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**List of Acronyms**

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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>BMLC</td>
<td>Biloxi Marsh Land Corporation</td>
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<tr>
<td>BOEM</td>
<td>Bureau of Energy Management</td>
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<tr>
<td>BUDMAT</td>
<td>Beneficial Use of Dredged Material</td>
</tr>
<tr>
<td>CAP</td>
<td>Continuing Authorities Program</td>
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<tr>
<td>CDBG</td>
<td>Community Development Block Grant</td>
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<tr>
<td>CIAP</td>
<td>Coastal Impact Assistance Program</td>
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<td>CM</td>
<td>Construction Management</td>
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<td>CUP</td>
<td>Coastal Use Permit</td>
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<tr>
<td>CWPPRA</td>
<td>Coastal Wetlands Planning, Protection and Restoration Act</td>
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<td>CWU</td>
<td>Central Wetland Unit</td>
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<tr>
<td>CZAC</td>
<td>Coastal Zone Advisory Committee</td>
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<tr>
<td>EDA</td>
<td>Economic Development Administration</td>
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<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<tr>
<td>GOHSEP</td>
<td>Governor's Office of Homeland Security and Emergency Preparedness</td>
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<tr>
<td>GOMESA</td>
<td>Gulf of Mexico Energy Security Act</td>
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<tr>
<td>HSDRRS</td>
<td>Hurricane Storm Damage and Risk Reduction System</td>
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<td>DoTD</td>
<td>Louisiana Department of Transportation and Development</td>
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<tr>
<td>LDSP</td>
<td>Long Distance Sediment Pipeline</td>
</tr>
<tr>
<td>LDWF</td>
<td>Louisiana Department of Wildlife and Fisheries</td>
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<tr>
<td>LPBF</td>
<td>Lake Pontchartrain Basin Foundation</td>
</tr>
<tr>
<td>MRGO</td>
<td>Mississippi River Gulf Outlet</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>NRDA</td>
<td>Natural Resource Damage Assessment</td>
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<tr>
<td>O&amp;M</td>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>P/E&amp;D</td>
<td>Planning, Engineering, and Design</td>
</tr>
<tr>
<td>PPL</td>
<td>Project Priority List</td>
</tr>
<tr>
<td>RESTORE Act</td>
<td>Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act</td>
</tr>
<tr>
<td>SBPG</td>
<td>St. Bernard Parish Government</td>
</tr>
<tr>
<td>TIGER</td>
<td>Transportation Investment Generating Economic Recovery</td>
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<tr>
<td>USACE</td>
<td>United States Army Corps of Engineers</td>
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<td>USDA</td>
<td>U.S. Department of Agriculture</td>
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<tr>
<td>USDOT</td>
<td>U.S. Department of Transportation</td>
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<tr>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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Executive Summary

The purpose of the 2018 Coastal Strategy Document (Strategy Document) is to provide a fact sheet and priority list for each coastal activity proposed by St. Bernard Parish Government (SBPG). The level of detail provided in each fact sheet will allow SBPG to strategically and competitively advance coastal activities from funding through implementation. The Strategy Document also includes a funding matrix that addresses a wide range of available funding sources, including (but not limited to):

- Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act (RESTORE Act);
- Gulf of Mexico Energy Security Act (GOMESA);
- Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA); and
- Natural Resources Damages Assessment (NRDA).

Coastal activity fact sheets have been arranged in accordance with the following tiered system:

- Tier 1 (Large-Scale, High Priority Restoration Projects);
- Tier 2 (Fisheries, Economic Development, and Community Resilience Projects); and
- Tier 3 (Small-Scale Local Coastal Programming).

Each coastal activity fact sheet includes the following information:

- Description/Location
- Current Status
- Previous Planning Efforts and Consistency
- Problem(s) Addressed
- Recommended Solution(s)
- Projected Costs and Benefits
- Potential Risks, Mitigation Measures, and Permitting Requirements
- Restoration of Areas Impacted by the Deepwater Horizon Oil Spill
- Funding Strategy and Sources

The 2018 Coastal Strategy Document serves as an update to the 2016 Coastal Strategy Document, which was adopted by the St. Bernard Parish Council in August 2016. Other previous state and local coastal planning efforts have been summarized in Appendix A.
I. Funding Sources and Matrix

SBPG has a unique and unprecedented opportunity to leverage funding from federal, state, and private sources to maximize local investment in coastal activities. The funding analysis included in this section is based on an extensive review of the key funding sources that may be pursued to implement the activities included in the Strategy Document. The intent is not to have a comprehensive repository or final strategy, but to maintain a database of funding sources and potential courses of action for all coastal activities in St. Bernard Parish.

The following elements are included in the Funding Sources and Matrix portion of the Strategy Document:

- A narrative providing a brief overview of the agencies that oversee coastal activity programming;
- Specific programmatic objectives and application processes;
- Program applicability to proposed SBPG coastal activities; and
- A funding matrix outlining relevant programming.

Each fact sheet included in the Strategy Document is also accompanied by a funding strategy and sources section that provides the most likely course(s) of action in terms of funding coastal activities in St. Bernard Parish.

RESTORE Act

The RESTORE Act will provide a significant amount of funding for eligible coastal activities through 2032 (see graphic on following page). This funding will be made available both directly to SBPG (Direct Component) and through the State of Louisiana via the Coastal Protection and Restoration Authority (CPRA) RESTORE Act Parish Matching Program. SBPG’s RESTORE Act Direct Component allocation (including interest) will be approximately $600,000/year, while the CPRA is slated to receive approximately $54.1 million/year in RESTORE Act funding. The CPRA has elected to make up to $100 million of its total allocation available for its Parish Matching Program, whereby parishes may request matching funds for eligible coastal activities.
The US Department of the Treasury (Treasury) has been tasked with administering RESTORE Act funds on behalf of the federal government. In order for coastal activities to become eligible for RESTORE Act Direct Component funding, they must be included in a Treasury-approved multiyear implementation plan. The Treasury reviewed and approved the SBPG 2017 RESTORE Act Multiyear Implementation Plan (MIP) in May 2017 and the parish began submitting RESTORE Act grant applications for specific coastal activities in September 2017. SBPG is currently in the process of updating its MIP (see http://sbpg.net/150/Coastal-Division).

SBPG submitted a request to the CPRA in July 2017 for $2.78 million in RESTORE Act Parish Matching Program funds for the Lake Lery Marsh Creation project (Phase 2). The CPRA approved the request in December 2017. SBPG will also be contributing $300,000 of its RESTORE Act Direct Component funding to the subject project, which is slated to begin in November 2018.

*Figure I.1: RESTORE Act funding diagram  
(Source: US Department of the Treasury)*
NRDA

Ecosystem damages caused by the Deepwater Horizon oil spill were settled as part of the NRDA process in a global settlement signed in April 2016. The settlement dictates that $288 million/year be allocated to approved NRDA projects in Louisiana. Many of the projects were referenced in the original settlement and have since moved forward into implementation. However, there are still opportunities to submit additional coastal activities for NRDA funding consideration.

NRDA trustees, including the Louisiana Trustee Implementation Group (LATIG), must develop a bi-annual restoration plan that accounts for NRDA-funded coastal activities. Approved NRDA activities are ultimately implemented by the CPRA. In September 2017, SBPG submitted a request to the LATIG for $3.5 million in NRDA funding for the Chandeleur Islands Maintenance and Re-vegetation project (see Appendix B). The LATIG is currently considering the request and is expected to make a decision in 2018.

Figure I.2: Louisiana NRDA Allocations
(Source: National Oceanic and Atmospheric Administration)

US Army Corps of Engineers Continuing Authorities Program

The US Army Corps of Engineers (USACE) Continuing Authorities Program
(CAP) includes nine distinct programs that may fund various coastal activities. These programs range from the Section 14 program, which applies to emergency protection of facilities along waterways, to the Section 1135 program, which calls for ecosystem restoration and/or enhancement. These programs offer funding levels ranging from $500,000 to $7 Million and matching funds ranging from 65% to 75%.

The CAP application process starts with a simple request letter/package to local USACE official(s) requesting an initial study. The results of the initial study are subsequently used to evaluate the merits of the proposed project and to determine whether a federal interest exists. In the event that a federal interest is determined and feasibility is established, a project may become part of a competitive process for funding.

The CAP 204, 205, and 206 programs (see the below table) may be the most viable for SBPG. However, the primary drawback with these programs is the turnaround time associated with approval, which may take up to three years. These programs might be most useful for parish projects that have not otherwise been funded.

SBPG submitted a CAP 206 request to the USACE for a portion of the Bayou Terre aux Boeufs Ridge Restoration and Armoring project in February 2016. The USACE has since determined that there is a federal interest in the project and has funded an initial study. Design and construction funds for the project will be considered as part of a nationally competitive process during the federal government’s 2018 fiscal year. As part of this process, the USACE will evaluate the project to determine if it is technically feasible, environmentally acceptable, and cost-effective. SBPG’s complete CAP 206 proposal and associated correspondence have been included in Appendix B.

**GOMESA**

The State of Louisiana will begin receiving $40 million to $120 million/year and SBPG will begin receiving $700,000 to $1.3 million/year as part of GOMESA Phase 2, which will go into effect in 2018. The State of Louisiana voted to put a number of restrictions on GOMESA funds in addition to those restrictions imposed by the federal government, including:

- Funds must be deposited directly in the CPRA Trust Fund;
- GOMESA funds may only be used only for the purposes of coastal protection and restoration; and
- No more than 7% of the funds may be used for administrative costs.
State GOMESA funds will be used primarily to construct 2017 State Master Plan projects, including those that are located in St. Bernard Parish. As part of the State’s efforts to fund infrastructure projects in coastal communities, 10% of the State’s GOMESA funds were initially allocated for the GOMESA Coastal Infrastructure Program, which was made available to coastal parishes for infrastructure projects that satisfied the following criteria:

- Contribute to community resilience (evacuation routes, connection to local businesses, contribution to regional commerce, etc.);
- Include local investment (cost-share);
- Contribute to state, regional and national energy security; and
- Provide opportunities to leverage funding from other sources.

SBPG submitted a proposal for the State’s GOMESA Coastal Infrastructure Program in October 2016. The proposal included the Louisiana Highway 300 Coastal Infrastructure Resilience project ($34.5 million). SBPG’s complete GOMESA Coastal Infrastructure proposal has been included in Appendix B. However, due to a downturn in offshore oil and gas production, the initial GOMESA Phase 2 allocation is now projected to be approximately half of what was originally estimated. The GOMESA Coastal Infrastructure Program has since been suspended indefinitely.

**CWPPRA**

The CWPPRA program, administered by five federal agencies (USACE, NOAA, USFWS, USDA, EPA) and the State of Louisiana (collectively represented on the CWPPRA Technical Committee and Task Force), is a competitive program that provides funding for a wide range of coastal projects. Currently, the CWPPRA program receives approximately $77 million/year. Projects considered for CWPPRA funding are nominated by federal agencies and subsequently vetted through a competitive process that includes a vote from coastal parishes (by basin); feasibility analysis and vote by the Technical Committee (statewide); planning and feasibility analysis (Technical Committee); and a final vote for Phase 1 funding (engineering/design) by the Technical Committee and Task Force.

Once Phase 1 is completed, the Technical Committee and Task Force must also approve Phase 2 (construction) funding via a similar competitive process. The cost-share for CWPPRA is 75% federal and 25% non-federal, and CPRA typically funds the non-federal portion for 2017 State Master Plan projects. The CWPPRA process is administered on an annual basis.

SBPG worked with the Natural Resources Conservation Service (NRCS) and
the Environmental Protection Agency (EPA) to nominate the Bayou La Loutre Ridge Restoration project for CWPPRA funding in 2016. The project was voted #1 overall in the Lake Pontchartrain Basin and #6 overall in Louisiana. The Technical Committee recommended Phase 1 approval in December 2016 and the Task Force officially approved the project in January 2017.

Two additional projects were submitted for consideration under CWPPRA in 2017: East Delacroix Marsh Creation, sponsored by the National Oceanic and Atmospheric Administration (NOAA); and Point aux Marchettes Shoreline Stabilization and Marsh Terracing, sponsored by the US Fish and Wildlife Service (USFWS). The Point aux Marchettes project was voted #1 overall in the Lake Pontchartrain Basin and #7 overall in Louisiana. The East Delacroix project was voted #2 overall in the Breton Basin and #5 overall in Louisiana. However, neither of the projects were selected for Phase 1 funding.

**Federal Emergency Management Agency**

The Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP); Pre-Disaster Mitigation (PDM) program; and Flood Mitigation Assistance (FMA) program provide grants for hazard mitigation projects. HMGP allocations are made following presidentially declared disasters. PDM and FMA are competitive programs with similar hazard mitigation goals. During the annual submittal period for PDM and FMA, applicants must prepare application packages that include a scope of work, schedule, budget, benefit-cost analysis, and other supporting documentation. Submittals are made to the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and FEMA Region 6. To date, SBPG has not applied for any FEMA funding for coastal activities. However, there may be future opportunities as CPRA begins to play more of a leadership role in coastal hazard mitigation efforts.

**Department of Commerce**

The Economic Development Agency (EDA) Utilities grant program may fund infrastructure improvements that will enhance or increase commerce and business activities in certain areas. The program places an emphasis on projects in rural communities. There are program requirements regarding commerce, which are used in the benefit-cost analysis. Application packages are submitted via grants.gov and must include a scope of work, schedule, budget, benefit-cost analysis, and written support from local businesses.
**US Department of Transportation**

The most recent Transportation and Infrastructure bill included funding for large-scale multi-modal and freight related projects through the Fast Lane and Transportation Investment Generating Economic Recovery (TIGER) competitive grant program. Grant applications, which must include a scope of work, schedule, budget, and benefit-cost analysis, are submitted via grants.gov. Matches are variable and preference is given to projects with higher non-federal matches.

US Department of Transportation (USDOT) programs are generally geared toward roadway and rail projects, so coastal applicability is limited. However, there are a number of fisheries and tourism-related projects included in the Strategy Document that may qualify. The LA Highway 300 Resilience project is the most likely candidate for USDOT funding.

**NOAA Coastal Ecosystem Resiliency Program**

This program, administered through NOAA Fisheries, is a nationally competitive program that emphasizes improving ecology and enhancing coastal communities’ resilience in the face of climate change and extreme weather events. Particular emphasis is placed on “healthy oceans” and “resilient coastal communities and oceans.” The following program goals are included in recent program publications:

- Restore habitat to support healthy fish populations and provide sustainable and lasting ecosystem functions that reduce hazard vulnerability and risks posed to coastal communities from extreme weather events, changing environmental conditions, and allow for adaptation to known or potential climate change impacts;

- Demonstrate collaboration and alignment among multiple stakeholders, including state and federal agencies, by proposing projects that implement ecosystem-based restoration recommendations and site-specific strategies outlined in existing coastal vulnerability or resiliency studies and comprehensive planning efforts;

- Result in socio-economic benefits associated with the restoration of healthy and resilient coastal ecosystems, such as increased economic activity, enhanced recreation including fishing, changes in human well-being, improved or protected infrastructure,
decreased flooding impacts, elimination of safety hazards, and/or reduced maintenance costs;

- Restore habitat within NOAA priority areas, such as Blueprint Habitat Focus Areas;

- Implement on-the-ground restoration actions that will begin within 24 months of the proposed award start date, will result in beneficial impacts, and achieve the stated ecosystem resiliency and habitat goals; and

- Receive approval from the State Governor as evidenced by a letter or other form of documented correspondence, such as a letter from a Governor’s appointee, prior to award.

This program may be applicable to many of the marsh creation or ridge restoration projects included in the Strategy Document, particularly those that benefit commercial and recreational fishing interests in St. Bernard Parish.

**Louisiana CPRA**

CPRA provides oversight on multiple programs and funding sources (see above regarding RESTORE Act and GOMESA). Additionally, coastal restoration and protection are allowable State surplus funding expenditures. Keeping CPRA leadership apprised of local coastal priorities and making direct appeals to them regarding funding needs are the most likely means of moving projects forward with CPRA assistance. Focusing on local projects that are consistent with the 2017 State Master Plan is critical to gaining support and/or leveraging funding from CPRA.

**Louisiana Capital Outlay**

Capital Outlay funds may be more accessible as State revenues increase. Examples of projects that qualify for Capital Outlay budget are: land acquisition; site development and improvement; acquisition or construction of buildings or other structures; additions or expansion to existing facilities; major repair or renovation of existing facilities; installation, extension, or replacement of utility systems or major building system components; roof replacement; hazardous materials abatement; fixed equipment that is connected to building utility systems; and initial equipment and furnishings for new buildings. Applications must be made through State legislators and must have an anticipated useful life of twenty
years or more and a cost of at least $50,000.

**Funding Matrix**

<table>
<thead>
<tr>
<th>Program</th>
<th>Eligible Activities</th>
<th>Funding</th>
<th>Cost-Share</th>
<th>Agency</th>
<th>Project Applicability</th>
<th>Process/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEDERAL SOURCES</td>
<td></td>
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<tr>
<td>RESTORE Act</td>
<td>Primarily ecosystem restoration projects with gulf-wide influence, part of Master Plan, and have local sponsor.</td>
<td>$15-50M</td>
<td>Variable</td>
<td>CPRA / RESTORE Act Gulf Council</td>
<td>Projects within the CPRA and/or Local Master Plans</td>
<td>Submitted to CPRA for POT 1 and POT 3 cost share, or to CPRA for POT 2 funding from Gulf Council.</td>
</tr>
<tr>
<td>NRDA</td>
<td>Projects that directly address the impacts of the BP Oil Spill.</td>
<td>Variable</td>
<td>None required- local match/ shovel-ready preferred</td>
<td>NRDA Trustee Council NOAA/ USFWS/ CPRA</td>
<td>Many of the projects are directly applicable, if not already identified</td>
<td>Submit projects directly to CPRA and show linkage and synergy with NRDA plans and requirements. Accelerate process by initiating projects to be shovel ready.</td>
</tr>
<tr>
<td>USACE - 14</td>
<td>Studies, Canals &amp; Bayous</td>
<td>$1.5 Million</td>
<td>35%</td>
<td>USACE</td>
<td>Emergency protection of public facilities along waterways</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>Program</td>
<td>Eligible Activities</td>
<td>Funding</td>
<td>Cost-Share</td>
<td>Agency</td>
<td>Project Applicability</td>
<td>Process/Notes</td>
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<tr>
<td>USACE - 103</td>
<td>Studies, Breakwaters &amp; Levees</td>
<td>$5 Million</td>
<td>35%</td>
<td>USACE</td>
<td>Beach replenishment to protect public and private properties</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>USACE - 107</td>
<td>Studies, Canals &amp; Bayous</td>
<td>$7 Million</td>
<td>10%-50%</td>
<td>USACE</td>
<td>Improvements to navigation canals/turning basins etc.</td>
<td>A letter requesting consideration of a project is submitted to the local authority, once approved a study is initiated, once the study passes the design and construction are carried out.</td>
</tr>
<tr>
<td>USACE - 111</td>
<td>Studies, Marsh Wetlands, Canals &amp; Bayous</td>
<td>$5 Million</td>
<td>10%-50%</td>
<td>USACE</td>
<td>Repair of shorelines damaged by federal navigation projects or mitigation of future damages</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>USACE - 204</td>
<td>Drainage, Studies, Marsh Wetlands</td>
<td>Variable</td>
<td>35%</td>
<td>USACE</td>
<td>Protection, creation, and restoration of aquatic and ecologically related habitats focusing on use of dredge material</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>Program</td>
<td>Eligible Activities</td>
<td>Funding</td>
<td>Cost-Share</td>
<td>Agency</td>
<td>Project Applicability</td>
<td>Process/Notes</td>
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<tr>
<td>USACE - 205</td>
<td>Studies, Breakwaters &amp; Levees</td>
<td>$7 Million</td>
<td>35%</td>
<td>USACE</td>
<td>Small-scale flood protection projects with measures ranging from levees to flood warning systems and pumps</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>USACE - 206</td>
<td>Studies</td>
<td>$5 Million</td>
<td>35%</td>
<td>USACE</td>
<td>Projects related to ecosystem restoration and habitat construction</td>
<td>A letter requesting consideration of a project is submitted to the local authority, once approved a study is initiated, once the study passes the design and construction are carried out</td>
</tr>
<tr>
<td>USACE - 208</td>
<td>Studies</td>
<td>$500,000</td>
<td>35%</td>
<td>USACE</td>
<td>Snagging and clearing of channels for flood control purposes</td>
<td>A letter requesting consideration of a project is submitted to the local authority; a study is initiated upon approval; design and construction are funded if approved.</td>
</tr>
<tr>
<td>USACE - 1135</td>
<td>Studies</td>
<td>$5 Million</td>
<td>25%</td>
<td>USACE</td>
<td>Ecosystem restoration or augmentation of an existing USACE project or of damages caused by USACE facilities</td>
<td>A letter requesting consideration of a project is submitted to the local authority, once approved a study is initiated, once the study passes the design and construction are carried out</td>
</tr>
<tr>
<td>Program</td>
<td>Eligible Activities</td>
<td>Funding</td>
<td>Cost-Share</td>
<td>Agency</td>
<td>Project Applicability</td>
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<tr>
<td>GOMESA Infrastructure</td>
<td>Water, Sewer, Drainage, Roads</td>
<td>Variable</td>
<td>TBD</td>
<td>Bureau of Energy Management</td>
<td>Projects related to infrastructure directly impacted by coastal wetland loss</td>
<td>A submittal in coordination with CPRA is made and project award based on priority criteria is made on a competitive basis</td>
</tr>
<tr>
<td>CWPPRA</td>
<td>Ridge Restoration, Marsh Creation, Shoreline Protection, Hydrologic Restoration</td>
<td>$20-40M</td>
<td>15%</td>
<td>Multiple</td>
<td>Coastal restoration projects geared to acquire, restore, manage, or enhance coastal wetlands</td>
<td>An application to the competitive program is submitted on an annual basis using a sponsor agency</td>
</tr>
<tr>
<td>FEMA - PDM, HMGP</td>
<td>Facilities</td>
<td>Variable (roughly $250K to $1 M)</td>
<td>75%</td>
<td>Dept. of Homeland Security</td>
<td>Flood and wind damage prevention related projects</td>
<td>A package containing benefit cost, project scope, and damage mitigation elements is submitted to GOHSEP and routed to FEMA for the PDM and Flood Mitigation Assistance (FMA) programs.</td>
</tr>
<tr>
<td>EDA - Public Works</td>
<td>Water, Sewer, Drainage, Roads</td>
<td>$1-$3 Million</td>
<td>50%-75%</td>
<td>Dept. of Commerce</td>
<td>Grant projects for public utilities and other public works that will create jobs and economic growth</td>
<td>Generation and submittal of a project application including project scope and benefit-cost analysis which places emphasis on economic development</td>
</tr>
<tr>
<td>Program</td>
<td>Eligible Activities</td>
<td>Funding</td>
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</tr>
<tr>
<td>Nationally Significant Corridors</td>
<td>Roads</td>
<td>Over $5 Million</td>
<td>20%-40%</td>
<td>USDOT</td>
<td>Large scale infrastructure projects related to transportation with an emphasis on freight</td>
<td>A grant application package is completed and submitted via Grants.gov. The package includes benefit-cost information, narratives, letters of support, and scope/cost information.</td>
</tr>
<tr>
<td>TIGER</td>
<td>Roads</td>
<td>$5 Million plus</td>
<td>80%-100%</td>
<td>USDOT</td>
<td>Large-scale transportation related projects</td>
<td>A grant application package is completed and submitted via Grants.gov. The package includes benefit cost information, narratives, letters of support, and scope/cost information.</td>
</tr>
<tr>
<td>NOAA Regional Coastal Resilience</td>
<td>Drainage, Roads, Facilities, Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>$500K to $1M</td>
<td>2:1 Federal to Non-Federal</td>
<td>NOAA, NOS</td>
<td>Projects promoting resilience in coastal communities, specifically targeting severe weather</td>
<td>Completion of a grants package and submittal through grants.gov.</td>
</tr>
<tr>
<td>Coastal Ecosystem Resilienty Grants Program</td>
<td>Studies, Marsh Wetlands</td>
<td>$250K to $750K</td>
<td>2:1 Federal to Non-Federal</td>
<td>National Marine Fisheries Service, NOAA, Commerce</td>
<td>Projects addressing coastal communities and ecosystems to protect from future hazards and support sustainable fisheries</td>
<td>Completion of grant application per terms of notice of funding opportunity through grants.gov.</td>
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</table>


