effects to the Coastal Wetlands during and after the proposed activity?: Best Management Practices

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**Impact Information:**

| | |
|---|---|
| **Number of Impact Types** | **01** |
| **Impact Type:** | **Wetland Fill** |
| Permanent or Temporary? | Permanent |
| Specific Purpose of Fill (Wetland Fill) | Fill material is required to bring the impacted area to the same elevation as the existing dry dock yard. The size of the expansion area was determined to meet the needs of the local residential and r |
| Acreage/Square Footage or Linear Feet (Wetland Fill) | 4.98 |
| Specify Unit of Measurement (Wetland Fill) | 01. Acreage |
| Cubic Yards of Fill Material (Wetland Fill) | 12,400 |
| Fill Material Type (Wetland Fill) | Sandy Clay |
| Habitat Type (Wetland Fill) | 09. High Marsh |
| Mitigation Type(Wetland Fill) | 04. Other (Enter Other Type below) |
| Enter Other Type (Mitigation Type/ Wetland Fill) | Mitigation in the form of credit purchase will be pursued in order to offset all impacts to scrub-shrub wetland areas. Necessary credits will be acquired from an approved mitigation bank. Impacts to o |
| Is this a component of a larger project? | No |
| Is any portion of this impact complete? | No |

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**Additional information relating to the proposed activity**

Have any other federal, state, or local agencies issued permits or other types of approvals for the proposed project?: No

Have any other federal, state, or local agencies denied approval for the proposed project?: No

**Project Schedule**

Do you know the Proposed Start Date? Yes
05/15/2022

Do you know the Proposed Completion Date? Yes
10/15/2022

Do you know the Estimated Cost of the Project? Yes
$500,000.00

**Adjacent Property Owners:**

**Application Certified by:** Mitch Tinsley

# Attachment “A”

# Permit Drawings
# Central Avenue Parcel

## *Section 19, T-9-S, R-14-W*
## Bay St. Louis, Hancock County, MS

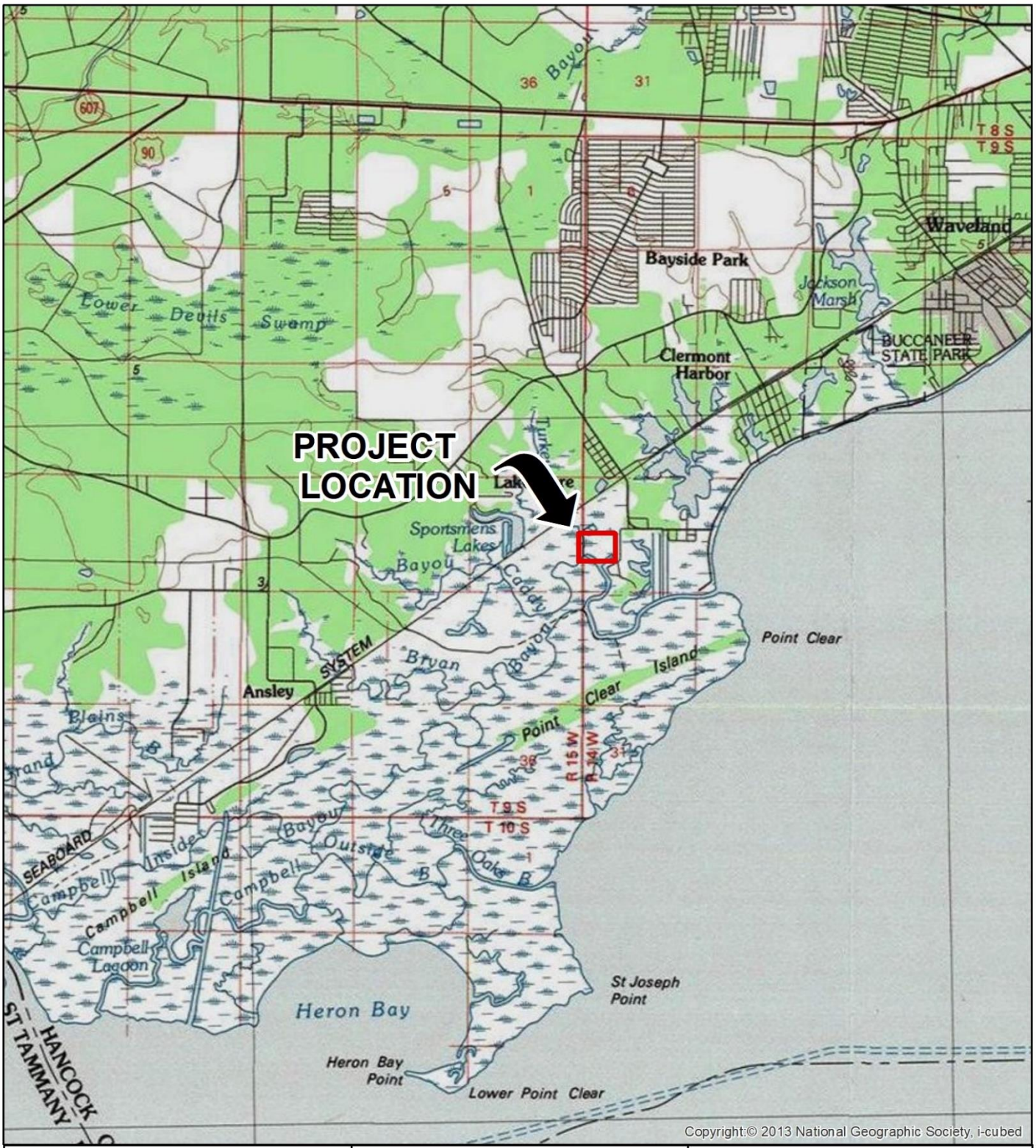



***FIGURE 1***

Base Map: ESRI USA Topo Maps
Source: USGS, NGS & i-cubed
Map Date: September 7, 2021

NORTH

0 0.4 0.8 1.2 1.6
Miles

***PROJECT LOCATION MAP***

ECOLOGICAL ASSET MANAGEMENT, LLC

***Permit Drawing for +/- 4.98 ac Project Area on Bayou Caddy***

Location: Bayou Caddy, MS
Portion of Section 19;
Township 9-South; Range 14-West
County: Hancock County, MS

