

	PROJECT ID	PROPOSAL DATE	LAST UPDATED DATE	PROJECT NAME
Eco Restoartion	109	11/19/2013	3/31/2022	Habitat Restoration & WQ Management in the mallini Bayou System
Eco Restoartion	1149	2/2/2015	1/27/2022	Oyster Bayou Restoration at Beauvoir

Eco Restoartion	1154	9/26/2011	1/24/2022	Hiller Park Environmental Enhancement Project
Eco Restoartion	1157	9/26/2011	1/24/2022	Bayou Auguste Environmental Enhancement and Wetlands Project
Eco Restoartion	1227	11/9/2011	3/31/2022	Sand Renourishment/Replenishment Development Program
Eco Restoartion	1233	9/7/2011	3/31/2022	Enhance Aquatic Habitat around Existing Piers
Eco Restoartion	1243	9/26/2011	3/16/2022	Purchase of Land Adjacent to Lake Mars

Eco Restoartion	1269	2/25/2022	2/25/2022	Ecological Restoration Genetics of Slash Pine on the Barrier Islands and Coastal Wetlands
Eco Restoartion	1652	8/7/2013	3/31/2022	Monitoring Population Ecology of a Critical Coastal Bioindicator, the Mississippi Diamondback Terrapin ( <i>Malaclemys terrapin pileata</i> )

Eco Restoartion	1653	8/7/2013	3/31/2022	Eco-tourism-Enhancement of IMMS Public Outreach and Education Programs
Eco Restoartion	1657	1/16/2014	3/2/2022	Coffee Creek - Restoration and Enhancement
Eco Restoartion	1661	1/20/2014	3/2/2022	Turkey Creek Restoration and Enhancement

Eco Restoartion	1683	1/24/2014	3/31/2022	Creeks and Streams Evaluation
--------------------	------	-----------	-----------	-------------------------------

Eco Restoartion	1733	2/10/2014	3/2/2022	Gulfport Urban Estuaries Enhancement
Eco Restoartion	1780	3/20/2014	3/16/2022	Gulf Park Estates Bellefontaine Beach Restoration

Eco Restoartion	1799	4/4/2014	3/31/2022	Multifaceted evaluation of living shorelines in the Mississippi Sound
Eco Restoartion	1800	4/4/2014	3/31/2022	A comprehensive approach for the restoration and recovery of essential prey items for Kemp's Ridley sea turtles ( <i>Lepidochelys kempii</i> ) in the Mississippi Sound

Eco Restoartion	1810	4/14/2014	3/31/2022	Long-term restoration, recovery, and monitoring of marine mammals and sea turtles in the north central Gulf of Mexico
Eco Restoartion	1863	3/1/2022	3/29/2022	Diamondhead Ecosystem Restoration, Stabilization & Sustainability Project - Living Shoreline Protection & Marsh Restoration
Eco Restoartion	1864	3/1/2022	3/29/2022	Diamondhead Ecosystem Restoration, Stabilization and Sustainability Project - Water Quality Restoration Enhancement Project



Eco Restoartion	2135	10/1/2014	1/24/2022	Biloxi Peninsula Shoreline Stabilization and Public Access Improvements
Eco Restoartion	2161	6/1/2015	1/20/2022	Mercury Methylation Rates, Isotopic Composition, and Trophic Transfer in the Northern Gulf of Mexico

Eco Restoartion	3225	6/1/2015	1/19/2022	Development of the MississippiSound environmental education program at the Mississippi State University Crosby Arboretum, through the MSU-ES, to foster coastal community resilience
--------------------	------	----------	-----------	--

Eco Restoartion	4248	11/25/2014	3/29/2019	Point Aux Chenes Marsh Shoreline Protection
Eco Restoartion	4277	1/24/2022	1/27/2022	Highway 603 Corridor

Eco Restoartion	4310	1/27/2015	3/16/2022	Jackson County Shoreline Protection Program
Eco Restoartion	4316	2/19/2015	8/27/2021	Bay St Louis stream restoration, canal dredging project and Removal of Derelict Boat Houses and Piers Project
Eco Restoartion	4342	3/25/2015	3/16/2022	Creation and Maintenance of Nearshore Tidal Marsh Land

Eco Restoartion	4343	7/24/2015	3/16/2022	West Jackson County Constructed Wetlands Restoration Project
Eco Restoartion	4354	4/20/2015	8/11/2021	Hancock County Utility Authority - Kiln / Delisle Phase 1
Eco Restoartion	4355	4/20/2015	8/11/2021	Hancock County Utility Authority - Kiln / Delisle Phase 2

Eco Restoartion	5401	9/2/2015	6/13/2019	Point Cadet Sunrise Park: Biloxi Tip of Peninsula Public Access and Shoreline Stabilization Improvement Project
Eco Restoartion	5509	9/8/2016	3/28/2022	Sanitary Sewer System & Water Main Replacement Project

Eco Restoartion	5517	10/15/2016	1/22/2022	Purchase property or conservation easement on 3 parcels west of Lake Mars pier in Jackson County to protect bird and turtle habitat
Eco Restoartion	5555	2/1/2022	1/19/2022	Sewer Infrastructure Rehab Project

Eco Restoartion	5647	7/14/2017	3/23/2022	Informing restoration efforts in the Mississippi Sound: Quantifying Gulf Sturgeon winter foraging habitat occupancy and coastal pelagic finfish habitat use with passive acoustic technology
Eco Restoartion	5710	8/1/2017	4/30/2020	Sea turtle entanglement reduction through the prevention and removal of recreational fishery-based marine debris



Eco Restoartion	5753	12/19/2017	5/14/2019	Synoptic Monitoring of Wetland and Barrier Island Restoration Efforts to Inform Adaptive Management Decisions
Eco Restoartion	5755	1/9/2018	1/9/2018	Reforestation of coastal areas
Eco Restoartion	5756	1/18/2018	1/18/2018	East McHenry Road Restoration and Improvements ( Final Phase)

Eco Restoartion	5759	1/24/2018	1/24/2018	Ecosystem restoration by decreasing gulf menhaden catch and effort
Eco Restoartion	5762	2/9/2018	2/9/2018	Pilot Study SAV MIitigation
Eco Restoartion	5764	2/23/2018	2/23/2018	Helena Utility District Sanitary Sewer and Water System Expansion
Eco Restoartion	5765	2/25/2018	2/25/2018	Mississippi Oyster Shell Recycling Program

Eco Restoartion	5784	7/10/2018	7/10/2018	Wolf River Land Protection
Eco Restoartion	5785	7/10/2018	7/10/2018	Turkey Creek Land Protection
Eco Restoartion	5786	7/10/2018	7/10/2018	Bayou Acadian Land Protection
Eco Restoartion	5788	7/11/2018	7/11/2018	Cedar Lake Island Land Protection

Eco Restoartion	5789	7/11/2018	7/11/2018	Ocean Springs Land Protection
Eco Restoartion	5790	7/11/2018	7/11/2018	Tchoutacabouffa River Land Protection
Eco Restoartion	5791	7/11/2018	7/11/2018	Sandhill Crane Land Protection
Eco Restoartion	5792	7/11/2018	7/11/2018	Latimer Land Protection

Eco Restoartion	5794	7/13/2018	7/13/2018	Camp Rowland
Eco Restoartion	5796	8/6/2018	8/6/2018	Phase 2 Land Acquisition for expansion of Grand Bay National Wildlife Refuge and National Estuarine Research Reserve
Eco Restoartion	5797	8/6/2018	8/6/2018	Chandeleur Island Holistic Ecosystem Restoration Project

Eco Restoartion	5798	8/6/2018	8/6/2018	Connecting and Extending Conservation Corridors in Coastal Counties
Eco Restoartion	5799	3/31/2022	3/31/2022	Pascagoula Tributaries Nutrient Reduction Project

Eco Restoartion	5800	8/9/2018	8/8/2018	Kittiwake Coastal Conservation Area
Eco Restoartion	5810	8/10/2018	8/10/2018	Restoration of Piping Plover and other overwintering shorebirds through reductions in anthropogenic stressors

Eco Restoartion	5812	8/10/2018	8/10/2018	Groundwater-neutral strategies to create habitat for migratory shorebirds on private lands of the Mississippi Delta
Eco Restoartion	5815	8/10/2018	8/10/2018	RESTORE Gulf-wide stream flow study Mississippi Component - add the Pearl River to the existing project.
Eco Restoartion	5818	8/10/2018	8/10/2018	Trees Please Gulfport: Urban Forest for Clean Waters



Eco Restoartion	5819	8/10/2018	8/10/2018	Red Creek Nutrient/Sediment Reduction Program Stone and George Counties, Ms. Lower Pascagoula River Drainage, Miss
Eco Restoartion	5820	8/10/2018	8/10/2018	Lower Pascagoula Nutrient Reduction

Eco Restoartion	5822	8/10/2018	8/10/2018	Trees Please Biloxi: Urban Forest for Clean Waters
Eco Restoartion	5824	8/10/2018	8/10/2018	Trees Please Pascagoula: Urban Forest for Clean Waters
Eco Restoartion	5826	8/10/2018	8/10/2018	Middle Escatawpa Nutrient Reduction
Eco Restoartion	5827	8/10/2018	8/10/2018	Upper Escatawpa Nutrient Reduction

Eco Restoartion	5828	8/10/2018	8/10/2018	Hobolochitto Nutrient Reduction
Eco Restoartion	5829	8/10/2018	8/10/2018	Trees Please Bay St. Louis
Eco Restoartion	5838	8/13/2018	8/13/2018	Long-term Water Quality and Biological Characterization Study of Mississippiâ€™s Coastal and Nearshore Habitats

Eco Restoartion	5840	8/13/2018	8/13/2018	Seagrass Identification and Mapping and Water Quality Monitoring in the Nearshore Waters Around the Barrier Islands of the Mississippi Sound
Eco Restoartion	5841	8/13/2018	8/13/2018	Assessment of Artificial Lighting Impacts on Sea Turtles and Public Outreach on Mississippi Mainland Beaches
Eco Restoartion	5843	8/13/2018	8/13/2018	Removal of Communications Tower from Horn Island Wilderness

Eco Restoartion	5844	8/13/2018	8/13/2018	Marine Debris Removal from Barrier Islands
Eco Restoartion	5846	3/31/2022	3/31/2022	Mississippi-Jourdan/Wolf Watershed Restoration
Eco Restoartion	5848	8/14/2018	8/14/2018	Grand Bay & Fontainebleau Habitat Restoration and Trail Enhancement Project

Eco Restoartion	5852	9/10/2018	9/10/2018	Mississippi Coastal Improvement Program (MsCIP) Deer Island Ecosystem Restoration Program
Eco Restoartion	5859	11/5/2018	11/5/2018	Mississippi Gulf Coast Near Shore Water Quality Project

Eco Restoartion	5865	1/7/2019	3/31/2022	Hickory Creek Headcut stabilization
Eco Restoartion	5867	1/24/2019	1/24/2019	City of Jackson Sewer Systems Improvement Project
Eco Restoartion	5868	2/2/2019	2/2/2019	Pascagoula River shoreline washout

Eco Restoartion	5873	2/20/2019	2/20/2019	Wolf River Weyerhaeuser Land Protection
Eco Restoartion	5877	3/14/2019	3/14/2019	Coastal Environment Land Protection



Eco Restoartion	5878	4/4/2019	10/9/2019	Biloxi Upstream and Downstream Storm Water Education and Community-Engaged Green Infrastructure
Eco Restoartion	5892	5/14/2019	8/11/2021	Hancock County Utility Authority - Kiln / Delisle Phase 3
Eco Restoartion	5899	9/10/2019	3/31/2022	Sand Dune Plantings

Eco Restoartion	5901	1/24/2020	1/24/2020	Enhancing Gulf Waters through Forested Watershed Restoration
--------------------	------	-----------	-----------	---

Eco Restoartion	5926	5/2/2020	3/23/2022	Impacts of overwash on sea turtle and shorebird populations
--------------------	------	----------	-----------	--

Eco Restoartion	5952	11/25/2020	11/25/2020	Nature-based Tourism with Increased Management and Stewardship for Beach Nesting and Foraging Species
Eco Restoartion	5982	12/8/2020	12/8/2020	Southern Bulkhead Extension at the Port of Pascagoula South Terminal
Eco Restoartion	5983	12/8/2020	12/8/2020	Port of Pascagoula South Terminal Extension of Bulkhead North to Terminal A

Eco Restoartion	5984	12/8/2020	12/8/2020	Port of Pascagoula Deep Water Access Improvements
--------------------	------	-----------	-----------	--

Eco Restoartion	5985	2/5/2021	2/11/2021	Enhance conservation of bottlenose dolphins in Mississippi state waters by strengthening capacity for science-based marine mammal health and management
--------------------	------	----------	-----------	---

Eco Restoartion	5986	2/11/2021	2/11/2021	Enhance conservation of sea turtles in Mississippi state waters by strengthening capacity for science-based animal health and management
Eco Restoartion	5987	6/3/2021	6/25/2021	Springwood Sewer Collection System
Eco Restoartion	5988	6/4/2021	6/4/2021	Bay St. Louis Lift Station Upgrades
Eco Restoartion	5989	6/4/2021	8/4/2021	NASA Wastewater Connection to HCUA

Eco Restoartion	6015	12/1/2021	9/2/2021	Monitoring and gauging water quality and habitat suitability by using sentinel species such as dolphins, turtles, and diamondback terrapins as indicators.
Eco Restoartion	6016	9/3/2021	3/16/2022	Pascagoula Moss Point Treatment Plant Odor Control Improvements
Eco Restoartion	6022	1/12/2022	1/14/2022	Coastal Protection Master Plan



Eco Restoartion	6023	1/22/2022	2/28/2022	Keegan's Bayou Restoration and Public Access
Eco Restoartion	6025	2/8/2022	2/28/2022	Hiller Park and Keesler AFB Drainage Area 9 Nutrient Reduction and Storm Water Control Project
Eco Restoartion	6026	2/23/2022	2/23/2022	Enhancement of the Institute for Marine Mammal Studies/Ocean Adventures Public Outreach and Education Programs

Eco Restoartion	6028	8/1/2022	2/25/2022	Beach Management to Restore Invertebrate Infauna and Shorebird Foraging Habitat
--------------------	------	----------	-----------	--

Eco Restoartion	6031	9/1/2022	3/1/2022	Beach restoration at the Gulfport tern sanctuaries to improve recreation and ecosystem function
Eco Restoartion	6032	3/2/2022	3/2/2022	Watershed Management Plans for the Mississippi Gulf Coast Natural Heritage Area

Eco Restoartion	6034	3/2/2022	3/4/2022	D'Iberville Interstate 110 Water Quality Improvements Project
--------------------	------	----------	----------	--

Eco Restoartion	6035	3/4/2022	3/6/2022	D'Iberville Lamey Street Bank Stabilization and Water Quality Imprvovements Project
--------------------	------	----------	----------	--

Eco Restoartion	6036	3/6/2022	3/6/2022	Public and private partnership to restore and conserve shorelines
--------------------	------	----------	----------	--

Eco Restoartion	6037	3/7/2022	3/7/2022	Freshwater Marshland Protection - Invasive Species Survey and Management
Eco Restoartion	6038	3/7/2022	3/7/2022	Myrtle Avenue Ditch - Government Street to Davis Bayou
Eco Restoartion	6039	3/7/2022	3/7/2022	East Ward 4 Drainage " Government Street to Davis Bayou
Eco Restoartion	6040	3/7/2022	3/7/2022	West Ward 4 Drainage: Davidson Road to Weeks Bayou

Eco Restoartion	6042	3/22/2022	3/22/2022	Ecosystem Restoration / Rehabilitation
--------------------	------	-----------	-----------	--



Eco Restoartion	6043	3/22/2022	3/22/2022	Development of decision tools to predict the influence of freshwater inflows on Gulf Sturgeon and other euryhaline fish populations.
--------------------	------	-----------	-----------	--

Eco Restoartion	6044	3/22/2022	3/22/2022	Utilization of Estuarine and Coastal Habitats of Rivers and Bays of the Northern Gulf of Mexico by Gulf Sturgeon: Evaluation of Value as Essential Fish Habitat and the Role of Freshwater Inputs
--------------------	------	-----------	-----------	---

Eco Restoartion	6045	3/22/2022	3/22/2022	Adaptive management of Gulf Sturgeon: linking monitoring to actionable restoration.
--------------------	------	-----------	-----------	--

Eco Restoartion	6047	3/23/2022	3/23/2022	Living shorelines assistance program
Eco Restoartion	6048	3/23/2022	3/23/2022	Removal of Low Dam on Pearl River
Eco Restoartion	6050	3/23/2022	3/23/2022	On Location Nutrient Runoff Capture, Recycling and On Board Algae Bloom and HAB Capture, Remediation, Repurposing Real Time Pilot Tests

Eco Restoartion	6051	3/23/2022	3/23/2022	Estimating trade-offs associated with off-bottom oyster culture: Gulf Sturgeon trophic subsidies or alteration of benthic dynamics in the footprint of Gulf Sturgeon critical habitat
Eco Restoartion	6053	3/25/2022	3/25/2022	Louisiana Wetlands Redux
Eco Restoartion	6055	3/25/2022	3/25/2022	Gulf of Mexico restoration

Eco Restoartion	6056	3/25/2022	3/25/2022	Coordinating and management of restoration activities for non-breeding Gulf of Mexico seabirds
Eco Restoartion	6057	3/25/2022	3/25/2022	Restoration of seabird habitat on the Navassa NWR

Eco Restoartion	6058	3/25/2022	3/25/2022	Estimating and mitigating fishery bycatch of northern gannet and great shearwater by expanding the seabird bycatch observing protocol for the western North Atlantic and Gulf of Mexico pelagic longline fleet
--------------------	------	-----------	-----------	--

Eco Restoartion	6059	3/25/2022	3/25/2022	Using hotspot analysis of fisheries seabird bycatch in the western North Atlantic and Gulf of Mexico to mitigate bycatch of northern gannet and great shearwater
--------------------	------	-----------	-----------	--



Eco Restoartion	6060	3/25/2022	3/25/2022	Our future is now
--------------------	------	-----------	-----------	-------------------

Eco Restoartion	6061	3/25/2022	3/25/2022	Great Shearwaters: Investigating health, habitat use, food habits, and risk from energy development and commercial fisheries
--------------------	------	-----------	-----------	--

Eco Restoartion	6062	3/25/2022	3/25/2022	Indigenous-led Common Tern Conservation in the Canadian Boreal Forest Biome of Manitoba and Ontario
Eco Restoartion	6063	3/25/2022	3/25/2022	Open-access web-based mapping tool to identify important areas for Open Ocean Priority Species across their full annual cycle

Eco Restoartion	6064	3/25/2022	3/25/2022	Recovering Audubon's Shearwater and Other Breeding Seabirds in The Bahamas impacted by Deepwater Horizon Oil Spill
--------------------	------	-----------	-----------	--

Eco Restoartion	6065	3/25/2022	3/25/2022	Restoring sustainable Common Tern breeding colonies across the Great Lakes region
Eco Restoartion	6066	3/25/2022	3/25/2022	Accountability and prevention of future oil spills

Eco Restoartion	6067	3/25/2022	3/25/2022	Oyster restoration Texas Coast
Eco Restoartion	6098	5/12/2022	5/12/2022	Harrison County Beach Replenish Project Against Storm Surge and Rising Tides from Global Warming

## DESCRIPTION

Design-Build project involving the dredging of 5.7 miles of 12 inter-connected bayous, construction of a seawater inlet pipeline-pump station and installation of aeration devices. Facility operations intend to manage WQ through the system to eliminate fish kills caused by stagnation & hypoxia, reduce nutrient (ORIGINAL ID#11460) Oyster Bayou and its adjoining bayhead swamp comprise approximately half of the Beauvoir 52-acre estate in Biloxi, MS. Operated through a 501(c)(3) nonprofit organization, Beauvoir is one of two National Historic Landmarks in South Mississippi and is open to the public every day of the year except Thanksgiving and Christmas. The estate, the last home of Jefferson Davis, includes a House Museum, a new Presidential Library and Museum Building and one of the few remaining urban forests in Mississippi. It is located on Highway 90, due north of the Harrison County Sand Beach and the Mississippi Coast Coliseum and Convention Center is its neighbor to the west. The grounds of Beauvoir traditionally have served as a catch basin for more than 300 acres of West Biloxi stormwater runoff. Thi once tidally-influenced area, which runs west-to-east midway across the estate, still empties into the Mississippi Sound through a culvert under Highway 90. Just prior to Hurricane Katrina, considerable public and private resources were invested over a 2-3-year period to restore approximately two thirds of the Oyster Bayou Restoration Project area. The weir, catch basins, vehicular access bridge, recontoured bayou banks and outdoor education pavilion survived the storm, but invasive plants species and sediment must be removed again, native plants must be reintroduced and the ADA-compliant boardwalk and educational signage must be repaired to bring this important natural resource back to its pre-storm condition. An estimated third of Oyster Bayou has remained untouched, in terms of restoration and storm clean-up. This is the area where the stormwater enters the estate through two culverts under Beauvoir Road. This area requires recountouring of the bayou banks and construction of a stormwater retention pond area to divert and slow the velocity of runoff as well as to expand capacity before the flow enters the main bayou area. Invasive plants must be removed and natives re-establ ished in this area, as well. Benefits of Oyster Bayou Restoration include improving water quality of the Gulf through reestablishing a bayou ecosystem that not only enhances wildlife and marine habitats, but provides a natural filtration system to treat runoff. In addition to the school children, scientists, naturalists and others who will benefit from exploring the restored bayou, the estimated 80,000 visitors to Beauvoir will have the opportunity to learn about this unique bayou ecosystem.

