

# Perdido Bay

Community-Based Watershed Plan

The Nature Conservancy in Florida

DECEMBER 2014

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The Nature Conservancy would like to thank all of the stakeholders from local, state and federal governments, NGOs, community groups and citizens who devoted their time, resources and support for this watershed planning process. Your desire and commitment to come together in the spirit of building a watershed community that will achieve more together than individually has created a solid foundation and legacy of collaboration and conservation for the Gulf. In particular, we would like to recognize the leadership demonstrated by the county governments in the Panhandle and Springs Coast to invest in a process that reaches across political and organizational boundaries and focuses on improving and protecting the watersheds today and for future generations.

# Table of Contents

Executive Summary	2
Introduction	4
Planning Process	5
Identifying Priority Issues, Root Causes, Major Actions	7
Project Identification and Performance Measurement	9
Current Status and Recommended Next Steps	13
TNC Recommendations	14
Path Forward	14
Appendices	
A—Deepwater Horizon Related Funding Opportunities	16
B—Stakeholder Participants	19
C—Stakeholder Meeting Notes	24
D—Watershed Overview and General Issues	58
E—Stakeholder-Identified Priority Issues, Root Causes, Major Actions and Project Types	65
F—Project Table	71

# Executive Summary

The Deepwater Horizon Oil Spill has focused attention on opportunities to restore and enhance Gulf Coast ecosystems and communities. In Florida, funding opportunities associated with civil and criminal settlements of the Deepwater Horizon Spill provide an opportunity to address direct damage from the spill as well as long-standing water quality, habitat and coastal resilience restoration needs. A healthy environment is the foundation of healthy economies and communities. The Nature Conservancy (TNC) believes that identifying restoration needs and projects by watershed in collaboration with diverse community stakeholders is essential for achieving comprehensive and long-term success for Gulf Restoration.

In 2013, TNC initiated a facilitated community-based watershed planning process along Florida's Gulf Coast for the following six watersheds: Perdido Bay, Pensacola Bay, Choctawhatchee Bay, St Andrew and St Joe Bays, Apalachicola to St Marks, and the Springs Coast. The Perdido, Pensacola and Choctawhatchee Bay watersheds also involved Alabama stakeholders. Similar planning efforts in the remaining Florida gulf coast areas have been led by other partners.

The community-based watershed planning provides a process for making thoughtful science-based decisions that help to both to assess already proposed projects and identify new projects that help solve recognized and documented problems in the watershed. Such a process involves understanding the priority issues facing each watershed (threats), the root causes creating each issue, and the major actions needed to address the root causes (solutions). Specifically, the process was designed to:

- **Develop watershed-based plans that identify the most pressing environmental issues affecting each watershed and solutions that address the issues, regardless of political jurisdiction and funding source.** Ideally, the plans will be 'living' documents used by all stakeholders to identify priority projects for funding that specifically address solutions to the identified issues and their root causes, documenting results to measure success, and updated as needed to help inform future activities needed to address watershed issues. The project list is designed to provide maximum flexibility for grouping projects to meet specific funding opportunity requirements and can be used to pursue project funding for RESTORE and non-RESTORE related funding programs (e.g., grants, Public Private Partnerships, etc.). The current project list is not comprehensive and further stakeholder input is needed to identify solutions necessary to resolve the watershed issues.

- **Create long term partnerships among stakeholders in each watershed and across the regions to maximize effectiveness of project implementation and funding efforts.** The stakeholders in each of the six watershed regions have voiced their desire to continue the coordination and outreach among diverse partners that this watershed planning process has supported and enhanced.
- **Provide a screening tool to evaluate the project priorities of these watershed plans for potential RESTORE funding by the communities, Florida Department of Environmental Protection (FDEP), Florida Fish and Wildlife Conservation Commission (FWC), National Fish and Wildlife Foundation (NFWF) and the Gulf Coast Restoration Council.** The project list can be used to pursue project funding for RESTORE and non-RESTORE related grants programs by clearly documenting the need for the projects in the context of how they will address solutions to critical watershed issues.

