



**Texas State Soil and Water Conservation Board
 Clean Water Act §319(h) Nonpoint Source Grant Program
 FY 2010 Project Workplan 10-05**

SUMMARY PAGE

Title of Project		Coastal Prairie Wetland Restoration at Sheldon Lake State Park			
Project Goals	<ul style="list-style-type: none"> • Support implementation of the Galveston Bay Plan by restoring 44 acres of coastal prairie wetlands at Sheldon Lake State Park • Utilize innovative BMPs to demonstrate cost-efficient water quality abatement through wetland restoration • Abate agricultural NPS pollution • Engage citizens in water resources management through direct involvement in wetland restoration work to increase knowledge about function of wetlands • Promote adoption of wetland restoration by other entities through the use of field days and educational materials 				
Project Tasks	(1) Project Administration and Coordination; (2) Wetland Plant Propagation; (3) Wetland Restoration; (4) Outreach and Education				
Measures of Success	<ul style="list-style-type: none"> • 44 acres of restored coastal prairie wetlands • 15,000 native plants propagated • Reduction in nutrient, sediment and bacteria loads from agricultural NPS pollution • Trained TMN volunteers who will complete the on-the-ground restoration work • Individuals participating in on-the-ground restoration work • Increased citizen knowledge and understanding about the nature and function of wetlands • Increase in wetland restoration by other entities in the Galveston Bay area 				
Project Type	Implementation (X); Education (X); Planning (); Assessment (); Groundwater ()				
Status of Waterbody on 2008 Texas Water Quality Inventory and 303(d) List	<u>Segment ID</u> 1006B	<u>Parameter</u> -	<u>Category</u> 3		
Project Location (Statewide or Watershed and County)	Sheldon Lake State Park in Carpenter's Bayou Watershed in Harris County				
Key Project Activities	Hire Staff (X); Surface Water Quality Monitoring (); Technical Assistance (); Education (X); Implementation (X); BMP Effectiveness Monitoring (); Demonstration (X); Planning (); Modeling (); Bacterial Source Tracking (); Other ()				
Texas NPS Management Program Elements	<ul style="list-style-type: none"> • Element 1 – LTG Objectives B, E, F, G • Element 1 – STGs 2B, 3A, 3D, 3F • Elements 2, 4 				
Project Costs	Federal	\$ 390,538	Non-Federal	\$ 267,457	Total \$ 657,995
Project Management	Texas AgriLife Extension Service				
Project Period	November 1, 2010 – October 31, 2013				

Part I – Applicant Information

Applicant							
Project Lead	John Jacob						
Title	Associate Professor and Extension Environmental Quality Specialist						
Organization	Texas AgriLife Extension Service, Sea Grant Program						
E-mail Address	jjacob@tamu.edu						
Street Address	1250 Bay Area Blvd, Ste. C						
City	Houston	County	Harris	State	TX	Zip Code	77058
Telephone Number	281-218-6253			Fax Number	281-218-6352		

Project Partners	
Names	Roles & Responsibilities
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and TCEQ.
Texas AgriLife Extension Service, Sea Grant Program (AgriLife Extension)	Provide staff to complete restoration project and educational outreach associated with the project
Texas Parks and Wildlife Department (TPWD)	Provide state park facility (Sheldon Lake SP) for restoration project
Texas Master Naturalist Program (TMN)	Provide volunteer labor and support for the entire wetland restoration project
Friends of Sheldon Lake State Park	Provide volunteer labor and support for wetland restoration. Assist with outreach and education.