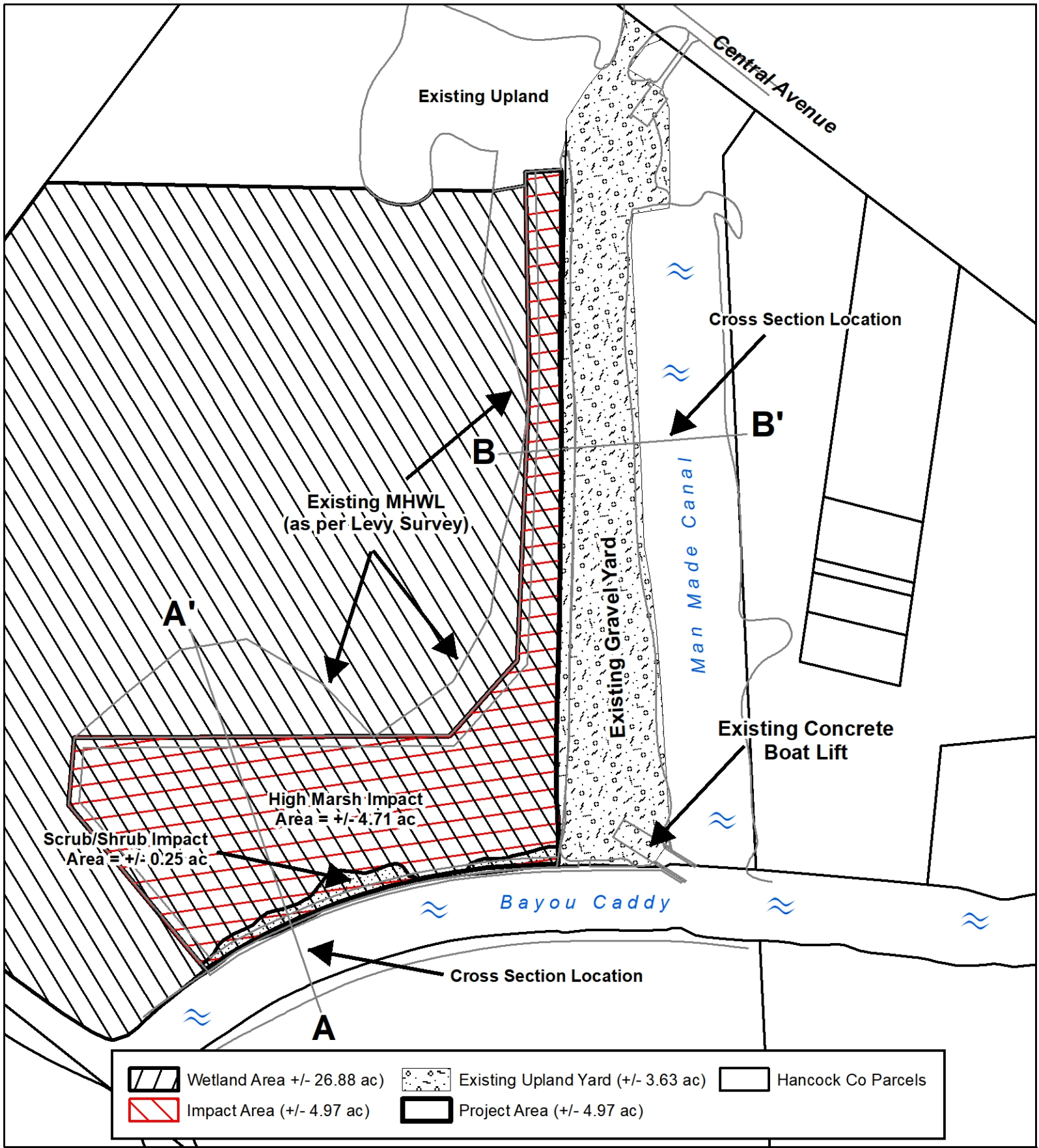



***FIGURE 2***

Base Map: Duke Levy HWL Survey & Hancock Co Tax Parcels
Source: Duke Levy & Assoc, Hancock Co & EAM Field Data
Map Date: September 7, 2021

NORTH

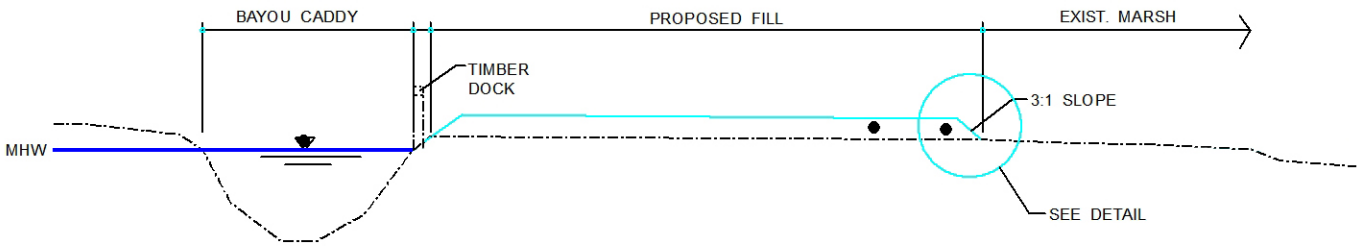
0 75 150 225 300
Feet

## *SITE PLAN AND CROSS SECTION MAP*

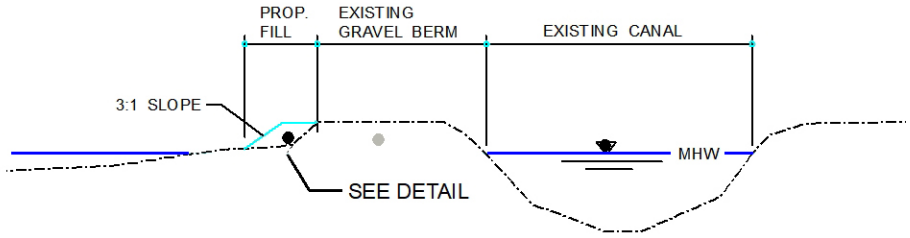
ECOLOGICAL ASSET MANAGEMENT, LLC

***Permit Drawing for +/- 4.98 ac Project Area on Bayou Caddy***

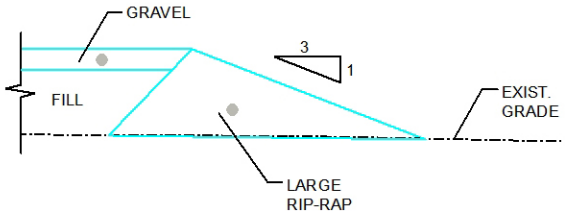
Location: Bayou Caddy, MS
Portion of Section 19;
Township 9-South; Range 14-West
County: Hancock County, MS




SECTION A - A'




SECTION B - B'




DETAIL (FOR ALL EXTERNAL 3:1 SLOPES)

***FIGURE 3***

Base Map: Heinrich & Assoc.
Source: Heinrich & Assoc.
Map Date: September 7, 2021

***SCALE: As Provided***

***TYPICAL CROSS SECTION & SLOPE DETAILS***

ECOLOGICAL ASSET MANAGEMENT, LLC

***Permit Drawing for +/- 4.98 ac Project Area on Bayou Caddy***

Location: Bayou Caddy, MS
Portion of Section 19;
Township 9-South; Range 14-West
County: Hancock County, MS

