Council Member Applicant and Proposal Information Summary Sheet

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Project Identification

Project Title: **Pensacola Bay Watershed Restoration**	Project
State(s): **Florida**	County/City/Region: **Escambia and Santa Rosa**

General Location: *Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)*

Pensacola Bay Watershed within Florida

Project Description

RESTORE Goals: *Identify all RESTORE Act goals this project supports. Place a **P** for Primary Goal, and **S** for secondary goals.*

- S Restore and Conserve Habitat
- P Restore Water Quality
- S Restore and Revitalize the Gulf Economy
- S Replenish and Protect Living Coastal and Marine Resources
- S Enhance Community Resilience

RESTORE Objectives: *Identify all RESTORE Act objectives this project supports. Place a **P** for Primary Objective, and **S** for secondary objectives.*

- S Restore, Enhance, and Protect Habitats
- P Restore, Improve, and Protect Water Resources
- S Protect and Restore Living Coastal and Marine Resources
- S Restore and Enhance Natural Processes and Shorelines
- S Promote Community Resilience
- S Promote Natural Resource Stewardship and Environmental Education
- S Improve Science-Based Decision-Making Processes

RESTORE Priorities: *Identify all RESTORE Act priorities that this project supports.*

- X Priority 1: Projects that are projected to make the greatest contribution
- X Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring
- X Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration ….
- X Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries …

RESTORE Commitments: *Identify all RESTORE Comprehensive Plan commitments that this project supports.*

- X Commitment to Science-based Decision Making
- X Commitment to Regional Ecosystem-based Approach to Restoration
- X Commitment to Engagement, Inclusion, and Transparency
- X Commitment to Leverage Resources and Partnerships
- X Commitment to Delivering Results and Measuring Impacts

RESTORE Proposal Type and Phases: *Please identify which type and phase best suits this proposal.*

X Project X Planning X Technical Assistance X Implementation ____ Program

Project Cost and Duration

Project Cost Estimate: **Total : $15,929,550**	**Project Timing Estimate**: Date Anticipated to Start: October 1, 2015 Time to Completion: 5 years (including monitoring) Anticipated Project Lifespan: >25 years

Pensacola Bay Watershed Restoration

Executive Summary

The Pensacola Bay Watershed headwaters are in southern Alabama, and the bay itself lies in northwestern Florida, in Escambia and Santa Rosa counties and adjacent to Alabama and the Florida city of Pensacola. It is ~13 miles long and 2.5 miles wide and lies behind the barrier beach of Santa Rosa Island. The bay leads into Escambia Bay to the north and East Bay to the east, and is connected to the Gulf of Mexico by Pensacola Pass. It is partially enclosed by the Gulf Islands National Seashore. Within Florida the Escambia River, Blackwater River, Shoal River, and Yellow River drainage basins are the major sources of water to the Pensacola Bay estuary. Several bayous discharge directly to the bay, the largest being Bayou Grande, Bayou Texar, and Bayou Chico. The Gulf Intracoastal Waterway runs through a section of the bay.

The Pensacola Bay estuary covers 144 square miles and comprises five interconnected arms or large embayments: Pensacola Bay, Escambia Bay, Blackwater Bay, East Bay, and Santa Rosa Sound. Tidal fluctuations and flushing of the estuary are limited. Railroad and highway bridges also limit mixing between the waters of the upper and lower parts of the bay. Water exits the estuary through a narrow pass at the mouth of Pensacola Bay. This proposal includes five projects that would improve water quality and restore habitats in the watershed.

1. Pensacola East Bay Living Shoreline Project – Phase I ($4,884,750)
2. Pensacola Bay Living Shoreline – Phase I ($1,795,950)
3. Pensacola Beach Reclaimed Water System ($2,925,000)
4. Beach Haven – Joint Stormwater & Wastewater Improvement Project - Phase II ($5,967,000)
5. Bayou Chico Contaminated Sediment Removal - Planning, Design, and Permitting ($356,850)

There are two living shoreline projects to restore lost oyster habitat. The wastewater reuse project would eventually make hundreds of thousands up gallons of reclaimed water available every day for irrigation on Santa Rosa Island. Each gallon of reclaimed water results in a corresponding reduction of the wastewater discharge into the Santa Rosa Sound. Continued expansion of this reclaimed water system will remove one of the last remaining point source wastewater discharges in the watershed and, at the same time, conserve potable water resources. The proposal also includes two projects in the heavily impacted Bayou Chico watershed, a combination stormwater/septic tank replacement project and an aggressive plan to remove contaminated sediment. All these projects would advance the goals in a variety of restoration plans already adopted for the Pensacola Bay watershed.

This proposal leverages and builds upon the more than $30 million in projects currently funded by Deepwater Horizon funding sources that address water quality and habitat restoration in this watershed. It also leverages more than $25 million in local funds invested in Bayou Chico. This proposal reflects the priorities of local governments, the Northwest Florida Water Management District and other stakeholders.

The primary Gulf Coast Ecosystem Restoration Council Comprehensive Plan goal addressed by this proposal is **restore water quality,** with a complementary goal to **restore and conserve habitats**.

The two living shoreline projects will build upon other successful projects constructed in Pensacola Bay, Mobile Bay, and other estuaries along the Gulf Coast. These types of projects provide good substrate for oyster larvae to settle and colonize, and they provide good nursery habitat for commercially and recreationally important finfish and shellfish. Other benefits include improved water quality and clarity, and reducing shoreline erosion without the use of seawalls.

The wastewater reuse project is an expansion of the existing Pensacola Beach Reclaimed Water System where highly treated wastewater will reclaimed and reused to irrigate the public rights-of-way and individual property owners in the commercial core and residential areas on Santa Rosa Island. The benefits include reduction in the discharge of nutrients and other pollutants into Santa Rosa Sound and a reduction of water withdrawn from the area's sensitive Sand and Gravel Aquifer.

Within the Bayou Chico watershed the proposal includes a suite of projects to help restore Bayou Chico and serve to complement or accelerate planned restoration activities identified in the Florida Department of Environmental Protection's adopted restoration plan for the Bayou. The proposal includes stormwater treatment facilities, connection of septic tanks to central sewer and a project to plan, design and secure permits for removal of contaminated sediments within heavily impacted portions of the bayou. Expected outcomes include restored and greatly improved benthic habitat quality, increased biological diversity and productivity, and improved water quality to help achieve the total maximum daily load restoration targets adopted for the bayou.

Similarly, the primary Comprehensive Plan objectives addressed are to **restore, improve, and protect water resources** and **restore, enhance, and protect habitat**. The entire proposal will also contribute directly to accomplishment of every Comprehensive Plan goal and objective.

Risks and uncertainties are project specific. The success of individual site restoration can be greatly affected by variable and intense weather conditions, as well as coastal erosion and sea level rise, but these risks can be mitigated through appropriate planning and design that enhance coastal resiliency and natural responsiveness to these processes and discrete events.

For the living shoreline project measures, success will be judged based on the linear feet of shoreline constructed, acreage of marsh restored, water quality improvement, habitat extent, and habitat utilization. Success of the wastewater reuse project will be reflected by the decrease in pollutants discharged to Santa Rosa Sound and the increased use of reclaimed water. For Bayou Chico, project success will mean a reduction in excess levels of nitrogen, phosphorus discharged and a solidly planned, designed and permitted project to remove contaminated sediments.

Funding is requested over a five year period to conduct the required planning, design and permitting, construction, and monitoring activities. The proposal seeks $15,929,550 for implementation of the five projects described above.

Proposal Narrative

The Pensacola Bay Watershed headwaters are in southern Alabama, and the bay itself lies in northwestern Florida, in Escambia and Santa Rosa counties and adjacent to Alabama. It is ~13 miles long and 2.5 miles wide and lies behind the barrier beach of Santa Rosa Island. The bay leads into Escambia Bay to the north and East Bay to the east, and is connected to the Gulf of Mexico by Pensacola Pass. It is partially enclosed by the Gulf Islands National Seashore. Within Florida the Escambia River, Blackwater River, Shoal River, and Yellow River drainage basins are the major sources of water to the Pensacola Bay estuary. Several bayous discharge directly to the bay, the largest being Bayou Grande, Bayou Texar, and Bayou Chico.

The Pensacola Bay estuary covers 144 square miles and comprises five interconnected arms or embayments: Pensacola Bay, Escambia Bay, Blackwater Bay, East Bay, and Santa Rosa Sound. Tidal fluctuations and flushing of the estuary are limited. Railroad and highway bridges also limit mixing between the waters of the upper and lower parts of the bay. Water exits the estuary through Pensacola Pass.

The watershed's diverse habitats support more than 200 species of fish and shellfish, including 70 identified rare, imperiled, or threatened animal species, including the Gulf sturgeon; and 68 rare, imperiled, or threatened plant species. Outside the City of Pensacola much of the watershed consists of conservation and recreational lands representing a diverse assemblage of ecological types and protecting many of the watershed's water resources and ecosystems. These lands include Blackwater River State Forest; Blackwater, Yellow, and Escambia Rivers Water Management Areas; Garcon Point Water Management Area; and Gulf Islands National Seashore. Large tracts of Eglin Air Force Base are also managed for conservation and endangered species protection. Waterbodies within the Pensacola watershed have been given additional protection through designation as Outstanding Florida Waters, including the Blackwater River; Shoal River; all waters in the Yellow River Marsh Aquatic Preserve, Fort Pickens Aquatic Preserve, Gulf Island National Seashore, and Blackwater River State Park; Escambia Bay Bluffs; and Milton to Whiting Field.

Pensacola Bay was once known for its thriving oyster industry, but by 1971 over 90% of Escambia Bay's commercially harvestable oysters were found dead from the fungus *Perkinsus marina*. Because of the lack of suitable substrate and disease, the oysters have been slow to recover (USEPA 2005). During the 1960s, ~9,500 acres of seagrass were observed in the Pensacola Bay system, but by 1992 that number had decreased to 4,500 acres. By 2003 seagrasses in Pensacola Bay, East Bay, and Escambia Bay covered 511 acres, a 43% decline from 1992. Eight marine waterbody segments in the Pensacola Bay system are nutrient-impaired, including two segments in Bayou Chico.