Part II – Project Information

Project Type							
Surface Water	X	Groundwater					
Does the project implement recommendations made in a completed WPP or an adopted TMDL or approved I-Plan?				Yes	X	No	
If yes, identify the document.		<i>The Galveston Bay Plan</i> , a Comprehensive Conservation and Management Plan developed under the auspices of the National Estuary Program (CWA §320)					
If yes, identify the agency/group that developed and/or approved the document.		Galveston Bay Council as facilitated by the Galveston Bay Estuary Program (TCEQ)	Year Developed	1994			

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305(b) Category	Size (Acres)
Carpenters Bayou	12040104	1006B	3	24,205

Water Quality Impairment
Describe all known causes (pollutants of concern) of water quality impairments or concerns from any of the following sources: <i>2008 Texas Water Quality Inventory and 303(d) List</i> , Clean Rivers Program Basin Summary/Highlights Reports or other documented sources.
<p><u>2008 Texas Water Quality Inventory and 303(d) List</u></p> <ul style="list-style-type: none"> • 1006B Carpenters Bayou (freshwater, above tidal) <ul style="list-style-type: none"> ○ not assessed ○ waterbody not included on 2008 TWQI because no data collected on segment during period of record ○ Category 3 – insufficient or no data and information to determine if any standard is attained • 1006_07 Carpenters Bayou (tidal) <ul style="list-style-type: none"> ○ receiving waterbody for 1006B ○ not assessed ○ waterbody not included on 2008 TWQI because no data collected on assessment unit during period of record ○ Category 3 – insufficient or no data and information to determine if any standard is attained • 1006 Houston Ship Channel Tidal <ul style="list-style-type: none"> ○ receiving waterbody for Carpenters Bayou (1006B and 1006_07) ○ Category 4b – chlordane, dieldrin, heptachlor epoxide ○ Category 5a – dioxin, PCBs ○ Concern – ammonia, nitrate <p><u>2008 HGAC Basin Highlights Report</u></p> <p>The main stem of the Houston Ship Channel does not meet state standards for fish and crab consumption due to the detection of PCBs and dioxin in their tissues. In addition, the main stem is also listed on the 303(d) List as not meeting standards for pesticides in fish tissue. Overall, bacteria impairments and nutrient concerns are found throughout the Houston Ship Channel prohibiting safe contact recreation use in non-tidal portions of tributaries within the watershed. An additional concern for nutrient enrichment exists because of elevated levels of ammonia and phosphates, which could lead to algal blooms.</p>

Project Narrative

Problem/Need Statement

Galveston Bay is an estuary of national importance and, through the federal CWA §320, is included in the National Estuary Program administered by the EPA. Based on historical topographic maps and 1930s aerial photographs, approximately 25 to 30% of the surface area of the Coastal Prairie Ecosystem (Clay Plain Ecosystem) (Smeins et al, 1991) consisted of freshwater marshes embedded in tall grass prairie. These wetlands provided important ecological services including habitat, flood buffering and water quality abatement. The majority of the wetland acreage was lost to agricultural uses, and more recently, commercial development (i.e., urban sprawl). Development of the landscape translated to an increasing habitat and water quality crisis. The cumulative loss of water quality and flood storage function associated with the rapid disappearance of these wetlands will likely have detrimental effects on water quality and flood attenuation in the Galveston Bay watershed (Forbes, Doyle, et. al). Restoration of these wetlands can provide much-needed water quality abatement of pollutants, as well as, restore critical habitat for this region.

Facilitated by staff of the Galveston Bay Estuary Program (GBEP), the Galveston Bay Council is the stakeholder advisory group that coordinates the implementation of the *Galveston Bay Plan*, which is a Comprehensive Conservation and Management Plan developed under the auspices of the National Estuary Program. GBEP has recently provided funding to Baylor University for the Freshwater Wetland Functional Assessment Study to improve understanding of ecosystem services provided by coastal freshwater wetlands in the Galveston Bay ecosystem (Forbes, Doyle, et. al).

AgriLife Extension completed in partnership with 11 other federal, state (including GBEP) and local agencies, a treatment wetland creation project at Houston's Mason Park. This stormwater wetland is as effective as any industrial water treatment facility, but is much cheaper to build and maintain (there are no moving parts, for example). More importantly, this stormwater wetland adds both beauty and habitat to its location. Rather than a sterile concrete-lined channel, this wetland is a verdant ribbon of waving green vegetation attracting a wonderful variety of birds. AgriLife completed over 2 years of water quality sampling onsite and published the preliminary data showing overall effectiveness in constituent pollutant removal for the system.