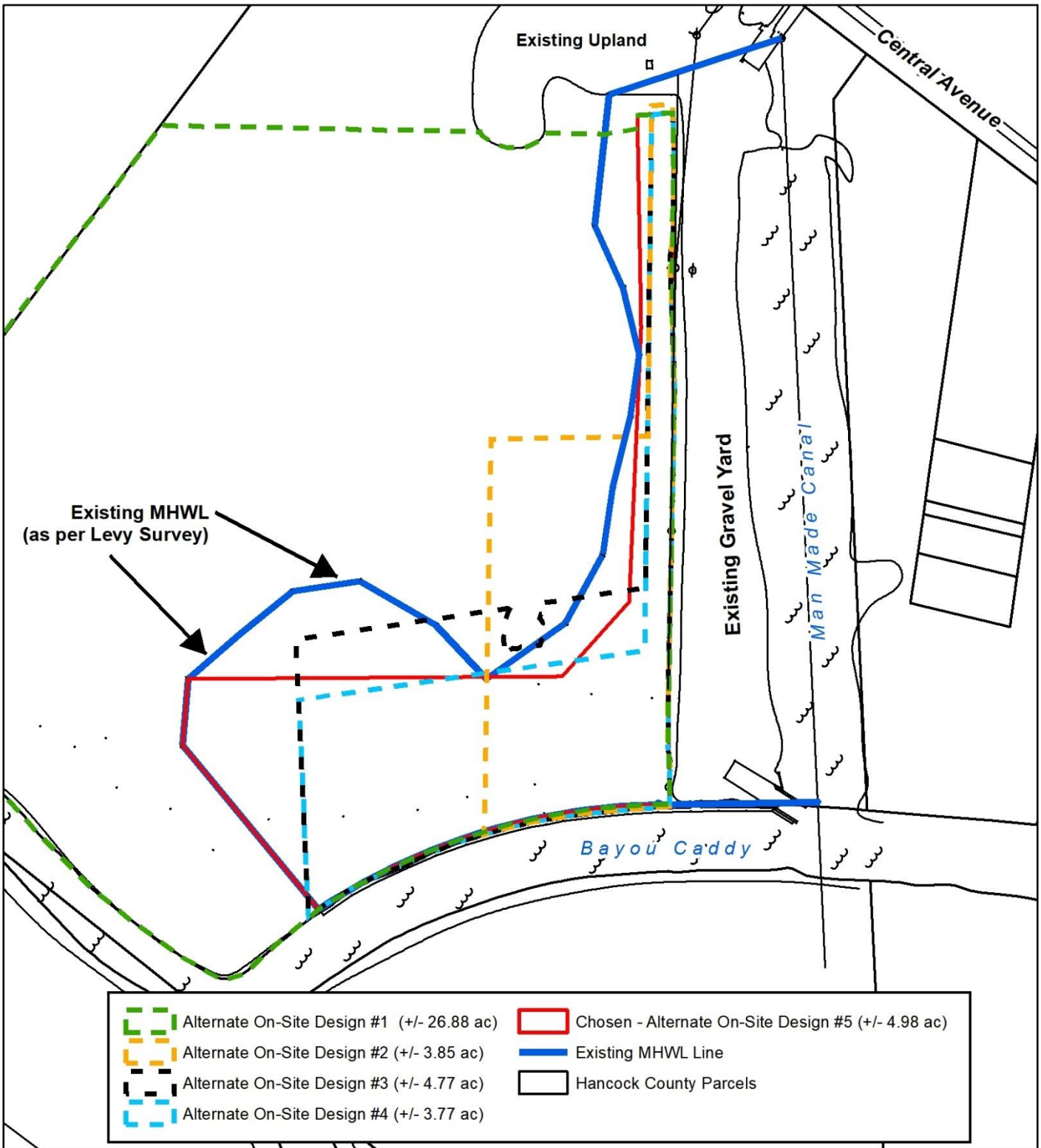



***FIGURE 5***

Base Map: Duke Levy HWL Survey & Hancock Co Tax Parcels
Source: Duke Levy & Assoc, Hancock Co & EAM Field Data
Map Date: September 7, 2021

NORTH

0 75 150 225 300
Feet

## *ALTERNATIVE ON-SITE DESIGNS*

ECOLOGICAL ASSET MANAGEMENT, LLC

***Permit Drawing for +/- 4.98 ac Project Area on Bayou Caddy***

Location: Bayou Caddy, MS
Portion of Section 19;
Township 9-South; Range 14-West
County: Hancock County, MS

# Attachment “B”

# Agent Authorization
# Central Avenue Parcel

## *Section 19, T-9-S, R-14-W*
## Bay St. Louis, Hancock County, MS

# MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

## Agent Authorization

I authorize the person(s) and/or company listed below to act as my agent regarding the proposed project as described in the Joint Application and Notification at the location listed below:

Ecological Asset Management
c/o Randy Ellis
(name of agent)

803 Highway 90
(address)

Bay St. Louis, MS, 39520
(city, state, zip code)

C: 228-216-7450, O:228-231-1077
(agent phone number)

Central Avenue
(location of project)

Section 19, Township 9-South, Rance 14-West

Hancock County, MS

Mike Cure
(print applicant name)

(applicant signature)

4/25/2022
(date)

Do you want the permit mailed to the agent? X Yes _ No

# Attachment “C”

# ENVIRONMENTAL ASSESSMENT
# Central Avenue Parcel

## *Section 19, T-9-S, R-14-W*
## Bay St. Louis, Hancock County, MS

# Environmental Assessment

## Project Description

The applicant proposes a project that is dependent on water access in order increase the extent and capacity of an existing dry docking boat yard on a +/- 4.98-acre project area located in Bay St. Louis, MS. The subject property is more specifically located in Section 19, Township-9-South, Range-14-West (Figure 1), Bay St. Louis, Hancock County, MS. Sandy clay material will be hauled in to raise the elevation of the property and to provide a suitable foundation for the expansion of the dry boat yard.

This expansion is being proposed in a rapidly growing area of the Mississippi Gulf Coast. The project will entail the filling of +/- 4.98 acres of jurisdictional wetlands for the expansion of an existing commercial boat yard in a +/- 4.98-acre project area. The project is intended for commercial use and will be located on land that is currently zoned by Hancock County as commercial resort district (C-4). The filling of the property will require +/- 12,400 cubic yards of sandy clay material sourced from Mining Pit # POO-058 which is a state authorized borrow pit. The project will provide for the expansion of an active boat yard to meet the demand of large vessels that require dry-docking for routine maintenance, emergency repairs, and severe weather protection. Best management practices will be employed to ensure that the fill material will not contaminate surrounding wetlands and/or other waters.

## Purpose and Need for Project

The purpose of this project is to fill +/- 4.98 acres of mixed high marsh wetlands and scrub-shrub wetlands to expand an existing boat yard operation on the subject property. Currently the facility capacity of the existing boat yard size is inadequate to meet the demand for the dry-docking of large vessels for routine inspection, maintenance, emergency repairs and protection during severe weather events, in the MS Gulf Coast region.

The proposed project location houses the largest boat lift in Hancock County; said lift has a weight capacity of 70 tons and an inside width of 24 feet. This lift is essential for a multitude of commercial fisheries (finfish, shrimp, oyster, etc), local businesses and residents alike to bring large commercial and private vessels ashore for inspection, maintenance and/or land-based transit. Provided specifications account for the projected growth of the MS Gulf Coast and all future storage requirements.

The proposed design considers the minimum necessary area needed for proper and safe turning radius of semi-trucks, which will be used to load and unload large vessels and deliver materials / equipment to the boat yard (See Figure 6: Minimum Turning Radius Requirement for Interstate Semitrailers). Ample area for the ingress and egress of large transit vehicles serves to alleviate risk of harm to individuals utilizing the site's lift or storage facilities.

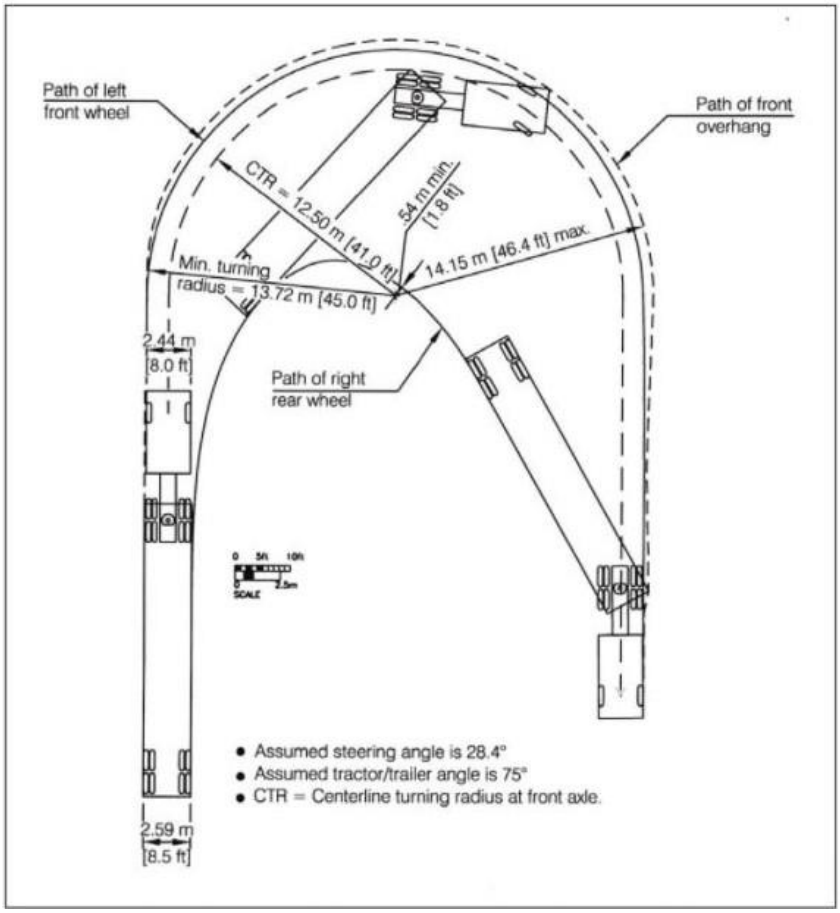



Figure 6: Minimum Turning Radius Requirement for Interstate Semitrailers

## Alternatives

### Off-Site Alternative

Alternative off-site locations were not considered for this project; the proposed development requires a boat lift capable of removing large vessels from the bayou. The proposed site houses a boat lift large enough boat lift to raise vessels greater than 24ft in width or 70 tons in weight. Aside from being the largest boat lift in Hancock County, MS, the dry-docking facility provides additional uniqueness by allowing for vessel maintenance by the owner or contracted individuals. The proposed development acts as an expansion to any already existing boatyard that is located along a waterway with the proper depth and width to allow large vessels to enter/exit without obstruction.