The Pensacola Bay Watershed Restoration proposal will accomplish high priority water quality and habitat restoration actions identified in adopted restoration plans. These actions will directly enhance water quality, aquatic ecosystems, and associated riparian habitats. This proposal includes five projects identified in the map below (Figure 1):

1. Pensacola East Bay Living Shoreline Project – Phase I ($4,884,750)
2. Pensacola Bay Living Shoreline – Phase I ($1,795,950)
3. Pensacola Beach Reclaimed Water System ($2,925,000)

4. Beach Haven – Joint Stormwater & Wastewater Improvement Project - Phase II ($5,967,000)
5. Bayou Chico Contaminated Sediment Removal - Planning, Design, and Permitting ($356,850)

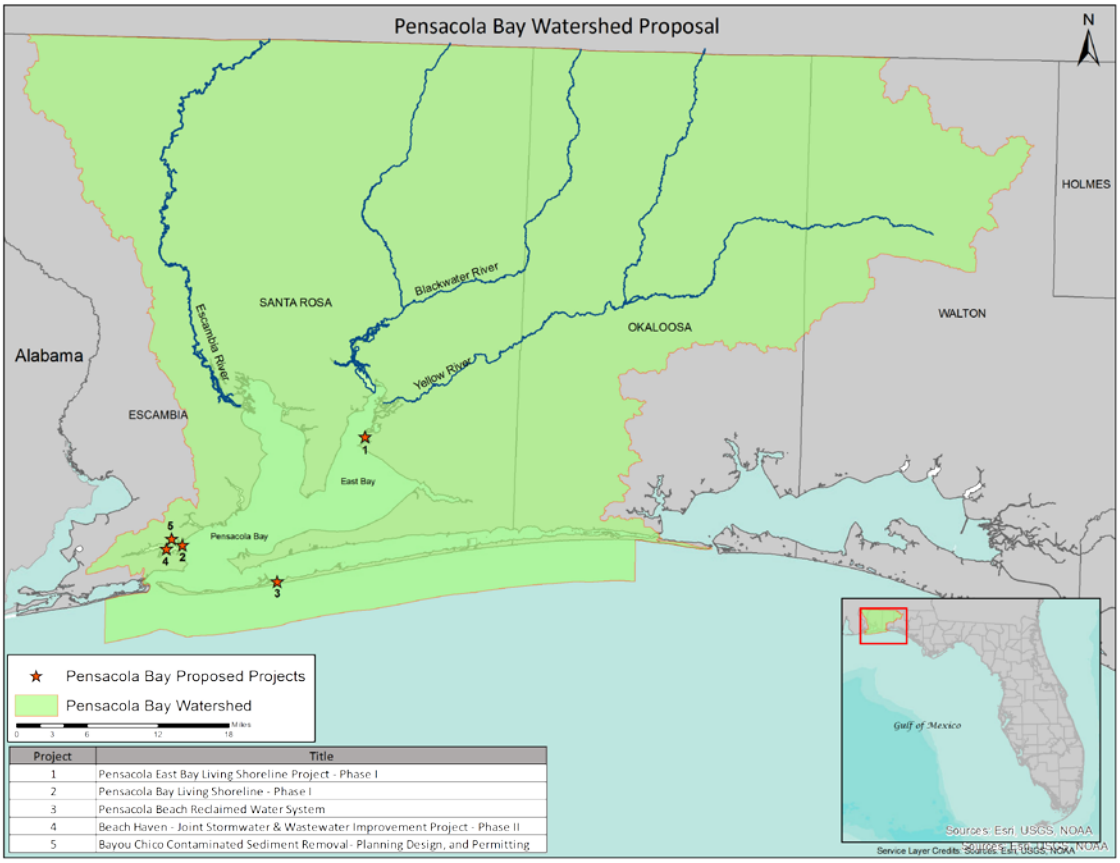

Figure 1. Pensacola Bay Watershed Restoration Proposal Projects

The primary Gulf Coast Ecosystem Restoration Council Comprehensive Plan goal addressed by this proposal is **restore water quality,** with a complementary goal to **restore and conserve habitats**. It will accomplish these ends by reducing excessive nutrients, and replenishing and protecting coastal and marine resources through restoration of key coastal and estuarine habitats.

The five projects are interrelated. Oysters need healthy habitats and good water quality to thrive. Excessive nutrients from wastewater discharges, including septic tanks, and stormwater runoff degrade water quality and deplete oxygen, which in turn promotes excessive algal growth that blocks light needed for seagrass growth. When algae and seagrasses die, they decay and further deplete oxygen, which aquatic animals need to live. Restoring contiguous riparian habitats and reducing nutrient loading to surface waters improve and sustain good water quality, enabling the long term viability of the bay and offshore resources, including oyster reefs, which in turn play a critical role in keeping estuaries healthy for other aquatic wildlife.

The *Pensacola Bay Watershed Restoration* proposal represents a large-scale, regional approach to solving critical water resource and habitat threats to Florida's Gulf Coast. As the individual project

summaries demonstrate, each one is founded on good scientific principles or other proven actions and methods that have achieved successful, measurable results. They leverage other *Deepwater Horizon* funding sources and build on past investments to extend their impact. Each project is summarized below.

Project 1. Pensacola East Bay Living Shoreline Project – Phase I ($4,884,750)

Background – The project proposes to design, monitor and implement a two mile section of non-contiguous, natural oyster reefs. This project will use natural shoreline stabilization methods (e.g., green infrastructure) to prevent further erosion along the shore of East Bay and conduct pre- and post-project monitoring. Protection and restoration of this area will protect publicly-owned lands and archaeological and historical sites from further erosion through dissipation of wave energy; reduce sedimentation into East Bay; provide critical habitat for oyster colonization and foraging grounds for shorebirds, wading and migratory birds; serve as important commercial and recreational habitat for finfish and shellfish and aquatic and terrestrial federal trust species; provide optimal conditions for saltmarsh and submerged aquatic vegetation growth that provide habitat diversity; and improved water quality and submerged sediment stabilization.

The project will take place entirely on public lands and is located in designated essential habitat for Gulf Sturgeon (*Acipenser oxyrinchus desotoi*). East Bay is part of the easternmost embayment within the Pensacola Bay Estuary and receives discharge from Blackwater Bay to the north and the East River to the southeast. Blackwater Bay receives discharge from the Blackwater and Yellow Rivers.

Oyster landings for Escambia County peaked in 1970 (Collard 1991), but by 1971, over 90% of commercially harvestable oysters in Escambia Bay experienced a die-off due to disease (Little 1976). Degraded water quality, lack of suitable substrate and sediment contaminants have all been suggested as causes for the decline in oyster abundance. Even with improved water quality in the watershed since the 1980's, oyster populations have been slow to recover naturally without suitable substrate, resulting from removal of dredged material and loss of living oyster reefs to disease (USEPA 2004). Based on salinity and temperature regimes "the Pensacola Bay System could be a very productive oyster harvest area" (USEPA 2004). A 1953 study by USFWS noted cumulative spat fall during a season may be as high as 1,000 spat per sq. inch, causing significant problems of deformed clustered growth due to limited substrate. Environmental Sensitivity Index (ESI) maps documenting oyster reef coverage within the watershed were developed from 1987-1992, and represent only 10% of the oyster reefs present in 1972. The documentation was created before Hurricane Ivan (2004), which significantly reduced oyster reef presence within the watershed. Therefore current oyster reef acreage may be lower than documented from 1987-1992. The East Bay Living Shoreline project would complement previous oyster habitat restoration projects within the watershed and would be integral to systematic watershed restoration.

Bay	Oyster reef 1972 (acres)	Oyster reef 1987-92 (acres)
East Bay	8,388	761
Escambia	200	110
Pensacola	0	0
Bay Total	8,588 (Source A)	871 (Source B)

Status of oyster reefs in watershed: (Source A: McNulty et al. 1972, Source B: Floridamarine 1995)

The 1990 Pensacola Bay System Surface Water Improvement and Management Plan (SWIM Plan) called for preservation of the watershed and restoration of habitats, citing oyster habitat as a crucial component to a healthy watershed and water quality (SWIM Plan #HA-02.3). Over the past century, there has been an estimated 85% global loss of native oyster reef habitats due to habitat degradation, overharvesting, reduced water quality, disease, boat wakes, and other factors (Beck et al. 2011). Beck et al. documented that the Gulf of Mexico is the only location in North America where oyster reefs are considered in fair condition (50-90% lost); other locations are either poor or functionally extinct and none are considered good (<50% lost). The authors suggest several strategies for conserving habitats, with oyster reef restoration and recovery being key.

Furthermore, the project area's average shoreline movement rates from 1934 to 2011 have been calculated at ~0.32 meters/year for a total of ~24.5 meters (almost 80 feet) lost to erosion. This is a significant loss of habitat for the diversity of species using the region. In addition, the sediment contribution to the estuary from the eroding shoreline can be detrimental to estuarine species by covering essential habitat, e.g. seagrasses, salt marsh and oyster reefs, and changing the habitat structure to bare sand.

Implementation Methodology – Through a systematic approach to restoration, the project will address an initial natural breakwater implementation phase along the southeast shore of East Bay (See Figure 2 in Location Information section), just north of the mouth of East River, to slow wave energy and accrete sediment to allow for future restoration phases. An assemblage of recycled and fossilized oyster shell will used, and reef composition will be based upon availability of materials. Project implementation will be contracted out and constructed utilizing High Density Polyethylene (HDPE), UV resistant, aquaculture grade mesh bagging material and built to a vertical relief between 2-5 ft. in depth with channel gaps between breakwaters to allow for passage of fish and flushing of water. Breakwater design will be agreed upon by local land and water management organizations. Reef design and implementation will not interfere with Gulf Sturgeon habitat. Project funding includes engineered design to optimize breakwater depth, size and height for wave attenuation and sediment accretion.

Monitoring and adaptive management – Pre-monitoring conducted along the entire eight mile proposed shoreline will consist of 9 sample stations in East Bay and 4 in Blackwater Bay, in the Yellow River Marsh Aquatic Preserve (Figure 2). At each of the 13 stations water quality parameters (salinity, dissolved oxygen, pH, turbidity, conductivity and temperature) will be collected initially and then quarterly after project installation using a YSI Multimeter. GPS points at each station will be marked and shoreline profile mapped for the project entirety. Each post marking will serve as a photo station. Shoreline elevation and slope will be measured along three transects extending from the upland marsh into 0.5 m mean water depth using a Radio Tele-Kinematic GPS. With horizontal accuracy of 5 cm and vertical accuracy of 3 cm, changes in shoreline shape (i.e., accrual or erosion) can be portrayed with great precision. Current meters and water level loggers will be will be deployed to determine the impact of breakwaters on water flow and direction, and the impact on wave height leeward of the breakwaters and control edges.

