

## RESTORE Council FPL 3 Proposal Document

### **General Information**

*Proposal Sponsor:*

Louisiana Coastal Protection and Restoration Authority

*Title:*

River Reintroduction into Maurepas Swamp

*Project Abstract:*

This proposal is to implement a river reintroduction project. The project goal is to convey Mississippi River water into the Maurepas Swamp to improve the structure, function, and resilience of the coastal forest habitat through reintroduction of fresh oxygenated water, nutrients, and sediment. Congress recently approved appropriations for the West Shore Lake Pontchartrain (WSLP) levee in the vicinity, which created an opportunity to save money by consolidating the final design and construction of these projects. The Maurepas project is anticipated to benefit ~45,000 acres of swamp habitat at a total cost of \$190 million, with \$130 million from Bucket 2. Louisiana is considering using ~\$60 million from Bucket 3 and/or other funds for the remaining cost, potentially used to meet wetland mitigation needs for the levee, providing additional cost savings to the state. The WSLP project and its mitigation are scheduled to be completed by 2024 resulting in the urgency to build both projects concurrently.

*FPL Category:*

Cat2: Implementation Only

*Activity Type:* Project

*Program:* N/A

*Co-sponsoring Agency(ies):* N/A

*Is this a construction project?:* Yes

*RESTORE Act Priority Criteria:*

(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

*Priority Criteria Justification:*

For priority criterion 1, it meets the scale (~45,000 acres of coastal swamp forest benefitted), duration (project life of 50 years provides long-term benefits to the project area), and sustainability (prolongs the existence of the swamp habitat by decades) factors.

For priority criterion 2, it provides landscape-scale benefits to the upper Pontchartrain Basin where freshwater input is most critical in the estuary. The Maurepas Swamp is the second largest

contiguous area of forested coastal wetland in Louisiana and one of the largest along the Gulf Coast.

For priority criterion 3, the project has been included in most coastwide and basin-level restoration plans for decades, including CWPPRA Conservation plan, Coast 2050, Louisiana's 2007, 2012, and 2017 Comprehensive Master Plan for a Sustainable Coast (CPRA 2017), and is listed as an example of the type of project, approach and technique in the 2019 RESTORE Comprehensive plan for the basin. By restoring, in part, the natural process that previously sustained this habitat, with the ability to adaptively manage the flows, this project increases the function, structure, and resiliency of the swamp forest under variable and uncertain conditions in the future.

*Project Duration (in years):* 8

## **Goals**

*Primary Comprehensive Plan Goal:*  
Restore and Conserve Habitat

*Primary Comprehensive Plan Objective:*  
Restore and Enhance Natural Processes and Shorelines

*Secondary Comprehensive Plan Objectives:*  
Restore , Enhance, and Protect Habitats  
Promote Community Resilience

*Secondary Comprehensive Plan Goals:* N/A

*PF Restoration Technique(s):*  
Restore hydrology and natural processes: Controlled river diversions

## **Location**

*Location:*  
Pontchartrain Basin, LA – Intake at River Mile 144.2 near Garyville, LA. Benefits ~45,000 acres in St. John the Baptist, St. James, & Ascension parishes, roughly between Lake Maurepas, Blind River, Reserve Relief Canal, and developed uplands along the Mississippi River plus some lake shoreline north of Blind River (Figures 1 and 2).

*HUC8 Watershed(s):*  
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas (Lake Maurepas)

*State(s):*  
Louisiana

*County/Parish(es):*  
LA - Ascension  
LA - St. James  
LA - St. John the Baptist

*Congressional District(s):*  
LA - 6  
LA - 2

## **Narratives**

### *Introduction and Overview:*

This proposal is for implementation of a river reintroduction project in the upper portion of the Pontchartrain Basin, Louisiana-Mississippi region. It will introduce Mississippi River water into the southern portion of the Maurepas Swamp via an intake and gated control structure at the river levee near Garyville, LA; a conveyance channel into the swamp with “guide levees” to ensure the water gets to the intended location and prevent flooding; and additional outfall management features designed to help distribute the flow throughout the project area. The goal of the project is to reduce or minimize future loss of coastal swamp forest habitat in the project area through the introduction of Mississippi River water. The project is needed to improve the health and essential functions of the swamp for long-term sustainability. The project area of influence is approximately 45,000 acres of baldcypress/water tupelo swamp, including closed canopy, transitional, and open canopy/marsh.

In FPL 1, the Council approved approximately \$14.2 million for planning, final engineering and design, and permitting for the project. The estimated cost of project construction is \$190 million, with \$130 million being requested from Bucket 2 of FPL 3.

Near-term Council action could advance the commitments in the 2016 Comprehensive Plan Update by facilitating this large-scale Gulf coast ecosystem restoration project, save money, and improve community resilience. Congress recently approved appropriations for the WSLP levee, which overlaps with a portion of the guide levees for the proposed project. The State and USACE would achieve substantial cost savings by consolidating the final E&D and construction of the overlapping portions of the two projects (Figure 2). In addition, the USACE is required to mitigate the wetland impacts of the levee. The swamp habitat mitigation can potentially be met with a portion of the environmental benefits of the Maurepas project. Louisiana is considering requesting ~ \$60 million from Bucket 3 and/or other source(s) to cover the portion of the Maurepas project that could be used to mitigate the levee impacts. If the USACE accepts this mitigation arrangement, Louisiana would be credited those funds towards its required share of the cost of the WSLP levee, thereby offsetting the proposed Bucket 3 investment. The timeline for implementing the Maurepas project will be heavily reliant upon and coordinated with that of WSLP.

This project is based on an extensive history of planning and science, federal and state support, and Congressional authorization. In 2001, the federal-state CWPPRA Task Force approved funds for the project to 30% design. In 2004, the USACE identified the project as a near-term priority in the LCA Ecosystem Restoration plan (USACE 2004), authorized by Congress in WRDA 2007. The State funded design to the 95% level, with NFWF GEBF funds used for additional planning tasks, including contracting a Technical Advisory Group (TAG) of forest wetland ecologists to develop performance measures and targets for ecosystem function, resilience, and sustainability (Krauss et al. 2017). The project was included in the 2007, 2012, and 2017 Louisiana Comprehensive Master Plan for a Sustainable Coast (CPRA 2017).

In 2012, the Gulf Coast Ecosystem Restoration Task Force (Task Force) Strategy called for expedited construction of authorized river reintroduction projects. The RESTORE Act directed the Council to include in its Comprehensive Plan, the strategy, projects, and programs recommended by the Task Force. By including this project in FPL3, the Council would be building upon this history, previous investments in project planning, and fulfilling the Task Force recommendation to expedite its construction. Implementing this project builds on the RESTORE investment from the 2015 Initial FPL to complete outstanding tasks required to make the project ready for construction. These tasks included creating a new hydrodynamic and water quality model, final design, landrights, continuation of engagement with the TAG, continuation of permitting and environmental compliance processes, and creating a Preliminary Operations, Maintenance, Monitoring, and

Adaptive Management (OMMAM) plan (Buras et al. 2018).

There are many ecological problems in this area, but probably the most significant is the current hydrologic regime, which is no longer conducive to sustain swamp forest habitat (Shaffer et al. 2009, 2016). Historically, the ~200,000 acre swamp received oxygenated water, sediment, and nutrient inputs from the Mississippi River during seasonal overbank flooding and via Bayou Manchac. That process was interrupted by the construction of local and eventually federal levees along the Mississippi River for flood control as well as the blockage of its connection with Bayou Manchac. This altered hydrologic regime has prevented natural connection of the swamp to the river's life-sustaining waters and resulted in oxygen-poor, stagnant water conditions that impair forest health and associated aquatic habitats.

The swamp's hydrology issues have been exacerbated by the construction of highways, pipelines, railroads, pull boat canals, the Amite River Diversion Canal, navigation canals, and oil and gas exploration canals, along with the spoil banks associated with canal excavation. The channelization of local streams and the construction of local flood mitigation features such as weirs, local levees, floodgates, and drainage ditches have also altered hydrology in the area. This altered hydrologic regime, especially the reduced freshwater inflow and outflow, has resulted in periodic intrusion of brackish water from Lake Pontchartrain into Lake Maurepas and the swamp (Shaffer et al. 2009, 2016). This intrusion was further increased by the construction of the Mississippi River Gulf Outlet (MRGO) that created a saltwater and storm surge conduit from the Gulf of Mexico south of New Orleans, through the lakes into the Maurepas Swamp. Since the 2009 closure of the MRGO, salinity reductions have been noted, but droughts, sea level rise, and storm surge still cause periodic high salinities, which can be fatal to baldcypress and water tupelo. Impounding features, coupled with low soil surface elevations, have exacerbated saltwater intrusion and caused mortality or degradation of trees in the project area (Shaffer et al. 2016). These hydrologic changes have led to the declining health of the Maurepas Swamp.

The isolation of the swamp from the Mississippi River has also resulted in the deprivation of nutrients and sediments which are important for forest health, structure, function, and resilience. Nutrients and sediments promote vertical accretion and help maintain soil surface elevation on pace with relative sea level rise. The healthier forests adjacent to streams transporting local upland runoff are receiving nutrients and sediment along with flowing water that helps sustain them (Shaffer et al. 2009, 2016), and demonstrate the need for periodic inundation of the whole system with river water as sheet flow. Net primary productivity, stem densities, and tree basal areas are very low and similar to other baldcypress swamps flooded by low nutrient, low dissolved oxygen, stagnant water (Shaffer et al. 2003, Hoepfner et al. 2008). Because neither baldcypress nor water tupelo seeds can germinate under flooded conditions, there has been limited recruitment of new trees to the swamp. Therefore, where mortality has created gaps in the canopy, the swamp has converted to marsh and open water.

Because the majority of the old growth swamp trees were clear-cut in the late 1800s and early 1900s, most of the current trees have spent their entire lives in these degraded conditions. The harvest of second-growth trees continued to utilize non-sustainable forestry practices (Chambers et al. 2005) until harvesting was limited by conservation acquisitions and the regulatory recognition that harvesting coastal wetland forests largely resulted in conversion to non-forested habitats. These factors, plus conversion of forests to other land uses, have contributed to an overall reduction in coastal forest area and reduced health, structural integrity, and resilience of what remains. The combination of these factors has resulted in significant swamp habitat loss, and the conversion of degraded swamp to freshwater marsh habitat and open water. Although restoration to a historic condition is not possible, the best available science suggests it is possible to rehabilitate and prolong

the existence of the existing forest through restoration of the processes that sustain it.

The objectives are to establish a hydrologic regime in the project area consistent with swamp forest sustainability that will introduce flowing oxygenated water; ameliorate salinity intrusion; facilitate nutrient uptake and retention; increase forest health and structural integrity; and increase rates of soil surface elevation gain to offset subsidence and future sea level rise. If these objectives are achieved, swamp habitat structure, function, and resilience will increase, and conversion to non-forested habitats will be reduced. According to the Wetland Value Assessment, the project will provide an estimated net 7667 Average Annual Habitat Units of swamp habitat improvement to 44,683 acres over the life of the project. (LaCour-Conant et al. 2019).

#### *Proposed Methods:*

The project consists of the following major components, designed to divert fresh water and associated fine sediments and nutrients from the Mississippi River into the Maurepas Swamp: 1) a gated river intake structure, 2) box culverts through the levee, 3) a sedimentation basin, 4) a conveyance channel and associated guide levees, and 5) outfall management features. The maximum design flow is 2,000 cfs, which can be achieved at least half the year with average river flow, with lower rates possible the rest of the year. This was informed by modeling conducted during planning and also based on the capacity of the existing Hope Canal channel under I-10. In 2007, during E&D of the project, URS (now AECOM) developed two numerical models used in the feasibility and preliminary design of the project. These numerical models included a 1D drainage model, EPA's Stormwater Management Model (SWMM), and a 2D hydrodynamic model – the Advanced Circulation (ADCIRC) Model. The SWMM was used to verify Hydrologic Engineering Center-River Analysis System (HEC-RAS) model results of conveyance channel parameters from the CWPPRA Phase 1 efforts. The ADCIRC model was used to study the behavior of 2000 cfs of fresh water within the Maurepas Swamp. Preliminary results of the ADCIRC model guided design of small water control features to improve freshwater retention and circulation. More recent Delft3D modeling (FTN 2019) supported previous results and shows the project can be operated to deliver sheet flow throughout the project area. Additional Delft model runs (FTN 2019) showed the potential for salinity reduction as well as the ability for nutrient uptake within the swamp without causing large nutrient increases in Blind River or Lake Maurepas.

The project will be located near Garyville, LA in St. John the Baptist Parish. The intake structure at River Mile 144.2 will be comprised of three 10-ft x 10-ft sluice gates connected to three 10-ft x 10-ft box culverts through the levee and underneath LA 44. The conveyance channel extends just under 5.5 miles from the river to a discharge point in the Maurepas Swamp approximately 1,000 ft north of I-10. The channel will have a typical bottom width of 40 ft and will be bounded on both sides by guide levees. The first 1.5 miles of the eastern guide levee would be constructed as part of the integration with the WSLP hurricane protection levee.

Major infrastructure crossings include LA 44, Canadian National and Kansas City Southern railroads, US 61, and I-10. Numerous outfall management features will be constructed to improve retention and circulation of river water within the Maurepas Swamp. The design includes lateral relief valves to be constructed off the water conveyance channel, south of I-10, each having pipes with knife gate valves to divert 125 cfs water to the west and east of the constructed channel into the swamp system. One-way check valves will be installed along the north side of I-10 on all culverts beneath I-10 from LA 641 to the Mississippi Bayou overpass. Weirs will be constructed in Bourgeois Canal and Bayou Secret at their intersections with Blind River. Cuts will be created in the abandoned railroad embankment north of I-10 and east of Blind River. Additional cuts may be added along the Reserve Relief Canal and elsewhere, pending final design and adaptive management of the project. Tree planting may be included where feasible to accelerate regeneration in areas most influenced by the

diversion.

*Environmental Benefits:*

Modeling (FTN 2019) shows the project can be operated to deliver sheet flow throughout the approximately 45,000-acre project area, providing freshening and nutrient uptake within the swamp without causing large nutrient increases in Blind River or Lake Maurepas. The TAG (Krauss et al. 2017) anticipated the project would help maintain favorable salinities in the swamp, promote soil surface elevation gains to offset relative sea-level rise, and promote near complete uptake of nitrate by the receiving wetlands. They further expect increased productivity reflected in stand density and overstory leaf area index in the swamp. A Wetland Value Assessment (WVA) (LaCour-Conant et al. 2019) using the Swamp Community Model quantified the estimated net project benefits as 7,667.5 Average Annual Habitat Units over 44,683 acres. Mitigation requirements for the 3002 acres of swamp habitat impacted by WSLP could potentially be satisfied with an estimated 1090 AAHUs from this project.

The communities surrounding the swamp include some of the fastest growing in the state, and currently have no major structural hurricane protection. Implementing this project would maintain an important floodwater storage area as well as improve its storm surge buffering capacity. Combined with the WSLP levee, it would provide substantially improved resilience for the communities and industrial infrastructure in the surrounding area. This project shares the first 1.5 miles of its eastern guide levee with the WSLP levee (Figure 2), which is anticipated to be constructed concurrently, and a healthy swamp forest will provide significant synergy with that levee protection. The restored area of the Maurepas Swamp would provide an additional layer of natural flood defense in front of the levee, a “multiple lines of defense” strategy, providing substantial, long-term improvements in community resilience. Concurrent construction of these two projects creates a unique opportunity to help facilitate two important coastal projects thereby providing for greater overall community resilience in the area.

*Metrics:*

Metric Title: HR009 : Restoring hydrology - Acres with restored hydrology

Target: 44,683 acres

Narrative: Long-term monitoring to quantify restoration success will be based on performance metrics and targets recommended by the TAG (Krauss et al. 2017) and described in the OMMAM Plan (Buras et al. 2018). For the grant period, preconstruction monitoring will establish baselines and post-construction monitoring will continue for 5 years under other funding sources. Taking advantage of the coastal Louisiana CRMS monitoring program, existing CRMS sites within and near the project area will be used and additional CRMS sites will be added in the project benefit area. The CRMS monitoring program will continue project-specific and regional monitoring beyond closeout of the award for the remainder of the 50-year project life. Some elements will be measured more often in the first few years of operation to inform adaptive management, and decrease frequency in later years. The project will be evaluated for the restored hydrology metric during the grant period by determining distribution of River water throughout the project area by monitoring water level, specific conductivity, salinity, and temperature; isotope analysis of water samples; synoptic surveys of water velocity, depth, DO, chl-a, turbidity, specific conductivity, pH, temperature, and suspended sediments. We will also measure other parameters to assess surface elevation change/accretion, vegetation and habitat, soil properties, nutrient uptake, and water quality.