### On-Site Alternatives

Identified project and alternative on-site designs include: (1) construction of the project as proposed, (2) construction of a larger expansions, (3) construction of yard with differing extent / boundaries and (4) the no - build alternative. Each alternative on-site design can be found in Attachment “A”, Figure 5 Alternative On-Site Designs.

The project, as proposed, meets the purpose and need of the project as it provides for the expansion of an existing boat yard, which is directly adjacent to the proposed project area, to supply for the current and projected demands of the dry-docking of large vessels for emergency repairs, routine maintenance, and severe weather events. Also, the proposed site is already situated along a waterway which is the proper width and depth for large vessels to have access to the boat yard.

The larger expansion alternative (Alternative On-Site Design #1) is undesirable because it would cause more impacts to aquatic resources. The proposed area is the minimum size necessary for the applicant to facilitate the purpose and need of the expansion.

In terms of area and design effectiveness, alternative designs #2 and #3 are well suited for the needs of the developer. Though this is true, each encompasses wetland areas that exist beyond the mean high-water line determined by Duke Levy & Associates, P.A. on April 4, 2021. Due to the impacts to estuarine areas below the mean high-water line these alternatives were not considered viable.

Alternative design #4 appears to be a suitable layout, but via market research and design consultation, it had been determined that the facility would require additional yardage. This +/- 3.77-acre expansion would not fulfill the public need of the yard, nor would it be financially viable for the developer.

The no build alternative is undesirable because it would not satisfy the purpose and need for the project and would cause the loss of potential income for the applicant and the publics need for dry docking large vessels.

## Affected Environment

### Site Analysis

The subject property exists along Bayou Caddy and consists of a scrub-shrub wetland community and a high marsh wetland community. Additionally, the project site contains a man-made canal that adjoins Bayou Caddy.

### Vegetation

The subject property consists of a scrub/shrub wetland community and a high marsh wetland community.

The scrub shrub wetland community was dominated by *Baccharis halimifolia* (Eastern Baccharis), *Triadica sebifera* (Chinese Tallow), and *Morella cerifera* (Wax Myrtle).

The high marsh wetland community Is dominated by *Juncus roemeranus* (Black Needlerush), *Spartina patens* (Saltmeadow Cordgrass), *Schoenoplectus pungens* (Common Threesquare) and *Distichlis spicata* (Greene Saltgrass).

### Wetlands

A wetland delineation was completed by Ecological Asset Management, LLC on March 30, 2020, and sent to the U.S. Army Corps of Engineers – Mobile District on April 27, 2022. The results of the study determined that the site contains +/- 4.98 acres of federally regulated wetlands.

### Water Quality

Water quality within the localized area surrounding the proposed project area is moderate to good. This portion of Bayou Caddy is subject to frequent disturbance from commercial and recreational crafts throughout the year. Development along the bayou is prone to introducing stormwater runoff during evens of heavy rainfall; these effects are temporary and do not appear to have had lasting consequences on water quality.

### Cultural Resources

Upon submittal of a Request for Cultural Resources Assessment with MS Department of Archives and History (MDAH) proposed project area, on November 4, 2021, it was determined that a cultural resource survey Phase 1 would be required (Appendix C-1). A CRS Phase 1 survey and report was performed on the proposed expansion area on February 1, 2022, by TerraXplorations, Inc. The report as specified in the Summary and Recommendations Section has suggested the project

as proposed should be cleared of all cultural resource concerns and no further archaeological studies are recommended. This final report and its findings will be submitted to the USACE Project Manager, once assigned, and will be forwarded to MDAH for review.

**Threatened and Endangered Species**

According to the U.S. Fish and Wildlife Service and the Mississippi Natural Heritage Program accessed on October 28, 2021, the following threatened and endangered species plus those with critical habitats are listed for Hancock County, Mississippi: Louisiana black bear (*Ursus a. luteolus*), West Indian manatee (*Trichechus manatus*), Mississippi sandhill crane (*Grus canadensis pulla*), Piping Plover (*Charadrius melodus*), Red-cockaded woodpecker (*Picoides borealis*), Black pine snake (*Pituophis melanoleucus*), Eastern indigo snake (*Drymarchon corais couperi*), Gopher tortoise (*Gopherus polyphemus*), Alabama red-bellied turtle (*Psuedemys alabamensis*), Wood Stork (*Mycteria* americana), Green turtle (*Chelonia Mydas*), Kemp's ridley turtle (*Lepidochelys kempii*), Loggerhead turtle (*Caretta caretta*), Yellow-blotched map turtle (*Graptemys flavimaculata*), Gulf Sturgeon (*Acipenser oxyrhynchus desotoi*), Mississippi gopher frog (*Rana capito sevosa*), Louisiana quillwort (*Isoetes louisianensis*), Pearl darter (*Percina aurora*), Louisiana quillwort (*Isoetes louisianensis*) and the Alabama red-bellied turtle (*Psuedemys alabamensis)*.

Based on a preliminary desktop survey conducted by EAM personnel, it was determined that of the vulnerable species noted above, only the following three species could persist within the geographical region: Piping plover (*Charadrius melodus*), Wood stork (*Mycteria* americana), Gopher tortoise (*Gopherus polyphemus*) and Loggerhead turtle (*Caretta caretta*). Ecological Asset Management, LLC biologists with expertise in T&E species surveys conducted an extensive field investigation using a sub-meter Global Positioning System (GPS) to delineate any potential habitat and to identify any threatened individuals or populations.

Upon completion of the field survey on March 24, 2020, it was determined that no known species listed as threatened and/or endangered will be impacted by the proposed project, nor is the habitat within the range of the proposed development suitable for any of the county's vulnerable species.

**Wildlife and Fisheries**

The project area consists of a scrub/shrub wetland vegetative community and a high marsh wetland community.

**Socio-Economics**

The subject property is currently zoned by Hancock County as Commercial Resort District (C-4). Currently, apart from property taxes, the property is not generating any revenues for Hancock County and the city of Bay St. Louis.

## Environmental Consequences

### Wetland Impacts

The project will require the filling of +/- 4.98 acres of mixed high marsh and scrub-shrub wetland areas. Mitigation in the form of credit purchase will be pursued in order to offset all impacts to scrub-shrub wetland areas. Necessary credits will be acquired from an approved mitigation bank. Impacts to on-site high marsh will be mitigated via the preservation and creation of a like habitat. A more detailed restoration plan will be submitted by separate cover.

### Water Quality

Construction best management practices (BMPs) will be utilized to prevent silt-laden runoff from entering the waterway or adjacent wetland areas during construction activities. BMPs include but are not limited to the placement of silt fences and hay bales around the project perimeter. All imported, non-native fill material be monitored and managed by the applicant.

The chosen site-design has avoided all on-site wetland areas to the maximum extent practical. It is not possible to avoid wetlands entirely as the prompted development is water dependent. The existing development allows for expansion rather than intrusion of an untouched ecosystem.

### Cultural Resources

The project does not anticipate any adverse effects on cultural resources within the project area. If artifacts or archaeological features are encountered during projects activities, all activities shall cease and the MDAH and USACE, Mobile District will be consulted with immediately.

### Threatened and Endangered Species

The project will have no known adverse effects on species listed as threatened or endangered by the U.S. Fish and Wildlife Service and the Mississippi Natural Heritage Program.