Habitat surveys will be conducted prior to installation and annually thereafter. Seine nets will be pulled to sample species diversity at five random locations in three replicates. Post-monitoring

seining will be conducted at one location at site in three replicates. Each species will be notated, with quantity and size measured. Oyster spat settlement and recruitment will be monitored annually. Locations for oyster monitoring will be chosen randomly at 4 locations using the most updated monitoring protocol (Baggett et al. 2014). A square meter quadrat will provide the area to be recorded and at each location the waterward, shoreward and top portion of each reef will be monitored. Monitoring is to include quantity, size and average size (in cm) within the quadrat for spat, juvenile and adult settlement; additionally observing dead organisms, other organisms within the quadrat, weather conditions and visibility. The presence or absence of submerged aquatic vegetation (SAV) will be monitored and recorded prior to implementation and will be monitored biannually to see response to optimal growing conditions.

Monitoring results will be evaluated annually to determine positive or negative trends, which will be examined in annual reports to consider needed adaptive management strategies.

Measures of Success - The metrics for success are 1) Number of linear feet of living shoreline constructed within East Bay, and 2) Acreage of marsh restored.

Risks and Uncertainties – The project is located in a "Conditionally Approved" shellfish harvesting area as defined by the Florida Department of Agriculture and Consumer Services (FDACS) Division of Aquaculture. Conditionally Approved areas are periodically closed to harvesting based on pollution events such as rainfall or increased river flow. Salinity and water quality conditions are generally suitable for oyster settlement and growth and the limiting condition seems to be availability of suitable substrate (EPA 2004). The risk of oyster harvesting at the project site is low due to the intertidal location of the reefs. There are a few oystermen in the area but all currently tong on sub-tidal reefs (personal communication with Pete Nichols). Weather conditions such as storm activity, high winds, and extremely low winter tides are factors that could affect project implementation and timeframe, as well as accessibility, but can be accounted for.

Outreach and Education Opportunities – Education and outreach programs are in place promoting living shoreline projects and their benefits to protection of resources, habitat and adaptation and resiliency to sea level rise through organizations including FDEP, Choctawhatchee Basin Alliance (CBA), The Nature Conservancy (TNC), USFWS Coastal Program, and Escambia and Santa Rosa counties. FDEP's Northwest Florida Aquatic Preserves Office has constructed small to medium scale projects throughout the Panhandle, including *Project Greenshores* and Naval Support Activity in Panama City, which have both achieved national and global awards and recognition (www.dep.state.fl.us/northwest/Ecosys/section/greenshores).

Through the Sea Grant program for Escambia and Santa Rosa counties, education and outreach will be provided through event booths, local support, community informational meetings, volunteer and internship programs and signage. FDEP and Choctawhatchee Basin Alliance work throughout the Panhandle education citizens, students, military, etc., on their programs and through a *Grasses in Classes* program where students learn about saltmarsh and oyster habitats and their value.

Leveraging Resources and Partnerships – This project has already been through initial state permitting stages to address submerged land guidelines and allowance in project construction and has achieved support from Eglin Air Force Base, Santa Rosa County, Santa Rosa County Sea

Grant, Northwest Florida Water Management District, Bay Area Resource Council, Northwest Florida Aquatic Preserves Office, The Nature Conservancy, and Dauphin Island Sea Lab.

Project Benefits – The East Bay project will achieve many ecological and socio-economic benefits, including:

- Restored estuarine habitat (emergent marsh, SAV, oyster reef) for fisheries and birds;
- Improved water quality by reducing shoreline erosion and turbidity and improving clarity;
- Improved water quality by vegetative assimilation of nitrogen and phosphorus;
- Reduced shoreline erosion by storm wave attenuation;
- Reduced flood water inundation due to sea level rise;
- Management of stormwater runoff by vegetative assimilation of pollutants; and
- Reduction of invasive vegetation species by installing native vegetation.
- Increased recreation and commercial fisheries production;
- Increased shoreline and infrastructure protection;
- Increased property values for protected properties; and
- Utilization of local engineering and construction work forces.

2. Pensacola Bay Living Shoreline – Phase I ($1,795,950)

Background – This project is similar to the East bay living shoreline project and addresses the same restoration needs of the Pensacola Bay Watershed. The project site along the western shore of Pensacola Bay has been identified by state and county scientists as a high priority for living shoreline restoration. Oyster reef restoration, emergent marsh restoration, and SAV restoration projects have been identified in the Pensacola Bay Surface Water Improvement and Management Plan (Northwest Florida Water Management District, 1988) and the Pensacola Bay Watershed Management Plan (West Florida Regional Planning Council, 2005) as high-priority projects to replace lost estuarine habitat. Subsequent project phases will further enhance habitat restoration in Pensacola Bay and protect the shoreline and military mission of NAS Pensacola.

The project will create ~2000 linear feet of an offshore rock and oyster reef breakwater and ~25 acres of protected emergent marsh and SAV behind the protective breakwater. It is the first phase of a multi-phase living shoreline project (Sites A, B, and C) that totals 24,800 linear feet of rock and oyster reef breakwater and 205 acres of emergent marsh and SAV habitat (Figure 3 in Location Information section). This project will fund planning, engineering, and design for all three sites but construction only for Site A. See Figure 4 in the Location Information section.

Phase 1 will be constructed adjacent to White Island in northwestern Pensacola Bay (Site A). Future phases (Sites B and C, Figures 5 and 6 in Location Information section) will extend the living shoreline southward along the eastern shore of NAS Pensacola, and along the eroded southern shore of NAS Pensacola across from Pensacola Pass. This project will remedy harm to the water quality, coastal marsh, SAV fishery habitat, and the marine living resources in the Pensacola Bay estuary. It complements the existing *Project Greenshores* and the proposed Sanders Beach living shoreline project that will use NRDA early restoration funds (Deepwater Horizon Oil

Spill Natural Resource Damage Assessment Trustees, 2014). This living shoreline project will apply the expertise and lessons learned by FDEP and Escambia County scientists, who designed, constructed, and monitored the successful *Project Greenshores* (www.epa.gov/gmpo/projects/greenshores_intro.html). The project's goals, and those of subsequent phases, are to:

1) Create a rock and oyster reef breakwater to promote settlement and colonization of oyster larvae and other encrusting organisms to become a healthy, functioning oyster reef habitat.
2) Restore fringe emergent marsh habitat with specific value for invertebrates and coastal birds to increase foraging habitat for shorebirds, wading birds, and migratory birds.
3) Increase nursery and adult habitat available for recreationally and commercially important shellfish and finfish species in the region (e.g., spotted trout, red drum, black drum, mangrove snapper, gag grouper, spot, croaker, mullet, blue crab, stone crab, and shrimp).
4) Promote the growth of SAV that supports a diversity of fish, shrimp, crabs, and other estuarine species.
5) Serve as a natural shoreline stabilization approach (e.g., green infrastructure) to help prevent further shoreline erosion along the west shore of Pensacola Bay by attenuating wave energy, decreasing shoreline erosion, improving water clarity, decreasing turbidity, and improving water quality.
6) Help protect the military mission, shoreline, and security of NAS Pensacola.

Implementation methodology – The project will use implementation methods similar to those described Project 1, immediately above. To successfully achieve the project's goals, an experienced Senior Scientist who has over 25 years of experience creating successful emergent marsh and living shoreline restoration projects will be the Project Manager. The offshore breakwater reef base will be constructed with recycled concrete and limestone rock. Recycled and fossilized oyster shells will be added to the top of the reef base to attract oyster spat and increase spat recruitment. Channel gaps between the breakwater segments will be incorporated into the design to allow for the passage of nekton and the circulation of water. The engineered design of the breakwater will optimize its ability to attenuate wave energy and provide a protected environment for the establishment of emergent marsh vegetation and SAV. The dominant emergent marsh vegetation species that will be installed will be smooth cordgrass (*Spartina alterniflora*).

Monitoring and adaptive management – Successful monitoring can prevent problems by providing early warning signals and improving coordination. Standard monitoring protocols described in Science-Based Restoration Monitoring of Coastal Habitats (Thayer et al., 2003; Thayer et al., 2005) will be used. The monitoring plan will detail collection methods, parameters to be measured, and quality assurance and control. Sampling sites and frequency and duration of sampling events will be included and verification of all collected data will ensure quality and integrity. Monitoring will be conducted before (baseline), during, and after construction. The pre- and post-construction monitoring will enable comparisons to determine if the project has been successful. Monitoring during construction will ensure the project is being constructed according to plans and permit conditions and any adaptive adjustments can be made.

Water quality parameters include depth, temperature, salinity, conductivity, dissolved oxygen, turbidity, total suspended solids, total nitrogen, total phosphorus, and fecal coliform bacteria.

Vegetation parameters include species present, percent coverage, percent survival, and height. Fishery habitat utilization parameters include relative abundance and species diversity.

Adaptive management means adjusting actions in order to meet project goals to ensure success (Fischenich et al., 2012). Adaptive management will be used during planning and construction to evaluate and determine if there are problems, or if objectives need to be refined, so that remedies can be implemented if necessary. Project monitoring during all phases of the project will provide the data and information needed to make good adaptive management decisions.

Measures of success – The metrics for success of this project are: 1) Number of linear feet of living shoreline constructed Pensacola Bay; 2) Acreage of marsh restored; and 3) Water quality improvement, habitat extent, and habitat utilization.

Risks and uncertainties – The risks and uncertainties described for the East bay living shoreline project also apply to this project, except the unconditionally approved shellfish harvesting discussion. Escambia County scientists have extensive experience with planning, construction, and monitoring of *Project Greenshores* and other successful living shoreline projects. Escambia County also commits to a long-term monitoring and adaptive management plan to minimize risk and uncertainties to ensure project success. The riparian land owners, NAS Pensacola, have been consulted on this proposed project.

Outreach and education – The project is an excellent opportunity for environmental education and community outreach, including opportunities for school, church, and civic groups to help install emergent marsh vegetation at the living shoreline sites. Hundreds of community volunteers and civic groups participated in the installation of vegetation at *Project Greenshores*. Other educational opportunities will include local presentations on ecology, function, and intrinsic value of emergent marshes and oyster reefs in the Pensacola Bay Estuary. Educational signs explaining the ecology of estuarine habitats and water quality principles will be installed along the project's shoreline.