*Risk and Uncertainties:*

Major risks consist of deviations to the schedule, cost, and long-term performance. The key risk is associated with the schedule; project timing is both critical and urgent.

Project schedule risks: Since this project may be considered partial mitigation for the WSLP project, it is essential that schedules and logistics are heavily coordinated and aligned to avoid a significant lost opportunity to build both projects in an integrated fashion that provides both ecosystem and risk reduction benefits. The project's complexity and numerous affected stakeholders have the potential to greatly impact the project schedule. Construction of the project features will affect ~30 different utilities, each requiring coordination and relocation dependent on each utility's relocation timeline. Timelines for the utilities must be coordinated since CPRA needs to capitalize on each utility's different "shut down days" for regular maintenance. Mississippi River conditions may pose a schedule risk. Louisiana has experienced unprecedented high river stages in recent years. If the river is high during construction, relocating the river levee may have implications for flood fight efforts and restrictions on activities within 1,500 feet of the levee could cause a delay.

If this project is considered mitigation for WSLP, regulatory review and permitting will be heavily coordinated with the USACE, who will work with CPRA to determine requirements that satisfy NEPA and additional laws and regulations, which could affect the project schedule.

Cost escalation risk: In the past, construction costs have increased due to increased fuel cost and cost of construction materials, particularly following major storms or hurricanes.

Project performance risks: If not adequately funded for operations and maintenance, the project will not perform as designed, since water flow through the project area is highly dependent on maintenance of the channel, culverts, bridges, and sedimentation basin. Depending on future water levels in the basin and river, full capacity operations may not be possible since the operation and performance rely on the head difference between the river and receiving basin.

Low Risk: Attaining voluntary landrights is not anticipated to be a significant risk. The portion of the project area near the Mississippi River is privately owned by Marathon Oil Corporation (formerly Pin Oak). CPRA has coordinated extensively with this group for 5 years regarding the location of the project and attaining the needed landrights should not be problematic. CPRA has coordinated with other private landowners in the area and no issues are anticipated. The majority of the project area is State-owned by LDWF as part of the Maurepas Swamp Wildlife Management Area. CPRA has been coordinating with LDWF about this project and it should not pose a significant project risk. Considerable coordination, however, will be required with LDWF to address any project-specific concerns they may have. This project has broad general support from local, state, and federal government, stakeholders, and the general public and has little to no documented opposition; therefore, this is considered a low risk. Also, CPRA believes the potential for unanticipated adverse environmental and/or socio-economic impacts is low.

Scientific uncertainties that may affect the project include future sea level rise rates (Pahl 2017), subsidence, weather events (such as droughts, rainfall, local riverine floods, and tropical events) (Frankson et al. 2019), variability in timing and volume of river flow (Tao et al. 2014, Mize et al. 2018, LaFontaine et al. 2019), interaction with new flood protection features such as WSLP, and other regional and local drainage, protection, and restoration projects. Since this is the first river reintroduction project targeting a coastal swamp in Louisiana, scientific uncertainties exist with respect to temporal and spatial attainment of various project benefits. The diversion will not affect the entire project area uniformly due to its large size, variable existing and future conditions (topography and location-specific levels of swamp degradation) and variable water influence (Krauss et al. 2017). This risk will be mitigated with adaptive management which includes monitoring and optimizing project operations and results during the project life. Future development in the watershed and the associated hydrologic changes that may occur are also uncertainties.

The primary measure that CPRA will utilize to mitigate risks is coordination that is both frequent and in advance of critical project milestones. This coordination will occur with USACE, utility companies, LDOTD, Pontchartrain Levee District, LDWF, St. John the Baptist Parish, and others as necessary. Other risks and uncertainties will be managed through targeted data collection, management, and analysis to inform adaptive management strategies and decisions.

*Monitoring and Adaptive Management:*

Ecological monitoring for up to 5 years pre-diversion operations will determine baseline conditions, continue during construction, and extend 50 years post-construction. Monitoring frequency will be greatest prior to and within the first few years of construction to inform operations and assess immediate project effects on the swamp and neighboring waterways. Monitoring for structural integrity and function will occur regularly during and after construction and includes visual inspections and hydrographic surveys.

Ecological monitoring is tailored to address whether the project's performance measures are being met (Krauss et al. 2017). Real-time monitoring of diversion discharge, water elevation, salinity and DO will allow for timely adjustments to diversion operations to maintain the project's hydrologic and salinity targets. Data from pre-existing hydrographic continuous recorders will supplement real-time stations, following CRMS protocols (Folse et al. 2018). Isotope analysis of water samples and synoptic surveys will provide additional insight into water distribution and flow. On-the-ground vegetation surveys will document tree growth and capture changes in recruitment, survivability, and canopy cover (Folse et al. 2018). Habitat analysis using CIR photography and satellite imagery will provide a broader-based evaluation of habitat change over years (Folse et al. 2018, Cowardin et al. 1979). Water quality analysis (nutrients, DO, chl a, TSS) will determine the efficiency of nutrient uptake in the swamp and inform operational adjustments to enhance nutrient retention. Sediment samples will be analyzed for nutrients, % organic matter, and bulk density. Surface elevation change and accretion will be assessed using rod surface elevation tables, feldspar marker accretion plots (Folse et al. 2018), and radioisotope dating of sediment cores.

The primary strategy for adaptive management is adjustments to operations of the diversion structure and outfall management features. Changes in timing, duration, and frequency must be flexible to meet the receiving basin's needs, including encouraging periods of low water to promote seedling establishment. Other adaptive management strategies could include additional spoil bank gapping, water control structures, check valves, lateral relief valves, or cuts in railroad embankments to assist with achieving the desired hydrology. Location-targeted plantings of baldcypress and water tupelo will also be considered.

*Data Management:*

Data collected in association with this project will be managed in accordance with established CRMS, SWAMP, and survey standards data management protocols, where applicable, and made publicly available. CPRA's data management system is called the Coastal Information Management System (CIMS; <https://cims.coastal.la.gov/>) and is our overall enterprise data repository that combines a network of webpages hosted by CPRA. It includes a spatial (GIS) database and relational tabular database in one public-facing, GIS-integrated system capable of robust visualizations and data delivery. It also has a library for sharing documents pertinent to CPRA's mission. CIMS facilitates CPRA, its partners, and the general public's access to CPRA's suite of protection and restoration projects as well as CRMS and SWAMP stations, Coastal Master Plan activities, geophysical data, and coastal community resiliency information. CIMS is the official repository for environmental, modeling, and monitoring data for restoration and protection projects undertaken by the State of Louisiana.



### *Collaboration:*

Through the collaborative process utilized for developing project ideas for FPL 3, a potential partnership between CPRA and the USACE was identified for the project. Congress recently approved appropriations for the WSLP levee project in the same vicinity as the Maurepas project (WSLP overlaps with Maurepas' guide levees), which creates an unprecedented opportunity for the partners to build a truly integrated wetland restoration and risk reduction project. This collaborative opportunity also allows the RESTORE Council the ability to facilitate the project, save money, and improve community resilience. Partnering with the USACE would reduce the Bucket 2 funds needed by consolidating the final design/integrated construction of the overlapping portions of the 2 projects while facilitating WSLP. The WSLP project and its mitigation are scheduled to be completed by 2024 resulting in the urgency to build both projects concurrently.

### *Public Engagement, Outreach, and Education:*

CPRA's Coastal Master Plan (CPRA 2017) guides all of our efforts, including the Maurepas Project. CPRA established a strategic outreach and engagement framework for the Coastal Master Plan that helped/helps guide communications and interactions with diverse audiences and stakeholders. These audiences/ stakeholders include key citizen groups and organizations, non-governmental organizations, local and State officials, business groups and the general public. Regularly scheduled opportunities for public input include: CPRA Board Monthly Public Meetings, National Environmental Policy Act / Permitting Project-Specific Opportunities, and Community Meetings. Specifically for the Maurepas Project, various informational meetings have been held about the project since it began under the CWPPRA Program in 2001. In April 2002, a Notice of Intent was published in the Federal Register to prepare an EIS. NEPA Scoping letters were mailed to 869 local organizations (tribal, etc.), the public, public interest groups, elected officials, and other agencies inviting them to participate in public scoping meetings. The purpose of those meetings was to provide information on the project and for the attendees to provide issues that they wanted to see addressed in the EIS. Various other project update meetings have been held between 2002 and now. The most recent public, informational meeting was co-hosted by CPRA and the Louisiana Wildlife Federation on the evening of March 26, 2018 in Reserve, LA. The intention of this meeting was to inform the attendees about the project, its current status and next steps, and provide a forum for questions. CPRA will continue to perform public education, outreach, and education on this project throughout the construction and post-construction processes. CPRA believes a successful restoration project is built on local knowledge, input from a diverse range of coastal stakeholders, and extensive dialogue with the public. We continue to reach out to the public in new ways to better share information on this and other restoration projects. CPRA is committed to engaging stakeholders and citizens in the effort to ensure their voices are heard and their input is incorporated.

### *Leveraging:*

Funds: \$10,717,183.00

Type: Building on Others

Status: Received

Source: CWPPRA, LCA, State-only

Source Type: Other

Description: The Maurepas project has leveraged other funding sources, including CWPPRA, LCA, State-only. The project was included on CWPPRA PPL 11 and planning efforts were performed. In 2001, CWPPRA Task Force approved funding to complete 30% design. Additional project investigations were performed for the Louisiana Coastal Area (LCA) Program and, in 2004, the USACE identified the project as a near-term priority in the LCA plan (USACE 2004). CPRA funded design to the 95% level.

**Funds:** \$153,422.00

**Type:** Building on Others

**Status:** Received

**Source:** NFWF-GEBF

**Source Type:** Other

**Description:** NFWF GEBF funds were used for other planning tasks, including contracting the TAG to develop performance measures and targets (Krauss et al. 2017).

**Funds:** \$14,190,000.00

**Type:** Building on Others

**Status:** Received

**Source:** RESTORE Bucket 2

**Source Type:** Other Federal

**Description:** Funds were provided under the RESTORE Council 2015 Initial FPL to complete planning tasks required to bring the project to a “construction ready” status. These tasks included creating a new hydrodynamic and water quality model (FTN 2019), final design, landrights, continuation of engagement with the TAG, continuation of permitting and environmental compliance processes, and creating a Preliminary Operations, Maintenance, Monitoring, and Adaptive Management (OMMAM) plan (Buras et al. 2018).

**Funds:** \$88,526,550.00

**Type:** Adjoining

**Status:** Proposed

**Source:** TBD

**Source Type:** Other

**Description:** Although the exact funding source for the project’s monitoring, adaptive management, and data management has not been finalized, other funding sources besides RESTORE are anticipated to be utilized for these tasks. These tasks are critically important to determine ecological success of the project and determine if any adaptive management actions (operational or otherwise) are needed. The current estimated cost for these 3 activities throughout the 50-year project life is \$88,526,550.

**Funds:** \$346,029,172.00

**Type:** Adjoining

**Status:** Proposed

**Source:** TBD

**Source Type:** Other

**Description:** An operations and maintenance plan for the 50-year project life has been drafted. Physical operations of the diversion and associated structures will be managed by CPRA and performed by CPRA or its designee(s). Maintenance activities of all project features will be divided among the various responsible parties. For example, railroad crossing maintenance, although funded through the project, would likely be performed by the actual railroad company while guide levee maintenance would likely be delegated to the local levee district. The 50-year O&M budget, including inflation, is \$346,029,172.

**Funds:** \$60,000,000.00

**Type:** Co-funding

**Status:** Proposed

**Source:** RESTORE Bucket 3 and/or other sources

**Source Type:** Other

**Description:** The planned project footprint of the WSLP project overlaps with the Maurepas project’s guide levees. Because these projects are adjoining/in the same vicinity, there is the

potential for leveraging with the USACE, as described throughout this proposal. Under this coordinated scenario, the USACE would provide CPRA a cost share for the WSLP mitigation, approximately \$60M would be requested from Bucket 3 and/or other source(s).. The WSLP project and its mitigation are scheduled to be completed by 2024.

#### *Environmental Compliance:*

The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Task Force approved the River Reintroduction into Maurepas Swamp Project for planning studies and design in 2001, with Environmental Protection Agency (EPA) as the federal sponsor and the State of Louisiana as the local sponsor. Engineering and design were initiated in 2002 and EPA initiated National Environmental Policy Act (NEPA) compliance with the publication of a Notice of Intent to prepare an Environmental Impact Statement (EIS) in the Federal Register. Public scoping meetings were held. EPA undertook informal consultation with the U.S. Fish and Wildlife Service (USFWS) for West Indian manatee, Gulf sturgeon, and pallid sturgeon. EPA completed consultations with SHPO and THPOs under Section 106 of the National Historic Preservation Act in 2008; SHPO concurred the project would not affect significant archaeological sites or standing structures.

In 2013, CPRA submitted a Joint Permit Application (CUP# 20130675) to construct the Project. The CWPPRA Task Force de-authorized this Project in January 2014 due to its construction costs. Prior to de-authorization, EPA completed a Draft Environmental Information Document (EID) (EPA 2011) that screened engineering alternatives and documented existing conditions in the Mississippi River, Maurepas Swamp, and the Pontchartrain Basin.

Currently, CPRA is updating EPA's EID to evaluate recent design changes and update environmental conditions in the Maurepas Swamp and Pontchartrain Basin. CPRA's EID would incorporate past consultations performed by EPA, including but not limited to: Endangered Species Act- Section 7 – Informal Consultation; Migratory Bird Treaty Act Consultation; Bald and Golden Eagle Protection Act – Consultation and Planning; and NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s). The EID would also include information from updated modeling and design reports. See Design Proposal submitted to RESTORE for more information.

CPRA has the opportunity to streamline this Project's Environmental Compliance by partnering with USACE to use the Maurepas Project as wetland mitigation for the swamp impacts of the federal WSLP Project, as the Maurepas Project was identified as a mitigation alternative in the WSLP EIS. With this opportunity, Environmental Compliance for the Maurepas Project would likely be documented in a supplemental Environmental Assessment (EA) to the WSLP EIS.

### **Budget**

#### *Project Budget Narrative:*

A total of \$130,000,000 is being requested from FPL 3a to fund construction of the River Reintroduction into Maurepas Swamp Project. The amount requested is not inclusive of the total construction estimate of \$190,000,000. The remainder of construction funds will likely be requested from the Spill Impact Component and/or other source(s) to take advantage of leveraging opportunities described above involving the combined construction of the West Shore Lake Pontchartrain Hurricane and Storm Damage Reduction Project and River Reintroduction into Maurepas Swamp project as it relates to the shared components of both projects. The funds being requested are solely intended to be used for project construction implementation. Project Management funds other than those described below, as well as funds to be used for any leveraging and cost sharing, are not part of this request..

Planning funds are not being requested as part of this request. An estimated 81% of this request is

for project construction implementation. An estimated 0.4% is being requested for project management activities such as construction oversight, budget and schedule management, and grant management and reporting. An estimated 0.5% is being requested for reporting on monitoring and adaptive management activities to ensure progress is made toward the acres with restored hydrology metric. An estimated 0.1% is being requested for data management activities. The construction Contingency is currently estimated at 10% and Escalation is estimated at 8% and both are included in the total construction estimate.