<table>
<thead>
<tr>
<th>Program</th>
<th>Eligible Activities</th>
<th>Funding</th>
<th>Cost-Share</th>
<th>Agency</th>
<th>Project Applicability</th>
<th>Process/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE SOURCES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CPRA</td>
<td>Marsh Wetlands</td>
<td>Variable</td>
<td>Variable</td>
<td>-</td>
<td>Projects fitting within master plan guidelines are advisable</td>
<td>Depending on the funding or desired outcome a variety of requests from formal letters to face to face meetings requesting priority projects is advisable</td>
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<tr>
<td>Capital Outlay</td>
<td>Water, Sewer, Drainage, Roads, Facilities, Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>Variable</td>
<td>Variable</td>
<td>25%</td>
<td>Any project fitting within state guidelines and priorities</td>
<td>A request for Capital Outlay allocation is made and processed via standard procedures</td>
</tr>
<tr>
<td>Pre-Scripted Missions</td>
<td>Drainage</td>
<td>$100,000</td>
<td>0%</td>
<td>GOHSEP</td>
<td></td>
<td>GOHSEP has the authority to set in place a plan to deploy National Guard resources including personnel and equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GOHSEP adds a specific set of tasks/resources in their disaster response plan</td>
</tr>
<tr>
<td>Program</td>
<td>Eligible Activities</td>
<td>Funding</td>
<td>Cost-Share</td>
<td>Agency</td>
<td>Project Applicability</td>
<td>Process/Notes</td>
</tr>
<tr>
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<td>---------</td>
<td>------------</td>
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<tr>
<td>LOCAL SOURCES</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESTORE Act - Economic Damages (Pot 1)</td>
<td>Water, Sewer, Drainage, Roads, Facilities, Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>Variable</td>
<td>100%</td>
<td>-</td>
<td>Virtually any coastal project can be funded.</td>
<td>Documentation of use and project purpose</td>
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<tr>
<td>RESTORE Act - Pot 2</td>
<td>Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>Variable</td>
<td>-</td>
<td>-</td>
<td>Projects aligning with the Master Plan are advisable</td>
<td>A request is made to the authority having jurisdiction</td>
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<tr>
<td>Public Private Partnerships</td>
<td>Water, Sewer, Drainage, Roads, Facilities, Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>Variable</td>
<td>Variable</td>
<td>Industry, Universities, Land Owners, PNP's, etc.</td>
<td>Any project with local support could be pursued.</td>
<td>Identifying a network of interested partners</td>
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<td>Bond Funds or Budgeted Items</td>
<td>Water, Sewer, Drainage, Roads, Facilities, Studies, Marsh Wetlands, Breakwaters &amp; Levees, Canals &amp; Bayous</td>
<td>Variable</td>
<td>100%</td>
<td>-</td>
<td>Parish discretion</td>
<td>Internal documentation of project intent and agreement by proper internal authorities</td>
</tr>
</tbody>
</table>
II. Overview of Proposed Coastal Activities

Tier 1

Coastal activities designated as Tier 1 include those that are considered large-scale, high priority coastal restoration projects. Such projects have preliminary budgets ranging from $3.5 million to over $30 million, making their feasibility contingent upon SBPG obtaining a significant amount of outside funding and/or strategically leveraging various sources of funding. Projects designated as Tier 1 priorities include:

- Bayou La Loutre Ridge Restoration and Marsh Creation;
- Bayou Terre aux Boeufs Ridge Restoration and Armoring;
- Chandeleur Islands Maintenance and Re-vegetation;
- Breton Marsh Creation;
- Lake Borgne Marsh Creation;
- Lake Lery Marsh Creation and Rim Restoration;
- Golden Triangle Marsh Creation;
- East Bank Sediment Pipeline;
- Point aux Marchettes Shoreline Protection and Terracing; and
- Central Wetlands Marsh Creation.
Tier 2 coastal activities include mid-sized projects and other activities that are focused on fisheries, economic development, and community resilience. Activities designated as Tier 2 priorities include:

- Louisiana Highway 300 Coastal Infrastructure Resilience;
- Delacroix Fishing Complex;
- Shell Beach Fishing Complex at the Katrina Memorial;
- Hopedale Fishing Complex and Public Seafood Market;
- Paris Road Corridor Streetscape Enhancement and Welcome Center;
- Living Shoreline Installation and Oyster Seed Grounds Restoration;
- Nunez Community College Fisheries Workforce Development Program; and
- Central Wetlands Unit Bike Path.
Coastal activities designated as Tier 3 priorities consist of **small-scale, local coastal programming**. Activities designated as Tier 3 priorities include:

- Local Marine Debris Removal Program;
- Local Maintenance Dredging and BUDMAT Program;
- Local Navigational Aids Program;
- Local Reforestation and Re-vegetation Program; and
- Derelict Crab Trap Removal Program.

The scope and location of most Tier 3 activities will vary each year. Consequently, these activities have not been mapped as part of the Strategy Document effort.
III. Tier 1 Coastal Activity Fact Sheets

Each coastal activity fact sheet includes the following baseline information:

- Project Priority
- Current Status
- Project Location
- Problem
- Previous Planning Efforts
- Recommended Solution
- Projected Benefits
- Projected Costs
- Consistency with CPRA Master Plan and other Ongoing Regional Efforts
- Potential Risks, Mitigation Measures, and Permitting Requirements
- Restoration of Areas Impacted by Deepwater Horizon Oil Spill
- Funding Strategy and Sources

A. Bayou La Loutre Ridge Restoration and Marsh Creation
Map III.1: Bayou La Loutre Ridge Restoration and Marsh Creation Project

Project Priority
Tier 1

Current Status
Phase 1 (engineering/design) for the Central Phase has been funded via CWPPRA.

Project Location
Bayou La Loutre, St. Bernard Parish

Problem
The historic Bayou La Loutre Ridge (elevated areas of land eight to ten feet in height and lined with small oaks and marsh elder) is fading through natural subsidence; subjected to shoreline erosion due to increased boat traffic since the closure of the Mississippi River Gulf Outlet (MRGO); and was exposed to adverse increases in salinity levels prior to the closure of the MRGO. Historically, elevated ridges and vegetation have provided natural protection for areas further inland by dampening storm surge energy. However, gaps have formed in the ridges, creating open water ponds and
streams due to tidal exchange and scouring. Without restoration measures, these open water areas will continue to expand, further exposing inland areas to flooding and scour from storm events.

**Previous Planning Efforts**

Previous planning efforts related to the restoration of the Bayou La Loutre Ridge date back to 2006. In addition to being included in the 2012 CPRA Master Plan, the project has been submitted for federal funding through CWPPRA and recommended as a priority project by the Lake Pontchartrain Basin Foundation (LPBF). This project is also a component of the Biloxi Marsh Land Corporation (BMLC) Restoration Plan.

**Recommended Solution**

The CWPPRA Priority Project List (PPL) 26 version of the project calls for the use of material from the bayou to restore the ridge. To minimize impacts on existing healthy marsh, it was later proposed that the ridge be constructed in the shallow water on the edge of the bayou rather than atop existing ridge. Following construction, the newly created ridge will also include vegetative plantings. Due to funding constraints, the project has been split into 3 distinct phases, with cost, need, and projected benefits dictating the order of construction.

**West Phase**

The West Phase runs along the western shore of Bayou La Loutre from Yscloskey to south of Hopedale. It aligns with the northern extent of ridge restoration measures outlined in the 2012 CPRA Master Plan and terminates at the northern extent of the plans submitted in CWPPRA’s PPL 26. It is 3.51 miles in length and is segmented where canals are present. It is anticipated that this reach would provide storm surge protection for the Yscloskey, Hopedale, and Shell Beach areas and would protect northern interior marshlands from further degradation and saltwater intrusion. It would also bolster the western and southern shores and reduce erosion impacts from further spreading southward. This phase includes 22.7 acres of new marsh and 6.4 acres of new ridge.

**Funding Strategy and Sources** - This phase of the project may be nominated for the CWPPRA program and/or funded by the CPRA.

**Central Phase**

The Central Phase will create approximately 5.46 miles (28,855 ft.) of ridge along Bayou La Loutre and 24.4 acres of Live Oak/Hackberry Maritime
forest habitat. The ridge habitat will be built centerline along the bank of the bayou. The structure will have a +4 elevation with a 5:1 slope on the bayou side and 3:1 slope on the marsh side. Additionally, the newly created ridge will include herbaceous and woody plantings with smooth cordgrass plantings along the toe.

Due to its west-east lateral orientation, it is anticipated that this reach would provide storm surge protection from southern storms; protect northern interior marshlands from further degradation and saltwater intrusion; and would rebuild the western and southern shorelines that have eroded due to boat traffic. This phase includes 34.9 acres of new marsh and 9.8 acres of new ridge. Included in the Central Phase is the Lena Lagoon marsh creation site, where approximately 421 acres of marsh will be created or nourished using sediment dredged from Lake Borgne. Lena Lagoon will have a semi-confined south and east flank and a fully confined north flank. Containment will be degraded as necessary to re-establish hydrologic connectivity with adjacent wetlands.

**Funding Strategy and Sources** – $3,230,000 was approved for CWPPRA Phase I (engineering and design) in January 2017. Phase 2 (construction) funding for this phase of the project must also be sought competitively via CWPPRA at a later date.

**East Phase**

The East Phase runs along the western and southern shore of Bayou La Loutre and aligns with the Central Phase to the west and continues for 11.31 miles until Bayou La Loutre forks near the Gulf of Mexico. It aligns with the southern edge of ridge restoration measures outlined in the 2012 CPRA Master Plan and is segmented where canals are present. It is anticipated that this reach would provide the greatest benefit to the northern interior marshlands and would help prevent further fragmentation as a result of storm surge and wave action. It would also rebuild the western and southern shorelines. This phase includes 73.2 acres of new marsh and 20.6 acres of new ridge.

**Funding Strategy and Sources** - This phase of the project may be funded by a combination of CPRA and RESTORE Act Direct Component.

**Projected Costs**

As of October 2017, the total cost for the Central Phase is estimated at $29,700,000. Since engineering and design of the West Phase and East Phase has not been performed, preliminary construction cost estimates
were performed based on recent field data collected for the Bayou La Loutre Ridge Restoration project found in CWPPRA’s PPL 26. Planning, engineering, and design (P/E&D), construction management (CM), and operation and maintenance (O&M) costs were estimated based on construction costs and methodologies outlined in the 2017 State Master Plan. It is important to note that construction costs for the West Phase and East Phase were estimated based upon field data collected for the Central Phase. Additional planning efforts may be required in order to further refine these details.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Length [mi]</th>
<th>Construction w/25% Contingency</th>
<th>P/E&amp;D Management</th>
<th>O&amp;M</th>
<th>Total</th>
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<tbody>
<tr>
<td>West</td>
<td>3.51</td>
<td>$2,400,000</td>
<td>$240,000</td>
<td>$120,000</td>
<td>$3,840,000</td>
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<tr>
<td>East</td>
<td>11.31</td>
<td>$7,712,000</td>
<td>$771,000</td>
<td>$386,000</td>
<td>$12,337,000</td>
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<tr>
<td>Total</td>
<td></td>
<td>$10,112,000</td>
<td>$981,000</td>
<td>$506,000</td>
<td>$16,177,000</td>
</tr>
</tbody>
</table>

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
This project is included in the 2017 State Master Plan and synergizes with the Lake Borgne Marsh Creation project, which was also included in the 2017 Master Plan. The project is also consistent with the MRGO Ecosystem Restoration Plan (2011).

Potential Risks, Mitigation Measures, and Permitting Requirements
Before construction, pipelines will have to be identified. Due to the high probability of encountering archaeological sites, it is also likely that a cultural resource survey will have to be performed. Required permits will include a Coastal Use Permit (CUP) and Section 404 permit. It is not anticipated that this project would cause any adverse impacts to local hydrology, as existing gaps along the ridges would be maintained.

There are known oyster leases in the proposed Central Phase and East Phase. Depending on the source of borrow material and construction methodologies, if impacts to existing oyster leases prove unavoidable, the Oyster Lease Acquisition and Compensation Program will be explored as a means of ensuring that leaseholders are fairly compensated.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
N/A

B. Bayou Terre aux Boeufs Ridge Restoration and Armoring
Map III.2: Bayou Terre aux Boeufs Ridge Restoration and Armoring Project

**Project Priority**
Tier 1

**Current Status**
This project is included in the 2017 State Coastal Master Plan. The armoring component of the Central Reach is currently in engineering and design, an effort that has been funded solely by SBPG. Additionally, the North Phase is pending a USACE CAP 206 funding request.

**Project Location**
Bayou Terre Aux Boeufs, St. Bernard Parish and Plaquemines Parish

**Problem**
The historic Bayou Terre Aux Boeufs Ridge is fading through subsidence, sea level rise, and shoreline erosion due to boat traffic. This critical landform may have also been adversely impacted by the MRGO. Historically, ridges and vegetation have provided natural protection for areas such as Delacroix Island by damping storm surge energy. However, the ridges are now lower and gaps have formed in many places, exposing Delacroix to
storm surge, increased tidal exchange, and scouring. Without restoration measures, these open water areas will continue to expand as the bayou continues to widen, exposing areas further inland to highly erosional forces.

**Previous Planning Efforts**
This project was considered for the MRGO Ecosystem Restoration Plan, but was removed from further consideration after it was determined (perhaps incorrectly) that the negative impacts to existing upland and marsh habitats outweighed the ecosystem benefits that would have been created. Though nominated for CWPPRA in the past, the Technical Committee has never advanced the project. However, the project was approved for inclusion in the 2017 State Master Plan. As part of that planning process, the CPRA expressed concern that raising the Bayou Terre Aux Boeufs Ridge might create a hydrologic barrier, thereby inhibiting the movement of freshwater and sediment to areas targeted for current and proposed diversions. However, SBPG has committed to designing a segmented ridge where hydrologic exchange nodes are present for the purpose of maintaining hydrologic continuity.

**Recommended Solution**
Protecting the remaining ridge in the Central Reach through strategic armoring is the first step towards restoring the entire ridge. Additional armoring in critical areas along the North and South reaches may also be required in future engineering and design efforts. Subsequent to any required armoring, the ridge elevation should be increased/restored using similar methodology proposed for the Bayou La Loutre Ridge Restoration project. Following this methodology, the ridge would be built up using material from bucket dredging the bayou, building into the shallow water of the bayou to minimize impacts on existing healthy marsh. Following construction, 50% of the newly created ridge is to include vegetative plantings.

The three reaches of the project (Central, North, and South) are based on need, cost, and projected benefits. SBPG chose to advance the armoring portion of the Central Reach first due to the observed shoreline erosion occurring in that area and the protection it would afford the existing infrastructure on Delacroix Island.

**Central Reach**
This reach runs along the west bank of Bayou Terre Aux Boeufs throughout the entire length of the existing tidal levee located directly eastward of Delacroix Island, and also includes the intersection of Bayou Gentilly and
Bayou Lery. It includes those portions of the bayou that experience the greatest vessel traffic and shoreline erosion, as measured via historical imagery. This phase is 3.42 miles long and is segmented where canals are present, allowing for hydrologic connectivity to maintain fishery ingress and egress. The armoring effort will not expand upon the existing ridges, but will be built along the existing shoreline and slightly into the bayou in order to minimize any adverse impacts to the ridge vegetation. The armoring will also serve as containment for future ridge restoration efforts.

Due to the different hydrodynamic erosional forces acting on Bayou Terre Aux Boeufs and its intersection with Bayou Gentilly, two different armoring templates are proposed (see below). The erosional forces are stronger at the bayou intersection, necessitating more robust armoring at those locations. This reach includes 22.1 acres of new marsh and 6.2 acres of new ridge.

**Funding Strategy and Sources** – This reach of the project is a good fit for GOMESA and may also be competitive for NRDA and RESTORE Act funding. SBPG’s initial investment in the engineering/design portion of the armoring component will help the parish satisfy any future cost-share requirements.

*Figure III.1: Typical Armoring Design Section for Bayou Terre aux Boeufs*

*Figure III.2: Typical Armoring Design Section for Bayou Gentilly*
North Reach

The North Reach runs along the western shore of Bayou Terre Aux Boeufs from south of Reggio and terminates at the north end of the tidal levee located directly eastward of Delacroix Island. It is 3.19 miles long and is segmented where canals are present, allowing for hydrologic continuity. As a standalone project, the North Reach would serve to rebuild the eroding western shoreline; provide additional erosion protection and reduce potential flooding events along Delacroix Highway; provide greater storm surge protection for communities such as Reggio and Wood Lake; and protect northern interior marshlands from further degradation and saltwater intrusion. Subsequent strategic armoring within critical areas of the reach will be further explored and constructed where deemed necessary and appropriate. This reach includes 20.6 acres of new marsh and 5.8 acres of new ridge.

Figure III.3: Potential Ridge Design Section Template for Bayou Terre aux Boeufs
Funding Strategy and Sources - This reach may be suitable for future CAP 206 requests or CWPPRA nomination via the USACE.

South Reach

The South Reach runs along the western shore of Bayou Terre Aux Boeufs from the termination of the tidal levee at Delacroix Island until the ridge begins to become noticeably less pronounced near Pumpkin and Drum bays. It is 12.61 miles long and is segmented where canals are present, allowing for hydrologic continuity. At this time, no current template for raising and replanting the ridge has been proposed, but the above North Reach section may be instructive. Subsequent strategic armoring within critical areas of the reach will be further explored and constructed where deemed necessary and appropriate. It is anticipated this reach would provide benefits to the northern interior marshlands and help prevent further fragmentation as a result of storm surge and wave action. This reach includes 81.6 acres of new marsh and 22.9 acres of new ridge.

Funding Strategy and Sources - This reach is currently the subject of a CAP 206 funding request. Should the CAP 206 funding not gain approval, future CWPRRA nomination via the USACE would be a viable alternative.

Projected Costs
Preliminary construction cost estimates for the project were based on data developed for the Bayou La Loutre Ridge Restoration project (CWPPRA PPL 26). P/E&D, CM, and O&M cost estimates are based on estimated construction costs and were prepared using methodologies outlined in the 2017 State Master Plan. It is important to note that construction costs were estimated using recent bathymetry collected for the Bayou La Loutre Ridge Restoration project. Future E&D will require updated, project-specific
bathymetry to refine the estimates. Project cost estimates for the armoring of the Central Reach are based on recent bathymetric data and projected unit quantities.

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<th>Construction Management</th>
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<td>$861,000</td>
<td>$431,000</td>
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<td></td>
<td><strong>32,443,000</strong></td>
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</table>

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
This project is included in the 2017 CPRA Coastal Master Plan and is adjacent to the Breton Marsh Creation project footprint. Additionally, the project connects with Coastal Impact Assistance Program (CIAP) project BS-17 (Lake Lery Marsh Creation Phase 1); abuts the boundaries of BS-17 to the north and south along Bayou Terre Aux Boeufs; and is consistent with other ridge restoration concepts found in the 2017 State Master Plan, the LPBF Multiple Lines of Defense Strategy, and the MRGO Ecosystem Restoration Plan. It also is a critical component of the Delacroix Island Resiliency Plan, as outlined in Appendix B.

Potential Risks, Mitigation Measures, and Permitting Requirements
The largest risk associated with the project is the mitigation that may be required for any adverse impacts to existing wetlands. Before construction, pipelines will also have to be identified. Due to the high probability of encountering archeological sites, a cultural resource survey may have to be performed. Required permits include a CUP and Section 404 permit. It is not anticipated that this project would cause any adverse impacts to local hydrology, as existing gaps along the ridges would be maintained, allowing sediment and freshwater from the Caernarvon Diversion to reach the area.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
This ridge was not directly impacted by the Deepwater Horizon oil spill. However, protection and restoration of the ridge will provide habitat for wildlife species impacted by the event, including Neotropical migrants and colonial waterbirds.
C. Chandeleur Islands Maintenance and Re-vegetation

Map III.3: Chandeleur Islands

Project Priority
Tier 1

Current Status
SBPG submitted this project to the LATIG for NRDA funding consideration in September 2017. The LATIG is currently reviewing the proposal (see Appendix B). SBPG is also in the process of commissioning a study to explore the benefits and costs associated with creating an additional barrier island chain further inland.