Leveraging of resources and partnerships – The outreach outlined above is one way local resources will be leveraged. In addition, NAS Pensacola is vital to the economy of Pensacola and Escambia County, and the project is an excellent example of how the military and the community can partner to provide water quality and habitat improvement to benefit all military personnel, citizens, and visitors to the Pensacola Bay area. The project builds on the more than $30 million in projects funded through other Deepwater Horizon funding sources that address water quality and habitat restoration in this watershed.

Project benefits – The same ecological and socio-economic benefits described for Project 1, above, apply to this project. Both living shoreline projects are cost-effective because they are less expensive to construct and maintain than seawalls and riprap to stabilize eroding shorelines. Living shorelines provide the added benefit of increasing estuarine emergent marsh and SAV habitat and improving water quality that seawalls and riprap cannot provide. Living shorelines are sustainable especially because minimal maintenance is needed. *Project Greenshores* required no maintenance after Hurricane Ivan, which destroyed seawalls and other shoreline structures. Living shorelines have a low cost to high benefit ratio compared to other shoreline stabilization methods.

Project 3. Pensacola Beach Reclaimed Water System ($2,925,000)

Background - This project expands the Emerald Coast Utilities Authority's (ECUA) Pensacola Beach Reclaimed Water System. ECUA has an ongoing reclaimed water program, which incorporates reuse at all three of its wastewater treatment facilities. The Pensacola Beach Wastewater Treatment Plant (WWTP) currently provides high quality reclaimed water to the Santa Rosa Island Authority for irrigation of the public rights-of-way on Pensacola Beach (see Figure 7 in Location Information section). The Bayou Marcus Water Reclamation Facility (WRF) discharges reclaimed water to the Bayou Marcus Wetlands, helping restore a 1,000-acre site that had been ditched and drained by the previous owner. The Central WRF's reclaimed water system enlists two major industrial reuse partners, which have reduced groundwater and surface water withdrawals since the facility came on-line in August 2010, replacing the former Main Street WWTP, which discharged 20 million gallons per day (mgd) into to Pensacola Bay. ECUA placed the existing Pensacola Beach Reclaimed Water System into operation in the spring 2011 (see Figure 8 in Location Information section). The current project's objective is to: 1) make additional reclaimed water available to the Santa Rosa Island Authority for irrigation of more public rights-of-way; and 2) make reclaimed water available for irrigation of individual properties in the commercial core and residential areas on Santa Rosa Island. The Pensacola Beach WWTP is permitted at 2.4 mgd, with current annual average daily flow of approximately 1.0 mgd, and is authorized for up to 0.432 mgd for public access irrigation.

Implementation methodology - Implementation of the full reclaimed water system for Pensacola Beach consists of five phases; the project in this proposal addresses Phases 1, 3, 4 and 5. Phase 2 is receiving money from the Northwest Florida Water Management District (NWFWMD) under the Local Water Supply Development Projects program. ECUA will provide matching funds and other funds to support overall project implementation. With the completion of each phase, the application capacity of the reclaimed water system will be increased, ultimately by 1.8 mgd.

Monitoring and adaptive management – Customer account records can be used to help determine current and historical irrigation demands. ECUA will compare historical records with future customer consumption records to ascertain conservation measures achieved through the proposed reuse expansion. ECUA monitors the treatment plant's reclaimed water for compliance with effluent limitations and submits monthly operating reports to the permit authority.

Should funding from external sources be provided in reduced amounts, adjustments to the proposed phasing plan would have to be considered. Other sources of funds would be pursued to supplement any shortfall. Adaptive management will be used during project planning and construction to determine if there are issues, or if objectives need to be refined, so that remedies can be implemented if necessary. Monitoring during all phases of the project will provide the information needed to make good adaptive management decisions.

Measures of success – The following metrics are anticipated to be used: 1) Increased usage by customers that currently have irrigation meters. Irrigation meters likely would be disconnected from the potable water distribution system and connected to the reclaimed water system after completion of each construction phase. 2) Decrease in the discharge of treated wastewater to Santa Rosa Sound. 3) Improvement in water quality and potential expansion of the existing sea grass beds in Santa Rosa Sound, which will be a long-term effort.

Risks and uncertainties – With any construction project there are potential risks to the environment and, to a lesser degree, the public. This potential is minimized by effective design, adequate construction documents and sufficient inspection. One uncertainty is the usage of reclaimed water as this will be controlled by end users and not ECUA. However, based on historical records, there is no reason to believe existing or new customers would reduce their demand to any measurable extent. If anything, customers may use more due to the minor nutrient concentrations in reclaimed water that benefits irrigation. In addition, extended periods of rainfall could reduce overall demand for reclaimed water. From an environmental perspective, there is potential for over-irrigation but this is deemed minimal due to the predominant soil conditions on a barrier island. Tropical storm activity and damage could temporarily affect the customer base and need for reclaimed water, but the system will be designed to minimize such damage, including from storm surge.

Outreach and Education – ECUA prominently posts reuse information on its web site. The start-up of the Pensacola Beach Reclaimed Water System in 2011 was noticed in press releases. ECUA is gathering information to apply to join FDEP's *Florida Water Reuse Trail*, and is confident of success given its three water reclamation facilities. Joining the *Florida Water Reuse Trail* will promote reuse and track in northwest Florida. See www.dep.state.fl.us/water/reuse/news.htm.

Leveraging of resources and partnerships – The reclaimed water system is sponsored entirely by the ECUA but has a successful partnership with the Santa Rosa Island Authority, the governmental body that provides administrative oversight for development on Pensacola Beach. The Authority's use of reclaimed water has proven successful in irrigating the right-of way on Via De Luna, the main thoroughfare on Pensacola Beach, using ECUA reclaimed water. ECUA provides the reclaimed water at a discount compared to what the Authority would have to pay to irrigate with potable water, which in turn conserves that potable water supply. The Northwest Florida Water Management District will provide $425,000 to the Emerald Coast Utilities Authority to construct a ground storage tank, pump station, and associated piping, valves, and other system components to assist in expansion of the Pensacola Beach reclaimed water system.

Benefits – Ecological benefits include conservation of potable water and reduced demand on the Sand-and-Gravel aquifer, ECUA's drinking water source; and reduced nutrient loading to Santa Rosa Sound. Reclaimed water usage has averaged ~140,000 gallons per day (gpd) recently, which would otherwise be discharged to Santa Rosa Sound—or up to ~1,280 pounds of total nitrogen, 430 pounds of total phosphorus, and 2,140 pounds of suspended solids each year. Implementation of the full reclaimed water system represents the potential to reuse ~760,000 gpd instead of discharging it to Santa Rosa Sound—thus, combining current reuse with the ultimate results of this project, total nitrogen loadings avoided would be up to ~8,220 pounds, total phosphorus up to about 2,740 pounds, and total suspended solids up to about 13,700 pounds per year. In terms of potential potable water saved per year, the 140,000 gpd of current reuse water equates to about 155 acre-feet; implementation of the full reclaimed water system would increase the potential potable water saved per year to about 1,010 acre-feet.

The improvement in water quality due to reduced wastewater discharge to surface waters is expected to improve and expand seagrasses. Fertilizer use may be reduced because of the nutrients in reclaimed water. The project advances the FDEP goals of more reuse and reduced surface water discharge. The local economy will benefit from the use of local work forces and businesses for planning, construction and future maintenance.

Project 4 - Beach Haven – Joint Stormwater & Wastewater Improvement Project - Phase II ($5,967,000)

Background – The project will help restore Bayou Chico and complement or accelerate planned restoration activities identified in Florida's adopted restoration plan for the Bayou. The Bayou Chico watershed is located in the southern end of Escambia County, just east of Blue Angel Parkway and north of Bayou Grande (see Figure 9 in Location Information section). It has a 10.36-square-mile drainage basin and a water surface area of approximately 0.39 square miles. Most lands surrounding Bayou Chico are urbanized and consist of well-established residential subdivisions and industrial and commercial uses. The watershed consists of Bayou Chico itself, which discharges directly to Pensacola Bay, and Jones Creek, Jackson Creek, Bayou Chico Drain, Bayou Chico Beach (at Lakewood Park), and Sanders Beach.

Bayou Chico has a long history of human activities and associated problems, including polluted stormwater runoff, wastewater inputs, nutrient enrichment, and contaminated sediments. Prior to 1971, at least eight industrial and domestic wastewater facilities discharged into Bayou Chico. The discharges have been eliminated and water quality has improved over the last decade, although some waterbody segments in Bayou Chico do not meet Florida's bacteria and nutrient water quality criteria. The FDEP has adopted Total Maximum Daily Loads (TMDLs) restoration targets for these "impaired" waterbody segments. The bacteria TMDL for Bayou Chico calls for a 61% reduction in bacteria sources; the nutrient TMDL for a portion of Bayou Chico calls for a 30% reduction in both total nitrogen and total phosphorus.

In October 2011, FDEP adopted the Bayou Chico Watershed Basin Management Action Plan (BMAP), a collaborative effort by Escambia County, Pensacola, ECUA, Florida Department of Transportation, Bayou Chico Association, U.S. Naval Air Station, the University of West Florida, the Bay Area Resources Council, and the Northwest Florida Water Management District. The plan identifies dozens of actions to restore the six impaired waterbody segments in the Bayou Chico watershed, including sanitary sewer expansion, stormwater improvements, pet waste ordinance adoption, septic tank inspections and testing, neighborhood clean-sweep programs, barge and derelict vessel removals, Clean Marina and Boatyard Program implementation, and Bayou Chico channel dredging to improve flushing. To date, Bayou Chico stakeholders have completed 52 projects at an estimated cost of $25 million. There are an additional 37 identified projects with a value of $53 million that remain unfunded at this time. The National Fish and Wildlife Foundation announced the award of $11 million for stormwater and tributary stream restoration projects in the bayou. This project will complement ongoing efforts by local stakeholders and speed up the timeline to return Bayou Chico to its fishable and swimmable goals. The State's full plan restoration plan and annual progress reports can be viewed at http://www.dep.state.fl.us/water/watersheds/bmap.htm.

The project includes construction of stormwater treatment facilities and connection of septic tanks to central sewer to new central sewer infrastructure. Expected outcomes include restored benthic habitat quality, increased biological diversity and productivity, and improved water quality. Bayou Chico was the site of the only regional staging area for the Deepwater Horizon Oil Spill cleanup operations, so it was directly impacted by this 24-hours per day cleanup operation, increased boat traffic, and oiled boat hulls.