(ORIGINAL ID#11204) Hiller Park Environmental Enhancement Project is designed to increase public awareness of the Coast's natural resources such as wetland plant and animal species unique to the bayou ecosystem. Included in the proposal is funding to restore Bayou La Porte's natural tidal flow thereby improving water quality and marine conditions for aquatic animals as well as restoration of wetlands to eradicate non-native plant species and replacement with native wetland plants. The total cost to BP, PLC to partner with the City of Biloxi would be \$2,900,000. The plan for Hiller Park includes those improvements in the original Tidelands Grant application and also replacement of the existing boat ramp with finger piers and a parking area in Bayou La Porte. Dredging of Bayou La Porte to remove sediment will enhance the natural tidal flow to the Bayou, improve water quality in the bayou and Back Bay, provide better marine habitat conditions, and provide better access to the boat ramp. Also proposed are four fishing piers, an 800' boardwalk to be located in Back Bay along the north shore of the park as well as wood footbridges in other natural areas. The piers will provide access to recreational fishing, crabbing, and shrimping, and will assist the City of Biloxi Summer Playground program by allowing children to fish, throw the cast net, and learn about nature. The boardwalks will increase public access throughout

(ORIGINAL ID#11193) Bayou Auguste Environmental Enhancement Project is designed to protect and enhance Bayou Auguste. In the aftermath of the oil spill, BP affirmatively acted to protect this delicate area from harm therefore both parties have recognized the environmental importance of this body of water. The goal of the project is conservation and restoration of the waterway to its natural function as a tidally influenced water body. A secondary benefit is enhancement of public awareness of the Bayou's environmental importance via a trail along its banks. The total project funding sought from BP, PLC would be \$685,000. The City of Biloxi has been working with the Gulf Coast Community Design Studio (GCCDS), Biloxi Housing Authority, Biloxi Public Schools, and the Land Trust for the Mississippi Coastal Plains in their effort to enhance and restore Bayou Auguste. The goal of this work is to conserve and restore Bayou Auguste to its natural function as a tidally influenced water body, and to enhance public access to the Bayou through the means of a trail along the banks. Water quality not only in the bayou but also in Back Bay will be improved by restoring the bayou's effectiveness as a natural filtration system for stormwater runoff and will enhance the ecosystem of the bayou to support marine and wildlife habitat, wetland restoration and public access. This project will include removal of riprap along the

(ORIGINAL ID#11440) During the Deepwater Horizon event, large amounts of sand were removed from beaches along with oil in the three coastal counties of Mississippi. This project proposes to replenish this loss and create additional sand systems to prevent impacts from the Deepwater Horizon event and future oil spills. Sand environments could be created at Deer Island and other key locations along the coast to

(ORIGINAL ID#1065) There are 7 piers located along the 26 mile stretch of sand beaches in Harrison County, MS. These piers provide recreational opportunities for the residents and tourists. They are also a location where people can enjoy the view of the MS Sound and the adjacent Barrier Islands. In order to attract aquatic life - crabs, fish, etc., it is proposed to plant sea grasses and provide artificial reefs around

(ORIGINAL ID#11179) The property to the west of the Lake Mars boat ramp is important for several reasons. First, it is a very environmentally sensitive area bordered by salt marsh. It has some useable high ground that could be used to expand the county's park area. This property needs to be controlled by the



Hurricane Katrina and the BP oil spill were very damaging to the ecosystems on the barrier islands of the Mississippi, Alabama, and Florida Gulf Coast. In addition, climate change continues to increase sea levels and also the likelihood of stronger and more frequent hurricanes. To counter these effects, a consensus has been developing that restoration of barrier island ecosystems will be needed, including replanting native trees.

The woody vegetation of the MS Gulf Coastal islands consists mostly of slash pine (*Pinus elliottii*) and live oak (*Quercus virginiana*). During tropical storms, these islands are often inundated with sea water. After Katrina (2005), 80% of the slash pine and 50% of the live oak were dead within a few months following the storm. There was very little wind-throw, implying that the mortality was largely the result of seawater exposure.

With major hurricane events occurring every decade or so, it is expected that natural selection in these populations would result in genetic adaptation to survive seawater inundation. Slash pine occurs not only on the barrier islands but also well inland, far from saltwater exposure. Seed sources normally found in commercial nurseries are derived from inland populations. If such expected adaptation exists, It will be a serious error to replant island environments with inland sources that are not well adapted to saltwater exposure.

Mergen et al. (1966) compared barrier island slash pine with mainland sources and found significant morphological differences between the two sources. Saltwater tolerance was not studied in their investigation. Land (1973) found saltwater tolerances to be higher in slash pine than in loblolly pine. It is likely not a coincidence that slash pine is the only pine species found on the MS Gulf Coastal islands.

We have developed a saltwater tolerance screening system. This allows us to screen 100s of families for their tolerance to saltwater. In a recent preliminary study with 13 half-sib families originating from MS

(ORIGINAL ID#12065) The Mississippi diamondback terrapin (*Malaclemys terrapin pileata*) is an estuarine turtle that exclusively inhabits coastal bays and salt marshes along the Atlantic and Gulf of Mexico coasts. It is considered a keystone species that contributes to the maintenance of salt marsh integrity. Terrapins were once abundant throughout their range; however, knowledge gaps exist regarding the viability of populations in many areas of the Gulf coast, including Mississippi. Numerous threats adversely affect terrapin populations including habitat loss, crab trap mortality, and nest predation. In addition to these current threats, pollution from the Deepwater Horizon oil spill degraded vital salt marsh habitats in the northern Gulf of Mexico. Monitoring a long-lived species in a disturbed environment can provide insight into the extent of damage to the particular species along with its habitats and prey. Because the diamondback terrapin is a long-lived species and plays an important role in these estuarine habitats, it represents a critical bioindicator of the health and integrity of salt marsh ecosystems.

(ORIGINAL ID#12066) The events surrounding the Deepwater Horizon oil spill stressed the need for having a well-informed citizenry regarding marine conservation and restoration. A key to this goal is to support education and outreach programs whose mission is to teach the public about the great natural resources of the Gulf of Mexico. The Institute for Marine Mammal Studies-Center for Marine Education and Research (IMMS-CMER) is a premier marine education and conservation facility that offers a variety of educational programs designed to meet the academic and outreach needs of multiple audiences on educational topics including marine mammals, sea turtles, fish biology, marine invertebrates, threatened/endangered species, invasive species, point and non-point pollution, marine habitats, and water quality. Our current educational programs consist of: - Student camps that provide hands-on exploration of coastal wetlands, beach and barrier islands, birding, and fisheries, - Academic field-trips designed to familiarize students with the plants, animals, habitats, and processes of marine and aquatic environments tailored to the visiting age group, - Teacher Workshops provide teachers with opportunities to expand their knowledge of coastal issues and provide a venue for teachers to earn continuing education

Coffee Creek is a drainway that is about 1.25 miles long and drains portions of the City east of Hwy 49 and south of Pass Road. The estuarine channel collects and treats storm water runoff starting around the intersection of 28th St and Gulf Ave with direct outfall to the Mississippi Sound. This restoration project intends on enhancing the Coffee Creek's unsightly outfall, restoring the channel's natural flows, and improving public access and recreational activities to portions of the sand beach where access was limited due to oiling during the 2010 oil spill. Initially, the project will involve routine maintenance and debris removal on an approximate 1/3 mi stretch beginning at the outfall at the Gulf. These low impact, non-structural improvements will restore natural flows and revitalize coffee creek as a natural corridor and refuge for estuarine wildlife. Secondly, beachfront enhancements are proposed in line with the current "Gateway" projects already underway within Harrison County. These enhancements may consist of aesthetic improvements (landscaping, etc.) and recreational improvements such as fire pits, showers, volleyball courts, pavilions, etc. while providing more access for fishing; the recreational improvements

Turkey Creek is 13.7 miles long with an approximate 17,800-acre drainage basin. Located in the City of Gulfport, the City of Long Beach, and Harrison County, Mississippi, this transitional freshwater/estuarine water body collects, stores, and treats storm water runoff for multiple municipalities. Turkey Creek holds high levels of debris deposited by storm events and local residents. With its natural flows impeded, during high flow conditions, this creek overflows the south stream bank and causes widespread flooding. In a 2005 "Flood Damage Reduction Study," the United States Army Corps of Engineers (USACE) recommended selective clearing and snagging for identified portions of the creek. Subsequent attempts to do so by Harrison County were halted by public protest from organizations such as: the NAACP, the North Gulfport Coalition, and the Sierra Club. Initially, this project proposes the formation of a "Turkey Creek Improvement Committee" consisting of the above referenced municipalities and organizations. This committee would be focused on Public Outreach and be tasked with suggesting improvements to be designed and approving final design prior to construction. Anticipated improvements would be limited to low impact methods such as shoreline stabilization, sediment and debris removal, stream maintenance,

Evaluate Harrison County creeks and streams for population, silted in obstructions, and clean/snag program. Particularly the following:

Name / County / USGS Topo Map  
Auguste Bayou / Harrison / Biloxi  
Bayou Acadian / Harrison / Bay St. Louis  
Bayou Bernard / Harrison / Gulfport North  
Bayou Laporte / Harrison / Biloxi  
Bayou Portage / Harrison / Bay St. Louis  
Big Creek / Harrison / Gulfport NW  
Biglin Bayou / Harrison / Biloxi  
Biloxi River / Harrison / Biloxi  
Brasher Bayou / Harrison / Biloxi  
Brickyard Bayou / Harrison / Gulfport North  
Cedar Bayou / Harrison / Bay St. Louis  
Cypress Creek / Harrison / Biloxi  
De Lisle Bayou / Harrison / Bay St. Louis  
Flat Branch / Harrison / Gulfport NW  
Flat Branch / Harrison / Gulfport North  
Flat Branch / Harrison / Success  
Fritz Creek / Harrison / Gulfport North

Turkey Creek Watershed covers approximately 11,000 acres in north Gulfport, Long Beach, and Harrison County. The watershed's two (2) main waterbodies are in need of significant restoration and enhancement. Turkey Creek and Brickyard Bayou are approximately 14 miles and 5 miles long, respectively. Both waterbodies are slow-moving coastal streams/tidal creeks that flow into ecologically important, sheltered estuarine ecosystems connected to the Back Bay of Biloxi and the Gulf of Mexico.

This project will restore and enhance these individual estuarine streams to provide an aquatic corridor that serves as a sheltered nursery and as a rearing area for multiple saltwater fish species including those with recreational and commercial value. In addition, recovering the ecological health of these small estuaries would allow them to provide a sheltered refuge for larger and more mature fish during natural or anthropogenic events such as storms, droughts, or oil spills. Enhancements to Turkey Creek will further offer an opportunity to actively organize and empower a local minority committee in designing, permitting, constructing and maintaining a socially acceptable restoration effort. Leah Manhan's 2013 film, "Come Hell or High Water: the Battle for Turkey Creek," describes the history of Turkey Creek, and the detrimental effects of human activity, land development, and natural occurrences.

In 2006, a report was prepared by the "Land Trust for the Mississippi Coastal Plain" entitled "Watershed Implementation Plan for the Turkey Creek Watershed" (funding from the Environmental Protection Agency Region IV). This report, focusing on Turkey Creek, confirmed that Turkey Creek, like Brickyard Bayou and the entire Turkey Creek watershed, faces environmental degradation from: filling of wetlands, channelization, trash and debris, unregulated development and construction, uncontrolled stormwater increases, aquatic, terrestrial, and riparian habitat dilapidation, invasive species (particularly Chinese Tallow and cogon grass), and chemical contamination.

Accordingly, Turkey Creek and Brickyard Bayou require similar restoration and enhancement efforts

This project will consist of a Wetland Coastal Preserves Program and Beach Restoration. The Wetland Coastal Preserves Program will target invasive species in and around the Gulf Park Estates and Marsh Restoration, ensuring that native flora and fauna thrive in the restored waterfront. The Bellefontaine Beach Restoration will rebuild and manage the Bellefontaine beachfront. It will serve to remedy or reduce the risks of future harm to the natural dunes and beach resources. The Preserve plan serves to enhance the ecological value of this important coastal habitat and manage the transition zone between the

Living Shorelines (LS) are primarily designed to control erosion using non-traditional materials that enhance shoreline stability while preserving natural coastal processes. Although these approaches for shoreline protection have been successful for increasing shoreline stability and improving localized biotic integrity in some areas, very few projects are monitored to evaluate long-term success. Given the novelty of LS, each project represents a unique opportunity to gain valuable information that can be used to inform future project design within an adaptive management framework. We propose a long-term, multifaceted monitoring approach for several proposed and newly constructed LS along the Mississippi coast that includes measuring physical and biological variables to determine if LS are improving shoreline stability and increasing biotic integrity compared to unaltered control sites.

The first objective is to quantify the effects of LS on shoreline stability, soil properties, water quality, and biotic communities compared to unaltered control sites that are likely candidates for shoreline protection, but are not receiving a treatment. Physical parameters include shoreline erosion, sediment quality, and water quality. Biological parameters include infaunal, demersal, and nektonic communities, and diamondback terrapin nesting and movement. The second objective in this study is to develop cost-benefit analyses for each monitored living shoreline by valuing project costs and net benefits for each site using functional values of sediment storage, nutrient retention, shoreline habitat, land values, and project

Kemp's ridley sea turtles are a Critically Endangered species that relies heavily on the north-central Gulf of Mexico for developmental habitat for foraging juveniles and sub-adults. Since 2010, more than 800 sea turtles, mostly immature Kemp's ridleys, have stranded dead along the Mississippi coast raising important questions about regional ecosystem health. Additionally, over 300 immature Kemp's ridleys have been incidentally hooked at local fishing piers in Mississippi. A variety of factors are likely responsible for increased strandings including degradation of natural oyster reefs and subsequent declines in abundance of essential prey items of the species that rely on these habitats. Declared failures of both oyster and blue crab fisheries in recent years support this hypothesis and illuminate the importance of a healthy ecosystem for recovering populations of Kemp's ridleys.

The purpose of this project is to facilitate the recovery of Kemp's ridley habitat by 1) monitoring the effects of recently established artificial and oyster reefs in the Mississippi Sound on Kemp's ridleys and essential prey items, and 2) establishing programs to enhance wild stocks of Kemp's ridley prey. These efforts will provide critical information for understanding the importance of reef habitats for developing

In the aftermath of BP Deepwater Horizon Oil Spill, larger numbers of bottlenose dolphins and sea turtles have stranded in the northern Gulf of Mexico, and many of these strandings have occurred along the coast of Mississippi. The Institute for Marine Mammal Studies (IMMS) has played a central role in the stranding response and rehabilitation efforts during this time. The proposed project will promote the restoration and recovery of dolphin and sea turtle populations in Mississippi waters through a systematic approach of 1) responding to dolphin and sea turtle strandings; 2) rehabilitating sick and injured dolphins and sea turtles; and 3) monitoring the recovery of wild dolphin and sea turtle populations. Representing apex predators, dolphins and sea turtles are ideal bioindicators of ecosystem health. This project, led by Mississippi State University (MSU), will facilitate understanding of how these species have endured numerous environmental stressors and foster their future survival, which is imperative for the restoration and recovery of the northern Gulf of Mexico.

This project adheres to the selection criteria set forth by the National Fish and Wildlife Foundation (NFWF), to remedy harm and eliminate or reduce the risk of future harm to Gulf Coast natural resources that were impacted by the Deepwater Horizon oil spill. This project conforms to NFWF criteria as follows:

- The Mississippi Sound and adjacent waters were directly impacted by the oil spill and response activities
- Marine mammals and sea turtles experienced direct and indirect injury resulting from the oil spill and response activities in the north-central Gulf of Mexico
- Project includes science-based methodologies that produce measurable and meaningful conservation outcomes to marine mammals, sea turtles, and their habitats
- This project will help mitigate damages from the oil spill, aid in the restoration and recovery of these species, and enhance management of marine resources by state and federal agencies

The Mississippi Sound and adjacent waters of the north central Gulf of Mexico (nGOM)

Hardening the Bay of Saint Louis with oyster & clams; reintroducing sea grasses along the shoreline compatible with tidal hydrology and salinity; monitoring both conservation & recovery are components of this project.

By hardening the Bay of Saint Louis with oyster and clams, water quality will be improved. Erosion as seen on slides 4 and 5 should be reduced or eliminated and monitoring stations should show anticipated accretion.

Stream restoration, sedimentation control, ditch bank restoration, habitat restoration, natural resource & monitoring both conservation and recovery are the components of this project.

Stream and ditch restoration will enhance the quality of water in adjacent waterways in addition to detention ponds and overflow discharge outfalls located within the City.

The City of Biloxi proposes to implement a variety of shoreline stabilization measures along the Biloxi Peninsula in areas owned and/or managed by the City to control erosion, adapt to sea-level rise and improve public safety and access. Shoreline improvements will include stormwater management BMPs accompanied by all-weather educational signage to identify short- and long-term public benefits of a properly-managed waterfront.

Improvements will include removal of nonnative, invasive plants species; installation of appropriate native plant species to support shoreline stabilization and restoration of shoreline habitats; removal of concrete, riprap, abandoned/obsolete infrastructure and miscellaneous debris; and stormwater management improvements to improve water quality. Public safety and access improvements will include provision of lighted, ADA-compliant boardwalks, where appropriate, designed for storm

Mercury Methylation Rates, Isotopic Composition, and Trophic Transfer in the Northern Gulf of Mexico

James Cizdziel, Ph.D., University of Mississippi

**The Problem.** There is a significant gap in understanding the sources and pathways of methylmercury (MeHg) entry into food webs in the northern Gulf of Mexico (GoM). This is of particular concern because, on average, residents of the Gulf Coast consume more marine fish than other U.S. residents, and because GoM fish tend to have higher levels MeHg than fish from other coastlines.<sup>1,2</sup> Indeed, as much as 30% of the coastal population is estimated to exceed EPA's reference dose for MeHg, which is used as a criterion to protect human health.<sup>3</sup> Moreover, with the economy of the Gulf coast states intricately linked to the GoM through fishing (both commercial and recreational), understanding the distribution, levels and cycling of Hg species is vital to the long-term health and stability of the region. Recognizing this, the National Science and Technology Council issued a 2004 report on "Methylmercury in the Gulf of Mexico: State of Knowledge and Research Needs"; identifying major data and knowledge gaps.<sup>4</sup> Nearly a decade later the Gulf of Mexico Alliance, Water Quality Team, Mercury Workgroup, developed a White Paper titled "Mercury Fate and Transport: Applying Scientific Research to Reduce the Risk from Mercury in Gulf of Mexico Seafood".<sup>3</sup> The document lays out many of the same scientific research priorities with the goal of mitigating risk of Hg exposure to humans. Yet there remains a paucity of measurements of MeHg in the Gulf and virtually no progress in answering fundamental questions such as: where in the GoM is MeHg, and where is MeHg most bioavailable (i.e. where does the majority of MeHg enter the foodweb?). The time for action is now. Below is a plan that includes innovative analytical techniques that would finally help to answer these questions.

**Objectives.** The objective of this work is to quantify and compare MeHg levels, isotopic compositions, and Hg methylation rates in a key estuary and coastal area in the northern GoM. We will, for the first time, use recently developed analytical approaches to trace the sources and movement of

## 1. INTRODUCTION

This proposal seeks to establish and implement a training program for the Gulf Coast region, called MississippiSound, through the Mississippi State University Extension Service (MSU-ES), with the mission of providing training, information, and resources for the general public to foster environmentally-friendly landscape practices. The consumer and community outreach program will encourage Gulf Coast stakeholders to utilize landscape design and management methods that will reduce property stormwater runoff and leaching leading to the contamination of surface and groundwater.

The Mississippi State University Extension Service has an established delivery method for extending knowledge to the public, and a proven track record. For more than 100 years, the MSU Extension Service has provided research-based information, educational programs, and technology transfer focused on issues and needs of the people of Mississippi, enabling them to make informed decisions about their economic, social, and cultural well-being. Extension's overall purpose is to provide education that will empower people to make intelligent decisions relating to their vocations, their families, and their environment. The Extension Service believes that quality of life is affected by the reciprocal relationship between people and their environment and therefore, environmental issues are of great importance.

The Crosby Arboretum, located within the Gulf Coast region, is the premier environmental education center in the state of Mississippi, dedicated to educating the public about their environment. The 104-acre interpretive site is owned by Mississippi State University and operated by the MSU Extension Service. The Arboretum's mission is to preserve, protect, and display plants native to the Pearl River Drainage Basin ecosystem, a major Mississippi watershed. The facility provides environmental and botanical research opportunities, and cultural, scientific, and recreational programs, as well as programs which provide education about the region's biological diversity. The Arboretum also maintains 700 acres of off-site natural areas in the Gulf Coast region, preserved for scientific study. Many rare, threatened, and endangered species of plants and wildlife are found within Arboretum preserves.



The area of the Grand Bay National Estuarine Research and Reserve (NERR) around Point aux Chenes Bay has Southward facing shoreline against the Mississippi Sound which needs protection from wave action. Every time I visit in my kayak the area has receded some, especially the eastern point of the entrance to Bayou Cumbest. Rock jetties like they have used in Louisiana at Fourchon or any type of barriers to help reduce wave action could do a lot to help prevent these Southern shorelines from receding. I have written a blog post regarding the erosion I have seen in this area. It can be viewed here: <https://samuraiflyshop.com/2017/07/21/support-project-4248-protect-point-aux-chenes-bay-shoreline/>

Historically, Grand Batture Island provided erosion protections for the Grand Bay NERR, and specifically Point aux Chenes Bay. Over time, Grand Batture was eroded into an island chain, and, in 1969, Hurricane Camille reduced Grand Batture to nothing more than fragmented shoals. This effectively removed any barrier for coastal erosion in Point aux Chenes Bay and accelerated the rate at which land has eroded within the Grand Bay NERR.