### Wildlife and Fisheries

No permanent impacts are anticipated to wildlife resources in the vicinity of the project area or adjacent systems. Temporary disturbances may cause terrestrial mammals / avian species to avoid the project area during times of construction, but it is expected that any aversion would subside after construction is complete. Marsh vegetation will be impacted during construction, but no habitat fragmentation will occur. All wetland impacts will be appropriately mitigated; a detailed restoration plan will be submitted by separate cover.

### Socio-Economics

The socio-economic impacts of the proposed boat lift would be positive. Residents of Hancock County and the MS Gulf Coast would most likely fill additional employment opportunities created by this project. Building materials will be obtained from local building supply stores. Hancock County will benefit from ad valorem and local sales taxes generated from the boat yard expansion. The development would create several permanent job positions when complete.

**Works Cited**


Ecological Asset Management, LLC.

*2020. Wetland Delineation, Cure Boat Yard*, Hancock County, MS.

Mississippi Museum of Natural Science

2001. *Endangered Species of Mississippi*. Mississippi Department of Wildlife, Fisheries and Parks, Museum of Natural Science. Jackson, MS.

U.S. Department of Transportation, Federal Highway Administration.

2021. *Minimum Turning Radius Requirement for Interstate Semitrailers* *https://ops.fhwa.dot.gov/publications/fhwahop12006/sec_4.htm*, Electronic document accessed October 28, 2021.

U.S. Fish & Wildlife Service

2010. *Habitat descriptions: Federally Endangered and Threatened and Candidate Species of Mississippi*. *http://www.fws.gov/mississippiES/pdf/T&ESpeciesHabitatinfo2010updated.pdf*, Electronic document accessed October 25, 2021.

U.S. Fish & Wildlife Service

*2010. Mississippi List of Federally Threatened and Endangered Species by County*. http://www.fws.gov/mississippiES/pdf/SpeciesbyCounty.pdf, Electronic document accessed October 25, 2021.

# Appendix C-1

# MDAH CRS Needed Letter
# For Environmental Assessment

# Central Avenue Parcel
# Bay St. Louis, Hancock County, MS

## *Section 40, T-9-S, R-14-W*

MDAH
MISSISSIPPI DEPARTMENT OF
ARCHIVES & HISTORY

P.O. Box 571
Jackson, MS 39205-0571
601-576-6850
mdah.ms.gov

November 29, 2021

Mr. Mitch Tinsley
Ecological Asset Management, LLC
803 Highway 90
Bay St. Louis, Mississippi 39520

RE: Proposed Filling of 3.77 Acres of Tidal Marsh Wetlands for the Expansion of an Active Boat Yard, S19, T9S, R14W, Lakeshore, by Cure Land Company, (USACE) MDAH Project Log #11-053-21, Harrison County

Dear Mr. Tinsley:

We have reviewed your November 4, 2021, request for a cultural resources assessment for the above referenced project, in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800.

After review, it is our determination, due to the topography of the area and the presence of recorded archaeological sites in close proximity to the project area that a cultural resources survey must be performed by a professional archaeologist. The area is part of a region with high potential to yield eligible cultural resources. The area should have survey by an archaeologist qualified for wetland surveys. The resulting report should reference the project log number above on the title page.

A list of individuals who have represented themselves as being willing and qualified to do archaeological survey work in Mississippi will be furnished upon request. A copy of this letter should be made available to the contracting archaeologist(s).

If we can be of further assistance, please do not hesitate to contact us at (601) 576-6940.

Sincerely,

Hal Bell

Hal Bell
Review and Compliance Officer

FOR: Katie Blount
State Historic Preservation Officer



Figure C-2: MDAH "CRS Needed" Letter

# WETLAND MITIGATION PLAN
# BAYOU CADDY BOAT YARD EXPANSION PROPERTY
# HANCOCK COUNTY, MISSISSIPPI

## History and Project Background

Ecological Asset Management, LLC (EAM) conducted a wetland delineation on March 21, 2023, for the Bayou Caddy Boat Yard Expansion property located off Central Avenue in Hancock County, Mississippi. The delineation was requested by Cure Land Company, LLC. The property is more specifically located in Section 19, Township-9-South, Range-14-West (Figure A).

The results of this wetland delineation concluded that the proposed on-site mitigation area contains +/- 2.02 acres qualified as jurisdictional scrub/shrub wetlands (Figure B). A permit application requesting the filling of +/- 4.72 acres of high marsh wetland habitat and +/- 0.25 acres of scrub/shrub wetlands was submitted to the Mississippi Department of Marine Resources (DMR) (DMR22-000323) and the Mobile District of the U.S. Army Corps of Engineers (USACE) (SAM-2022-00495-APS).

## Goals and Objectives

The mitigation goals and objectives for the Bayou Caddy Boatyard Expansion property include restoring tidal marsh wetlands and meeting or exceeding "no-net-loss" of wetland function requirements for the impact areas. The impact areas include +/- 4.72 acres of high marsh wetlands and +/- 0.25 acres of scrub/shrub wetlands. The applicant proposes to purchase mitigation credits through an approved mitigation bank to offset impacts to the +/- 0.25 scrub/shrub wetlands. Because mitigation will be achieved by purchasing credits through a mitigation bank, the remainder of this report will address the mitigation for impacts to the +/- 4.72 acres of high marsh wetland habitat.

The applicant proposes off-site mitigation of the impacts to the existing +/- 4.72 acres of high marsh through the preservation of +/- 54.17 acres of off-site tidal marsh (Parcel # 179-0-32-003.000), the creation of +/- 1.68 acres of tidal marsh, and the enhancement of +/- 2.02 acres of scrub/shrub wetlands (Figures C & D). The increase in total acres of marsh will exceed "no-net-loss" of wetland function requirements and will also improve this portion of the Campbell Bayou-Bayou Caddy Watershed (HUC-12, USGS 2018).

## Baseline Information

The physical setting of the Bayou Caddy property was interpreted with the aid of the following resources: *Soil Survey of Hancock County, Mississippi* (Smith et al. 1981); *Geology and Geomorphology of the Coastal Counties in Mississippi-Alabama* (Schmid and Otvos 2004); *Sources for Water Supplies in Mississippi* (Wasson 1980); aerial photographs of portions of the project area, ESRI USA Topo Maps; USGS National Hydrography Dataset (2018); Hancock

County Zoning Codes; and USDA NRCS SSURGO Soil Survey Geographic Data. These were supplemented with first-hand observations during the site inspection performed by EAM on March 21, 2023 (Figures A-D).

**Geology and Soils**

Geologically, the entire Gulf Coast region, including Hancock County, is part of the Prairie Complex, a diverse depositional sequence consisting of numerous coastal rivers and streams. This complex is characterized by terraces and by fluvial, colluvial, estuarine, deltaic, and marine units deposited over a considerable part of the late Pleistocene (Wisconsin to Sangamon stage) landscape. The project area lies on the Holocene Coastal Deposits, which is the most recent geologic formation in this region. The sediments that make up the Holocene Coastal Deposits are composed of loam, sand, gravel and clay. Locally, these environments are predominantly found within coastal estuaries and marshlands (Schmid and Otvos 2004; Moore 1969).

According to the *Soil Survey of Hancock County, Mississippi* (Smith et al. 1981), the soils on the Bayou Caddy property are Handsboro association (HA) and Beauregard silt loam (Be), which are described as follows:

> **HA– Handsboro association.** This map unit consists of very poorly drained, well decomposed organic soils on tidal marshes that are flooded daily by seawater. Slopes range from 0 to 1 percent. … These soils range from moderately alkaline to neutral throughout. Permeability is moderate. The available water capacity is high for salt-tolerant plants. Runoff is very slow, and the erosion hazard is slight.
>
> **Be– Beauregard silt loam.** This moderately well drained soil is on low upland ridges. Slopes range from 0 to 1 percent. … This soil ranges from slightly acid or strongly acid in the surface layer and is medium acid or strongly acid in the subsoil. The permeability is moderately slow in the upper part of the subsoil and slow in the lower part. The available water capacity is very high. Runoff is slow, and the erosion hazard is slight.