Implementation methodology – Escambia County and ECUA are cooperating on the Joint Stormwater/Wastewater Improvement Project. Escambia County is the lead agency and Project Manager and will manage all aspects of this project to ensure successful completion. There are three primary tasks: Design and Permitting, Construction, and Monitoring. The deliverables are 100% design plans, all required permits, construction completion, and monitoring data. The project manager will determine required permits and assure timely permit application. Escambia County will use local engineering consulting firms to assist with design and permitting, and local contractors to complete construction. Escambia County follows Florida purchasing requirements and guidelines to select contractors. Monitoring will be managed by Escambia County Water Quality & Land Management Division scientists.

Monitoring and adaptive management – Pre- and post-project monitoring will be conducted to assess the project's achievement of its goals and objectives; understand why the project has or has not performed as anticipated; inform adaptive management; and improve the effectiveness and efficiency of future projects. There is an active water quality monitoring program in Bayou Chico, so this water quality monitoring data will also be included in the Project Monitoring Report. All monitoring will be in accordance with Federal and State protocols. To ensure projects perform as anticipated, and to improve future projects, adaptive management will be employed.

Measures of success – The project's metrics are: 1) amount of nitrogen prevented from entering system annually; 2) amount of phosphorus prevented from entering system annually; and 3) amount of sediment prevented from entering system annually.

Risks and uncertainties – With any construction project there are potential risks to the environment and to a lesser degree to the public. This potential is minimized by effective design, adequate construction documents and sufficient construction inspection.

Leveraging and partnerships – The Bayou Chico Association has been a vocal and active group of homeowners and business owners who have successfully lobbied elected officials to improve the quality of the Bayou Chico watershed. Many water quality improvement projects have been constructed in the bayou watershed because of the concerns, actions and partnerships of Bayou Chico Association members. To date, the Bayou Chico stakeholders have completed 52 projects at an estimated cost of $25 million. The Escambia County Community Redevelopment Agency (CRA) and Neighborhood Enterprise Division have programs to pay a 50:50 match for septic tank removal and sewer connection or pay 100% of those costs for low income residents. The CRA also has committed an additional $215,000 to the proposed Beach Haven Project. The County Water Quality and Land Management Division has recently received a USEPA 319 Grant to contribute $750,000 toward new stormwater treatment in Beach Haven. Escambia County Neighborhood Enterprise has committed $318,000 from Community Development Block Grant funds in addition to already funding $300,000 for the preliminary project design. In addition, ECUA has made extensive investments in its Sewer Expansion Program projects for the Bayou Chico watershed.

Benefits – This project will reduce sediment and nutrient loadings to Bayou Chico, reduce BOD, reduce TSS, reduce turbidity, increase water clarity, and improve light penetration for photosynthesis to enable expansion of SAV and emergent marsh habitat. Additional benefits include reduction in bacteria and nutrients to in assist in achievement of the TMDLs established

for the Bayou. Expected pollutant load reductions include 1,206 pounds of nitrogen, 315 pounds of phosphorus, 7,082 pounds of BOD, and 28,683 pounds of sediment.

Project 5 - Bayou Chico Contaminated Sediment Removal - Planning, Design, and Permitting ($356,850)

Background - As described in Project 4 above, Bayou Chico has experienced considerable environmental degradation due to historic impacts, including industrial and domestic wastewater discharges, shipyard-related pollution, and long-term untreated stormwater runoff. Legacy pollutants remain in the Bayou Chico sediment, and significant restoration needs remain to be accomplished to allow the bayou to heal and regain its natural richness and productivity. Over many decades, Bayou Chico has been filling in with stormwater sediment from Jones Creek, Jackson Creek, and Maggie's Ditch. Fine grained sediment with a high silt and clay content has accumulated throughout the bayou smothering bottom habitat and degrading water quality and biological communities. The accumulated sediment is enriched with nutrients, heavy metals, and other pollutants typical of stormwater runoff and commercial activities in the basin. Commercial and recreational boating activities and periodic wave action from storms re-suspend the accumulated bottom sediment causing water quality and habitat impairment.

Minimal current velocities in the bayou, along with many years of deposition of fine sediments from stormwater runoff, have caused gradual sediment accumulation in the bayou (NWFWMD, 1994; Mohrherr, 2006; FDEP et al., 2011). A NWFWMD report in 1994 stated that the bayou was less than 7 feet deep in most areas with poor tidal exchange (NWFWMD, 1994). Sediment thickness estimates of "soft" materials in Bayou Chico were initially measured by Glasson and others in 1977 (Glasson et al., 1977). The distribution showed a range of zero to more than 10 feet in thickness of fine materials. Current actual thicknesses will have to be measured. Figure 10 shows the areas to be designed and permitted for this project and dredged in a future phase. The total area to be dredged outside the main navigational channel is ~120 acres. The amount to be dredged will depend upon the chemical character of the material, accessibility of the dredging equipment, bid costs of the dredging, and depth to a "clean" substrate. A detailed dredge plan will be developed after chemical and physical characterization of the sediment is completed during planning.

Maintenance dredging of the Bayou Chico navigation channel was successfully completed by the U.S. Army Corps of Engineers in 2008 to improve navigation and water circulation in the bayou. At that time, 54 samples were analyzed and showed elevated levels of total recoverable petroleum hydrocarbons, semi-volatile organic compounds, organochloride pesticides, metals, and total organic carbon (TOC). Removal of the sediment from the navigation channel resulted in improved water quality in the bayou. The proposed project's removal of additional sediment will significantly improve water quality, benthic habitat and the ecology of Bayou Chico.

Other major improvements to Bayou Chico have contributed to restoration and will further protect the bayou's quality after contaminated sediment is removed, examples of which are listed below:

- Closure of a wastewater treatment plant removed a surface water discharge;
- Removal of the old Barrancas Avenue bridge and construction of a new bridge improved water circulation and flow;

- Elimination of septic tanks and installation of sanitary sewer in surrounding neighborhoods in the watershed improved water quality;
- Repairing sanitary sewer lift stations in the watershed reduced sewer overflows;
- Preservation of the Jones Swamp wetland conservation area in the watershed protected water quality;
- Implementation of a new fertilizer ordinance reduced nutrient loading;
- Removal of the old railroad trestle south of Navy Boulevard improved water circulation and flow;
- Construction of natural stream restoration projects in several segments of tributaries to the bayou improved water quality and stream habitat;
- Construction of stormwater retrofit projects in the watershed improved water quality; and
- Implementation of the Clean Marina Program for boatyards and marinas in the bayou.

Funding for the project will allow Escambia County to plan, design and secure permits for future dredging and removal of contaminated sediments enriched with nutrients and hydrocarbons. The dredging of contaminated sediment will occur during a future phase.

Implementation methodology – As noted, the project is to plan, design and secure permits for future dredging and removal of contaminated sediments. The sponsor has extensive experience in this aspects of the project. Pre-dredge sediment characterization will require sediment core sampling and laboratory analysis to determine the quality of sediment to be dredged and sediment disposal options. It would include use of ~60 vibracores with clear plastic sleeves to assess the thickness and characterization of the fine sediments and to quantify the material which would ultimately be removed. Visual inspection of the sediment will be conducted in the field to determine the preliminary depth to a clean substrate and the proposed dredging depth. Water quality monitoring will be conducted before dredging (baseline), during dredging operations, and post-dredging.

Monitoring and adaptive management – Project monitoring can prevent problems from occurring by providing early warning signals and improving coordination. Standard monitoring protocols described in Science-Based Restoration Monitoring of Coastal Habitats (Thayer et al., 2003; Thayer et al., 2005) will be use. The monitoring plan will detail the collection methods, parameters to be measured, and quality assurance and control procedures. Sampling sites and frequency and duration of sampling events will be included. Verification of collected data will ensure quality and integrity. Water quality parameters that will be monitored will include depth, temperature, salinity, conductivity, dissolved oxygen, turbidity, total suspended solids, total nitrogen, total phosphorus, and fecal coliform bacteria. Ponar dredge samples will be collected to compare pre- and post-dredging benthic habitats. Species abundance and species diversity of benthic invertebrates will be analyzed.

Adaptive management will be employed during project planning and the future dredging phase to determine if there are issues, or if objectives need to be refined, so that remedies can be implemented if necessary. Project monitoring during all phases of the project will provide the information needed to make good adaptive management decisions.

Measure of success - Measurable goals, objectives, and metrics for this proposed phase of the project will include: 1) Planning to include sediment characterization, sediment quality analysis,

and sediment quantity to be removed; 2) Design to include engineered drawings depicting the areas to be dredged and the quantities of dredged material to be removed; and 3) Obtaining permits from the US Army Corps of Engineers and the FDEP.

Risks and uncertainties – Since this a planning, design, and permitting effort, the risks are minimal. Escambia County scientists have extensive experience with the planning, designing, permitting, implementation, and monitoring of environmental restoration projects.

Outreach and education - The project provides an excellent opportunity for environmental education and community outreach. The major expense of removing contaminated sediment can be compared to the less costly preventative measures and practices that would have prevented contaminants from entering the waterbody. The sponsor will give presentations to civic groups and schools about the ecology, functions, and intrinsic values of healthy watersheds, healthy benthic habitat, and fishable and swimmable waters. Educational signs explaining the ecology of estuarine habitats and the principles of water quality will be installed along the project shoreline.

Leveraging of resources and partnerships – The Bayou Chico Association partnership is fully characterized in Project 4, above. Bayou Chico is shared by the City of Pensacola and Escambia County, so cooperation between these two local governments is crucial for successful environmental improvements. As noted above, local partners have already completed 52 projects under the adopted Bayou Chico Basin Management Action Plan at a cost of ~$25 million.

Project benefits – The primary benefit is that planning, design and permitting will fully address National Environmental Policy Act (NEPA) requirements for preparation of an Environmental Impact Statement or Environmental Assessment needed for future implementation of the dredging project. As discussed elsewhere, the removal of contaminated sediments will improve water quality by removing enriched nutrients and other pollutants and eliminate the re-suspension of pollutants. It will remove fine sediment and clay that smothers benthic habitat and negatively impacts healthy biological activity. The dredging will also improve circulation and tidal flushing, which will further improve water quality and habitat. The project will improve the saltwater/freshwater ratio, increasing the assimilative capacity of the bayou and increasing water clarity due to less turbidity. This will allow for a significant increase in light penetration (ultraviolet light), which will aid bacteria die-off and prevent regrowth and re-establishment and recovery of submerged aquatic vegetation near the mouth of the bayou where it has historically occurred. Commercial navigational access and improvements for recreational use are expected as well.