Sheldon Lake State Park & Environmental Learning Center is a 2,800 acre outdoor education and recreation facility located in northeast Harris County. Sheldon Reservoir, located on Carpenter's Bayou, a tributary of Buffalo Bayou, was constructed in 1942 by the federal government to provide water for war industries along the Houston Ship Channel. TPWD acquired the reservoir in 1952 and designated it as the Sheldon Wildlife Management Area; it was opened in 1955. Sheldon Lake was designated a state park in 1984. Formerly in the "country," Sheldon Lake has survived a tremendous influx of urbanization over the past 50 years as Houston has grown. Sheldon Lake is now a green and blue "oasis" for wildlife and people on the edge of Texas' largest city. [TPWD, <http://www.tpwd.state.tx.us/>]

Sheldon Lake State Park was once coastal prairie and pine/oak savanna dotted and crossed by circular and linear marsh basins. Rice farming on the property that would become the Park and reservoir construction inundated, filled or drained almost all of its prairie wetlands. TPWD, in partnership with AgriLife Extension, is now restoring the Park's agricultural lands to pre-settlement condition prairie and wetland for the conservation of native plant and animal populations.

Restoration Phase I in 2004 carefully removed fill material to expose the original wetland topsoil and restore hydrology to 10 acres of marsh within 100 acres of prairie. The wetlands and surrounding uplands were planted with native vegetation. All soils are used on site or are placed in upland areas within existing agricultural fields. Phase I of the restoration was successful and is being used as a template for regional wetland mitigation projects and is visited by thousands of Houston area students each year.

Completing the wetland restoration at Sheldon Lake State Park will provide much-needed water quality abatement of pollutants, as well as, restore critical habitat for this region. This project assists in accomplishing the following priority actions from the *Galveston Bay Plan*:

- HP-1 Restore, create, and protect wetlands
- WSQ-6 Reduce nutrient and BOD loadings to problem areas

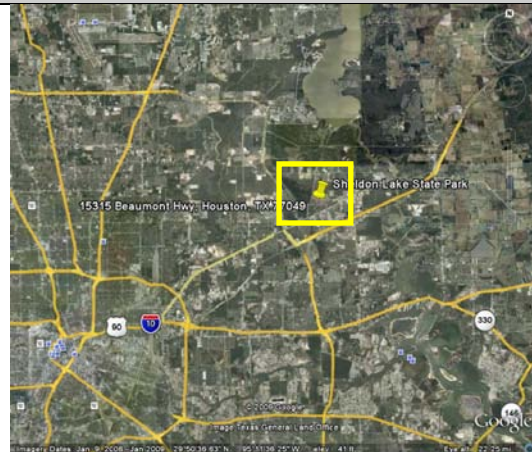
- NPS-11 Implement agricultural NPS control programs
- PPE-5 Continue to develop effective volunteer opportunities for citizens

Project Narrative

General Project Description (Include Project Location Map)

This project will restore 44 acres of seasonal and semi-permanent marsh at Sheldon Lake State Park. The fields are considered prior converted wetlands under the federal 1985 Food Security Act. The property is wholly within Sheldon Lake State Park and is to remain in TPWD ownership in perpetuity. The Park's Interpretive Master Plan shows the restoration site to be used as native prairie and wetland habitat with a nature trail winding through the upland portion.

All restoration activities will be managed and coordinated by the Wetland Restoration Team, a partnership between AgriLife Extension and the Texas Master Naturalist Program (TMN). The Team is a group of trained TMN volunteers who specialize in wetland education and restoration. The Team was responsible for the wetland planting during Phase I of the restoration project. Trained mentors from the Team work with local school and other volunteer groups by providing the knowledge and experience about the restoration process. The mentors provide individual guidance as well as act as quality control for the restoration.