*Total FPL 3 Project/Program Budget Request: \$130,000,000.00*

*Estimated Percent Monitoring and Adaptive Management: 0.5 %*

*Estimated Percent Planning: 0 %*

*Estimated Percent Implementation: 81 %*

*Estimated Percent Project Management: 0.4 %*

*Estimated Percent Data Management: 0.1 %*

*Estimated Percent Contingency: 18 %*

*Is the Project Scalable?:*

No

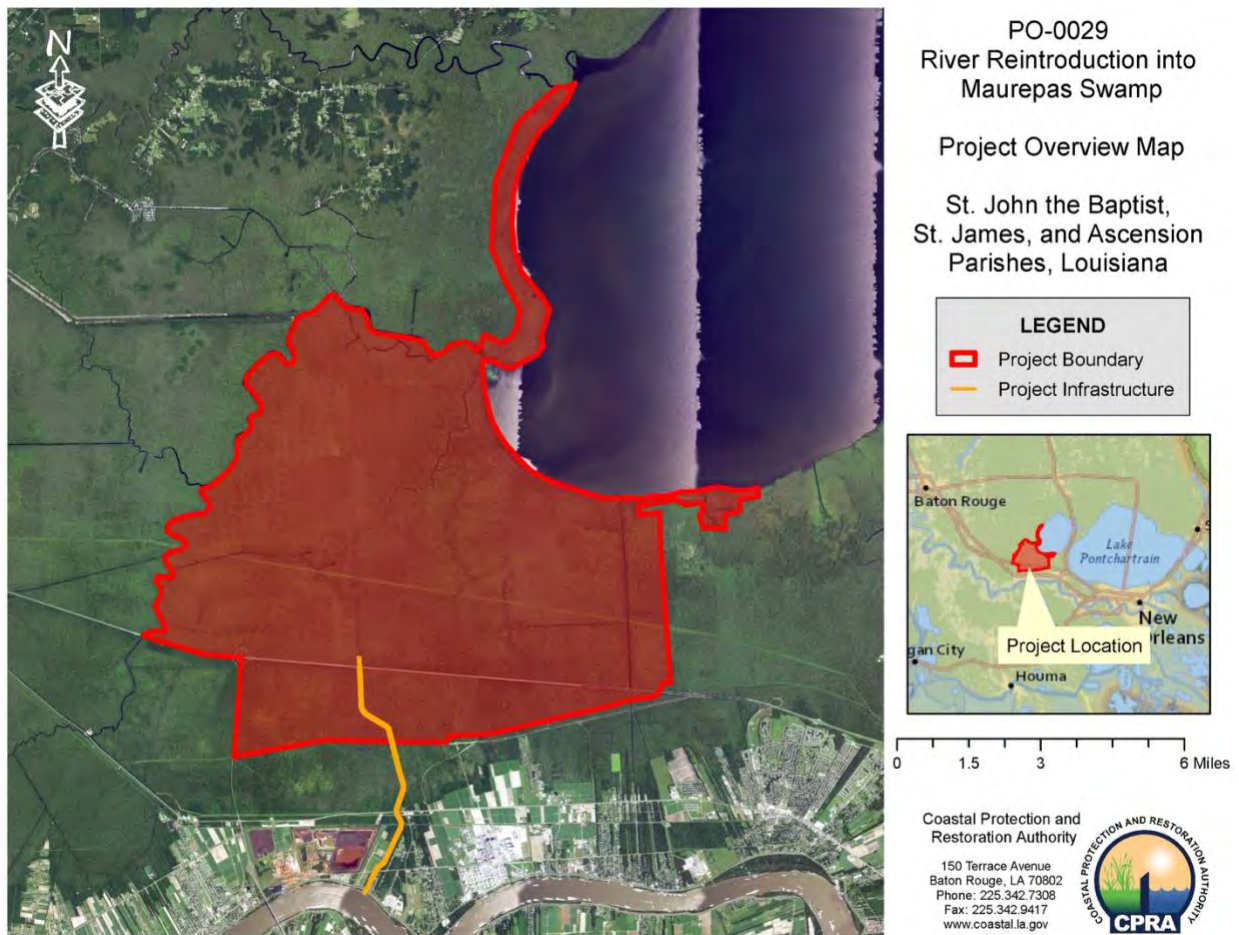
*If yes, provide a short description regarding scalability:*

N/A

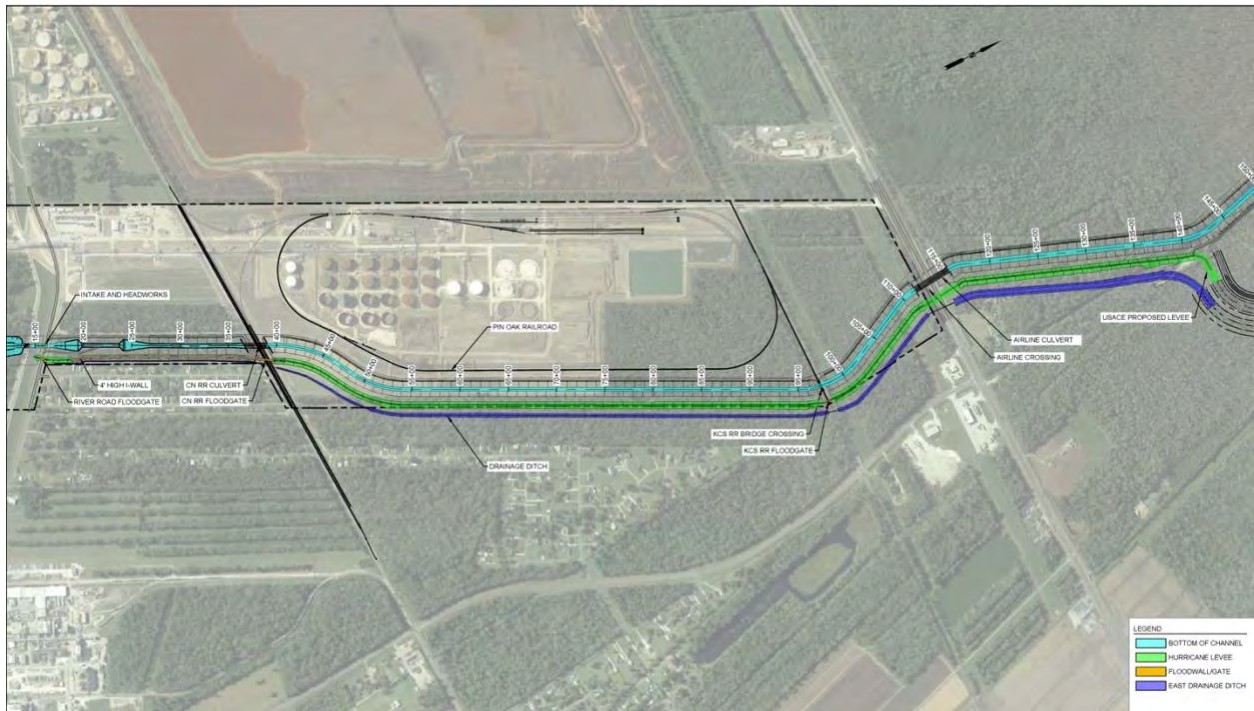
## Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Endangered Species Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
National Historic Preservation Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Magnuson-Stevens Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Fish and Wildlife Coordination Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Coastal Zone Management Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Coastal Barrier Resources Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Farmland Protection Policy Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Water Act Section 404	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
River and Harbors Act Section 10	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Water Act Section 401	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Marine Protection, Research and Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Marine Mammal Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
National Marine Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Migratory Bird Treaty Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Bald and Golden Eagle Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Air Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

## Maps, Charts, Figures



Caption : Figure 1: River Reintroduction into Maurepas Swamp Project Overview- This project is located in the Pontchartrain Basin with the intake at River Mile 144.2 near Garyville, Louisiana with conveyance channel alignment (shown in orange). Project benefit area (shown in red) is approximately 45,000 acres roughly between Lake Maurepas, Blind River, Reserve Relief Canal, and developed uplands along the Mississippi River. The benefit area also includes some lake shoreline north of Blind River and east of Reserve Relief Canal.



Caption : Figure 2: Integrated reach of WSLP and River Reintroduction into Maurepas Swamp Project - The first 1.5 miles of conveyance channel, guide levees, crossings, and drainage features of Maurepas Swamp project are integrated along shared alignment with the West Shore Lake Pontchartrain hurricane risk reduction project with the diversion channel being on the west (flood side) and the WSLP levee to the east. The diversion intake structure, headworks, and conveyance channel are shown in blue; flood wall/flood gate are shown in orange; drainage features are shown in purple; and the shared levee alignment is shown in green.



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Office of the Governor  
State of Louisiana

JOHN BEL EDWARDS  
GOVERNOR



P.O. Box 94004  
BATON ROUGE, LOUISIANA 70804-9004  
(225) 342-7015  
GOV.LA.GOV

July 23, 2019

Major General Mark Toy  
United State Corps of Engineers  
Commander, Mississippi Valley Division  
President, Mississippi River Commission  
1400 Walnut Street  
Vicksburg, MS 39180

Dear General Toy:

As you are aware, over the last year the Mississippi River watershed has received the highest level of precipitation in recorded history resulting in a high water event on the Mississippi River of unprecedented duration. As a result of the extended high water on the river, the Bonnet Carré Spillway has been operated for an unprecedented period of time this year to keep the volume of the Mississippi River flows at New Orleans from exceeding 1.25 million cubic feet per second (cfs). While we whole-heartedly support the operation of the Bonnet Carré Spillway to protect lives and property, we also recognize that an opportunity exists to manage the water resources during high water events on the Mississippi River to benefit the environment and reduce risk of flooding.

With regard to that opportunity, the 2017 Coastal Master Plan currently has authorized two freshwater diversions along the east bank of the Mississippi River – the Maurepas Diversion and the Union Diversion – which would divert water into swamps and bottomland hardwood habitats upriver from Spillway in the Pontchartrain Basin. The planned Ama Diversion, which is also in the 2017 Coastal Master Plan, is located just downriver from the Bonnet Carré Spillway on the west bank and would divert freshwater into the Barataria Basin. By diverting freshwater through the proposed diversions higher up in the basins, a higher level of nutrient uptake would occur in the swamps and bottom land hardwood resulting in increased production to these habitats. Combined, these three diversions could divert up to 77,000 cfs from the Mississippi River as part of a regional water management strategy, reducing the duration and quantity of water required to be diverted through the Bonnet Carré Spillway directly into Lake Pontchartrain. We encourage inclusion of the Ama and Union Diversion Projects in the next Water Resources Development Act as part of a strategy of regional management of the lower Mississippi River.

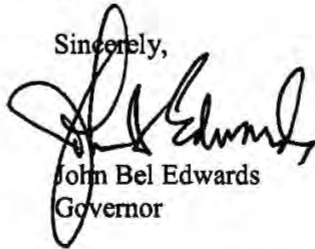
Major General Mark Toy  
July 23, 2019  
Page 2

In addition, the state of Louisiana currently operates the Davis Pond Diversion on the west bank of the Mississippi River into the Barataria Basin with a goal of reducing saltwater intrusion in order to create ecosystem improvements and bring about environmental and related commercial and recreational benefits. While Davis Pond has been effective in meeting its original project authorization, it's possible for Davis Pond operations to be modified to achieve more project benefits including a more regional management of the lower Mississippi River water during flood events. We recommend inclusion of a study to evaluate the increased operation of the Davis Pond Diversion in the next Water Resources Development Act as part of a strategy of regional management of the lower Mississippi River.

We are also aware that there may be other opportunities along the Mississippi River at Lake St. Joseph, a naturally separated oxbow north of Old River Control Structure in Tensas Parish, and along the Ouachita River to capture river water during high water events and reduce both flooding and nutrient loads down river. The Mollicy Farms floodplain restoration project implemented by the Nature Conservancy and the US Fish and Wildlife Service has helped alleviate flooding downstream and improve water quality by reconnecting 25 square miles of floodplain back to the Ouachita River. We encourage the inclusion of a project at St. Joseph and other projects along the Ouachita River, as Section 1135 Projects, in the next Water Resources Development Act as part of a strategy of regional management of the lower Mississippi River in order to further investigate projects that would reconnect the Mississippi, Ouachita and Red Rivers to their historic floodplain.

We appreciate your leadership and your thoughtful consideration of these opportunities to better manage the lower Mississippi River for the benefit of the state of Louisiana and the nation. If you have any questions or would like to meet to further discuss these opportunities, please feel free to contact me at your earliest convenience.

Sincerely,



John Bel Edwards  
Governor

cc: Colonel Stephen Murphy  
Senator Bill Cassidy  
Senator John Kennedy  
Representative Steve Scalise  
Representative Cedric Richmond

Representative Clay Higgins  
Representative Mike Johnson  
Representative Ralph Abraham  
Representative Garret Graves





October 14, 2019

Louisiana Coastal Protection and Restoration Authority  
 Attn: Chip Kline, Chairman  
 Office of the Governor, Coastal Activities  
 1051 N. Third Street  
 Capitol Annex Building, Suite 138  
 Baton Rouge, Louisiana 70802

Dear Coastal Protection and Restoration Authority members,

The undersigned groups appreciate the opportunity to share our supporting comments on the Mississippi River Reintroduction into Maurepas Swamp Project, submitted by the State of Louisiana for RESTORE Council consideration for the Funded Priorities List 3a of the RESTORE Pot 2 Council-selected projects.

We represent a coalition of conservation interests that have worked for decades to restore a healthy Gulf of Mexico ecosystem—starting with prompt restoration of the Mississippi River Delta—reconnecting the Mississippi River to its delta to protect communities, environment, and economies. Our groups continue to recommend urgent action on projects that will reduce land loss and restore wetlands in the Mississippi River Delta through comprehensive restoration actions that have the potential to provide multiple benefits and services over the long term to the entire Gulf of Mexico.

The Mississippi River Reintroduction into Maurepas Swamp has long been discussed as an important coastal restoration project: it was featured as a key restoration project in the 1998 “Coast 2050” plan, was further developed in the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) program with EPA as its sponsor, was included in the Louisiana Coastal Area (LCA) Study (WRDA 2007) and the previous three Louisiana Coastal Master Plans (2007, 2012 and 2017). We believe that this project is aligned with RESTORE Council goals and objectives, and is a very strong candidate for RESTORE Council Pot 2 funding given the large-

scale anticipated project benefits, and its ability to restore the long-term resiliency of the surrounding ecosystem.

This diversion, planned near Angelina, will provide sediment and fresh, oxygenated water to existing wetlands in East Maurepas swamp. Dominated by bald cypress and water tupelo trees, the Maurepas swamp complex is one of the largest forested wetlands in the nation. However, levees constructed along the river have isolated the area from spring floods and the vital fresh water, nutrients and sediment they bring. This isolation, coupled with rising salinities throughout the Pontchartrain Basin while the MRGO was open, has left the swamp in a state of rapid decline – trees are dying, and young trees are not growing to replace them. The River Reintroduction into Maurepas Swamp project will benefit 45,000+ acres of swamp by reconnecting it with the river, aiding the prevention of further wetland loss and the conversion of swamps to marshes, as well as helping to offset future increases in salinity throughout the western Pontchartrain Basin. The fine grain sediment may also increase elevation to a point where there are periods without inundation so that seeds can germinate, perpetuating the forest into the future.

Swamps provide many benefits, including reducing storm surge from hurricanes and flooding and stifling erosion, as well as incredible habitat for birds and other wildlife. Our swamps also help make Louisiana the “Sportsman’s Paradise,” providing incredible ecotourism opportunities from kayaking to birding to fishing and hunting. One study estimates that more than 2 million people visit Louisiana annually to hunt, fish or see wildlife.

Additionally, this project will complement other nearby diversions being planned, including the Union and Manchac Landbridge diversions. Together, these diversions maintain important swamp and coastal habitats that help protect many communities in the region, including Baton Rouge. These projects will help maintain the Manchac Landbridge, a narrow strip of land between Lakes Pontchartrain and Maurepas, which will prevent the two lakes from merging, a situation that would be devastating and could send storm surge to communities from the River Parishes into the Greater Baton Rouge area.

Finally, the Mississippi River Reintroduction into Maurepas Swamp project would be directly adjacent to the United States Army Corps of Engineers’ West Shore Lake Pontchartrain levee project. We believe that the long term ecosystem benefits of this project would provide mitigation for bottomland hardwood and swamp habitat that is lost through the construction of the West Shore Lake Pontchartrain project. We have encouraged the Army Corps to provide funds to construct the Maurepas project as mitigation for the loss of bottomland hardwood habitat that will occur through the construction of the levee. Combined with the awarding of funds through RESTORE Pot 2, Louisiana will be able to construct this very important project.

Due to the urgency of getting this project constructed and operating, the below signatories commend Louisiana’s Coastal Protection and Restoration Authority for submitting this project for consideration in FPL 3a, and we urge the RESTORE Council to select this project for funding.

Sincerely,

Audubon Louisiana

America's WETLAND Foundation

Coalition for Coastal Resilience and Economy

Coalition to Restore Coastal Louisiana

Environmental Defense Fund

Greater New Orleans, Inc.

Lake Pontchartrain Basin Foundation

Land Trust for Louisiana

National Audubon Society

National Wildlife Federation

Restore or Retreat

Theodore Roosevelt Conservation Partnership





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www.lawildlifefed.org

October 10, 2019

Coastal Protection and Restoration Authority  
Attn: Chip Kline, Chair  
coastal@la.gov

Re: Letter of support for *River Reintroduction into Maurepas Swamp* project

Dear Coastal Protection and Restoration Authority Members:

Louisiana Wildlife Federation (LWF) has worked to increase awareness in the River Parishes about coastal restoration projects. LWF's outreach efforts have been focused on educating citizens, community leaders and elected officials on the importance of restoring the Maurepas Swamp region. Of particular focus are diversion projects in the area that would reconnect the Mississippi River to these sinking wetlands – projects such as the River Reintroduction into Maurepas Swamp.

This letter is to extend LWF's full support for this project to receive funding for construction from the Gulf Coast Ecosystem Restoration Council (Council) through Bucket 2 (Council-Selected Restoration Component).

This project would reintroduce freshwater, nutrients and suspended sediment to an area that has been cut off from the Mississippi's rejuvenating floodwaters for about 80 years after the leveeing of the river and the closure of the Bayou Manchac distributary. Manchac Pass is one of the main connections of upstream freshwater from Lake Maurepas to Lake Pontchartrain. Therefore, the health of Maurepas Swamp has a direct effect of the health of Lake Pontchartrain – and the entire basin.