There is evidence to support this erosion over the years in a study published in 2007. This study can be viewed at the following link:

<http://grandbaynerr.org/wp-content/uploads/2010/12/Grand-Bay-National-Estuarine-Research-Reserve-Site-Profile-Final-Draft-01Oct2007.pdf>

Another study titled "Impacts of historic morphology and sea level rise on tidal hydrodynamics in a microtidal estuary (Grand Bay, Mississippi)" which was published in Volume 111, Part B of Continental Shelf Research, December 2015, supports the fact that erosion has progressively increased in the Grand Bay NERR due to a lack of a tidal barrier. This study can be found here:

<http://www.sciencedirect.com/science/article/pii/S0278434315300212>

Finally, the United States Geological Survey provided a time lapse video showing the effects of this

Highway 603 is a major corridor to the community with high traffic speeds, long frontages, and loosely planned infrastructure. The low elevation of the roadway and its proximity to multiple water crossings causes multiple environmental and community resilience problems: poor water quality due to non-point source runoff, persistent flooding, low density land use, and ditches that occupy a large percentage of the right-of-way rendering alternative transportation path construction impossible.

This project will analyze areas where improvements may positively impact water quality and community resilience along the Jourdan River and tributary waterways: Breath Bayou, Bayou LaCroix, Four Dollar Bayou, Edwards Bayou, and Bayou Talla. The project will develop landscape guidelines for the corridor to enhance stormwater retention and conveyance and provide appeal for economic development. The planners will identify areas of persistent flooding of the roadway and adjacent lands and consider options for elevation or hydrologic reconnection. The planners will also consider areas for resilient parking areas for residents who otherwise move their vehicles to the highway verges when high water threatens. The corridor will also explore the feasibility of constructing protected bike lanes within the Highway 603 right-of-way.

The purpose of this project is to qualitatively and quantitatively study the sand beaches and natural shorelines within Jackson County. Erosion of the beach and shorelines through natural accretion and storm activity requires continuous maintenance and replenishment efforts to sustain the coastline. The goals of the study are as follows:

1. Develop baseline data to accurately quantify and qualify the sand beach shorelines.
2. Develop numerical models to simulate beach and shoreline erosion for high and low frequency storm events.
3. Develop strategies to control erosion of the sand beaches.
4. Investigate "living shoreline" options and determine those that are the most suitable for this environment.
5. Develop a Management, Operations, and Maintenance Program for the sand beaches.
6. Develop and investigate an offshore dredging replenishment program.

Bay St Louis has over 27 miles of waterways inside the city limits. The waterways include natural streams and a system of canals that connect to the Jordan River and Bayou Lacroix. The entire system is in great need of maintenance dredging and debris removal to cure the residual impacts of sediment and trash accumulated from decades of hurricane and flood deposits. Dredging the entire system would have multiple benefits that would include but not be limited to improving: water quality, flood prevention with better drainage/runoff, navigation, recreational safety and useful byproduct (sediment removed could serve as marsh replenishment material for the Wolf River Marsh Restoration Project).

The dredging and disposal of the material could be phased by dredging the main, natural and bayous. Estimated cost of Phase 1 is \$3.5 million.

Phase 2 would consist of dredging the manmade canals located near Blue Meadow Road and Paradise Street with an estimated cost of \$2.5 Million.

Phase 3 would consist of dredging the manmade canals located near Chapman Road with an estimated cost of \$2.0 million.

This project will serve to restore and maintain eroded onshore and nearshore tidal salt marsh within Jackson county by creating new habitat with naturally occurring sediments dredged from area navigation channels.

The goal of the project is to develop "Beneficial Use" sites within Jackson County that will restore existing eroded salt marsh areas. The proposed beneficial use sites are as follows:

1. West Pascagoula River Delta
2. Gulf Park Estates
3. Bangs Lake

The marshes within these areas have degraded to open water from a combination of factors including lack

The West Jackson County Constructed Wetlands Treatment System was established in in 1990 to treat the centralized wastewater collected in western Jackson County, Mississippi. As wastewater passes through multiple cells of wetland vegetation, excess nutrients, heavy metals, and other environmentally harmful contaminants are removed from it prior to release into Costapia Bayou. In addition to wastewater treatment, the wetlands are a favored habitat for a variety of wildlife and serves as a complementary habitat to the adjacent MS Sandhill Crane National Wildlife Refuge. Due to the concentration of birds in these wetlands, we formed an agreement with the National Audubon Society to open the facility for avian observation and counting every Thursday. For the last several years, the wetland vegetation has been decimated by the invasive apple snail. Apple snails are a serious threat to freshwater wetlands and estuaries worldwide, with severe damage documented along the Gulf of Mexico coast. Consumption of wetland vegetation by the apple snail has led to drastic reductions in the wastewater treatment efficiency and wildlife habitat. The main objectives of this proposal are to restore the functionality and habitat provided by this treatment wetland through eradication of the apple snails and restoring of vegetation. The Jackson County Utility Authority has begun efforts to remove apple snails under monitoring by the

This project is Phase 1 of the area East of the Hancock County Arena along Kiln / Delisle Road. It will be to install a sewer collection system with grinder pumps and lift stations in the designated area to connect approximately 30 homes and discontinue use of septic tanks. These tanks are close to creeks, streams and bayous that empty out through Rotten Bayou into the Bay of St. Louis and eventually the

This project is Phase 2 of the area East of the Hancock County Arena. It will be to install a sewer collection system with grinder pumps and lift stations in the designated area to connect approximately 150 homes that use septic tanks. These tanks are close to creeks, streams and bayous that empty out through Rotten Bayou into the Bay of St. Louis and eventually the Gulf of Mexico. Rotten Bayou is on

The City of Biloxi is requesting funding support to remove marine debris and to restore the shoreline of Point Cadet from the Biloxi-Ocean Springs Bridge north to the Biloxi Fishing Bridge. Debris removal, storm-resilient shoreline stabilization measures and pedestrian access improvements along the City-owned waterfront property will expand public opportunity to access a unique area where the Mississippi Sound merges with the waters of the Back Bay of Biloxi. The project will enhance preservation of undeveloped shoreline for the benefit of the public as well as for marine and bird species. In addition, low impact all-weather educational signage will expand opportunities to learn about habitat supported by tidally-impacted areas and to encourage long-term stewardship of Coastal natural resources.

The project includes extending the small sand beach on the shore east of the Maritime and Seafood Industry Museum; incorporating the use of the seawall in improving pedestrian access; improving the safety and security of the walkway under the Biloxi-Ocean Springs Bridge; and constructing a small pier for fishing and crabbing. Upland improvements to be built near the MSIM include a shoofly around a mature live oak tree; a gazebo; a fountain; a foundation for the Golden Fisherman statue; and a wooden boat-building and training demonstration site.

Those who attend the many activities hosted at the MSIM and/or Biloxi Waterfront Park frequently are tempted to walk along the shoreline north of the Park's splash pad to access the nearby Biloxi Fishing Bridge. Hurricane debris, litter, unchecked invasive plant growth and lack of a well-defined, level walkway make what should be an enjoyable nature walk into a hazardous experience. Project implementation will address this problem by providing ADA-compliant pedestrian connectivity along the shoreline of the project area.

In addition to the general public, others who will benefit specifically from project implementation are shoreline and wade fishermen, throwers of cast nets and those who enjoy non-motorized water activities such as kayaking, canoeing, and paddle boarding. Participants in the MSIM's numerous educational

Need for Project: Significantly reduce I/I; consolidate facilities, reduce operating costs, reduce sanitary sewer overflows and eliminate numerous water main breaks.

75,000 LF of new 12" and smaller gravity sewer  
10,000 LF of new sewer force main  
75,000 LF of new water main

**Project Benefits:**

Significantly reducing I/I

Reduce operating cost by reducing electrical costs associated with pumping, reducing wastewater treatment costs, reducing spot repair costs, reducing repairs associated with root intrusion, reduce root intrusion chemical costs, reduce maintenance cost by reducing #'s of pump stations, reduce sanitary sewer overflows that harm the sensitive coastal environment and damage the ecosystem, reduce raw sewage dumps to drainageways that discharge to coastal beach areas and cause health hazards for residents and vacationers enjoying recreational activities along the coast line, reduce raw sewage dumps

We do an Audubon Coastal Bird Survey at Lake Mars pier. The property west of the pier is vandalized by trucks and partiers. Last weekend there was a small truck 1/3 submerged in mud and another large truck trying to get it out. They said they had been there 3 days. In addition, the landowners facing the property cut down trees to give themselves a view--these few scrub trees were all that was keeping the beach from erosion.

These parcels are all owned by the same person. You can see them on this map:

<http://www.co.jackson.ms.us/services/webmapping.php>

Click on "Jackson County web mapping beta"

Use the "+" symbol. Click into "Fontainebleau" and keep clicking until you are on Beachview/Lake Mars Road. Only the parcel directly around the pier is owned by Jackson County. The other three, to the west, are the ones that need protection.

Audubon Coastal Bird Survey also has a Graveline site. There, vandals started a fire and burned the marsh. So someone convinced some entity to build a concrete wall. It keeps the trucks out, and now

Diamondhead Water and Sewer District is located in Hancock County Mississippi within the City of Diamondhead. We provide water and sewer service to approximately 4300 customers and a population of 9100. The District's certificated area is located within watershed areas that drain with open ditches and nominal amounts of subsurface drainage. The discharge points for these watershed areas are tidally influenced due to the geographical location of the District's certificated area. Located along the Southern Certificated Area Boundary is the Northern Shoreline of the Bay of St Louis, the Western Certificated Area Boundary is the East Shoreline of Rotten Bayou and the Northern Certificated Boundary is the Southern Shoreline of Rotten Bayou and Bayou LaSalle.

Forty years ago the clay sewer mains were installed in the District's certificated area at the primary material for sewer mains. At the time of installation, pipe bedding standards were not as widely understood as they are today. The rigid nature of clay makes it very brittle and when unstable soil conditions are introduced, cracking will occur. Once a clay sewer pipe cracks and starts to leak the surrounding soil enters the pipe with any flow creating voids and uneven loads and eventually the pipe will collapse. The District is currently experiencing large amounts of inflow and infiltration as a result of a large portion of our infrastructure consisting of cracked and leaking 40 year old clay pipe that needs rehabilitation. The increase in I&I causes excess amounts of water into the sewer infrastructure resulting in sewage overflows, costly cleanup and potential hazards to the environment

NOAA Project ID#13110: Mississippi Sound currently has a variety of planned, ongoing, or completed habitat restoration projects (e.g., living shorelines, island restorations, oyster reef replenishment), and compensatory restoration projects (artificial reefs). All of these are within federally designated, critical habitat for Gulf Sturgeon (GS), and habitat for important coastal pelagic finfish (Mackerel, Red Drum). These projects have the potential to alter habitat characteristics (sediment composition, water quality, macroinvertebrate abundance) important to these fish. Restoration efforts require assessment for potential impacts on these species (e.g., loss or conversion of foraging habitat), specifically for GS. Unfortunately, most of the science related to GS habitat dependency is derived from work in their eastern range, and may not be applicable to silty-bottom habitats in the west. Additionally, artificial reef projects may enhance habitat for coastal finfish, but bury GS habitat. The objectives of this project are to describe habitat-specific occupancy patterns for GS and other coastal pelagic finfish (Mackerel, Red Drum) within Mississippi Sound, in relation to restoration projects. Specifically, we will (1) develop an acoustic telemetry array within restored and non-restored habitats to monitor acoustically tagged target species to determine habitat use and occupancy, (2) assess use patterns of these species in restored versus non-restored regions, and (3) provide a decision support tool to inform resource managers and restoration practitioners of the impacts each restoration effort has on habitat use by these species.

The five-year revision of the Gulf Sturgeon Recovery Plan highlighted the need to identify habitat parameters for GS estuarine feeding habitats, especially of western populations (Pearl and Pascagoula Rivers), which have been slower to recover than their eastern counterparts; it also renewed consideration for GS habitat restoration. Habitat-specific occupancy patterns for GS in estuaries are lacking, particularly for juveniles and sub-adults. Therefore, we will fill knowledge-gaps related to what actually constitutes suitable GS habitat by size-class. Mackerels (Spanish and King) and Red Drum may use the same habitats as GS, but during different seasons and in different ways (prey selection). These species likely benefit from compensatory restoration more than GS, but this has not been quantified.

Based on occupancy patterns of these species between restored and non-restored habitats (e.g., silty bottoms, oyster and artificial reefs, areas adjacent to living shorelines), we will determine if restoration

NOAA Project ID#13569: The goal of the project is to reduce sea turtle injury and mortality from exposure to and entanglement in discarded or lost recreational fishing gear. Sea turtle exposure to, and entanglement in, discarded or lost recreational fishing gear, such as monofilament line and cast net material, is an important, and growing problem. This project idea includes the following: 1) Identify problem "hotspots" for sea turtle entanglement at state and regional levels across the Gulf of Mexico. Project locations would be selected and prioritized based on intensity of use for recreational fishing, known co-location with sea turtles (e.g., foraging areas), and frequency of entanglement/ingestion-related strandings. Based on location-specific patterns of entanglements and/or entanglement risk, determine priority management needs for each hotspot. 2) Reduce the number of, and potential for, entanglement incidents at identified hotspots through a suite of possible techniques, including site clean-ups (recovery of gear and debris from hot spot areas), increasing proper monofilament disposal areas, reduction of the amount of monofilament from waterways, especially in key sea turtle nesting and foraging areas,

#### Background:

In coastal Mississippi, we have many restoration and conservation projects underway in the aftermath of the Deepwater Horizon spill. Additional projects are being planned from other sources in concert with future projects from RESTORE, NRDA, and NFWF authorities. Cumulatively, these projects will influence coastal Mississippi for decades. A systematic monitoring effort, conducted on project- as well as coastal watershed-scales is recommended here to evaluate short-term performance of site-specific projects and examine long-term trends at watershed and ecosystems scales.

#### Rationale:

Ideally, a basic monitoring plan includes data collection and analysis over three stages of a project (Yeppen, Moody and Schuster, 2016). These include: (1) Baseline Monitoring- determining the pre-construction condition of the site against which all future monitoring and analysis will be compared; (2) As-built configuration- initial survey of completed project to validate final configuration against design and engineering requirements; and (3) Long-term performance monitoring- periodic monitoring that compares the condition of the project site to the baseline. These longer-term measurements are needed to determine progress toward the restoration targets and inform adaptive management strategies that allow Mississippi program officials to evaluate outcomes and reconsider restoration approaches (Patten, 2006). This effort requires consistent data management and controls for multiple years of data collection, analysis, and presentation (Gunderson, Cosens, and Garmestani, 2016). An interactive atlas of baseline measurements, maps, and information products precisely geo-registered and compiled at consistent scales will be the resultant outcome of each year's monitoring elements.

#### Approach:

The following technical themes will be common to this monitoring effort:

1. Project requirements and restoration targets were validated during previous DMR Tidelands projects
2. Technical approach to monitoring, data acquisition and geo-spatial scales previously validated in Tidelands projects.
3. Best available space-to-seafloor environmental technologies previously demonstrated.

Many coastal areas have lost native vegetation that creates vital habitat and stabilizes the shoreline. The long leaf pine was historically located in many areas along our coast and has been lost in recent years. I suggest a project to identify and reforest these areas (Petit Bois Island, Deer Island, Point a Pins, etc).

East McHenry road is a narrow gravel road that runs east to west from Hwy 15 through Desota National Forest to Hwy 49 in the southern part of Stone County, near the Harrison County Line. Several roads head south into Harrison County from East McHenry road. In 2014, the county received a FLAP grant for the first phase of improvement which will replaced one low weight bridge and widen and pave 1.3 miles of the road. In 2015, a second FLAP grant was secured for 3 more bridges and 2.3 miles of road. The last portion of the project is 2.63 miles with one bridge. Currently, Stone County has no funding for this portion. If funded, Stone county will have a continuous paved road making traveling safer. The

NOAA Project ID# 13491: The Gulf menhaden is forage for a wide diversity of fish, bird, and marine mammal populations that inhabit the Gulf of Mexico, its estuaries, wetlands and tributaries. Annually, the purse seine fishery targeting this species removes about 1 billion pounds (450,000 metric tons, mt) of living biomass from the ecosystem. While that biomass is dominated by gulf menhaden, substantial quantities of commercially-, recreationally-, and ecologically-important species are also extracted as bycatch. In addition, deleterious fishery interactions with protected species occur, such as with bottlenose dolphin and sea turtles. Hundreds of billions of larval menhaden (and relatives) were likely killed as a result of the DWH oil spill (PDARP 2017). This project seeks to produce ecosystem benefits via a short-term, voluntary, company-specific quota program for a specified period. Proposed is "purchase" of the fleet's future expected annual landings beyond 300,000 metric tons for a 5-yr period, which would represent about a 33% decrease in pre-oil spill (i.e., 2005-2009) landings. This initial offer would total \$75M for: (1) the two menhaden reduction companies to hold themselves to a 5-yr voluntary total allowable catch (TAC) of 300,000 metric tons; and (2) development and implementation of a multi-species/fishery monitoring and assessment program with which to quantify impacts. Compensation would be allocated between the two companies (Omega Protein and Daybrook) based on their 2005-2009 landings. The compensation would add significant profits to current operations, as the companies would not have operating costs for that portion of the 'landings' beyond the 300,000 mt TAC. Given the diversity of living resources and fisheries that are predicted to benefit, and the magnitude of those benefits, this action may be a viable, cost-effective and potentially transformative opportunity to

Compton Engineering has encountered several projects where submerged aquatic vegetation is present and impacts need to be mitigated for. Compton proposes to conduct a pilot study in the Back Bay of Biloxi to located suitable habitat that is devoid of SAV , harvest mature eelgrass plants, plant test plots

The Helena community is located in southeast Jackson County, Mississippi and currently consists of approximately 650 homes. The area has historically high-groundwater and low-permeability soils. This combination of conditions has led to a septic system failure rate estimated at 98 percent. Expansion of the existing Helena Utility District sanitary sewer collection system would serve to prevent further pollution from failed septic systems. Additionally, due to the high contamination levels in the near surface water aquifer, water distribution system expansion is necessary to provide potable water to the Helena Citizens who are currently utilizing private wells as their sole potable water source.

The Helena Utility District was formed in 2006 and consists of approximately 290 customers connected to a low pressure sewer system and 100 customers connected a potable water distribution system. This proposed project will include expansion of the existing Helena Utility District sanitary sewer collection and potable water distribution systems to connect to the remaining 360 homes that currently utilize individual septic systems for wastewater treatment and private groundwater wells as their sole water

The Mississippi Commercial Fisheries United, Inc. proposes for funding an oyster shell recycling program that engages Mississippi restaurants, oyster processors, and the general public to establish a recycling program that provides free oyster shell pickup, training, and drop-off locations to recycling otherwise discarded oyster shells. Oyster shells are the preferred cultch material for oyster reef restoration but due to their limited supply has been used minimally in recent restoration efforts. Alternative cultch materials have thus far proven to be largely ineffective at restoring oyster reefs in the Mississippi Sound.

Funds for this project would include the procurement and management for necessary collection materials, transportation vehicles, employees, land for shell staging, and heavy equipment for shell sanitation.



The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel includes 10,203 feet (1.9 miles) of riverfront buffer along the Wolf River. LTMCP currently protects and manages approximately 22 miles of riverfront conservation easement surrounding this property along the Wolf River. The land is mostly hardwood forest with wetland and riparian habitats with upland pine forest. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi Sound. Ecological Value: Provides valuable habitat for a

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 25 acres of forested shrub wetland that borders each side of Turkey Creek as well as approximately 13 acres of upland pine forest that has been thinned. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi Sound. LTMCP protects and manages 237 acres of land along the Turkey Creek watershed, in an effort to create a continuous corridor that buffers both sides of Turkey Creek. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters.

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 18.10 acres of forested shrub wetland that borders the Wolf River for a total of 787 feet. The Wolf River runs through Bayou Acadian into the Bay of St. Louis. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi Sound. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters. These flooding waters have a natural function of turnover

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. These parcels consist of approximately 6 acres of forested shrub wetland, and 2.89 acres of estuarine and marine wetland habitat that borders both sides of the Tchoutacabouffa River. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi sound. LTMCP protects and manages 49.71 acres adjacent to the Cedar Lake Island Land Protection project. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters. These flooding waters have a natural function of turnover and flushing of

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 0.28 acres of freshwater emergent wetland, and 3.51 acres of freshwater forested wetland habitat that borders Old Fort Bayou. An intermittent stream is present on the property. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi sound. LTMCP is also looking to acquire 63.85 acres of adjacent land to the south. These two parcels share an intermittent stream that flows into Old Fort Bayou. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters. These flooding waters have a natural function of turnover and flushing of coastal

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 26.8 acres of freshwater forested wetland, 1.35 acres freshwater pond, 5.24 acres of riverine habitat, and 6.6 acres of forested evergreen upland habitat. Bayou Costapia and Tuxachanie Creek meet the Tchoutacabouffa River at this parcel. Also, LTMCP manages and protects a total of 206 acres directly adjacent to this property along the Tchoutacabouffa River including the Tchoutacabouffa Nature Preserve. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi sound. With the acquisition of this parcel, LTMCP would create a corridor of conservation lands 2.1 miles long along the Tchoutacabouffa River. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters. These flooding waters have a natural function of turnover

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 3 acres of freshwater forested wetland and 8.75 acres of mixed hardwood upland. LTMCP are interested in acquiring and restoring a total of approximately 188 acres of adjacent property. This block of conservation land would share a border with the Mississippi National Wildlife Refuge to the East. Ecological Value: Protects areas that provide clean water for our natural resources further down the watershed.