This first edition of the Perdido Bay community-based watershed plan documents the results of the watershed planning process to date - the priority issues, root causes, major actions and initial set of priority projects - identified by the Perdido Bay watershed stakeholders. The next steps are to identify additional projects to fill in gaps identified during the September 10, 2014 watershed meeting, refine the project maps as needed to more clearly define geographic extent of the projects (polygons rather than points), develop a science based selection process that prioritizes the projects proposed through this watershed process, and create a stakeholder organizational structure that will serve to continue the watershed planning and implementation work.

# Introduction

As a result of the Deepwater Horizon oil spill, potentially billions of dollars will be coming to Gulf of Mexico communities for environmental and economic restoration. These funds will be coming through various pathways – Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast Act (RESTORE), National Fish and Wildlife Foundation’s (NFWF) Gulf Environmental Benefit Fund (GEBF), and the Natural Resource Damage Assessment (NRDA). Each of these pathways has its own particular process, goals and objectives. A brief overview of each is provided in Appendix A-Deepwater Horizon Related Funding Opportunities.

In 2013 Florida opened an online portal to receive project suggestions based on their stated priorities and, to date, has received over 1,200 suggested projects totaling over \$16 billion worth of work. As this was occurring, TNC and partners recognized the need for a thoughtful and strategic decision-making process to help assess existing and future projects in the context of addressing issues that are negatively impacting the environmental integrity of the landscape. In southwest Florida this context is being provided by the three National Estuary Programs (NEPs) in that area. In the Big Bend area, the process is being led by the Suwanee River Water Management District and partners. In the Panhandle and Springs Coast, this context is being provided by the Community Based Watershed Planning process facilitated by TNC. The process involves understanding the priority issues facing each watershed, the root causes creating each issue, and the major actions needed to address the root causes (solutions).

One of the core principles in the watershed planning process is that, although the Deepwater Horizon related funding was the spark for community discussions and information sharing, the priorities and projects identified through the process can be funded by non-Deepwater Horizon related sources as well. In addition, there is a need for integration and coordination between projects and funding sources to maximize the effectiveness and results of Gulf investments. This is recognized during public meetings at every level of government regarding the implementation of RESTORE and the other Gulf related funding opportunities. By harnessing all applicable funding sources and applying them to the most appropriate project, each community will maximize the number of projects that can be completed and, therefore, make the most progress in improving and protecting the long-term health of their watershed.

The community-based watershed process has been designed and adapted to facilitate communication among the diverse stakeholders. The process identifies a priority suite of projects necessary to improve and maintain the health of Gulf watersheds and matches priority projects with the most appropriate funding source(s). In addition to the Deepwater Horizon related

funding sources detailed in Appendix A, there are numerous other funding opportunities that could and should be leveraged as the Gulf of Mexico watersheds are restored that include, but are not limited to:

- o Federal/State Grants – stormwater projects, habitat creation and restoration, land acquisition, etc.
- o Public Private Partnerships (P3) – public infrastructure projects that include cost recovery mechanisms (e.g., sewer projects)
- o Wetland mitigation opportunities
- o Private foundations and contributors

The Perdido Bay Community Based Watershed Plan documents the planning process, the initial set of priority projects, and next steps for the Perdido Bay Watershed.

## Planning Process

The Nature Conservancy organized and facilitated “watershed discussions” for the Perdido Bay watershed with a variety of diverse community stakeholders that included federal, state and local governments, Non-Governmental Organizations (NGOs) and interested businesses, community groups and citizens. Several meetings were held during the development of this plan and the meeting dates and participants can be found in Appendix B–Stakeholder Participants.

The motivation for the community watershed planning is to help ensure a healthy and protected natural environment that supports a vibrant economy and community. The key objectives of this process are to:

- o **Develop watershed-based plans that identify the most pressing environmental issues affecting each watershed and solutions that address the issues, regardless of political jurisdiction and funding source.** Ideally, the plans will be ‘living’ documents used by all stakeholders to identify priority projects for funding that specifically address solutions to the identified issues and their root causes, documenting results to measure success, and updated as needed to help inform future activities needed to address watershed issues. The project list is designed to provide maximum flexibility for grouping projects to meet specific funding opportunity requirements and can be used to pursue project funding for RESTORE and non-RESTORE related funding programs (e.g., grants, Public Private Partnerships, etc.). The current project list is not comprehensive and further stakeholder input is needed to identify solutions necessary to resolve the watershed issues.