One of the largest forested wetlands in the Gulf Coast, Maurepas Swamp serves as critical habitat for both people and wildlife. This swamp protects surrounding communities by serving as a buffer to storm surge during hurricanes and storage for floodwaters. Maurepas Swamp is also a popular recreational destination. Wildlife benefits from this project include improved primary productivity and water quality, increasing food resources for freshwater fish – which themselves serve as food for other wildlife including wading and migratory birds, alligators and bald eagles.

With levees along the Mississippi River preventing nourishment of the swamp with river water, salinities have risen, causing tree mortality. Without the cypress and tupelo trees, the lake will convert to marsh and open water. Once completed, the project is expected to maintain 45,000 acres of coastal swampland over the next 50 years.

The River Reintroduction into Maurepas Swamp project will benefit the swamp by reconnecting it with the river, prevent continued wetland degradation and the conversion of swamps to marshes. The fine grain sediment may also increase elevation to a point where there are periods without inundation so that seeds can germinate, perpetuating the forest into the future.

The Mississippi River Delta is one of ten watersheds across the Gulf that the Council has chosen to focus on to leverage funds to address critical ecosystem needs in high priority locations. The Council awarded funding for engineering and design for the River Reintroduction into Maurepas Swamp

project in 2015. The project is also a priority in the State's 2017 Coastal Master Plan. It would only make sense for the Council to continue its support of this project so that it may be completed as soon as possible to prevent further land loss, conversion to open water, and rising salinity levels throughout the entire Pontchartrain Basin. Louisiana Wildlife Federation strongly believes that the Council should recommend this project for construction funding.

Louisiana Wildlife Federation is a statewide, nonprofit organization that represents 21 affiliate organizations and more than 5,400 members dedicated to the conservation of Louisiana's wildlife and natural resources. Thank you for the opportunity to submit these comments.

Sincerely,

A handwritten signature in cursive script that reads "Rebecca Triche".

Rebecca Triche  
Executive Director





October 11, 2019

Coastal Protection and Restoration Authority  
Attn: Chip Kline, Chair  
Coastal@la.gov

RE: *Letter of Support for River Reintroduction into Maurepas Swamp*

Dear Coastal Protection and Restoration Authority-

We are writing to express urgent support for the River Reintroduction into Maurepas Swamp project to be awarded construction funds from the Gulf Coast Ecosystem Restoration Council (Council) for Council-Selected Restoration Component (Bucket 2). This project will significantly contribute to the long-term sustainability of the estuarine environment and community resilience of southeast Louisiana. This project is an important opportunity to implement a Multiple Lines of Defense approach because the benefited swamps would also provide a buffer to the nearby Federal West Shore Lake Pontchartrain Levee project. These projects are complementary and both enhance flood protection, so we also support the concept of Maurepas Diversion as mitigation to unavoidable impacts from the West Shore Levee.

The MRGO was a federal navigation channel that severely altered the hydrology of the region, destroying tens of thousands of acres of protective wetlands surrounding Greater New Orleans. It was singled out as a key factor in the catastrophic flooding that Hurricane Katrina caused in communities like the Lower Ninth Ward in New Orleans and communities like Arabi, Chalmette and Violet in St. Bernard Parish. Since 2006, the MRGO Must Go Coalition, representing 17 conservation and community organizations, has worked with local, state, and federal governments to advance planning and lay the groundwork for large-scale restoration of the MRGO area. **Over 76,000 members of the public commented in support of ecosystem restoration projects along the MRGO through the USACE MRGO ecosystem restoration planning process and the 2012 Louisiana State Master Plan planning process.**

The MRGO ecosystem restoration area, which covers 3.8 million acres, stretches from Lake Maurepas to Chandeleur Sound including Mississippi Sound and its bordering wetlands and barrier islands. Though impacted by the MRGO, it is a resilient wetland landscape that can continue to provide ecosystem services to the Gulf of Mexico marine and estuarine environments of Louisiana, Mississippi and Alabama.

The River Reintroduction into Maurepas Swamp project aims to restore freshwater flow from the Mississippi River that has been cut-off since the construction of the Mississippi River flood control levees and the closure of Bayou Manchac. The lack of oxygenated freshwater, and sediment input has caused saltwater intrusion and lower productivity, enhancing net subsidence. Additionally, the lack of sediment input and subsidence has increased the depth, frequency and duration of flooding in the area, preventing the seeds of swamp species from germinating and therefore, eliminating the next generation of swamp trees. *Without restoration, one of the largest bald cypress swamps in the nation is threatened to convert to open water.*

Much of the planning and design work has been completed on this project and the State of Louisiana is working on final design. Once the project is complete, the project is expected to maintain over 45,000 acres of land, southwest of Lake Maurepas, over the next 50 years. Maurepas Land Bridge was identified as a “critical landscape feature” by the Army Corps of Engineers (Corps LACPR study released in 2009) because of its importance in reducing storm surge.

The RESTORE Act provides a powerful opportunity to move this urgent project forward, restoring coastal habitat impacted by the MRGO while also contributing to community and economic resiliency. This project is primed for implementation and authorized in the 2017 Coastal Master Plan. **Our Coalition believes that the Council should recommend this project for construction funding.**

Thank you for your work and please let us know how we can best help you in your efforts. Our member organizations represent millions of knowledgeable and capable individuals whose shared interest is the recovery of our precious wetlands and natural resources. Please contact Coalition coordinator, Amanda Moore, at [moorea@nwf.org](mailto:moorea@nwf.org) should you have any questions.

Sincerely,

MRGO Must Go Coalition

American Rivers  
Citizens Against Widening the Industrial Canal  
Coalition to Restore Coastal Louisiana  
Environmental Defense Fund  
Global Green  
Gulf Restoration Network  
Holy Cross Neighborhood Association  
Lake Pontchartrain Basin Foundation  
Levees.org  
Louisiana Environmental Action Network  
Louisiana Wildlife Federation  
Lower Mississippi Riverkeeper  
Lower Ninth Ward Center for Sustainable Engagement and Development  
Mary Queen of Vietnam Community Development Corporation  
National Audubon Society  
National Wildlife Federation  
Sierra Club – Delta Chapter

*Additional Signer:*

[lowernine.org](http://lowernine.org)



United States Department of the Interior  
U.S. GEOLOGICAL SURVEY

Wetland and Aquatic Research Center  
700 Cajundome Boulevard  
Lafayette, Louisiana 70506  
(337) 266-8500

October 8, 2019

Mr. Bren Haase  
Executive Director  
Coastal Protection and Restoration Authority of Louisiana  
150 Terrace Ave.  
Baton Rouge, LA, 70801

Dear Mr. Haase:

I would like to offer my support for the River Reintroduction into Maurepas Swamp Project proposal, which I understand will be submitted for RESTORE Act funding consideration. I believe that this project will be beneficial for increasing not only the health of the Maurepas Swamp, but also for enhancing the availability of cultural resources associated with the Swamp for many years to come. Furthermore, from a scientific perspective, this project will offer scientists an opportunity to see how freshwater reintroductions at this scale will actually affect a freshwater wetland in need of nutrient and sediment subsidies, and allow our first window into how management of a diversion structure can influence the health and sustainability of a swamp forest on a large scale.

I have studied the ecology of coastal forested wetlands of Louisiana since 1995, with my first assessment looking into salt tolerance improvement in one of the sentinel swamp forest species of the Maurepas Swamp, *Taxodium distichum*. Even then, we knew that no matter how much we were able to improve salinity tolerance in this species and others, that without ambitious engineering programs that serve to re-connect ailing wetlands with the Mississippi River in concert with genetic programs, that holistic restoration projects would be unsuccessful. Indeed, the global literature drew similar conclusions for projects underway in other countries. Some 24 years later, we are still hoping for the first freshwater reintroduction project that primarily influences swamp forest habitat to be built in coastal Louisiana. Since the Maurepas Swamp was first disconnected from the Mississippi River at Bayou Manchac in 1814, it has undergone decline by various degrees. Sediment deficits and periodic pulses of salinity have influenced change in the Maurepas Swamp, and as coastal saline wetlands are lost seaward of Maurepas Swamp, impact to the Swamp becomes increasingly imminent. The Maurepas Swamp is currently undergoing rapid submergence in many locations, and it suffers from lower nutrient levels than it is accustomed to receiving historically. Past freshwater diversion projects have generally introduced fresh water from the Mississippi River into wetlands that have already undergone change to low salinity wetlands; this diversion project offers a different situation that should be successful since most of the forested wetlands of Maurepas Swamp have already benefitted from reduced salinity associated with the closure of the Mississippi River Gulf Outlet. This closure and a freshwater diversion project may be ideal for the future sustainability of Maurepas Swamp.

As a scientist, I led the development of the performance measures (USGS SIR 2017-5036) for which this diversion project will be rated against. The co-authors of this document and I, as well as numerous reviewers, spent a great deal of time thinking about this project and its value to the people of Louisiana. I feel very strongly that it will be a successful project even if some of the performance measures will take time to meet. Through proper management of the diversion structures, there is a lot of flexibility to have this diversion managed correctly in time. Of course, it must be built first, and I commend proactive measures to build this freshwater reintroduction project before the Maurepas Swamp undergoes further degradation.

Sincerely,

Ken W. Krauss, Ph.D.  
Research Ecologist

### FPL 3 Internal Staff Review

Project/Program	River Reintroduction to the Mississippi River		
Primary Reviewer	John Ettinger	Sponsor	Louisiana
EC Reviewer	John Ettinger	Co-Sponsor	
1. Is/Are the selected Priority Criteria supported by information in the proposal?			Yes
Notes	Addresses criteria 1, 2, and 3. With respect to criterion 1, CPRA notes that the proposal addresses scale, duration and sustainability, consistent with FPL 3 Proposal Submission Guidelines and Review Process.		
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?			Yes
Notes			
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?			Yes
Notes			
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?			Yes
Notes	Restore hydrology and natural processes: Controlled river diversions.		
5. Does the proposal align with the applicable RESTORE Council definition of project or program?			Yes
Notes	Proposal is a discrete, large-scale project.		
6. Does the budget narrative adequately describe the costs associated with the proposed activity?			Yes
Notes	The budget narrative makes it clear that that vast majority of funds are for implementation/construction. The proposal does not provide detail on the sub-elements of this construction cost. That level of detail is not required by the Proposal Submission Guidelines and Review Process, which call for a summary "of the amount of funding requested in major functional cost categories."		
7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?			Yes
Notes	Please see the Proposal Package for external BAS review comments, external reviews summary, Sponsor response to external reviews, and internal review panel summary documents.		
8. Have appropriate metrics been proposed to support all primary and secondary goals?			Yes
Notes			
9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?			N/A
Notes	FPL Category 2 funds requested.		

## **FPL 3a BAS Review Summary – LA River Reintroduction into Maurepas Swamp**

*October 31, 2019*

Overall the external Best Available Science reviews for the River Reintroduction into Maurepas Swamp proposal are positive. All reviewers agree that the proposal is based on science that uses peer-reviewed data. Reviewers feel that the scientific basis of this project is justified using science that maximizes the quality, objectivity, and integrity of information. While no statistical information is included in the justification, it is suggested that statistical information will be used to analyze project outcomes under the adaptive management plan. Reviewers feel the project has clearly defined goals and objectives, measures of success aligning with the primary project goals are identified, and the methods for the proposed project are clearly defined with appropriate justification.

Generally, reviewers feel the proposal objectives and methods are justified using peer reviewed literature and publicly available information. Reviewer 3, however, points out that the cited literature indicates the size of the proposed diversion (2000 cfs) will be too small to influence the entire Maurepas sub-basin (Schaffer et al. 2016). This reviewer also points out that the proposed diversion period of operation is only half a year which Shaffer et al. (2016) state "may be highly beneficial during times of severe drought" but not enough to restore the swamp.

Reviewers agree the proposal identifies a monitoring and data management strategy that supports project measures of success, providing appropriate scientific justification and discussion of adaptive management. While Reviewer 3 points out that the monitoring strategy is general and does not clearly tie to measures of success, it should be noted that detailed monitoring strategies are not required at the proposal stage. Reviewer 1 expresses confusion about the timeline of the project, as the project duration is listed as 8 years, but elsewhere in the proposal the project lifespan is described as 50 years.

All reviewers agree that all literature sources used to support the proposal are accurately and completely cited. However, Reviewer 3 points out that "3 of 5 peer reviewed papers referenced are those that include Shaffer as the primary or secondary author. All other references are unrefereed CPRA, EPA, NOAA, USFWS reports." Generally, though, reviewers feel that the information discussed and used for project justification is recent and relevant to the proposed activity.

The proposal evaluates uncertainties and risks in achieving its objectives over time (all reviewers), including both short- and long-term risks (Reviewers 1 and 2). One additional risk not identified by the proposal is the potential for the health and state of the larger swamp sub-basin to impact success in the smaller target area (Reviewer 3). The proposal documents a wide variety of scientific uncertainties which will be integrated into an adaptive management plan (Reviewer 1). However, mitigation strategies for the identified risks is not discussed apart from stating that risks will be addressed in the adaptive management plan (Reviewers 1 and 3). Environmental benefits of the proposed activity are clearly defined within the project proposal (all reviewers). The proposal identifies potential long-term environmental risks (all reviewers) to be addressed under a long-term adaptive management plan (Reviewer 1). Although there is no evaluation of past successes and failures of similar efforts within the proposal, Reviewer 2 believes that this proposal is informed by past work in the region. In general, reviewers feel the proposal is well put together and that the project partners are "well-poised to conduct this project" (Reviewer 2). Reviewers 1 and 2 express confidence that the project partners have adequate experience to carry out the project successfully.

Reviewer 2 provides the following final comment: “Overall, this appears to be a well thought out project that has taken many years to develop through study of the hydrological and biological processes in the region.”



## **CPRA responses to FPL 3a BAS Review comments (10-31-2019) on LA River Reintroduction to Maurepas Swamp proposal**

CPRA was pleased to receive an overall positive Best Available Science review of this project and our proposal. Due to the character count limits in the proposal template, we were not able to fully describe numerous complexities associated with this project, which may have led to some of the comments that warrant responses. We will amend the proposal where possible to address some of the comments that showed the need for more clarity on certain topics. The references cited in the proposal provide much additional detail, including summaries of the significant work over the past 20 years that has been used to develop and inform this project. The following responses to BAS Review comments are provided to help clarify some of the project details and/or rectify some misunderstandings regarding the project.

*Project timeline* – **Reviewer 1 expressed confusion on the project duration.** The project is being designed for a 50-year project life, but the requested grant duration is only 8 years, per guidance given to CPRA from RESTORE staff. These 8 years include construction duration as well as reporting on several years of pre-operation and post-construction monitoring for the metric of “acres with restored hydrology” to demonstrate that it meets its Primary Comprehensive Plan Goal to “Restore hydrology and natural processes and Primary Objective of “Restore and enhance natural processes and shorelines.” Although other secondary objectives are listed, these could take longer to show measurable success and could be beyond a feasible grant duration.

*Project size and accretion* – **Reviewer 3 made several comments related to the size of the project influence area and the statement in Shaffer et al. (2016) that this project is of insufficient capacity to restore the entirety of the Maurepas Swamp or basin.** We agree that this project is insufficient to address the needs of the entire Swamp and is not intended to do so. Although it is a large-scale project by most standards, this project is designed to influence only a portion of the overall Maurepas Swamp, approximately 45,000 acres of approximately 200,000 acres in total. The size of the diversion channel and associated maximum flow were limited by the capacity of the existing Hope Canal channel under Interstate 10 to avoid the significant implications of altering this major highway in this location.

Restoration of the entire Maurepas Swamp or basin to its historical condition is not possible, but numerous other projects (including other Mississippi River reintroductions, reforestation, shoreline protection, invasive species control, conservation acquisitions, and removal of hydrologic barriers) have been implemented and/or are planned by CPRA and other entities to address the needs of this and other areas of the basin. Louisiana’s 2017 Comprehensive Master Plan for a Sustainable Coast (CPRA 2017) includes a significantly larger river reintroduction upstream from this project at Union, and another farther downstream to address the Maurepas Landbridge area. The Technical Advisory Group (TAG), which includes Dr. Shaffer, acknowledged the importance of implementing this smaller project quickly and using the lessons learned from it to inform other reintroduction projects (Krauss et al. 2017).