**Hydrology**

Hancock County is in the Coastal Division of Mississippi, which is a farm grouping of six counties with a more-or-less uniform subtropical climate. The average yearly precipitation is 62.63 inches (NOAA 2023). Hancock County, Mississippi is underlain by the Citronelle and Miocene aquifers (Wasson 1980). The principal aquifer for the subject property is the Citronelle. The Citronelle aquifer averages approximately 300 feet in thickness and is composed of layers of sand and gravel. It is underlain by Miocene deposits consisting of layers of sand and clay (Wasson 1980).

The local hydrology was investigated extensively throughout the project area. It was determined that the natural hydrology has not been altered. Hydrology is influenced by topography and tidal flow during extreme high tide events. Areas of lower elevation are saturated and occasionally flooded by rising and falling tides, whereas areas of higher elevation remain dry and unaffected

by tidal flow. The areas at higher elevations drain into the wetland area via sheet flow.

**Vegetation**

Vegetation in the existing marsh area is currently dominated by *Spartina patens* (Saltmarsh Cordgrass) and *Juncus roemeranus* (Black Needlerush). No invasive species are present in this area.

Vegetation in the scrub/shrub mitigation area is currently dominated by *Baccharis halimifolia* (Groundseltree), *Pinus elliottii* (Slash Pine), *Quercus laurifolia* (Laurel Oak), *Triadica sebifera* (Chinese Tallow), *Iva frutescens* (Jesuit's Bark), *Juncus roemeranus* (Black Needlerush), *Spartina patens* (Saltmarsh Cordgrass) and *Solidago mexicana* (Southern Seaside Goldenrod). The general health of the vegetation in this area is poor due to frequent impacts such as mowing and soil compaction. Invasive species are present in this area, including *Triadica sebifera* (Chinese Tallow). Upland plant encroachment was observed within the wetland area.

Vegetation in the upland mitigation area is currently dominated by *Quercus virginiana* (Southern Live Oak), *Baccharis halimifolia* (Groundseltree), *Pinus elliottii* (Slash Pine), *Andropogon glomeratus* (Bushy Bluestem), *Spartina patens* (Saltmarsh Cordgrass), *Teucrium canadense* (American Germander) and *Rubus pensilvanicus* (Pennsylvania Blackberry). The general health of the vegetation in this area is poor due to frequent impacts such as mowing, surface compaction and material storage. Invasive species are present in this area, including *Imperata cylindrica* (Cogon Grass).

**Wildlife Usage**

The habitats within the mitigation and impact areas are not known to contain any species listed as threatened or endangered. The project location is not in an area listed as a critical habitat for the Gulf Sturgeon. Based on the field survey conducted by EAM personnel on March 21, 2023, it was determined that no known species listed as threatened and/or endangered will be impacted by the proposed project, nor is the habitat within the range of the proposed project suitable for any of the county's vulnerable species. The selected mitigation area currently provides minimal habitat value for wildlife such as fur-bearing animals and avian species, and marsh areas are utilized by benthic and other marine organisms.

**Historic and Existing Land Uses**

The majority of the site is currently vacant and unimproved, although the mitigation area is subject to frequent disturbances, such as soil compaction and mowing. The majority of the upland area is currently used for material storage.

**Mitigation Site Selection and Justification**

The mitigation area was selected due to its proximity to the proposed area of impact and for its potential to create tidal marsh at higher elevations. Restoration efforts to convert higher elevation areas to marsh is becoming increasingly important with sea level rise (SLR). Research at Grand Bay National Estuarine Research Reserve is investigating shoreline changes associated with SLR

and coastal marshes (Terrano 2018). Tidal marsh ecosystems rely on sedimentation rates that are equal or greater than the rate of sea level rise in order for successful marsh migration to higher elevations. Increased rates of sea level rise pose a threat to existing tidal marsh. Restoration of higher elevation coastal areas to marsh helps the ecosystem to adapt to the impacts of SLR and prevent permanent habitat loss.

The mitigation site was primarily selected because a portion is currently functioning as a scrub/shrub wetland that is connected to an existing healthy *Juncus roemerianus* marsh with a natural hydrological connection to Bayou Caddy. Because the mitigation area is adjacent to an existing healthy marsh, the potential for success of the mitigation project is considered high.

The applicant's proposed mitigation work plan can be described in the following three tasks.

***Task 1: Mitigation Work Plan***

Mitigation efforts shall commence within 15 days after the permit is issued. Restoration will be completed within 30 days. Within 72 hours of the finished wetland restoration, photographs of the mitigation area shall be taken from fixed on-site monitoring locations to document site conditions. These photographs will be submitted to the DMR and the Regulatory Division of the USACE within 14 days of the restoration completion date.

For this task, a loader with rubber tires and a grading blade will be utilized to scrape and remove soils in the mitigation area until the elevation is consistent with that of the adjacent *Juncus roemerianus* marsh with a natural grade into the upland area. This elevation will be determined using a SOKKIA Set 2110 Digital Total Station. To prevent damage such as rutting, the front-end loader will not move into areas that cannot support its weight.

All material removed during this task will be moved to an approved upland location to be determined and approved by the USACE. Best management practices will be utilized through the installation of temporary silt fencing around the mitigation area. Silt fencing will be properly installed along the existing marsh boundary to stabilize the soils on the slope and to prevent erosion during construction. Additional silt fencing will be placed along the restored upland-marsh boundary. The silt fencing in this area will remain until soils become stable.

All disturbed soil in upland locations will be seeded with a native grass mix to control erosion in these areas. The mitigation area will be planted with *Juncus roemerianus* plants acquired from a local nursery, as well as transplants from the project area. The nursery plants will consist of 2" plugs and will be planted on 4 foot staggered centers. *Juncus roemerianus* was selected because it will conform to the vegetation in the existing adjacent marsh.

Because the soils in the mitigation area are the same as the soils in the adjacent healthy marsh, it will not be necessary to import or modify soils in order to sustain healthy marsh vegetation. The adjacent marsh has a direct connection to Bayou Caddy. Once proper elevations are achieved, the mitigation area will share that natural connection. Once construction is complete, soils and hydrology will be consistent with that of the adjacent healthy *Juncus roemerianus* marsh.

***Task 2: Monitoring and Adaptive Management Plan***

Monitoring of the project site by the applicant and qualified biologists will be conducted twice a year, in the spring and fall, for five years. Biannual monitoring reports generated from information documented during these field evaluations will be submitted to the USACE and DMR for review. Two fixed monitoring points and one random monitoring point will be established and used in all reporting.

Planted *Juncus roemerianus* will be inspected for survival and percentage ground cover. Vegetative cover shall reach a minimum of 95% with native species within three years of the five-year monitoring period. If coverage is not increasing within the first two years, further measures (i.e., planting additional *Juncus roemerianus)* will be taken to ensure 95% coverage by year three. Dead or damaged marsh grass will be replaced unless it is determined that an adequate amount of *Juncus roemerianus* is becoming established through natural succession. Invasive vegetation will be killed or removed if it is found to be inhibiting the growth of planted marsh. Signage will be placed by the applicant to forbid trespassing that could damage the planted vegetation and impair the wetland restoration effort.

Management of the mitigation area will be the responsibility of the applicant and qualified biologists. Because the mitigation area will have a natural hydrologic connection to Bayou Caddy, we do not anticipate potential challenges resulting from drought. The only anticipated challenges are from invasive species and tropical storms. The mitigation site was selected and designed to accommodate these challenges due to its connection to the flourishing adjacent marsh. There are no invasive species present in the marsh area at this time. If these challenges do occur, they will be properly mitigated for and addressed in the monitoring reports.

***Task 3: Site Protection***

Before construction begins, an approved Declaration of Restrictive Covenant protecting existing and restored wetlands and waterbottoms will be recorded in the deed records office of Hancock County, Mississippi.