- **Create long term partnerships among stakeholders in each watershed and across the regions to maximize effectiveness of project implementation and funding efforts.** The stakeholders in each of the six watershed regions have voiced their desire to continue the coordination and outreach among diverse partners that this watershed planning process has supported and enhanced.
- **Provide a screening tool to evaluate the project priorities of these watershed plans for potential RESTORE funding by the communities, Florida Department of Environmental Protection (FDEP), Florida Fish and Wildlife Conservation Commission (FWC), and the Gulf Coast Ecosystem Restoration Council and non-RESTORE funding programs such as the NFWF.** The project list can be used to pursue project funding for RESTORE and non-RESTORE related grants programs by clearly documenting the need for the projects in the context of how they will address solutions to critical watershed issues.

The Perdido Bay Community Based Watershed Plan was developed using the following process. The process is ongoing and future steps are detailed in the Recommended Next Steps section. This process was not meant to duplicate the state's process for soliciting project ideas via their online portal. Rather it is specifically tailored to address the needs of the watershed as identified by the stakeholders during the community meetings facilitated by TNC.

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6

- Convene key stakeholders and determine the boundary of the watershed for the purposes of this planning effort. The boundary identified by the stakeholders for the Perdido Bay is the same boundary identified in the Northwest Florida Water Management District's Surface Water Improvement and Management (SWIM) Plan for Perdido Bay. This watershed extends into the State of Alabama and stakeholders from Alabama were invited to participate in the planning process. We recognize that representation from Alabama needs to be expanded.
- Discuss stakeholders' vision for the watershed
- Identify the priority issues that must be addressed, the root causes of the priority issues, and the major actions necessary to implement solutions for the root causes
- Develop a suite of priority projects that will help resolve identified issues and root causes. TNC developed an online form to solicit projects from stakeholders. Stakeholders were also asked to identify performance metrics that can be applied to monitor and track success of the project, once implemented, as well as changes in the overall health of the watershed (e.g., improved water quality, increase in seagrass habitat, etc.).
- Identify remaining needs and new projects to address gaps that are not addressed by the current proposed projects.

- o Integrate results of the plans into the stakeholder’s processes implemented by their respective affiliations, i.e., RESTORE processes, County comprehensive plan implementation, NGO restoration plans.

Meetings for the Perdido Bay watershed began in May 2013 and continued through September 2014. After each meeting, meeting notes were distributed to all participating stakeholders (Appendix C–Stakeholder Meetings Notes). The notes and comments received were used to develop this draft plan. This plan represents the first edition of the Perdido Bay Community-based Watershed Plan. The plan will be updated as future meetings are conducted and to recognize progress on implementation of solutions.

### 1) Identifying Priority Issues, Root Causes, and Major Actions:

The first step in the watershed planning process was to hear stakeholder perspectives on what they envisioned for their watershed’s future. To do so, the following question was e-mailed to stakeholders prior to the first meeting held for the Perdido Bay watershed. It was also provided on slips of paper to be filled out during the meeting:

*In a sentence, of just a word or few, what is your Vision for the Perdido Bay Watershed’s future (land/river/estuary/Gulf)? What do you hope it looks like in 10, 20, or 50 years and beyond?*

During the meeting held on August 6, 2013, TNC facilitated a short brainstorming session as an introduction for everyone to hear and understand each other’s thoughts and viewpoints on their vision for the Perdido Bay watershed. A vision statement was not developed; this can be done at a later date as part of creating a long term organizational structure to manage the implementation of this plan.