**Reviewer 3 also suggested that based on the science, accretion would not occur with a project of this size.** It is unclear what science this reviewer is referencing. The project area swamps are sediment and nutrient starved and should have increased accretion from the combination of belowground biomass and sediment with the addition of Mississippi River water (Krauss et al. 2017). Fine suspended sediments in the river water will settle out as the water leaves the channel and sheet flow occurs through the swamp vegetation. Modeling based on known rates of assimilation shows these nutrients will be readily taken up by the swamp (FTN 2019). In an experiment conducted on baldcypress to mimic nutrient and sediment additions similar to Mississippi River

water, an elevation surplus occurred when nutrient addition was combined with sediment addition (Shaffer et al. 2016), suggesting that sites most proximal to a river reintroduction may receive the greatest benefits from nutrient loading.

The TAG report on performance metrics (Krauss et al. 2017) is based on an extensive literature review of the science along with the substantial professional expertise of its members. In this report, the TAG stated “Sediments and nutrients from river water might contribute directly to sedimentation processes, including sediment deposition and the stimulation of organic matter production to promote surface elevation gain.” The TAG reviewed the accretion data from monitoring sites along waterways in the swamp where fine sediments and nutrients are introduced from non-point sources upstream and where the forest is healthiest and maintaining soil surface elevations that offset relative sea level rise. They used these data to determine a target metric for the project area and stated “the river reintroduction should maintain the system at or in exceedance of its current elevation.” The Davis Pond and Caernarvon freshwater diversions, although not designed for sediment input, have shown considerable accretion in their outfall areas over time.

*Project operations - Reviewer 3 commented that the diversion would only operate half the year.* That is not necessarily true. Modeling conducted during the early planning, engineering, and design of the project determined that under an average annual hydrograph of the Mississippi River flow as measured at the Reserve Relief Canal gauge, the intake structure as designed could provide up to 2000 cfs at least half the year, with reduced or pulsed flows possible at some points during the remainder of the year, depending on ecosystem needs. The operational regime is not finalized and will be fine-tuned in the early years of operation based on monitoring data and will be adaptively managed over the life of the project. The preliminary Operations, Maintenance, Monitoring, and Adaptive Management Plan (Buras et al. 2018) describes this in further detail and provides additional references to the modeling reports. The diversion would likely be operated in a pulsed fashion on a seasonal and as-needed basis within the limits of the river hydrograph and also within the capacity of the swamp to uptake the majority of the nutrients in the River water prior to flowing into Lake Maurepas and Blind River. Initial and recent modeling both indicate the river water with its associated suspended sediments and nutrients can reach most of the project area within 20 days if at maximum capacity at which point it could be shut off or operated at reduced flows. Recent modeling also showed salinity reduction can be achieved in a shorter time frame. Increased residence time beyond steady state may not provide any additional benefits to the swamp. The TAG also recommended seasonal variation of flow and reducing River input when opportunities of low water conditions occur that may allow for natural regeneration or planting of seedlings. These factors as well as variable background conditions (such as droughts) will all be considered in operational decisions.

*Project metrics and use of statistical analysis – Reviewer 3 comments that the monitoring and data management strategies are not clearly tied in to the project measures of success and that the measures of success are not clearly defined.* Five performance measures have been developed for the project, as outlined in the report by Krauss et al. (2017) and are the basis of CPRA’s long-term monitoring plan for the project. While attainment of each will influence operations of the diversion, the first performance measure —establishing a hydrologic regime consistent with swamp forest sustainability—will be the most critical to daily diversion operations and to achieving other metrics that reflect the influence of the project. This led to choosing only one metric (acres of hydrology restored) for assessing success of the project toward the Primary Objective identified in the proposal for the purpose of reporting to the council for the duration of the grant. This will primarily rely on hydrologic data such as water level that indicates flow throughout the project area, along with potential use of associated water temperature, salinity, and suspended sediment data to track



movement of river water through the swamp. Extensive baseline data from CRMS stations and other sources already exist.

Statistical analysis of data collected at existing CRMS and new project-specific monitoring stations, and other monitoring methods such as remote sensing and aerial photography may be used to compare pre- and post-operations effects of the project. These analyses will inform the adaptive management of the project which will primarily be in the form of altering the amount and duration of flow by operation of the sluice gates in the headworks as well as the lateral discharge valves to best distribute the water throughout the swamp. Once the project is operational, hydrologic barriers may be identified and addressed. The details of the decision process will be further developed as part of the monitoring plan for the project, but as noted by Council review, detailed monitoring strategies are not required at the proposal stage.

*Peer reviewed literature* - **While most reviewers acknowledge the large extent of research that informs and supports this project, Reviewer 3 expressed some concern that Dr. Shaffer is an author of 2 of the 3 peer-reviewed papers listed (although others were actually cited) and that other supporting references cited were grey literature of agency authorship and not peer reviewed.** Due to the character limit imposed by the proposal template, including the References section, and the request for links to the documents to be included in this section of the proposal, we primarily cited those documents that summarized and applied the peer-reviewed scientific literature and grey literature to the real-world needs in developing this project. The project proposal and initial planning under CWPPRA and LCA were federally sponsored by EPA and the USACE respectively with significant input by other federal and state agency experts and associated academic advisors. The TAG report (Krauss et al. 2017) specifically details an extensive review they conducted of the scientific literature (with citations) and notes that very little is directly applicable to this project since no similar project has been implemented and experimental studies have only limited application in the real world. They used their substantial professional expertise to determine the relevance of this literature in developing their recommendations. The TAG report is a USGS Scientific Investigation and did undergo external peer review. All authors and reviewers of that report are considered subject matter experts. The Wetland Value Assessment (LaCour-Conant et al. 2019) also was informed by the TAG and extensive scientific literature review, and also was reviewed by members of the TAG, other subject matter experts, and USFWS. Dr. Will Conner, Dr. Ken Krauss, and national and regional environmental groups have provided letters of support for the project.

*Previous experience and success and failures with other similar projects* – **All 3 Reviewers commented that the proposal lacked information on previous similar projects and evaluation of past successes and failures.** This will be the first Mississippi River reintroduction project designed specifically to restore swamp forest processes that will enhance ecosystem health and reduce or minimize habitat loss. It will require intense monitoring in the early years post-construction to gauge performance and fine-tune operations and management of the project. However, CPRA has decades of experience adaptively managing, operating, and maintaining other freshwater river diversions (river reintroductions) into open water and marsh habitats to address the specific goals for those projects. CPRA has responsibility for operating several Mississippi River freshwater diversions and siphons since the first such diversion at Caernarvon became operational in 1991, followed by the Davis Pond freshwater diversion in 2002. Operating these other freshwater diversions is somewhat different from the Maurepas project as they have considerably higher discharge capacity (8000 and 10,640 cfs respectively), but they do utilize similar gated structures that allow variable flows and are typically operated at reduced rates due to limitations in authorized objectives. The yearly operation of these two projects for decades has resulted in CPRA expertise in outfall management and the ability to be responsive to emergencies, such as avoidance of flooding and avoidance of impacts from chemical and oil spills. CPRA also has experience with many hydrologic restoration projects,

specifically including projects in swamps. The Hydrologic Restoration of the Amite River Diversion Canal (PO-0142) project, also located in Pontchartrain Basin, was completed in January 2017. The Hydrologic Restoration and Vegetative Planting in the des Allemands Swamp (BA-34-2), located in Barataria Basin, was completed in December 2017. Both of these swamp hydrologic restoration projects include spoil bank gapping, which is one of the project features of the Maurepas project. CPRA has performed project-specific monitoring and data analysis for all of these projects and utilized data from CRMS sites to best manage the projects to meet their intended goals and ecosystem needs.

*Uncertainty and risk in achieving objectives* – **Although all reviewers expressed satisfaction in how the proposal addressed the uncertainties and risks in achieving environmental objectives over time, Reviewer 3 questioned whether the “health and state of the larger swamp sub-basin will impact success [of the] smaller area targeted by the diversion.”** Assuming the reviewer means large scale changes in the estuary could cause project failure, the two most prominent possibilities are (1) the return of higher salinity regimes and (2) relative sea-level rise sufficient to substantially increase flooding. There is every indication that (1) salinity is downward trending since the closure of the MRGO, which buoys this project rather than threatens it; and (2) introduction of fresh water adds resilience to the forest in the face of inevitable relative sea-level rise, but the entire coast is vulnerable to this same problem. If other portions of the larger swamp sub-basin are lost, the importance of maintaining this portion will become even more significant. Changes in the amount of runoff from upstream areas of the sub-basin could be addressed with operational adjustment of flows.

*Mitigation strategies for identified risks* – **Reviewers 1 and 3 commented that mitigation strategies were not provided for all identified risks.** As stated in the proposal, the primary measure that CPRA will use to mitigate for scientific uncertainties is adaptive management, including the potential of constructing additional project features as described in the adaptive management portion of the proposal. Also as stated in the proposal, the primary measure that CPRA will utilize to mitigate for implementation risks is coordination with relevant parties that is both frequent and in advance of critical project milestones. Coordination with the USACE for WSLP and associated regulatory issues will occur weekly, regular coordination with utility companies will occur as needed, and coordination with LDOTD will occur through the required road work permits. CPRA has coordinated with the landowners, Pontchartrain Levee District, LDWF, and St. John the Baptist Parish for many years and will increase the amount of coordination as the project progresses to construction. High river events may delay construction of the project features closest to the river, so mitigation measures may include adjusting construction sequencing and consideration of different construction methods. Some of the risks identified (schedule changes, cost escalation, and potential lack of O&M funding) can be mitigated by utilizing contingency funding included within the existing budget and locating additional sources of project funding. Planned operations and maintenance for the project is also a mitigation measure.

## **FPL 3a Internal Best Available Science Review Panel Summary**

On Thursday, November 7, 2019 the RESTORE Council convened an internal Best Available Science (BAS) review panel. The purpose of this internal panel was to use Council member-agency expertise to address external BAS review comments, and potentially identify project/program synergies not identified prior to proposal submission. The ultimate goal of the panel was to provide Council members with substantive best available science content to inform their decision-making.

The internal panel was convened via webinar with representatives from each of the Council's eleven member agencies present. Each BAS Panel member was provided the following:

- 1) Full FPL 3a proposals
- 2) 3 external BAS reviews for each proposal
- 3) Summary of external BAS reviews for each proposal
- 4) Proposal Sponsor's response to the BAS reviews summary

Proposal sponsors provided a brief synopsis of their proposal to the panel, a summary of comments made in external reviews, and discussed their proposed response to the external reviews. Council staff then solicited feedback from the panel. The proceedings of the meeting are summarized below.

### *LA River Reintroduction into Maurepas Swamp Proposal*

#### **Panel comments on Sponsor response to external BAS comments:**

*Mitigation of risk:* Reviewers 1 and 3 comment that mitigation strategies for the identified risks are not discussed apart from stating that risks will be addressed in the adaptive management plan -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Project timeline:* Reviewer 1 confusion about the timeline of the project, as the project duration is listed as 8 years, but elsewhere in the proposal the project lifespan is described as 50 years -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Size and accretion:* Reviewer 3 comment that the size of the proposed diversion (2000 cfs) will be too small to influence the entire Maurepas sub-basin (Schaffer et al. 2016) -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Operations:* Reviewer 3 comment that the proposed diversion period of operation is only half a year which Shaffer et al. (2016) state "may be highly beneficial during times of severe drought" but not enough to restore the swamp -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Metrics and Statistical analysis:* Reviewer 3 comment that the monitoring strategy is general and does not clearly tie to measures of success -

- It was recommended that although ecosystem responses may continue past the 5 years of monitoring, modeling may be useful to provide longer-term forecasts of likely outcomes.
- The panel agrees that Louisiana has appropriately addressed this comment.

*Peer Reviewed Literature:* Reviewer 3 comment that 3 of 5 peer reviewed papers referenced include Shaffer as the primary or secondary author, while all other references are unrefereed CPRA, EPA, NOAA, USFWS reports -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Prior Experience:* Reviewer 2 note that there is no evaluation of past successes or failures (though it is informed by past work in the region) -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Sub-basin impact:* Reviewer 3 comment that the health and state of the larger swamp sub-basin may impact success in the smaller target area -

- The panel agrees that Louisiana has appropriately addressed this comment.

*Other reviewer comments:* N/A

#### Panel comments on existing or future synergies with proposed activity:

CPRA highlighted the other restoration activities in the area including river reintroduction projects upriver at Union and downriver to address the Maurepas landbridge area; the Amite River diversion canal; gapping the south bank (CWPPRA); Maurepas Swamp reforestation (Lake Pontchartrain Basin Foundation); and conservation efforts (Coastal Forest Conservation Initiative).

#### *AL Perdido River Land Conservation and Habitat Enhancements Proposal*

#### Panel comments on Sponsor response to external BAS comments:

*Peer reviewed literature:* Reviewers 1 and 3 note that a comprehensive literature review is not included, though references are used appropriately and sufficiently support the rationale of the project -

- The panel agrees that Alabama has appropriately addressed this comment.

*Risk and uncertainties around land acquisition:* Reviewers 1 and 2 comment that no pre-negotiation has been mentioned; if the land acquisition fails they will look for alternative land in the vicinity -

- The panel agrees that Alabama has appropriately addressed this comment.

*Justification of activities:* Reviewer 1 comment that, while the proposal has clear methods, the justifications for proposed activities and the assessment of cost-effectiveness are vague and need more information -

- The panel agrees that Alabama has appropriately addressed this comment.

*Previous success of similar land acquisition and habitat enhancement activities:* Reviewer 1 comment that more information on past projects is needed, pointing out that while similar projects are listed the proposal, it does not provide any specific information on these success stories -

- It was suggested that it may be helpful to provide a map of synergistic projects.
- The panel agrees that Alabama has appropriately addressed this comment.

*Other reviewer comments:* N/A

**Panel comments on existing or future synergies with proposed activity:**

Alabama highlighted additional restoration and conservation activities taking place in the Perdido watershed. Building on other good work in the watershed is a priority for AL, and they may consider decision support tools, such as the Council funded Strategic Conservation Assessment tool, in identifying activities in the watershed moving forward.

Florida also highlighted synergistic activities in the area, including the Florida Trustee Implementation Group's recently approved Perdido River Paddle Trail, which has several recreational sites proposed directly across the river from the proposed Alabama acquisition parcel. FPL 3b may afford the opportunity for Florida and Alabama to collaborate on additional land conservation and habitat enhancement opportunities in this watershed.



# SCIENCE EVALUATION

Bucket 2 Comprehensive Plan Component

**PROPOSAL TITLE**

River Reintroduction into Maurepas Swamp

**LOCATION (IF APPLICABLE)**

Pontchartrain Basin, LA

**COUNCIL MEMBER BUREAU OR AGENCY**

Louisiana

**TYPE OF FUNDING REQUESTED (Planning, Implementation, Planning/Implementation)**

Implementation

**REVIEWED BY:**

Reviewer 1

**DATE:**

10-26-19

**Best Available Science:**

*These 4 factors/elements help frame the reviewers answers to A, B and C found in next section:*

1. Has the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?

YES

NO

NEED MORE INFORMATION

**Comments**

The proposal describes a large extent of research that has occurred on the project-specifically, as well as including external references concerning swamp health.

**2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?**

YES

NO

NEED MORE INFORMATION

Comments

The information is very project and location specific to Louisiana.

**3. Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?**

YES

NO

NEED MORE INFORMATION

Comments

**4. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)**

YES

NO

NEED MORE INFORMATION

Comments

The discussion of risks and uncertainties is very thorough including both project implementation risks as well as future project performance risks and uncertainties and the use of adaptive management to manage those risks.



Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

**A. Has the applicant provided reasonable justification that the proposal is based on science that uses peer-reviewed and publicly available data?**

YES  NO  NEED MORE INFORMATION

Comments:

The applicant demonstrates a clear scientific connection between the ecosystem stressors and how the project will address them.

**B. Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?**

YES  NO  NEED MORE INFORMATION

Comments:

As above. No statistical information was included in the justification, however it was hinted that it would be used to analyze project outcomes under the adaptive management plan.

**C. Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?**

YES  NO  NEED MORE INFORMATION

Comments:

Page 7 clearly documents a wide variety of scientific uncertainties that would be integrated into an AM plan and acknowledges that this is the first river reintroduction project targeting swamp so there are many temporal and spatial scientific uncertainties.



## Science Context Evaluation

**A. Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?**

YES

NO

NEED MORE INFORMATION

Comments:

The sponsor has not explicitly demonstrated this expertise in the proposal, however it is known by this reviewer that the sponsor does have the experience needed for implementation. The proposal does demonstrate an extensive history of planning and E&D on the project, as well as high collaboration with other agencies with expertise.

**B. Does the project/program have clearly defined goals objectives?**

YES

NO

NEED MORE INFORMATION

Comments:

page 5

**C. Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?**

YES

NO

NEED MORE INFORMATION

Comments:

The methods section demonstrates clear justification with a series of models that have predicted project outcomes. The large-scale impact (~45k acres) is cost-effective for the investment.