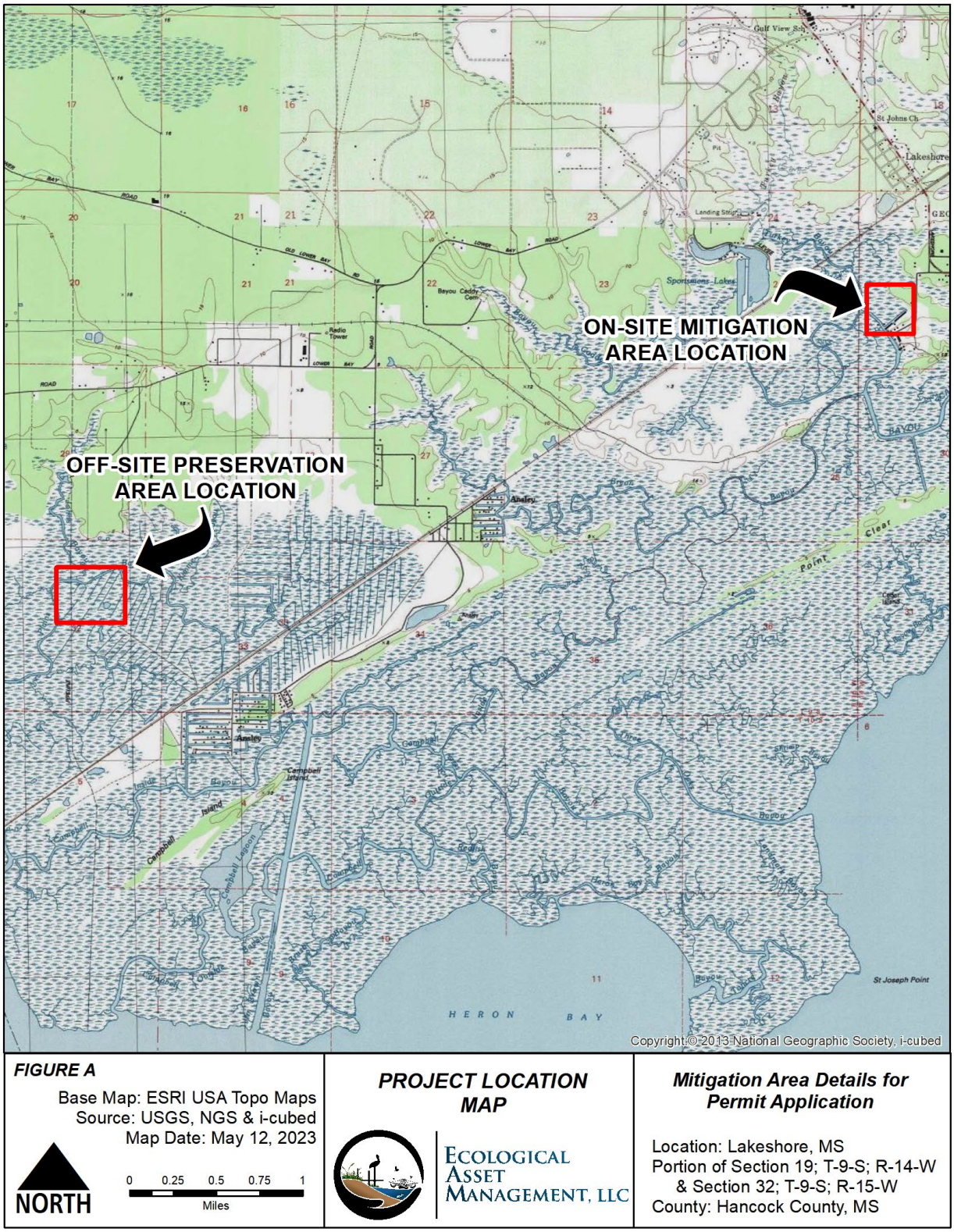



Figure A: Project Location Map of Bayou Caddy property in Section 19, T-9-S, R-14-W & Section 32, T-9-S, R-15-W, Hancock County, MS

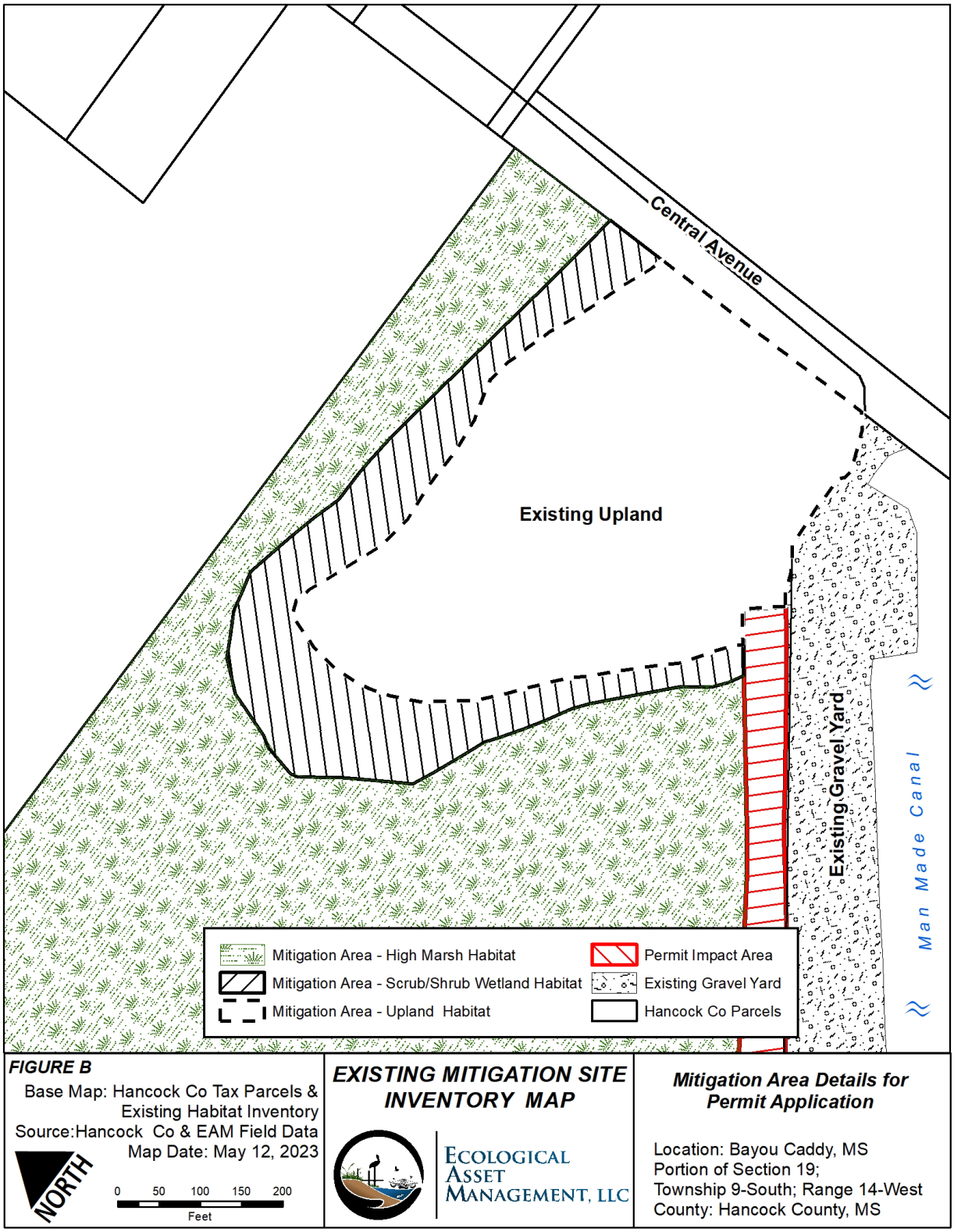



Figure B: Existing Mitigation Site Inventory Map of Bayou Caddy property in Section 19, T-9-S, R-14-W, Hancock County, MS