<u>Gulf Coast Ecosystem Restoration Council's Comprehensive Plan Goals and Objectives</u>

Implementation of the *Pensacola Bay Watershed Restoration* proposal will contribute to the accomplishment of each of the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan Goals and Objectives. The table in included in the **Other** section summarizes the situation.

Location Information

Project 1 – Pensacola East Bay Living Shoreline Project – Phase I

The project is located in Santa Rosa County in the East and Blackwater Bays, embayments within the Pensacola Bay system in Santa Rosa County, FL (Sections 14, 20, 19, 22, 23, 32, 33; Township 27 & 28; Range 1S). The project is defined as the east shore of East Bay from Escribano Point south to the mouth of the East River, and the small bay along the east shore of Blackwater Bay immediately north of Escribano Point. The project area located in Blackwater Bay is within the boundaries of the Yellow River Marsh State Aquatic Preserve. Current property land records show that the land directly adjacent to the project shoreline is either publicly owned by the Northwest Florida Water Management District, Department of Defense Eglin Air Force Base, or the US Forest Service.

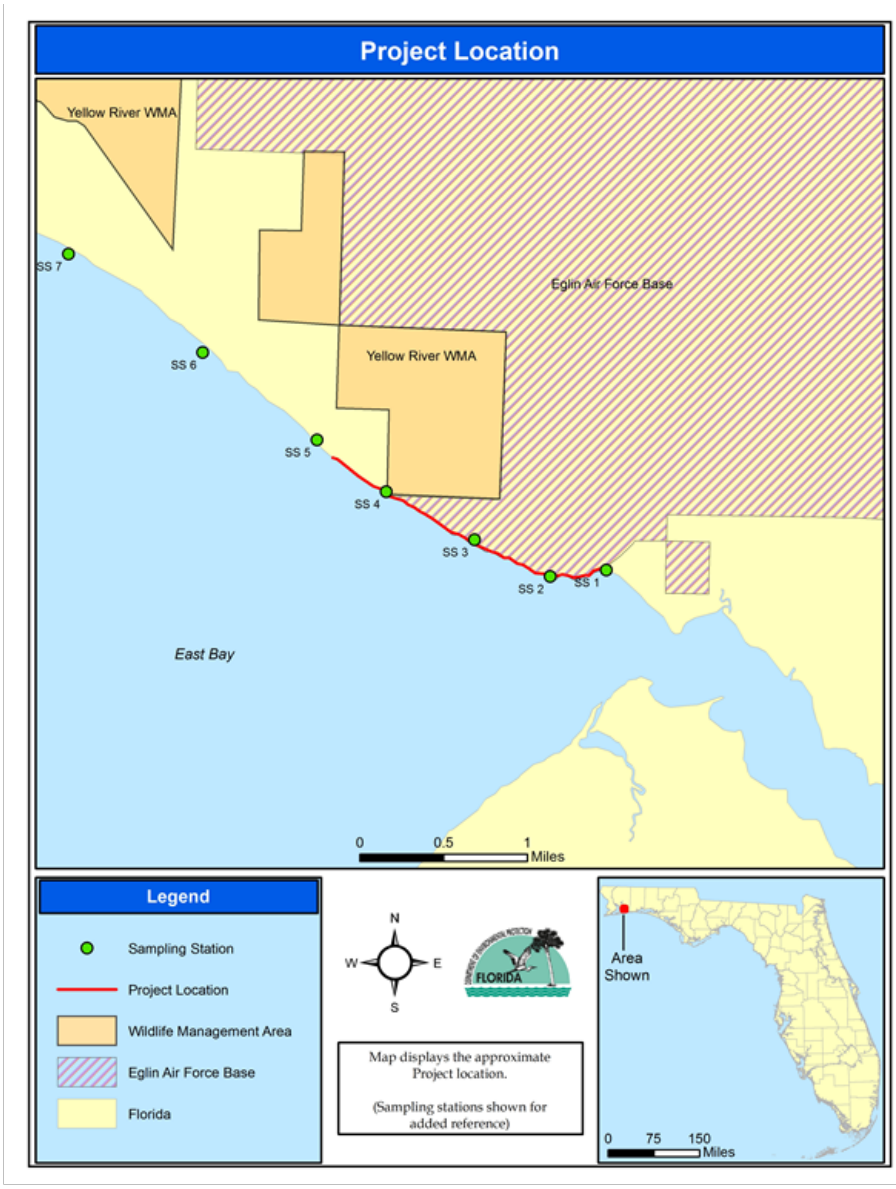

Figure 2. Pensacola East Bay Living Shoreline Project – Phase I

Project 2 – Pensacola Bay Living Shoreline – Phase I

Phase 1 of this living shoreline project will be constructed adjacent to White Island in northwestern Pensacola Bay (Site A). Future phases of this project (construction at Sites B and C) will extend the living shoreline project southward along the eastern shore of Naval Air Station (NAS) Pensacola, and along the eroded southern shore of NAS Pensacola across from Pensacola Pass.

Figure 3. Pensacola Bay Living Shoreline Project - Sites A, B, and C

Figure 4. Site A - White Island Living Shoreline will be designed/permitted/constructed in this Phase I

Figure 5. Site B - Eastern Shore of NAS Pensacola Living Shoreline will be designed and permitted in this Phase I, but construction will occur in a future phase

Figure 6. Site C - Sherman Cove Living Shoreline will be designed and permitted in this Phase I, but construction will occur in a future phase

Project 3 – Pensacola Beach Reclaimed Water System

The project is located on Pensacola Beach, Florida. The following aerial shows the location of the Pensacola beach WWTP (Figure 7), and its outfall into Santa Rosa Sound. The map on the following page shows the location of the ECUA service area where reclaimed water will be made available (Figure 8).

Figure 7. Aerial photograph of Pensacola Beach WWTP

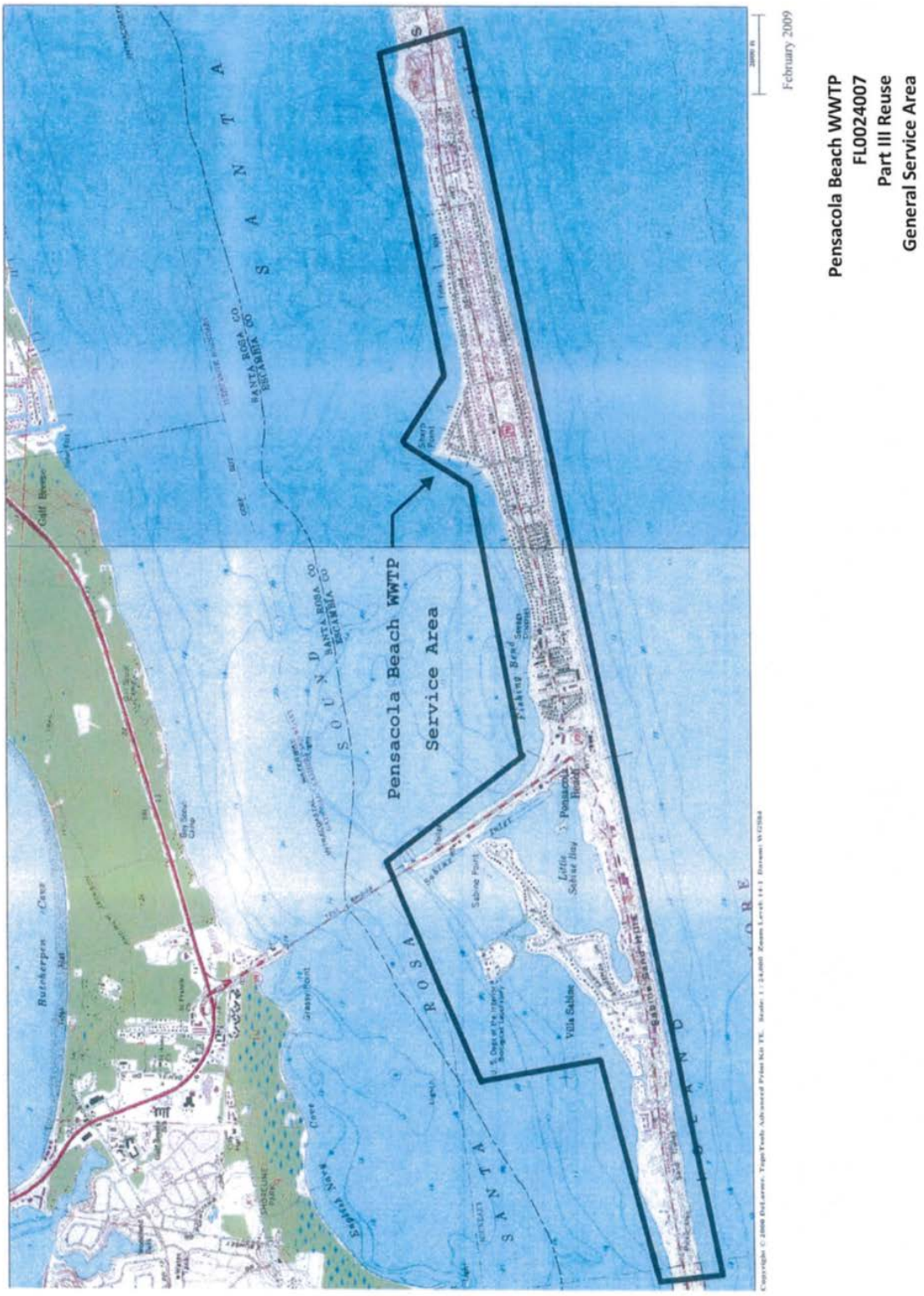

Figure 8. Pensacola Beach location of the ECUA service area

Project 4 – Beach Haven – Joint Stormwater & Wastewater Improvement Project - Phase II
Bayou Chico is located in northwestern Pensacola Bay. The Bayou Chico watershed is located in the southern end of Escambia County. The Bayou Chico Watershed consists of Bayou Chico, which discharges to Pensacola Bay, and the tributaries of Jones Creek, Jackson Creek, and Maggie's Ditch. The following map shows the project's location.