Wetland vegetation should largely vegetate restored basins by the end of the second growing season following project initiation. Restoration of these wetlands at Sheldon Lake SP will not only provide visitors with a glimpse of this landscape, but also will store or detain rainfall runoff, remove pollutants from surface waters, and thus improve Carpenters Bayou (and therefore Buffalo Bayou) water quality and reduce downstream flood levels. Additionally, the success of this project will demonstrate the use and success of restoring wetlands to treat potential constituent pollutants in agricultural settings.

The project anticipates the restoration of 44 acres of freshwater coastal prairie wetlands. With the restoration work to be completed, it will be necessary to propagate at least 15,000 native wetland plants. These 15,000 plants will then be installed into the excavated pond areas to restore the wetlands to their pre-settlement condition.

AgriLife Extension and TPWD will produce an engineering design for this restored wetland system which is consistent with NRCS conservation practice standards for Wetland Restoration (657) and Constructed Wetland (656). AgriLife Extension and TPWD will develop and implement an operation and maintenance plan for the restored wetland for the designed life of the restored wetland. AgriLife Extension will conduct vegetation transects to determine wetland plant stand establishment.

AgriLife Extension and TPWD will conduct field days at the restored wetland site to highlight the innovative construction methods and utility of the restored wetland targeted to various audiences. AgriLife Extension will make presentations on the restored wetland at local and regional meetings, including Galveston Bay Council and subcommittee meetings, Clean Rivers Program Basin Steering Committee meetings, TMN meetings, and watershed stakeholder meetings for certain TMDLs (i.e., Houston area Bacteria Implementation Group) and WPPs. AgriLife Extension will develop, host and maintain a project webpage for the public dissemination of project materials.

To highlight the restored wetland system, TPWD will develop and install interpretive signage at Sheldon Lake SP and develop educational materials for distribution to visitors at the State Park. TPWD will 1) publish an article on this project in the quarterly TPWD Wetland News, and 2) produce a short program on this project for TPW-TV.

Tasks, Objectives and Schedules						
Task 1	Project Administration and Coordination					
Costs	Federal	\$ 90,009	Non-Federal	\$ 37,357	Total	\$ 127,366
Objective	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.					
Subtask 1.1	AgriLife Extension will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15 th of January, April, July and October. QPRs shall be posted on the project website and distributed to all project partners.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.2	AgriLife Extension will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.3	AgriLife Extension will host coordination meetings or conference calls, at least quarterly, with project partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. AgriLife Extension will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.4	AgriLife Extension will attend and participate in public meetings as appropriate in order to communicate project goals, activities, and accomplishments to affected parties. Such meetings may include, but are not limited to, Galveston Bay Council and subcommittee meetings, Clean Rivers Program Basin Steering Committee and Coordinated Monitoring meetings, Texas Forest Service Wetland/BMP Coordinating Committee meetings, TMN Gulf Coast Chapter meetings, and watershed stakeholder meetings for certain TMDLs and WPPs.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.5	AgriLife Extension will develop (Months 1-3), host and maintain (Months 4-36) a project webpage for the public dissemination of project materials.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.6	AgriLife Extension will develop and disseminate project informational materials, including, but not limited to, flyers, brochures, letters, news releases, and other appropriate promotional publications. TSSWCB must approve all announcements, letters and publications prior to distribution.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.7	AgriLife Extension will develop a project Final Report.					
	Start Date	Month 34	Completion Date	Month 36		
Deliverables	<ul style="list-style-type: none"> • Quarterly progress reports in electronic format • Reimbursement Forms and necessary documentation in hard copy format • List of action items needed from project coordination meetings • Promotional materials, as developed and disseminated • Project website • Final Report in electronic and hard copy formats 					