**D. Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?**

YES

NO

NEED MORE INFORMATION

Comments:

**E. Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

The metric is restored hydrology of ~45k acres of swamp habitat (Goal 1 and Objective 1). The project is in line with Goal 1 and Goal 3 of the Comp Plan as well as Objective 1, 2, 4 and 5, however other metrics would be needed to capture how the project fulfills these other goals and objectives.

**2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?**

YES

NO

NEED MORE INFORMATION

Comments

The information is very project and location specific to Louisiana.

**3. Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?**

YES

NO

NEED MORE INFORMATION

Comments

**4. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)**

YES

NO

NEED MORE INFORMATION

Comments

The discussion of risks and uncertainties is very thorough including both project implementation risks as well as future project performance risks and uncertainties and the use of adaptive management to manage those risks.

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**Please summarize any additional information needed below:**



# SCIENCE EVALUATION

Bucket 2 Comprehensive Plan Component

**PROPOSAL TITLE**

River Reintroduction into Maurepas Swamp

**LOCATION (IF APPLICABLE)**

Pontchartrain Basin, LA

**COUNCIL MEMBER BUREAU OR AGENCY**

Louisiana

**TYPE OF FUNDING REQUESTED (Planning, Implementation, Planning/Implementation)**

Implementation

**REVIEWED BY:**

Reviewer 2

**DATE:**

10/19/2019

**Best Available Science:**

*These 4 factors/elements help frame the reviewers answers to A, B and C found in next section:*

1. Has the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?

YES

NO

NEED MORE INFORMATION

**Comments**

Yes, the proposed project frames this on a large body of research that has been conducted specifically in the study region of Maurepas Swamp. The cited references include several reports examining the value and significance of reintroducing river flow into the swamp as well as some peer-reviewed scientific literature.



**2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?**

YES

NO

NEED MORE INFORMATION

Comments

The information supporting the proposal is directly relevant to the Gulf Coast and the study/project area.

**3. Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?**

YES

NO

NEED MORE INFORMATION

Comments

**4. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)**

YES

NO

NEED MORE INFORMATION

Comments

Yes, the proposal goes into great detail regarding the specific risks involved with such a large scale project. These risks encompass both short-term project implementation risks (e.g., timing of project and challenges with multiple stakeholders) and long-term success risks (e.g. climate change).

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

**A. Has the applicant provided reasonable justification that the proposal is based on science that uses peer-reviewed and publicly available data?**

YES  NO  NEED MORE INFORMATION

Comments:

The overall project goals are founded in previous scientific research in the region.

**B. Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?**

YES  NO  NEED MORE INFORMATION

Comments:

The proposal is well grounded in previous research conducted in the area while also proposing a preliminary high-intensity data collection phase that will proceed the project implementation followed by high-intensity data collection during the implementation and following it (5 years with hopes to continue into 50 years). Also, the proposers have used multiple models to help assist with the project design with all of the models generally agreeing.

**C. Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?**

YES  NO  NEED MORE INFORMATION

Comments:

The scientific uncertainties and risks are clearly stated and include potential ongoing and future threats such as climate change and flow variation.



## Science Context Evaluation

**A. Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?**

YES  NO  NEED MORE INFORMATION

Comments:

This appears to be a well put together proposal that includes a broad set of stakeholder focused on one goal - enhancement of the Maurepas Swamp to reduce current and future saltwater intrusion and enhance the overall ecosystem. The project partners have been collectively working on this and appear well-poised to conduct this project.

**B. Does the project/program have clearly defined goals objectives?**

YES  NO  NEED MORE INFORMATION

Comments:

Yes, to divert freshwater from the Mississippi River to the Maurepas Swamp to ameliorate saltwater intrusion, enhance nutrient uptake, increase surface elevation through more accretion, and enhance forest health, particularly bald cypress.

**C. Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?**

YES  NO  NEED MORE INFORMATION

Comments:

Yes, the proposers are also requesting funding from other sources to help with costs.

**D. Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?**

YES  NO  NEED MORE INFORMATION

Comments:

This work is grounded in specific regional plans. In addition, the state governor is also on board with these restoration activities and the benefits will certainly benefit a highly populated region.

**E. Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)**

YES  NO  NEED MORE INFORMATION

Comments:

Yes, they have baselines and also will employ an adaptive management approach.

**F. Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

Yes, the proposal describes the uncertainties due to future risks such as climate change and land use change.

**G. Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

The complexity of the project and number of stakeholders could prevent timely implementation. In addition, Mississippi River levels could also lead to a delay in implementation. The project needs to be adequately funded to succeed due to the high performance costs. Generally, that project has a high likelihood of meeting it's goals in the long-term, but short-term. Scientific uncertainties are adequately described and include uncertainties regarding sea level rise, river flow variability, subsidence of wetlands, and interactions with other projects that may occur in the future. There is a plan to mitigate risks through adaptive management in collaboration with stakeholders.

**H. Does the project/program consider recent and/or relevant information in discussing the elements above?**

YES

NO

NEED MORE INFORMATION

Comments:

**I. Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

This is a bold, but informed by past work in this region. Based on the previous reports, there is significant reason to implement this project. Also, from a scientific perspective, an interesting project to follow restoration through time.

**J. Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

Yes, the project will be monitoring pre-, during, and post- implementation of the project and includes a suite of methods such as synoptic sampling of water chemistry and flow, vegetation surveys, surface elevation change and accretion in the wetland, and remote sensing approaches. They plan to use these metrics to inform potential alterations in the timing, magnitude, and duration of flows into the wetland to enhance growth and recruitment of bald cypress.

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Please summarize any additional information needed below:

Overall, this appears to be a well thought out project that has taken many years to develop through study of the hydrological and biological processes in the region.





# SCIENCE EVALUATION

Bucket 2 Comprehensive Plan Component

## PROPOSAL TITLE

River Reintroduction into Maurepas Swamp

## LOCATION (IF APPLICABLE)

Pontchartrain Basin, LA

## COUNCIL MEMBER BUREAU OR AGENCY

Louisiana

## TYPE OF FUNDING REQUESTED (Planning, Implementation, Planning/Implementation)

Implementation

## REVIEWED BY:

Reviewer 3

## DATE:

October 23, 2019

## Best Available Science:

*These 4 factors/elements help frame the reviewers answers to A, B and C found in next section:*

1. Has the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?

YES

NO

NEED MORE INFORMATION

## Comments

Yes and no. The objectives in the proposal are clearly supported by peer-reviewed science papers as well as publicly available reports. The project itself has been long identified as a priority for restoration. However, the impact of the proposed methodology that focuses on a diversion flux of 2000 cfs diversion is questionable. Shaffer et al. 2016 (Water) indicate that the proposed diversion of 2000 cfs is "too small to influence the entire Maurepas sub-basin, especially in terms of accretion". Shaffer et al. 2016 suggest diversion volumes of 1400 m<sup>3</sup>/s to 5000 m<sup>3</sup>/s (~50,000 cfs - 175,000 cfs) which are 25 times (using the minimum 1400 m<sup>3</sup>/s) the proposed flow rate are needed. Shaffer et al. 2016 also state that "Even if saltwater impacts can be reduced, forested wetland soils need to accrete vertically if they are to survive in the long-term because regeneration cannot occur with permanent or semi-permanent flooding." The proposed diversion period of operation is only 1/2 year which Shaffer et al. 2016 also note which "may be highly beneficial during times of severe drought" but not enough to restore the swamp. Based on the science, accretion within the swamp will not occur with such small diversion flows and the long-term restoration of the Maurepas sub-basin will be in jeopardy. One positive note is that G. Shaffer is listed as a science consultant on the Wetland Value assessment report (laCour-Conant et al, 2019)

**2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?**

YES

NO

NEED MORE INFORMATION

Comments

N/A

**3. Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?**

YES

NO

NEED MORE INFORMATION

Comments

Yes and No. The work of Shaffer et al 2009 and 2016 is referenced in terms of its documentation of the current state of the Maurepas Swamp, but the proposal does not acknowledge that Shaffer et al proposed approaches to restoration (See the comments to 1. above). Also of note is that the 3 of 5 peer reviewed papers referenced are those that include Shaffer as the primary or secondary author. All other references are unrefereed CPRA, EPA, NOAA, USFWS reports.

**4. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)**

YES

NO

NEED MORE INFORMATION

Comments

The one thing not addressed is if the health and state of the larger swamp sub-basin will impact success smaller area targeted by the diversion.

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Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

**A. Has the applicant provided reasonable justification that the proposal is based on science that uses peer-reviewed and publicly available data?**

YES                       NO                       NEED MORE INFORMATION

Comments:

**B. Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?**

YES                       NO                       NEED MORE INFORMATION

Comments:

**C. Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?**

YES                       NO                       NEED MORE INFORMATION

Comments:



## Science Context Evaluation

**A. Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?**

YES

NO

NEED MORE INFORMATION

Comments:

The experience of the project partners is unclear from the proposal though broadly the program sponsor has participated in other river diversion projects. Furthermore, LaCour-Conant et al. 2019 point out the success of the only other swamp restoration project (Hydrologic Restoration and Vegetative Planting in the Des Allemands Swamp (BA-34-2)), though it is not as large of a scale as the proposed project.

**B. Does the project/program have clearly defined goals objectives?**

YES

NO

NEED MORE INFORMATION

Comments:

**C. Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?**

YES

NO

NEED MORE INFORMATION

Comments:

One does need to dive into the references to find the details and justifications for the methods proposed.

**D. Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?**

YES

NO

NEED MORE INFORMATION

Comments:

**E. Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

The types of in-situ measurements (observations) to be collected are clearly stated as well as the timeline and general frequency for such collections. The actual metrics for each measurement and how they will be evaluated, i.e. is the current diversion configuration successful or is there need for changes in the adaptive management strategy, are not articulated in the proposal itself.

**F. Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

**G. Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

The risks and uncertainties are clearly delineated but the mitigation of such risks is not discussed.

**H. Does the project/program consider recent and/or relevant information in discussing the elements above?**

YES

NO

NEED MORE INFORMATION

Comments:

**I. Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

The proposal itself does not offer any evaluations of past successes or failures of similar efforts.

**J. Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)**

YES

NO

NEED MORE INFORMATION

Comments:

There is monitoring and data management strategy but it is quite general stating that the CPRA data management system will be used. There is not a clear tie in to the project measures of success. The measures of success are not explicitly defined.

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**Please summarize any additional information needed below:**

# RESTORE Council FPL 3 Proposal Document

## **General Information**

*Title:*

River Reintroduction into Maurepas Swamp

*Project Abstract:*

This proposal is to implement a river reintroduction project. The project goal is to convey Mississippi River water into the Maurepas Swamp to improve the structure, function, and resilience of the coastal forest habitat through reintroduction of fresh oxygenated water, nutrients, and sediment. Congress recently approved appropriations for the West Shore Lake Pontchartrain (WSLP) levee in the vicinity, which created an opportunity to save money by consolidating the final design and construction of these projects. The Maurepas project is anticipated to benefit ~45,000 acres of swamp habitat at a total cost of \$190 million, with \$130 million from Bucket 2. Louisiana is considering using ~\$60 million from Bucket 3 or other funds for the remaining cost, potentially used to meet wetland mitigation needs for the levee, providing additional cost savings to the state. The WSLP project and its mitigation will be completed by 2024 resulting in the urgency to build both projects concurrently.

*FPL Category:*

Cat2: Implementation Only

*Activity Type:*

Project

*Program:*

N/A

*Co-sponsoring Agency(ies):*

N/A

*Is this a construction project?*

Yes

*RESTORE Act Priority Criteria:*

(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

*Priority Criteria Justification:*

For priority criterion 1, it meets the scale (~45,000 acres of coastal swamp forest benefitted), duration (project life of 50 years provides long-term benefits to the project area), and sustainability (prolongs the existence of the swamp habitat by decades) factors.

For priority criterion 2, it provides landscape-scale benefits to the upper Pontchartrain Basin where freshwater input is most critical in the estuary. The Maurepas Swamp is the second largest contiguous area of forested coastal wetland in Louisiana and one of the largest along the Gulf Coast.

For priority criterion 3, the project has been included in most coastwide and basin-level restoration plans for decades, including CWPPRA Conservation plan, Coast 2050, Louisiana's 2007, 2012, and 2017 Comprehensive Master Plan for a Sustainable Coast (CPRA 2017), and is listed as an example of the type of project, approach and technique in the 2019 RESTORE Comprehensive plan for the basin. By restoring, in part, the natural process that previously sustained this habitat, with the ability to adaptively manage the flows, this project increases the function, structure, and resiliency of the swamp forest under variable and uncertain conditions in the future.

Project Duration (in years): 8

## **Goals**

*Primary Comprehensive Plan Goal:*

Restore and Conserve Habitat

*Primary Comprehensive Plan Objective:*

Restore and Enhance Natural Processes and Shorelines

*Secondary Comprehensive Plan Objectives:*

Restore , Enhance, and Protect Habitats

Promote Community Resilience

*Secondary Comprehensive Plan Goals:*

N/A

*PF Restoration Technique(s):*

Restore hydrology and natural processes: Controlled river diversions

## **Location**

*Location:*

Pontchartrain Basin, LA – Intake at River Mile 144.2 near Garyville, LA. Benefits ~45,000 acres in St. John the Baptist, St. James, & Ascension parishes, roughly between Lake Maurepas, Blind River, Reserve Relief Canal, and developed uplands along the Mississippi River plus some lake shoreline north of Blind River (Figures 1 and 2).

*HUC8 Watershed(s):*

Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas (Lake Maurepas)

*State(s):*

Louisiana

*County/Parish(es):*

LA - Ascension

LA - St. James

LA - St. John the Baptist

*Congressional District(s):*

LA - 6

LA - 2

## **Narratives**

### *Introduction and Overview:*

This proposal is for implementation of a river reintroduction project in the upper portion of the Pontchartrain Basin, Louisiana-Mississippi region. It will introduce Mississippi River water into the southern portion of the Maurepas Swamp via an intake and gated control structure at the river levee near Garyville, LA; a conveyance channel into the swamp with “guide levees” to ensure the water gets to the intended location and prevent flooding; and additional outfall management features designed to help distribute the flow throughout the project area. The goal of the project is to reduce or minimize future loss of coastal swamp forest habitat in the project area through the introduction of Mississippi River water. The project is needed to improve the health and essential functions of the swamp for long-term sustainability. The project area of influence is approximately 45,000 acres of baldcypress/water tupelo swamp, including closed canopy, transitional, and open canopy/marsh.

In FPL 1, the Council approved approximately \$14.2 million for planning, engineering and design, and permitting for the project. The estimated cost of project construction is \$190 million, with \$130 million being requested from Bucket 2 of FPL 3.

Near-term Council action could advance the commitments in the 2016 Comprehensive Plan Update by facilitating this large-scale Gulf coast ecosystem restoration project, save money, and improve community resilience. Congress recently approved appropriations for the WSLP levee, which overlaps with a portion of the guide levees for the proposed project. The State and USACE would achieve substantial cost savings by consolidating the final E&D and construction of the overlapping portions of the two projects (Figure 2). In addition, the USACE is required to mitigate the wetland impacts of the levee. The swamp habitat mitigation can potentially be met with a portion of the environmental benefits of the Maurepas project. Louisiana is considering requesting ~ \$60 million from Bucket 3 or other source(s) to cover the portion of the Maurepas project that could be used to mitigate the levee impacts. If the USACE accepts this mitigation arrangement, Louisiana would be credited those funds towards its required share of the cost of the WSLP levee, thereby offsetting the proposed Bucket 3 investment. The timeline for implementing the Maurepas project will be heavily reliant upon and coordinated with that of WSLP.

This project is based on an extensive history of planning and science, federal and state support, and Congressional authorization. In 2001, the federal-state CWPPRA Task Force approved funds for the project to 30% design. In 2004, the USACE identified the project as a near-term priority in the LCA Ecosystem Restoration plan (USACE 2004) authorized by Congress in WRDA 2007. The State funded design to the 95% level, with NFWF GEBF funds for additional planning tasks, including contracting a Technical Advisory Group (TAG) of forest wetland ecologists to develop performance measures and targets for ecosystem function, resilience, and sustainability (Krauss et al. 2017). The project was included in the 2007, 2012, and 2017 Louisiana Comprehensive Master Plan for a Sustainable Coast (CPRA 2017).

In 2012, the Gulf Coast Ecosystem Restoration Task Force (Task Force) Strategy called for expedited construction of authorized river reintroduction projects. The RESTORE Act directed the Council to include in its Comprehensive Plan, the strategy, projects, and programs recommended by the Task Force. By including this project in FPL3, the Council would be building upon this history, previous investments in project planning, and fulfilling the Task Force recommendation to expedite its construction. Implementing this project builds on the RESTORE investment from the 2015 Initial FPL



to complete outstanding tasks required to make the project ready for construction. These tasks included creating a new hydrodynamic and water quality model, final design, landrights, continuation of engagement with the TAG, continuation of permitting and environmental compliance processes, and creating a Preliminary Operations, Maintenance, Monitoring, and Adaptive Management (OMMAM) plan (Buras et al. 2018).