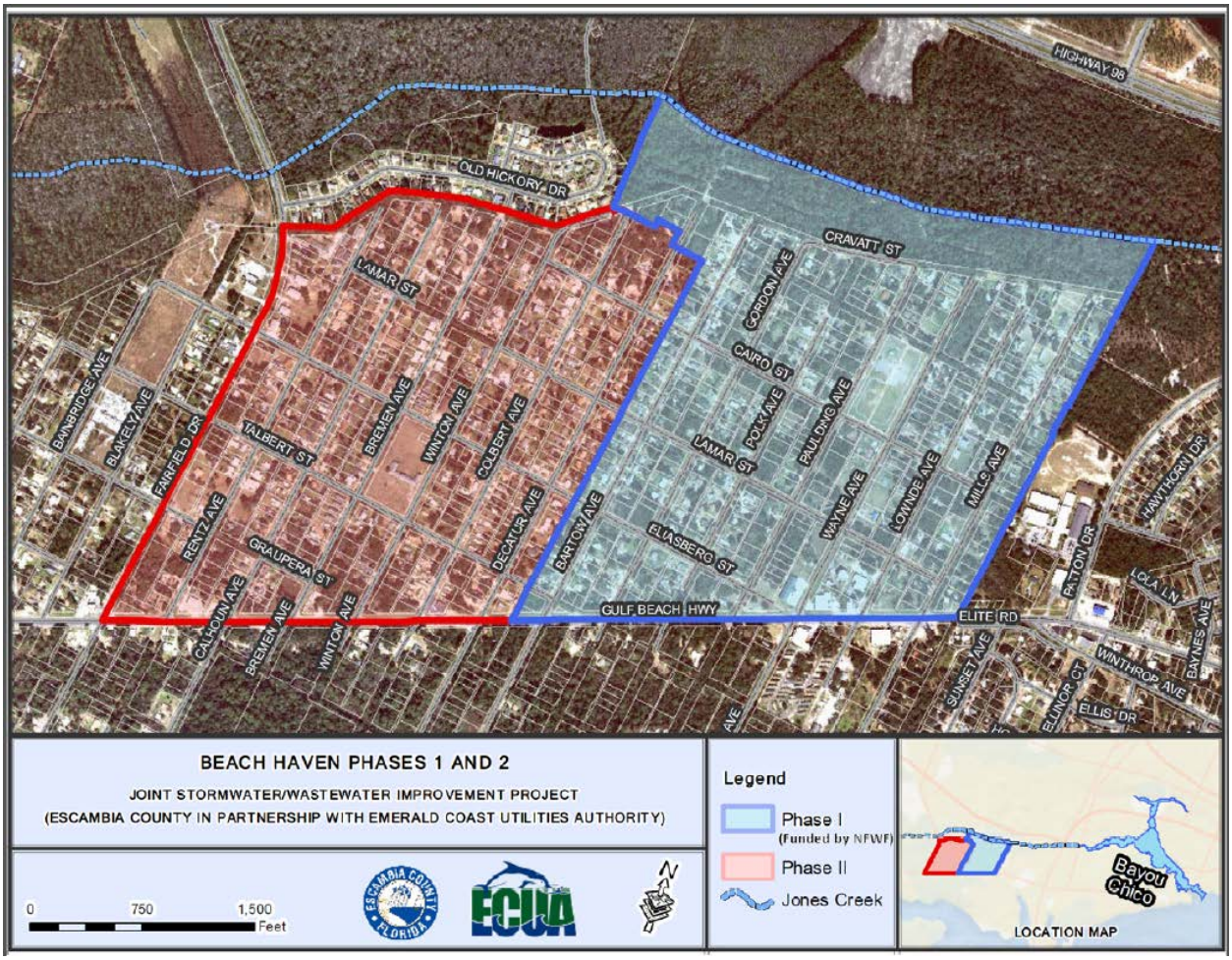

Figure 9. Beach Haven Stormwater/Wastewater Improvement Project

Project 5 – Bayou Chico Contaminated Sediment Removal- Planning, Design, and Permitting

Bayou Chico is located in northwestern Pensacola Bay. The Bayou Chico watershed is located in the southern end of Escambia County. The Bayou Chico Watershed consists of Bayou Chico, which discharges to Pensacola Bay, and the tributaries of Jones Creek, Jackson Creek, and Maggies Ditch.

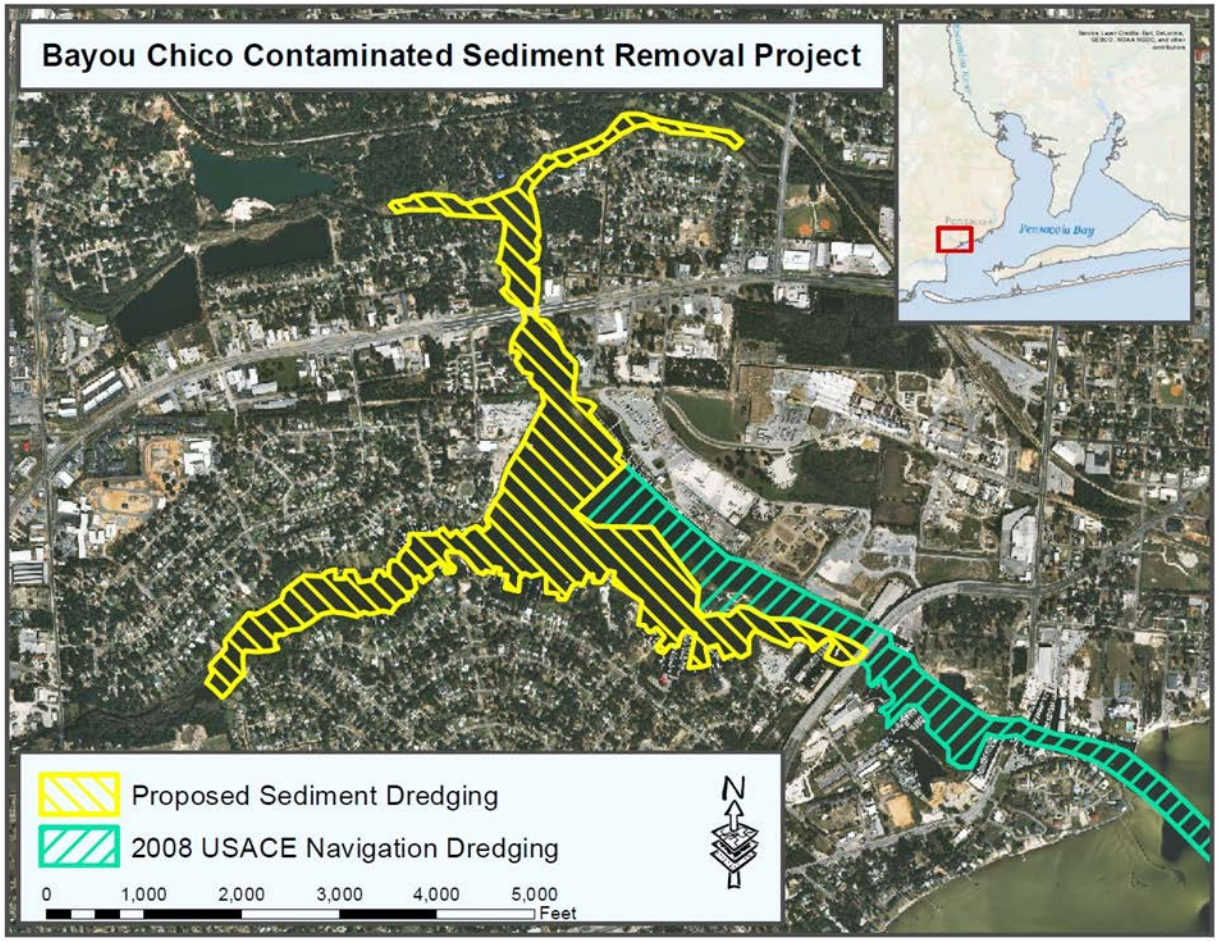

Figure 10 - Proposed contaminated sediment removal by dredging in Bayou Chico

High Level Budget Narrative

Project	Project Implementation	Project Contingency	Project Oversight	Project Administration	Total Funding Requested
1. Pensacola East Bay Living Shoreline – Phase 1	$4,175,000	$417,500	$167,000	$125,250	$4,884,750
2. Pensacola Bay Living Shoreline – Phase 1	$1,535,000	$153,500	$61,400	$46,050	$1,795,950
3. Pensacola Beach Reclaimed Water System	$2,500,000	$250,000	$100,000	$75,000	$2,925,000
4. Beach Haven – Joint Stormwater/Wastewater Improvement Project - Phase II	$5,100,000	$510,000	$204,000	$153,000	$5,967,000
5. Bayou Chico Contaminated Sediment Removal- Planning Design, and Permitting	$305,000	$30,500	$12,200	$9,150	$356,850
Proposal	**Proposal Implementation**	**Proposal Contingency**	**Proposal Oversight**	**Proposal Administration**	**Total Funding Requested**
Pensacola Bay Watershed Restoration	$13,615,000	$1,361,500	$544,600	$408,450	$15,929,550

Notes:

Project 1: implementation include costs associated with design, permitting, and environmental compliance, construction, implementation, operations and maintenance, monitoring and adaptive management, and data management. Any overhead/indirect costs are at the standard federal rate. A 10% contingency has been included for project implementation, a 4% is included to fund State of Florida oversight activities, and a 3% is included to fund State of Florida administration activities including contract management. The State of Florida will competitively select a contractor for this project enter into a sub-contract. This project will leverage the significant investments made from other *Deepwater Horizon* funding sources in or near East Bay. To date more than $5,687,862 in funds has been used for land purchases and land management activities in the Escribano Point area of East Bay.

Project 2: implementation include costs associated with design, permitting, and environmental compliance, construction, implementation, operations and maintenance, monitoring and adaptive management, and data management. Any overhead/indirect costs are at the standard federal rate. A 10% contingency has been included

for project implementation, a 4% is included to fund State of Florida oversight activities, and a 3% is included to fund State of Florida administration activities including contract management. The State of Florida will enter into a sub-contract with Escambia County. This project will leverage the significant investments made from other *Deepwater Horizon* funding sources in this area of Pensacola bay, including stormwater quality improvement in downtown Pensacola, and a living shoreline project at Sanders Beach. These investments total $13,706,500.

Project 3: implementation include costs associated with design, permitting, and environmental compliance, construction, implementation, operations and maintenance, monitoring and adaptive management, and data management. Any overhead/indirect costs are at the standard federal rate. A 10% contingency has been included for project implementation, a 4% is included to fund State of Florida oversight activities, and a 3% is included to fund State of Florida administration activities including contract management. The State of Florida will enter into a sub-contract with Emerald Coast Utilities Authority. The Northwest Florida Water Management District will provide $425,000 to the Emerald Coast Utilities Authority to construct a ground storage tank, pump station, and associated piping, valves, and other system components to assist in expansion of the Pensacola Beach reclaimed water system.