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. This parcel consists of approximately 45 acres of upland pine forest. Ecological Value Provides valuable habitat for a wide variety of plants and animals native to Mississippi, as well as migratory birds. -

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. These parcels consist of 3677 acres of planted pine forest as well as bottomland hardwood with several creeks that flow into both the Jourdan River as well as the Wolf River. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi sound. Ecological Value: Protects properties as a buffer area for storm surge by providing dispersal and displacement in the event of flooding waters. These flooding waters have a natural function of turnover and flushing of coastal

This effort seeks to permanently protect lands identified by the U. S. Fish and Wildlife Service and the State of

Mississippi as critical for acquisition and long-term management by the Grand Bay National Wildlife Refuge (NWR) and Grand Bay National Estuarine Research Reserve (NERR). This project will add approximately 1,686 acres to the nearly 18,000 acres currently owned by the U.S. Fish and Wildlife Service and the State of Mississippi. It will add critical coastal lands to the Grand Bay NWR/ NERR for permanent protection, and improved management of coastal wetlands, and adjacent upland areas. The Grand Bay NWR/NERR protect one of the last expanses of wet pine savanna habitat in the country. Due to fire suppression and conversion to pine plantation, less than 5% of the original acreage of this habitat system remains- making it one of the most endangered ecosystems in the country. Because of the great biological significance of this area, it is important to continue to expand the protection of both core and buffer areas, while enhancing management capabilities. The targeted 1,686 +/- acres consists of wet pine savanna, maritime forest, tidal and non-tidal wetlands, salt marshes, salt pannes, bays and bayous.

The Chandeleur Islands (‘Chandeleurs’) form an iconic island chain in the northern Gulf of Mexico included in the Breton National Wildlife Refuge, the second oldest refuge in the system. The Chandeleurs are essential for protecting coastal communities; providing habitat for wildlife, including threatened and endangered species and migratory birds (protected species); and for promoting both recreational and commercial fisheries. We propose using natural coastal sediment dispersal processes as tools to restore the Chandeleurs. Wave driven currents run parallel to the Chandeleurs eroding sand from islands and transporting it to ‘sand sinks’ north and south of the islands (see figure 1B). Hewes Point, a submerged sand spit, is one of these ‘sand sinks’ that consists of sand eroded from the island chain. The sand at Hewes Point can be mechanically returned to the central part of the system, extending the island lifespan by centuries.

We propose:

— Mining sand from Hewes Point and strategically placing sand reserves behind the center of the island chain (see figure 1B);

— Mimicking a natural process by allowing shoreline erosion to slowly feed sand from the reserves to the beaches, replenishing sand lost on the beach;

— Protecting sand reserves from storms by placing them mostly below the mean water line where the destructive forces of storms are minimal;

— Using tidal passes and low areas in the dune as pathways to ensure that sand is retained within the system, maximizing the longevity of this restoration; and

— Using sediment to restore New Harbor Island which is an important bird rookery.

The Land Trust for the Mississippi Coastal Plain (LTMCP) is a nationally accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological significance in Hancock, Harrison, Jackson, George, Stone, and Pearl River Counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools to target priority conservation lands for the benefit of coastal Mississippi habitats, species, and recreation.

The goal of this project is to provide funding to purchase individual parcels of land, which may be relatively small in acreage but are located in areas that have been identified as crucial to extending corridors of existing conservation lands. The Land Trust has identified several sites that would expand key conservation corridors presently owned by LTMCP, the Mississippi Secretary of State's Office, as well as the Mississippi Department for Marine Resources. These sites can be found on the Mississippi Department of Environmental Quality's portal ([www.restore.ms](http://www.restore.ms)): project numbers 5436 Brickyard Bayou Land Protection, adjacent to the Pascagoula River Coastal Preserves owned by MDMR; 5788 Cedar Lake Island Land Protection, adjacent to the LTMCP Cedar Lake Island Preserve; and 5790 Tchoutacabouffa River Land Protection, adjacent to LTMCP Tchoutacabouffa Nature Preserve. Protection of these upstream lands is vital to the water quality and erosion control downriver and into the Mississippi Sound.

**Ecological Value:**

The Gulf of Mexico's health and productivity is directly and significantly influenced by the quality and quantity of fresh water delivered bays and estuaries in the Mississippi Sound. In turn the quality and quantity of water in major tributaries such as the Pascagoula River is heavily influenced by land use and the condition of its tributary rivers. To make meaningful, measurable improvements to the Pascagoula Rivers water quality and quantity it is necessary to start in these tributary rivers and watersheds. The Pat Harrison Waterway District has the legal authority and administrative mechanisms to coordinate federal and state agency activities to improve water quality and quantity in the Pascagoula Basin and actively engage County and local governments in those efforts. In particular projects coordinated with county and city officials in the Bouie, Leaf and Chickasawhay Rivers and watersheds can measurably and

Kittiwake Conservation has been able to identify some acreage in Pass Christian that appears suitable for coastal preservation. This property was partially used as part of the Camp Kittiwake, a church camp used into the 1950's, then partially developed as a residential subdivision, Kittiwake, and for the Kittiwake Baptist Church. The remaining 12 acres has laid fallow for the past 50 years.

Our neighborhood group, loosely organized as Kittiwake Conservation, see the area being retained for its natural features; its vegetation and wildlife, while adjacent to the sand beach. The area presents itself as an area where local runoff can be filtered naturally prior to reaching the Sound, reducing the number of beach closures in the area after heavy rainfall. Presently, the acreage is semi-wetland forest, and the home to herons, eagles, osprey, fox, bobcat, racoon, armadillo and rabbits.

This property (11.8 acres) was recently purchased by an individual in 2017, and has expressed some interest in allowing the acreage to be used as a park, a wildlife preserve, a conservation area, and appears willing to part with the land for such uses.

Across US 90 is the sand beach. This area has often been "closed" due to high bacterial count, particularly after heavy rainfall. This tract of land could be used to develop a series of "swales" to naturally filter the surface water of sediment and pollutants prior to reaching the Sound, and some existing underground water routes could be rerouted into the same system of swales.

There are few intact land parcels available along Beach Boulevard that have not been through development, especially over the past 50 years. This is a parcel that has been neglected and allowed to become its own wildland. With minimal development it could become its own show piece of what upland areas would have looked like prior to significant development. A trail meandering through from Second Street to Beach Boulevard might be the extent of developing the area. A parking area on each

NOAA Project ID# 13873: The impact of habitat loss on shorebirds may be exacerbated by disturbance from human recreational use, which further reduces the amount of coastal habitat that is functionally available. This can have consequences for the condition of individual birds or for population processes, both of which should be considered in strategies to reduce conflict between shorebirds and recreational users of coastal habitat. Our objectives were to implement measures to mitigate the negative impacts from human recreational use, coastal habitat modifications to Piping Plover (*Charadrius melodus*) body condition and demography. Also applies to additional overwintering bird species. The condition of these

NOAA Project ID# 13868 Summary of rationale and proposed project: Nearly half of North American shorebird species (such as sandpipers and plovers) are declining, and a key factor in these declines is a loss of available habitat for migration stopover, especially in fall (July-October) when such habitat is more limited. To mitigate the impact of the Deepwater Horizon oil spill on this group of birds, we need high-quality stopover habitat for them not just on the immediate Gulf Coast, but also away from the Gulf Coast, in the MS Delta. Private lands, including aquaculture farms and former aquaculture farms being managed for duck hunting, and also active agricultural fields, can provide high-quality stopover habitat for migratory shorebirds. Groundwater is an increasingly valuable and limited resource in the MS Delta, so groundwater-neutral strategies for such wildlife habitat creation are needed. We will work with private landowners to provide high-quality, groundwater-neutral stopover habitat for migratory shorebirds in the MS Delta. Goal 1: Create 600 hectares of fall habitat for migrating shorebirds on private lands in the MS Delta, which has been estimated to be necessary to support the number of birds typically migrating through our region. Goal 2: Demonstrate the viability of ground-water neutral strategies for creating shorebird habitat, including use of surface water sources, lateral pumping, water storage, and drop-fill pumping strategies. Goal 3: Engage a diverse suite of private landowners and establish the desire for long-term voluntary implementation of these practices. Estimated Cost: \$200,000 per year We have begun to build towards these goals by developing a network of partnerships with farmers and waterfowl

There is an approved RESTORE Act-funded Gulf-wide river flow study that will use a Mississippi coastal plain stream as a study site. It is currently being planned by the USGS Gulf Water Science Center in Nashville, with Rodney Knight as the principal investigator. This study needs to either focus on the Pearl River or model both the Pearl and the Pascagoula rivers with the OASIS modeling program for regulated rivers.

The following three questions have been posed for investigation using OASIS, a powerful modeling framework:

- 1) How far downstream can a dam's disruption to flow be detected?
- 2) How sensitive are the fresh water needs of the estuary to upstream damming?
- 3) Can the coastal waters be so distant from a dam's influence on the river that it can't be detected?

With the current plans to add more low head dams/weirs and a new impoundment on the Pearl River in Jackson, Ms in the name of flood control, these three questions need to be answered for the Pearl before more structures are placed on it. If the best river scientists in the U.S. cannot answer these questions about the Pearl River, further damming is not justifiable.

In a phone conversation with the USGS principal investigator, he said that there is no reason both rivers could not be investigated. The environmental data set on the Pascagoula may be a bit better than that of the Pearl, but beyond this and affordability under the budget, there isn't a reason that OASIS couldn't be

In undeveloped areas of the coast, rain is intercepted by trees and the rest soaks into the ground, filtering out pollution. But on the developed coast, buildings, parking lots, roads, and other impervious surfaces, trees and soil no longer slow the rainfall and filter the water. The resulting stormwater instead picks up nitrogen and phosphorus pollutants. It flows rapidly into bayous, beaches, and Mississippi Sound via storm drains. The results include beach closures, oyster contamination, and fish kills.

Red Creek in George County has been suffering from water quality problems due to periodic sediment influx with rainfall events. Several sites are possible origins, but one large one exists. A 400-acre recreational riding park for All Terrain Vehicles, "R.C.O.R." on Vestry Road has been in operation for about 15 years, and the runoff from the constantly disturbed soils and mud pits on the site has been and is still reaching Red Creek through small woodland branches running into the Creek from from its south bank. Despite citizen complaints over the past 3 years, and in spite of several attempts at characterizing the source, timing, and magnitude of the sediment inputs from this site, or other sites, no definitive answers have been put forward by any person or government agency that can be used to isolate, regulate or otherwise modify or mitigate this water quality impairment from mud and sediment.

Remote sensing, drone photography, balloon cameras, trail cameras, and or photography using airplanes could be used to document runoff events that fill Red Creek with sediment in this section of the stream in George County as well as upstream in Stone County. With such visual documentation, simultaneous testing of Red Creek water quality for sediment and nutrient components must be done so a visual/testing record of this problem can be created.

Engagement and creative collaboration of MDEQ staff and NRCS/USDA could possibly result in discovery of the right "hook" or incentive so that these agencies can collaborate on the water quality problem in this section of Red Creek. The land is mostly forested in the vicinity, and there is almost no agricultural land use along Red Creek. There also is not a protected species like the Gulf sturgeon with habitat in Red Creek that can be used to clearly justify federal agency intervention or some kind of enhanced soil conservation practice payments. Also, the owner of the Red Creek Off Road park has been intransigent and has not, to my knowledge, voluntarily undertaken measures to reduce the sediment contribution from his land to the Creek.

This situation is at an impasse, and has been for about 3 years. There is not enough data collected by

Improve water quality by reducing nutrient loads to coastal watersheds. Develop conservation plans on agricultural land and rural communities that support them to address nutrient and sediment runoff; and implement conservation practices identified in the conservation plans.

The primary goal for this project is to improve water quality through nutrient and sediment reduction. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, over 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture. This watershed-scale project restores water quality impacted by the DWH oil spill by reducing nutrients and the sediments carrying them into coastal waters. Runoff from cropland, pasture, grassland, forest, urban areas contributes nutrients and sediments that adversely affect the health of coastal waters of the Gulf. While agricultural lands are a contributor (and in many instances, not the leading contributors) of nutrients to coastal waters, there are opportunities to address nutrient related resource concerns at their sources across multiple landuses in the lower Pascagoula River watershed.

USDA will provide outreach and technical assistance to voluntary participants -- especially on the most

In undeveloped areas of the coast, rain is intercepted by trees and the rest soaks into the ground, filtering out pollution. But on the developed coast, buildings, parking lots, roads, and other impervious surfaces, trees and soil no longer slow the rainfall and filter the water. The resulting stormwater instead picks up nitrogen and phosphorus pollutants. It flows rapidly into bayous, beaches, Biloxi Bay, and Mississippi Sound via storm drains. The results include beach closures, oyster contamination, and fish kills.

In undeveloped areas of the coast, rain is intercepted by trees and the rest soaks into the ground, filtering out pollution. But on the developed coast, buildings, parking lots, roads, and other impervious surfaces, trees and soil no longer slow the rainfall and filter the water. The resulting stormwater instead picks up nitrogen and phosphorus pollutants. It flows rapidly into bayous, beaches, Pascagoula River, and the Mississippi Sound via storm drains. The results include beach closures, oyster contamination, and fish

Improve water quality by reducing nutrient loads to coastal watersheds. Develop conservation plans on agricultural land and rural communities that support them to address nutrient and sediment runoff; and implement conservation practices identified in the conservation plans.

The primary goal for this project is to improve water quality through nutrient and sediment reduction. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, over 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture. This watershed-scale project restores water quality impacted by the DWH oil spill by reducing nutrients and the sediments carrying them into coastal waters. Runoff from cropland, pasture, grassland, forest, urban areas contributes nutrients and sediments that adversely affect the health of coastal waters of the Gulf. While agricultural lands are a contributor (and in many instances, not the leading contributors) of nutrients to coastal waters, there are opportunities to address nutrient related resource concerns at their sources across multiple landuses in the Middle Escatawpa River watershed.

USDA will provide outreach and technical assistance to voluntary participants -- especially on the most

Improve water quality by reducing nutrient loads to coastal watersheds. Develop conservation plans on agricultural land and rural communities that support them to address nutrient and sediment runoff; and implement conservation practices identified in the conservation plans.

The primary goal for this project is to improve water quality through nutrient and sediment reduction. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, over 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture. This watershed-scale project restores water quality impacted by the DWH oil spill by reducing nutrients and the sediments carrying them into coastal waters. Runoff from cropland, pasture, grassland, forest, urban areas contributes nutrients and sediments that adversely affect the health of coastal waters of the Gulf. While agricultural lands are a contributor (and in many instances, not the leading contributors) of nutrients to coastal waters, there are opportunities to address nutrient related resource concerns at their sources across multiple landuses in the Upper Escatawpa River watershed.

USDA will provide outreach and technical assistance to voluntary participants -- especially on the most



Improve water quality by reducing nutrient loads to coastal watersheds. Develop conservation plans on agricultural land and rural communities that support them to address nutrient and sediment runoff; and implement conservation practices identified in the conservation plans.

The primary goal for this project is to improve water quality through nutrient and sediment reduction. The health of the Gulf of Mexico depends upon the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, over 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture. This watershed-scale project restores water quality impacted by the DWH oil spill by reducing nutrients and the sediments carrying them into coastal waters. Runoff from cropland, pasture, grassland, forest, urban areas contributes nutrients and sediments that adversely affect the health of coastal waters of the Gulf. While agricultural lands are a contributor (and in many instances, not the leading contributors) of nutrients to coastal waters, there are opportunities to address nutrient related resource concerns at their sources across multiple landuses in the Hobolochitto Creek watershed.

USDA will provide outreach and technical assistance to voluntary participants -- especially on the most

In undeveloped areas of the coast, rain is intercepted by trees and the rest soaks into the ground, filtering out pollution. But on the developed coast, buildings, parking lots, roads, and other impervious surfaces, trees and soil no longer slow the rainfall and filter the water. The resulting stormwater instead picks up nitrogen and phosphorus pollutants. It flows rapidly into bayous, beaches, St. Louis Bay, and Mississippi Sound via storm drains. The results include beach closures, oyster contamination, and fish kills.

NOAA Project ID# 13909: The collection and analysis of biological and water quality data as part of a long-term sampling plan can provide valuable information on background parameters and species diversity and abundance. It may also provide agencies with a better understanding of how coastal and near-shore environments are utilized by protected species, such as the piping plover, red knot, and Gulf sturgeon, as well as commercially and recreationally important species, such as shrimp and redfish, and how impacts to those environments may affect these species. Since benthic macroinvertebrates have limited mobility, communities transform in response to changes in water quality and impacts from other events such as hurricanes, beach restoration, and oil spills. Changes in the benthic macroinvertebrate community would likely impact the Gulf sturgeon and shorebird species by altering the food supply. To comprehensively understand potential impacts, benthic and water quality sampling stations will be established along the mainland and barrier islands targeting shorebird and Gulf sturgeon foraging areas, including the establishment of stations near stormwater outfalls. The deployed water quality arrays will collect data at regularly scheduled intervals every one to five minutes, capturing changes in water quality over time. Chemical and nutrient water quality samples will be collected during each benthic macroinvertebrate sampling event. These water quality data will be linked with benthic macroinvertebrate data collected near each array, providing an understanding of the response and recovery rate of the benthic community. Additional benthic samples will be collected closer to shore in the intertidal zone, focusing on shorebird foraging areas. Tidal pool and wrack line samples will be collected adjacent to the established intertidal benthic sampling stations. EAI will apply for the requisite permits to collect biological samples. Targeted water column sampling will provide Catch-per-Unit-Effort (CPUE) data that can identify cyclical patterns and critical habitats for nearshore larval and adult fish, shrimp, and

NOAA Project ID# 13907: Seagrass plays an important role providing habitat for various commercially and recreationally important species in the nearshore waters of the Mississippi Sound, particularly along the barrier islands. Seagrass establishment and survival is dependent upon multiple variables, including sediment type and water quality. Each of these factors can be influenced by human activity and storm events, leading to spatial and temporal changes in seagrass coverage. This project involves conducting Echosounder tows paired with in-water surveys to accurately map seagrass beds and underlying substrates in the nearshore waters around the barrier islands. Transects will be created and surveyed in areas where seagrass has historically been documented. Each seagrass bed, including prop scarring and other impacted areas, will be delineated using sub-meter accurate GPS units during each survey. Accurately mapping seagrass along nearshore environments can assist agencies in establishing protected areas to reduce future impacts, as well as documenting the effects of storm events, vessel groundings, and other environmental disasters. Seagrass surveys would occur twice a year, at the beginning and end of the growing season. Water quality data logger arrays will be deployed around seagrass beds to collect data at regularly scheduled intervals, capturing changes in water quality over time. In addition, chemical and nutrient water quality samples will be collected monthly near the water quality arrays. During trips to the

NOAA Project ID# 13906: Threatened and endangered sea turtles utilize the mainland beaches of Mississippi as nesting habitat. Artificial lights have been shown to reduce sea turtle nesting on otherwise suitable nesting beaches and cause disruption of the sea turtle's ability to find the sea. The first objective of this project is to conduct comprehensive nighttime lighting evaluations along the beaches of the Mississippi Gulf coastline, including Gulfport and Biloxi. The intent of the surveys is to evaluate all visible lights from the beach with respect to their potential effects on nesting and hatchling sea turtles. Lights that are illuminated and visible from the beach will be identified and evaluated (rated with respect to their potential effects on sea turtles). Based on a light's intensity, location, distance from the beach, type of fixture and other relevant factors, recommendations will be made for corrective measures. Sub-meter accurate GPS units fitted with laser rangefinders along with digital SLR cameras will be used to precisely locate and photograph lights, enabling evaluation of their effects on sea turtles and the beach. Interactive maps will be produced showing the GPS location of each light source and the location on the beach from which they were observed. With these maps, property owners and managers will be able to click each location on the beach to bring up information about the light along with a photo of the light source. Recommendations for modifying each light to provide sufficient light for human safety and

NOAA Project ID# 13892: Horn Island is congressionally designated as part of the Gulf Islands Wilderness. A 199-foot communications tower is located in the approximate center of Horn Island and is easily visible from most locations on the island and surrounding waters. The tower has reached end of its useful life and is deteriorating rapidly and is a growing safety concern. Its presence is a significant impact to the wild primitive character and natural landscape of the island. The tower is a physical hazard to wildlife, particularly migratory bird species. In addition to the tower are guy wires and anchors, concrete slabs, a dock on the Sound side of the island, a ranger residence, fencing, solar panels, and a road from the dock to the residence in the middle of the island, down to the Gulf-side shore. This project would remove the tower, guy wires and anchors, concrete slabs, and solar panels. The other items/structures will not be removed as part of this project. This project will also restore approximately five acres of dune habitat in the center of Horn Island where the road currently exists. By implementing this project, the

NOAA Project ID# 13893: Marine Debris arrive on the islands from a range of sources, including visitors and campers on the island, mainland sources, off shore oil rigs and services, commercial and recreational fishing, as well as debris generated by hurricanes and storms. Debris will be collected from supratidal, intertidal, and subtidal zones. Marine debris impacts are wide spread to both people and ecosystems. Debris represents a threat to a wide range of species (birds, fish, mammals) from entanglement, ingestion, transport of invasive species, and toxicity. Debris can also have impacts to humans from the aesthetic impacts of a fouled beach, to health concerns from medical or sewage based debris to impacts to vessels from fouling intakes and propellers. Marine Debris ranges in size from cigarette butts to entire sailboats.