Tasks, Objectives and Schedules						
Task 2	Wetland Plant Propagation					
Costs	Federal	\$ 102,010	Non-Federal	\$ 74,200	Total	\$ 176,210
Objective	To collect and propagate native wetland vegetation for the restoration project					
Subtask 2.1	AgriLife Extension will collect local native wetland plants (within 50 mile radius of Sheldon Lake SP) to restore the wetland site. Collection will be conducted using ecologically sound methodologies to ensure the integrity of native wild populations.					
	Start Date	Month 1		Completion Date	Month 12	
Subtask 2.2	AgriLife Extension will propagate all collected native wetland plants. All plants will remain on Sheldon Lake SP.					
	Start Date	Month 13		Completion Date	Month 24	
Subtask 2.3	AgriLife Extension will work with TMN to train Wetland Restoration Team members to be mentors for the restoration process. Training will include classroom and field instruction as well as practicals (i.e. outdoor labs).					
	Start Date	Month 13		Completion Date	Month 24	
Deliverables	<ul style="list-style-type: none"> Approximately 15,000 native wetland plants propagated Training materials for Wetland Restoration Team members 					

Tasks, Objectives and Schedules						
Task 3	Wetland Restoration					
Costs	Federal	\$ 101,510	Non-Federal	\$ 81,700	Total	\$ 183,210
Objective	To restore 44 acres of prairie wetlands on Sheldon Lake State Park					
Subtask 3.1	AgriLife Extension will train and organize with TMN to prepare mentors for completing restoration (planting) of constructed site.					
	Start Date	Month 13		Completion Date	Month 36	
Subtask 3.2	AgriLife Extension and TPWD will produce an engineering design for this restored wetland system. The design will include a description specifying physical dimensions and functionality such as total area, through-flow, water depth(s), type and amount of vegetation, and the maintenance, recreational, educational infrastructure to be installed at the site. The drawings will also include detailed descriptions of the materials used in the construction of the wetland system and all its structures and the location, density and type of vegetation of all vegetated areas in the wetland. The design shall be consistent with NRCS conservation practice standards for Wetland Restoration (657) and Constructed Wetland (656).					
	Start Date	Month 1		Completion Date	Month 12	
Subtask 3.3	AgriLife Extension will include in the Final Report maps that delineate the contributing watershed for the restored wetland and a description of current and historic land use of the wetland and its contributing watershed.					
	Start Date	Month 34		Completion Date	Month 36	
Subtask 3.4	TPWD shall obtain all necessary local, state, and federal permits that apply before the restoration is conducted. Texas water rights permits and Clean Water Act § 401/404 permits may be required.					
	Start Date	Month 1		Completion Date	Month 12	
Subtask 3.5	AgriLife Extension and TPWD will develop (Months 1-12) an operation and maintenance plan for the restored wetland. TPWD will implement (Months 13-36+) the O&M plan for the designed life of the restored wetland. The O&M plan shall be consistent with NRCS Conservation Practice Standards for Wetland Restoration (657) and Constructed Wetland (656).					
	Start Date	Month 1		Completion Date	Month 36	
Subtask 3.6	AgriLife Extension and TMN will plant the constructed restoration site with trained mentors and student volunteers under the guide of the trained mentors. AgriLife Extension, with TPWD, will also treat wetland areas with appropriate herbicide to remove exotic vegetation.					
	Start Date	Month 13		Completion Date	Month 36	
Subtask 3.7	AgriLife Extension will conduct vegetation transects to determine wetland plant stand establishment. Criteria for determining stand establishment shall be consistent with the engineering design (Subtask 3.2) and NRCS Conservation Practice Standards.					
	Start Date	Month 13		Completion Date	Month 36	
Deliverables	<ul style="list-style-type: none"> • Engineering design for restored wetland system • O&M plan for restored wetland system • Completed, restored 44 acres of freshwater wetlands 					