Project 4: implementation include costs associated with design, permitting, and environmental compliance, construction, implementation, operations and maintenance, monitoring and adaptive management, and data management. Any overhead/indirect costs are at the standard federal rate. A 10% contingency has been included for project implementation, a 4% is included to fund State of Florida oversight activities, and a 3% is included to fund State of Florida administration activities including contract management. The State of Florida will enter into a sub-contract with Escambia County. The Escambia County Community Redevelopment Agency (CRA) and Neighborhood Enterprise Division have programs to pay a 50:50 match for septic tank removal and sewer connection or pay 100% of those costs for low income residents. The CRA also has committed an additional $215,000 to the proposed Beach Haven Project. The County Water Quality and Land Management Division has recently received a USEPA 319 Grant to contribute $750,000 toward new stormwater treatment in Beach Haven. Escambia County Neighborhood Enterprise has committed $318,000 from Community Development Block Grant funds in addition to already funding $300,000 for the preliminary project design. This project will also leverage the significant investments made from other *Deepwater Horizon* funding sources in Bayou Chico, including stormwater quality improvements and tributary stream restoration. These investments total $11,032,250. This project also leverages $25 million in local funds used to complete 52 environmental projects in the Bayou Chico watershed.

Project 5: implementation include costs associated with design, permitting, environmental compliance, monitoring and adaptive management, and data management. Any overhead/indirect costs are at the standard federal rate. A 10% contingency has been included for the project, as additional sediment sampling may be required, a 4% is included to fund State of Florida oversight activities, and a 3% is included to fund State of Florida administration activities including contract management. The State of Florida will enter into a sub-contract with Escambia County. This project leverages over $11 million in *Deepwater Horizon* funds and $25 in local funds used to complete 52 environmental projects in the Bayou Chico watershed.

Environmental Compliance Checklist

This Environmental Compliance Checklist (Checklist) is being completed at the overall proposal level. Since the various proposed projects in this proposal are at various stages of environmental compliance review, we have checked No for all environmental compliance types listed on this Checklist. Individual Checklists will be submitted for each proposed project at a later date.

Environmental Compliance Type	**Yes**	**No**	**Applied For**	**N/A**
Federal				
National Marine Sanctuaries Act (NMSA)		X		
Coastal Zone Management Act (CZMA)		X		
Fish and Wildlife Coordination Act		X		
Farmland Protection Policy Act (FPPA)		X		
NEPA – Categorical Exclusion		X		
NEPA – Environmental Assessment		X		
NEPA – Environmental Impact Statement		X		
Clean Water Act – 404 – Individual Permit (USACOE)		X		
Clean Water Act – 404 – General Permit(USACOE)		X		
Clean Water Act – 404 – Letters of Permission(USACOE)		X		
Clean Water Act – 401 – WQ certification		X		
Clean Water Act – 402 – NPDES		X		
Rivers and Harbors Act – Section 10 (USACOE)		X		
Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)		X		
Endangered Species Act – Section 7 - Biological Assessment (BOEM,USACOE)		X		
Endangered Species Act – Section 7 – Biological Opinion (NMFS, USFWS)		X		
Endangered Species Act – Section 7 – Permit for Take (NMFS, USFWS)		X		
Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS)		X		
Marine Mammal Protection Act – Incidental Take Permit (106) (NMFS, USFWS)		X		
Migratory Bird Treaty Act (USFWS)		X		
Bald and Golden Eagle Protection Act – Consultation and Planning (USFWS)		X		
Marine Protection, Research and Sanctuaries Act – Section 103 permit (NMFS)		X		
BOEM Outer Continental Shelf Lands Act – Section 8 OCS Lands Sand permit		X		
NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)		X		
NHPA Section 106 – Memorandum of Agreement/Programmatic Agreement		X		
Tribal Consultation (Government to Government)		X		
Coastal Barriers Resource Act – CBRS (Consultation)		X		
State				
As Applicable per State		X		

Data / Information Sharing Plan

The Florida Department of Environmental Protection will provide a central location to access data and other information related to all of the projects in the proposal. It is not possible to have a single, uniform data sharing plan because the projects involve different approaches to the proposal's primary goal of restoring water quality and in how they will achieve the associated goals and objectives related to restoring habitat, replenishing and protecting living coastal and marine resources, and enhancing the Gulf economy and community resilience. The nature of the data they generate will vary, whether scientific, demographic or financial.

Completion reports and monitoring data will be made available to the Gulf Coast Ecosystem Restoration Council, the Florida Department of Environmental Protection, regional partners and stakeholders, and any person or entity upon request.

Northwest Florida Water Management District information will also be reported annually as part of the District's March 1 Consolidated Annual Report (http://nwfwater.com/data-publications/reports-plans/consolidated-annual-reports/).

Information and data associated with the Emerald Coast Utility Authority reuse project will be made available by the Authority on its website, http://www.ecua.fl.gov/, or upon request. In addition, all effluent data and other water quality information associated with the Pensacola Beach Reclaimed Water System is delivered to the Florida Department of Environmental Protection in monthly Discharge Monitoring Reports, which may be obtained from ECUA or from the FDEP Domestic Wastewater Program, http://www.dep.state.fl.us/water/wastewater/dom/index.htm. In addition, current and future reclaimed water reuse data is provided to FDEP and included in the agency's annual Reuse Inventory, copies of which are available at http://www.dep.state.fl.us/water/reuse/inventory.htm.

Escambia County and ECUA are cooperating on the Joint Stormwater/Wastewater Improvement Project and both entities will make information available upon request or on their respective websites, http://myescambia.com/government/departments/sw/engenvqual for the Escambia County Engineering and Environmental Quality division, or http://www.ecua.fl.gov/, for ECUA.

Water quality data will be collected pursuant to approved quality assurance plans and made available through the Florida Department of Environmental Protection's Storage and Retrieval Data Warehouse (STORET), http://storet.dep.state.fl.us/DearSpa/.

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Other

As referenced in the narrative, the table below summarizes the Comprehensive Plan goals and objectives fulfilled by the projects in the Pensacola Bay Watershed Restoration proposal.

Comprehensive Plan Goal	Proposal Contributions	Comprehensive Plan Objective	Project Contributions
1. Restore and Conserve Habitat – Restore and conserve the health, diversity and resilience of key coastal, estuarine and marine habitats.	Five of the six projects in this proposals are primarily restoration projects that will contribute to the restoration and conservation of coastal ecosystem health, diversity, and resilience.	1. Restore, Enhance, and Protect Habitats.	Completion of water quality and habitat restoration projects will restore and conserve aquatic, wetland, and riparian habitats, contributing to restoration and conservation of coastal ecosystem health, diversity, and resilience.
2. Restore Water Quality – Restore and protect water quality of the Gulf Coast region's fresh, estuarine and marine waters.	Project 5 focuses on improving water quality from agricultural discharges in the watershed. The other projects that improve hydrology and habits also contribute to improved water quality.	2. Restore, Improve, and Protect Water Resources.	Completed projects will directly improve and protect water resources. Public engagement will further promote long-term stewardship and success.
3. Replenish and Protect Living Coastal and Marine Resources – Restore and protect healthy, diverse and sustainable living coastal and marine resources.	Restoration and protection of water quality and wetland and aquatic habitats will directly restore and protect living coastal and marine resources.	3. Protect and Restore Living Coastal and Marine Resources.	Protection and restoration of water quality and coastal and wetland habitats will directly protect and restore living coastal resources.
4. Enhance Community Resilience – Build upon and sustain communities with capacity to adapt to short- and long-term changes.	Restored riparian, wetland, and floodplain functions will contribute to the resilience of coastal ecosystems and coastal human communities.	4. Restore and Enhance Natural Processes and Shorelines.	Protection and restoration of riparian and wetland habitats will directly enhance natural process and shorelines.
5. Restore and Revitalize the Gulf Economy – Enhance the sustainability and resiliency of the Gulf economy.	The Bay's economy and quality of life depend on the health and quality of the watershed and estuary. Completion of water quality and habitat restoration projects will benefit the oysterman and enhance the resilience and quality of the area's economy.	5. Promote Community Resilience.	Restored riparian and wetland habitats and floodplains will contribute to the resilience of coastal ecosystems and coastal human communities.
		6. Promote Natural Resource Stewardship and Environmental Education.	Public engagement and outreach and public distribution of watershed data and information will contribute to long-term resource stewardship and environmental education.
		7. Improve Science-Based Decision-Making Processes.	Projects will use professionally accepted scientific methodology, to include water and habitat quality data and empirically-based evaluations of BMPs and treatment and restoration methods.

ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Pensacola Bay Watershed Restoration

PROPOSAL NUMBER

FL-1

LOCATION

Pensacola Bay Watershed within Florida

SPONSOR(S)

Florida

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Planning/Technical Assistance/Implementation

REVIEWED BY:

Bethany Carl Kraft/ Ben Scaggs

DATE:

11-17-14

1. Does the project aim to restore and/or protect natural resources, ecosystems, fisheries, marine and wildlife habitat, beaches, coastal wetlands and economy of the Gulf Coast Region?

◉ YES ○ NO

Notes:

Proposal seeks funding to accomplish high priority water quality and habitat restoration actions identified in adopted restoration plans.

2. Is the proposal a project?

◉ YES ○ NO

If yes, is the proposed activity a discrete project or group of projects where the full scope of the restoration or protection activity has been defined?

◉ YES ○ NO

Notes:

3. Is the proposal a program?

◯ YES ◉ NO

If yes, does the proposed activity establish a program where the program manager will solicit, evaluate, select, and carry out discrete projects that best meet the program's restoration objectives and evaluation criteria?

◯ YES ◯ NO

Notes:

4. Is the project within the Gulf Coast Region of the respective Gulf States?

◉ YES ◯ NO

If no, do project benefits accrue in the Gulf Coast Region?

◯ YES ◯ NO

Notes:

Eligibility Determination

ELIGIBLE

Additional Information

Proposal Submission Requirements

1. Is the project submission overall layout complete? ***Check if included and formatted correctly.***

A. Summary sheet	☑	F. Environmental compliance checklist	☑
B. Executive summary	☑	G. Data/Information sharing plan	☑
C. Proposal narrative	☑	H. Reference list	☑
D. Location information	☑	I. Other	☑
E. High level budget narrative	☑		

If any items are NOT included - please list and provide details

2. Are all proposal components presented within the specified page limits (if applicable)?

◉ YES ○ NO

Notes: