EDWARD WISNER DONATION COASTAL RESTORATION MASTER PLAN

MAY 2019

POND

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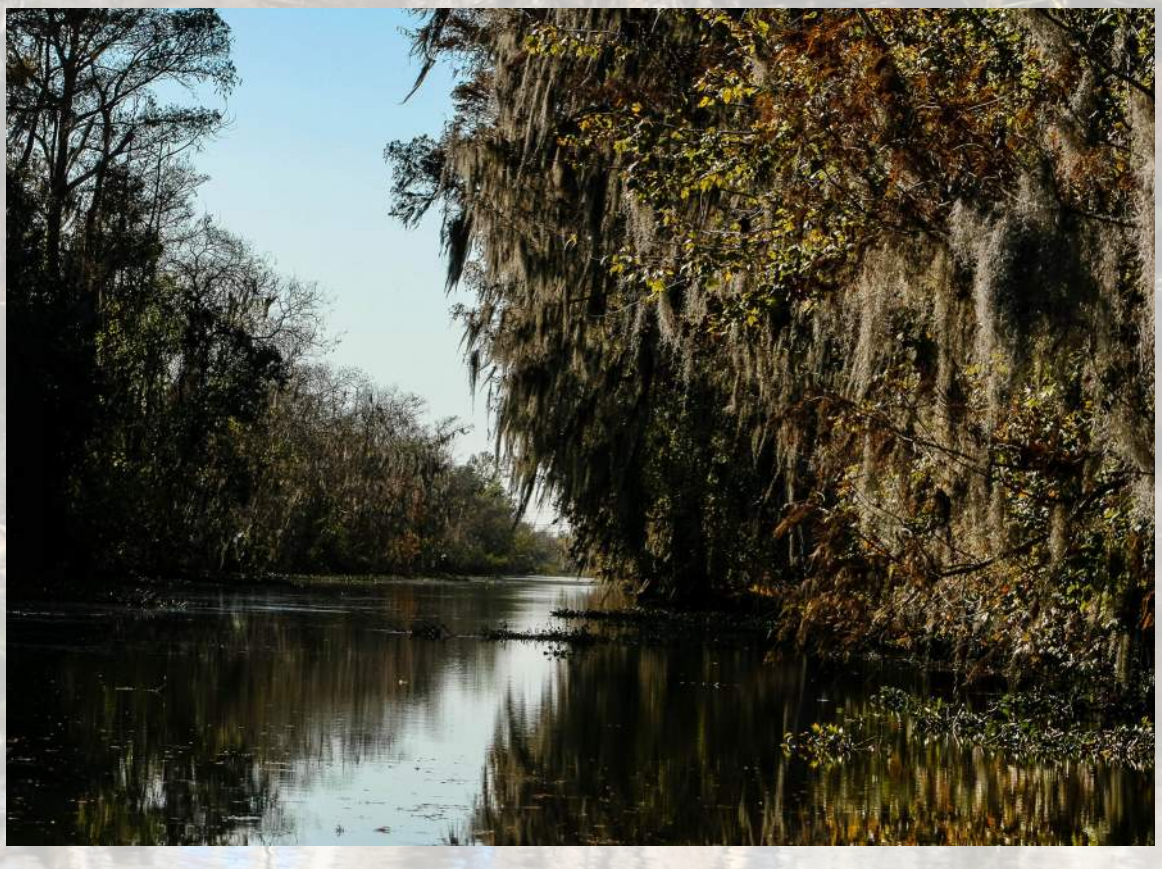
1.0 INTRODUCTION

1.1 PROJECT PURPOSE

As coastal Louisiana faces increasing threats from flooding, coastal erosion, land subsidence, storms, salt-water intrusion, human activities, and sea level rise, there is a great need to advance our scientific understanding of the coast and how coastal Louisiana will need to adapt to future conditions. The Edward Wisner Donation has undertaken this challenge by creating a Coastal Master Plan that builds on past progress and establishes a clear vision for the future.

The Edward Wisner Donation owns and manages more than 40,000 acres across three parishes, including Jefferson Parish, St. John the Baptist, and Lafourche (See Figure 1). Through a collaborative process, stakeholders developed the Coastal Restoration Master Plan to guide reclamation and restoration of this land. The plan identifies infrastructure projects aimed at benefiting the economy and ecological resources as well as funding sources including those available through the Coastal Protection and Restoration Authority (CPRA)'s administration of the New Project Development Program.



1.2 HISTORY AND ORGANIZATION

Image 1-2: Portrait of Edward Wisner

Biography of Edward Wisner

In 1888, on his way to Florida seeking improved health, Edward Wisner passed through New Orleans. In Louisiana he envisioned farming land reclaimed from swamps. Mr. Wisner was an editor and banker in his home town of Athens, Michigan, before his health forced him south. For a time he settled in Bryan City (later renamed Wisner, LA) in North Louisiana selling lumber, colonizing land, editing a newspaper, and running a bank. In 1900 he moved to New Orleans and amassed over a million acres of swamp lands in the Mississippi delta. His success in converting "useless" swamp land into fertile farmlands earned him the moniker "the Father of Reclamation." Mr. Wisner's philanthropic embrace of his new community extended beyond his involvement as President of the Louisiana Development League, Vice President of the National Drainage Congress and position on the board of directors at the First Unitarian Church of New Orleans. In August 1914, Mr. Wisner set up an *inter-vivos* donation of 50,000 acres of land in Jefferson, Lafourche and St. John the Baptist Parishes to the City of New Orleans, as Trustee, for the benefit of the City, Tulane University, Charity Hospital and the Salvation Army. The income to the City was dedicated in Mr. Wisner's gift to beautification of the City, and for the recreation, education and health of the City's residents. Agriculture was Mr. Wisner's vision, but oil and gas have generated far greater revenues than could have been foreseen. This property is largely employed in oil and gas production and industrial leases to companies who support the oil and gas industry.

History of the Edward Wisner Donation

In 1929, Mr. Wisner's Act of Donation was challenged by his widow and two daughters, claiming it violated several articles of the Civil Code of Louisiana and failed to comply with Act 124 of 1882. An Agreement of Compromise and Satisfaction was reached, granting Mrs. Mary J. Wisner (Edward Wisner's widow) and their two daughters, jointly, an undivided 40% interest in the Donation. Each beneficiary group was given a seat on the Edward Wisner Donation Advisory Committee, which was formed for the more cost-effective and efficient operation and management of the Donation. The Mayor of the City of New Orleans remains the Trustee of the Donation, and acts upon the advice and consent of the majority of the representatives of the Edward Wisner Donation Advisory Committee.

2.0 EXISTING CONDITIONS

2.1 LAND AREAS

The Edward Wisner Donation owns and manages more than 40,000 acres of freshwater- intermediate- saline tidal wetlands in Lafourche (including nine miles of Fourchon Beach), Jefferson, and St. John the Baptist Parishes of south Louisiana. The Caminada-Moreau Headland coastal system, including Fourchon Beach, Elmer's Island and nearshore regions, extending from Belle Pass east to Caminada Pass, is unique for the northern Gulf of Mexico and the rest of the U.S. by being comprised of complex landforms and having the most dynamic beach-dune-wetland system of any region in the Nation.

Critical habitats and important biological diversity included are: sandy beaches, dunes, back-barrier wash-over sand flats, vegetated wetlands (freshwater, intermediate, saltwater) and marsh, maritime mangrove forest, Chenier beach ridges, estuaries, distributary bayous (Moreau, Lafourche), open-water bays, and intertidal and subtidal offshore regions. Its dynamic nature is due to its complex geologic history as part of the Mississippi River delta system, sedimentary framework and character, high rates of sea-level rise and land subsidence, and frequent high-energy coastal storm processes driving sediment movement and coastal change.

The Louisiana delta plain is the product of periodic lateral shifts in the channel and mouth of the Mississippi River over the past 7 thousand years. The growth of successive new delta lobes in the Gulf and deterioration of older lobes have provided sand for formation of the barrier islands along the coast. Past flooding of the Mississippi River provided fine-grained silt and clay sediments for formation and maintenance of the vast wetlands. The condition of abundant sediment at the coast or in the wetlands is no longer the case and has not been so for the past hundred years or more due to a combination of natural processes and pervasive manmade alterations to the River and across the entire delta plain.

FIGURE 1: Wisner Donation Properties


0
5
10
20
Miles
Data Sources: Edward Wisner Donation, Pond, ESRI
Wisner Donation
Co-Owned Areas
Pooled Areas
Parish Boundary

2.0 EXISTING CONDITIONS

The Fourchon/Leeville landholdings are located in the southern-most portion of Lafourche Parish. The following information provides a summary of the lands' primary existing conditions. Figure 2 provides geographic reference of the parcels.

Image 2-1: Oil infrastructure near Port Fourchon

2.1.1 Fourchon/Leeville

Size/Ownership

35,000 acres in Lafourche Parish. As shown in Figure 2, portions of Wisner's landholding are co-owned with Greater Lafourche Port Commission and/or Conoco Phillips.

Use

Oil and Gas support services for 90% of the Gulf of Mexico's rigs, the LUMCON Fourchon Lab, oil and gas drilling, transmission, and exploration, hunting, fishing, oyster harvesting, crab trapping.

Revenue

Greater Lafource Port Commission, Louisiana Offshore-Onshore Crude Oil Pipeline (LOOP), Chevron Pipeline, Harvest Pipeline, EPL, Shell Mars Pipeline, Tennessee Gas, Cantium, Marquis Energy, 65 fishing camps, 6 commercial harvesting leases, 5 recreational oyster leases, and trapping leases. The Port provides nearly one-half of the Donation's annual revenue. Wisner receives about 36% of total revenue from royalty payments from Chevron, and Marquis Energy which comprises 20-50% of total annual revenue.

Existing Projects

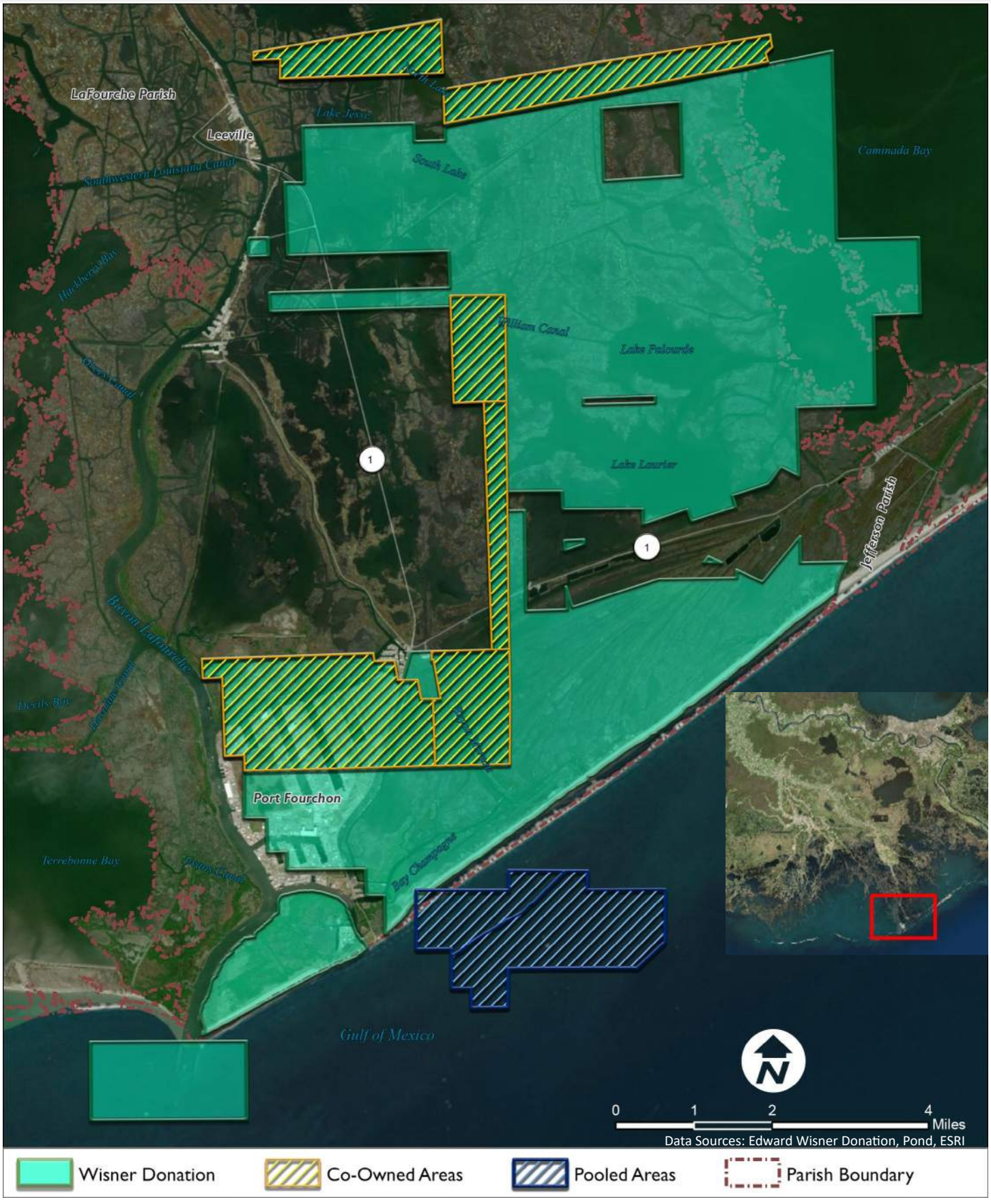
The following are current or recent development or restoration projects on or near Wisner property: Caminada Headland Beach and Dune Restoration Projects, CPRA; CAM Back Barrier Marsh Creation Project, CWPPRA; Port Fourchon Geotube Shoreline Protection Project; Wisner Sand Remediation Project; Native Plant Revegetation, LDAF; Live Sand Oak Planting Project, LDAF; West Fourchon Marsh Creation and Marsh Nourishment Project, Lafourche Parish; East Leeville Marsh Creation and Nourishment Project, CWPPRA. The Port has a lease for Fourchon Island from Wisner to construct a deep-water facility to accommodate deep-draft vessels. This project is in the design stage and includes deepening the navigation channels for large vessels and opening new and expanded dock facilities.

Endangered, Threatened, and Important Migratory Species

Piping Plovers, Snowy Plovers, Wilson's Plovers, White Pelicans, Brown Pelicans, Bald Eagles, Ospreys, Peregrine Falcons, American Kestrels, Ibis, Egrets, Herons, Roseate Spoonbills, Least Terns, Gulf-billed Terns, Sandwich Terns, Royal Terns, Red Knots, American Oystercatchers, Black Skimmers, Loggerhead Sea Turtle, Green Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, Hawksbill Sea Turtle, Alligators, Dolphins, Manatees, River Otter, Mink Muskrat, Raccoon, Nutria (non-native species).

Critical Natural Resources and Habitats:

Erosion processes are affecting Fourchon Beach and extend several miles offshore to water depths of -40+ ft. The entire coastal-offshore seafloor profile is being eroded and moving landward.


LaFourche Parish
Leeville
Lake Jesse
South Lake
Caminada Bay
Southwestern Louisiana Canal
Huckleberry Bay
William Canal
Lake Palourde
Lake Laurier
Jefferson Parish
Bayou Lafourche
Devils Bay
Port Fourchon
Terrebonne Bay
Bay Champagne
Gulf of Mexico
0 1 2 4 Miles
Data Sources: Edward Wisner Donation, Pond, ESRI
Wisner Donation
Co-Owned Areas
Pooled Areas
Parish Boundary

2.0 EXISTING CONDITIONS

Wisner owns seven distinct parcels of undeveloped land surrounding Lac des Allemands. These are located on or near the border between St. John the Baptist and Lafourche Parishes. Figure 3 shows the location of these areas.

Image 2-2: Stakeholders discussing existing conditions.

2.1.2 LAC DES ALLEMANDS

Size/Ownership

1,500 acres in St. John the Baptist and Lafourche Parishes
The land within St. John the Baptist Parish falls within the West Des Allemands Wetlands (WDAW) Environmental Management Unit (EMU) in the West Bank Management Zone.

Uses

Cypress timbering, pipeline corridor, hunting, two fishing camps, trapping, alligator egg collecting, and other recreational opportunities.

Revenue

Recreational leases for deer hunting, alligator egg collecting, and nutria trapping; Phillips 66 pipeline, Belle Rose pipelines

Existing Projects

Kraemer Bayou Boeuf Levee Lift (Lafourche Parish Project since 2016) is located near Wisner landholdings.

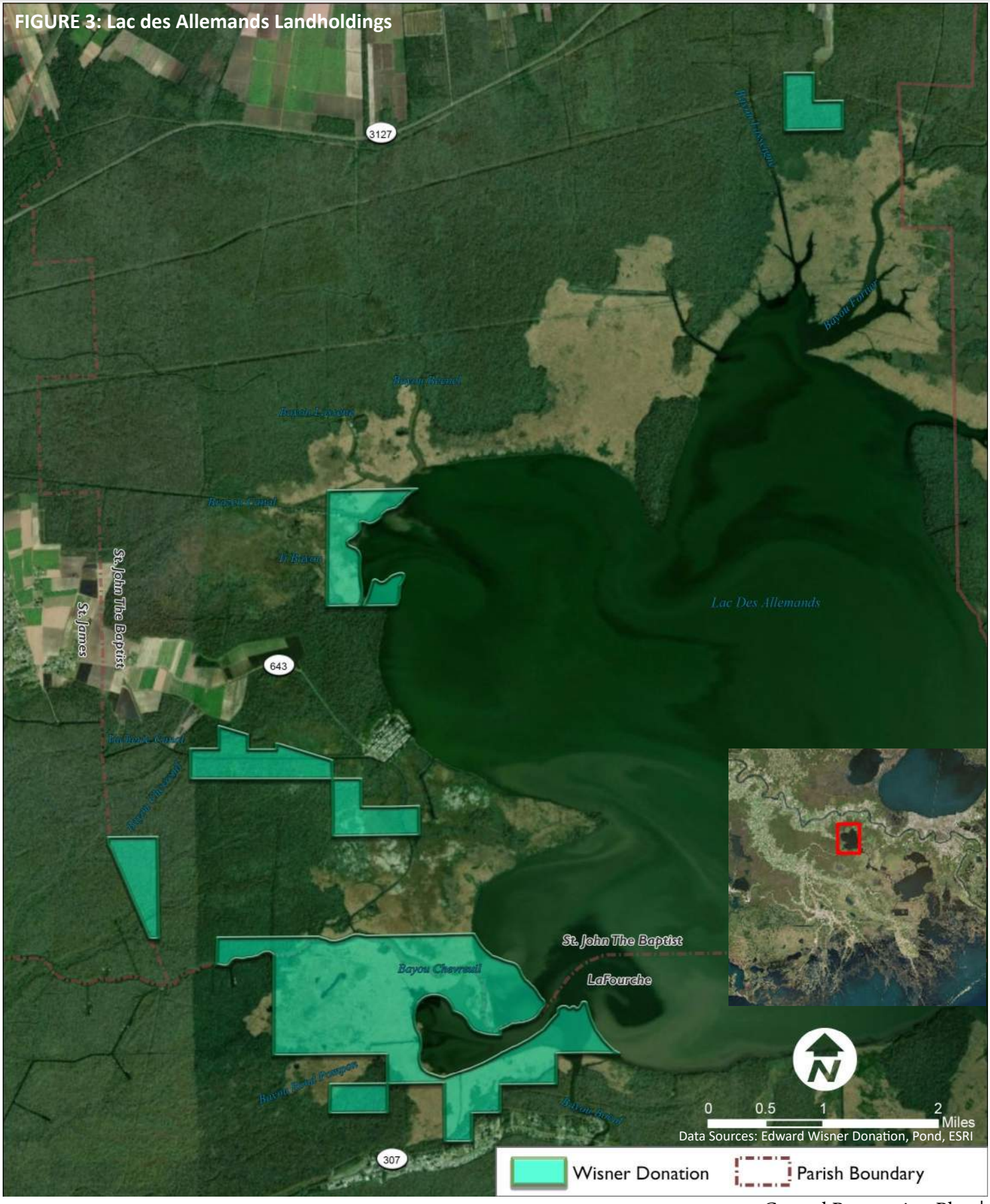
Flora and Fauna

Bull-tongue, maiden cane, cattail, cutgrass, smartweed and wax myrtle, white-tailed deer, squirrels, rabbits, largemouth bass, sunfish, crappie, catfish, bald eagles, osprey, gadwall, teal, wigeon, mallard and shoveler ducks, wood ducks, mottled ducks, hood mergansers, and black-bellied whistling ducks

Critical Natural Resources and Habitats

Lac des Allemands is a natural 12,000-acre shallow lake with a maximum depth of 10 feet and an average depth of five feet. Lac des Allemands is fed by numerous distributaries in the Barataria Basin, including Ti Bayou, Coulee du Cimentiere, Bayou Lassene, Bayou Becnel, Bayou Rond Pompon, and Bayou Chevreuil, to the west. The WDAW area is comprised of permanently or semi-permanently flooded cypress-tupelo swamp and freshwater marsh (part of which is a flotant that lifts off the bottom and floats when water level is high). The WDAW EMU is composed of forested wetlands around the edge of the upper, freshwater reach of the Barataria estuary, and it is called an "inter-distributary" deltaic basin because it is formed between Mississippi River distributary channels.

FIGURE 3: Lac des Allemands Landholdings



2.0 EXISTING CONDITIONS

Image 2-4: Cypress log and knees.

2.1.3 BAYOU SEGNETTE

The Bayou Segnette landholdings are located in the center of Jefferson Parish surrounded by Jean Lafitte National Historic Park and Preserve. The following information provides a summary of the lands' primary existing conditions. Figure 4 provides geographic reference of the parcels.

Size/Ownership

1,800 acres within the Jean Lafitte National Historical Park in Jefferson Parish. There are specific guidelines for uses in the 8,600 acre Jean Lafitte National Historical Park ("core area") and 12,000 acre Park Protection Zone of the Barataria Unit. The National Park Service, however, does not enforce on Edward Wisner Donation land. This land falls within the Bayou Segnette Management Unit.

Uses

Recreational walking/hiking, bird- and widlife-watching, canoing, fishing, alligator egg collecting, and nutria trapping. There is an Entergy transmission line that runs north-south across the property, as well as two Shell pipelines.

Revenue

136 fishing camps, recreational leases for deer hunting and alligator trapping, Shell and other pipelines, Hillcorp royalties.

Projects

The CRCL (Coalition to Restore Coastal LA) has initiated a Cypress Tree Planting Project on their property. Additionally, USACE Yankee Pond mitigation project, freshwater diversion, marsh creation projects are being executed in the surrounding area.

Flora and Fauna

Palmetto, hawthorne, holly, willow, maple, sweetgum, ash, elm, and oak, cypress, tupelo, over 200 species of birds, alligators, nutrias, white-tailed deer, swamp rabbits, armadillos

Critical Natural Resources and Habitats

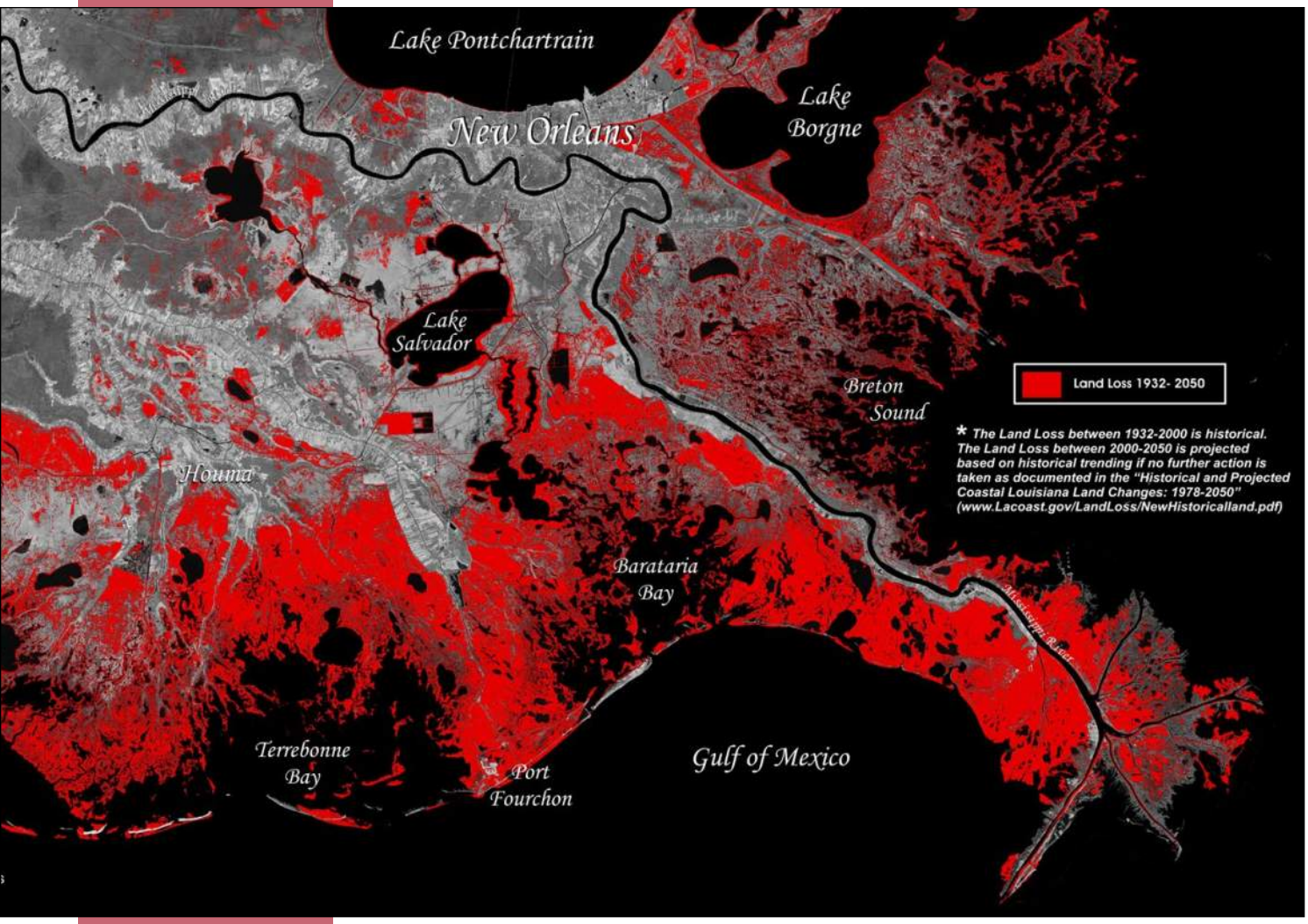
This area is principally undeveloped wetlands and forested wetlands. Major vegetative associations include, hardwood forest on levee ridges, backslope swamp, and freshwater marsh between levees. This Management Unit is less than three feet above mean sea level and natural gravity flow drainage occurs within 33,441 acres of wetlands. Bayou Segnette and its connection with the Millaudon Canal are the principle drainage routes to Bayou Bardeaux and from the northern portion of the unit. This unit lies entirely outside the proposed hurricane protection levee and entirely within the "prohibited service" area jointly established by the U.S. EPA and Jefferson Parish and noted by the USACE.