Project Location
Chandeleur Islands and Chandeleur Sound, St. Bernard Parish

Problem
The cumulative effects of natural degradation and extreme weather events over the past two decades have caused grave concern regarding the long-term sustainability of the Chandeleur Islands (Fitzgerald et al. 2015). A number of studies have suggested that the islands may become
subaqueous within the next two hundred (200) years (Suter et al. 1988; Penland et al. 1988). At least one study has projected that the island chain is in danger of being reduced to a set of shallow shoals as early as 2037 (Fearnley et al. 2009). Although the BP Oil Spill caused severe damage to the Chandeleur Islands in 2010, similar events are unlikely to occur in the future. However, the oil spill’s lingering effects on vegetation along the island chain may compromise the ecosystem’s resilience to future tropical weather events, which remain the greatest and most persistent threat to the sustainability of the islands (Fearnley et al. 2009).

Barrier island landforms such as the Chandeleur Islands have the capacity to naturally regenerate. In fact, a number of recent studies have confirmed the occurrence of natural barrier rebuilding along the island chain (Kulp et al. 2007; Fitzgerald et al. 2015). However, sustainable rebuilding must be supported not only by natural barrier island aggradation, but also re-vegetation (Fitzgerald et al. 2015). The proposed project is intended to facilitate natural barrier island aggradation by fostering sediment retention and the acceleration of re-vegetation along the most vulnerable reaches of the Chandeleur Islands.

**Previous Planning Efforts**
The Chandeleur Islands have garnered surprisingly little attention over the past several decades despite the release of several major coastal restoration plans in Louisiana. Such plans include Coast 2050: Toward a Sustainable Coastal Louisiana (Coast 2050) (Louisiana Department of Natural Resources 1998) and multiple iterations of the State Master Plan (Louisiana CPRA 2007, 2012 & 2017). The only two notable restoration projects to have been implemented along the Chandeleur Islands during this same time period include a vegetative planting in 2001 and the construction of an emergency berm in response to the Deepwater Horizon oil spill (2010).

**Recommended Solution**
After decades of research and planning, it is now imperative that coastal stakeholders take decisive action with respect to protecting and restoring the Chandeleur Islands. Furthermore, new funding streams such as NRDA and NFWF have provided opportunities that are unlikely to be available again in the foreseeable future. SBPG proposes the development and implementation of a project that applies lessons learned from previous barrier island restoration efforts and the best current available science. The overarching purpose of the proposed project is to enhance the resilience of the Chandeleur Islands and sustain their ecological and physical functionality. In the interim, SBPG is also in the process of
commissioning a study to explore the benefits and costs associated with creating an additional barrier island chain further inland.

The proposed project consists of four distinct strategic interventions: (1) re-vegetation from the wrack line to the foredune of the islands; (2) installation of sand fencing and vegetation form behind the sand fence to the barrier flats; (3) re-vegetation along the back bay flat to the intertidal zone of the islands; and (4) re-establishment of marsh-elder (*Iva frutescens*) and seashore-elder (*Iva imbricata*) on existing dunes that are +5 feet in height. Sand Live Oak may also be installed on the dunes at a later date. The cumulative benefits of these interventions will be the facilitation of sand retention and the promotion of accretion on the Chandeleur Islands, which will sustain habitat, encourage biodiversity and maintain the islands as a barrier to storm surge. No dredging is proposed in conjunction with the proposed project.

1.) Wrack Line to foredune:
Railroad Vine (*Ipomea pes-caprae*) - 1,304 plants, 40 ft. spacing for a total length of 52,170 ft.

Bitter Panicum (*Panicum amarum*) - 21,138 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.

Marsh-hay Cordgrass (*Spartina patens*) - 21,138 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.

2.) Sand Fence to barrier flats:
Sand Fence - 52,170 ft. in total length.

Gulf Bluestem (*Schizachyrium maritimum*) - 20,868 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.

Seashore Paspalum (*Paspalum vaginatum*) - 13,865 plants in double rows, 5 ft. spacing for a total length of 34,663 ft.

3.) Back bay flats to intertidal zone:
Salt Grass (*Distichlis spicata*) - 9,178 plants in double rows, 5 ft. spacing for a total length of 22,947 ft.

Smooth Cordgrass (*Spartina alterniflora*) - 39,222 plants in double rows, 5 ft. spacing for a total length of 98,056 ft.

4.) Existing dunes of +5 ft. in height:
Marsh-elder (Iva frutescens) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

Seashore-elder (Iva imbricata) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

Sand Live Oak (Quercus geminata) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

**Projected Costs**

The total estimated budget for the proposed project is $3.5 million. The preliminary budget consists of two primary components: sand fencing and vegetation.

**Sand Fencing:** (52,170 linear feet) (Materials; equipment; labor; lodging) $2,500,000

**Vegetation:** (Please see the above quantities for each species) (Materials; equipment; labor; lodging) $1,000,000*

Since the project will occur at remote locations, it is likely that installation crews will stay near the islands overnight. Consequently, lodging has been factored into the preliminary budget.

* Vegetation estimate is based on $10/unit for woody species and $4/unit for other species.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**

The 2017 State Master Plan does not include any specific projects for the Chandeleur Islands. However, the CPRA does express its commitment to “developing a plan for barrier islands that identifies sources of sand and addresses environmental considerations so that shorelines can be rapidly restored...” (CPRA 2017, 43) The plan also acknowledges the State of Louisiana’s history of investment in barrier island restoration and reaffirms the State’s commitment “to invest in rebuilding these features,” including the designation of $1.5 billion to fund a barrier island program in the future (CPRA 2017, 87 & 88).

**Potential Risks, Mitigation Measures, and Permitting Requirements**

Previous planning and restoration efforts on the Chandeleur Islands have been generally limited due to a lack of funding and the threat of tropical weather in the chain’s fragile coastal environment. However, lessons learned from previous restoration efforts coupled with the best current
available science may provide new opportunities to sustain the Chandeleur Islands and preserve their functionality as a habitat for wildlife and a buffer to storm surge. New sources of funding for coastal restoration in Louisiana also make the protection and restoration of the islands more feasible than ever.

Since the proposed project is largely a nature-based solution, mitigation and permitting requirements would be minimal. However, it is worth noting that a number of federal designations provide a level of legal protections along the island chain that would require a significant level of coordination with the US Department of the Interior and other stakeholders.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**

In response to the Deepwater Horizon Spill, the State of Louisiana proposed the construction of a 100-mile long berm on the Gulf side of the Chandeleur Islands (Fitzgerald et al. 2015). The purpose of the proposed project was to capture oil on the artificial berm before it reached the islands. The USACE approved the construction of four sections of the proposed berm, which ultimately resulted in the dredging and installation of 3.7 million cubic meters of material along the Gulf side of the Chandeleur Islands.

Since oil had already reached the barrier island chain prior to project completion, the emergency berm did not perform well in terms of keeping oil off the Chandeleur Islands (Fitzgerald et al. 2015, 20). However, the enormous amount of material dredged for the project did serve the purpose of temporarily nourishing island beaches. As with other nourishment efforts on the Chandeleur Islands, the dredged material was gradually displaced by normal wave action and acute tropical events, including Hurricane Isaac (2012). But it is worth noting that some of the displaced material was redistributed offshore and alongshore, thereby continuing to provide physical and ecological value in the Chandeleur Island system. The proposed project is aimed at maximizing the potential of capturing displaced material for the purpose of generating land mass and habitat.

**Funding Strategy and Sources** - This project is currently under consideration for NRDA funding.
D. Breton Marsh Creation

Map III.4: Breton Marsh Creation Polygon

Project Priority
Tier 1

Current Status
This project is included in the 2017 State Coastal Master Plan and portions of the polygon are currently being considered for funding via CWPPRA.

Project Location
Delacroix, St. Bernard Parish

Problem
Due to subsidence, saltwater intrusion, decreased sediment supply, oil and gas activity, and relative sea level rise, approximately 39 square miles of marsh around the upper and central portions of Breton Sound were converted to open water (USGS Open File Report 2006-1274). Continued degradation of these marshes further expose existing infrastructure to open water conditions, thus decreasing protection from future hurricanes and flooding for communities such as Delacroix and Reggio.
Previous Planning Efforts
This project was analyzed, but not selected for inclusion in the 2012 State Master Plan. However, select areas were included in the approved 2017 State Master Plan and portions of the approved polygon were submitted for consideration during the CWPPRA PPL 27 process but did not advance.

Recommended Solution
The proposed project would create and nourish approximately 12,000 acres of marsh. Due to the size of the polygon, it is recommended that the project be split into many phases, with projected need and benefits serving as the order of design and construction. Lake Lery and Lake Borgne are currently the most cost effective borrow sites for the project. However, other borrow sources (i.e. Mississippi River, offshore deposits, etc.) may be identified through a comprehensive planning and feasibility effort.

Projected Costs
Based on preliminary estimates generated in the 2017 State Master Plan, it is estimated that this project would cost approximately $982,400,000 for the entire 12,000-acre polygon. However, significant savings could be accomplished with the creation of a sediment pipeline connecting to the Mississippi River, as identified on page 50 of the Coastal Strategy Document.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
This project is included in the 2017 State Master Plan and synergizes with nearby projects such as Bayou Terre Aux Boeufs Ridge Restoration.

Potential Risks, Mitigation Measures, and Permitting Requirements
The proposed project would require a CUP and may cross existing oil/gas pipelines in the area.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
N/A

Funding Strategy and Sources – Some portions of the polygon have already been nominated for CWPPRA, although none advanced in 2017. The RESTORE Act may also be a suitable funding source for the proposed project(s).
E. Lake Borgne Marsh Creation

Map III.5: Lake Borgne Marsh Creation Polygon

Project Priority
Tier 1

Current Status
This project is included in the 2017 State Master Plan. Increment 1 (1,550 acres) of CPRA’s Lake Borgne Marsh Creation project (PO-180) was selected in the Final Restoration Plan and is currently in engineering and design.

Project Location
Lake Borgne, St. Bernard Parish

Problem
The landform separating Lake Borgne and the MRGO has undergone both interior and shoreline wetland loss due to subsidence, storm events, historic use of the MRGO prior to deauthorization (i.e., deep draft vessel traffic), and wave fetch. Although much of the project area is now protected from edge erosion by rock dike features, interior wetland loss
attributed to subsidence continues to cause marsh fragmentation and open water conversion.

**Previous Planning Efforts**
The project was considered for the MRGO Ecosystem Restoration Plan. A portion of Increment 1 was previously nominated and selected for CWPPRA. However, this area has since been absorbed into the Increment 1 component of the LATIG version of the project. Select areas included in the State Master Plan project footprint have been submitted for federal funding through CWPPRA, although none have advanced.

**Recommended Solution**
The proposed project would create and nourish approximately 5,900 acres of marsh. Due to the size of the project polygon, it is recommended that the project be split into many phases, with projected need and benefits serving as the order of design and construction. Lake Borgne is currently the most cost effective borrow site for the project. However, other borrow sources (i.e. Mississippi River, offshore deposits, etc.) may be identified through a comprehensive planning and feasibility effort.

**Projected Costs**
Based on preliminary estimates generated in the 2017 State Master Plan, it is estimated that the entire project would cost approximately $271,700,000. However, significant savings could be accomplished with the creation of a sediment pipeline connecting to the Mississippi River, as identified on page 50 of the Coastal Strategy Document.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
This project is included in the 2017 State Master Plan and synergizes with nearby projects such as the Bayou La Loutre Ridge Restoration, New Orleans East Landbridge Restoration, and Golden Triangle Marsh Creation.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
The proposed project would require a CUP and may cross existing oil/gas pipelines in the Lake Borgne area.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources** - $3.17M in NRDA funding was approved for engineering and design (Increment 1 only) in January 2015.
F. Lake Lery Marsh Creation and Rim Restoration

Map III.6: Lake Lery Marsh Creation and Rim Restoration Project

Project Priority
Tier 1

Current Status
Phase 1 is complete; Phase 2 is being funded via the RESTORE Act Direct Component and the CPRA’s Parish Matching Program; and a funding source has not been identified for Phase 3.

Project Location
Lake Lery, St. Bernard Parish and Plaquemines Parish

Problem
Hurricane Katrina heavily damaged much of the shoreline of Lake Lery and the surrounding wetlands in 2005. In the years following this storm, wind-induced waves within the lake have begun to cause further damage to the lake’s already eroded shorelines, with the northwestern edge seeing the greatest rate of shoreline retreat. Currently, the northwestern shoreline has become so damaged that the interior emergent marshes that are still intact
are being exposed to damaging waves, further exacerbating the loss of emergent marsh habitat. Even with the benefits of the Caernarvon Diversion, marshes may not be able to fully recover absent a significant marsh creation effort. Additionally, the most eastern reaches of Lake Lery near the western levee of Bayou Terre Aux Boeufs and Delacroix have faded throughout the years and nourishment is required to protect vital infrastructure in adjacent communities.

Previous Planning Efforts
Recent restorations efforts include the South Lake Lery Shoreline and Marsh Restoration project (BS-16) and the Lake Lery East Shoreline and Marsh Restoration project (Phase 1) (BS-17), which are now both constructed. Initially, BS-17 was intended to include two restoration sites, with the southern site totaling approximately 68 acres (Phase 1) and the northern site totaling approximately 30 acres (hereafter referred to as Phase 2). However, due to funding limitations, only Phase 1 has been constructed.

Recommended Solution
Building from the methodologies incorporated in BS-16 and BS-17, this project includes the dredging of material from Lake Lery and pumping the material into contained marsh creation cells along the northwest and eastern reaches of the Lake Lery shorelines. Due to funding and need (based on erosion rates), it is recommended to split the projects into distinct phases, with cost, need, and projected benefits dictating the order of construction. Based on design elements and projected costs, the project was broken down into the following additional phases.

Phase 2
Phase 2 would restore areas near the western natural levee of Bayou Terre Aux Boeufs and continues from the northern extent of BS-17. It extends the northern area of restoration of BS-17 to coincide with the current tidal levee found on the eastern side of Bayou Terre Aux Boeufs and would create approximately 30 acres of marsh while nourishing an additional 10 acres. Unlike Phase 3, it is not anticipated that a shoreline embankment or alternative shoreline protection scheme would be required due to the relatively sheltered location of the area. Geotechnical surveys, planning, and engineering/design have already been performed for the majority of this site, and appropriate permits describing the usable borrow areas and piping corridors are already approved (P20141578). Construction activities are set to begin in late 2018.

Phase 3
Phase 3 encompasses the northwestern part of Lake Lery, an area that has recently been subjected to the greatest extent of shoreline retreat. The shoreline embankment of this phase, required to prevent damage to the proposed marsh creation cell, runs parallel to the shoreline for 2.42 miles from the Plaquemines Parish and St. Bernard Parish boundary, terminating at the intersection of the remaining Eighty Arpent Canal southern bank. The embankment would be created out of material dredged from Lake Lery and have a 50-ft. crown width and a height of 3 ft. The lake side of the shoreline would have a gentle 5:1 embankment slope, which will provide a broader surface area to establish and support smooth cordgrass and bullwhip plantings, and to reduce wave impact erosion. The backside marsh-side slope of the shoreline embankment would be 4:1 to reduce the volume of fill material required while also providing adequate slope stability and bearing capacity.

Included in Phase 3 is the creation of 177 acres of marsh and the nourishment of an additional 209 acres from near the edge of the embankment to approximately 1,500 ft. behind the existing shoreline. Gaps would be placed throughout the marsh cells as needed in order to promote hydraulic conductivity between Lake Lery and the interior marsh.

**Projected Costs**

Preliminary construction cost estimates were performed based on recent field data and project bids collected for projects BS-16 and BS-17. P/E&D, CM, and O&M costs were estimated based on estimated construction costs and were prepared using methodologies outlined in the 2017 State Master Plan.

<table>
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<th>P/E&amp;D</th>
<th>Construction Management</th>
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<td></td>
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**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**

This project is consistent with BS-16 (South Lake Lery Shoreline and Marsh Restoration), which restored the shorelines and created marsh along the western and southern boundaries of Lake Lery; BS-17 (Lake Lery Rim Establishment and Marsh Creation), which was designed to provide net benefits to the southeastern portion of the Lake Lery shoreline; Bayou Terre Aux Boeufs Ridge Restoration, which prevents Bayou Terre Aux Boeufs from eroding along the western shoreline; and the Breton Marsh Creation
polygon, which has been included in the 2017 State Master Plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
Geotechnical concerns relative to the ability of the borrow to stack and hold in place to contain the slurry will have to be addressed as part of the engineering/design process. There are pipelines in the immediate vicinity of the projects, so pipeline right-of-way agreements will need to be performed. Finally, required permits include a CUP and Section 404 permit, as well as a cultural resources survey.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources** – Funding has not been identified for Phase 3. However, CWPPRA may be a viable source of future funding. Additionally, the RESTORE Act and/or Parish/State GOMESA funding may be an option.
**G. Golden Triangle Marsh Creation**

*Map III.7: Golden Triangle Marsh Creation Polygon*

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**Project Priority**

Tier 1

**Current Status**

This project is included in the 2017 State Coastal Master Plan and is one of five projects included on the Funded Priority List by the Gulf Coast Ecosystem Restoration Council. Currently, engineering/design of approximately 600 acres is being funded via the RESTORE Act.

**Project Location**

Golden Triangle, St. Bernard Parish and Orleans Parish

**Problem**

The Golden Triangle is a narrow band of brackish marsh directly east of New Orleans between Lake Borgne and the confluence of the MRGO and Gulf Intercostal Waterway (GIWW). Since the Inner Harbor Navigation Canal – Lake Borgne Surge Barrier stretches across the Golden Triangle Marsh, these wetlands serve as an important natural buffer in the multiple...
lines of defense protecting St. Bernard Parish and New Orleans from storm surge. Additionally, the Golden Triangle Marsh falls within the acquisition boundary of the Bayou Sauvage National Wildlife Refuge, one of the last remaining marsh areas adjacent to Lake Pontchartrain and Lake Borgne (U.S. Fish and Wildlife Service 2009). The Golden Triangle Marsh is being lost due to subsidence, storm events, and saltwater intrusion caused largely by the MRGO. Over time, the marsh interior has been breaking up, forming new areas of open water and increasing connectivity with Bayou Bienvenue and the GIWW.

**Previous Planning Efforts**
The subject marsh creation polygon was officially identified in the 2007 State Master Plan and has since undergone technical analysis by the USACE and CPRA as part of the MRGO Ecosystem Restoration Plan. The project currently has a signed USACE Chief’s Report and a completed programmatic environmental impact statement (EIS). Portions of the polygon have been nominated for CWPPRA funding as far back as 2012.

**Recommended Solution**
The 2017 State Master Plan version of the project would create and nourish approximately 3,900 acres of marsh. Due to the large scale and size of the project footprint, the project has been divided into smaller phases, with immediate need and projected benefits serving as the order of design and construction. Lake Borgne is currently the most cost effective borrow site for the project. However, other borrow sources (i.e. Mississippi River, offshore deposits, etc.) may be identified through a comprehensive planning and feasibility effort.

**Projected Costs**
Based on preliminary estimates generated in the 2017 State Master Plan, it is estimated this project would cost approximately $273,700,000. However, significant savings could be accomplished with the creation of a sediment pipeline connecting to the Mississippi River, as identified on page 50 of the Coastal Strategy Document.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
This project is included in the 2017 State Master Plan and synergizes with nearby projects such as New Orleans East Landbridge Restoration and Lake Borgne Marsh Creation (Increment 1).

**Potential Risks, Mitigation Measures, and Permitting Requirements**
The proposed project would require a CUP and a Section 404 permit. Existing oil/gas pipelines in the Lake Borgne area may pose challenges
during the permitting process.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**

N/A

**Funding Strategy and Sources** - $3.2 million in State RESTORE Act funding was approved for engineering/design of the initial phase in 2016. It is anticipated that State RESTORE Act funds will also be used for construction of the initial phase.
H. East Bank Sediment Pipeline

Map III.8: Potential East Bank Sediment Pipeline Corridor and Associated Marsh Creation Polygons

**Project Priority**
Tier 1

**Current Status**
SBPG and Plaquemines Parish Government may fund the preliminary design and analysis portion of the project.

**Project Location**
St. Bernard Parish and Plaquemines Parish

**Problem**
New sources of sediment are needed for marsh creation projects in St. Bernard and Plaquemines parishes. The 2017 State Master Plan includes 6 large-scale marsh creation projects between the east bank of the Mississippi River and the MRGO. These projects will create approximately 26,000 acres of marsh at a cost of $1.1 billion. It is critical that renewable and out-of-system sediment sources are identified and accessed to the extent
possible since available material from Breton Sound will be insufficient to meet overall demand. Furthermore, dredging and deepening waterways around the Breton Sound may worsen storm surge and wave-induced erosion. Fortunately, the referenced large-scale marsh creation projects are relatively close to the Mississippi River, creating an opportunity for a long-distance sediment pipeline corridor to be established on the East Bank of the river.

Previous Planning Efforts
CPRA has already successfully transported sediment over 26 miles from the Mississippi River to project sites located on the West Bank of Plaquemines Parish and in Jefferson Parish. A feasibility study for transporting sediment over 40 miles from the Atchafalaya River to project sites in Terrebonne Parish is also currently underway.

Recommended Solution
The preliminary design and analysis portion of the East Bank Sediment Pipeline project will include a thorough review of available historical, technical, and scientific literature generated by CPRA and others. The effort will also include an analysis of existing and available topographic and bathymetric surveys; river stage and current data; geotechnical, geomorphological and geophysical information; data from various journals and reports (proprietary and governmental); reports from consultants; and reports from universities and governmental agencies, including the US Geological Survey, USACE, NOAA, and others. Additional information reviewed will include existing and available environmental and physical features, including pipelines; oil and gas infrastructure; navigation rights-of-way; cables; wrecks; artificial reefs; oyster leases; and any other objects or boundaries that may impact potential borrow sites, access corridors, and long-distance sediment pipeline operations in the project area.

Potential riverine borrow area boundaries will be delineated and the expected volume and characteristics of sediment available for dredging will be calculated. Known submerged pipelines and utilities in the proposed project footprint must also be identified. The effort will include an analysis of using induced river shoaling expected from the Mid-Breton and Mid-Barataria Sediment Diversions as sources of sediment for the East Bank Sediment Pipeline. There will also be analysis of the availability and type of dredges currently performing work in the Mississippi River for the purpose of identifying the most current information on dredging technology.