NOAA Project ID#13900: The Deepwater Horizon oil spill caused direct, significant and long-term harm to the Gulf of Mexico, the Mississippi Sound and Mississippi's Bay of St. Louis. Following clean up from the oil spill, the long-term recovery and restoration of these waterbodies depends on the health of its bays and estuaries. The health of these bays and estuaries is directly influenced by quality and quantity of water from tributary rivers. Land use in those tributary watersheds directly impacts the quality and quantity of water these tributaries provide to the Mississippi Sound and the Gulf of Mexico. The Natural Resources Conservation Service recognized this inland/coastal linkage by including the Jourdan River in its Gulf of Mexico Initiative. Mississippi's Bay of St. Louis and its two tributaries the Jourdan and Wolf Rivers offers an ideal ecosystem for a tributary water quality and quantity restoration program. The area is large enough to measurably contribute to restoring and protecting water quality in Bay of St. Louis Bay, the Mississippi Sound and the Gulf of Mexico, yet a small enough to effectively monitor those benefits. The health and expansion of the oyster population in the Bay will be the ultimate measure of the programs success. The program area blends urban, suburban, exurban and rural land uses that is fairly typical on the Gulf Coast. In addition to waterfront residential developments, cities on and near Bay of St. Louis have traditional working waterfronts that support various small shops, restaurants, marinas, commercial docks and industries vital to the local tax base and economy. The Mississippi Department of Marine Resources (DMR) Coastal Preserves Program has three (3) Gulf Ecological Management Sites (GEMS) in the Bay's estuaries; a) Jourdan River Preserve (6,423 acres), b) Bayou La Croix Preserve (1,478 acres) and c) Wolf River Preserve (2,462 acres). Part of the Hancock County Marsh GEM is also in the program area. DMR identified septic systems as a major threat to the ecological function of each of these GEMS. Over time, many of the Bay's bayous and creeks became clogged with debris which traps

NOAA Project ID#13898: This project would build on the successes of previous and ongoing efforts to restore wet pine savanna habitats at Grand Bay NWR and the Fontainebleau Unit of Mississippi Sandhill Crane NWR. Historically, wet pine savannas provided habitat for cranes, grassland birds, reptiles, amphibians, migrating songbirds, and many other species of wildlife native to the Gulf coast. This fire-dependent ecosystem has degraded due to invasive species, fire suppression, and land use changes. To restore these important habitats, we propose to use restoration techniques including prescribed fire, mechanical treatment of woody vegetation, timber management, and invasive species control. The project

Scope of Work: This Project will complement the existing Federal restoration projects at Deer Island by minimizing the fracturing of diversity and creation of an additional 400 acres of highly productive wetlands, beach and dune and maritime forest habitat. Planned improvements include restoration of a portion of the northern and southern shorelines of the island, and new stone training dikes to prevent future erosion. Project will also restore emergent coastal tidal marsh, restore vital nodal connections of marsh/estuarine habitat for Gulf Sturgeon (threatened species) feeding and nursery use as well as federally protected migratory species, project will restore critical winter habitat for Piping Plover (threatened species), and nesting habitat for raptors including Bald Eagle as well as listed sea turtles, project will also fully restore barrier island and natural hydrologic conditions to MS Sound as well as historical inflows of Gulf water into the sound area. The project will also fully restore historic geomorphic features through restoration, stabilization of island elevations and shoreline profiles.

Background and Cost: A feasibility study was completed in September 2009. The recommended total project, estimated to cost \$25,800,000 with an estimated Federal cost of \$16,770,000 and an estimated non-Federal cost of \$9,030,000. Of this amount, \$1,231,000 is estimated to be needed to complete PED

This Storm Water Filtration Project is proposed to address the ongoing poor near shore water quality issues which continuously plague the Mississippi Gulf Coast. Each year, segments of our coastline have "Water Contact Advisories" posted as a result of elevated bacteria levels found within the near shore waters. These Advisories are to discourage individuals from accessing these areas and being a tourist destination, this overall perception has a negative lasting impact.

Although there are several aspects of addressing this problem underway, such as upgrading sanitary sewer systems and implementing Eco-Friendly "Green" solutions, they do not fully address all of the bacteria sources contributing to these periods of elevated bacteria levels within our near shore waters.

This Storm Water Filtration System technology is designed to capture the storm water run off during rain events, force through a treatment process to remove sediment and bacteria, retain the contaminants for disposal within the sanitary sewer system and return the treated storm water back into the discharging outfall.

Ideally, the treatment facility should be positioned near the discharge outfall location or as close as geographically permitted to maximize the area of watershed treated. However, this technology can be placed in strategic locations based on existing conditions to treat various segments throughout a watershed. This flexibility of an adaptable design specific to existing conditions, makes for an ideal

Hickory Creek, along with White Cypress Creek and Catahoula Creek, make up the upper Jourdan River Watershed. They are all downcutting, each with a nick zone that migrates upstream. The one on Hickory Creek, less than a quarter mile downstream of Caesar Necaize Road, is threatening the bridge and roadway. When we entered this project in the portal in January of 2019 we noted that it was a half mile downstream of the road. Everytime there's a rain event, it makes visible progress.

Hickory Creek, in its un-degraded state, is a sinous coastal stream that is fairly small in appearance. However, it drains a large watershed upstream of the headcut, some 35 square miles. It utilizes its floodplain to accommodate the high water flows that result from heavy rainfall events. On these occasions, the stream and the floodplain together operate as one wide, forested stream.

Below the nick zone, the stream is downcut enough that it loses the ability to put floodwater out onto the floodplain. When this happens, the water blows out the banks to accommodate the flow. The resulting soil and vegetation loss is staggering. The soil loss is a large contributor to the siltation problem in Bay St. Louis.

Downstream of the nick zone, at some point the stream achieves a new form of stability within its canyon. Between these two areas, a length of, say,  $\frac{3}{4}$  of a mile, is a constantly moving zone of

Proposal to assist the City of Jackson, MS with major citywide sewer rehabilitation. Although the City of Jackson is currently operating under an EPA consent decree due to Clean Water Act violations incurred by the Savanna Street Wastewater Treatment Plant, raw sewage from the plant and its associated collection lines continues to flow directly into the Pearl River and its associated tributaries. In the first three quarters of 2018 alone, City of Jackson Sanitary System Overflows released 4.5 million gallons of untreated sewage to the Pearl River and Savanna Street WWTP released 2.65 billion gallons through prohibited bypasses. The Savanna Street WWTP is currently in significant non-compliance with its NPDES permit and in the first three months of 2018, the nitrogen and ammonia total released was 105% above permit limits. In 1996, the entire section of the Pearl River from Ross Barnett Reservoir to confluence with the Strong River was placed on the 303(d) list of impaired water bodies due to nutrients/organic enrichment and low dissolved oxygen. Recommended action in 2015 TMDL for Pearl River from Ross Barnett Reservoir to Strong River is 70% reduction of total phosphorus. In a letter to MDEQ dated April 16, 2015, MDEQ acknowledged, "that a substantial portion of the existing nutrient

The bank is washing away every time the river rises. Cumbest bluff residents

Are losing their property, one house has less than 15' ft. Before collapsing in the river. Something needs to be done fast

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. The Land Trust holds a conservation easement on approximately 18 miles of the Wolf River North of I10 in partnership with The Wolf River Conservation Society which is a non-profit corporation dedicated to conserving, managing, and protecting the Wolf River and its watershed from its headwaters in Lamar County to its termination at the Bay of St. Louis. The State of Mississippi has classified the entire length of the Wolf as a Fish & Wildlife stream to protect recreational use and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The Wolf River is also Mississippi's first scenic stewardship stream.

The goal of this project is to establish funding to purchase individual parcels of land owned by the Weyerhaeuser Company totaling 39,028 acres, located in areas identified as crucial to establishing complete corridors of conservation land. The Wolf River Conservation Society has identified these sites based on locations that would continue conservation corridors previously established by the State of Mississippi, North of I10, in Harrison County that totals approximately 1320 acres managed by the

The Land Trust for the Mississippi Coastal Plain (LTMCP) is an accredited Land Trust dedicated to the conservation, promotion, and protection of open spaces and green places of ecological, cultural, or scenic significance in the counties of the Mississippi Coastal Plain. LTMCP utilizes both fee simple and conservation easement tools in conserving land for the benefit of habitats, species, and recreation. The Land Trust holds a conservation easement on approximately 18 miles of the Wolf River North of I10 in partnership with The Wolf River Conservation Society (WRCS). WRCS is a non-profit corporation dedicated to conserving, managing, and protecting the Wolf River and its watershed from its headwaters in Lamar County to its termination at the Bay of St. Louis. The State of Mississippi has classified the entire length of the Wolf River as a Fish & Wildlife stream to protect recreational use and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The Wolf River is also Mississippi's first scenic stewardship stream.

The goal of this project is to establish funding to purchase individual parcels of land totaling 428.5 acres, located in areas identified as crucial to connecting continuing corridors of conservation land. The Wolf River Conservation Society has identified these sites based on locations that would expand conservation corridors previously established by the State of Mississippi, North of I10, in Harrison

The people that live, work and visit the Biloxi peninsula are all within a few hundred yards of the Biloxi Back Bay or the Mississippi Sound and their actions have immediate impacts on the environment because all the stormwater runs into marine water either directly or by way of one of several bayous leading to the Back Bay. In the past few years most of the streets and the storm drainage systems on the peninsula have been or are being replaced, a situation that is positive as far as moving stormwater out of streets but will increase the stormwater impact on the bayous and back bay with more and faster moving storm water. What is more, the construction work itself has impacted the natural waterways due to increased silt running into the bayous from unpaved roads. The time for the Biloxi peninsula is right for a comprehensive community-engaged stormwater management campaign that improves and creates both upstream and downstream green infrastructure.

Upstream, the project will improve the quality and quantity of water that enters the storm drainage system with four related activities:

- 1.Environmental education with Biloxi Public School students
- 2.Stormwater education to residents of the Biloxi peninsula
- 3.Low-impact development training and design resources for developers and city staff
- 4.A property owners small-grant program to do on-site and neighborhood-scale green infrastructure projects.

Downstream, the project will improve the stormwater quality and quantity that enters the marine environment with two related activities:

- 1.Restoration and improvements of natural waterways that connect storm drainage to the Back Bay, especially Keegan Bayou and Bayou Auguste, which have been impacted most by the road construction work.
- 2.Coordination and leveraging of on-going and planned projects to bring green infrastructure planning and funds to install and maintain landscape areas

Environmental education with Biloxi Public School students. For the past seven years GCCDS has developed and implemented educational outreach programs with Biloxi Junior High School, East

This project is Phase 3 of the area East of the Hancock County Arena. It will be to install a sewer collection system with grinder pumps and lift stations in the designated area to connect approximately 80 homes and discontinue the use of septic tanks. These tanks are close to creeks, streams and bayous that empty out through Rotton Bayou into the Bay of St. Louis and eventually into the Gulf of Mexico.

Planting of native sea oats will create sand dunes along the 26 mile long man-made beach in Harrison County. Sea oats will grow for an early spring planting. The grasses, with 6-8 vigorous shoots between 10 and 16 inches in length, will be deep planted approximately 8-10 inches deep at different sites along the Sand Beach. This methodology was discovered by landscape architects on beach planting after Hurricane

## Overview of Proposed Activity

Background: The Gulf of Mexico's forests, when healthy, reduce sediment and nutrient yields, regulate surface water flows, and improve groundwater recharge relative to other land uses (Sun et al., 2004; Lockaby et al. 2013). They offer recreational opportunities, wildlife habitat, improved air quality, support for the region's economy, and are an integral part of the carbon cycle. Protecting forests at risk of conversion to more intensive uses (Klepzig et al., 2014), restoring native species (Brantley et al., 2018), controlling invasive species, managing for resilience against catastrophic loss (e.g., wildfire, hurricane, drought, pests, etc.), and restoring forested wetlands, floodplains and riparian areas are vital to the health of the Gulf (Vose et al., 2011).

Proposal: This application seeks to establish a program that will enhance and maintain water quality and quantity by protecting, managing, and restoring forested ecosystems. The Program is centered on advancing the RESTORE Council's water quality and quantity goal, but benefits will accrue in all goals. The focus is on protecting and restoring forests, including urban forests, in priority watersheds in Alabama, Florida and Mississippi where the need is great, and Partners stand ready to assist and leverage investments. The Program is a scalable, science-based approach implemented on public and private lands. It involves:

- Landowner outreach techniques that build upon and look to enhance existing tools and networks.
- Coordinated delivery through State Forestry Agencies in Alabama, Florida, and Mississippi.
- Focused recruitment of forest landowners in targeted watersheds.
- Science-based decision support from the USDA Forest Service Southern Research Station who will use the Soil and Water Assessment Tool (SWAT) model and other data and tools to inform priorities, assess and monitor project impacts, and inform adaptive-management decisions.
- Potentially using a portion of funding for an open and competitive Request for Proposals (RFP) to extend the reach of these efforts and cultivate innovation.



NOAA Project ID#14266 The Deepwater Horizon (DWH) oil spill injured many different taxa that utilize shoreline habitats along the northern Gulf of Mexico (GoM) coast including shorebirds; a taxa that can benefit from increased survival and productivity. For shorebirds one Restoration Approach is to “Restore and conserve bird nesting and foraging habitat”; see link [https://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Birds\\_Strategic\\_Framework\\_06.23.17.pdf](https://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Birds_Strategic_Framework_06.23.17.pdf). However, targeted restoration planning requires an understanding of how beach geomorphology influences shorebird productivity (e.g., nest success and chick survival) as well as adult annual survival. This project will also provide data useful for restoration of additional species that nest on sandy beaches across the northern Gulf of Mexico such as sea turtles and diamondback terrapins.

A significant threat to breeding shorebirds, which can be detrimental to nest success and chick survival, on beaches across the GoM is inundation events. Inundation occurs from overwash of beaches during extreme high tides or storm events or from a rising water table and can impact habitats in multiple ways. Direct mortality of eggs can occur when nests are washed away or if eggs sit in water for long periods of time thereby drowning developing embryos. However, inundation can have many indirect effects such as altering habitat, increasing predation risks, reducing available habitat and increasing exposure from artificial lighting. To address this threat and aid in implementing the objectives identified in the PDARP to improve habitats for survival and productivity, we propose the following objectives:

1. Evaluate risk of inundation to nesting beaches across the GoM

Methods: Multiple study sites will be selected and analyzed to capture regional variability in barrier island characteristics potentially relevant to nest site selection and success. Extensive readily available elevation data exist for GOM barrier islands. Historical data will be used to identify and characterize island geomorphologic features following established approaches. In addition to metrics that characterize island state based on observations at a single point in time, such as beach slope and width, hydrodynamic data will be used to evaluate dynamic classification metrics (e.g., inundation frequency) relevant to beach nesting. Likely nest inundation events will be identified as times when the total water level exceeds

The Secret Coast or Mississippi's Gulf Coast offers a mix of recreational activities that cater to many types of visitors and locals, alike. Man-made, public beaches, in Hancock, Harrison, and Jackson County account for nearly 56% of Mississippi's coastline and provide protection to seawalls and coastal roadways such as Highway 90. These beaches draw both day and overnight visitors. A 2017 study from Longwoods International found that 27% of overnight visitors and 25% of day-trippers visited the Mississippi Coast just to enjoy the beaches, far outranking the national norm. The beaches provide many different experiences including fishing, jet-skiing, aqua cycling, and sailing for people to enjoy. Moreover, the beaches are adjacent to other amenities including continued development, casinos, shops, restaurants, bases for U.S. Armed Forces, universities, hospitals, and active ports which offer a well-rounded holiday experience.

Just as these sandy oases attract visitors, they also provide essential habitat for beach-nesting and foraging species, including colonial seabirds, solitary shorebirds, and marine turtles. These species compete for space with recreational beach visitors and negotiate with sources of disturbance including aforementioned recreational activities but also naïve actions such as children chasing birds or kite flying as well as allowing domesticated dogs off-leash which can destroy bird and turtle nests in a matter of seconds. The permitted use of personal fireworks on the beaches on July 4th can flush breeding bird species off nests, exposing eggs and chicks to the elements such as extreme heat as well as to predators. The unregulated shooting of fireworks can cause possible abandonment, while also creating a dangerous environments for people attending festivities at the beach.

Additionally, beach managers need to carefully balance efforts to clean the beach, which include the mechanized removal of trash and debris for people's enjoyment, while still providing this unique habitat essential for the health of beach-dependent species as well as the beach system itself. Maintenance equipment to keep the beaches clean can crush camouflaged bird eggs or buried turtle eggs. Migrating birds depend on minimal disturbance to feed to replenish fat stores to make long hemispheric journeys each spring and fall. Abating disturbance in wildlife breeding areas can lead to increased hatching success and survival of young birds and turtles. Moreover, many of Mississippi's beach-nesting species

The Jackson County Port Authority is proposing the extension of the sheet pile bulkhead of the Port of Pascagoula's South Terminal in the Pascagoula River Harbor to the south. The project would consist of the installation of 800 linear feet of 90 foot long sheet piles and associated tie backs; approximately 4,000 cubic yards of select fill material behind the new sheet pile bulkhead; providing a new concrete top cap along the dock edge; and the installation of a cathodic protection system to protect the bulkhead from corrosion. The extension of the sheet piling bulkhead will support deeper dredging alongside the terminal and facilitate development along the shoreline in areas that do not presently have a bulkhead. The project will support significant terminal expansion possibilities in the future. The bulkhead will provide an extended terminal interface at this location. The increased bulkhead length would increase the

The Jackson County Port Authority is proposing the extension of the sheet pile bulkhead of the Port of Pascagoula's South Terminal in the Pascagoula River Harbor to the north. The project would consist of the installation of 960 linear feet of 90 foot long sheet piles and associated tie backs; approximately 6,000 cubic yards of select fill material behind the new sheet pile bulkhead; providing a new concrete top cap along the dock edge; and the installation of a cathodic protection system to protect the bulkhead from corrosion. The extension of the sheet piling bulkhead will support deeper dredging alongside the terminal and facilitate development along the shoreline in areas that do not presently have a bulkhead. The project will support significant terminal expansion possibilities in the future. The bulkhead will provide an extended terminal interface at this location. The increased bulkhead length would increase the

The Jackson County Port Authority is proposing the replacement and rehabilitation of the sheet pile bulkhead of the Port of Pascagoula's South Terminal in the Pascagoula River Harbor and expansion of the concrete wharf adjacent to the bulkhead. The project would consist of the installation of 1,200 linear feet of 90 foot long sheet piles and associated tie backs; installation of approximately 1,725 new timber pilings and an approximately 43,000 square foot concrete foundation slab adjacent to the existing concrete slab; installation of approximately ten thousand cubic yards of sand and flowable fill between the existing sheet pile bulkhead and the new sheet pile bulkhead, and above the concrete foundation slab; construction of a new approximately 200,000 square foot concrete wharf adjacent to the new bulkhead; the installation of a new fender system for the vessels to moor to while at the berth; and the installation of a cathodic protection system to protect the bulkhead from corrosion. The existing sheet pile bulkhead is over fifty years old and requires substantial rehabilitation. The bulkhead is the key terminal interface at this location. The rehabilitation of the existing bulkhead will include installation of longer sheet pilings and the existing dock being elevated approximately 18 inches to match adjacent dock elevations. The longer sheet pilings will support deeper dredging alongside the terminal. The project will support significant terminal expansion possibilities in the future. The increased bulkhead length would effectively double the available space for ships to moor at the terminal, and the larger wharf will increase the available space for staging and offloading operations to 500% of the current capacity. The replacement and rehabilitation and extension of the sheet pile bulkhead and wharf improvements at the South Terminal would consist of several components. The estimated cost of the project is anticipated to be approximately \$24.2 million dollars. The property is under full control of the Jackson County Port Authority. The cost estimate is current as of November 2020.

The Port of Pascagoula is a deep draft commercial harbor that has been the center of trade since the early 19th century. It is the largest port in the State of Mississippi. Five other counties are adjacent to Jackson County from the Alabama state line to the Louisiana state line. These counties have historically realized economic benefit and will be affected by any further development and use of the Port. The facilities of

The Mississippi Sound (MSS) is home to the nation's largest bay, sound, and estuarine (BSE) population of common bottlenose dolphins (*Tursiops truncatus*). The MSS serves as a nursery ground for newborn dolphin calves in the spring and summer months and provides vital foraging habitat for dolphins year-round. As a top predator, dolphins are an important sentinel species for the ecosystem. In addition, the fertile waters of the MSS also support a large recreational and commercial fishing industry and an oyster industry. The MSS is heavily impacted by freshwater inputs from large watersheds such as the Mississippi River, Pearl River, and Pascagoula River. In particular, the 2019 openings of the Bonnet CarreÛ Spillway introduced a substantial amount of freshwater from the Mississippi River into the Mississippi Sound, which is not normally exposed or connected to this riverine system. During this year, dolphin mortalities increased by more than three times over the yearly average from 2014-2018. Other large ecological disasters such as the Deepwater Horizon (DWH) oil spill, hurricanes, and algal blooms also affect dolphins. Therefore, effective management of dolphin health in the MSS is critical for the viability of this important species in the Gulf of Mexico, and it requires science-based decision making and interventions from experienced and qualified experts to manage this resource in the context of the economically vital MSS.

To effectively and sustainably manage this vital species in the MSS over the next ten years, Mississippi State University College of Veterinary Medicine (MSU-CVM) and the Institute for Marine Mammal Studies (IMMS) have developed a comprehensive, science-based plan with the following objectives:

- 1) Determine the threats to dolphin health, including human interactions, in the MSS that result in strandings and mortalities.
- 2) Assess the environmental threats affecting dolphins and their habitat, particularly changes to water quality and salinity, pollutants, and prey availability in the natural habitats of dolphins in the MSS.
- 3) Estimate the abundance and distribution of the dolphin population in the MSS using line-transect methodology for stock assessments.

The Mississippi Sound (MSS) is home to the most critically endangered sea turtle in the world, the Kemp's ridley (*Lepidochelys kempii*), along with other endangered or threatened sea turtle species such as the loggerhead (*Caretta caretta*) and the green sea turtle (*Chelonia mydas*). Juvenile Kemp's ridley sea turtles utilize the MSS for development, foraging on blue crabs that are abundant in the MSS. The green sea turtle, omnivorous at the juvenile stage, forages on sea grass beds and fish prey in this area. Loggerhead sea turtles have been documented to nest on Mississippi beaches from as early as 1990 (Hoggard 1991). In addition, the fertile waters of the MSS support a large recreational and commercial fishing industry as well as an oyster industry. The MSS is heavily impacted by freshwater inputs from large watersheds such as the Mississippi River, Pearl River, and Pascagoula River, by large ecological disasters such as the Deepwater Horizon (DWH) oil spill, and by natural events such as hurricanes and algal blooms. Therefore, effective management of turtle health in the MSS is critical for the viability of these important species in the Gulf of Mexico, and it requires science-based decision making and interventions from experienced and qualified experts to manage this resource in the context of the economically vital MSS.