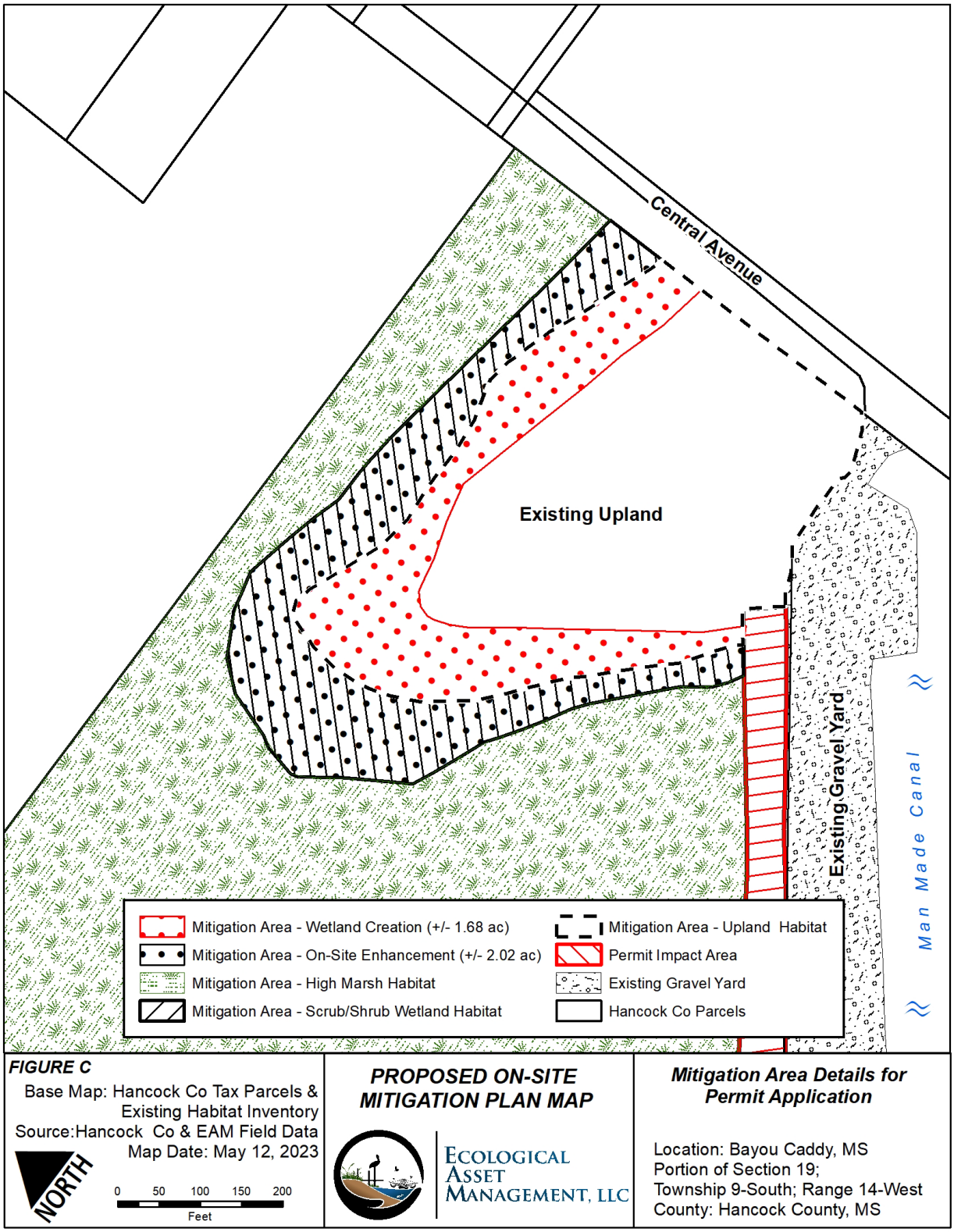



Figure C: Proposed On-site Mitigation Plan Map Bayou Caddy property in Section 19, T-9-S, R-14-W, Hancock County, MS

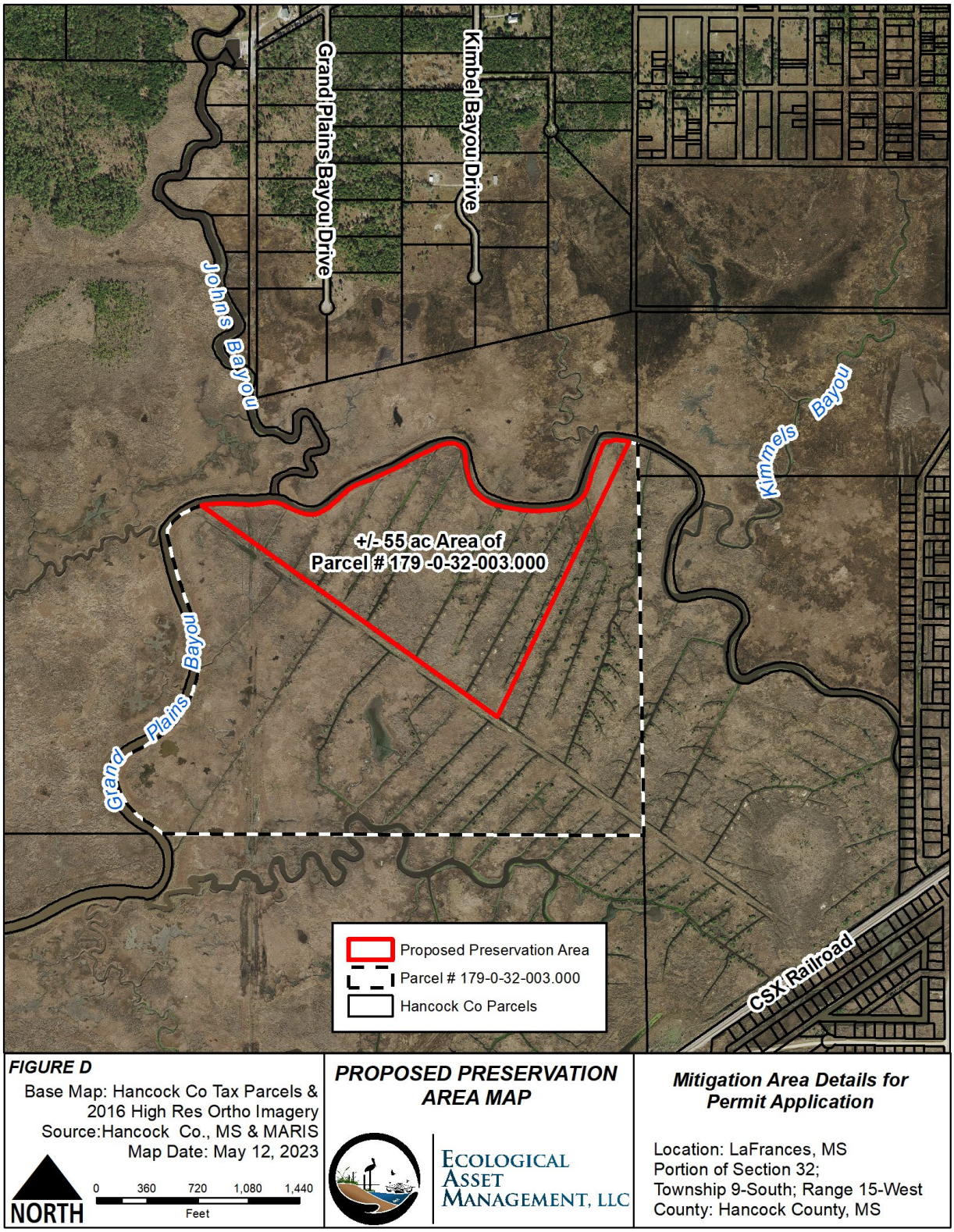



Figure D: Proposal Preservation Area Map (Parcel # 179-0-32-003.000) in Section 32, T-9-S, R-15-W, Hancock County, MS

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