The above analyses should yield a number of preferred locations and geometries for potential riverine borrow areas. Likewise, the analyses will
inform decisions regarding a potential pipeline corridor and the location of other associated infrastructure. Finally, it is understood that some borrow areas are already identified for use on other 2017 State Master Plan projects, so the replenishment and sequencing of their utilization will be accounted for accordingly.

**Projected Benefits**
The East Bank Sediment Pipeline has the potential to service multiple large-scale marsh creation projects, ultimately making implementation faster and cheaper. The project would also benefit the immediate non-critical infrastructure (i.e., minor oil and natural gas facilities).

**Projected Costs**
The preliminary design and analysis portion of the project is projected to cost $1,355,000 and may be cost-shared between SBPG and Plaquemines Parish Government. Engineering/design and construction costs will ultimately depend on the initial findings and the chosen course of action.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
The proposed project may support many of the large-scale marsh creation projects included in the 2017 State Master Plan, particularly those located in St. Bernard Parish and the East Bank of Plaquemines Parish.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
Due to the nature of this project, environmental and cultural impact assessments must be performed. It is likely that jurisdictional wetland determinations will be required for pipeline placement, work zones, and project fill areas where applicable. A CUP and Section 408 permit would be required, and mitigation requirements may be considerable. Finally, the size and scope of the proposed project would require extensive coordination with landowners.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
The project would provide a cost-effective source of sediment for a multitude of project locations impacted by the Deepwater Horizon oil spill.

**Funding Strategy and Sources** – The preliminary design and analysis portion of the project may be fully funded ($1.355 million) by SBPG and Plaquemines Parish Government.
I. Point aux Marchettes Shoreline Protection and Marsh Terracing

Map III.9: Point aux Marchettes Shoreline Protection and Marsh Terracing Project

Project Priority
Tier 1

Current Status
The project was submitted for consideration under CWPPRA PPL 26 (2016) and PPL 27 (2017) but did not advance.

Project Location
Biloxi Marsh Complex, St. Bernard Parish

Problem
Historic wetland loss in the area has been caused mainly by shoreline erosion. Based on a hyper-temporal analysis conducted by USGS to detect land change trends from 1985 to 2016, the interior loss rate for the Biloxi Marsh area was calculated to be 0.53 %/yr. Using maps from 1998 and 2013, Lake Borgne shoreline erosion rates were calculated along the Biloxi Marsh Wildlife Management Area (specifically in the vicinity of Point aux
Marchettes). Shoreline erosion rates in that area ranged from 10 ft./yr. to 90 ft./yr. A 30,000 LF section of shoreline was estimated to have an average erosion rate of 26 ft./yr. It is estimated that without the project there would be over 260 acres lost due to shoreline erosion. The shoreline along the subject area is particularly valuable because it protects approximately 500 acres of marsh in the Biloxi Marsh Wildlife Management Area and serves as critical habitat for a number of wildlife species.

**Previous Planning Efforts**
The project is included in the BMLC Restoration Plan.

**Recommended Solution**
The proposed project would: (1) protect approximately 30,000 feet of critical shoreline; (2) protect approximately 260 acres of highly productive brackish marsh habitat; and (3) create 7,000 LF of terraces (3 acres of marsh). Additionally, the project would create or improve habitat for rare species, species of concern, and threatened and endangered species.

**Projected Costs**
Based on preliminary estimates generated under CWPPRA PPL 27, it is estimated this project would cost approximately $42.5 million, including 25% contingency.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
The proposed project is consistent with the 2012 State Master Plan (which included the construction of 57,000 ft. of rock breakwaters along the eastern shore of Lake Borgne) and other regional and local coastal restoration efforts such as Lake Borgne Shoreline Protection (PO-30). This project, combined with the Central and East phases of Bayou La Loutre Ridge Restoration to the south and Breton Marsh Creation efforts to the west, would help create a buffered environment for much of the Biloxi Marsh Complex. However, the project was not included in the 2017 State Master Plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
The proposed project would require a CUP.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources** - This project did not advance under CWPPRA in 2017. The Parish will likely have to fund this project directly.
J. Central Wetlands Marsh Creation

*Map III.10: Central Wetlands Marsh Creation Polygon*

**Project Priority**
Tier 1

**Current Status**
This project is included in the 2017 State Master Plan.

**Project Location**
Central Wetlands Unit, St. Bernard Parish and Orleans Parish

**Problem**
Before the construction of the MRGO, the Central Wetlands Unit (CWU), a 29,140-acre semi-impounded marsh, was made up of a combination of bald cypress and water tupelo swamps, in addition to fresh marsh and bottomland hardwood forests. Historically, the CWU provided natural storm surge protection to parts of Orleans Parish and St. Bernard Parish. However, as a result of the MRGO construction, sea-level rise, subsidence, and recent storm events, much of the area has turned into open water and ghost swamps, with increased salinities in the surface water and soil.
Previous Planning Efforts
A two-year study conducted by LPBF (Recommendations for Restoration: CWU, Louisiana) concluded in July 2015, where bathymetric, surface salinity, soil salinity and vegetation data were collected in the CWU and a series of recommendations for the restoration of the area were developed. Marsh creation in the subject polygon was later modeled and included in the 2017 State Master Plan.

Recommended Solution
The proposed project would create and nourish approximately 2,800 acres of marsh. Due to the scale and size of the project footprint, the project has been divided into smaller phases, with immediate need and projected benefits serving as the order of design and construction. Lake Borgne is currently the most cost effective borrow site for the project. However, other borrow sources (i.e. Mississippi River, offshore deposits, etc.) may be identified through a comprehensive planning and feasibility effort.

Projected Costs
Based on preliminary estimates generated in the 2017 State Master Plan, it is estimated this project would cost approximately $122,300,000. However, significant savings could be realized with the creation of a sediment pipeline connecting to the Mississippi River, as identified on page 50 of the Coastal Strategy Document.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
This project is included in the 2017 State Master Plan and synergizes with nearby projects such as New Orleans East Landbridge Restoration and Golden Triangle Marsh Creation.

Potential Risks, Mitigation Measures, and Permitting Requirements
The proposed project would require CUP and a Section 404 permit.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
N/A

Funding Strategy and Sources – The most likely funding sources for the project are CWPPRA or NRDA.
IV. Tier 2 Coastal Activity Fact Sheets

Each coastal activity fact sheet includes the following baseline information:

- Project Priority
- Current Status
- Project Location
- Problem
- Previous Planning Efforts
- Recommended Solution
- Projected Benefits
- Projected Costs
- Consistency with CPRA Master Plan and other Ongoing Regional Efforts
- Potential Risks, Mitigation Measures, and Permitting Requirements
- Restoration of Areas Impacted by the Deepwater Horizon Oil Spill
- Funding Strategy and Sources
A. Louisiana Highway 300 Coastal Infrastructure Resilience

Map IV.1: Louisiana Highway 300 Coastal Infrastructure Resilience Project

Project Priority
Tier 2

Current Status
The project was submitted for consideration under CPRA’s GOMESA Coastal Infrastructure Program. However, the program has since been suspended.

Project Location
Reggio and Delacroix, St. Bernard Parish

Problem
Saltwater intrusion, erosion, and subsidence have devastated the marine environment near Delacroix. Such impacts have been exacerbated by oil and gas activities in the area, including the excavation of pipeline canals. LA 300 is now frequently flooded by Bayou Terre Aux Boeufs during high tide and storm events, placing both the community and local economy at risk. The highway is the only means of ingress/egress for residents,
fishermen and others. Residents of Delacroix are essentially trapped in their homes when the highway is flooded. Additionally, commercial and recreational fishermen are unable to access their boats or transport their landings when there is water on LA 300.

**Previous Planning Efforts**

In an effort to increase the resilience of Delacroix Highway, the Louisiana Department of Transportation and Development (DoTD) recently completed a highway elevation project from Reggio to Delacroix. To complement this effort, SBPG is proposing that DoTD, CPRA, and SBPG work together to enhance the current DoTD project.

**Recommended Solution**

The proposed project includes the strategic installation of interlocking sheet pilings in Bayou Terre aux Boeufs along the western shoulder of LA 300. This intervention offers an excellent opportunity to increase the long-term sustainability of the highway while decreasing future maintenance costs.

**Projected Costs**

SBPG estimates that securing a 20-year bond for the total probable construction cost ($24,125,917) would add $10,449,574 to the total project cost, bringing the grand total to $34,575,491 (see the full project proposal in Appendix B).

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**

The proposed activity is not explicitly included in the 2017 State Master Plan. However, the project constitutes an eligible activity as per the CPRA’s GOMESA Coastal Infrastructure program. It is also consistent with recent DoTD efforts to increase the resilience of coastal highways, including LA 300.

**Potential Risks, Mitigation Measures, and Permitting Requirements**

All project features would be designed and constructed in accordance with DoTD standards. The proposed project would require a CUP.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**

N/A

**Funding Strategy and Sources** - Funding for this project has been requested under the CPRA’s GOMESA Coastal Infrastructure program. However, the program has since been suspended.
B. Delacroix Fishing Complex

Image IV.1: Delacroix Fishing Complex Rendering

Project Priority
Tier 2

Current Status
Phase 1 (fishing pier, restrooms, and parking lot) of the Delacroix Fishing Complex is complete. Subsequent phases will include a boat hoist and dry dock facility.

Project Location
Delacroix, St. Bernard Parish

Problem
Recreational fishing piers are needed in St. Bernard Parish in order to provide a space for locals and tourists to fish and enjoy the natural environment while remaining a safe distance from area highways. Deficiencies in recreational fishing infrastructure have had the effect of limiting economic opportunities in St. Bernard Parish.
Previous Planning Efforts
SBPG outlined a vision for sustaining the parish’s unique cultural and economic resources in its 2012 Coastal Zone Management Program Document. Goals set forth in this document include:

Promoting recreational facilities in the wetlands through the development of facilities such as parks and boat launches; and

Supporting environmentally sound economic uses with special emphasis on sustainable multiple-use of waterfront areas. (Coastal Environments, Inc. 2012)

Similar projects were later included in the previous version of the Coastal Strategy Document (2016) and the SBPG RESTORE Act MiP (2017).

Recommended Solution
The proposed fishing complex would service Delacroix, a historic and popular fishing destination. The pier would be available for recreational fishing activities and other community events, including boat blessings. The hoist and dry dock would be available to service the needs of commercial fishermen, offering them an opportunity to dry dock and repair their vessels without travelling outside of the parish.

Projected Benefits
This project would promote recreational fishing and tourism in eastern St. Bernard Parish while also servicing the needs of the commercial fishing industry.

Projected Cost
$2,000,000

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
Two of the stated objectives outlined in the 2012 and 2017 State Master Plans are to sustain cultural heritage and promote a working coast. The CPRA defines these objectives as follows:

Cultural Heritage: Sustain, to the extent practicable, the unique cultural heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment; and
**Working Coast:** Promote a viable working coast to support regionally and nationally important businesses and industries.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
Some project components will be constructed over the water, thereby requiring a CUP. Other components will be implemented on the dry side of LA 300 and will require minimal local permitting.

** Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
Following the Deepwater Horizon oil spill, the seafood industry in St. Bernard Parish was decimated. The proposed project would promote both commercial and recreational fisheries in St. Bernard Parish and contribute to the ongoing recovery of the local seafood industry.

**Funding Strategy and Sources** - Phase 1 of the project was funded solely by SBPG. It is anticipated that SBPG will also be the sole funding source for all subsequent phases.
C. Shell Beach Fishing Complex at the Katrina Memorial

Map IV.2: Proposed Shell Beach and Hopedale Fishing Complex Locations

Project Priority
Tier 2

Current Status
SBPG has completed a preliminary design and site plan for the proposed project. The project has also been included in the updated SBPG RESTORE Act MIP (2017).

Project Location
Shell Beach, St. Bernard Parish

Problem
Recreational fishing piers are needed in eastern St. Bernard Parish in order to provide a space for locals and tourists to safely fish and/or enjoy the natural environment while remaining a safe distance from area highways. This deficiency has had the effect of limiting economic opportunities in eastern St. Bernard Parish.
Previous Planning Efforts
SBPG outlined a vision for sustaining the parish’s unique cultural and economic resources in its 2012 Coastal Zone Management Program Document. Goals set forth in this document include:

Promoting recreational facilities in the wetlands through the development of facilities such as parks and boat launches; and

Supporting environmentally sound economic uses with special emphasis on sustainable multiple-use of waterfront areas. (Coastal Environments, Inc. 2012)

Similar projects were later included in the previous version of the SBPG Coastal Strategy Document (2016) and SBPG RESTORE Act MIP (2017).

Recommended Solution
The proposed project includes the construction of a recreational fishing complex in Hopedale. Site selection for the improvements is ongoing and will be based on the location and availability of waterfront property and the likelihood of public utility and economic benefits. Once site selection is finalized and the project is designed and constructed, SBPG believes the improvements will be invaluable tools for the promotion of ecotourism and the consumption of Gulf seafood in eastern St. Bernard Parish.

Projected Benefits
The objective of the proposed project is to design and construct a recreational fishing pier and public seafood market/pavilion complex in Hopedale. The fishing pier and public seafood market/pavilion complex would include a dock, covered pavilion, restroom, and parking lot. Once constructed, the facilities would be operated and maintained by SBPG in perpetuity for the purpose of enhancing economic opportunities in eastern St. Bernard Parish.

Projected Costs
The total estimated cost for the proposed project is $1,450,000. The estimate has been based on Phase 1 of the Delacroix Fishing Complex (completed) and similar efforts.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
Two of the stated objectives outlined in the 2012 and 2017 State Master Plans are to sustain cultural heritage and promote a working coast. The CPRA defines these objectives as follows:
Cultural Heritage: Sustain, to the extent practicable, the unique cultural heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment; and

Working Coast: Promote a viable working coast to support regionally and nationally important businesses and industries.

Similar projects were later included in the previous version of the SBPG Coastal Strategy Document (2016) and SBPG RESTORE Act MIP (2017).

Potential Risks, Mitigation Measures, and Permitting Requirements
Some project components will be constructed over the water, thereby requiring a CUP. Other components will be implemented inland and will require minimal local permitting.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
Following the Deepwater Horizon oil spill, the seafood industry in St. Bernard Parish was decimated. The proposed project would promote both commercial and recreational fisheries in St. Bernard Parish and contribute to the ongoing recovery of the local seafood industry.

Funding Strategy and Sources - - It is anticipated that the RESTORE Act Direct Component program will fund this project. However, supplemental funding may be requested through the RESTORE Act Parish Matching Program.
D. Hopedale Fishing Complex and Public Seafood Market

Project Priority
Tier 2

Current Status
The project has been included in the updated SBPG RESTORE Act MIP (2017).

Project Location
Hopedale, St. Bernard Parish

Problem
Recreational fishing piers are needed in St. Bernard Parish in order to provide a space for locals and tourists to fish and enjoy the natural environment while remaining a safe distance from area highways. Additionally, the parish is currently lacking available space for commercial fishermen to engage in the direct-to-market sale of fresh seafood. Deficiencies in recreational fishing infrastructure and the lack of a public seafood market have had the effect of limiting economic opportunities in St. Bernard Parish.

Previous Planning Efforts
SBPG outlined a vision for sustaining the parish’s unique cultural and economic resources in its 2012 Coastal Zone Management Program Document. Goals set forth in this document include:

- **Promoting recreational facilities in the wetlands** through the development of facilities such as parks and boat launches; and

- **Supporting environmentally sound economic uses** with special emphasis on sustainable multiple-use of waterfront areas. (Coastal Environments, Inc. 2012)

Similar projects were later included in the previous version of the SBPG Coastal Strategy Document (2016) and SBPG RESTORE Act MIP (2017).

Recommended Solution
The proposed project includes the construction of a recreational fishing complex and public seafood market in Hopedale. A series of marked kayak trails may also be installed along Bayou La Loutre for the purpose of facilitating navigation for non-motorized boats between Hopedale Marina...
and the MRGO. SBPG believes the improvements will be invaluable tools for the promotion of ecotourism and the consumption of Gulf seafood in St. Bernard Parish.

**Projected Benefits**
The fishing complex and public seafood market would include a dock, covered pavilion, restroom, and parking lot. Marked kayak trails may also be added to the project. Once constructed, the facilities would be operated and maintained by SBPG for the purpose of enhancing economic opportunities in St. Bernard Parish.

**Projected Costs**
The preliminary estimated cost of the project is $1,000,000.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
Two of the stated objectives outlined in the 2012 and 2017 State Master Plans are to sustain cultural heritage and promote a working coast. The CPRA defines these objectives as follows:

- **Cultural Heritage**: Sustain, to the extent practicable, the unique cultural heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment; and

- **Working Coast**: Promote a viable working coast to support regionally and nationally important businesses and industries.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
Some project components will be constructed over the water, thereby requiring a CUP. Other components will be implemented inland and will require minimal local permitting.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
The proposed project would promote both commercial and recreational fisheries and contribute to the ongoing recovery of the local seafood industry.

**Funding Strategy and Sources** - It is anticipated that the RESTORE Act Direct Component program will fund this project.
E. Paris Road Corridor Streetscape Enhancement and Welcome Center

Map IV.3: Paris Road Corridor Streetscape Enhancement Project Footprint

Project Priority
Tier 2

Current Status
SBPG has submitted a RESTORE Act Direct Component grant application for the streetscape enhancement portion of the project (currently under review by the US Treasury). The welcome center portion of the project is currently in the early planning phase.

Project Location
Chalmette, St. Bernard Parish

Problem
Paris Road runs north—south through the CWU and is one of only three thoroughfares connecting St. Bernard Parish to New Orleans. While the other major thoroughfares have been enhanced since Hurricane Katrina, the Paris Road corridor remains unimproved. Efforts to enhance the
streetscape and capitalize on the natural features along the highway have heretofore not been undertaken.

**Previous Planning Efforts**
The project was first proposed in the St. Bernard Coastal Restoration Plan (2012). In the Restoration Plan, multiple strategies were suggested, including a visitor center and museum complex describing the history of the area. The proposed project has since been updated and included in the 2014 SBPG Comprehensive Master Plan, 2016 Coastal Strategy Document, and SBPG RESTORE Act MIP (2016 and 2017).

**Recommended Solution**
The objectives of the proposed project are to design and install a suite of streetscape enhancements that will improve aesthetics along the Paris Road corridor and increase public awareness of the natural environment and ecotourism opportunities in St. Bernard Parish. A welcome center may also be added at a later date.

**Projected Benefits**
The proposed project constitutes an infrastructure project benefiting the economy and ecological resources in St. Bernard Parish and will promote local tourism and recreational fishing.

**Projected Costs**
The estimated cost of the design and installation of the streetscape enhancement component is estimated at $800,000. The estimated cost of the welcome center component is yet to be determined.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
N/A

**Potential Risks, Mitigation Measures, and Permitting Requirements**
Since many of the proposed interventions may occur on the State right-of-way, SBPG must coordinate closely with DoTD to obtain the proper permits and permissions.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
The project will promote local tourism and recreational fishing, which were significantly impacted by the Deepwater Horizon oil spill.

**Funding Strategy and Sources**  
It is anticipated that the RESTORE Act Direct Component program will fund this project.
F. Living Shoreline Installation and Oyster Seed Grounds Restoration

Map IV.4: Living Shoreline and Oyster Seed Grounds Restoration Sites

Project Priority
Tier 2

Current Status
The Living Shoreline Demonstration project (PO-0148) is complete. Biloxi Marsh Living Shoreline (PO-0174) is currently in engineering/design. CRCL completed one recycled oyster reef site in 2016 and will begin a second site in 2019. Finally, 100 acres of public oyster seed grounds in Lake Fortuna are scheduled for restoration in 2018.

Project Location
St. Bernard Parish

Problem
The shorelines along the Breton and Chandeleur sounds are among the first to receive high-energy waves from oncoming storm surge and serve as a buffer to interior marshes. However, without an active deltaic supply of
sediment, these areas now suffer some of the highest rates of land loss due to erosion, subsidence, and sea level rise. With the progression of continued land loss, further inland marshes will be placed at greater risk over time. Consequently, artificial oyster reef technology (living shorelines) is now being proposed and applied for the purpose of protecting the most vulnerable stretches of coastline.

Living shoreline applications combat marsh erosion by altering water flow patterns, attenuating wave forces, and trapping and stabilizing sediment. Perhaps more importantly, the products provide a long-term, sustainable, and natural means of shoreline protection, as they are capable of producing a hard structure of calcium carbonate, thereby allowing individual oysters to bond together and build biogenic carbonate reefs.

**Previous Planning Efforts**

*Living Shoreline Installations*

The Living Shoreline Demonstration project (PO-148) was commissioned by CPRA and funded via the Coastal Impact Assistance Program (CIAP) with the goals of: (a) protecting vital marsh habitat in Eloi Bay; (b) propagating additional oyster reef growth in the region; and (c) producing vital data on the performance of various configurations for future oyster barrier reef installations. It created 3.1 miles of shoreline protection, utilizing four different various configurations of artificial barrier reef products. Subsequent monitoring of the different systems is ongoing for the purpose of measuring each configuration’s effectiveness in terms of shoreline protection and oyster growth.

The Biloxi Marsh Living Shoreline Project (PO-174) was commissioned by CPRA and funded via the RESTORE Act in 2017. Engineering and design for the project is currently ongoing. The project will include 9-11 miles of living shoreline structures, stretching from the footprint of PO-148 to the north of Eloi Point. It is anticipated that construction will begin in late 2019.

*Oyster Seed Grounds Restoration*

The Louisiana Natural Resource Trustees selected the Louisiana Oyster Cultch project as a Phase I Deepwater Horizon (DWH) early restoration project to compensate the public for injury to oysters. Six cultch placement sites were selected (including Lake Fortuna) with the goals of: (a) monitoring oyster recruitment and production in restored areas to assess performance against specific criteria; and (b) constructing an oyster
hatchery facility to improve existing oyster hatchery capabilities to help facilitate success of the cultch plantings. It is anticipated that in 2018, the Louisiana Department of Wildlife and Fisheries (LDWF) will fund a $3.7 million oyster cultch project on a 100-acre public seed grounds site in Lake Fortuna.

**Recommended Solution**

In regards to living shoreline installations, more monitoring of the long-term effects of already-built structures is needed to properly assess the feasibility and effectiveness of the various products. Recent research has suggested that living shoreline installations reduce shoreline retreat by an average of 1 m yr\(^{-1}\) for shorelines in moderate- and high-exposed areas (La Peyre et al., 2015). It is important to note that in such instances, shoreline retreat was reduced but not reversed. This is due largely to subsidence and sea-level rise. Hence, living shoreline installations may need to be implemented in conjunction with other restoration approaches in order to prevent land loss.

In addition to the completed Living Shoreline project and the ongoing Biloxi Marsh Living Shoreline project, SBPG proposes to focus future living shoreline efforts along the entire perimeter of the Biloxi Marsh. The below map illustrates where additional interventions might be located. Product selection, placement, and alignment in future projects will be informed by available monitoring data for installed products, advances in living shoreline technology over time, and project-specific engineering and design efforts.
The Louisiana Oyster Cultch project saw increased oyster production across all test sites, illustrating the effectiveness of the intervention in terms of oyster seed production. However, there are public seed grounds sites that have been problematic for a variety of reasons, including salinity levels. It is therefore critical that new technology be applied when possible for the purpose of facilitating oyster growth. Such technology may include the use of new types of cultch material and/or alternative seeding methods. The referenced Lake Fortuna project is anticipated to provide a large-scale demonstration of alternative oyster seed grounds restoration techniques.

Projected Costs
Based on cost estimates produced in the design and alternatives analysis of PO-148, CPRA bid data, and information obtained from manufacturers,
and contractors, the cost of living shoreline installations may range from $380/ft. to $1,690/ft., with an average cost of approximately $600/ft.

Although the cost of oyster seed grounds restoration will vary depending on location and methods employed, the pending Lake Fortuna project may be instructive. The project will cost $3.7 million for the placement of cultch material (fossilized and dry oyster shells) and spat-on-shell material across a 100-acre site. This particular method will cost approximately $37,000/acre.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**

Although not explicitly included in the 2017 State Master Plan as stand-alone projects, living shoreline installations and oyster seed grounds restoration activities are programmatically consistent with the plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**

Due to varying site conditions in St. Bernard Parish, it is critical that any living shoreline project include the appropriate product, placement, and alignment based on the recovered data and observed results from previous projects. CUP will be required for all living shoreline projects and may be required for oyster seed grounds restoration. Pipelines and existing oyster leases will need to be identified in both instances. Finally, dredging and backfilling operations will likely need to be permitted based on the water bottom depths of selected project sites.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**

The living shoreline interventions would help sustain the shoreline of marshes that were previously impacted by the Deepwater Horizon oil spill. Since the oyster fishery was also significantly impacted by the oil spill, oyster seed ground restoration activities would also provide an excellent means of mitigating damage.

**Funding Strategy and Sources** – RESTORE Act and NRDA funds are already being utilized to implement the subject activities. Additionally, Section 14, Section 103, Section 111, and Section 206 of the USACE CAP may be options. Living shoreline applications may also be included in future CWPRRA proposals where appropriate. Finally, there are several USFWS programs and private sources of funding that may be explored.
Project Priority
Tier 2

Current Status
SBPG has submitted a RESTORE Act Direct Component grant application for the initial two years of program funding (currently under review by the US Treasury). Nunez Community College (Nunez) will be a sub-recipient of the award.

Project Location
Chalmette, St. Bernard Parish

Problem
Nunez recently commissioned An Assessment for a Fisheries Hub of Excellence at Nunez Community College (TMG Consulting 2016) to explore establishing the school as a center for fisheries-oriented workforce development. The study identified a number of needs for fisheries-oriented businesses in the region. An opportunity now exists to develop new curriculum at Nunez for the purpose of establishing a program that will address unmet workforce development needs relative to the aforementioned sectors.
Previous Planning Efforts
The establishment of Nunez as a center for fisheries-oriented workforce development has been explored for over a decade, culminating with the aforementioned TMG Consulting study.

Recommended Solution
The purpose of the proposed program is to design and implement a workforce development program that is focused on creating or enhancing jobs and entrepreneurship in emerging fisheries-oriented sectors.

Projected Benefits
The objective of the proposed program is to design and administer a workforce development program that addresses unmet needs relative to the emerging fisheries-oriented sectors in St. Bernard Parish. The proposed program will be designed to ultimately foster workforce development and job creation in St. Bernard Parish and throughout the region.

Projected Costs
SBPG’s initial RESTORE Act Direct Component request was for $225,000.

The breakdown of the request is as follows:

• $112,500 for program design; outreach; staffing; and scholarship awards during year 1; and

• $112,500 for program outreach; staffing; and scholarship awards during year 2.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
N/A

Potential Risks, Mitigation Measures, and Permitting Requirements
N/A

 Restoration of Areas Impacted by Deepwater Horizon Oil Spill
N/A

Funding Strategy and Sources – It is anticipated that the RESTORE Act Direct Component program will fund the first two years of the proposed workforce development program.
H. Central Wetlands Unit Bike Path

Project Priority
Tier 2

Current Status
SBPG is in the process of including Phase 3 of the ongoing bike path project in its SBPG RESTORE Act MIP (2017), thereby making the activity eligible for Direct Component funding.

Project Location
Chalmette, St. Bernard Parish

Problem
In June 2017, SBPG adopted the St. Bernard Parish Bikeway and Pedestrian Plan Update. The purpose of this document is to provide a plan for a parish-wide network for non-motorized travel that links local destinations, communities within St. Bernard Parish, and the parish with neighboring communities. A major feature of the plan is a regional network that takes advantage of St. Bernard’s unique geography by providing trails along the levee system. At the present time, it is difficult for the average citizen to enjoy this natural area if they do not have marine transportation. This new trail will provide that access 24 hours a day, free of charge. The trail
will be accessible at selected points that connect to existing parks, recreational facilities, neighborhoods and bridges.

**Previous Planning Efforts**
This project represents one phase of a larger ongoing effort to provide a comprehensive network of bike paths throughout St. Bernard Parish, as referenced in the above plan.

**Recommended Solution**
The purpose of this proposed project is to construct a portion of the comprehensive trail network. This phase includes engineering/design and construction of a 6 ft. wide limestone screenings path on top of the back levee for a distance of approximately one mile (Phase III). This segment begins at Paris Road and extends eastward to Val Riess Park, one of two major SBPG regional parks.

**Projected Benefits**
Once constructed, SBPG believes these improvements will be invaluable tools for the promotion of ecotourism and increasing public awareness and appreciation for the natural environment.

**Projected Costs**
The estimated cost for Phase 3 of the proposed project is $500,000.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
N/A

**Potential Risks, Mitigation Measures, and Permitting Requirements**
N/A

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources** – It is anticipated that the RESTORE Act Direct Component program will fund Phase 3 of this project.
V. Tier 3 Coastal Activity Fact Sheets

Each coastal activity fact sheet includes the following baseline information:

- Project Priority
- Current Status
- Project Location
- Problem
- Previous Planning Efforts
- Recommended Solution
- Projected Benefits
- Projected Costs
- Consistency with CPRA Master Plan and other Ongoing Regional Efforts
- Potential Risks, Mitigation Measures, and Permitting Requirements
- Restoration of Areas Impacted by the Deepwater Horizon Oil Spill
- Funding Strategy and Sources
A. Local Marine Debris Removal Program

Project Priority
Tier 3

Current Status
SBPG recently completed a marine debris removal project in the Violet Canal and will be completing a similar project in Bayou Yscloskey and Bayou La Loutre in 2017. The parish is currently working with stakeholders to identify additional marine debris removal target areas.

Project Location
St. Bernard Parish

Problem
Marine debris in St. Bernard Parish waterways consists mainly of abandoned marine vessels and discarded marine equipment. The presence of such items is largely a consequence of weather events (tropical, tidal, and other storms) and illegal dumping. In some instances, the presence of marine debris in St. Bernard Parish waterways may constitute a threat to public health and safety and/or an environmental hazard.

Previous Planning Efforts
SBPG has worked with the Coastal Zone Advisory Committee (CZAC) and local commercial and recreational fishermen to identify marine debris removal target areas. The Violet Canal was targeted because of the amount and size of the debris present in the waterway and because the canal is used as a safe harbor for large commercial and recreational marine vessels during tropical weather events. Community Development Block Grant (CDBG) funding was utilized to remove a significant amount of marine debris from the Violet Canal in 2017.

Yscloskey Bayou and Bayou La Loutre were also targeted for marine debris removal in 2017. SBPG targeted these particular areas because of the amount and size of debris present in the waterways (largely leftover from Hurricane Katrina) and because of the commercial and recreational fishing industry’s heavy reliance on these waterways for navigation. SBPG funded its own marine debris removal efforts at these locations. SBPG will continue to work with stakeholders to identify marine debris removal target areas on an ongoing basis.
Recommended Solution
SBPG will identify marine debris removal target areas on an ongoing basis and will fund and implement removal efforts where necessary and appropriate. SBPG may also install emergency navigational aids and/or perform maintenance dredging where necessary and appropriate. In the event that SBPG identifies marine debris that constitutes an imminent threat to public health and safety and/or environmental quality, it will first seek to identify a responsible party. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will remove the marine debris on an emergency basis.

Projected Costs
Expenditures on future efforts will vary depending on the scale and location of identified marine debris.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
The proposed program activities are not explicitly included in the 2017 State Master Plan.

Potential Risks, Mitigation Measures, and Permitting Requirements
SBPG will work to identify responsible parties to the extent practical and feasible. In the event that a responsible party is identified, SBPG will request that the individual or entity take immediate corrective action and apply for the requisite CUP and any other permits/approvals. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will remove marine debris on an emergency basis. In such instances, SBPG will apply for the requisite CUP and other permits/approvals after the fact.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
N/A

Funding Strategy and Sources - SBPG will fund any emergency marine debris measures on an as needed basis. The parish may also seek finding from NOAA to fund an ongoing marine debris removal program.
B. Local Maintenance Dredging and BUDMAT Program

Project Priority
Tier 3

Current Status
SBPG is currently working with stakeholders to identify waterways in need of maintenance dredging and potential sites for the beneficial use of dredged material (BUDMAT).

Project Location
St. Bernard Parish

Problem
A number of waterways in St. Bernard Parish have become silted-in due to weather events (tropical, tidal, and other storms), causing navigational hazards and environmental concerns. Although in some instances responsible parties such as the CPRA have engaged in maintenance dredging, there are other navigable waterways in St. Bernard Parish that may be better serviced locally. In such instances, it is critical that SBPG also identifies locations near the targeted areas where the dredged material may be beneficially used for small-scale marsh creation, ridge restoration, and/or local tidal levee enhancement.

Previous Planning Efforts
CPRA plans on performing maintenance dredging in the Violet Canal in early 2018. However, the dredged material generated from the project will be disposed of rather than beneficially used. SBPG is interested in working with stakeholders to identify additional maintenance dredging locations that are near sites where dredged material may be beneficially used in marsh creation and similar projects.

The Port of Gulfport (Mississippi) and the Port of Mobile (Alabama) have been considering port expansion projects that would require a significant amount of dredging. St. Bernard Parish has been identified as a potential BUDMAT site for the proposed projects. The timeline for such projects is contingent upon port funding and permitting.

Recommended Solution
SBPG will identify maintenance dredging and BUDMAT target areas on an ongoing basis and will fund and implement projects where necessary and appropriate. SBPG may also install emergency navigational aids and/or
perform marine debris removal where necessary and appropriate. In the event that SBPG identifies a silted-in waterway that constitutes an imminent threat to public health and safety and/or environmental quality, it will first seek to identify a responsible party. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will conduct maintenance dredging on an emergency basis. The parish will actively seek BUDMAT opportunities for all maintenance dredging projects.

**Projected Costs**
Expenditures on future efforts will vary depending on the scale and location of identified maintenance dredging target areas and BUDMAT opportunities. SBPG may also consider purchasing its own dredging equipment and staffing a dredging crew for the purpose of maintaining local dredging capacity year-round.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
Program activities are not explicitly included in the 2017 State Master Plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
SBPG will work to identify responsible parties to the extent practical and feasible. In the event that a responsible party is identified, SBPG will request that the individual or entity take immediate corrective action and apply for the requisite CUP and any other permits/approvals. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will perform maintenance dredging on an emergency basis. In such instances, SBPG will apply for the requisite CUP and other permits/approvals after the fact. The parish will actively seek BUDMAT opportunities for all maintenance dredging projects.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources** - SBPG will fund any emergency maintenance dredging on an as needed basis. The parish may also seek finding from CPRA and/or the USACE.
C. Local Navigational Aids Program

Project Priority
Tier 3

Current Status
SBPG completed an emergency navigational aids project on Bayou La Loutre near the MRGO (Shell Beach) in 2016. The parish is currently working with stakeholders to identify other navigational hazards throughout St. Bernard Parish. The program is focused primarily on sites where imminent threats to public health and safety exist.

Project Location
St. Bernard Parish

Problem
Many existing navigational aids in St. Bernard Parish waterways have gradually degraded due to aging and/or the impacts of tropical weather events. Illegal dumping and the improper disposal of marine vessels and other equipment have also resulted in the introduction of new navigational hazards. Additionally, as more coastal restoration projects are constructed, new navigational hazards may be introduced in parish waterways. Such hazards may be the result of construction debris, changes in hydrology (such as shoaling), and/or the general aging of the infrastructure over time. Finally, tropical weather events may generate a wide range of navigational hazards during any given hurricane season.

Previous Planning Efforts
SBPG has worked with the CZAC and local commercial and recreational fishermen to identify navigational hazards that constitute an imminent threat to public health and safety. Stakeholders identified the confluence of Bayou La Loutre and the MRGO (Shell Beach) as such an area. The parish subsequently installed a series of channel markers around the site as an emergency safety measure. SBPG will continue to work with stakeholders to identify imminent threats on an ongoing basis.

Recommended Solution
SBPG will identify navigational hazards on an ongoing basis and install navigational aids as an emergency measure where necessary and appropriate. SBPG may also engage in marine debris removal and/or maintenance dredging where necessary and appropriate. In the event that SBPG identifies a navigational hazard that constitutes an imminent
threat, it will first seek to identify a responsible party. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will install navigational aids on an emergency basis in accordance with US Coast Guard standards.

**Projected Costs**
SBPG allocated $50,000 for the emergency installation of navigational aids near the confluence of Bayou La Loutre and the MRGO in 2016. Expenditures on future efforts will vary depending on the scale and location of identified navigational hazards.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
Program activities are not explicitly included in the 2017 State Master Plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
SBPG will work to identify responsible parties to the extent practical and feasible. In the event that a responsible party is identified, SBPG will request that the individual or entity take immediate corrective action and apply for the requisite CUP and any other permits/approvals. If a responsible party cannot be identified and/or is unable to take immediate corrective action, SBPG will install navigational aids on an emergency basis in accordance with US Coast Guard standards. In such instances, SBPG will apply for the requisite CUP and other permits/approvals after the fact.

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

*Funding Strategy and Sources* - SBPG will fund any emergency navigational aid measures on an ongoing basis.
D. Local Reforestation and Re-vegetation Program

Project Priority
Tier 3

Current Status
A number of program components were implemented in 2016-2017, including: (1) black mangrove propagule collection/potting, planting, and monitoring; (2) cypress tree planting; and (3) local support of Louisiana Department of Agriculture and Forestry (LDAF) planting efforts. Program components are projected to be similar in 2018.

Project Location
St. Bernard Parish

Problem

Black Mangroves

The Biloxi Marsh Complex functions as a land bridge preventing wave action and storm surge from impacting interior marshes. Additionally, the complex provides essential fish habitat and serves as a hydrologic barrier between adjacent saline and brackish marsh environments. However, the shorelines of the Biloxi Marsh are rapidly deteriorating. This increases the likelihood of further deterioration of the interior marshes, ultimately resulting in increased storm surge heights in the Mississippi Sound and Lake Borgne.

Cypress Trees

The Hurricane and Storm Damage Risk Reduction System (HSDRRS) includes approximately 23 miles of floodwall in St. Bernard Parish, stretching from the intersection of Bayou Bienvenue and the MRGO to the Mississippi River near the Plaquemines Parish line. Various stretches of outer marsh directly adjacent to the HSDRRS are currently in a weakened state and are lacking native trees, thereby potentially exposing some parts of the system to unbuffered storm surge and damage or failure.

Other

Before the construction of the MRGO, the CWU and other parts of St. Bernard Parish consisted of a combination of bald cypress and water
tupelo swamps, in addition to fresh marsh and bottomland hardwood forests. These environments provided a natural means of storm surge protection for the developed parts of the parish. However, as a result of saltwater intrusion, relative sea-level rise, and recent tropical weather events, much of these areas have drastically degraded. Additionally, Roseau cane throughout coastal Louisiana has been exposed to an invasive scale since 2016. This infection now threatens the health of Roseau cane throughout St. Bernard Parish.

Previous Planning Efforts
SBPG worked with Nichols State University (NSU) and others to develop a black mangrove program in 2016. The program includes annual propagule collection/potting at Chalmette High School (CHS); greenhouse management at CHS; annual planting in the Biloxi Marsh; and ongoing program monitoring. CHS students and faculty work with SBPG, NSU, and the LSU Ag Center on all aspects of program implementation. During the initial 2016-2017 program year, funding was provided by the St. Bernard Parish Council; Low-Tide Charters (private fly-fishing guide service); Orvis fly-fishing outfitters; the American Fly Fishing Trade Association (AFFTA); Biloxi Marsh Lands Corporation (private landowner); and Lake Eugenie Land and Development, Inc. (private landowner). The annual program budget is currently $17,000. A total of 1,500 black mangroves were potted at CHS in 2016 and 1,000 black mangroves were planted in the Biloxi Marsh in 2017. SBPG and its partners have since potted an additional 1,500 black mangroves at CHS and will plant an additional 1,500 black mangroves in April 2018.

LPBF recently celebrated the successful planting of 10,000 cypress trees near Caernarvon. SBPG partnered with LPBF, Restore the Earth, and the St. Bernard Wetlands Foundation to plant an additional 2,350 cypress trees near Caernarvon in 2017. The group is currently working together to identify sites for an additional planting of 2,000 cypress trees in 2018.

SBPG worked with LDAF on two vegetative plantings in 2017, including a Roseau cane planting (500 stalks) in Reggio and a spartina planting (1,000 plugs) along Bayou La Loutre. LDAF recently completed scoping on a large-scale bulrush (1,500 plugs) near Bayou Chaperon (in CWU). LDAF also recently scoped a large-scale giant cut grass (500 plugs) planting near Reggio. These two plantings will be implemented in 2018.

SBPG has agreed to make a contribution ($8,500) to a study regarding the causes and effects of the invasive Roseau cane scale. The study will be conducted by Louisiana State University and others beginning in 2018.
Recommended Solution
SBPG will continue to work with the aforementioned partners to implement and scale up existing program components while developing new program components. The black mangrove and cypress tree plantings are funded through 2018. Additionally, SBPG will work with LDAF on the CWU and Reggio plantings in 2018.

Projected Benefits
Applied locally, these small-scale projects can help curb marsh erosion rates at minimal cost.

Projected Costs
Black Mangrove Program ($17,000/year)
Cypress Tree Planting ($1,000/year)
Other ($1,000/year)
Roseau Cane Study ($8,500 in 2018)

As existing program components are scaled up and new program components are developed, the project costs are expected to increase. However, SBPG will continue to seek public and private funding for all program activities.

Consistency with CPRA Master Plan and other Ongoing Regional Efforts
Program activities are not explicitly included in the 2017 State Master Plan.

Potential Risks, Mitigation Measures, and Permitting Requirements
Plantings are low-impact interventions that generally do not require any permits or mitigation. However, it is critical that private landowners in targeted areas are engaged in the process and grant consent.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill
The eastern shoreline of the Biloxi Marsh represents the only current target area to have been impacted by the Deepwater Horizon oil spill. The planting of black mangroves in this target area will continue to mitigate damages from the spill.

Funding Strategy and Sources – The short-term strategy is to continue partnerships with entities that are currently engaged in program components. As current components are scaled up and new programming is developed, SBPG will additional partners and funding.
E. Derelict Crab Trap Removal Program

Project Priority
Tier 3

Current Status
The 2017 derelict crab trap sweep (Delacroix) is complete. A similar event is being planned for 2018.

Project Location
St. Bernard Parish

Problem
The Magnuson-Stevens Act defines essential fish habitat as “those waters and substrate necessary to fish for spawning, feeding, breeding, or growth to maturity” (Gulf of Mexico Fishery Management Council 1998, 4). Given the importance of essential fish habitat to various protected species and managed stocks, including the diamondback terrapin, red drum, and grouper, it is critical that stakeholders mitigate potential adverse impacts where possible. The purpose of the Derelict Crab Trap Removal Program is to sustain essential fish habitat by removing derelict crab traps from coastal estuaries in St. Bernard Parish.

The blue crab is one of the most abundant and lucrative fisheries in Louisiana. According to the LDWF, the average annual landing of blue crabs in the state is 44.8 million pounds ($34.7 million value) (Bourgeois, Marx & Semon 2014, 15). Louisiana has accounted for 62% of all blue crab landings in the Gulf of Mexico region since 1968 (Bourgeois, et al. 2014, 16). The abundance of blue crabs in Louisiana has enticed an average of over 8,000 commercial and recreational crab fishers to obtain crab gear licenses each year (Bourgeois, et al., 20 and 25).

It is estimated that crab fishers in Louisiana lose as many as 45,000 crab traps per year (Guillory & Perret 1998). Such “derelict” crab traps are typically lost due to weather conditions or equipment malfunctions. Derelict traps are spread throughout essential fish habitat and have the capacity to trap and kill various protected species and managed stocks while “ghost” fishing. Recent studies of derelict traps in Louisiana have indicated that 65% of all derelict traps are actively ghost fishing and that the diamondback terrapin, 19 different species of finfish (including red drum and grouper), and other aquatic wildlife are all subject to being trapped and killed by derelict traps (Anderson & Alford 2014; Bourgeois, et al. 2014, 28).
Derelict traps are a significant threat to essential fish habitat in the estuaries of coastal Louisiana and can pose as navigational hazards in shallow waters. The proposed program is intended to mitigate the potential adverse impacts associated with derelict traps by actively facilitating their removal.

**Previous Planning Efforts**
LDWF, LPBF, and SBPG hosted a derelict crab trap removal event in March 2017. The event was based in Delacroix and resulted in the removal of 1,386 derelict crab traps. A similar event is being planned for 2018.

**Recommended Solution**
LDWF, SBPG, and the LPBF will share existing data and engage stakeholders in order to identify derelict trap target sites throughout St. Bernard Parish and develop a schedule (including closure dates) for conducting sweeps. The team will subsequently engage stakeholders and volunteers to perform derelict trap removal in accordance with the established schedule and target areas. Previous derelict trap sweeps conducted by LDWF and LPBF will be used as models for all program sweeps.

**Projected Costs**
Based on forecasted costs completed by the LPBF, it is anticipated this program costs approximately $50,000 per sweep. To date, the program has largely been funded through LDWF and LPBF. However, SBPG will continue to provide financial and in-kind support as needed.

**Consistency with CPRA Master Plan and other Ongoing Regional Efforts**
The proposed program activities are not explicitly included in the 2017 State Master Plan.

**Potential Risks, Mitigation Measures, and Permitting Requirements**
N/A

**Restoration of Areas Impacted by Deepwater Horizon Oil Spill**
N/A

**Funding Strategy and Sources**
LDWF and LPBF will continue to fund the program with support from SBPG.
References


Appendix A: Previous State and Local Coastal Planning Efforts

2007-2017

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<tr>
<th>Plan</th>
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<td><a href="http://coastal.la.gov/resources/library/reports/">http://coastal.la.gov/resources/library/reports/</a></td>
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Appendix B: Local Project Proposals

1. Bayou Terre aux Boeufs Ridge Restoration CAP 206 Proposal

Dear Sir:

The Mississippi River Gulf Outlet (MRGO) has adversely impacted the Bayou Terre aux Boeufs ridge and surrounding marsh near Delacroix, Louisiana (please see the attached map) by drastically increasing salinity levels in the area and ultimately reducing the amount of healthy wetlands, wildlife habitat, and storm surge protection the area once provided St. Bernard Parish (MRGO Restoration Plan 2012, 1-4). Consequently, the United States Corps of Engineers MRGO Ecosystem Restoration Plan (MRGO Restoration Plan) contemplated the restoration of the Bayou Terre aux Boeufs ridge and surrounding marsh (MRGO Restoration Plan 2012, 2-85 and 2-86). Although the USACE initially expressed a number of concerns regarding the ridge restoration portion of the proposed effort, St. Bernard Parish Government (SBPG) respectfully requests further consideration for this critical project (MRGO Restoration Plan 2012, 2-101 and 2-102).

SBPG and its Coastal Zone Advisory Committee have designated the Bayou Terre aux Boeufs ridge restoration project as a Tier I priority for St. Bernard Parish (please see the attached list of SBPG priority projects). Additionally, the project is currently being considered for inclusion in the 2017 Louisiana Coastal Protection and Restoration Authority (CPRA) Master Plan Update (please see the attached list of proposed CPRA projects). SBPG is prepared to work closely with the USACE to leverage state (CPRA) and local (SBPG) resources in order to bring this project to fruition.

I request that the USACE, New Orleans District, undertake an investigation of aquatic ecosystem restoration potential under the authority of Section 206 of the Water Resources Development Act of 1996, as amended. SBPG hereby expresses our willingness to serve as the study sponsor.
I understand that initial feasibility investigations would be federally funded up to $100,000. Any remaining feasibility costs would be shared 50/50 pursuant to the terms of a CAP Feasibility Cost Share Agreement (FCSA).

If the feasibility investigations demonstrate federal participation in a specific project is warranted and justified, our objective will be to proceed with design and implementation. We are capable of fulfilling our financial obligations for further study, design, construction, operation, and maintenance: in general, providing a minimum of 35 percent of the total project costs during the design and implementation phase, including furnishing lands, easements, right-of-way, relocations, and disposal areas. We are also aware that the USACE and our responsibilities will be delineated in the Project Partnership Agreement (PPA), which both parties will execute before construction commences.

If you need additional information, please contact John Lane (504)579-2173

Sincerely,

Guy McInnis
Parish President
St. Bernard Parish Government
Mr. Guy McInnis  
Parish President  
St. Bernard Parish Government  
8201 West Judge Perez Drive  
Chalmette, Louisiana 70043

Dear President McInnis:

This is in response to your letter expressing your interest in the restoration of the Bayou Terre aux Boeufs ridge and your willingness to serve as the non-Federal sponsor for the project under Section 203 of the Continuing Authorities Program. The request follows your placement of the project as a Tier 1 priority for St. Bernard Parish after your recognition of a loss of wetlands in the area.

With this letter, the U. S. Army Corps of Engineers, New Orleans District acknowledges it has received a copy of your letter and has requested approval to initiate a new start study. This request will be evaluated against other potential studies nationwide and will have to compete for Federal funds with the Continuing Authorities Program.

If you have any questions regarding this matter, please feel free to contact me at (504) 862-2124.

Sincerely,

Brad L. Inman  
Senior Project Manager  
Projects and Restoration Branch
PROJECT INITITATION FACT SHEET

1. Project –
P2# – 459617 – CAP 206 St. Bernard Parish, Louisiana
CWIS # – 459617 – Bayou Terre aux Boeufs Restoration

2. Authority – Section 206 of the 1996 Water Resources Development Act, as amended

3. Sponsor agency and POC: St. Bernard Parish, Louisiana, John Lane


5. Location:
The project is located in the Delacroix Marsh area in the southern portion of St. Bernard Parish, LA along Bayou Terre aux Boeufs starting near Reggio, Louisiana and extending down the bayou towards Breton Sound.

6. Problem: The marsh has been subjected to numerous assaults such as storm surges, sea-level rise, oil field canal excavation, invasive species, and especially increased salinity levels. The resulting damage (most often evidenced by severe erosion) ultimately reduces the amount of healthy wetlands which is home to numerous migratory birds, fish estuaries and spawning grounds, oyster harvesting locations, and wildlife habitat. The degradation also reduces the ancillary benefit of providing a buffer between the Gulf of Mexico and developed areas of St. Bernard Parish. The degradation is growing more rapidly with the passing of time and frequency of storm events. As soon as the damage begins, it triggers a faster and continued expansion of erosion to the marsh.

7. Eligibility Criteria:
   a. Does the problem meet the eligibility requirements of the study authority? If yes, cite specific paragraph in Appendix F used to determine eligibility. Yes, F-30
   b. Would typical Corps of Engineers solutions correct the problem? Yes
   c. Are there any obvious benefits that could justify a potential study? Yes, an increase in ecological benefits through aquatic ecosystem restoration.
   d. Does the sponsor understand the cost sharing requirements and their responsibilities if the study proceeds to a cost shared activity (e.g. feasibility or construction)? Yes, see attached letter of intent.

8. Copy of sponsor request - attached
2. Chandeleur Islands Maintenance and Re-vegetation Project

St. Bernard Parish Government
Coastal Division

Chandeleur Islands Maintenance and Re-Vegetation

September 2017
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Prepared by: Blaise Pezold (Louisiana Department of Agriculture and Forestry) and Jerry Graves (Graves Public Services, LLC) in conjunction with St. Bernard Parish Government, the Louisiana Coastal Protection and Restoration Authority, and the United States Fish and Wildlife Service
I. Executive Summary

The Chandeleur islands comprise a unique and dynamic system that performs a number of critical ecological and physical functions. Whether due to natural processes such as erosion and tropical weather or due to human-caused impacts such as oil spills, the chain of islands is subject to constant change. Although the evidence suggests that the long-term sustainability of the Chandeleur islands may be questionable absent some immediate and significant intervention, relatively little has been done to protect or restore this critical system.

Previous planning and restoration efforts on the Chandeleur islands have been generally limited due to a lack of funding and the threat of tropical weather in the chain’s fragile coastal environment. However, lessons learned from previous restoration efforts coupled with the best current available science may provide new opportunities to sustain the Chandeleur islands and preserve their functionality as a habitat for wildlife and a buffer to storm surge. New sources of funding for coastal restoration in Louisiana also make the protection and restoration of the islands more feasible than ever.

St. Bernard Parish Government and its partners propose to engage in the protection and restoration of Chandeleur islands by developing and implementing a number of specific interventions on the islands. The overarching purpose of the proposed interventions is to facilitate natural barrier island aggradation along the most vulnerable reaches of the system, thereby promoting the long-term sustainability and functionality of the islands. Given the recent influx of coastal restoration resources, including those which have been specifically designated for barrier islands in Louisiana, St. Bernard Parish Government believes now is the time for immediate and significant intervention with respect to protecting and restoring one of the most critical coastal land formations in Louisiana.
II. Context and Problem Statement

Context

The Chandeleur Islands are one of the most ecologically significant land formations in coastal Louisiana. The chain of barrier islands formed over 2,000 years ago on the rim of the St. Bernard lobe of the Mississippi River delta and has the distinction of being the oldest transgressive barrier island complex in the state (Pilkey & Fraser 2003; Coastal Environments, Inc. 2012). French explorer Pierre Le Moyne d’Iberville named the islands in 1700 while searching for the mouth of the Mississippi River (Rightor 1900). Although located at least twenty (20) miles from the mainland of St. Bernard Parish, some portions of the chain were still inhabited as recently as 1915 (US Department of the Interior 2008).

The US federal government has utilized and preserved the Chandeleur Islands in various ways over the past three centuries. President James Polk signed an Executive Order in 1847 for the purpose of acquiring 5,000 acres of property on the islands in order to construct the Chandeleur Island Light (US Coast Guard). President Theodore Roosevelt later designated Breton Island as a National Wildlife Refuge (NWR) in 1904 (US Department of the Interior 2008). The Breton NWR is the second oldest refuge in the US and was the first federal refuge to be visited by Roosevelt himself.

Image II-1: President Theodore Roosevelt visited the Breton NWR in 1915 (Library of Congress)
The landforms along the Chandeleur Islands are constantly changing. The average rate of land loss on the barrier island chain is estimated to be approximately .08 square kilometers/year (Penland et al. 1992). Historical relative sea-level rise near parts of the Chandeleur Islands was measured at an average of 0.5 centimeters/year from 1880-2006 (Miner et al. 2007). Finally, the rate of erosion occurring on the islands is among the highest for all similar landforms in the United States (Fitzgerald et al. 2015).

Tropical weather is a constant threat to the Chandeleur islands. A hurricane severely impacted the islands in 1915, damaging the Chandeleur Light, destroying a school building, and causing the last remaining inhabitants to abandon the area (US Department of the Interior 2008). Other tropical weather events have also dramatically accelerated land loss on the Chandeleur islands, including hurricanes Camille (1969), Georges (1998), and Katrina (2005) (Hymel 2004; US Department of the Interior 2008). The Islands were most recently impacted by hurricanes Gustav (2008), Ike (2008), and Isaac (2012).

<table>
<thead>
<tr>
<th>Hurricane</th>
<th>Year</th>
<th>Estimated Land Loss</th>
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<tbody>
<tr>
<td>Camille</td>
<td>1969</td>
<td>35%</td>
</tr>
<tr>
<td>Georges</td>
<td>1998</td>
<td>40%</td>
</tr>
<tr>
<td>Katrina</td>
<td>2005</td>
<td>70%</td>
</tr>
</tbody>
</table>

Figure II-1: Tropical weather events have caused significant land loss on the Chandeleur Islands over the past century (Hymel 2004; US Department of the Interior 2008).

The critical ecological and physical functions of the Chandeleur Islands have persisted despite the ongoing challenges associated with their dynamic marine environment. The Breton NWR was designated as a component of the National Wilderness Preservation System in 1964 and continues to be managed by the US Department of the Interior. Additionally, the American Bird Conservancy has designated the Chandeleur Islands as a Globally Important Bird Area (USD) 2008. In addition to the island chain's value as a bird rookery, the beaches, dunes, and marshes around the islands provide critical habitat for a variety of wildlife, including sea turtles. The Chandeleur Islands also provide a level of protection from normal wave action and acute episodes of storm surge during tropical weather events (Lake Pontchartrain Basin Foundation 2006).
Chandeleur Islands Birds

- American Oystercatcher
- Brown Pelican
- Piping Plover
- Laughing Gull
- Black Skimmer
- Royal Caspian
- Terns (various)
- Willet
- Wilson's Plover
- Red Knot
- Redhead
- Ducks (various)

*Figure II-2: The Chandeleur Islands function as critical habitat for a variety of birds*

In addition to the extreme land loss associated with tropical weather events, the Chandeleur Islands have also recently been impacted by human activity. The BP Oil Spill (April 20, 2010) resulted in the release of nearly five million barrels of crude oil off the coast of Louisiana (Austin et al. 2014). Oil began washing ashore along the Chandeleur Islands as early as May 5, 2010 and the leaking well was not completely sealed until September 19, 2010 (Weber 2010). The BP Oil Spill, which ultimately became the most environmentally devastating oil spill in US history, caused extensive damage to vegetation along the Chandeleur Islands (Shapiro et al. 2016).

Chandeleur Islands Vegetation

- Smooth Cordgrass
- Black Mangrove
- Elgrass
- Sea Oats
- Manatee egrass
- Shoalgrass
- Grouse Bush
- Wax Myrtle

*Figure II-3: A number of vegetative species are present on the Chandeleur Islands, providing wildlife habitat, stability, and the capacity for the islands to regenerate following extreme events.*
Problem Statement

The cumulative effects of natural degradation and extreme events over the past two decades have caused grave concern regarding the long-term sustainability of the Chalcedon Islands (Fitzgerald et al. 2015). A number of studies have suggested that the islands may become subaqueous within the next two-hundred (200) years (Suter et al. 1988; Penland et al. 1988). At least one study has projected that the island chain is in danger of being reduced to a set of shallow shoals as early as 2037 (Fearley et al. 2009). Although the BP Oil Spill caused severe damage to the Chaldeon Islands in 2010, similar events are unlikely to occur in the future. However, the oil spill’s lingering effects on vegetation along the island chain may compromise the ecosystem’s resilience to future tropical weather events, which remain the greatest and most persistent threat to the sustainability of the islands (Fearley et al. 2009).

Barrier island landforms such as the Chaldeon Islands have the capacity to naturally regenerate. In fact, a number of recent studies have confirmed the occurrence of natural barrier rebuilding along the island chain (Kulp et al. 2007; Fitzgerald et al. 2015). However, sustainable rebuilding must be supported not only by natural barrier island aggradation, but also by re-vegetation (Fitzgerald et al. 2015). The proposed project is intended to facilitate natural barrier island aggradation by fostering sediment retention and the acceleration of re-vegetation along the most vulnerable reaches of the Chaldeon Islands.
III. Previous Planning and Restoration Efforts

The Chandeleur islands have garnered surprisingly little attention over the past several decades despite the release of several major coastal restoration plans in Louisiana. Such plans include Coast 2050: Toward a Sustainable Coastal Louisiana (Coast 2050) (Louisiana Department of Natural Resources 1998) and multiple iterations of Louisiana’s Comprehensive Master Plan for a Sustainable Coast (State Master Plan) (Louisiana Coastal Protection and Restoration Authority 2007, 2012 & 2017). The only two notable restoration projects to have been implemented along the Chandeleur islands during this same time period include a vegetative planting in 2001 and the construction of an emergency berm in response to the BP Oil Spill of 2010.

**Coast 2050 (1998)**

The Louisiana Department of Natural Resources (LDNR) and its partners completed the Coast 2050 plan in 1998. The plan acknowledged the dynamic nature of the Chandeleur islands and the challenges associated with island protection and restoration efforts, including those challenges relative to federal regulations regarding island maintenance. Coast 2050 ultimately suggested a strategy for the islands that included using dredged material to restore the landform to its 1990 acreage [LDNR 1998, 88]. However, the suggested strategy was never funded or implemented.

**Coastal Wetlands Planning, Protection, and Restoration Act (2001)**

The Chandeleur islands Marsh Creation Project (PO-27) was funded through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program in 2000. The purpose of the project was to accelerate natural vegetative colonization and enhance sediment trapping and accretion along the islands. The project consisted of the strategic installation of over 80,000 plugs of smooth cordgrass (approximately 35,000 linear feet of shoreline) at various overwash sites on the bay side of the island chain. The project was completed in 2001 for a total cost of $830,000.

An extraordinary amount of tropical activity occurred near the Chandeleur islands between 2002 and 2005 [Hymel 2007]. However, the islands “proved amazingly resilient through the comparatively weaker storms of 2002-2003,” including Tropical Storm Isodore (2002) and Hurricane Lili (2002) [Hymel 2007, 3]. LDNR found in a 2004 monitoring exercise that smooth cordgrass cover had substantially increased from 2001-2003 despite the frequency of tropical activity during that time [Hymel 2004]. The findings of the referenced monitoring exercise are summarized in the below graph.
Image III-1: Smooth cordgrass cover increased from 2001-2003 despite the frequency of tropical activity near the Chandeleur Islands during the 2002 and 2003 hurricane seasons (Hymel 2004).

The 2004 and 2005 hurricane seasons were extremely active and included major hurricanes such as Ivan (2004), Katrina (2005), and Rita (2005). LDNR found in a 2007 monitoring exercise that following Hurricane Ivan, smooth cordgrass coverage on the islands had decreased but remained greater than prior to completion of the CWPPRA project (Hymel 2007, 25). However, the 2005 hurricane season proved to be devastating to smooth cordgrass on the Chandeleur Islands. The below graph depicts project monitoring results from 2001-2004 (post-Ivan). LDNR staff subsequently recommended that sand fencing and vegetative plantings along sand dunes be incorporated into any future vegetative planting efforts on the Chandeleur Islands (Hymel 2007, 26).
**Image III-2:** Smooth cordgrass cover increased until Hurricane Ivan, but dramatically decreased following hurricanes Ivan and Katrina (Hymel 2007)

**Biloxi Marsh Stabilization and Restoration Plan (2006)**

The Biloxi Marsh Lands Corporation (BMLC) commissioned the Biloxi Marsh Stabilization and Restoration Plan (BMLC Plan) in 2006 for the purpose of outlining a set of proposed stabilization and restoration measures for various areas around the Biloxi Marsh Complex, including the Chandeleur Islands. The islands are listed in the plan as one of BMLC’s featured restoration zones, and a number of specific projects are proposed:

- Annual vegetative plantings;
- Beach/dune/marsh creation platforms; and
- Coastal engineering structures. (BMLC 2006, 18 & 19)

The BMLC Plan not only highlighted the habitat value of the Chandeleur Islands, but also their ability to protect the Biloxi Marsh from normal wave energy and acute episodes of storm surge during tropical weather events. The value of the Chandeleur Islands as a storm surge barrier was similarly highlighted in the Lake Pontchartrain Basin Foundation’s (LPBF) *Multiple Lines of Defense Strategy to Sustain Coastal Louisiana* (Multiple Lines of Defense Strategy).
Multiple Lines of Defense Strategy to Sustain Coastal Louisiana (2006)

The LPBF Multiple Lines of Defense Strategy was written largely in response to the severe damage sustained by coastal Louisiana during the 2005 hurricane season. The plan includes two key elements: (1) utilizing natural and manmade features which directly impede storm surge damage; and (2) establishing and sustaining wetland habitat goals (LPBF 2006, 3). The LPBF considers barrier islands to be the second line of defense (the first being the offshore shelf), and the plan highlights the value of barrier islands in terms of reducing both wave height and storm surge during tropical weather events.

2007 State Master Plan

The Louisiana Coastal Protection and Restoration Authority (CPRA) presented its initial version of the State Master Plan for coastal restoration in 2007. The plan called for barrier shoreline restoration in the Terrebonne and Barataria basins because of the proximity of those barrier islands to the mainland. However, the CPRA was less optimistic about the prospects of protecting and restoring the Chandeleur Islands. The CPRA did acknowledge the habitat value of the islands and stated that it would coordinate with the USDI on implementing a federal habitat management plan once established. The USDI would complete its Delta and Breton Wildlife Refuges Comprehensive Conservation Plan (USDI Conservation Plan) in 2008.

USDI Conservation Plan (2008)

The USDI Conservation Plan highlights the previous success of vegetative plantings, sand fencing, and beach nourishment along the Chandeleur islands, stating that positive accumulations of up to 4” of sand had been accomplished during various projects prior to Hurricane Katrina (USDI 2008, 25). However, the USDI also highlights the devastating impact the hurricane had on the islands and the long-term consequences of material displacement. The plan states that future habitat management on barrier islands hinged on the exploration of new technology and sources of sediment.

A number of specific goals were set forth in the USDI Conservation Plan, including: (1) manage, conserve, and if feasible, restore the physical and ecological functions of barrier island habitats for fish and wildlife resources; (2) monitor and maintain island habitat with large-scale restoration projects; (3) protect the islands in accordance with the Wilderness Act of 1964; and (4) develop a habitat management plan by 2018 (USDI 2008, 37 & 38). The plan also proposes a number of specific projects for the Breton NWR:
- Plan and coordinate a research project to determine if the islands are able to be saved and restored;
- Perform dedicated dredge disposal and restore the refuge to pre-Katrina levels; and
- Ensure that the islands are in compliance with the Wilderness Act of 1964. (USDI 2008, 49)

**Emergency Berm (2010)**

In response to the BP Oil Spill, the State of Louisiana proposed the construction of a 100-mile long berm on the Gulf side of the Chandeleur Islands (Fitzgerald et al. 2015). The purpose of the proposed project was to capture oil on the artificial berm before it reached the islands. The United States Army Corps of Engineers (USACE) approved the construction of four sections of the proposed berm, which ultimately resulted in the dredging and installation of 3.7 million cubic meters of material along the Gulf side of the Chandeleur Islands.

Since oil had already reached the barrier island chain prior to project completion, the emergency berm did not perform well in terms of keeping oil off the Chandeleur islands (Fitzgerald et al. 2015, 20). However, the enormous amount of material dredged for the project did serve the purpose of temporarily nourishing island beaches. As with other nourishment efforts on the Chandeleur islands, the dredged material was gradually displaced by normal wave action and acute tropical events, including Hurricane Isaac (2012). But it is worth noting that some of the displaced material was redistributed offshore and alongshore, thereby continuing to provide physical and ecological value in the Chandeleur Island system.

**2012 State Master Plan**

The second iteration of the CPRA’s State Master Plan for coastal restoration was not favorable to the protection or restoration of the Chandeleur islands, primarily because the agency’s critical landform analysis indicated that the islands were too far from the mainland to reduce storm surge (CPRA 2012, 111). However, the CPRA frequently acknowledged the importance of barrier island ecological functions throughout the plan (CPRA 2012, 17, 25 & 31). As with the previous State Master Plan, the 2012 State Master Plan did not include any specific projects for the Chandeleur Islands.