To manage this vital species effectively and sustainably in the MSS over the next ten years, MSU-CVM and IMMS have developed a comprehensive plan with the following objectives:

- 1) Conduct stranding response/rehabilitation and implement a systematic approach to identify threats to sea turtle health, including human interactions, in the MSS. This includes providing timely response to incidentally captured, stranded, and injured turtles on the Mississippi coast and a systematic approach to determining cause of death.
- 2) Assess the environmental threats impacting sea turtles and their habitat, including investigating changes to noise pollution, water quality, and pollutants in the habitats of turtles in the MSS.
- 3) Evaluate turtle movements, distribution, and habitat utilization using satellite tagging and fecal analysis.

This project would provide sanitary sewer service for the Springwood Subdivision. The project will use individual grinder systems at each residence that will discharge into a small diameter sewer collection system. A proposed sewer lift station at the corner of Oak and Kingswood will pump the sewer through a

The lift station will need upgrades to both pumps and the electrical system to increase capacity. These upgrades are needed due to the possibility of overflows near waterways and wastewater going out into the Bay of St. Louis. Also, pipes and valves will need to be replaced.

This project consists of connecting to a force main that NASA has constructed and continuing to run that force main from the North gate of NASA Eastward to the entrance of HCUA's Northern Regional Wastewater Treatment Plant. It will consist of 5 lift stations and 7 miles of pipe. This will allow for

Title: Monitoring and gauging water quality and habitat suitability by using sentinel species such as dolphins, turtles, and diamondback terrapins as indicators.

Proposed by: Institute for Marine Mammal Studies, Inc. And Mississippi State University-College of Veterinary Medicine

The Mississippi Sound harbors the largest dolphin population in the US and serves as a nursery for baby dolphins. It is a critical habitat for the juvenile Kemp's Ridley that is the most endangered sea turtle in the world. The marshes are home to the diamondback terrapin. All three species are top predators in their respective habitats and thus reflect the health of the ecosystem. The Mississippi sound has been impacted by both natural (hurricanes, floods) and anthropogenic factors (oil spills, dredging, River diversions, pollutants). Millions of dollars are being spent on ensuring that the water quality and the ecosystem is maintained at optimum conditions for the survival of the species that inhabit it. By monitoring the population dynamics and health of the sentinel species and correlating it to the efforts in enhancing water quality will help us not only gauge the success of our efforts but also allow us to adjust our plans accordingly. Basically, we want the sentinel species to tell us how our efforts in water quality management are really working. To accomplish this, we suggest a holistic approach that takes into account the physical, chemical, and biological aspects of the ecosystem. We will use the sentinel species as a barometer to evaluate the condition of the habitat that supports these animals. We will collate the changes in the environment to the changes in the population dynamics and use of the habitat by these species. In summary, these sentinel species (top predator) are doing well, we can be assured that their environment and habitat is appropriate. Changes in the populations will help management agencies to make adaptive changes to their various strategies

IMMS along with MSU has several proposals listed in the RESTORE portal. We plan to combine

The project proposes to add odor control measures to multiple processes within the treatment facility including the covering of existing basins to limit the release of odors within the downtown area.

The Jackson County Utility Authority (JCUA) operates a 10 MGD wastewater treatment plant located in downtown Pascagoula, MS. The plant serves the City of Pascagoula and City of Moss Point resident treating all wastewater to MSDEQ Permit Standards before releasing treated effluent to the Pascagoula River. As re-growth in the area around the plant occurs, the JCUA continues to receive feedback from residential and commercial interests noting pungent odors around the facility. The project proposes odor

- Mississippi has approximately 44 miles of coastline vulnerable to high-energy environments and storm surges.

- Breakwaters can fully dissipate the wave energy, protecting the coastline and beaches.

- Breakwaters can be designed to nourish beaches naturally, creating sand bars around the breakwaters over time.

The Mississippi Coastal Protection Master Plan sets forth a path for the State to respond to the loss of coastal land and the threats from storm surge events. The Master Plan consists of establishing a list of projects that build or maintain land, and reduce risk to our communities. Due to the timing of funding for all projects established, the Master Plan will identify long-term program of design, construction,

The project involves restoring Keegan's Bayou which is located on the south side of the Biloxi Back Bay. The "headwaters" or origin of the Bayou actually reaches into the heart of Keesler AFB. After leaving the Air Force Base the bayou snakes along the south side of Division Street and then turns north and flows parallel to I-110 before entering the back bay. the purpose of this project is to create, restore and enhance coastal wetlands. Additionally the project will enhance public access to natural resources for recreational use.

Restoration activities include removal of marine debris, accumulated sediment, and invasive/non-native plant species. The restore activities will result in a reduction of nutrients being introduced into Back Bay. The sediment removal will result in storm water control and hydrologic restoration. Environmentally appropriate measures to be taken include establishing marsh plants to slow down and disburse roadway run off and storm water discharged directly into the bayou to allow pollutants to settle before outfall into the bay.

A major west Biloxi drainage area begins in Keesler Air Force Base's Drainage Area 9 and runs through the City of Biloxi's Hiller Park. Storm water and debris collects in several retention ponds before flowing into Biloxi Back Bay. A map of the Hiller Park drainage area and outfall is included in this project package. The project focus is two fold. First to control storm water and move it slowly through a series of detention ponds ia a "waterfall effect: thus reducing the amount of nutrients released into the Bay. Secondly the project will involve the planting of march grass and other environmental friendly plants to

Background: The Institute for Marine Mammal Studies Center for Marine Education and Research (IMMS-CMER) is a premier marine education and conservation facility that offers a variety of educational programs designed to meet diverse educational and outreach needs. This mission has been expanded to include Ocean Adventures, a public display facility featuring interactive programming with dolphins, sea lions, birds, snakes, alligators, rays, and sharks. Since opening in 2018 Ocean Adventures has attracted over 100,000 visitors annually. Current educational programs consist of field trips, student summer camps, dozing with dolphin programs, talks and presentations, hands-on interactions with marine mammals, swimming with and feeding sting rays and sharks, interactions with tropical birds, interactions with snakes and alligators, college courses led by our experienced scientists and an opportunity to learn about marine mammals, various fish species, aquatic turtles, snakes, sea turtles and the conservation and research work conducted at IMMS. This exposure is critical in fostering an educational foundation for local residents and visitors to the Mississippi Gulf Coast, to assist them in understanding the importance of conserving the Mississippi Sound and its marine life.

The Mississippi Sound is home to the largest population of bottlenose dolphins in the U.S., as well as critical habitat for the Kemp's ridley sea turtle. Thus, it is critical that Gulf Coast residents and visitors be educated regarding the issues facing this region. Additionally, Mississippi students consistently score low on national tests for STEM fields. By improving and expanding upon the framework that IMMS and Ocean Adventures have established by bringing low income and at-risk students to the facility, and enhancing the organization's outreach capabilities, this investment would impact not only Mississippi's environment, but also its children. Finally, projects aimed at improving local understanding regarding

Audubon Delta proposes to enhance beach management to restore invertebrate infauna and shorebird foraging habitat, particularly for the threatened piping plover. This effort will cost approximately \$442,000 over three (3) years. We believe this matches the MS TIG RP4 program goals of restoring and enhancing dunes and beaches, protecting coastal habitats, and promoting environmental stewardship, education, and outreach.

Migratory shorebirds and seabirds spend the majority of their annual cycle on their wintering grounds (Elliot-Smith and Haig 2020), but for many species, conservation efforts are heavily geared toward improving nest and chick survival on the breeding grounds (e.g., Melvin et al. 1992, Neuman et al. 2004, Burger et al. 2010). However, population growth rates for some shorebird species including Piping Plover (*Charadrius melodus*) are more sensitive to changes in adult survival rates than to changes in breeding productivity (Plissner and Haig 2000, Calvert et al. 2006), and conditions experienced on migratory stopover and wintering grounds can reduce adult survival rates (Roche et al. 2010, Gibson et al. 2018). Furthermore, sublethal events and conditions experienced during winter and migration can result in carryover effects that reduce breeding productivity in the subsequent season (Swift et al. 2020). Thus, understanding ecological factors contributing to survival and breeding productivity in connection with time spent in the wintering grounds is critical.

This project proposes to 1) implement and test the efficacy of beach management techniques to improve habitat quality for Piping Plovers, with Snowy Plovers and Black Skimmers as secondary beneficiaries; and 2) undertake a study to characterize food availability for Piping Plovers across a range of sites in order to inform future restoration and management. Beach management activities will be geared toward reducing human disturbance (which will also benefit Snowy Plovers and Black Skimmers) and enhancing food availability (which will also benefit Snowy Plover).

Goal: Protect and restore migratory stopover and winter habitat for Piping Plover, Snowy Plover, and



Audubon Delta proposes to enhance beach management to restore two one-mile stretches of shoreline at locally recognized "Important Bird Areas" for Least Terns. The effort will cost approximately \$404,000 over three (3) years. We believe this matches the MS TIG RP4 programs goals of restoring and enhancing dunes and beaches, protecting coastal habitats, and promoting environmental stewardship, education, and outreach.

The 26-mile stretch of man-made mainland beach in Harrison County, Mississippi is home to two historical Least Tern sanctuaries which have been designated as an Audubon Important Bird Area (IBA), which is a globally-recognized designation. This IBA, located in Gulfport, holds a significant population of breeding Least Terns, a species which has declined across its range due to habitat loss and degradation. This area was originally designated as a Tern Sanctuary by the Harrison County Board of Supervisors in the mid-1970s in order to protect Least Tern nests from beach raking and disturbance from beachgoers. Two one-mile stretches of beach between Debuys and Cowan roads were fenced off and received signs and dune plantings to improve the habitat. The Sanctuary hosted the largest Least Tern colonies in Mississippi for many years, with numbers reaching up to 3,350 breeding pairs in 1997. Subsequently, the largest colonies began to form in Biloxi, and numbers began to decline coast-wide, particularly after Hurricane Katrina when monitoring and stewardship efforts were put on hold in the aftermath. Audubon Delta resumed coast-wide stewardship efforts in 2014. In that time, a peak of 470 pairs was recorded at the eastern Sanctuary (â€œGreat Southernâ€) in 2016, which dwindled to 18 pairs in 2021. The western Sanctuary (â€œCowanâ€) has generally held 100-200 pairs since 2014.

There are a variety of issues occurring within these Sanctuaries that have degraded the habitat and likely contribute to the decline of Least Tern breeding in this area. This stretch of beach has narrowed considerably, leaving less room for breeding activities. Recent hurricanes have scoured away the dune plantings, destroyed the wooden fencing, and washed away the large â€œNest in Peaceâ€ signs that used to be displayed prominently to inform beachgoers of the purpose of these sanctuaries. The dune plantings

The Mississippi (MS) Gulf Coast is defined by its coastal resources, colorful characters, and rich culture. It is an area where people enjoy the natural, economic, and historical assets of coastal MS. Unique coastal resources include the Grand Bay National Estuarine Research Reserve, Gulf Islands National Seashore, Coastal Barrier Resource System, Grand Bay National Wildlife Refuge and others such as wetlands, barrier islands, beaches, bayous, tidal rivers, and associated flora and fauna. These resources belong to the people of MS and deserve to be conserved. A watershed management approach is necessary to better restore and protect our coastal resources; therefore, we propose the development of Watershed

The City of D'Iberville is planning to execute a series of landscaping projects along the Interstate 110 (I-110) interchanges within the city limits. While landscaping projects provide beautification and cohesive aesthetic, primary goals of the projects will restore approach embankments that are destabilized due to sloughing, reduce sediment runoff, and improve water quality in receiving waterbodies'. The project site is approximately 75 acres, cumulatively. Interchanges included in this project are: I-110 and Rodriguez Street; I-110 and Popp's Ferry Road; I-110 and I-10; and Promenade Parkway/Sangani Boulevard. These interchanges are in the Back Bay of Biloxi (HUC12:031700090605) watershed and the Cypress Creek-Tchoutacabouffa River (HUC12: 031700090407) watershed, which eventually discharges into the Back Bay of Biloxi. Both watersheds are priority watersheds in the Mississippi Department of Environmental Quality's (MDEQ) Mississippi's Nonpoint Source Pollution Control Section 319(h) Grant Program Work Plan for Grant Year 2020. MDEQ's nonpoint source (NPS) program implements strategies throughout priority watersheds in Mississippi to help improve water quality and reduce nutrients in receiving water bodies.

The Back Bay of Biloxi and the Tchoutacabouffa River are listed on MDEQ's 303(D) list (2020 final list and 2022 proposed list) as impaired waterbodies. Total Maximum Daily Loads for fecal coliform were developed for the Back Bay of Biloxi in 2002 and the Tchoutacabouffa River in 1999. While not explicitly stated in the TMDL, published studies show increased surface runoff and sediment in brackish and saltwater environments correlate to increased fecal coliform survival and overall higher fecal coliform concentrations in water bodies. Additionally, nutrients such as nitrogen and phosphorus bind to sediments, increasing fecal coliform concentrations in water bodies as these nutrients are necessary for fecal coliform to survive. Through reducing sediment and nutrient nonpoint source runoff into the Back Bay of Biloxi and the Tchoutacabouffa River, this project will help meet TMDL's established for the receiving water bodies'. In CONTROLLING NONPOINT SOURCE RUNOFF POLLUTION FROM ROADS, HIGHWAYS, AND BRIDGES, EPA noted that roads are a significant pollutant source to receiving water bodies. As stormwater flows over the interstate, it picks up dirt and dust, rubber and metal deposits from tire wear, antifreeze and engine oil that has dripped onto the pavement, pesticides

The City of D'Iberville is planning to execute a bank stabilization and water quality improvement project in the stormwater ditch immediately north of the Boy's and Girls Club east off Lamey Street to Meadow Drive as the eastern boundary. The stormwater ditch is a trapezoid concrete channel west of Lamey Street and is partially concrete rip-rapped and partially natural east of Lamey Street. The natural portion of the stormwater ditch is not stabilized with rip-rap or other measures, resulting in erosion leading to an unstable bank and compromised water quality in receiving water bodies. The project site is approximately 2000 feet long. The project is located within the Back Bay of Biloxi watershed (HUC12:031700090605), a priority watershed listed in the MDEQ Mississippi's Nonpoint Source Pollution Control Section 319(h) Grant Program Work Plan for Grant Year 2020. The program implements strategies throughout the priority watersheds in Mississippi to improve water quality and reduce nutrients in receiving water bodies. Stabilizing the stormwater ditch and reducing erosion at this location is a direct implementation of a project designed to meet the program goals. Furthermore, the use of native species in the project design can help remove nutrients from stormwater runoff. A recent inspection of the project site showed erosion along the top of bank as well as within the stormwater ditch. Furthermore, sediment deposition was seen within the ditch. Concrete portions of the ditch increase velocity of stormwater within the conveyance system causing erosion in the natural channel and increasing the amount of sediment in water. As the stormwater slows down, due to energy dissipation via erosion, sediment deposition occurs. This creates a cycle of high-velocity sediment erosion followed by low-velocity sediment deposition followed by sediment erosion, etc. resulting in portions of the channel showing erosion features while other portions of the channel show deposition features. The stormwater ditch is located within the city limits and is part of the right-of-way owned by the city. As such, the city can execute a project on the site to address the issues of concern. Design considerations and innovative construction techniques may be needed to reduce conflicts between construction equipment and utility lines. The project aims to slow

Living shorelines have been recognized as a beneficial and viable alternative to hardened shorelines by environmental professionals in Mississippi, including MDMR and MDEQ. These projects serve as environmentally friendly alternatives to hardened shorelines, such as bulkheads and seawalls, because they protect shorelines from erosion, provide habitat, improve water quality, protect properties from storm damage, and increase coastal resiliency. Additionally, unlike a hardened shoreline, living shorelines, when properly implemented, can be self-sustaining for their lifetime, requiring little to no upkeep following construction. In fact, several of the RESTORE funded projects are focused on installing large-scale living shorelines along federal or state-owned shorelines. However, the vast majority of coastal property is privately owned; therefore, to maximize the benefits of living shoreline projects, there must be buy-in from private property owners. Two of the biggest reasons for lack of living shoreline adoption at the private property scale are the lack of living shoreline knowledge and the cost of installation. While living shoreline projects are similar in cost or cheaper than hardened shorelines, most property owners are reluctant to spend large sums of money on an unfamiliar concept. Additionally, contractors are more familiar and comfortable with installing hardened shorelines; therefore, they are reluctant to push living shorelines over hardened techniques. A technique that has been extremely successful for terrestrial best management practices (BMPs) are cost-share or assistance programs. The Natural Resource Conservation Service (NRCS), and other agencies, have numerous of these programs focused on encouraging BMPs that improve downstream water quality (e.g., stream buffers, etc.) and promote conservation (e.g., invasive species treatment, longleaf pine planting, etc.). However, none of these programs currently exist for living shoreline programs in the Gulf of Mexico.

To address these issues, a team of living shorelines experts from the Mississippi State University Coastal Research and Extension Center (CREC) propose to 1) increase knowledge of living shorelines for both property owners and contractors and 2) setup a living shoreline assistance program. Knowledge of living shoreline projects will be increased through property owner and contractor workshops. Topics covered in these workshops will include the concept of living shorelines, benefits to the property owner and

Situation: The northern Gulf Coast freshwater marsh vegetation is being significantly impacted by an invasive species of snail commonly called the Apple Snail or "Ampullariidae". This very prolific snail feeds on the natural and other critical marsh grasses within these crucial wetlands that act as filters for the downstream saltwater marshes that were impacted by the oil spill. Coastal restoration involves not only the direct impact areas but also the supporting wetlands that are necessary for the continuation of the natural processes overall.

Other areas along the coast are currently being surveyed with active management activities ongoing to control the impact and spread of this invasive species, however, this intruder is currently impacting the lower reaches of the the Pearl River basin with very little management or control activities being employed. The Pearl River discharges into the Louisiana and Mississippi marshes impacted by the oil spill.

Proposal: Employ resources necessary to initiate an effective management and control plan addressing this problem species and their impact on the critical marshes, to include at a minimum:

- Establishment and documentation of the target areas for plan focus within the primary discharge marshes of the mouth of Pearl River via on site surveys, especially during active egg mass production. It is anticipated that the initial target areas would be focused within the primary discharge freshwater/saltwater interface from the Pearl.

- Removal of egg masses, necessary for reproduction, within the identified areas.

- Removal and destruction of captured live snails, trapping and hand capture.

- Identification of the prime food sources of the snails and performing targeted control of the spread of the invasive plants and grasses preferred by the snails.

- Establish a Geographic Information System (GIS) database for field documentation of findings and

This project will address a vital drainage connection between Government Street, a major east/west corridor, and Davis Bayou via the Myrtle Avenue neighborhood. Eight (8) sections of open ditch totaling 9,600 LF (1.2 miles) within City easements will be addressed with the goal of reducing nutrient and sediment from discharging directly into the sensitive Davis Bayou ecosystem. These drainways, directly impacting an estimated 5.5 acres, outfall at two locations directly into Davis Bayou and connect a primary east/west connection between commercial and medium to high density residential.

This project will address a vital drainage connection between Government Street and Davis Bayou within the eastern area of Ward 4, just south of Clay Boyd Park and on the west side of Government Street as it curves south. Nine (9) sections totaling 10,070 LF (1.9 miles) of open ditch within City easements will be improved with the goal of reducing nutrient and sediment from discharging directly into the sensitive Davis Bayou ecosystem. These drainways, directly impacting an estimated 5.8 acres, outfall at two locations directly into Davis Bayou.

This project consists of 4 sections totaling 2,085 LF (0.4 miles) of open ditch within City easements beginning in the western area of Ward 4 and crossing into Ward 2. The drainway, which outfalls at four locations directly into Weeks Bayou, will require about 75% clearing and stabilization to allow for staging sediment control along the entire length of the ditches. These control points will reduce nutrient

NOAA Project ID# 14865 I own 192 acres that in the 1950's there was a gravel operation here. They dug three lakes and they diverted 3 waterways and cut a drainage ditch to drain the 40 acre Cypress Tupelo swamp. As a result, all wetlands downstream and adjacent properties have been severely ecologically affected. I have contacted MDEQ,EPA,USDA and some of their partnering organizations about a collaborative project to control non point pollution from stormwater by collecting and removing sediment with experimental engineering techniques. The water will then flow through the oxbow then feed the the lake I'm going to make from the three gravel pits. This lake will be developed to target whatever species are best suited to thrive in the new created environment. Then the water will be directed to restore downstream degraded wetlands and will protect and enhance endangered species habitat.

As I said, I've contacted several organizations however I believe the more experienced people or organizations that can develop help plan or give input would only result in a plan that works as intended when applied.

This project will solve several water control issues that affect down steam areas.

Targeted Goals

Nonpoint source pollution- sediment removal by innovative and experimental techniques to learn the most effective, practicable and cost effective ways to implement on bigger projects.

Restore 40 acre oxbow by blocking drainage ditch.

Install wood duck boxes before filling old oxbow

Build a boardwalk before filling oxbow for bird, aquatic life studies and educational and recreational purposes.

Dredge gravel and sand from three old pits and turn into 1 lake that is structurally set up for targeted species. I.e. rock spawning areas and underwater habitat. When river rises species can be allowed to swim into adjacent waterways.

Build a small facility for educational purposes and for biologist if needed for the fish lake.

only allow kids to fish.