Tasks, Objectives and Schedules						
Task 4	Outreach and Education					
Costs	Federal	\$ 97,009	Non-Federal	\$ 74,200	Total	\$ 171,209
Objective	To demonstrate the water quality benefits of the restored wetland system through field days, presentations at stakeholder meetings, and dissemination of educational materials.					
Subtask 4.1	AgriLife Extension and TPWD will conduct 4 field days at the restored wetland site (2 per year) to highlight the innovative construction methods and utility of the restored wetland. Targeted audiences should include 1) other entities in the Galveston Bay area considering conducting wetland restoration, 2) TPWD staff from other State Parks, and 3) media including TV and newspapers.					
	Start Date	Month 13		Completion Date	Month 36	
Subtask 4.2	AgriLife Extension will make presentations on the restored wetland at local and regional meetings, including 1) GBEP meetings, 2) TSSWCB Southeast and South Central Texas Regional Watershed Coordination Steering Committee, and 3) HGAC NRAC, CRP, and BIG meetings.					
	Start Date	Month 1		Completion Date	Month 36	
Subtask 4.3	AgriLife Extension and TPWD will explore the applicability of enrollment of this restored wetland system in the Wetland Reserve Program, a USDA Farm Bill program. AgriLife Extension will develop outreach materials promoting participation in WRP targeted to entities in the Galveston Bay area.					
	Start Date	Month 1		Completion Date	Month 36	
Subtask 4.4	TPWD, in coordination with AgriLife Extension, will develop and install interpretive signage at Sheldon Lake SP highlighting the restored wetland system. TPWD will develop educational materials for distribution to visitors (general public and youth) at Sheldon Lake SP highlighting the restored wetland system.					
	Start Date:	Month 6		Completion Date:	Month 36	
Subtask 4.5	AgriLife Extension will 1) produce an article on this project to be published in the quarterly <i>TPWD Wetland News</i> , and 2) produce a short program on this project for TPW-TV.					
	Start Date	Month 13		Completion Date	Month 36	
Deliverables	<ul style="list-style-type: none"> • Promotional materials, notices, agenda and attendance lists for Field Days • Presentations at local and regional meetings, as developed and presented • WRP promotional materials • Interpretive signage in place and materials for distribution to SP visitors • Article in TPWD Wetland News • Short program for TPW-TV 					

Project Goals (Expand from Summary Page)

- Support the implementation of the Galveston Bay Plan and the Sheldon Lake State Park Interpretive Master Plan by restoring 44 acres of coastal prairie wetlands at Sheldon Lake SP
- Utilize innovative construction methods as part of the demonstration project, showing cost-efficient water quality abatement per acre of restored wetland
- Abate agricultural NPS pollution to receiving waterbody through stormwater filtering capacity of restored wetland
- Engage citizens in community and watershed-level land and water resources management through direct involvement in wetland restoration work and dissemination of educational materials to increase knowledge about the nature and function of wetlands
- Promote adoption of wetlands restoration by entities in the Galveston Bay area through field days and dissemination of educational materials in order to restore ecosystem function and abate NPS pollution

Measures of Success (Expand from Summary Page)

- Propagation of at least 15,000 native wetland plants and subsequent successful vegetative establishment at wetland restoration site
- Restoration of 44 acres of coastal prairie wetlands at Sheldon Lake State Park
- Reduction in nutrient, sediment and bacteria loads from agricultural NPS pollution
- Number of trained TMN volunteers who will complete the on-the-ground restoration work
- Number of individuals participating in field days and on-the-ground restoration work
- Measured impact of educational programming through increased citizen knowledge and understanding about the nature and function of wetlands
- Increase in wetland restoration by other entities in the Galveston Bay area for NPS pollution abatement (long-term measure may not be quantifiable during this project)

2005 Texas Nonpoint Source Management Program Reference (Expand from Summary Page)

Goals and/or Milestone(s)

Element 1 – Explicit short- and long-term goals, objectives and strategies that protect surface... water.