There are many ecological problems in this area, but probably the most significant is the current hydrologic regime, which is no longer conducive to sustain swamp forest habitat (Shaffer et al. 2009, 2016). Historically, the swamp received oxygenated water, sediment, and nutrient inputs from the Mississippi River during seasonal overbank flooding and via Bayou Manchac. That process was interrupted by the construction of local and eventually federal levees along the Mississippi River for flood control as well as the blockage of its connection with Bayou Manchac. This altered hydrologic regime has prevented natural connection of the swamp to the river's life-sustaining waters and resulted in oxygen-poor, stagnant water conditions that impair forest health and associated aquatic habitats.

The swamp's hydrology issues have been exacerbated by the construction of highways, pipelines, railroads, pull boat canals, the Amite River Diversion Canal, navigation canals, and oil and gas exploration canals, along with the spoil banks associated with canal excavation. The channelization of local streams and the construction of local flood mitigation features such as weirs, local levees, floodgates, and drainage ditches have also altered hydrology in the area. This altered hydrologic regime, especially the reduced freshwater inflow and outflow, has resulted in periodic intrusion of brackish water from Lake Pontchartrain into Lake Maurepas and the swamp (Shaffer et al. 2009, 2016). This intrusion was further increased by the construction of the Mississippi River Gulf Outlet (MRGO) that created a saltwater and storm surge conduit from the Gulf of Mexico south of New Orleans, through the lakes into the Maurepas Swamp. Since the 2009 closure of the MRGO, salinity reductions have been noted, but droughts, sea level rise, and storm surge still cause periodic high salinities, which can be fatal to baldcypress and water tupelo. Impounding features, coupled with low soil surface elevations, have exacerbated saltwater intrusion and caused mortality or degradation of trees in the project area (Shaffer et al. 2016). These hydrologic changes have led to the declining health of the Maurepas Swamp.

The isolation of the swamp from the Mississippi River has also resulted in the deprivation of nutrients and sediments which are important for forest health, structure, function, and resilience. Nutrients and sediments promote vertical accretion and help maintain soil surface elevation on pace with relative sea level rise. The healthier forests adjacent to streams transporting local upland runoff are receiving nutrients and sediment along with flowing water that helps sustain them (Shaffer et al. 2009, 2016), and demonstrate the need for periodic inundation of the whole system with river water as sheet flow. Net primary productivity, stem densities, and tree basal areas are very low and similar to other baldcypress swamps flooded by low nutrient, low dissolved oxygen, stagnant water (Shaffer et al. 2003, Hoepfner et al. 2008). Because neither baldcypress nor water tupelo seeds can germinate under flooded conditions, there has been limited recruitment of new trees to the swamp. Therefore, where mortality has created gaps in the canopy, the swamp has converted to marsh and open water.

Because the majority of the old growth swamp trees were clear-cut in the late 1800s and early 1900s, most of the current trees have spent their entire lives in these degraded conditions. The harvest of second-growth trees continued to utilize non-sustainable forestry practices (Chambers et al. 2005) until harvesting was limited by conservation acquisitions and the regulatory recognition that harvesting coastal wetland forests largely resulted in conversion to non-forested habitats. These factors, plus conversion of forests to other land uses, have contributed to an overall reduction in

coastal forest area and reduced health, structural integrity, and resilience of what remains. The combination of these factors has resulted in significant swamp habitat loss, and the conversion of degraded swamp to freshwater marsh habitat and open water. Although restoration to a historic condition is not possible, the best available science suggests it is possible to rehabilitate and prolong the existence of the existing forest through restoration of the processes that sustain it.

The objectives are to establish a hydrologic regime consistent with swamp forest sustainability that will introduce flowing oxygenated water; ameliorate salinity intrusion; facilitate nutrient uptake and retention; increase forest health and structural integrity; and increase rates of soil surface elevation gain to offset subsidence and future sea level rise. If these objectives are achieved, swamp habitat structure, function, and resilience will increase, and conversion to non-forested habitats will be reduced. According to the Wetland Value Assessment, the project will provide an estimated net 7667 Average Annual Habitat Units of swamp habitat improvement to 44,683 acres over the life of the project. (LaCour-Conant et al. 2019).

#### *Proposed Methods:*

The project consists of the following major components, designed to divert fresh water and associated fine sediments and nutrients from the Mississippi River into the Maurepas Swamp: 1) a gated river intake structure, 2) box culverts through the levee, 3) a sedimentation basin, 4) a conveyance channel and associated guide levees, and 5) outfall management features. The maximum design flow is 2,000 cubic feet per second. This was informed by modeling conducted during planning and also based on the capacity of the existing Hope Canal channel under I-10. In 2007, as part of the Engineering and Design Phase of the project, URS (now AECOM) developed two numerical models that were used in the feasibility and preliminary design of the project. These numerical models included a 1D drainage model, EPA's Stormwater Management Model (SWMM), and a 2D hydrodynamic model – the Advanced Circulation (ADCIRC) Model. The SWMM was used to verify Hydrologic Engineering Center-River Analysis System (HEC-RAS) model results of conveyance channel parameters from the CWPPRA Phase 1 efforts. The ADCIRC model was employed to study the behavior of 2000 cfs of fresh water within the Maurepas Swamp watershed. Preliminary results of the ADCIRC model guided design of small water control features within the watershed to improve freshwater retention and circulation. More recent Delft3D modeling (FTN 2019) supported previous results and shows the project can be operated to deliver sheet flow throughout the project area. Additional Delft model runs (FTN 2019) showed the potential for salinity reduction as well as the ability for nutrient uptake within the swamp without causing large nutrient increases in Blind River or Lake Maurepas.

The project will be located near Garyville, LA in St. John the Baptist Parish. The intake structure at River Mile 144.2 will be comprised of three 10-ft x 10-ft sluice gates connected to three 10-ft x 10-ft box culverts through the levee and underneath LA 44. The conveyance channel extends just under 5.5 miles from the river to a discharge point in the Maurepas Swamp approximately 1,000 ft north of I-10. The channel will have a typical bottom width of 40 ft and will be bounded on both sides by guide levees. The first 1.5 miles of the eastern guide levee would be constructed as part of the integration with the WSLP hurricane protection levee.

Major infrastructure crossings include LA 44, Canadian National and Kansas City Southern railroads, US 61, and I-10. Numerous outfall management features will be constructed to improve retention and circulation of river water within the Maurepas Swamp. The design includes lateral relief valves to be constructed off the water conveyance channel, south of I-10, each having pipes with knife gate valves to divert 125 cfs water to the west and east of the constructed channel into the swamp system. One-way check valves will be installed along the north side of I-10 on all culverts beneath I-10 from LA 641 to the Mississippi Bayou overpass. Weirs will be constructed in Bourgeois Canal and Bayou Secret at their intersections with Blind River. Cuts will be created in the abandoned railroad

embankment north of I-10 and east of Blind River. Additional cuts may be added along the Reserve Relief Canal and elsewhere, pending final design and adaptive management of the project. Tree planting may be included where feasible to accelerate regeneration in areas most influenced by the diversion.

#### *Environmental Benefits:*

Modeling (FTN 2019) shows the project can be operated to deliver sheet flow throughout the approximately 45,000-acre project area, providing freshening and nutrient uptake within the swamp without causing large nutrient increases in Blind River or Lake Maurepas. The TAG (Krauss et al. 2017) anticipated the project would help maintain favorable salinities in the swamp, promote soil surface elevation gains to offset relative sea-level rise, and promote near complete uptake of nitrate by the receiving wetlands. They further expect increased productivity reflected in stand density and overstory leaf area index in the swamp. A Wetland Value Assessment (WVA) (LaCour-Conant et al. 2019) using the Swamp Community Model quantified the estimated net project benefits as 7,667.5 Average Annual Habitat Units over 44,683 acres. Mitigation requirements for the 3002 acres of swamp habitat impacted by WSLP could potentially be satisfied with an estimated 1090 AAHUs from this project.

The communities surrounding the swamp include some of the fastest growing in the state, and currently have no major structural hurricane protection. Implementing this project would maintain an important floodwater storage area as well as improve its storm surge buffering capacity. Combined with the WSLP levee, it would provide substantially improved resilience for the communities and industrial infrastructure in the surrounding area. This project shares the first 1.5 miles of its eastern guide levee with the WSLP levee (Figure 2), which is anticipated to be constructed concurrently, and a healthy swamp forest will provide significant synergy with that levee protection. The restored area of the Maurepas Swamp would provide an additional layer of natural flood defense in front of the levee, a “multiple lines of defense” strategy, providing substantial, long-term improvements in community resilience. Concurrent construction of these two projects creates a unique opportunity to help facilitate two important coastal projects thereby providing for greater overall community resilience in the area.

#### *Metrics:*

Metric Title: HR009 : Restoring hydrology - Acres with restored hydrology

Target: 44,683 acres

Narrative: Monitoring to quantify restoration success will be based on performance metrics and targets recommended by the TAG (Krauss et al. 2017) and described in the OMMAM Plan (Buras et al. 2018). Preconstruction monitoring will establish baselines and post-construction monitoring will continue for 5 years under other funding sources during the grant period and continue for the 50-year project life. Taking advantage of the coastal Louisiana CRMS monitoring program, existing CRMS sites within and near the project area will be used and additional CRMS sites will be added in the project benefit area. The CRMS monitoring program will continue project-specific and regional monitoring beyond closeout of the award. Some elements will be measured more often in the first few years of operation to inform adaptive management, and decrease frequency in later years. The project will be evaluated for this metric by determining distribution of River water throughout the project area by monitoring water level, specific conductivity, salinity, and temperature; isotope analysis of water samples; synoptic surveys of water velocity, depth, DO, chl-a, turbidity, specific conductivity, pH, temperature, and suspended sediments. We will also measure other parameters to assess surface elevation change/accretion, vegetation and habitat, soil properties, nutrient uptake, and water quality.

### *Risk and Uncertainties:*

Major risks consist of deviations to the schedule, cost, and long-term performance. The key risk is associated with the schedule; project timing is both critical and urgent.

Project schedule risks: Since this project may be considered partial mitigation for the WSLP project, it is essential that schedules and logistics are heavily coordinated and aligned to avoid a significant lost opportunity to build both projects in an integrated fashion that provides both ecosystem and risk reduction benefits. The project's complexity and numerous affected stakeholders have the potential to greatly impact the project schedule. Construction of the project features will affect ~30 different utilities, each requiring coordination and relocation dependent on each utility's relocation timeline. Timelines for the utilities must be coordinated since CPRA needs to capitalize on each utility's different "shut down days" for regular maintenance. Mississippi River conditions may pose a schedule risk. Louisiana has experienced unprecedented high river stages in recent years. If the river is high during construction, relocating the river levee may have implications for flood fight efforts and restrictions on activities within 1,500 feet of the levee could cause a delay.

If this project is considered mitigation for WSLP, regulatory review and permitting will be heavily coordinated with the USACE, who will work with CPRA to determine requirements that satisfy NEPA and additional laws and regulations, which could affect the project schedule.

Cost escalation risk: In the past, construction costs have increased due to increased fuel cost and cost of construction materials, particularly following major storms or hurricanes.

Project performance risks: If not adequately funded for operations and maintenance, the project will not perform as designed, since water flow through the project area is highly dependent on maintenance of the channel, culverts, bridges, and sedimentation basin. Depending on future water levels in the basin and river, full capacity operations may not be possible since the operation and performance rely on the head difference between the river and receiving basin.

Low Risk: Attaining voluntary landrights is not anticipated to be a significant risk. The portion of the project area near the Mississippi River is privately owned by Marathon Oil Corporation (formerly Pin Oak). CPRA has coordinated extensively with this group for 5 years regarding the location of the project and attaining the needed landrights should not be problematic. CPRA has coordinated with other private landowners in the area and no issues are anticipated. The majority of the project area is State-owned by LDWF as part of the Maurepas Swamp Wildlife Management Area. CPRA has been coordinating with LDWF about this project and it should not pose a significant project risk. Considerable coordination, however, will be required with LDWF to address any project-specific concerns they may have. This project has broad general support from local, state, and federal government, stakeholders, and the general public and has little to no documented opposition; therefore, this is considered a low risk. Also, CPRA believes the potential for unanticipated adverse environmental and/or socio-economic impacts is low.

Scientific uncertainties that may affect the project include future sea level rise rates (Pahl 2017), subsidence, weather events (such as droughts, rainfall, local riverine floods, and tropical events) (Frankson et al. 2019), variability in timing and volume of river flow (Tao et al. 2014, Mize et al. 2018, LaFontaine et al. 2019), interaction with new flood protection features such as WSLP, and other regional and local drainage, protection, and restoration projects. Since this is the first river reintroduction project targeting a coastal swamp in Louisiana, scientific uncertainties exist with respect to temporal and spatial attainment of various project benefits. The diversion will not affect the entire project area uniformly due to its large size, variable existing and future conditions (topography and location-specific levels of swamp degradation) and variable water influence (Krauss et al. 2017). This risk will be mitigated with adaptive management which includes monitoring and

optimizing project operations and results during the project life. Future development in the watershed and the associated hydrologic changes that may occur are also uncertainties.

The primary measure that CPRA will utilize to mitigate risks is coordination that is both frequent and in advance of critical project milestones. This coordination will occur with USACE, utility companies, LDOTD, Pontchartrain Levee District, LDWF, St. John the Baptist Parish, and others as necessary. Other risks and uncertainties will be managed through targeted data collection, management, and analysis to inform adaptive management strategies and decisions.

*Monitoring and Adaptive Management:*

Ecological monitoring for up to 5 years pre-diversion operations will determine baseline conditions, continue during construction, and extend 50 years post-construction. Monitoring frequency will be greatest prior to and within the first few years of construction to inform operations and assess immediate project effects on the swamp and neighboring waterways. Monitoring for structural integrity and function will occur regularly during and after construction and includes visual inspections and hydrographic surveys.

Ecological monitoring is tailored to address whether the project's performance measures are being met (Krauss et al. 2017). Real-time monitoring of diversion discharge, water elevation, salinity and DO will allow for timely adjustments to diversion operations to maintain the project's hydrologic and salinity targets. Data from pre-existing hydrographic continuous recorders will supplement real-time stations, following CRMS protocols (Folse et al. 2018). Isotope analysis of water samples and synoptic surveys will provide additional insight into water distribution and flow. On-the-ground vegetation surveys will document tree growth and capture changes in recruitment, survivability, and canopy cover (Folse et al. 2018). Habitat analysis using CIR photography and satellite imagery will provide a broader-based evaluation of habitat change over years (Folse et al. 2018, Cowardin et al. 1979). Water quality analysis (nutrients, DO, chl a, TSS) will determine the efficiency of nutrient uptake in the swamp and inform operational adjustments to enhance nutrient retention. Sediment samples will be analyzed for nutrients, % organic matter, and bulk density. Surface elevation change and accretion will be assessed using rod surface elevation tables, feldspar marker accretion plots (Folse et al. 2018), and radioisotope dating of sediment cores.

The primary strategy for adaptive management is adjustments to operations of the diversion structure and outfall management features. Changes in timing, duration, and frequency must be flexible to meet the receiving basin's needs, including encouraging periods of low water to promote seedling establishment. Other adaptive management strategies could include additional spoil bank gapping, water control structures, check valves, lateral relief valves, or cuts in railroad embankments to assist with achieving the desired hydrology. Location-targeted plantings of baldcypress and water tupelo will also be considered.

*Data Management:*

Data collected in association with this project will be managed in accordance with established CRMS, SWAMP, and survey standards data management protocols, where applicable, and made publicly available. CPRA's data management system is called the Coastal Information Management System (CIMS; <https://cims.coastal.la.gov/>) and is our overall enterprise data repository that combines a network of webpages hosted by CPRA. It includes a spatial (GIS) database and relational tabular database in one public-facing, GIS-integrated system capable of robust visualizations and data delivery. It also has a library for sharing documents pertinent to CPRA's mission. CIMS facilitates CPRA, its partners, and the general public's access to CPRA's suite of protection and restoration projects as well as CRMS and SWAMP stations, Coastal Master Plan activities, geophysical data, and coastal community resiliency information. CIMS is the official repository for environmental, modeling, and monitoring data for restoration and protection projects undertaken by the State of

Louisiana.

*Collaboration:*

Through the collaborative process utilized for developing project ideas for FPL 3, a potential partnership between CPRA and the USACE was identified for the project. Congress recently approved appropriations for the WSLP levee project in the same vicinity as the Maurepas project (WSLP overlaps with Maurepas' guide levees), which creates an unprecedented opportunity for the partners to build a truly integrated wetland restoration and risk reduction project. This collaborative opportunity also allows the RESTORE Council the ability to facilitate the project, save money, and improve community resilience. Partnering with the USACE would reduce the Bucket 2 funds needed by consolidating the final design/integrated construction of the overlapping portions of the 2 projects while facilitating WSLP. The WSLP project and its mitigation are scheduled to be completed by 2024 resulting in the urgency to build both projects concurrently.