NOAA Project ID#14775 - Estuarine habitats of the Northern Gulf of Mexico (GOM) and their inland freshwater rivers provide critical ecosystem function and population stability for many commercial, recreational, and endangered aquatic species. Management of these ecosystems in support of species and their habitats is complicated based on changing environmental conditions as a result of anthropogenic factors such as dams and diversions, changing climate, water use, temperature changes, and rising sea levels. Many accounts highlight the uncertain forcing influence of freshwater inflows on estuarine environments, habitat variation, and ultimately populations of species. Understanding and predicting how freshwater inflows influence environmental change, and aquatic species, is a primary objective for partners managing and restoring resources in the GOM. The influence of climate on future hydrologic regimes and biota present high levels of uncertainty to managers; recognizing how uncertainty influences decision-making can inform restoration and resource management choices. Date Entered May 6, 2021 Edited Jul 9, 2021

This project will develop predictive decision tools that will couple extant fishery-independent monitoring data from partners with USGS streamflow models under various climate and sea level rise scenarios. The Pascagoula, Pearl, Mobile, Choctawhatchee, Apalachicola, and Suwannee River basins (and associated bays/Mississippi Sound) of the Gulf of Mexico are critical habitats for the Threatened Gulf Sturgeon. Development of decision tools in these basins will serve as the basis for restoration and adaptive management of Gulf Sturgeon populations and will be applicable to other euryhaline species. All basins are associated with various Marine Protected Areas and/or extensive State and Federal protected lands within their watersheds, and each have different levels of river disturbance (e.g., dams, diversions, dredging) and impacts from coastal development (land-use).

Basin-specific populations of Gulf Sturgeon will be the primary focus of this project. The species is long-lived and utilizes riverine, estuarine and marine habitats in the GOM, depending on life history stage. River flow rates for spawning habitat and inflows that support juvenile prey communities are key factors influencing the Gulf Sturgeon ecology; life history success is dependent on basin-specific hydrologic variation. The project will investigate other key euryhaline species with varying life history

NOAA Project ID#14769 The estuarine and marine habitats in the Gulf of Mexico are critical to a successful life cycle for a wide variety of commercially and recreationally important and at-risk, threatened, and endangered aquatic species. Complicating the management of these habitats in support of these aquatic species are changing environmental conditions as a result of anthropogenic factors such as water use, temperature changes, and rising sea levels. There is a need for the ability to understand and predict how these environmental changes affect these aquatic species. Matagorda Bay and Pascagoula, Pearl, Apalachicola, Choctawhatchee, and Mobile rivers of the Gulf of Mexico are important nursery habitats for many of these aquatic species. These bays are associated directly and indirectly with various Marine Protected Areas as defined by the National Marine Protected Areas Center, a partnership between NOAA and Department of the Interior.

The Gulf Sturgeon is a long-lived, euryhaline fish species, that has juveniles that use these bays as nurseries that can tolerate salinities from freshwater to marine. Gulf Sturgeon populations are currently considered threatened throughout the Gulf of Mexico and were considered to be injured by the Deepwater Horizon oil spill. Consequently, the species is the subject of multiple Natural Resource Assessment Damage studies focused on long-term population dynamics and movement of juvenile and adult fish. Population trends are variable in different river basins and populations are more stable in the eastern basins. These data indicate that basins should be restored or managed differently to enhance survival of the different natal populations. Gulf Sturgeon are anadromous, thereby they use diverse habitats ranging from riverine to estuarine to marine; management actions in each of these habitats may influence population structure. Habitat use varies ontogenetically where juvenile sturgeon primarily inhabit estuaries and year-class strength is thought to be related to riverine flows during spawning and early life history stages.

Reducing uncertainty regarding how freshwater inflows influence growth of juvenile Gulf Sturgeon



NOAA Project ID#14787 The Deepwater Horizon Oil Spill caused injury to species, habitats, and ecological function across the Gulf of Mexico (GOM) region. In response to the disaster, the RESTORE (Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies) Act of 2012 established the RESTORE Council as the administrative body that oversees expenditure of funds toward planning for a regional approach to the “long term health of the valuable natural ecosystems and economy of the Gulf Coast region.” The guiding plan (RESTORE Council Comprehensive Plan Update 2016) tasked a workgroup (Council Monitoring and Assessment Work Group; CMAWG) to develop monitoring procedures, standards and an adaptive management (AM) plan to evaluate success of on-the-ground projects and inform future decisions for project implementation. Many decisions by the Council will likely be made in the face of various sources of uncertainty” or knowledge gaps” associated with project selection and/or the potential success of implemented restoration actions. The Council would benefit from explicit methods to incorporate uncertainty of different types in their decision-making; structured decision-making and adaptive management provide both frameworks and methodology to do so.

One of the most comprehensive ongoing restoration and management efforts with regard to natural resource injured by the oil spill, is the case of Gulf Sturgeon. Gulf Sturgeon are a federally Threatened species that has been subject to an ongoing recovery plan led by USFWS and NOAA Fisheries since 1991. The species is a bottom feeding, anadromous fish that occupies shallow unvegetated habitats that range from marine to coastal freshwater rivers where they spawn. Their current (reduced from historic) range spans from the Suwannee River, FL to Lake Pontchartrain, LA; eight coastal rivers are used as spawning and nursery habitats. Critical habitat is designated as 14 distinct geographic areas of the GOM, along with its rivers. Monitoring projects have been funded by NRDA and implemented Gulf-wide and long-term data from historic and current efforts have been organized in a consolidated database. In 2025, NOAA and USFWS will prepare a Species Status Assessment (SSA) to determine if the species can be delisted.

NOAA Project ID#14831 Intertidal habitats, such as marshes, provide a multitude of benefits that are integral to maintaining healthy and resilient coastal ecosystems. These benefits include, but are not limited to, filtering nutrient pollution and improving water quality (Sparks et al., 2015), providing habitat for commercially and recreationally important species of fish and shellfish (Beck et al., 2001), sequestering carbon (McLeod et al., 2011), and reducing storm damage (Arkema et al., 2013). Even with these known benefits, intertidal habitats have been lost through time due to coastal development and underappreciation for the functions and services they provide, among other reasons. One of the major reasons for this loss is the increased prevalence of hardened shorelines.

Hardened structures, such as bulkheads and sea walls, have been the standard for stabilizing shorelines for decades. However, these hardened structures can do more harm than good. Shoreline hardening destroys critical intertidal marsh habitat (Douglass and Pickel 1999), can increase shoreline erosion (Smith et al., 2019), and is vulnerable to failure. There are more cost-effective and sustainable alternatives to hardened shorelines that utilize natural elements, such as marsh plants and invertebrates, to provide numerous benefits (Narayan et al., 2016). Shoreline projects that incorporate conservation or restoration of natural elements have been collectively termed "living shorelines." Like hardened structures, living shorelines stabilize shorelines, but they do so by using plant roots and other living components to anchor the sediment in place. Unlike hardened shorelines, living shorelines also improve water quality, increase fish and shellfish production, and provide habitat to several different species of birds and sportfish (Gittman et al., 2016). Additionally, living shorelines are typically cheaper to install and have been proven to be more resilient to storm events than hardened shorelines (Smith et al., 2018).

The primary goal for this project is to develop and implement strategy encouraging waterfront property owners to conserve and restore intertidal habitat within their riparian rights zone (i.e., on state-owned water bottom) through choosing living shorelines over hardened alternatives. Given that the vast majority

NOAA Project ID#14824 Remove the low-level dams associated with the now non-functional Pearl River Navigation Project. This project is already in the project inventory and should proceed. It would reopen the Pearl and Bogue Chitto Rivers to surgeon spawning, would have other ecological and recreational benefits. It has little if any negative impacts and has been endorsed by the U.S. Fish and Wildlife Service, and the Louisiana Department of wildlife and Fisheries. The current project description in the inventory of projects is well-done. Evidently some planning and design work is underway, but

NOAA Project ID#14764 Capturing and use N+P effluents at nonpoint sources before entering waterways and using the effluents to grow algae for biofertilizer and other potential algae bio-based products.

- Capturing algae blooms and HABs on waterways/waterbodies, recycling and replacing with clean water, taking tonnage of algae bloom and HAB biomass to shore for further dewatering and processing into potential products. (using slow moving boats and vessels, frac tanks, etc.)

USDA grants are available to farm drainage sites for demonstration pilot tests at nonpoint sources.

Decades of research, testing and monitoring algae blooms and HABs 'alone' have not fixed any of these devastating water quality problems. NAA is taking an end-to-end holistic approach to helping to fix

NOAA Project ID# 14743 The drastic declines of oyster populations globally and regionally in the northern Gulf of Mexico (GOM) has resulted in the loss of many valuable ecosystems services, reduced harvest for the fishery itself, and has stripped estuarine systems of important habitat for many ecologically and economically important species. Natural and restored oyster reefs have demonstrable enhancement of secondary consumers; however, implementation of artificial and oyster reef enhancement have shown conflicting results in terms of oyster production and fisheries enhancement. In terms of enhancing sustainable oyster production, resource managers have recently looked to the use of aquaculture techniques to help augment production from natural reefs. The most common form of culture being implemented in the northern GOM is in the form of off-bottom oyster culture.

Off-bottom oyster production is on the rise in Mississippi, Alabama, and Florida waters. However, selecting suitable locations for off-bottom culture is complicated in Mississippi and Florida waters because much of the suitable habitat is federally designated critical habitat for Gulf Sturgeon (GS). The Endangered Species Act (ESA) requires that actions that may alter habitat characteristics (substrate composition, macroinvertebrate prey density) be formally assessed for potential influence to GS populations. Unfortunately, the Gulf Sturgeon Recovery Plan (USFWS, 2009) acknowledges that the bulk of science related to GS habitat dependency is based on eastern GOM habitat data. Data regarding the relative importance of silty substrates and oyster reefs that dominate western GOM habitats is lacking; thus, the current review/design of oyster restoration and culture projects is more dependent on 'speculation' of GS habitat rather than 'knowledge.'

Furthermore, the use of off-bottom culture has the potential to either attract or repel nekton, including

NOAA Project ID#14859 Cease erosion and restore Wetlands along the Louisiana's Gulf Coast and other Gulf States Shorelines with a concept and application which may ease Global wetland erosion and restoration.

This proposal is for establishment of a 501c3 which would then allow for Beta testing of scale which

NOAA Project ID# 14828 This is merely a comment from a concerned citizen with regard to our planet and it's inhabitants. I feel assured that the trustees and the involvement of other individuals that understand and have a thorough knowledge of the situation will do the very best that they can to provide restoration and recovery of the entire Gulf regions plant life, sea life, turtles and birds while monitoring and protecting the process and progress of the region from trash, debris, predators, beachgoers plastic and

NOAA Project ID#14811 Seabirds were the group of birds most negatively impacted by the Deepwater Horizon Oil Spill (DWH) and are critically important inhabitants of productive marine ecosystems globally, where they often play key roles as high trophic-level predators. As a result, many of these species are also of conservation concern. Their nesting colonies, which for the most part do not occur in the lower 48 states, are sensitive to predators and myriad negative anthropogenic factors. To date, large-scale restoration work has occurred across the Gulf of Mexico. It has provided new nesting habitat or restored poor habitat for many breeding near-shore seabird species such as Brown Pelicans and Black Skimmers. However, pelagic seabirds that breed outside of the Gulf have received less attention, particularly those that nest outside the United States.

In response to the Open Ocean TIG call for proposals, we offer a programmatic effort to implement Caribbean breeding colony restoration, management, and monitoring for pelagic seabirds lost during the DWH. The DWH spill caused quantifiable (scaled) injury to Audubon's Shearwater, Magnificent Frigatebird, Sooty Tern, Bridled Tern, Brown Noddy, Masked Booby, and White-tailed Tropicbird that nest on Caribbean Islands. Here, we recommend a multi-species restoration approach that will occur in three phases. Opportunities for effective restoration actions for colony nesting seabirds during the non-breeding season are minimal and, because they are logistically challenging, have low probabilities of success (e.g., managing prey fish species over large spatial scales; see Jodice et al. (2019), <https://gomamn.org/wp-content/uploads/2020/02/chapter6-1.pdf>). Thus, our efforts are focused on breeding colonies.

Phase 1 will occur in the first project year and is the restoration planning phase. Using existing information on breeding colonies throughout the greater Caribbean, we will identify colony locations that maximize the number of breeding pairs for scaled restoration across the DWH-impacted species. Emphasis will be placed on colonies with tractable restoration issues with baseline population data that will deliver the greatest likelihood of providing quantifiable and ecologically relevant bird-year gains within the breeding populations. Phase 2 will constitute the implementation of these restoration activities.

NOAA Project ID# 14808 This project will focus on the removal of goats, dogs, cats, and potentially rats from Navassa. It will involve a preliminary trip to determine densities of target species as well as a total of as many as four trips to conduct the actual eradication of the first three species. Removal of these species will be accomplished through hunting and trapping. Because rats are present on the island, during these visits an assessment of the status of the rat population will be conducted. If determined to be feasible, eradication will be undertaken, potentially involving aerial application of rodenticide pending environmental evaluation and compliance.

The Navassa NWR was established in 1999 and is administered as part of the Caribbean Islands National Wildlife Refuge Complex. The island itself is approximately 500 ha in size but the refuge also includes marine habitat within a radius of 12 nautical miles. The island's vegetation is evergreen woodland/forest comprised of four main tree species. A second major habitat is the fan palm forest that occurs in stands throughout the island. Historically, the island supported a herpetofauna that consisted of 8 endemic reptiles, of which four species are extant. Fifty-eight species of birds have been recorded for Navassa. The island is important for breeding seabirds, in particular the Red-footed Booby (*Sula sula*), the Magnificent Frigatebird (*Fregata magnificens*), brown booby (*Sula leucogaster*), and the White-tailed

NOAA Project ID#14803 A recent DWH oil spill assessment of injury to seabirds indicated that northern gannet, Audubon's shearwater, and great shearwater were the top three species highly impacted by the DWH oil spill. The DWH Open Ocean Trustees will consider restoration actions across the Gulf of Mexico, as well as in non-Gulf areas where injured bird species migrate or breed. Incidental catch of seabirds in pelagic longline (PLL) fisheries is a growing global concern (Brothers et al. 1999, Gilman et al. 2014, Li et al. 2016). Northern gannet and great shearwater are among the most commonly identified species in the PLL fishery. Although bycatch of Audubon's shearwater has not been reported by the Pelagic Observer Program (POP), it is likely to have occurred without observation because of low population size combined with the low observer coverage of the PLL fishery (Zhou et al. 2019). The US Atlantic POP, which started in 1992 and covers about 6.5% of annual longline effort, offers a unique opportunity to assess the impacts of fishery operations on seabird populations in the western North Atlantic and inform the process of mitigation.

A problem of the Atlantic POP and other PLL monitoring protocols is the mismatch between the stage of the fishing operation where most seabird-fishery interactions occur (at gear deployment) and where by-caught seabirds are recorded (at gear retrieval). Seabirds caught at gear deployment are likely dead or bearing sustained injuries upon retrieval due to exposure during the remainder of the set, the soak and the haul. Furthermore, the bird is more likely to have fallen off the hook or been eaten by predators and so not recorded than one caught on the haul, causing underestimation of the bycatch total.

Seabird bycatch risk may respond differently to fishing tactics at different stages. Interactions between seabirds and longline operations can be highly species-specific and related to regional differences in longline rigging and operating strategies (Zhou et al. 2020). Northern gannets reported as bycatch are often found alive, but no assessment of the degree of the injury is made after release. The great shearwater bycatch is usually dead. The current POP protocol is inadequate to provide complete observations on risk factors associated with seabird bycatch. Therefore, a field study on the Atlantic PLL fishery is necessary to examine seabird-fishery interactions during gear deployment and calibrate the

NOAA Project ID#14805 A recent DWH oil spill assessment of injury to seabirds indicated that northern gannet, Audubon's shearwater, and great shearwater are the top three species that were highly impacted by the DWH oil spill. The DWH Open Ocean Trustees will consider restoration actions across the Gulf of Mexico, as well as in non-Gulf areas where injured bird species migrate or breed. Incidental catch of seabirds in pelagic longline (PLL) and gillnet fisheries are the main bycatch concerns (Brothers et al. 1999; Gilman et al. 2014; Li et al. 2016; Hatch 2017). Bycatch of northern gannets and great shearwaters has been reported in PLL, gillnet, and other fisheries. Bycatch of great shearwater in the gillnet fishery is one to two orders of magnitude greater than that of nine other seabird species examined by Hatch (2017). Great shearwater is the number one named seabird species in the observed PLL bycatch, and northern gannet, with herring gull, is number two. Although the bycatch of Audubon's shearwater has not yet been found in the observer programs, it may be because of this species' low population size and the low observer coverage (Zhou et al. 2019). Seabird bycatch in longline fisheries has contributed to population declines of several albatross species (in the family Diomedidae) and shearwater species (in the Procellariiformes order) (Croxall et al. 1982; Tasker et al. 2000; Belda and Sanchez 2001; Furness 2003). Direct mortality of seabirds occurs when they get hooked or entangled and are drowned as hooks sink, which may also cause indirect mortality of chicks if one or both parents are killed during chick dependency (Brothers et al. 1999; Gilman 2001).

Seabird bycatch events are heterogeneous along the western North Atlantic (WNA) and Gulf of Mexico (GOM) with some locations and seasons having high probabilities of bycatching seabirds. Analyzing hotspots of bycatch events will help captains and fisheries managers to mitigate bycatch. A hotspot analysis, which includes both locations and times with high probabilities of bycatch, recently was conducted with pelagic longline data on observed seabird bycatch from the eastern seaboard from North Carolina to New England. Hotspot locations seemed to change among years and co-vary with large-scale climate oscillations (Bi et al. 2020). Initial findings led to simulation modeling studies to find ways to redeploy fleet effort to reduce seabird risk without losing fleet revenue.

## NOAA Project ID#14798 Description of Innovation

Aquaculture for stock enhancement is a valuable conservation tool when done correctly. Since the species produced in an IMTA are different by nature different places, they require totally separate production systems with little overlap or synergy from a production standpoint. With real-time monitoring and data analysis, we intend setting the stage for the next generation of aqua-culture systems that are better for fish, better for people, and better for the planet.

These are the plans we will implement in constructing our Open Ocean IMTA to ensure we meet the SDG's set out by FAO.

Remote Site Selection Studies will combine remotely sensed data from satellites, ocean buoys or models to analyse the optimal location for an open ocean IMTA farm.

In-Situ Site Characterization On-site research that examines the physical parameters at the site to help develop the lease application and the design of our grid system.

The Species Selection Exam will price points, production cost estimates and supply and demand data for key markets to evaluate location-specific production challenges for several key species we want to include.

Deposition Model will be done to incorporate in-situ ocean current data with projected production volumes, farm layout, feed rates and digestibility coefficients to estimate the farm contributions to benthic nutrient loads.

Carrying Capacity Model will also be draw up to investigate how the farm layout, species and feeding regime will impact local environments considering neighbouring sites and oceanographic conditions.

Farm Level Economic Analysis done will Project capital and operational costs to help create a pro forma financial statement, balance sheet, cash flow projections and ROI calculations for each phase of a project.

The Biological Plan created will contain species and location-specific biological plan based on growth rates using local temperatures and species feeding rates to produce a production timeline and harvest schedule.

NOAA Project ID# 14781 Great Shearwaters (*Ardenna gravis*, GS) are long-lived, bi-hemispherical migrants that are among the offshore species most impacted by the Deepwater Horizon (DWH) oil spill. Their habits of rafting on the surface for extended periods, making foraging flights within meters of the water's surface, and feeding in the top few meters of the water column make them particularly vulnerable to oil spills. Importantly, as long-lived top predators, GS tend to accumulate contaminants, such as those released during the DWH oil spill. In addition, GS suffer the highest fishing related mortality of any seabird in the North Atlantic, including NOAA's Stellwagen Bank National Marine Sanctuary (SBNMS). Our project focuses on the Open Ocean Fund priorities to Conserve bird foraging habitat and Prevent incidental bird mortality. Our international team consists of the world's top scientists involved with GS research.

The proposal seeks to continue Platform Transmitting Terminal tracking studies of GS in NOAA's SBNMS and Gulf of Maine (GOM) (n = 68; 2012 – 2019), while expanding into other parts of the species winter range, including the Scotian Shelf, coastal areas of Newfoundland, and the Grand Bank. We will also collaborate with southern ocean scientists to use existing unpublished data (n=83; 2009 – 2014) to map movements in the southern oceans and from the breeding grounds north. Together existing and new data will be modeled to produce habitat suitability models and maps which will be used to assess risks to pelagic seabirds to current and proposed oil and gas activities and commercial fishing operation in the North and South Atlantic. This will include testing a new hypothesis of age-specific habitat use differences in the North Atlantic. Since there are population level impacts to age specific mortality, this finding would have important conservation implications.

We will also investigate captured birds for food habits using stable isotope analysis of blood and feathers, and direct prey identification through fecal DNA. These data will identify the forage species needed by GS, which will benefit management decisions directed at forage fishes. For example, our identification of GS being dependent on sand lance in the GOM supported regulations promulgated in Massachusetts and Rhode Island to limit sand lance landings, thereby discouraging the development of a commercial fishery such as exists in the North Sea and has been shown to negatively impact seabirds.



NOAA Project ID#14494 Common Terns were among the bird species that suffered high mortality from the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. Common Terns migrating through the Gulf of Mexico are known, from migration tracking data, to originate in breeding areas in Manitoba. A relatively large breeding population occurs in Manitoba with an estimated 8,000 pairs in colonies in the three largest lakes (Winnipeg, Manitoba, and Winnipegosis) and substantial numbers (thousands of pairs) nesting across the thousands of lakes within the extensive Boreal Forest biome of Manitoba and adjacent regions of northwestern Ontario.

Conservation Partners: The Seal River Watershed Alliance is a coalition led by five Indigenous governments who are working to establish a new 12-million-acre protected area in northern Manitoba. This immense watershed is currently unprotected and contains within it more than a thousand lakes, 35 of which are larger than 6000 acres in size and support nesting colonies of terns. Misipawistik Cree Nation is working to establish a separate 1.5 million acre protected area along the northwestern shores of Lake Winnipeg, where there are large numbers of nesting Common Terns. Pimachiowin Aki Corporation (a not-for-profit charitable organization), comprising Bloodvein River, Little Grand Rapids, Pauingassi and Poplar River First Nations, and the provinces of Manitoba and Ontario, has established the largest terrestrial UNESCO 'mixed' cultural and natural World Heritage Site in North America (7 million acres) straddling eastern Manitoba and northwestern Ontario. Pimachiowin Aki is located on the eastern shores of Lake Winnipeg where there are large Common Tern nesting colonies and also includes several large interior lakes and four free-flowing rivers within its boundaries.