Long Term Goal Objective B – Support the implementation of state, regional, and local programs to prevent NPS pollution through assessment, implementation, and education.

Long Term Goal Objective E – Develop partnerships [and] relationships... to facilitate collective, cooperative approaches to manage NPS pollution.

Long Term Goal Objective F – Increase overall public awareness of NPS issues and prevention activities.

Long Term Goal Objective G – Enhance public participation and outreach by providing forums for citizens... to contribute their ideas and concerns about the water quality management process.

Short Term Goal Two – Implementation – Objective B – ...implement BMPs to address constituents of concern... in watersheds identified as impacted by NPS pollution.

Short Term Goal Three – Education – Objective A – Enhance existing outreach programs at the state, regional, and local levels to maximize the effectiveness of NPS education.

Short Term Goal Three – Education – Objective D – Conduct outreach through [AgriLife] Extension... and others to facilitate broader participation and partnerships [to] enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen.

Short Term Goal Three – Education – Objective F – Implement public outreach and education to maintain and restore water quality in waterbodies impacted by NPS pollution.

Element 2 – Working partnerships to appropriate state, regional, and local entities, private sector groups, and federal agencies.

Element 4 – Abatement of water quality impairments from NPS pollution and prevention of significant threats to water quality from present and future NPS activities.

Estimated Load Reductions Expected (Only applicable to implementation projects)

Wetlands provide a sediment retention and nutrient removal system that uses natural chemical, physical and biological processes involving wetland vegetation, soils and their associated microbial populations to improve water quality (Waidler, et al). There are few quantitative data available to estimate the pollutant reduction and flood storage effectiveness of small freshwater wetlands; and, there is little water quality data on coastal freshwater wetlands in general, and linkages between these functions and downstream waterbodies are largely theoretical (Forbes, Doyle, et al). However, the following pollutant removal efficiencies are presented:

Median Pollutant Removal Efficiency, Stormwater Treatment Wetlands	
Pollutant	Median %
Total Suspended Solids	72
Total Phosphorus	48
Solubel Phosphorus	25
Total Nitrogen	24
Nitrate/Nitrite	67
Bacteria	78

From *Stormwater Wetlands for the Texas Gulf Coast* (Texas Sea Grant; 2009)

Pollutant Removal Efficiency, Wetland Creation	
Pollutant	%
Sediment	77.5
Phosphorus	44
Nitrogen	20

From *Conservation Practice Modeling Guide for SWAT and APEX* (Waidler, et al; 2009)

Estimated load reductions expected from implementing BMPs through this project (restored wetland) would be based on known, existing pollutant loading to Carpenters Bayou and the above pollutant removal efficiencies. However, no current water quality data exist for this waterbody (freshwater, above tidal) and no modeling has been conducted to estimate pollutant loading from this watershed.

Effectiveness of particular BMPs in reducing pollutants is dependent on a myriad of factors including natural weather phenomena and the ability of landowners to correctly install, operate, maintain or manage the BMP. With these factors in mind, the general pollutant removal efficiencies to be expected, as presented above, should be regarded as the “best case scenario” with probability that actual reductions will be less.

The mechanism for reporting pollutant load reductions achieved through implementation of BMPs funded with CWA §319(h) monies, is through the EPA Grants Reporting and Tracking System (GRTS). Actual load reductions achieved can only be reported after the BMPs are installed and operational. Currently, EPA Program Activity Measures (PAMs) only call for load reductions achieved for nitrogen, phosphorus, and sediment. Nitrogen, phosphorus, and sediment load reductions achieved through this project will be reported through GRTS.