*Public Engagement, Outreach, and Education:*

CPRA's Coastal Master Plan (CPRA 2017) guides all of our efforts, including the Maurepas Project. CPRA established a strategic outreach and engagement framework for the Coastal Master Plan that helped/helps guide communications and interactions with diverse audiences and stakeholders. These audiences/ stakeholders include key citizen groups and organizations, non-governmental organizations, local and State officials, business groups and the general public. Regularly scheduled opportunities for public input include: CPRA Board Monthly Public Meetings, National Environmental Policy Act / Permitting Project-Specific Opportunities, and Community Meetings. Specifically for the Maurepas Project, various informational meetings have been held about the project since it began under the CWPPRA Program in 2001. In April 2002, Notice of Intent was published in the Federal Register to prepare an EIS. NEPA Scoping letters were mailed to 869 local organizations (tribal, etc.), the public, public interest groups, elected officials, and other agencies inviting them to participate in public scoping meetings. The purpose of those meetings was to provide information on the project and for the attendees to provide issues that they wanted to see addressed in the EIS. Various other project update meetings have been held between 2002 and now. The most recent public, informational meeting was co-hosted by CPRA and the Louisiana Wildlife Federation on the evening of March 26, 2018 in Reserve, LA. The intention of this meeting was to inform the attendees about the project, its current status and next steps, and provide a forum for questions. CPRA will continue to perform public education, outreach, and education on this project throughout the construction and post-construction processes. CPRA believes a successful restoration project is built on local knowledge, input from a diverse range of coastal stakeholders, and extensive dialogue with the public. We continue to reach out to the public in new ways to better share information on this and other restoration projects. CPRA is committed to engaging stakeholders and citizens in the effort to ensure their voices are heard and their input is incorporated.

*Leveraging:*

Funds: \$10,717,183.00

Type: Building on Others

Status: Received

Source: CWPPRA, LCA, State-only

Source Type: Other

Description: The Maurepas project has leveraged other funding sources, including CWPPRA, LCA, State-only, and NFWF. The project was included on CWPPRA PPL 11 and planning efforts were performed. In 2001, CWPPRA Task Force approved funding to complete 30% design. Additional project investigations were performed for the Louisiana Coastal Area (LCA) Program and, in 2004, the USACE identified the project as a near-term priority in the



LCA plan (USACE 2004). CPRA funded design to the 95% level.

**Funds:** \$153,422.00

**Type:** Building on Others

**Status:** Received

**Source:** NFWF-GEBF

**Source Type:** Other

**Description:** NFWF GEBF funds were used for other planning tasks, including contracting the TAG to develop performance measures and targets (Krauss et al. 2017).

**Funds:** \$14,190,000.00

**Type:** Building on Others

**Status:** Received

**Source:** RESTORE Bucket 2

**Source Type:** Other Federal

**Description:** Funds were provided under the RESTORE Council 2015 Initial FPL to complete planning tasks required to bring the project to a “construction ready” status. These tasks included creating a new hydrodynamic and water quality model (FTN 2019), final design, landrights, continuation of engagement with the TAG, continuation of permitting and environmental compliance processes, and creating a Preliminary Operations, Maintenance, Monitoring, and Adaptive Management (OMMAM) plan (Buras et al. 2018).

**Funds:** \$88,526,550.00

**Type:** Adjoining

**Status:** Proposed

**Source:** TBD

**Source Type:** Other

**Description:** Although the exact funding source for the project’s monitoring, adaptive management, and data management has not been finalized, other funding sources besides RESTORE are anticipated to be utilized for these tasks. These tasks are critically important to determine ecological success of the project and determine if any adaptive management actions (operational or otherwise) are needed. The current estimated cost for these 3 activities throughout the 50-year project life is \$88,526,550.

**Funds:** \$346,029,172.00

**Type:** Adjoining

**Status:** Proposed

**Source:** TBD

**Source Type:** Other

**Description:** An operations and maintenance plan for the 50-year project life has been drafted. Physical operations of the diversion and associated structures will be managed by CPRA and performed by CPRA or its designee(s). Maintenance activities of all project features will be divided among the various responsible parties. For example, railroad crossing maintenance, although funded through the project, would likely be performed by the actual railroad company while guide levee maintenance would likely be delegated to the local levee district. The 50-year O&M budget, including inflation, is \$346,029,172.

**Funds:** \$60,000,000.00

**Type:** Co-funding

**Status:** Proposed

**Source:** RESTORE Bucket 3 and/or other sources

**Source Type:** Other

**Description:** The planned project footprint of the WSLP project overlaps with the Maurepas project's guide levees. Because these projects are adjoining/in the same vicinity, there is the potential for leveraging with the USACE, as described throughout this proposal. Under this coordinated scenario, the USACE would provide CPRA a cost share for the WSLP mitigation, approximately \$60M would be requested from Bucket 3 and/or other source(s). Anticipated completion of the 2 projects by 2024.

***Environmental Compliance:***

The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Task Force approved the River Reintroduction into Maurepas Swamp Project for planning studies and design in 2001, with Environmental Protection Agency (EPA) as the federal sponsor and the State of Louisiana as the local sponsor. Engineering and design were initiated in 2002 and EPA initiated National Environmental Policy Act (NEPA) compliance with the publication of a Notice of Intent to prepare an Environmental Impact Statement (EIS) in the Federal Register. Public scoping meetings were held. EPA undertook informal consultation with the U.S. Fish and Wildlife Service (USFWS) for West Indian manatee, Gulf sturgeon, and pallid sturgeon. EPA completed consultations with SHPO and THPOs under Section 106 of the National Historic Preservation Act in 2008; SHPO concurred the project would not affect significant archaeological sites or standing structures.

In 2013, CPRA submitted a Joint Permit Application (CUP# 20130675) to construct the Project. The CWPPRA Task Force de-authorized this Project in January 2014 due to its construction costs. Prior to de-authorization, EPA completed a Draft Environmental Information Document (EID) (EPA 2011) that screened engineering alternatives and documented existing conditions in the Mississippi River, Maurepas Swamp, and the Pontchartrain Basin.

Currently, CPRA is updating EPA's EID to evaluate recent design changes and update environmental conditions in the Maurepas Swamp and Pontchartrain Basin. CPRA's EID would incorporate past consultations performed by EPA, including but not limited to: Endangered Species Act- Section 7 – Informal Consultation; Migratory Bird Treaty Act Consultation; Bald and Golden Eagle Protection Act – Consultation and Planning; and NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s). The EID would also include information from updated modeling and design reports. See Design Proposal submitted to RESTORE for more information.

CPRA has the opportunity to streamline this Project's Environmental Compliance by partnering with USACE to use the Maurepas Project as wetland mitigation for the swamp impacts of the federal WSLP Project, as the Maurepas Project was identified as a mitigation alternative in the WSLP EIS. With this opportunity, Environmental Compliance for the Maurepas Project would likely be documented in a supplemental Environmental Assessment (EA) to the WSLP EIS.

## **Budget**

***Project Budget Narrative:***

A total of \$130,000,000 is being requested from FPL 3a to fund construction of the River Reintroduction into Maurepas Swamp Project. The amount requested is not inclusive of the total construction estimate of \$190,000,000. The remainder of construction funds will likely be requested from the Spill Impact Component and/or other source(s) to take advantage of leveraging opportunities described above involving the combined construction of the West Shore Lake Pontchartrain Hurricane and Storm Damage Reduction Project and River Reintroduction into Maurepas Swamp project as it relates to the shared components of both projects. The funds being requested are solely intended to be used for project construction implementation. Project Management funds as well as funds to be used for any leveraging and cost sharing are not part of

this request and will be requested separately to satisfy the total project construction estimated budget.

Planning funds are not being requested as part of this request. An estimated 81% of this request is for project construction implementation. An estimated 0.4% is being requested for project management activities such as construction oversight, budget and schedule management, and grant management and reporting. An estimated 0.5% is being requested for reporting on monitoring and adaptive management activities to ensure progress is made toward the acres with restored hydrology metric. An estimated 0.1% is being requested for data management activities. The construction Contingency is currently estimated at 10% and Escalation is estimated at 8% and both are included in the total construction estimate.

*Total FPL 3 Project/Program Budget Request:*  
\$130,000,000.00

Estimated Percent Monitoring and Adaptive Management: 0.5 %  
Estimated Percent Planning: 0 %  
Estimated Percent Implementation: 81 %  
Estimated Percent Project Management: 0.4 %  
Estimated Percent Data Management: 0.1 %  
Estimated Percent Contingency: 18 %

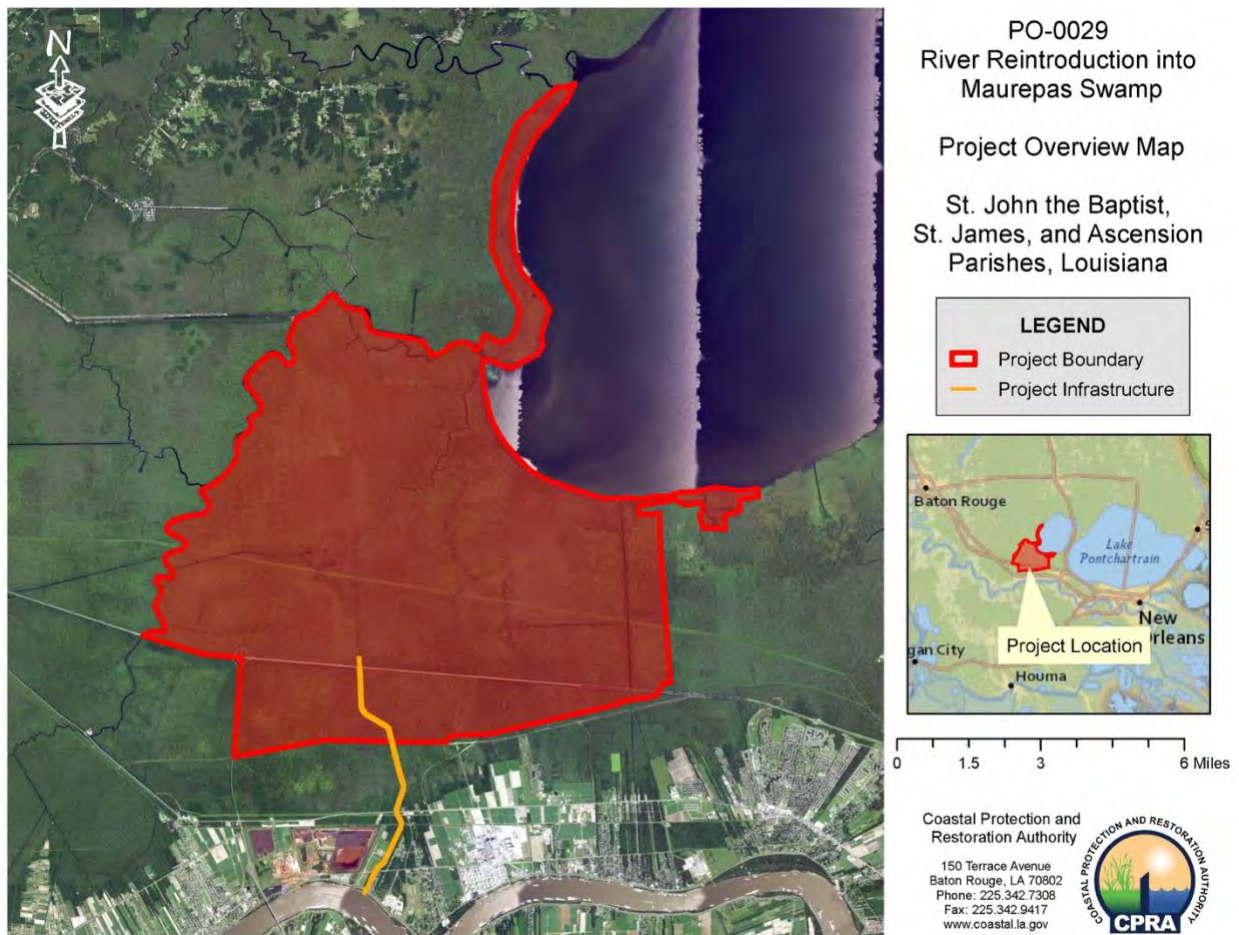
Is the Project Scalable?  
No

If yes, provide a short description regarding scalability:  
N/A

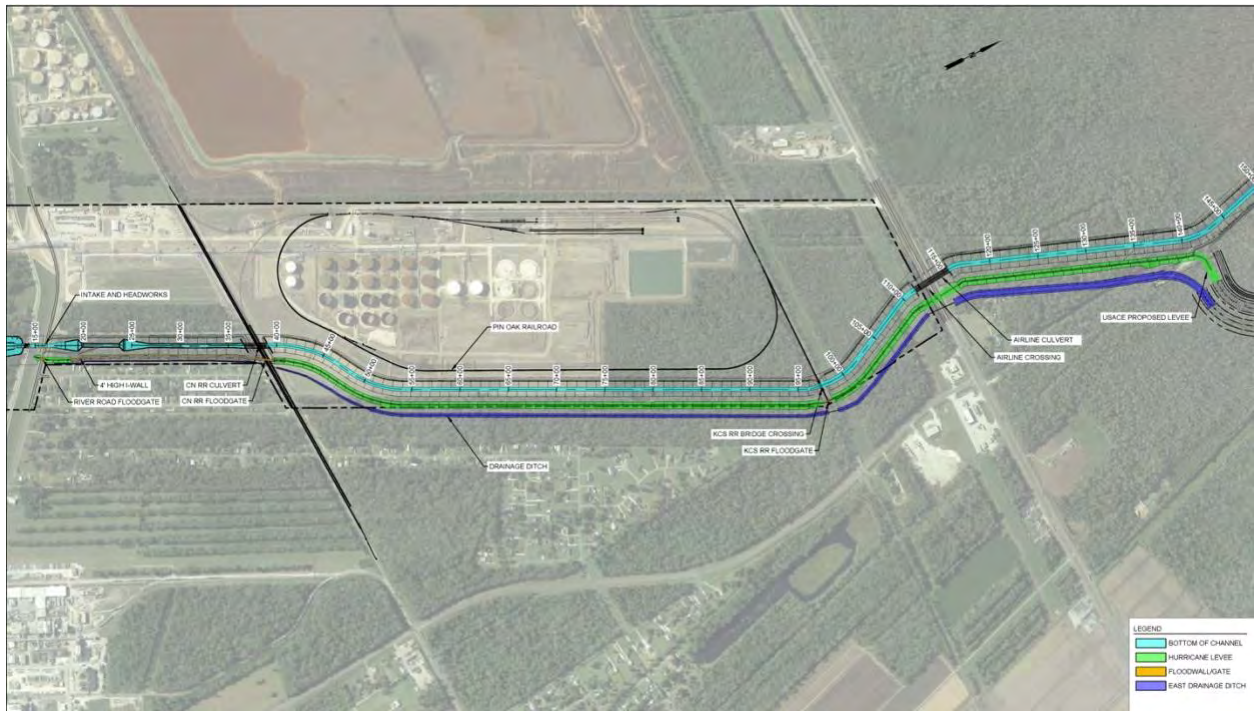
## Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Endangered Species Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
National Historic Preservation Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Magnuson-Stevens Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Fish and Wildlife Coordination Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Coastal Zone Management Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Coastal Barrier Resources Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Farmland Protection Policy Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Water Act Section 404	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
River and Harbors Act Section 10	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Water Act Section 401	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Marine Protection, Research and Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Marine Mammal Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
National Marine Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Migratory Bird Treaty Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Bald and Golden Eagle Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Air Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

## Maps, Charts, Figures



Caption : Figure 1: River Reintroduction into Maurepas Swamp Project Overview- This project is located in the Pontchartrain Basin with the intake at River Mile 144.2 near Garyville, Louisiana with conveyance channel alignment (shown in orange). Project benefit area (shown in red) is approximately 45,000 acres roughly between Lake Maurepas, Blind River, Reserve Relief Canal, and developed uplands along the Mississippi River. The benefit area also includes some lake shoreline north of Blind River and east of Reserve Relief Canal.



Caption : Figure 2: Integrated reach of WSLP and River Reintroduction into Maurepas Swamp Project - The first 1.5 miles of conveyance channel, guide levees, crossings, and drainage features of Maurepas Swamp project are integrated along shared alignment with the West Shore Lake Pontchartrain hurricane risk reduction project with the diversion channel being on the west (flood side) and the WSLP levee to the east. The diversion intake structure, headworks, and conveyance channel are shown in blue; flood wall/flood gate are shown in orange; drainage features are shown in purple; and the shared levee alignment is shown in green.



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