Actions: Local Indigenous Guardians in these areas would: 1) develop and distribute educational materials to reduce human disturbance of Common Tern and other waterbird colonies; 2) deploy signage and deterrents at colonies to reduce human disturbance; 3) regularly patrol waterbird nesting islands and surrounding waters; 4) establish new colonies in safe, protected areas using social attraction

NOAA Project ID#14492 A long-standing challenge for addressing oil spill injuries to migratory bird populations is that some of the most effective restoration activities may not be at the site of the spill, but at places where birds spend time during another period of the year. For example, restoration of breeding habitat may increase productivity and, thus, population size more quickly than restoration of migratory stopover or wintering locations. While the opportunity for off-site restoration is well understood, the implementation of these projects is often limited by information on where birds injured during one period of their life cycle can best be targeted during other periods of the year. This project would produce a tool that would allow Gulf Coast managers to identify where off-site restoration or protection activities can provide the greatest benefits and guide long-term monitoring to evaluate the success of these activities.

Our proposed work will develop an open-access web-based mapping tool that identifies important areas for Open Ocean TIG Priority Species across their full annual cycle. The tool would be developed by integrating bird tracking, band recoveries (and other resightings of marked birds), and distribution maps. For each species, we will develop maps that identify priority breeding areas, describe migratory movements between breeding and wintering grounds, categorize important stopover areas, and document wintering areas that are connected to the priority breeding areas. These results will be presented in a web-

NOAA Project ID#14491 The Bahamas offers the best opportunity to recover 100% of the Audubon's Shearwater (AUSH) and many other seabirds that breed in The Bahamas and were impacted by the Deepwater Horizon oil spill. Sustainability of the efforts requires in-country capacity to be built and seabird colony management integrated into the National Protected Area System.

Management of National Parks in The Bahamas is the responsibility of The Bahamas National Trust (BNT). To reduce investment risk, Audubon will administer and manage funding, and partner with BNT and Island Conservation for implementation and training. The approach is based on a successful program that has created protection in the Bahamas for more than 30% of the Atlantic Piping Plover breeding population.

Previous seabird restoration attempts, while initially successful, have not been sustainable as they have been conducted outside of protected areas offering no reason to continue the work. By focusing on improved capacity (currently no capacity exists) and management plans within the protected area system, we can recover AUSH sustainably. Protected areas often lack active management for nesting seabirds and suffer from invasive predators, such as rats, that cause reproductive failure and colony abandonment.

Invasive vegetation and disturbance can be equally damaging. Restoration of the seabird population will build through a phased approach “ starting with the restoration of nesting sites in protected areas that are accessible and staffed, with more remote locations like Cay Sal Marine Protected Area with higher ROI when capacity has been built in phase II or III. All of the locations identified in this proposal are Marine Important Bird Areas by BirdLife International

Sustainability of the project will be a major focus. We plan to achieve this through 1) focusing on National Parks and marine protected areas; 2) building local technical and organizational capacity; and 3) building economic models within local communities and management agencies that help underwrite

NOAA Project ID#14490 Tern species that use the Gulf of Mexico during the non-breeding season and nest elsewhere had some of the highest estimated mortalities incurred following the BP oil spill.

Common Terns that breed in the Great Lakes region and migrate through or overwinter along the Gulf of Mexico were exposed to oil through physical contact and by consuming contaminated prey. The population of Common Terns that nest in the Great Lakes region haven't recovering fully because of numerous challenges on their breeding grounds that limit productivity.

Common Tern breeding populations in the Great Lakes have suffered steep declines in recent decades due to record high Great Lakes water levels and loss of natural-island nesting sites. Due to loss of natural breeding sites, this species is becoming increasingly dependent on artificial nesting habitat. Common Terns are listed as state endangered, threatened, as a species of concern, or have been extirpated in all the Great Lakes states and provinces. There is an urgent need to provide sustainable and resilient nesting sites for this breeding population to survive. In addition, UMRGL Joint Venture identified a need to coordinate regular monitoring at high priority breeding sites to determine trends in population and site usage and causes behind mortality and colony site abandonment.

We propose a three-phase approach to Common Tern conservation.

In the first phase, we will assemble and coordinate a Great Lakes tern conservation-working group that prioritizes Common Tern restoration in locations where Black Tern, Caspian Tern and/or Forster's Tern colonies exist. Working group partners will include managers, experts, community groups, tribes, and others with local and indigenous knowledge and the ability to collaborate. Resources will be shared at annual working group meetings to collaborate on management strategies and monitoring protocols.

Phase 2 will include creating, maintaining, and disseminate best management practices to promote successful and sustainable tern colonies, centralized monitoring databases, and standardization and documentation of data collection to ensure consistency of protocol implementation and data quality. We will provide funding for partners for managing threats at colonies. Threat management such as predator deterrence for Common Terns may benefit other species of conservation concern that breed in proximity

NOAA Project ID#14737 There is no conclusive data on the impact that this oil spill has had on the environment of the Gulf Coast. Therefore, a priority of this council should be to ensure that oil spills of this magnitude are mitigated in the future. How many more oil spills will it take before marine life is totally devastated? Since there is no good answer to this question. Please consider options such as the ones below toward making companies like BP more accountable.

Monitoring by independent agencies (non-government) for all drilling sites on a monthly/quarterly basis. It may be that these agencies would have to be established in order to be independent of government control. These oil companies have way too much money and are always lobbying Congress to get around regulations. If inspections are substandard, then Inspections are pointless.

Substantial fines and penalties for above mentioned safety violations. These fines and penalties would be non-tax deductible for the company.

Severe fines and penalties for any oil spills. Again, any fines and penalties would be non-deductible for

NOAA Project ID# 14563 The Texas Oyster (Center) represents a very timely and exceptional opportunity to provide the scientific leadership to assure the restoration and continued health of Texas oysters. The Center will be the first of its kind in the United States dedicated to management, science, and conservation of oysters through aquaculture. The goal is to produce one billion oyster larvae a year to support development of oyster mariculture; enhance oyster reef restoration; and accelerate estuarine ecosystem recovery following disasters like hurricanes.

The focus of this Center will be the enhancement of oyster reef health through aquaculture and reef restoration. The Center will provide outreach and training to Texas residents for long-term environmental health of the Gulf Coast. Our intention is to improve resilience of the Texas coast to environmental depredations (e.g., hurricanes, excessive freshwater inflow), over-fishing of oyster reefs, and catastrophic human-induced disasters such as the Deep -Water Horizon oil spill. The Center will represent a collaborative effort among various research groups within HRI, all of whom are invested in assuring the well-being of the Gulf of Mexico: Marine Resource Development, Coastal Conservation and Restoration, and Socio-Economics.

The Center brings together a diverse group of experts in the areas of sustainable fisheries hatchery production, fisheries science, restoration ecology, and marine science outreach and education. Apart from being a consumable fisheries product, oysters play a critical role in the provision of long-term ecological services for residents of Texas. The Gulf Coast is critical to the economy of states along its shores as well as the U.S. economy as a whole. The success of these regional economies is tied closely to the sustainability of fisheries in bays and estuaries it encompasses.

The Ed Rachal Foundation (ERA) in partnership with the Palacios Marine Agricultural Research Organization (PMAR) and Harte Research Institute (HRI) Corpus Christ, Texas area, are constructing two facilities with the following specific goals: 1) to restore and develop new critical oyster reef habitat for promotion of environmental health and sustainability of estuaries; 2) to provide oyster larvae, spat on shell, and seed oysters for development of oyster aquaculture along the Texas coast to replace destructive fishing efforts; and 3) to ensure responsible stewardship of Gulf Coast resources for future generations

There are places in Harrison County where the water comes over the existing seawall in just a small rainstorm and/or a small tropical depression. With the on going rising tides do to Global warming, it is past time to dredge sand back onto the beach at least 500 feet from the seawall. If this project is not done within a year or two from this date, there will be a time in the very near future, when the rising tides will wash away Highway 90 in Harrison County. The Restore Act funds should be used for this Vital Project before Any and All other projects. If Mississippi loses Highway 90 to Rising tides, All of the Casinos, Restaurants, Hotels and other businesses will be lost and cause a Enormous Economic impact not only to Harrison County, but to the State of Mississippi. There are Thousands of individual Residential Homes

LOC COUNT Y	ECO RESTORATION	WORKFORCE DEVELOPMENT, RESEARCH & EDUCATION	INFRASTRUCTURE	INFRASTRUCTURE BUDGET PCT	TOURISM	SEAFOOD	SMALL BUSINESS	ECONOMIC DEVELOPMENT
Harrison	Yes	No	Yes		No	No	No	No
Harrison	Yes	Yes	Yes		Yes	No	No	Yes

Harrison	Yes	No	Yes		Yes	No	No	Yes
Harrison	Yes	Yes	No		Yes	No	No	No
Harrison	Yes	No	No		No	No	No	No
Harrison	Yes	Yes	No		Yes	No	No	No
Jackson	Yes	No	No		Yes	No	No	Yes

Harrison	Yes	Yes	Yes		No	No	No	No
Hancock, Harrison	Yes	No	No		No	No	No	No

Hancock, Harrison, Jackson	Yes	Yes	No		Yes	No	No	Yes
Harrison	Yes	No	Yes	50	Yes	No	No	Yes
Harrison	Yes	No	Yes		Yes	No	No	Yes



Harrison	Yes	No	No		No	No	No	No
----------	-----	----	----	--	----	----	----	----

Harrison	Yes	Yes	Yes		Yes	No	No	No
Jackson	Yes	No	Yes		Yes	Yes	No	Yes

Hancock	Yes	Yes	No		No	No	No	No
Hancock, Jackson, Harrison	Yes	Yes	No	60	No	Yes	No	No

Hancock, Harrison, Jackson	Yes	Yes	No		No	No	No	No
Hancock	Yes	Yes	No		Yes	Yes	No	No
Hancock	Yes	Yes	No		Yes	Yes	No	Yes

Harrison	Yes	Yes	Yes	30	Yes	No	No	Yes
	Yes	Yes	No		No	Yes	No	No

Pearl River	Yes	Yes	No		No	No	No	No
----------------	-----	-----	----	--	----	----	----	----

Jackson	Yes	No	No		Yes	No	No	No
Hancock	Yes	No	No		No	No	No	Yes

Jackson	Yes	No	Yes		Yes	No	No	No
Hancock	Yes	No	Yes		Yes	Yes	No	Yes
Jackson	Yes	No	No		No	No	No	No



Jackson	Yes	Yes	Yes	62	No	No	Yes	Yes
Hancock	Yes	No	Yes	70	Yes	Yes	No	Yes
Hancock	Yes	No	Yes		Yes	No	No	Yes

Harrison	Yes	Yes	Yes	60	Yes	Yes	No	No
Jackson County ,Jackson	Yes	No	Yes	100	Yes	Yes	No	Yes

Jackson	Yes	No	No		No	No	No	No
Hancock, Harrison	Yes	Yes	Yes	80	No	No	Yes	Yes

Harrison County, Hancock County, Jackson County	Yes	Yes	No		No	No	No	No
	Yes	Yes	No		No	No	No	No

Hancock, Harrison, Jackson Counties	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No
Stone	Yes	No	Yes	100	Yes	No	No	Yes

	Yes	No	No		No	No	No	No
Jackson	Yes	No	No		No	No	No	No
Jackson	Yes	No	Yes	100	No	No	No	No
George, H arrison, Ja ckson, Ha ncock, Mo bile, St Tammany , Stone, Pe arl River	Yes	Yes	Yes		No	Yes	Yes	Yes

Hancock	Yes	No	No		No	No	No	No
Harrison	Yes	No	No		Yes	No	No	No
Harrison	Yes	No	No		Yes	No	No	No
Harrison	Yes	Yes	No		Yes	No	No	No

Jackson	Yes	No	No		Yes	No	No	No
Harrison	Yes	Yes	No		Yes	No	No	No
Jackson	Yes	No	No		No	No	No	No
Jackson	Yes	No	No		No	No	No	No



Pearl River	Yes	No	No		Yes	No	No	No
Jackson, Mobile	Yes	Yes	No		Yes	No	No	No
	Yes	No	No		No	No	No	Yes

Jackson, Harrison	Yes	Yes	No		Yes	No	No	No
Jackson, George,Stone	Yes	No	No		No	No	No	No

Harrison	Yes	Yes	No		Yes	No	No	No
	Yes	Yes	No		No	No	No	No

	Yes	Yes	No		No	No	No	No
Rankin, Hinds, Copiah, Simpson, Lawrence , Marion, Pearl River, Hancock Tammany ,Hancock	Yes	Yes	No		No	No	No	No
Harrison	Yes	Yes	Yes		Yes	No	No	Yes

George	Yes	No	No	50	Yes	No	No	No
George	Yes	Yes	No		Yes	No	Yes	No

Harrison, Jackson	Yes	Yes	Yes		Yes	No	No	Yes
Jackson	Yes	Yes	Yes		Yes	No	No	Yes
Jackson, George	Yes	Yes	No		Yes	No	Yes	No
George	Yes	Yes	No		Yes	No	Yes	No

Pearl River	Yes	Yes	No		Yes	No	Yes	No
Hancock, Harrison	Yes	Yes	Yes		Yes	No	No	Yes
Harrison, Hancock, and Jackson Counties	Yes	No	Yes		No	No	No	No

Harrison, Jackson, and Hancock Counties	Yes	No	No		No	No	No	No
Jackson, Harrison, and Hancock Counties	Yes	Yes	No		No	No	No	No
Jackson County	Yes	No	No		No	No	No	No



Jackson County	Yes	No	No		No	No	No	No
Hancock, Harrison, Pearl River, Stone and Lamar Counties, Hancock, Stone, Pearl River, Harrison	Yes	No	No	15	No	No	No	Yes
Jackson	Yes	No	No		No	No	No	No

Harrison	Yes	Yes	Yes		Yes	Yes	No	Yes
Harrison	Yes	No	Yes	95	Yes	Yes	No	Yes

Hancock	Yes	No	No	95	No	No	No	No
	Yes	No	Yes		No	No	No	No
Jackson	Yes	No	Yes		No	No	No	No

Harrison	Yes	Yes	No		Yes	Yes	Yes	Yes
Harrison	Yes	Yes	No		Yes	Yes	Yes	Yes

Harrison	Yes	Yes	Yes	60	No	No	No	Yes
Hancock	Yes	No	Yes	70	Yes	Yes	No	Yes
Harrison	Yes	No	No		No	No	No	No

Hancock, Stone,St Tammany ,Mobile,J ackson,Fo rrest,Was hington,H arrison,G eorge,Per ry,Pearl River	Yes	Yes	No		No	No	No	No
--	-----	-----	----	--	----	----	----	----

Gulf County, Baldwin County, Harrison County, St. Bernard Parish, Nueces County	Yes	No	No		No	No	No	No
---	-----	----	----	--	----	----	----	----

Harrison, Jackson, Hancock	Yes	Yes	No		Yes	No	No	No
Jackson	Yes	No	Yes	100	No	No	No	Yes
Jackson	Yes	No	Yes	100	No	No	No	Yes



Jackson	Yes	No	Yes	100	No	No	No	Yes
---------	-----	----	-----	-----	----	----	----	-----

Harrison	Yes	Yes	No		No	No	No	No
----------	-----	-----	----	--	----	----	----	----

Harrison	Yes	Yes	No		No	No	No	No
	Yes	No	Yes		Yes	Yes	No	Yes
	Yes	No	Yes		Yes	Yes	No	Yes
	Yes	No	Yes	100	No	Yes	No	Yes

Hancock, Harrison, Jackson	Yes	No	No		No	No	No	No
Jackson	Yes	No	Yes	100	Yes	No	No	Yes
	Yes	No	Yes		No	No	No	No

Harrison	Yes	No	No	20	No	No	No	No
Harrison	Yes	No	No	25	No	No	No	No
	Yes	Yes	No		No	No	No	No

Harrison, Hancock	Yes	Yes	No		No	No	No	No
----------------------	-----	-----	----	--	----	----	----	----

Harrison	Yes	No	No	20	Yes	No	No	No
Hancock, Harrison, Jackson, Pearl River, Stone, George	Yes	No	No	10	No	No	No	No

Harrison	Yes	No	No		No	No	No	No
----------	-----	----	----	--	----	----	----	----



Harrison	Yes	No	Yes		No	No	No	No
----------	-----	----	-----	--	----	----	----	----

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

Hancock	Yes	No	No		No	No	No	No
Jackson	Yes	No	Yes		No	No	No	No
Jackson	Yes	No	Yes		No	No	No	No
Jackson	Yes	No	Yes		No	No	No	No

Poplarville	Yes	No	No		No	No	No	No
-------------	-----	----	----	--	----	----	----	----

St. Bernard Parish, St. Tammany Parish, Jackson County, Baldwin County, Mobile County, Santa Rosa County, Okaloosa County, Walton County, Holmes County, Franklin County, Liberty County, Suwanne e County	Yes	No	No		No	No	No	No
---	-----	----	----	--	----	----	----	----

Escambia County, Matagorda County, Okaloosa County, Mobile County, George County, Holmes County, Suwannee County, Geneva County, Hancock County, Hamilton County	Yes	No	No		No	No	No	No
---	-----	----	----	--	----	----	----	----

Harrison County, St. Tammany Parish, George County, Baldwin County, Santa Rosa County, Okaloosa County, Walton County, Holmes County, Franklin County, Liberty County, Suwanne e County	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

Jackson County	Yes	No	No		No	No	No	No
Pearl River County	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No



Harrison County,Ja ckson County,Fr anklin County, Walton County,L evy County	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No

	Yes	No	No		No	No	No	No
	Yes	Yes	No		No	No	No	No

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----

	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No

	Yes	No	No		No	No	No	No
--	-----	----	----	--	----	----	----	----



	Yes	No	No		No	No	No	No
	Yes	No	No		No	No	No	No

	Yes	No	No		No	No	No	No
Harrison	Yes	No	Yes	40	No	No	No	No

ESTIMATED COST	FUNDING AVAILABLE
\$20,375,000	\$0
\$1,000,000	\$0

\$2,900,000	\$0
\$685,000	\$0
\$5,000,000	\$0
\$1,750,000	\$0
\$0	\$0

\$500,000	\$50,000
\$2,500,000	\$0

\$9,500,000	\$0
\$9,500,000	\$0
\$5,000,000	\$0

\$85,000

\$0

\$13,000,000	\$0
\$0	\$0



\$5,500,000	\$0
\$2,000,000	\$0

\$5,000,000	\$0
\$4,600,000	\$0
\$5,000,000	\$0

\$15,000,000	\$0
--------------	-----

\$120,000	\$0
-----------	-----

\$590,200

\$0

\$0	\$0
\$400,000	\$20,000

\$500,000	\$0
\$0	\$0
\$2,775,000	\$0

\$650,000	\$0
\$2,291,100	\$0
\$3,644,400	\$0

\$500,000	\$25,000
\$25,000,000	\$25,000,000



\$0	\$0
\$6,732,000	\$0

\$2,585,000	\$0
\$1,000,000	\$0

\$5,000,000	\$0
\$0	\$0
\$3,140,000	\$0

\$75,000,000	\$0
\$250,000	\$0
\$10,000,000	\$0
\$300,000	\$50,000

\$0	\$0
\$0	\$0
\$0	\$0
\$0	\$0

\$0	\$0
\$0	\$0
\$0	\$0
\$0	\$0

\$0	\$0
\$0	\$0
\$147,000,000	\$0

\$0	\$0
\$5,000,000	\$0



\$3,000,000	\$0
\$2,000,000	\$0

\$200,000	\$20,000
\$3	\$0
\$1,000,000	\$0

\$500,000	\$0
\$2,000,000	\$0

\$1,000,000	\$0
\$1,000,000	\$0
\$2,000,000	\$0
\$2,000,000	\$0

\$2,000,000	\$0
\$1,000,000	\$0
\$2,000,000	\$0

\$550,000	\$0
\$175,000	\$0
\$450,000	\$0

\$950,000	\$0
\$20,000,000	\$0
\$6,500,000	\$0

\$25	\$431,000
\$12,000,000	\$0



\$0	\$0
\$0	\$0
\$0	\$0

\$0

\$0

\$0

\$0

\$2,080,000	\$0
\$2,529,550	\$0
\$2,000,000	\$0

\$30,000,000

\$0

\$1,835,831

\$0

\$330,000	\$0
\$7,370,000	\$0
\$8,940,000	\$0

\$24,220,000

\$0

\$0

\$0



\$0	\$0
\$2,573,150	\$0
\$600,000	\$0
\$10,250,000	\$2,000,000

\$4,500,000	\$0
\$7,000,000	\$0
\$60,000,000	\$0

\$4,100,000	\$70,000
\$1,500,000	\$0
\$300,000	\$0

\$422,000

\$0

\$404,000	\$0
\$9,000,000	\$9,000,000

\$2,716,552

\$0

\$1,556,009

\$0

\$4,000,000

\$0



\$100,000	\$0
\$3,600,000	\$900,000
\$3,776,250	\$994,063
\$781,875	\$195,469

\$0

\$0

\$3,000,000

\$480,000

\$3,000,000

\$480,000

\$1,000,000

\$160,000

\$5,000,000	\$0
\$0	\$0
\$2,500,000	\$0

\$700,000	\$0
\$2,000,000	\$5,000
\$0	\$0

\$5,500,000

\$0

\$1,500,000

\$0



\$399,000

\$0

\$263,000

\$0

\$1,500,000

\$0

\$2,120,400

\$96,000

\$7,000,000	\$0
-------------	-----

\$750,000	\$0
-----------	-----

\$6,000,000

\$0

\$3,200,000	\$0
\$0	\$0

\$500,000	\$10,000,000
0	0