FIGURE 4: Bayou Segnette Landholdings

2.0 EXISTING CONDITIONS

2.2 LAND LOSS

Land loss throughout the Lower Barataria Basin is attributed largely to natural processes associated with a deteriorating delta mass (See Figure 5 below). The problem has been further complicated by man's activities, primarily through the modification of natural drainage patterns. By 1900, artificial flood control levees were constructed along the Mississippi River and Bayou Lafourche and, in 1904, Bayou Lafourche was artificially dammed. These practices stopped virtually all riverborne sediments and freshwater from entering the Basin, where they were critically needed for maintenance. Thus, the land building processes in this area have stopped, while natural land processes in this area have been increased by man's activities. The problem of land loss can be divided into four major categories. Land Subsidence is one of the most critical problems in the coastal zone. Combined with wave attack and loss of river-borne sediment supply, it constitutes the primary cause of severe land loss in the marshlands and landward retreat of the coastline.



Saltwater Intrusion into the estuaries of the Barataria Basin is one of man's greatest environmental impacts. By leveeing the Mississippi River and damming Bayou Lafourche, the Basin's two major sources of freshwater were removed, leaving precipitation as the only major source of freshwater for the area. Without these two major suppliers of freshwater, saltwater from the Gulf of Mexico began to intrude into freshwater marshes and swamps. Additionally, the dredging of large transportation waterways and numerous oil and gas-well-access and pipeline canals; hurricanes, storms, and tidal surges; and discharge from the production process of gas and oil have contributed to saltwater intrusion. Dredge and fill Activities such as creation of canals, embankments, drainage projects, and dredged material banks influence the deterioration/growth rates of surrounding marsh by altering natural flow patterns in turn causing subsidence, saltwater intrusion, and erosion.

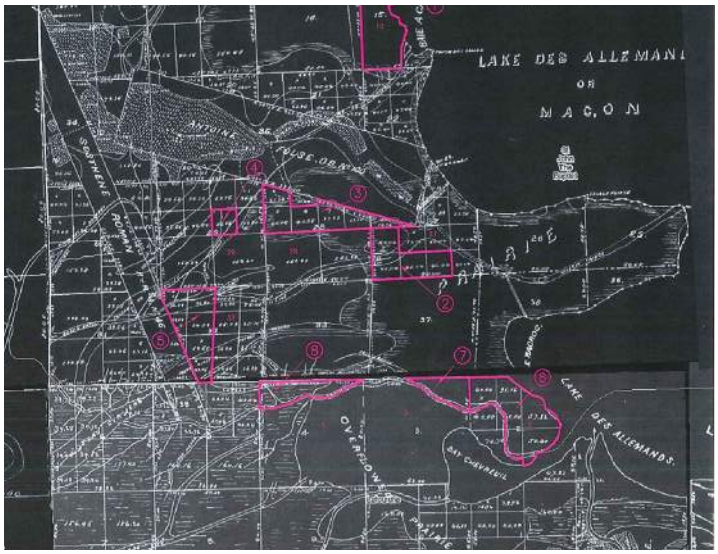


Image 2-5: 2013 Survey from the Riverlands Surveying Company of Township 13 South, Range 18 East & Township 14 South, Range 18 East Southeastern District west of the Mississippi River, St. John the Baptist Parish.

Image 2-6: 2013 Survey from the Riverlands Surveying Company of Township 12 South, Range 19 East Southeastern District west of the Mississippi River, St. John the Baptist Parish, Louisiana

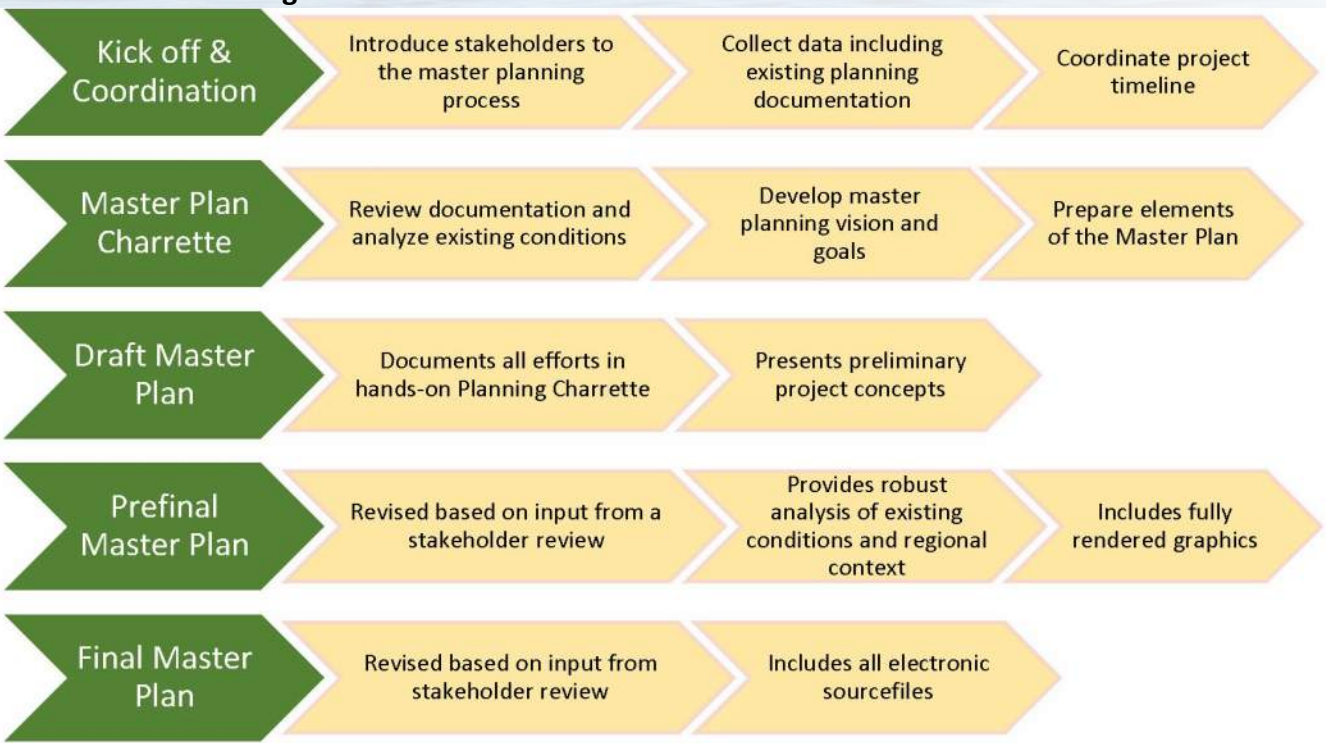
3.0 PLANNING PROCESS

3.1 PROCESS

The Gulf of Mexico coastal community has seen significant change over the past few years. The physical geography of the coastline is changing due to natural processes and mandmade interventions. Resources, such as those from the Gulf Coast Ecosystem Restoration Trust Fund, and parish and statewide planning efforts with the Coastal Protection and Restoration Authority have led to increased collaboration and support for protection, restoration, and enhancement projects. A changing physical geography, availability of resources, and increased planning efforts have necessitated coastal landowners develop a list of viable projects that are executable at various scales. This Coastal Master Plan documents existing conditions on Edward Wisner Donation land and provides new recommendations to enable the Donation to make best use of available land and facilities. This Coastal Master Plan is developed within the framework of a proven master planning process, and provides the foundation for holistic, compliant, realistic, and executable planning actions now and in the future. This Coastal Master Plan is developed through a community approach and is based on research and institutional knowledge gained through intensive data gathering and analysis. The planning process consists of several tasks, shown in the graphic below.

The Coastal Master Plan charrette was executed February 1, 2019 at the University of New Orleans. Representatives from Cantium LLC, Chevron Pipeline, Greater Lafourche Port Commission (GLPC), Nicholls State, the National Park Service, Shell Pipeline, Louisiana Offshore Oil Port (LOOP) LLC, St. John the Baptist Parish, Tierra Resources, ORA Estuaries, the Edward Wisner Donation, Caillouet Land Corporation, and the National Oceanic and Atmospheric Administration, participated in the event. Following an introductory brief and discussion, stakeholders completed several hands-on exercises to analyze assets and liabilities, define program needs, and prepare a list of projects for the Edward Wisner Donation land. Results of these efforts were presented in an outbrief to stakeholders.

FIGURE 6: Master Planning Process



3.2 VISION AND GOALS

Cantium Energy

National Oceanic and Atmospheric Administration

The National Park Service

Greater Lafourche Port Commission

The University of New Orleans

Caillouet Land Corporation

Chevron Pipeline

Shell Pipeline

LOOP LLC

Nicholls State University

St. John the Baptist Parish

Tierra Resources

ORA Estuaries

Louisiana Universities Marine Consortium

The Edward Wisner Donation

PLANNING GOALS

1. Protect Natural and Financial Assets

2. Preserve and Enhance the Natural Environment

3. Strengthen Community Partnerships

4. Prioritize Executable Efforts

5. Exemplify Responsible Stewardship

The planning goals, listed below, establish a common design theme that will be used to guide the preservation, restoration, and enhancement of Edward Wisner Donation land.

Through a group development process, the master planning vision statement was developed, refined and planning goals were highlighted.

MASTER PLANNING VISION

As a **responsible steward of the land**, the Edward Wisner Donation, in cooperation with the larger Barataria Basin **community**, will develop practices and infrastructure that **protect natural and financial assets** and enhance the natural **environment**.

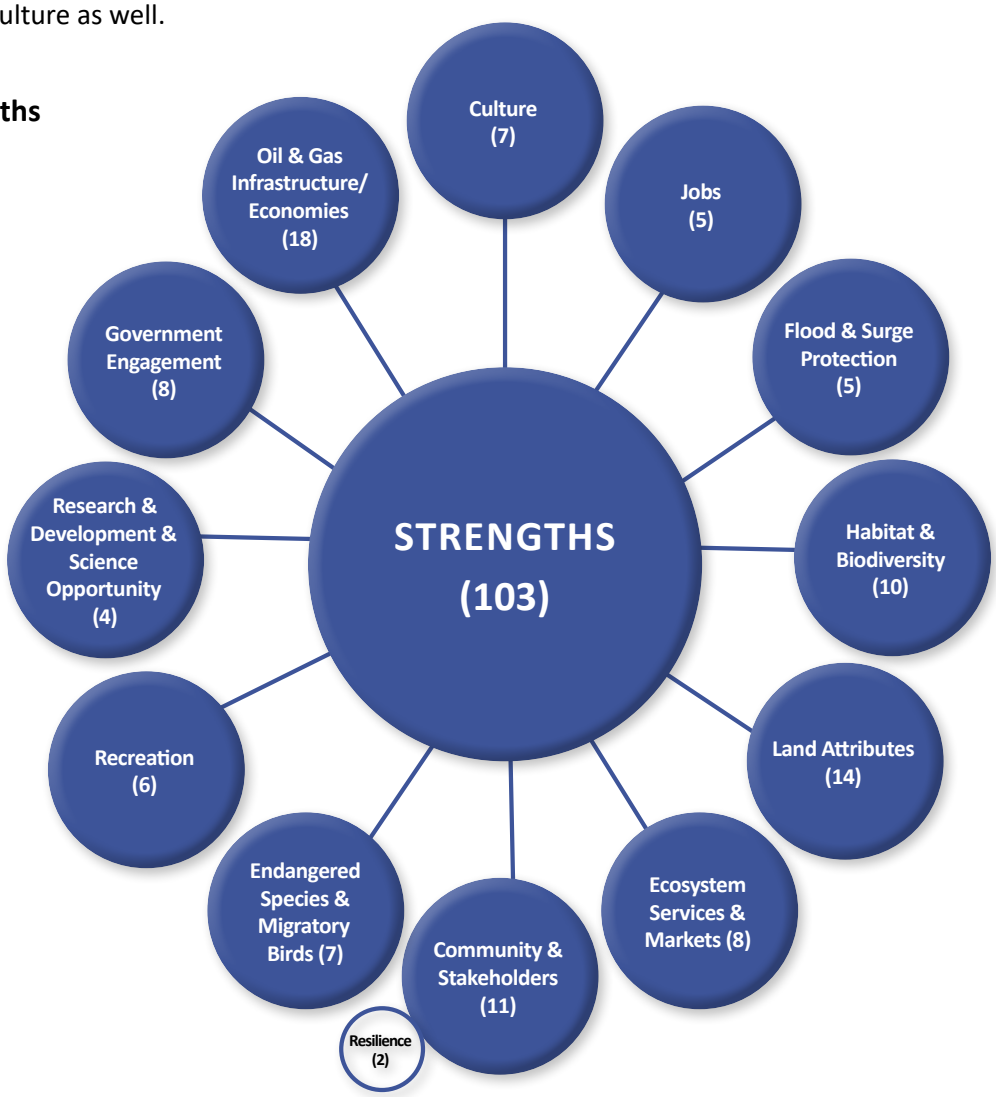
3.0 PLANNING PROCESS

3.3 SWOT

Using a technique called the Crawford Slip Method, workshop participants responded to a series of questions about strengths, weaknesses, opportunities, threats, and vision for future development. Responses for each question were arranged into a concept map that visually depicted common themes. Concept maps created during the workshop are summarized and graphically depicted on the following pages.

Strengths are current assets for Wisner Land and the greater Barataria Basin community that should be preserved and/or replicated. The strengths identified fell within twelve categories. The majority of responses fell into the category Oil & Gas Infrastructure/Economies; and included oil and gas revenue and tariff, Port Fourchon, existing royalty/lessee base, and energy security. Related to economies, a strength was the career diversity in the area including careers in natural resource harvest. The attributes of the land itself were a strength and the flood and surge protection that it provides, as well as, a recreational space, learning environment, and a habitat for endangered species and migratory birds. The second largest category was Community and Stakeholders, and the importance of people was reflected in the categories Government Engagement and Culture as well.

FIGURE 7: Strengths



Weaknesses are liabilities that should be remedied or removed. The overarching goal of this plan is to address the issue of subsidence, sea level rise, and flooding; which leads to an alarming rate of coastal land loss, increased storm surge, habitat loss, and saltwater intrusion. Each project should be geared toward addressing these weaknesses, but also strive to create the cultural change that was indicated in the categories of Culture, Attitudes, Education, and Legal. Prevailing attitudes, such as, "not worth saving", "too far from civilization", and "restoration does not equal more income"; greatly impact the ability of the Edward Wisner Donation to realize its vision. The lack of education and the legal complications of coastal preservation can lead to a loss of culture. Specifically, a loss of historic ways of life and a knowledge of land and water. Insufficient funding and aging infrastructure were also sited at weaknesses that affect the ability of the Edward Wisner Donation to access their land.

FIGURE 8: Weaknesses

3.0 PLANNING PROCESS

Opportunities are elements that may be capitalized on in the future. Stakeholders identified opportunities in the regional economy with the understanding that these opportunities would also affect the ecological well-being of the land and greater Barataria Basin community. Regional Economic opportunities were further subdivided into port expansion; mitigation of wetlands and carbon; energy from oil and gas and alternative sources; LA Highway 1; and seafood, restaurants, and culture. The second largest opportunity cited was Community Engagement. By engaging the community, coastal Louisiana can become an example for restoration that will showcase land protection and restoration. Citizen Participation is an important part of ensuring that the necessary stakeholders are involved. The category, Administration of Many Stakeholders, was specifically targeted as an opportunity for coordination among landowners, nongovernmental organizations, universities, the State, and other programs.

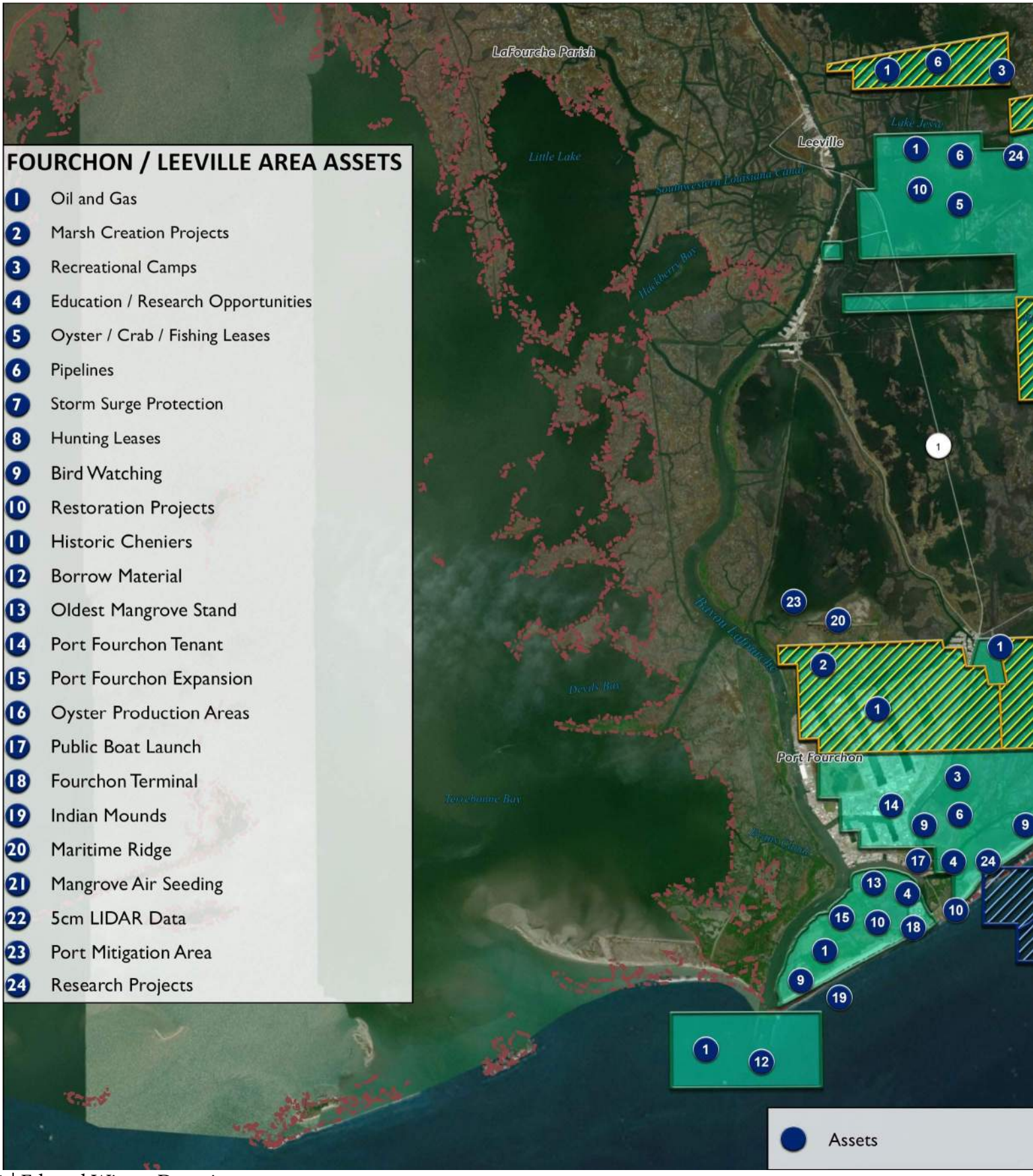
FIGURE 9: Opportunities

Threats are elements that may impede future development. Threatened land and water access, sea level rise, manmade issues, oil and pollution, land loss, and storms and surges endanger the health of coastal Louisiana. Other threats listed inhibit the ability of stakeholders and stewards to protect and preserve the community, economy, and natural environment. These threats are referred to as confounding politics, improper management, loss of culture, and lack of national attention. The lack of a diversified economy, lack of job security, outsourcing of fisheries, the low price of oil and the depletion of mineral reserves all threaten the economy and culture. The lack of funding for coastal restoration negatively affects the ability of stakeholders to properly manage restoration projects. Finally, the lack of time is a threat. Mother nature works faster than humans can and without sustainable practices follows the laws of diminishing returns.

FIGURE 10: Threats

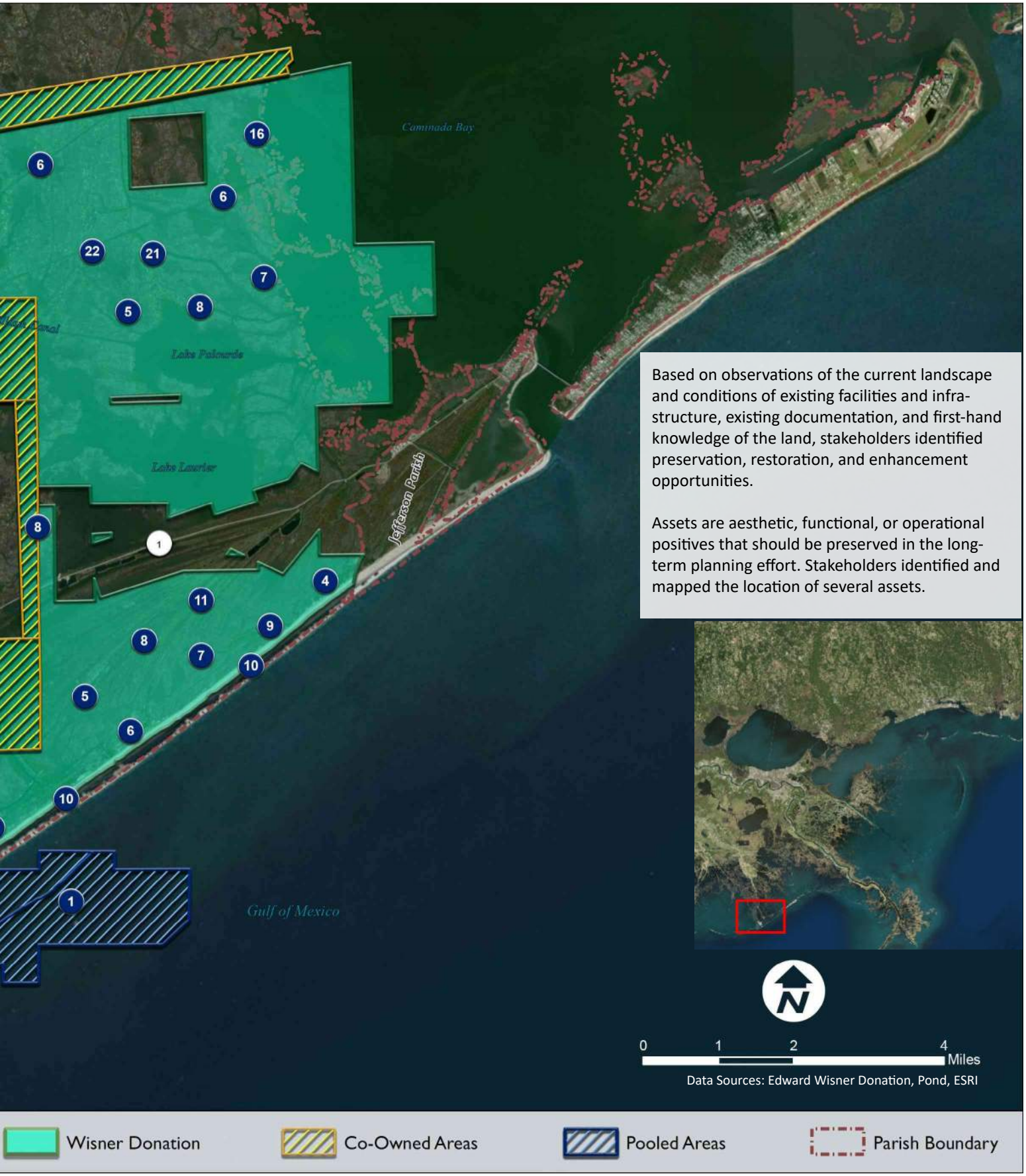
3.0 PLANNING PROCESS

3.4 ASSETS



FOURCHON / LEEVILLE AREA ASSETS

1. Oil and Gas
2. Marsh Creation Projects
3. Recreational Camps
4. Education / Research Opportunities
5. Oyster / Crab / Fishing Leases
6. Pipelines
7. Storm Surge Protection
8. Hunting Leases
9. Bird Watching
10. Restoration Projects
11. Historic Cheniers
12. Borrow Material
13. Oldest Mangrove Stand
14. Port Fourchon Tenant
15. Port Fourchon Expansion
16. Oyster Production Areas
17. Public Boat Launch
18. Fourchon Terminal
19. Indian Mounds
20. Maritime Ridge
21. Mangrove Air Seeding
22. 5cm LIDAR Data
23. Port Mitigation Area
24. Research Projects


Caminada Bay
Lake Palourde
Lake Laurier
Jefferson Parish
Gulf of Mexico
16
6
6
22
21
7
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11
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6
10
1
Based on observations of the current landscape and conditions of existing facilities and infra-structure, existing documentation, and first-hand knowledge of the land, stakeholders identified preservation, restoration, and enhancement opportunities.
Assets are aesthetic, functional, or operational positives that should be preserved in the long-term planning effort. Stakeholders identified and mapped the location of several assets.
N
0
1
2
4
Miles
Data Sources: Edward Wisner Donation, Pond, ESRI
Wisner Donation
Co-Owned Areas
Pooled Areas
Parish Boundary

3.0 PLANNING PROCESS

FIGURE 12: Assets in Lac des Allemands Area

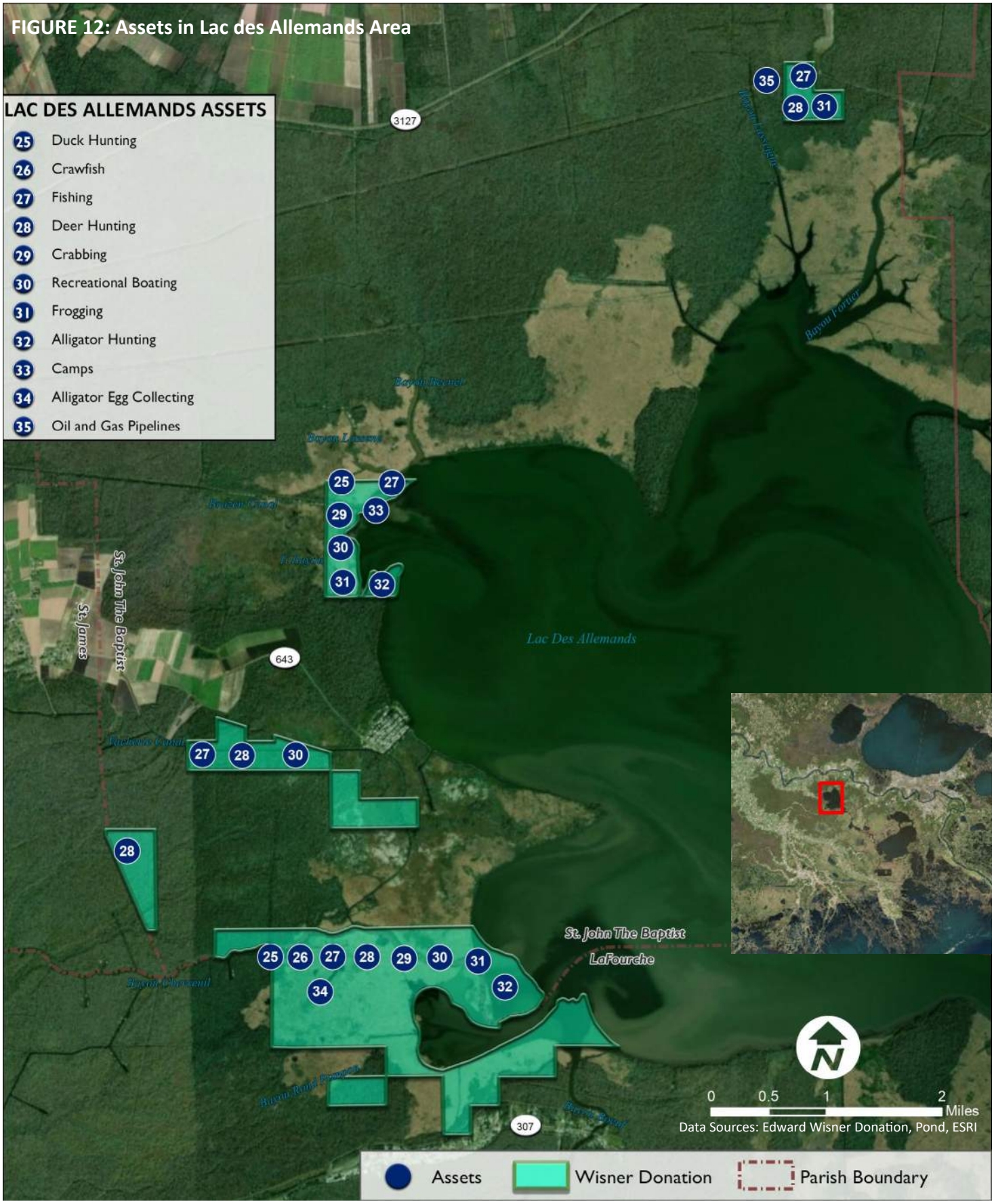
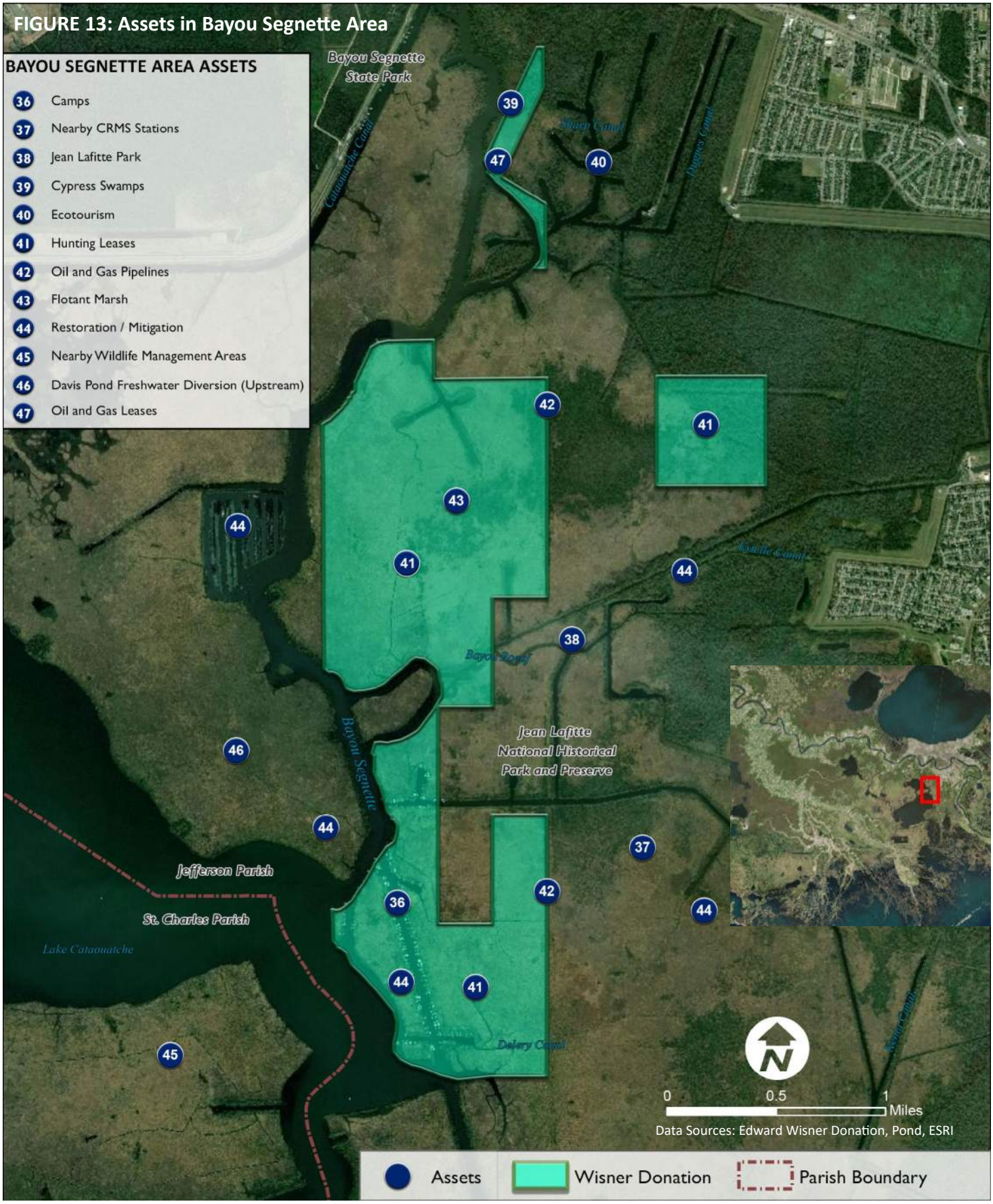


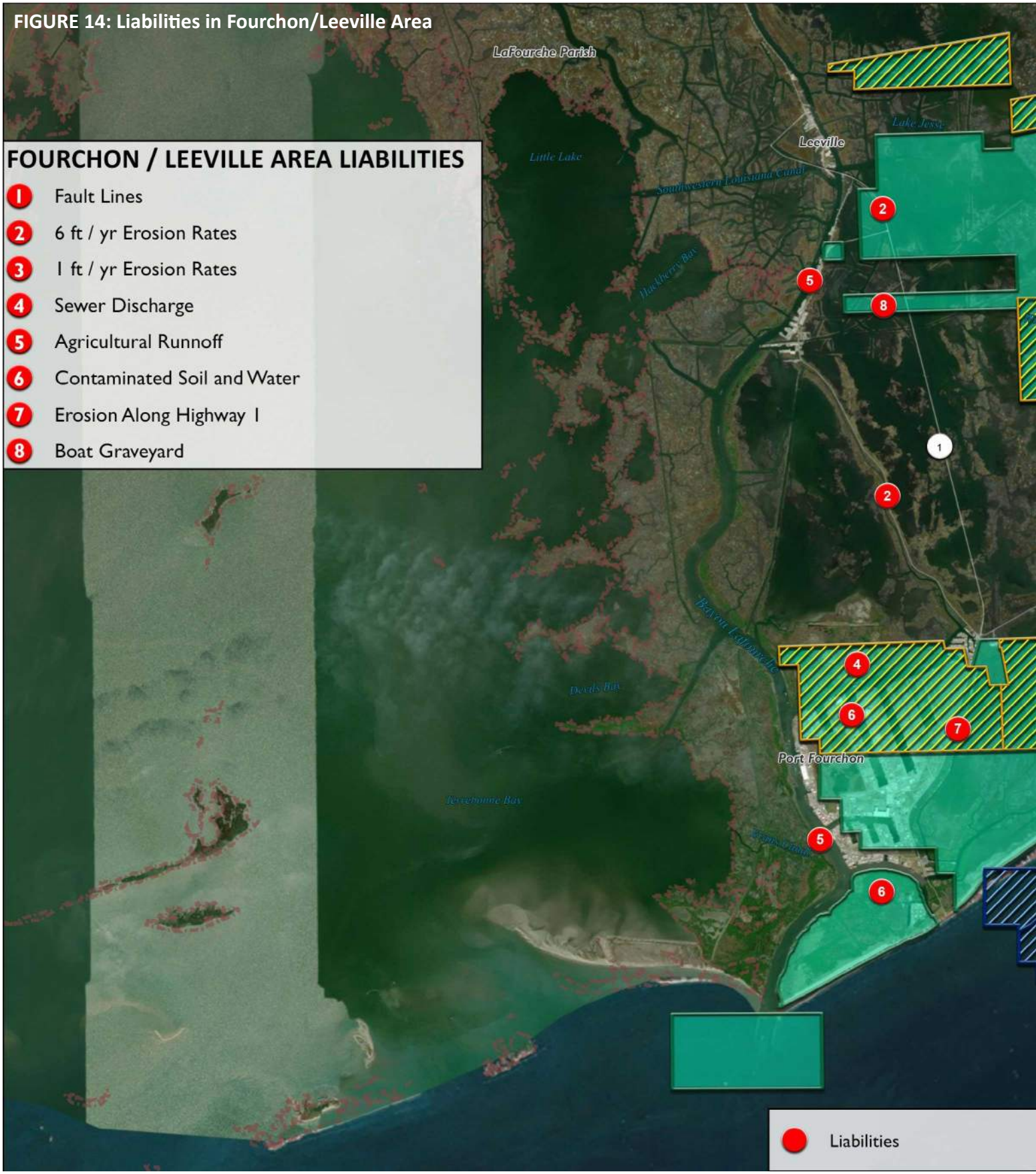
FIGURE 13: Assets in Bayou Segnette Area

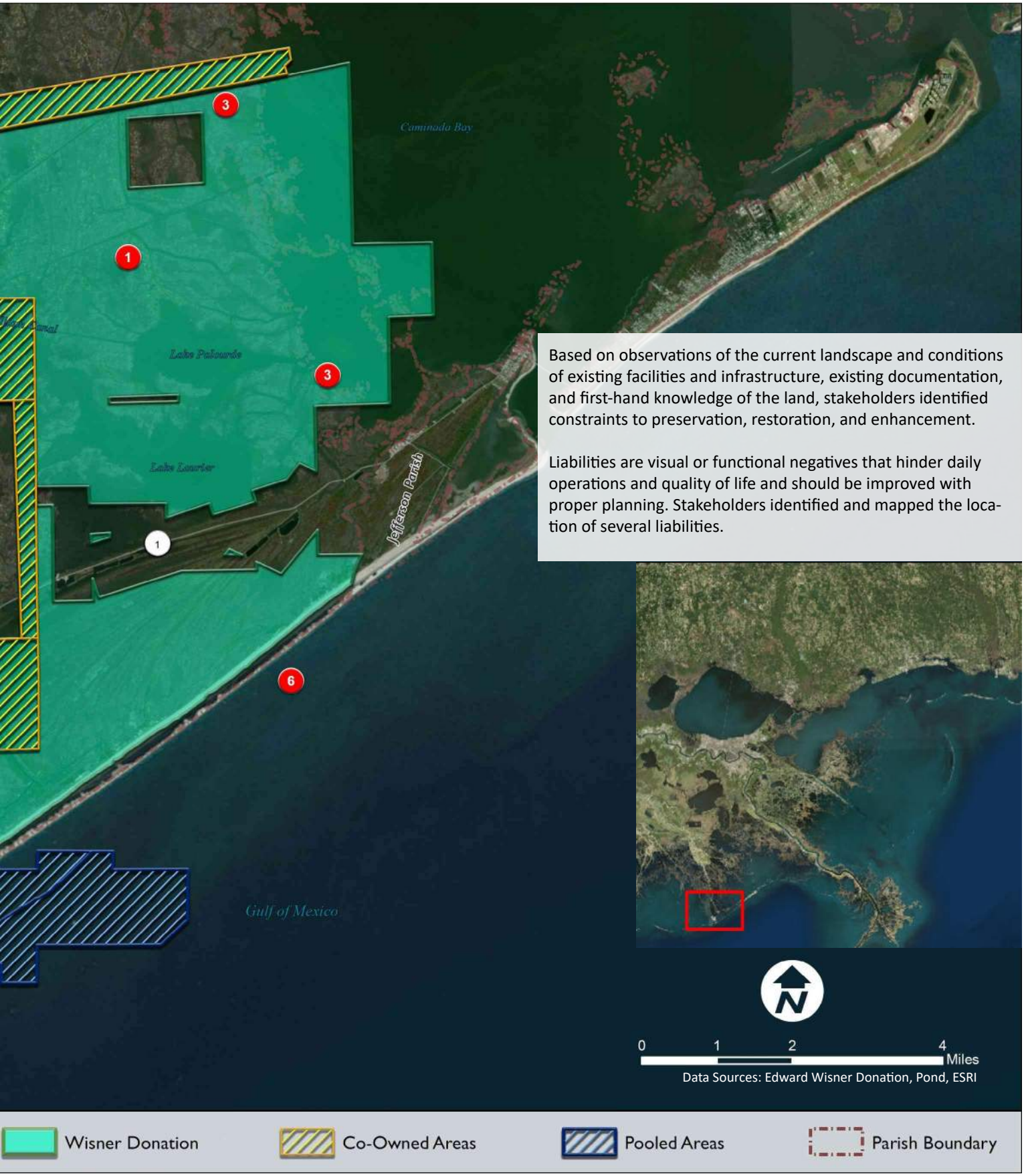


3.0 PLANNING PROCESS

3.5 LIABILITIES

FIGURE 14: Liabilities in Fourchon/Leeville Area





Based on observations of the current landscape and conditions of existing facilities and infrastructure, existing documentation, and first-hand knowledge of the land, stakeholders identified constraints to preservation, restoration, and enhancement.

Liabilities are visual or functional negatives that hinder daily operations and quality of life and should be improved with proper planning. Stakeholders identified and mapped the location of several liabilities.

3.0 PLANNING PROCESS

FIGURE 15: Liabilities in Lac des Allemands Area

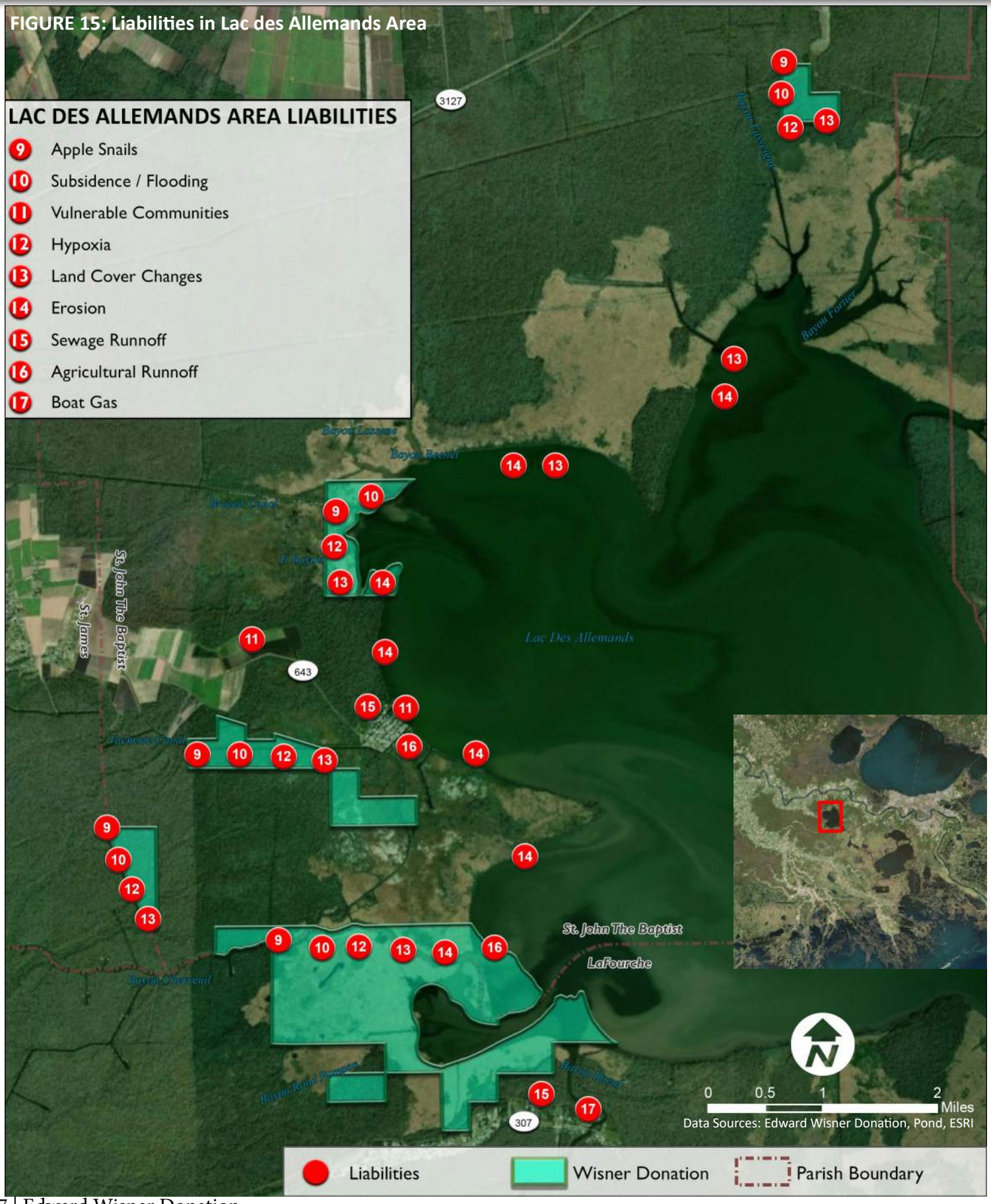
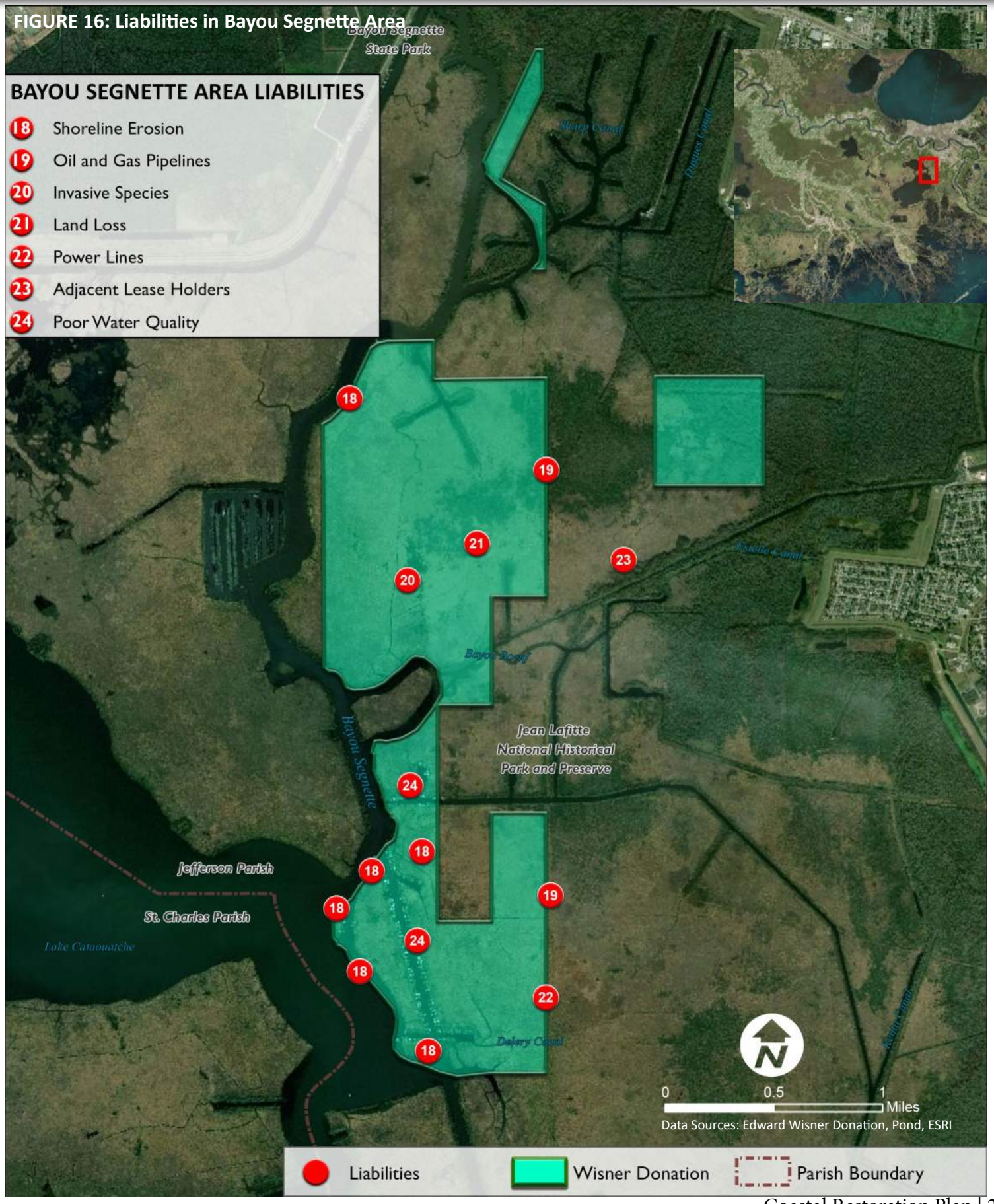


FIGURE 16: Liabilities in Bayou Segnette Area



4.0 COASTAL RESTORATION PLAN

4.1 PLAN DEVELOPMENT

The Coastal Master Plan was developed through a stakeholder-based approach and is based on research and institutional knowledge gained through intensive data gathering and analysis. Under the direction of the Edward Wisner Donation, Pond began gathering data from various sources including the following planning documents:

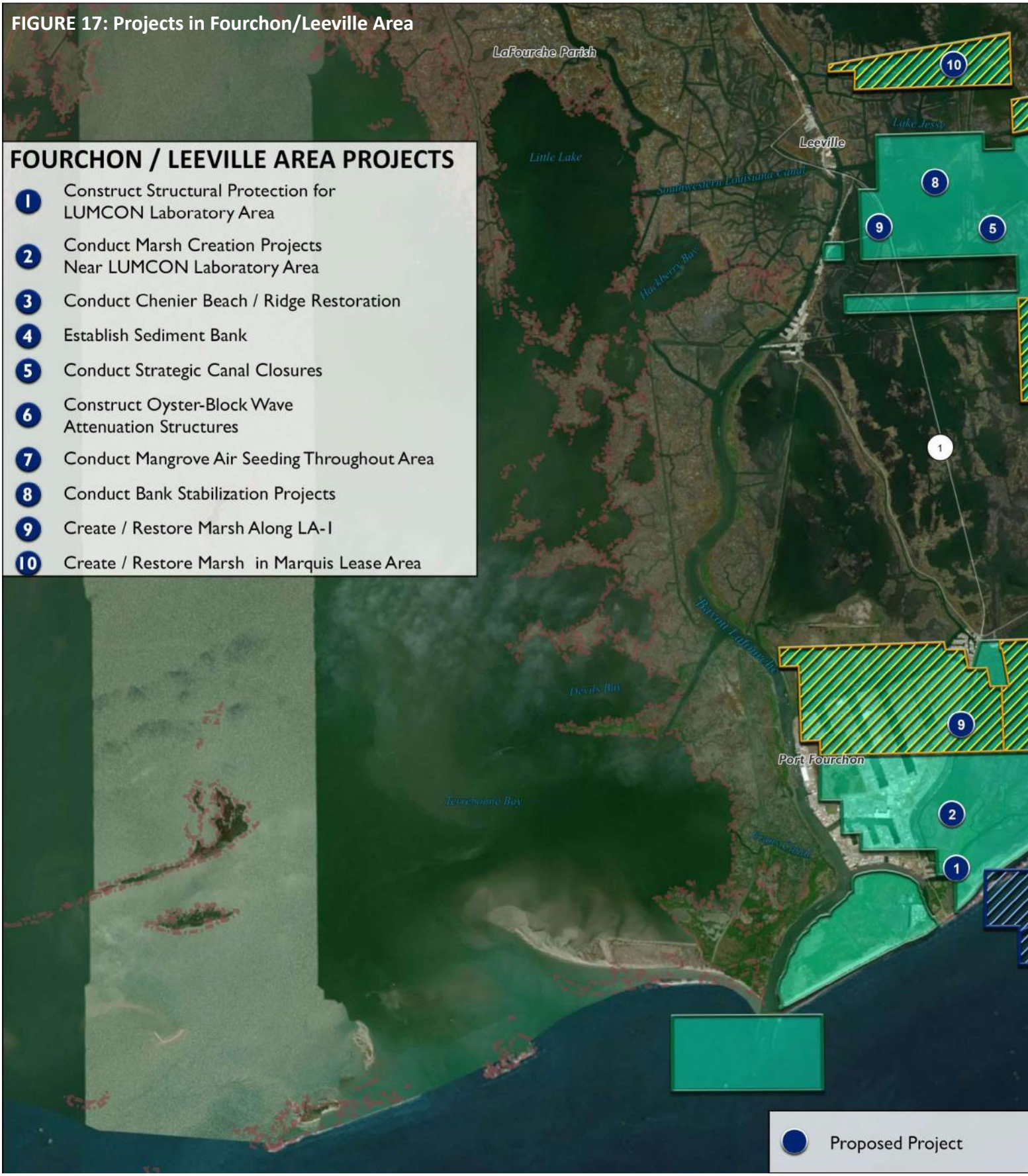
- Beach, Dune, Wetlands Management Plan 2016 developed for The Edward Wisner Donation
- Louisiana's Comprehensive Master Plan for a Sustainable Coast 2017
- The Gulf Coast Ecosystem Restoration Council Comprehensive Plan Update 2016
- Lafourche Parish Restore Act Multiyear Implementation Plan 2015
- St. John the Baptist Parish Coastal Management Plan 2017
- Jefferson Parish, Louisiana Coastal Zone Management Program 1982

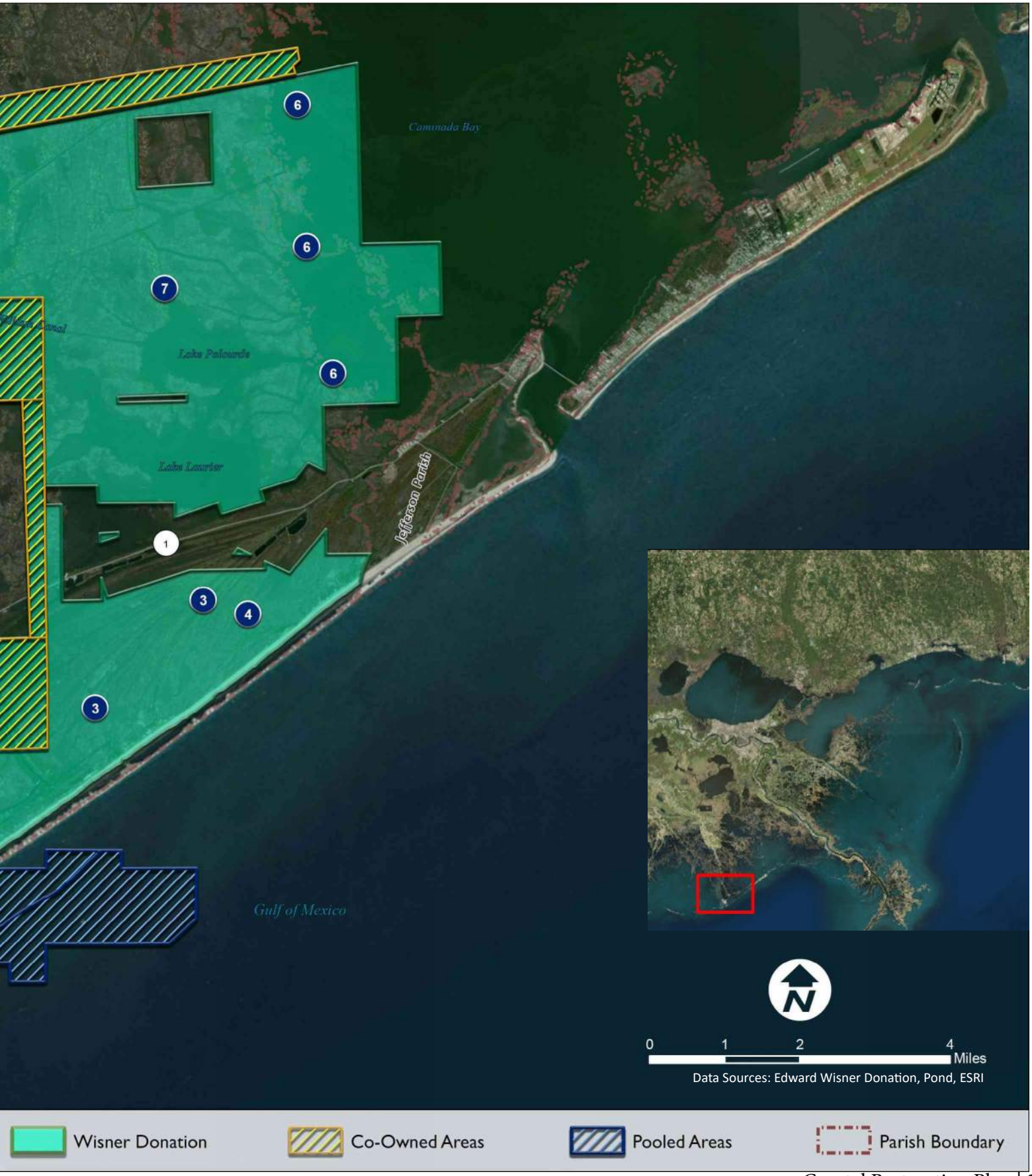
On February 1, 2019, Pond held a hands-on workshop with stakeholders, gathering stakeholder expertise and developing the components of the Coastal Master Plan. In addition to identifying assets and liabilities on Wisner land, stakeholders developed a list of potential projects. Projects were selected on their scalability, anticipated impact to natural and economic resources, and availability of funding. Following the workshop, Pond drafted a report for review. Based on feedback from The Edward Wisner Donation and various stakeholders, the final Coastal Master Plan was revised.

Image 4-2: Stakeholders take collaborative planning action during the hands-on Coastal Master Planning Charrette.

4.2 COASTAL RESTORATION PLAN

FIGURE 17: Projects in Fourchon/Leeville Area




Caminada Bay
Lake Palourde
Lake Laurier
Jefferson Parish
Gulf of Mexico
6
6
7
6
1
3
4
3
0
1
2
4
Miles
Data Sources: Edward Wisner Donation, Pond, ESRI
Wisner Donation
Co-Owned Areas
Pooled Areas
Parish Boundary

4.0 COASTAL RESTORATION PLAN

FIGURE 18: Projects in Lac des Allemands Area

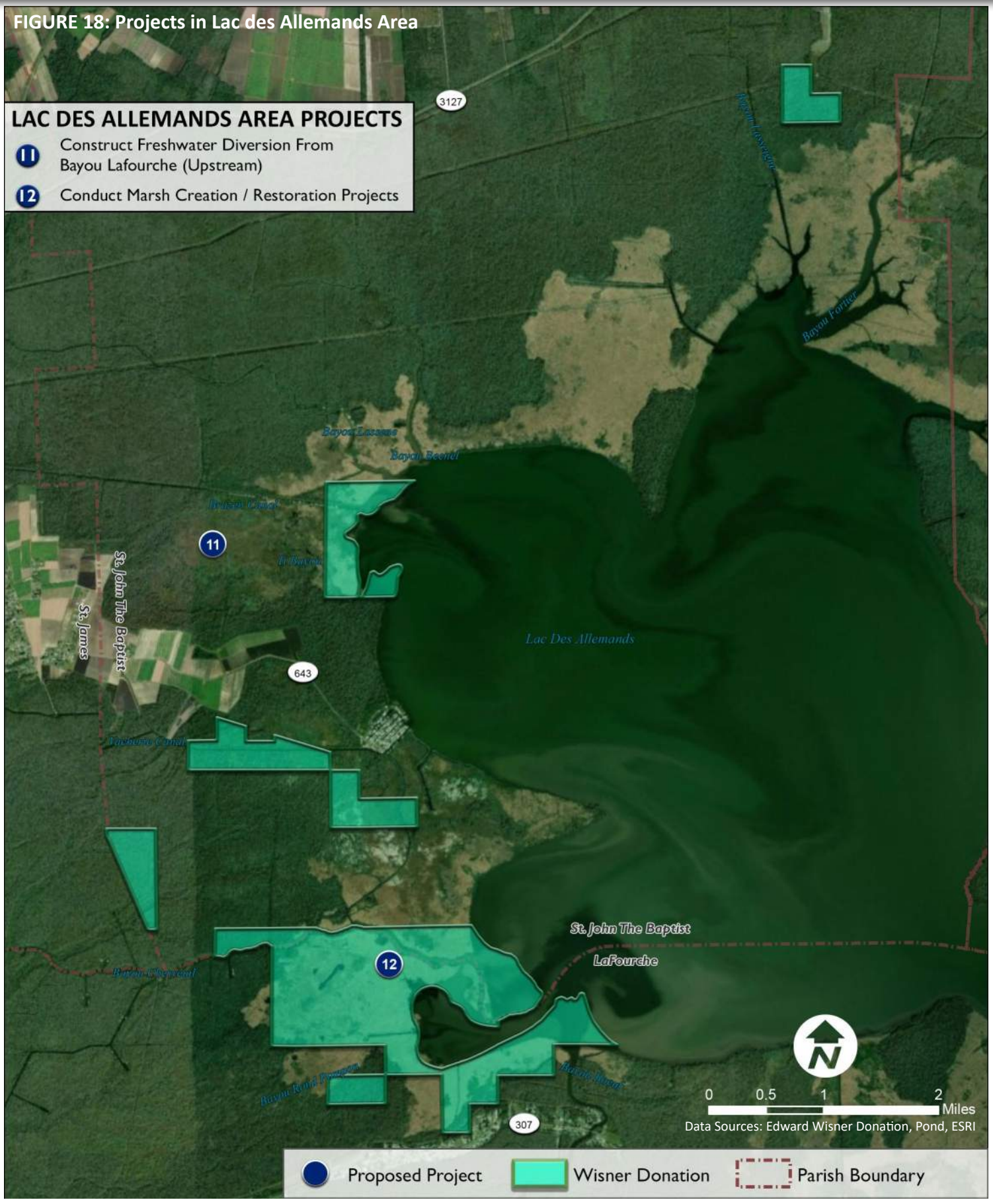
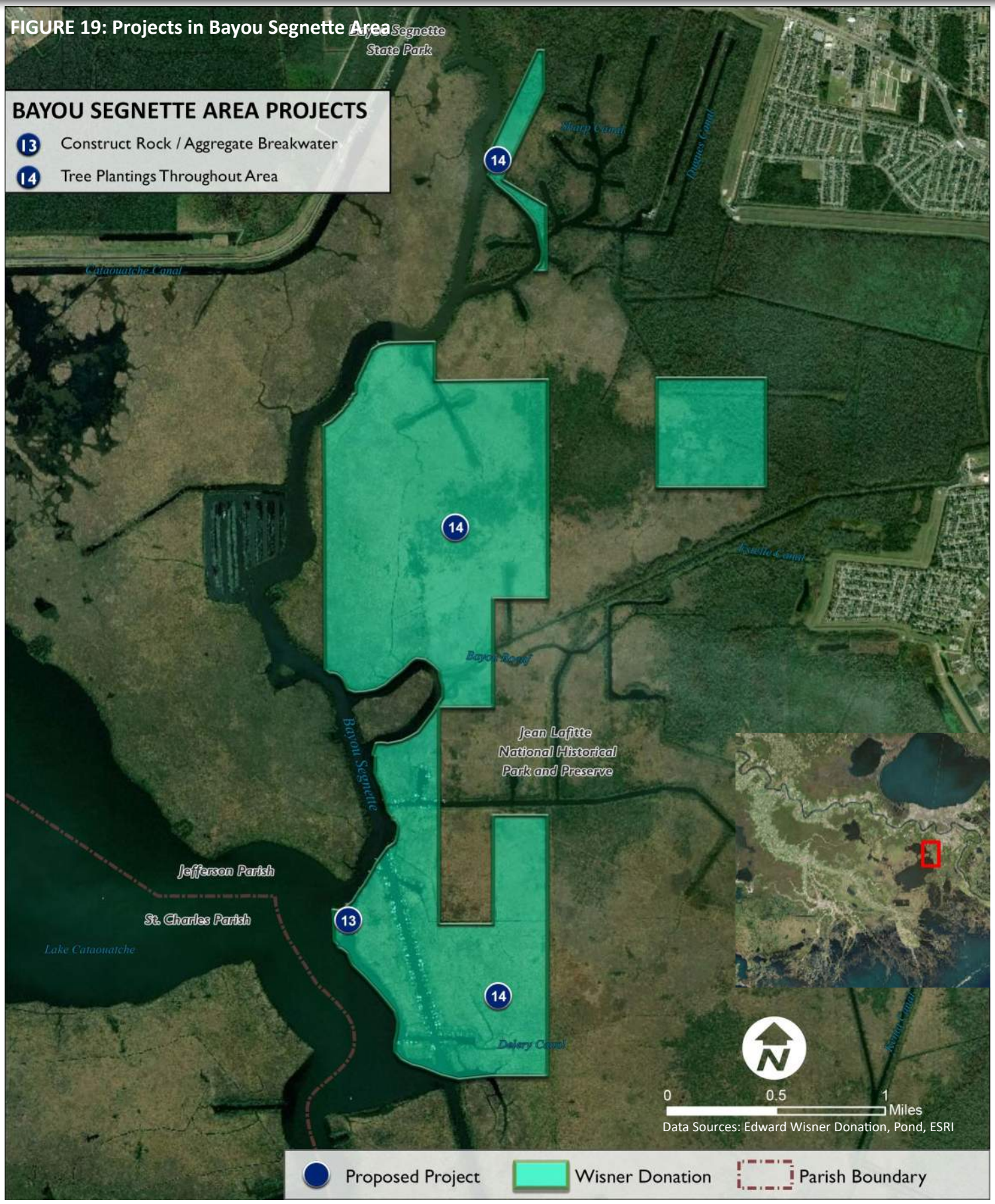


FIGURE 19: Projects in Bayou Segnette Area



4.0 COASTAL RESTORATION PLAN

4.3 PROPOSED PROJECTS

FOURCHON / LEEVILLE

1 – Maintenance and Management Plan for LUMCON Laboratory Grounds and Bulkhead

Project Type: Shoreline Protection

The Louisiana University Marine Consortium (LUMCON) Laboratory is located on Bayou Moreau on the side of a navigable waterway. This facility serves six local universities, as well as several federal agencies. The land surrounding the laboratory is protected by a, recently restored, roughly 375'-long bulkhead. A maintenance and management plan should be developed to ensure the bulkhead and the surrounding land are adequately maintained.

2 – Marsh Creation - LUMCON/Port Fourchon

Project Type: Marsh Creation

ROM Cost: $53m

The marshland immediately north of the LUMCON Laboratory and east of Port Fourchon has been substantially deteriorated by saltwater intrusion. This important natural area serves as a buffer between Port Fourchon and event-driven storm surge. In coordination with other wave attenuation and structural protection projects executed in the area, this marshland throughout this 1,300 acre should be restored, utilizing sediment dredged from nearby navigation canals when possible.

3 – Chenier Caminada Ridge Restoration

Project Type: Ridge Restoration

ROM Cost: $9m

The chenier ridge immediately northwest of the Caminada Headland beach (roughly 40,000 ft in length) is heavily eroded. This historic ridge, once home to the largest fishing village in Louisiana, should be restored through the dual approach of depositing natural sediment throughout the chenier--filling low areas between ridges and building up the elevation--and planting a series of live oak trees. The execution of these efforts should be scaled and phased appropriately to ensure salinity throughout the chenier is minimized in tree-planting areas. This may require elevating to a height that discourages oaks from drawing water from nearby water bodies, primarily relying, instead, on stormwater. Alternatively, salt-tolerant tree species should also be considered if the degree of land preparation required for oak growth is deemed prohibitive.

4 – Sediment Bank

Project Type: Other

The Environmental Protection Agency (EPA) has begun an initia-

tive to develop "sediment banks," areas where dredged material could be temporarily stored for future restoration projects. Wisner should work with the EPA to identify strategic sites on Wisner property best suited for banking sediment of a known quantity and grain size below water level.

5 – Canal Closures

Project Type: Shoreline Protection

The erosion of marshland areas east of LA 1 has been exacerbated by the prevalence of navigation canals cut through natural freshwater areas. While several canals are still in regular use, many are obsolete. Unused and obsolete canals should be systematically identified and rock fill should be used to close their seaward end, to limit saltwater intrusion. This effort should be coordinated with Oil and Gas personnel and other stakeholders to ensure necessary waterways are retained. Bank stabilization efforts should also be conducted in coordination with canal-filling to produce most effective results.

6 – Oyster Barrier Reef

Project Type: Oyster Barrier Reef

ROM Cost: $16m

Utilizing "Oyster Castles" or similarly-engineered concrete armor units, construct a series of linear breakwaters along the western shore of Caminada Bay to attenuate wave action, reduce shoreline erosion, foster the development of oyster habitats, rebuild marsh behind the breakwaters, and protect endangered marshland surrounding Louisiana Highway 1 (LA 1).

7 – Mangrove Air Seeding

Project Type: Other

Wisner has been partnering with Tierra Resources to seed strategic marshland areas for mangrove growth. Mangroves thrive in wetland terrain and deter coastal erosion. This initiative should continue and its effectiveness should be evaluated to determine applicability for other Wisner areas of land loss.

8 – Bank Stabilization

Project Type: Bank Stabilization

The banks of many navigation canals throughout Wisner's property have been eroded, allowing saltwater to penetrate. The condition of both active and obsolete navigation canals should be assessed, and a strategy should be developed for using rock infill to stabilize failing banks.

4.0 COASTAL RESTORATION PLAN

4.3 PROPOSED PROJECTS

9 – Marsh Creation along LA-1 Highway
Project Type: Marsh Creation
ROM Cost: $29m
LA-1–a vital access road and hurricane evacuation route–is becoming increasingly vulnerable to inundation, due to its loss of surrounding protective wetlands. Wisner should use sediment deposits to foster marsh creation in the approximately 700 acres that immediately surround LA-1. ‘

10 – Marsh Creation in the Marquis Lease Area
Project Type: Marsh Creation
ROM Cost: $30m
Wisner co-owns a 735 acre parcel of wetland area northeast of Leeville. The entirety of this parcel, leased to Marquis Energy, continues to experience substantial erosion. Sediment, ideally dredged from nearby areas, should be strategically utilized to foster the development of marsh in this area.

LAC DES ALLEMANDS
11 – Freshwater Diversion from Bayou Lafourche
Project Type: Hydrologic Restoration
ROM Cost: $75m
The upper Barataria Basin–including Lac des Allemands and Bayou Chevreuil–is increasingly nutrient-starved and at risk of significant land loss due to saltwater intrusion. The regular introduction of water from Bayou Lafourche into this sub-basin (comprised of portions of Assumption, St. James, St. John the Baptist, St. Charles, and Lafourche Parishes) would help mitigate the degrading effects of saltwater intrusion into this freshwater ecological system. Wisner should work to develop a pump/siphon system along Bayou Lafourche to push a steady supply of freshwater into the larger network of bayous and lakes of the upper
Barataria hydrologic system.

12 – Marsh Creation along Bayou Chevreuil
Project Type: Marsh Creation
ROM Cost: $49m
Bayou Chevreuil flows through Wisner’s property through an area of cypress-tupelo swamp and freshwater flotant marsh. Saltwater intrusion has begun to degrade this fragile natural systems. Sediment deposits, dredged from Lac des Allemands, should be strategically utilized to restore and grow marsh throughout this 1,200 acre area.

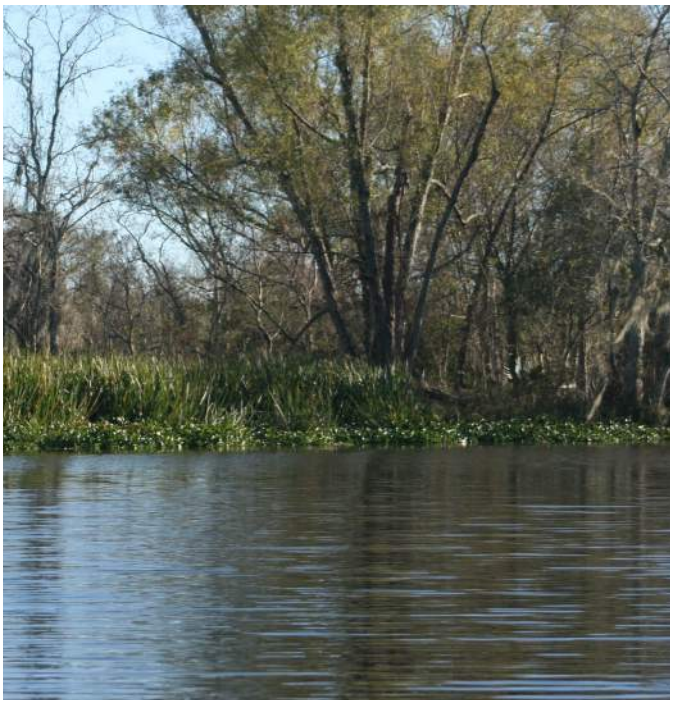
BAYOU SEGNETTE

13 – Shoreline Protection

Project Type: Shoreline Protection

ROM Cost: $15m

The eastern bank of Bayou Segnette, across from Couba Island is a high-erosion area of particular concern. Southward high winds exacerbate wave-driven erosion along the bank. Wisner should work with the Jean Lafitte National Park and Preserve to develop a series of offshore breakwaters along the 6,400 ft of threatened coastline.



14 – Tree Planting

Project Type: Other

ROM Cost: <$1m

Wisner should partner with the Jean Lafitte National Park and Preserve, as well as other community organization, to develop a tree planting initiative throughout the Bayou Segnette area. Volunteers could be required to plant live oaks and salt tolerant cypress trees, as well as, bitter panicum, spartina, switch grass, and Indian Feather throughout the area to combat erosion and restore natural ecological systems.

Project Types

Bank Stabilization is the onshore placement of earthen fill and vegetation planting designed to reduce wave energies and maintain shorelines in open bays, lakes, and bayous.

Diversions use channels and/or structures to divert sediment and freshwater from the Mississippi and Atchafalaya Rivers into adjacent basins.

Marsh Creation establishes new wetlands in open water areas such as bays, ponds, and canals through sediment dredging and placement.

Oyster Barrier Reefs are bioengineered to improve oyster propagation and serve as breakwaters to attenuate wave energies.

Ridge Restoration uses dredging, sediment placement, and vegetative plantings to restore natural ridge functions in basins.

Shoreline Protection provided by near-shore rock breakwaters reduces wave energies on shorelines surrounding open bays, lakes,sounds, and bayous.

Other can include vegetative plantings, sediment banking, air seeding, etc.