Part III – Financial Information

Budget Summary				
Federal	\$	390,538	% of total project	59%
Non-Federal	\$	267,457	% of total project (≥ 40%)	41%
Total	\$	657,995	Total	100%
Category		Federal	Non-Federal	Total
Personnel	\$	221,284	\$ 0	\$ 221,284
Fringe Benefits	\$	53,871	\$ 0	\$ 53,871
Travel	\$	16,815	\$ 0	\$ 16,815
Equipment	\$	21,134	\$ 0	\$ 21,134
Supplies	\$	17,496	\$ 0	\$ 17,496
Contractual	\$	2,470	\$ 0	\$ 2,470
Construction	\$	0	\$ 0	\$ 0
Other	\$	6,528	\$ 230,101	\$ 236,629
Total Direct Costs	\$	339,598	\$ 230,101	\$ 569,699
Indirect Costs (≤ 15%)	\$	50,940	\$ 0	\$ 50,940
Unrecovered Indirect Costs			\$ 37,356	\$ 37,356
Total Project Costs	\$	390,538	\$ 267,457	\$ 657,995

The TSSWCB CWA §319(h) NPS Grant Program has a 60/40% match requirement. The cooperating entity will be reimbursed 60% from federal funds and must contribute a minimum of 40% of the total costs to conduct the project. The 40% match must be from non-federal sources and should be described in the budget justification. Reimbursable indirect costs are limited to no more than 15% of total federal direct costs. The project budget generally covers a three year period.

Budget Justification (Federal)		
Category	Total Amount	Justification
Personnel	\$ 221,284	Salary for project manager (full time, 3 years); Office manager (approximately 1/4 year part-time for 3 years); Graduate student worker (part-time- 20hr/wk; January through August 2013)
Fringe Benefits	\$ 53,871	Fringe, 17.1% of personnel plus TRS eligibility per FTE and PTE
Travel	\$ 16,815	Mileage reimbursement accrued through project functions/workdays (for both State vehicle (8 passenger van) and Project Manager personal vehicle. Most workdays require both the state vehicle to transport the volunteers and a separate vehicle to transport additional equipment and Staff. Approximately, 14 round trips to the State Park each month (roughly 50 miles/trip at \$0.50/mile for 36 mos). Collection trips for offsite plant material: 3 trips each month (roughly 100 miles/trip at \$0.50/mile for 24 mos). Education/Outreach trips to the park: 1 trip/mo (roughly 50 miles/trip at \$0.50/mile for 24 mos).
Equipment	\$ 21,134	Purchase of necessary ATV field equipment (2 ATV units: one unit with extra large capacity, 2 row seating) to move supplies and volunteers to and from project location.
Supplies	\$ 17,496	Office supplies used associated with project educational component (\$30/month, 36 months); Additional toner cartridges and imaging unit to accommodate large printing jobs for outreach materials (\$3,062); Laptop computer (\$850); laptop for graduate student (\$950), tablet computer (\$500), and associated supplies for computers (\$370). Additionally, Extension will host several classes and workshops which will require additional supplies above normal monthly usage; additional purchases include, but are not limited to, gloves and boots for volunteers and students, soil (3 loads @\$250/load), soil knives, shovels and muck buckets for planting/collection, and a laminator for printing educational field datasheets (\$8,480); herbicide to treat exotic vegetation within the restoration site (\$1,170).
Contractual	\$ 2,470	Development, fabrication and installation of appropriate signage onsite at wetland
Construction	\$ 0	N/A
Other	\$ 6,528	Meeting registration fees, postage, equipment maintenance and outreach materials, Wetland Team shirts for volunteers (\$753), and pesticide applicators license.
Indirect	\$ 50,940	15% of total direct federal costs

Budget Justification (Non-Federal)		
Category	Total Amount	Justification
Personnel	\$ 0	N/A
Fringe Benefits	\$ 0	N/A
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 230,101	Trained labor from TMN volunteers throughout the project. Estimated values are from "Independent Sector" – website used by the State to determine current value of volunteer labor. (12 4-hr workdays/month, avg 6 volunteers/workday, \$21.47/hr, 3 years)
Indirect	\$ 0	N/A
Unrecovered IDC	\$ 37,356	11% of total direct federal costs