**National Fish and Wildlife Federation Gulf Environmental Benefit Fund (2013)**

A US District Court ordered BP/Transocean to pay over $2.5 billion to the National Fish and Wildlife Fund (NFWF) for projects benefitting those areas impacted by the oil spill. The Gulf Environmental Benefit Fund (GEBF) will receive over $1.2
billion specifically for barrier island and river diversion projects in Louisiana (NFWF 2017). Over $465 million has already been awarded to projects in Louisiana, although no funding has been allocated to any specific projects on the Chandeleur Islands. NFWF is currently working to identify additional projects in Louisiana and across the Gulf coast.

**Louisiana Trustee Implementation Group Draft Restoration Plan (2016)**

In accordance with the Oil Pollution Act of 1990, a council of federal and state trustees was established to conduct a Natural Resources Damage Assessment (NRDA) and develop a plan to mitigate the damages associated with the BP Oil Spill. The plan acknowledges the value of barrier islands such as the Chandeleur Islands and the damage that was inflicted on such areas as a result of the spill. One of the projects developed as part of NRDA Phase III Proposed Early Restoration was the Louisiana Outer Coast Restoration Project, which includes the restoration of North Breton Island.

The Louisiana Outer Coast Restoration project will include: (1) the placement of sediment for the purpose of creating beaches, dunes, and back marsh; (2) the installation of sand fencing to trap and retain sediment; and (3) re-vegetation. There are four different areas included in the scope of work, including North Breton Island (the only site in the Chandeleur Islands). The total project budget is $318,363,000. According to the CPRA, the project is currently in the engineering and design phase.

The Louisiana Trustees may consider additional projects that meet the following restoration criteria: (1) habitat projects on federally managed lands and (2) bird projects. Other potential project types include those that focus on sea turtles and marine mammals. Projects that mitigate damages from the BP Oil Spill may be considered for NRDA funding regardless of whether said projects are specifically included in the 2017 State Master Plan.

**2017 State Master Plan**

The 2017 State Master Plan does not include any specific projects for the Chandeleur Islands. However, the CPRA does express its commitment to “developing a plan for barrier islands that identifies sources of sand and addresses environmental considerations so that shorelines can be rapidly restored...” (CPRA 2017, 43). The plan also acknowledges the State of Louisiana’s history of investment in barrier island restoration and reaffirms the State’s commitment “to invest in rebuilding these features,” including the designation of $1.5 billion to fund a barrier island program in the future (CPRA 2017, 87 & 88).
IV. Chandeleur Islands Maintenance and Re-Vegetation Project

After decades of research and planning, it is now imperative that coastal stakeholders take decisive action with respect to protecting and restoring the Chandeleur Islands. Furthermore, new funding streams such as NRDA and NFWF have provided opportunities that are unlikely to be available again in the foreseeable future. St. Bernard Parish Government (SBPG) proposes the development and implementation of a Chandeleur Islands Maintenance and Re-Vegetation Project that applies lessons learned from previous barrier island restoration efforts and the best current available science. The overarching purpose of the proposed project is to enhance the resilience of the Chandeleur Islands and sustain their ecological and physical functionality.

The proposed project consists of four distinct strategic interventions: (1) re-vegetation from the wrack line to the foredune of the islands; (2) installation of sand fencing and vegetation form behind the sand fence to the barrier flats; (3) re-vegetation along the back bay flat to the intertidal zone of the islands; and (4) re-establishment of the extirpated species marsh-elder (Iva frutescens) and seaside-elder (Iva imbricata) on existing dunes that are >5 feet in height. Sand live oak may also be installed on the dunes at a later date. The cumulative benefits of these interventions will be the facilitation of sand retention and the promotion of accretion on the Chandeleur Islands, which will sustain habitat, encourage biodiversity and maintain the islands as a barrier to storm surge. No dredging is proposed in conjunction with the proposed project.

1.) Wrack Line to foredune:

Railroad Vine (Ipomoea pes-caprae) - 1,304 plants, 40 ft. spacing for a total length of 52,170 ft.

Bitter Panicum (Panicum amarum) - 21,138 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.

Marsh-hay Cordgrass (Spartina patens) - 21,138 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.

2.) Sand Fence to barrier flats:

Sand Fence - 52,170 ft. in total length.

Gulf Bluestem (Schizachyrium maritimum) - 20,868 plants in double rows, 5 ft. spacing for a total length of 52,846 ft.
Seashore Paspalum (Paspalum vaginatum) - 13,865 plants in double rows, 5 ft. spacing for a total length of 34,663 ft.

3.) Back bay flats to intertidal zone:

Salt Grass (Distichlis spicata) - 9,178 plants in double rows, 5 ft. spacing for a total length of 22,947 ft.

Smooth Cordgrass (Spartina alterniflora) - 39,222 plants in double rows, 5 ft. spacing for a total length of 98,056 ft.

4.) Existing dunes of +5 ft. in height:

Marsh-elder (Iva frutescens) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

Seashore-elder (Iva imbricata) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

Sand Live Oak (Quercus geminata) - 1,668 plants in mott formations, 5 ft. spacing for a total length of 8,336 ft.

The total estimated budget for the proposed project is $3.5 million. The preliminary budget consists of two primary components: sand fencing and vegetation.

**Sand Fencing** (52,170 linear feet) (Materials; equipment; labor; lodging) **$2,500,000**

**Vegetation** (Please see the above quantities for each species) (Materials; equipment; labor; lodging) **$1,000,000*”

Since the project will occur at remote locations, it is likely that installation crews will stay near the islands overnight. Consequently, lodging has been factored into the preliminary budget.

* Vegetation estimate is based on $10/unit for woody species and $4/unit for other species.
References


3. Louisiana Highway 300 Coastal Infrastructure Resilience Project

St. Bernard Parish Government
Coastal Division

Louisiana Highway 300 Coastal Infrastructure Resilience Project

Social and Economic Context

Delacroix was originally settled by immigrants from the Canary Islands (Islas) in 1779. The settlement was one of the earliest examples of Louisiana’s working coast, as ranchers from as far away as Texas would herd cattle to the area to have their livestock domesticated by Isleño cattlemen. The Isleño community would later become well-known for its proficiency in farming, trapping, fishing and other endeavors. Delacroix now functions as one of the most vibrant commercial and recreational fishing hubs in Louisiana. The area is also critical to the inland oil and gas industry and the servicing of offshore wells.

The first major transportation route to Delacroix was the Mexican Gulf Railway, which was constructed through St. Bernard Parish in the 1840’s. Louisiana Highway 300 (LA 300) was not constructed until 1955. The highway has since become a critical evacuation route and major commercial artery in eastern St. Bernard Parish. LA 300 also served as one of the main access roads during the response to the BP Oil Spill, and remains an important transportation route for future offshore emergency response efforts in the Gulf of Mexico.

Saltwater intrusion, erosion, and subsidence have devastated the marine environment near the Delacroix community. Such impacts have been exacerbated by oil and gas activities in the area, including the excavation of miles of pipeline canals. LA 300 is now frequently flooded by Bayou Terre Aux Boeufs during high tide and storm events, placing both the community and local economy at risk. The highway is the only means of ingress/egress for residents, fishermen and others. Residents of Delacroix are essentially trapped in their homes when the highway is flooded. Commercial and recreational fishermen are also unable to access their boats or transport their landings when there is water on LA 300. It is therefore critical that the State of Louisiana and St. Bernard Parish Government (SBPG) work together to preserve life and commerce in Delacroix by increasing the resilience of the highway.
Select Commercial Fisheries Landings in St. Bernard Parish, 2014

<table>
<thead>
<tr>
<th></th>
<th>St. Bernard Parish</th>
<th>Louisiana</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oyster Producers</td>
<td>170</td>
<td>905</td>
<td>19%</td>
</tr>
<tr>
<td>Total Sacks</td>
<td>289,484</td>
<td>1,435,207</td>
<td>20%</td>
</tr>
<tr>
<td>Gross Value</td>
<td>$8,000,788</td>
<td>$36,707,762</td>
<td>22%</td>
</tr>
<tr>
<td>Shrimp Producers</td>
<td>319</td>
<td>4,970</td>
<td>6%</td>
</tr>
<tr>
<td>Total Pounds</td>
<td>3,026,576</td>
<td>96,863,816</td>
<td>3%</td>
</tr>
<tr>
<td>Gross Value</td>
<td>$5,461,154</td>
<td>$178,402,762</td>
<td>3%</td>
</tr>
<tr>
<td>Crab Producers</td>
<td>315</td>
<td>10,046</td>
<td>3%</td>
</tr>
<tr>
<td>Total Pounds</td>
<td>7,623,254</td>
<td>36,578,367</td>
<td>20%</td>
</tr>
<tr>
<td>Gross Value</td>
<td>$10,196,865</td>
<td>$80,784,752</td>
<td>20%</td>
</tr>
</tbody>
</table>

(Source: www.lsuaggcenter.com/agsummary)

As the above table indicates, commercial fisheries in St. Bernard Parish are a vital component of the seafood industry in Louisiana. Fisheries-related employment accounted for over 1,100 jobs ($23 million in total wages) and the production of more than $43 million in goods and services in St. Bernard Parish during 2013 (www.coast.noaa.gov). The tourism/recreational fishing industry, which accounted for 81.9% of all fisheries-related jobs in St. Bernard Parish as of 2013 (please see the below graph), also continues to thrive and grow.

(Source: www.coast.noaa.gov)

St. Bernard Parish Government
Project Description

In an effort to increase the resilience of LA 300, the Louisiana Department of Transportation and Development (DoTD) recently devised a plan to elevate the highway from Reggio to Delacroix (please see the below map). To complement this effort, SBPG is proposing that DoTD, the Coastal Protection and Restoration Authority (CPRA), and SBPG work together to enhance the current DoTD project and exponentially increase the resilience of LA 300 by strategically installing interlocking sheet pilings in Bayou Terre aux Boeufs along the western shoulder of the highway. Additionally, SBPG proposes that funds be allocated for the replacement of driveway aprons on the eastern shoulder of LA 300, where access may be adversely impacted by the highway elevation project. This set of interventions offers an excellent opportunity for an interagency partnership that would ultimately increase the long-term sustainability of LA 300 while decreasing future highway maintenance costs for the State of Louisiana.

The proposed project would maximize resilience against future environmental conditions by stabilizing the banks of Bayou Terre aux Boeufs and the shoulder of LA 300, thus decreasing the likelihood and severity of future flood events and highway inaccessibility. Additionally, the proposed project would mitigate the impacts of the planned DoTD elevation project by providing the funds necessary to ensure that driveway aprons along the eastern side of the highway remain accessible. This effort is consistent with the following objectives of Louisiana’s 2012 Coastal Master Plan:

St. Bernard Parish Government
Flood Protection: Reduce economic losses from storm surge based flooding to residential, public, industrial, and commercial infrastructure.

Cultural Heritage: Sustain the unique heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.

Working Coast: Promote a viable working coast to support regionally and nationally important businesses and industries.

Permitting, Land Ownership, and Maintenance

All project features would be designed and constructed in accordance with DoTD standards. The proposed project would require a Coastal Use Permit, and the primary landowners impacted by the project would be the State of Louisiana and the Meraux Foundation (please see the attached letter of support). SBPG intends on transferring ownership of all sheet pile installations to DoTD when the project is complete (a letter of support is currently being processed by the DoTD legal staff). SBPG will work closely with DoTD to ensure ongoing monitoring of all project components.

Probable Construction Cost

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveying/Geotechnical</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>$40,000</td>
</tr>
<tr>
<td>Design (6% of Construction)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>$1,143,151</td>
</tr>
<tr>
<td>25’ Coated Interlocking Sheet Piles (21,850 LF)</td>
<td>546,250</td>
<td>SF</td>
<td>$35</td>
<td>$19,116,750</td>
</tr>
<tr>
<td>6” Portland Cement Pavement (Aprons)</td>
<td>2,671</td>
<td>SY</td>
<td>$100</td>
<td>$267,100</td>
</tr>
<tr>
<td>Mobilization/Layout (10% of Construction)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>$1,938,585.0</td>
</tr>
<tr>
<td>SBPG Admin. (7% of Design/Construction)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>$1,578,331.0</td>
</tr>
</tbody>
</table>

**TOTAL:** $24,125,917

SBPG estimates that securing a 20-year bond for the total probable construction cost would add $10,449,574 to the total project cost, bringing the grand total to $34,575,491. Since it is critical that the proposed resilience measures are constructed concurrent with the DoTD elevation project, the parish would like to request that the CPRA commit $1,728,775 each year for twenty years beginning in 2017. SBPG is prepared to immediately start coordinating with DoTD in order to ensure that the resilience measures are designed in a manner consistent with agency standards and that the project schedule is appropriately coordinated.

St. Bernard Parish Government
Project Map

The below map illustrates those portions of the LA 300 shoulder along Bayou Terre aux Boeufs [highlighted in yellow] where SBPG is proposing to install interlocking sheet pilings.
4. Delacroix Island Resiliency Plan

**Delacroix Island Resiliency Plan**

**Current Status**

Improvements to LA 300 are set to begin before the end of 2016

**Project Location**

Delacroix Island, St. Bernard Parish

**Problem**

As noted in the 2012 St. Bernard Master Plan, Delacroix Island is an important resource to the future of St. Bernard Parish.

It is a critical economic, cultural and social component of the parish, serving as a link between the levee-protected centralized business centers, where most of the parish’s population, businesses and commercial and industrial development is concentrated, and the outer marshes and bayous, whose renewable and non-renewable resources contribute greatly to the economy of the parish, state and nation. In addition, it is also well suited as a strategic staging area for rapid and sustained response to emergency situations, such as boating accidents, petroleum well blowouts and oil and hazardous materials spills in the surrounding estuarine marsh environment, the Chandeleur Sound, the Breton Sound, and nearshore Gulf east of the Chandeleur Islands.

The area is also subject to flooding from storm surge and will require management, restoration, and flood protection measures if the area is to remain viable. Land loss and rising sea level will challenge the future viability of Delacroix Island and necessitate on-going adjustments in local coastal and flood protection measures and implementation of best management for infrastructure development.
With its configuration of boat launching and docking facilities, seafood off-loading areas, intricate network of tidal channels, and close proximity to prime natural resource harvesting areas and inshore oil and gas fields, Delacroix Island already possesses important infrastructure and assets, and further economic development and coastal protection activities, would prove to enhance services available for the area’s inhabitants as well as provide additional revenue streams for the parish.

**Previous Planning Efforts**

The importance of overall protection and restoration measures regarding Delacroix Island has been called out in previous reports and plans such as the 2012 St. Bernard Master Plan.

**Recommended Solution**

Based on forecasted funding sources, anticipated need, and available data, it is recommended to split up the overall Delacroix Island protection and restoration scheme into narrowly-defined components, which should allow for faster implementation and easier constructability. In this strategy, the resiliency plan was split up in discrete components involving: (1) the existing tidal levee protecting the eastern side of Delacroix Island, (2) LA 300, the state highway which connects Delacroix Island to the upper reaches of the Parish, and (3) a component involving growing the economic, tourism, and recreational capabilities of Delacroix Island.

**LA 300 Component** - LA 300 connects the upper reaches of the Parish to local fishing villages and is the only vehicular route, which provides access to Delacroix Island. As such, protection and maintenance of this thoroughfare is critical, both for protecting the livelihoods and industry built out of Delacroix Island and for providing a means of egress in the event of emergency.

Abutting Bayou Terre Aux Bouefs to the western side, select portions of LA 300 sit dangerously low, often times becomes inundated after large rain or storm events, and various sections suggest that existing bulkheads are no longer functioning properly at adequately preventing erosional forces from further eroding away at the road foundation. The DoTD currently has plans to renovate specific sections of road that have been identified. SBPG is interested in coordinating with the DoTD to raise sections of LA 300 where needed.

**Projected Benefits** - This component would raise low-lying sections of LA 300 to prevent flooding and further erosional impacts.

**Projected Costs** – This project should not have any associated costs required of the Parish.

**Potential Risks, Mitigation Measures, and Permitting Requirements** – As DoTD is acting as the lead, it is not expected that SBPG will be incurring any potential risks or will have to produce relevant permits for this component.

**Funding Strategy and Sources** - This component will be funded via DoTD.
Economic, Tourism, and Recreational Component - The Louisiana coast, in general, is very popular for recreation, especially activities such as fishing, sight-seeing, boating, camping, and bird watching. Continued redevelopment of marinas, overnight accommodations, boat ramps and bait shops, fishing charter boat operations, ecotourism guide operations, and other water-oriented activities in St. Bernard Parish will further provide opportunities for residents from the parish, the GNO Metropolitan Area, and tourists to access the wetlands and waterways for recreation and education.

With Louisiana currently experiencing one of the higher wildlife-associated recreation participation rates of the nation according to periodic surveys published by the U.S. Fisheries and Wildlife Service, Delacroix Island, with its unique position as one of the southernmost boat launches, is a prime candidate where further development of the existing infrastructure, facilities, and programs could return immediate economic benefits for the Parish and its citizens.

In this submittal, a plan detailing the implementation of a proposed fishing pier in Delacroix is described herein, as part of the “Recreational Fishing Pier and Public Seafood Market/Pavilion” project.

Projected Benefits - This component would serve to bring in additional money, job opportunities, and traffic into the Parish, and depending on the development strategy, could also serve to restore local environmental issues.

Projected Costs - Project costs would be dictated by the location and nature of the development scheme proposed in a more comprehensive planning effort.

Potential Risks, Mitigation Measures, and Permitting Requirements - Risks, mitigation measures, and permitting requirements would be dictated by the location and nature of the development scheme proposed in a more comprehensive planning effort.

Funding Strategy and Sources - Given the oyster fishery, recreational opportunities, and historical context, this component would candidate to compete for funding via the RESTORE Act.

Tidal Levee Component - The existing back levee located on the eastern side of Delacroix Island, constructed mainly as a tidal surge barrier, may be experiencing the effects of subsidence and sea-level rise, in addition to coastal erosion effects, causing the levee to lose its effectiveness in protecting Delacroix Island from inundation.

Upon inspection, the back levee appears to be in very good condition as (1) there are no apparent washouts or erosional areas on the
flood or protected sides of the levee, (2) the toe of the flood side has significant mixed scrub-shrub vegetation growth present, and (3) most of the adjacent area is marsh. In the past, armoring the front edge of the flood side via placement of rock or rubble stone has been proposed, but due to the current healthy condition of the levee and extensive and prohibitive wetland mitigation costs that would likely result, other protective measures may warrant consideration.

Many times armoring is done on the back side of the levee to prevent erosion to the levee when an over-topping event is incurred, as seen with Hurricane Katrina; however, any placement of material on the levee, be it flood side, protected side, or crown, is problematic as it increases the cost of future lifts as the armoring must be removed in order to do so. Furthermore, armoring can cause levee failures if the soils are too weak to support the additional weight of the rocks/rubble.

At this time, it is expected the most economical, readily available, and beneficial method would be maintaining the flood side toe of the levee with robust vegetation and through possible implementation of utilizing living shoreline products in areas of adjacent open water. Should armoring the back levee be desired, it would need to be initiated with a comprehensive geotechnical, wave/surge modeling, and engineering analysis to ensure that such a project does not do more harm than good.

Projected Benefits - This component would make the back levee more resilient in the face of severe erosional events and could reduce the inundation of Delacroix Island during future storm events.

Projected Costs - After identifying the conditions of the flood side toe and surveying the existing vegetation, it is expected that the plantings should not have large associated costs and would be a good candidate for volunteering opportunities. At an estimated cost of $300/ft, projected costs for providing adequate protection for the entirety of the 2.75 mile levee via living shoreline products could be expected to near $4.5M. The cost for a comprehensive engineering evaluation such as this likely falls within the $400-600K range, which would inform the ultimate advisability, feasibility, and cost of any armoring effort.

Potential Risks, Mitigation Measures, and Permitting Requirements - There are no known risks associated with the additional plantings of this component; however, work on the flood side of the levee, be it armoring the levee or installing living shoreline products, would require permits and may incur mitigation costs depending on the impact to wetlands during installation and construction.

Funding Strategy and Sources – It is expected that this component may be eligible for funding via the Direct Component of the RESTORE Act under the scope of coastal flood protection and related infrastructure. Another good fit for the levee component would be the NOAA Regional Coastal Resilience program.
Consistency with CPRA Master Plan and other Ongoing Regional Efforts

The armoring of the tidal back levee was submitted for inclusion into the 2017 Master Plan, but will not be included in the update due to inconsistencies in scope with the principles and objectives of the master plan. The components proposed herein for Delacroix Island interplay well with some of the other proposed projects, namely the Armoring of Bayou Gentilly, the North Phase of the Bayou Terre Aux Bouefs Ridge Restoration, Phases 1 and 2 of the Lake Lery Rim Restoration and Marsh Creation, and the Recreational Fishing Pier and Public Seafood Market/Pavilion projects.

Restoration of Areas Impacted by Deepwater Horizon Oil Spill

It can be safely be said that Delacroix Island was one of the areas most impacted by the Deepwater Horizon oil spill. Due to its overwhelming reliance on the Gulf for much of its revenue, much of the area became financially burdened until well after the cleanup efforts were completed. In addition, many of the wetlands that protect Delacroix Island and serve as a buffer for strong storm events were irreconcilably affected, thus threatening the future well-being of Delacroix Island. These components would allow Delacroix Island to financially recover some of its lost revenue and bolster the existing defenses of the area, providing a positive outlook for its overall viability.
2016 Annual Coastal Report

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Bayou Terre Aux Beoufs, Delacroix, Louisiana

Bayou La Loutre, Yscloskey, Louisiana
I. Executive Summary

The purpose of the 2016 Annual Coastal Report is to provide a summary of coastal restoration activities from the previous year and to articulate a vision for the future. The report also includes a comprehensive profile of ongoing and proposed coastal restoration activities in St. Bernard Parish. Finally, the report includes general information regarding the St. Bernard Parish Government (SBPG) Coastal Division.

Governor John Bel Edwards appointed St. Bernard Parish President Guy McInnis to the Louisiana Coastal Protection and Restoration Authority (CPRA) Board in early 2016. As a CPRA Board member, President McInnis represents the interests of St. Bernard Parish while also playing a leadership role in coastal restoration activities across Louisiana. President McInnis's appointment was the first for a local St. Bernard Parish official since the inception of the CPRA.

The SBPG Coastal Division spent the first half of 2016 engaging in a planning process that ultimately resulted in the adoption of the 2016 Coastal Strategy Document. The planning process built on the previous work of the Coastal Zone Advisory Committee (CZAC) and other stakeholders, and the final product includes an updated prioritized list of projects; a set of updated project maps; a preliminary scope of work and budget for each project; and a project funding matrix. The Coastal Strategy Document was approved by the CZAC and adopted by the St. Bernard Parish Council in August 2016.

Since its adoption, the Coastal Strategy Document has informed SBPG decision-making regarding all coastal restoration activities. Virtually every project included on the approved priority list is currently the subject of a pending request for program funding or a grant application. Several projects identified in the Coastal Strategy Document have already advanced from the planning stage to engineering and design or construction and implementation.

Coastal restoration activities conducted in 2017 will be a reflection of the planning that was completed in 2016. Additional priority list projects will advance to engineering and design or construction and implementation, and a number of smaller projects will be completed. As new funding streams become available, SBPG will be well-positioned to capitalize on new opportunities and continue forging partnerships with public agencies, non-governmental organizations (NGO), and private landowners. The overall vision for 2017 is to continue persistently seeking project funding and engaging a broad base of stakeholders.
II. 2016: Recap and Highlights

Projected Total Expenditures by Project Phase

- **Construction and Implementation**
  - **December 2016:** The St. Bernard Parish Council approved $15,000 in funding for the installation of navigational aids near the confluence of the Mississippi River Gulf Outlet (MRGO) and Bayou La Loufresse.
  - **November 2016:** The Coalition to Restore Coastal Louisiana (CRCL) completed a 4.5-mile long shoreline protection project ($600,000) along the shores of Lake Bilo, Lake Fortuna, and Lake Athanasia.
2016 Annual Coastal Report

- **November 2016:** SBPG initiated its Black Mangrove Planting Program ($258,000) by collecting black mangrove propagules in the Biloxi Marsh and potting 1,500 seeds in the greenhouse facility at Chalmette High School (CHS). Students from CHS will assist SBPG and its partners at Nicholls State University, the LSU Ag Center, and the Louisiana Department of Agriculture and Forestry with raising the propagules until the trees are mature enough to plant along the shoreline of the Biloxi Marsh. Other project partners include the Meraux Foundation, Orvis, and Low Tide Charters. The parish’s black mangrove planting program has been endorsed by over twenty entities, including public agencies, universities, NGOs, and private partners.

![CHS students planting black mangrove propagules at the school's greenhouse](image)

- **September 2016:** The CPRA initiated its Living Shoreline Demonstration Project ($23.5 million), which includes the installation of thousands of artificial reef products along the shores of Eloi Bay and Lydia Point to the shores of Treasure Bay (approximately 21 linear miles). The purpose of this project is to stimulate the growth of oyster reefs along the coast and protect the shoreline.

- **August 2016:** The Lake Lery Marsh Creation project ($8 million) was enhanced with a synthetic shoreline protection product and vegetative plantings along the shoreline and within the containment berm area. The project created approximately 65 acres of new marsh near Delacroix.
May 2016: SBPG conducted side sonar in the Violet Canal as part of its ongoing Violet Harbor of Refuge Project ($2 million). The data collected during this sonar exercise will be utilized in future marine debris removal activities in the canal. The purpose of this project is to facilitate the use of the Violet Canal as a safe harbor during tropical weather events.

Projected Total Expenditures by Project Type

- Marsh Creation ($466,499,000)
- Ridge Restoration ($44,600,000)
- Economic Development ($39,025,000)
- Shoreline Protection ($27,300,000)
- Other ($2,588,000)

Engineering and Design

December 2016: The Coastal Wetlands Planning, Protection and Restoration (CWPPRA) Technical Committee recommended approval for Phase 1 (engineering/design) of the Bayou La Loutre Ridge Restoration and Marsh Creation Project ($29.4 million). The project will restore approximately 5.5 miles of historic forested ridge along Bayou La Loutre and will create or nourish over 380 acres of marsh.
December 2016: The St. Bernard Parish Council approved engineering/design funding ($1.3 million) for Phase 1 of the Bayou Terre Aux Beaus Ridge Restoration Project ($15.2 million). Phase 1 of the project will include shoreline protection along Bayou Terre Aux Beaus and Gentilly Bayou near Delacroix. SBPG has also submitted a grant application to the United States Corps of Engineers (USACE) for funding through the Continuing Authorities Program (CAP 206). The USACE Mississippi Valley Division has since conducted a field visit and submitted the project to the United States Department of the Army for review.

December 2016: The St. Bernard Parish Council approved engineering/design and construction funding for the Delacroix Recreational Fishing Pier and Dry Dock Project ($1 million). The publicly owned and operated complex will include a dock, covered pavilion, parking lot, and hoist/dry dock facility.

November 2016: The CPRA committed Natural Resource Damage Assessment (NRDA) funding for the engineering/design of the Lake Borgne Marsh Creation Project (Phase 1) ($131 million). The initial phase of the project will create over 1,200 acres of new marsh along the land bridge between Lake Borgne and the MRGO.

November 2016: The CPRA committed state RESTORE Act funding for the engineering/design of the Golden Triangle Marsh Creation Project ($272.8 million) near the St. Bernard/Orleans parish line. The project will create approximately 4,200 acres of marsh between the MRGO and Gulf Intracoastal Waterway.

October 2016: SBPG partnered with the Lake Pontchartrain Basin Foundation (LPBF) and Louisiana Department of Wildlife and Fisheries to conduct a Derelict Crab Trap Removal Project near Delacroix. Removal efforts will be conducted during the first-ever statewide crab fishing closure in early 2017. SBPG also has a pending National Oceanic and Atmospheric Administration (NOAA) Marine Debris Removal Program grant application for additional project funding and expansion through 2019.

September 2016: SBPG partnered with the LPBF to build on the organization’s previous cypress reforestation efforts and develop a Caernarvon Cypress Reforestation Program ($112,000). The next phase of the program will consist of planting approximately 2,400 cypress trees in a 12-acre area in the marsh near the floodwall at Caernarvon. The planting is scheduled to occur in February 2017.
• June 2016: The CPRA committed state RESTORE Act funding for the engineering/design of the Biloxi Marsh Living Shoreline Project ($3.2 million). The purpose of this project is to stimulate the growth of oyster reefs along the coast and protect the shoreline.

Planning

• December 2016: SBPG completed a first draft of its RESTORE Act Multiyear Implementation Plan (RESTORE MIP) for the purpose of accessing RESTORE Direct Component funding beginning in 2017. Currently, the RESTORE MIP includes additional recreational fishing piers and a public seafood market; a streetscape enhancement project along the Paris Road corridor; a fisheries-oriented workforce development program in conjunction with Nunez Community College; and construction funding for Phase 2 of the Lake Lery Marsh Creation Project. There is currently over $1.9 million in Direct Component funding available to SBPG, and the CPRA will be making additional state-level Direct Component matching funds available to local entities in 2017. SBPG will submit a final version of its RESTORE MIP to the United States Department of the Treasury for review and approval in early 2017.

• November 2016: SBPG began planning an ongoing marine debris removal and maintenance dredging program for critical navigable waterways throughout the parish. It is estimated that the program will cost approximately $150,000 annually. Program planning will be finalized in early 2017.

• November 2016: SBPG submitted a request to the CPRA for over $34 million in state Gulf of Mexico Security Act (GOMESA) funding to install sheet piling along Louisiana Highway 300 (LA 300) and Bayou Terre Aux Beoufs. The proposed project would be implemented in conjunction with the LA 300 road elevation project that has already been designed and funded by the Louisiana Department of Transportation and Development. It is anticipated that the CPRA will make a decision regarding the request in 2017.

• October 2016: The CPRA announced that it is planning a maintenance dredging project in the Violet Canal for 2017. The project will complement SBPG’s upcoming marine debris removal efforts in the Violet Canal and will greatly contribute to the overall maintenance of the canal as a safe harbor during tropical events.
- **September 2016**: SBPG partnered with the Louisiana Department of Agriculture and Forestry to begin planning a Central Wetlands Unit Vegetative Planting Program. The initial planting of bulrush is tentatively scheduled to occur in 2018.

- **August 2016**: The St. Bernard Parish Council adopted the Coastal Strategy Document, a comprehensive local coastal restoration plan that is intended to guide all local coastal restoration activities for the next ten years.

*Shell Beach, Louisiana (Painting by: Elaine Mercer)
III. 2017: Vision for Restoring the Coast

The upcoming year will be pivotal for coastal restoration in St. Bernard Parish. The CPRA recently published a draft of its 2017 Coastal Master Plan, which includes a number of new projects that SBPG championed in 2016, including Bayou Terre Aux Boeufs Ridge Restoration and Lake Borgne Marsh Creation. The Upper Breton Sediment Diversion proposed by the CPRA in 2012 is no longer included in the Coastal Master Plan, although SBPG will continue to monitor the status of the proposed Mid Breton Sediment Diversion.

As the above 2016 Recap and Highlights section indicates, a number of critical projects are slated for either construction and implementation or engineering and design during the upcoming year. SBPG will work closely with the CPRA and other partners to ensure that all projects are executed in a manner that is most beneficial to St. Bernard Parish. The Coastal Division will also remain in close contact with local officials to ensure an appropriate level of oversight and monitoring during all phases of each project. Finally, SBPG remains committed to utilizing local contractors and other resources for coastal restoration activities to the extent possible.

Public education and outreach will be critical to the success of coastal restoration activities going forward. SBPG will continue to cultivate relationships with federal and state officials while also working closely with public and private sector partners, NGOs, and academic institutions. SBPG will also increase its efforts to provide more opportunities for volunteers to become engaged in coastal restoration during the upcoming year.

Given the popularity of recent events such as CPRA Community Conversations and the Louisiana Department of Wildlife and Fisheries 3-day mobile licensing program, SBPG will continue striving to provide the public with direct access to federal and state agencies. In fact, SBPG will be hosting an official CPRA board meeting in October 2017. This will mark the first time such a meeting has been conducted in St. Bernard Parish since the inception of the CPRA.

St. Bernard Parish is currently poised for an incredible amount of investment in coastal restoration. New funding streams such as RESTORE and GOMESA will begin to provide a level of funding that once seemed impossible to obtain. Furthermore, the current St. Bernard Parish Council has chosen to invest an unprecedented amount of local funding in coastal restoration. It is therefore critical that SBPG continues to build on its current momentum and capitalize on new opportunities in 2017.
## IV. Master Project List

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<th>Project</th>
<th>Phase</th>
<th>Cost</th>
<th>Funding</th>
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**TOTAL:** $580,012,000
V. SBPG Coastal Division

Executive Director of Coastal Operations
John Lane
jlane@sbpg.net

Coastal Zone Management Administrator
William McCartney
wmccartney@sbpg.net

Coastal Advisor
Jerry Graves, Ph.D.
jgraves@sbpg.net

Coastal Advisor
Capt. George Ricks
gricks@sbpg.net
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Parish President Guy McInnis and John Lane, Executive Director of Coastal Affairs
I. Executive Summary

The St. Bernard Parish Government (SBPG) Coastal Division reached a number of critical milestones in 2017. Engineering and design began for five large-scale projects: Bayou La Loutre Ridge Restoration; Bayou Terre aux Beoufs Ridge Restoration (Phase 1); Lake Borgne Marsh Creation (Phase 1); Golden Triangle Marsh Creation (Phase 1); and Biloxi Marsh Living Shoreline. SBPG also constructed Phase 1 of the Delacroix Fishing Complex and installed navigational aids near Shell Beach and Hopedale. Finally, the Louisiana Coastal Protection and Restoration Authority (CPRA) board convened at Chalmette High School in July, marking the first time the agency has conducted an official meeting in St. Bernard Parish.

Local coastal restoration efforts have benefitted greatly from partnerships and volunteerism. The SBPG Coastal Division worked closely with a number of public, private, and nongovernmental entities throughout the year to implement small-scale coastal restoration projects. Such projects include the planting of cypress trees near Caernarvon; the planting of black mangroves in the Biloxi Marsh; and the removal of derelict crab traps near Delacroix. Hundreds of volunteers from around the United States, including many from Chalmette High School (CHS) and local groups and businesses, contributed thousands of hours of labor during the implementation of the aforementioned projects.

The SBPG Coastal Division engaged in a number of planning and grant writing activities in 2017. The first iteration of the parish’s RESTORE Act Multiyear Implementation Plan was approved by the US Treasury in May. SBPG has since submitted RESTORE Act Direct Component grant applications for the Paris Road Corridor Streetscape Enhancement project and the Nunez Community College Fisheries Workforce Development program. The parish also recently submitted a request to the Deepwater Horizon Trustee Implementation Group (TIG) for $3.5 million in Natural Resource Damage Assessment (NRDA) funding for the Chandeleur Islands Maintenance and Re-vegetation project.

A number of high priority coastal activities will be implemented during the coming year. Several projects will likely be funded via the RESTORE Act in 2018, including Lake Lery Marsh Creation (Phase 2). Additionally, each of the previously referenced small-scale coastal restoration projects (cypress trees, black mangroves, and derelict crab traps) will occur again next year. Finally, the SBPG Coastal Division looks forward to capitalizing on new funding opportunities in 2018, including Phase 2 of the Gulf of Mexico Energy Security Act (GOMESA).
II. 2017: Recap and Highlights

Projected Total Expenditures by Project Phase

Over $25 million in additional projects were completed in 2017, most notably the Living Shoreline and Delacroix Fishing Complex. Projected engineering and design expenditures have remained relatively static since 2016. Total projected planning expenditures have increased by approximately $40 million since last year, largely due to the passage of the State’s 2017 Coastal Master Plan and the introduction of the East Delacroix Marsh Creation polygon and other large-scale projects.
Construction and Implementation

- **January 2017**: SBPG completed an emergency navigational aids project near the Mississippi River Gulf Outlet (MRGO) at Shell Beach and Hopedale. Channel markers were installed in order to mitigate some of the navigational hazards caused by the MRGO rock dam closure.

- **February and March 2017**: SBPG worked with the Lake Pontchartrain Basin Foundation (LPBF), Louisiana Department of Wildlife and Fisheries (LDWF), and Sweetwater Marina to conduct a derelict crab trap sweep in Delacroix. Approximately 3000 derelict crab traps were removed from St. Bernard Parish waterways during the event. Two similar sweeps will be conducted in February and March of 2018.

- **March 2017**: SBPG worked with the Louisiana Department of Agriculture and Forestry (LDAF) and Common Ground to plant 500 Roseau cane stalks in Reggio and 1500 plugs of smooth cordgrass along Bayou La Loutre. The parish will be working with LDAF on a similar bulrush project in the Central Wetlands Unit in 2018.

- **March and April 2017**: SBPG worked with LPBF, the St. Bernard Wetlands Foundation, and Restore the Earth to plant 2300 cypress trees in the Caernarvon area. Approximately 1000 additional cypress trees will be planted near Caernarvon in March 2018.

- **April 2017**: SBPG worked with Nicholls State University, the LSU Ag Center, and others to plant 1000 black mangroves in the Biloxi Marsh. The project was largely funded by private contributions and grants. The SBPG Coastal Division, CHS, and the LSU Ag Center have raised 3000 black mangrove plants in the school’s greenhouse since 2016. An additional 1000 mature black mangroves will be planted in the Biloxi Marsh in April 2018.

- **August 2017**: SBPG completed the construction of the Delacroix Fishing Complex (Phase 1), which included a fishing pier, pavilion, and restroom. The property for the fishing pier and pavilion was donated by the Meraux Foundation. Phase 2 (boat hoist and dry dock) construction will be completed in 2018.

- **October 2017**: SBPG completed the Violet Safe Harbor (marine debris removal) project in the Violet Canal. The CPRA will also be performing maintenance dredging along a portion of the canal in January 2018.
Projected total expenditures by project type have generally remained static since 2016. However, the shoreline protection category increased by $40 million due to the reclassification of the Point aux Marchettes project. The reclassification of the project from marsh creation to shoreline protection is the result of recent project scoping conducted by various federal agencies as part of the Coastal Wetlands Planning, Protection and Restoration (CWPPRA) process. Newly proposed projects such as Chandeleur Islands Maintenance and Re-vegetation have also resulted in a fairly significant increase in projected expenditures for projects designated as other.
Engineering and Design

- January 2017: The CWPPRA Task Force approved Phase 1 (engineering/design) funding for the Bayou La Loure Ridge Restoration and Marsh Creation project ($29.4 million). The CPRA has since agreed to fund the 25% non-federal cost-share for the project. Engineering/design began in November 2017.

- February 2017: SBPG engaged Royal Engineering for the purpose of initiating engineering/design ($1.3 million) for Phase 1 of the Bayou Terre Aux Beoufs Ridge Restoration project ($15.2 million). Engineering/design is approximately 90% complete as of November 2017. This portion of the project is being funded by SBPG.

- October 2017: The CPRA engaged The Duplantis Group for the purpose of initiating engineering/design for the Lake Borgne Marsh Creation Project (Phase 1) ($131 million). The initial phase of the project will create approximately 600 acres of marsh. The project is being funded through the NRDA program.

- October 2017: The CPRA engaged CB&I for the purpose of initiating engineering/design for the Golden Triangle Marsh Creation project (Phase 1) ($272.8 million) near the St. Bernard/Orleans parish line. The initial phase of the project will create approximately 600 acres of marsh. The project is being funded through the RESTORE Act.

- October 2017: The CPRA engaged Hatch Mott MacDonald for the purpose of initiating engineering/design for the Biloxi Marsh Living Shoreline project ($3.2 million). The purpose of this project is to stimulate the growth of oyster reefs along the coast and protect the shoreline. The project is being funded through the RESTORE Act.

- December 2017: SBPG advertised a request for proposals to remove marine debris from Yscloskey Bayou and Bayou La Loutre. It is anticipated that a contractor will be selected and work will begin in early 2018.

- December 2017: SBPG and Plaquemines Parish Government (PPG) have proposed a partnership to engage Royal Engineering and Coastal Engineering Solutions to conduct a study/preliminary design for the East Bank Sediment Pipeline project ($1.3 million). The project would provide a renewable source of sediment from the Mississippi River to service marsh creation efforts throughout the region. The initial portion of the project may be funded by SBPG and PPG.
Planning

- **January 2017:** SBPG has a pending request to the CPRA for $35 million in GOMESA funding to install sheet piling along Louisiana Highway 300 (LA 300). The proposed project would complement the LA 300 road elevation project that was recently completed by the State. It is anticipated that the CPRA will make a decision regarding the request in early 2018.

- **April 2017:** SBPG worked with several federal agencies to nominate the Point aux Marchettes Shoreline Protection ($40 million) and East Delacroix Marsh Creation ($25 million) projects for CWPPRA funding. Both were voted as top projects in their respective basins and have since been endorsed by over twenty entities and elected officials, including Senators Cassidy and Kennedy and Congressman Scalise. The CWPPRA Technical Committee will make its final recommendations regarding project funding in December 2017.

- **May 2017:** The US Treasury approved the initial version of the parish’s RESTORE Act Multiyear Implementation Plan (RESTORE MIP). SBPG has since submitted grant applications for several projects and is currently in the process of updating its RESTORE MIP to include additional projects. SBPG anticipates that it will submit its updated RESTORE MIP to the US Treasury for review and approval by February 2018.

- **July 2017:** SBPG received a number of grants and private contributions for its ongoing black mangrove program. Grantors included Orvis and the American Fly Fishing Trade Association, Low Tide Charters, Biloxi Marsh Lands Corporation, and Lake Eugenie Land Development. Incorporated also recently made private contributions to the program.

- **September 2017:** SBPG submitted a request to the CPRA for RESTORE Act Parish Matching Funds ($2.7 million) to complete construction of the Lake Lery Marsh Creation (Phase 2) project. It is anticipated that the CPRA will make a decision regarding the request in early 2018.

- **September 2017:** SBPG submitted a request to the Deepwater Horizon TiG for $3.5 million in NRDA funding for the Chandeleur islands Maintenance and Re-vegetation project. It is anticipated that the TiG will make a decision regarding the request in early 2018.

- **December 2017:** SBPG is in the process of updating its 2016 Coastal Strategy Document. It is anticipated that the updated plan will be submitted to the St. Bernard Parish Council for review in early 2018.
III. 2018: Vision for Restoring the Coast

The State of Louisiana’s 2017 Coastal Master Plan includes a number of new large-scale projects in St. Bernard Parish. The SBPG Coastal Division is in the process of updating its Coastal Strategy Document and other local plans in order to better align the State’s priorities with those of the parish. Additionally, it is worth noting that the CPRA has removed the Upper Breton Sediment Diversion project from the updated State master plan. SBPG will continue to closely monitor any new developments regarding proposed large-scale sediment diversions.

RESTORE Act and GOMESA funding will be made available to fund a number of coastal activities in 2018. It is anticipated that SBPG will receive over $1 million in RESTORE Act Direct Component funds and at least $600,000 in GOMESA funds over the next year. These funds have been set aside for projects ranging from marsh creation to economic development. Other pending grant applications made through the CPRA, such as the GOMESA Coastal Infrastructure Program and RESTORE Act Parish Matching Program, may also facilitate project funding and implementation in 2018.

The SBPG Coastal Division will remain heavily engaged in the CWPPRA process, which provides the parish with opportunities to obtain funding for large-scale projects annually. After obtaining Phase 1 funding for the Bayou La Loutre Ridge Restoration project in 2016, two additional projects (Point aux Marchettes Shoreline Protection and East Delacroix Marsh Creation) were nominated for program funding in 2017. The SBPG Coastal Division will be working closely with its federal and state partners to nominate additional projects in 2018.

Small-scale coastal restoration programming will continue to provide SBPG with opportunities to engage in coastal restoration on an ongoing basis while the parish seeks funding for larger projects. As demonstrated in 2017, such projects also provide opportunities for community education and engagement. The SBPG Coastal Division will continue to work with its private and nongovernmental partners, as well as local citizens, to continue implementing its annual small-scale coastal restoration programming in 2018.
## IV. Master Project List

<table>
<thead>
<tr>
<th>Project</th>
<th>Phase</th>
<th>Cost</th>
<th>Funding</th>
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**Total:** $620,519,000
V. SBPG Coastal Division

Executive Director of Coastal Affairs
John Lane
jlane@sbpg.net

Coastal Zone Management Administrator
William McCartney
wmccartney@sbpg.net

Coastal Advisor
Jerry Graves, Ph.D.
jgraves@sbpg.net

Coastal Advisor
Capt. George Ricks
gricks@sbpg.net

Parish President Guy McInnis at the CPRA board meeting at Chalmette High School