The following are the unedited comments that were presented on paper and during the brainstorming and have been grouped by common themes:

- o **Overall thoughts**
  - o Active management
  - o Information exchange, cross-state interaction
  - o Unimpaired waters
  - o Upstream engagement
  - o Resilience to climate change/SLR/storm hazards
  - o Innovative approaches
  - o Long-term health

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o **Healthy habitats and resources**

- o Re-establish fishery and vegetation (SAV)
- o Ecosystem Health
- o Restore to historic conditions (needs to be defined)

o **Clean Water**

- o Fewer Health Advisories
- o No impaired waters - impaired waters are restored and off the 303d list
- o Attenuate run-off within watershed

o **Educated and active community**

- o Implement Research and Studies
- o Summarize prior research
- o Forum for active information exchange
- o Active management through a state partnership or working group
- o Reestablish the Perdido Ecosystem Restoration Group (PERG) as a forum for the stakeholder collaboration
- o Entire watershed geography is engaged in process, i.e. beyond just the “Coastal Counties”
- o Support Eleven Mile Creek Bacteria Prevention and Control Plan
- o Innovative approaches
- o Identify local “indicator organisms”
- o Point source vs. non-point source assessments
- o Improved understanding of discharge to receiving wetlands

8

The next step was to start identifying the Priority Issues, Root Causes, Major Actions facing the Perdido Bay Watershed. Appendix D–Watershed Overview and General Issues contains a general description of the Perdido Bay Watershed, a map of the watershed, and the high level issues it faces.

The following are the terms and definitions used for the watershed planning process:

- o Priority Issues: main themes of problems that were universal across the watersheds and need to be addressed
- o Root Cause: source(s) of the priority issues
- o Major Action: essential activity(ies) that needs to be accomplished to address the root causes of the priority issues.

During this portion of the process there was much discussion and numerous issues, root causes and major actions were identified. For purposes of facilitating the discussion, it was explicitly recognized that there is considerable overlap and inter-relationships between issues, root causes and major actions. As such, there is no one correct way to categorize them and the groupings that were made were done in order to present the information in a logical fashion. The following list is the high level groupings for the Priority Issues and Major Actions. For a complete listing of these, and their relationships with the Root Causes, please see Appendix E – Stakeholder Identified Priority Issues, Root Causes, Major Actions and Project Types.

The Priority Issues identified by the watershed stakeholders, each having one or more root cause, are:

- o Water Quality
- o Natural Resource Protection and Management
- o Education and Outreach
- o Coastal Community Resilience

The Major Actions identified by the watershed stakeholders are:

- o Protect, restore, create and/or manage natural habitat and resources and increase buffer areas
- o Increase cooperation and coordination for management, monitoring, funding, implementation, outreach, enforcement
- o Reduce impacts to groundwater and ensure adequate fresh water availability
- o Reduce and treat stormwater
- o Reduce nutrient loading
- o Reduce sedimentation
- o Increase economic diversification

## 2) Project Identification and Performance Measurement

The next step in the process was to begin to identify the priority projects that would initiate the implementation of major actions needed to address the identified root causes and priority issues. The process of identifying priority projects involves understanding and documenting how a project relates to identified root causes and priority issues. To aid in the prioritization of projects, each proposed project should include specific performance metrics that identify the expected results and quantify, if feasible, how those results relate to and address a root cause(s) and priority issue(s)

identified in the watershed. Documented results will help inform future decision making and prioritization activities by tracking actual versus predicted results. These results will help inform communities and decision makers in the selection of future projects that show the most promise for return on investment based on desired outcomes.

Both short and long-term metrics must be identified to effectively monitor and evaluate the impact from implemented projects on the critical watershed issues they were designed to address. Short-term metrics focus on monitoring the success and effectiveness of the individual project efforts at addressing root causes (e.g., for a sediment stabilization project, what percent of the project area was successfully stabilized). Long-term metrics will focus on the impact of those projects on the priority watershed issues (e.g., return of stream channels, increase in water clarity/quality, increase in seagrass coverage, improved fish landings, etc.) It should be noted that direct correlations between specific projects and improvement in a priority issue or issues may sometimes not be possible, particularly when several projects need to be implemented to adequately address a priority issue. However, these longer-term measures are important since they track the ultimate results the community and funders are seeking to achieve. Including effective metrics will also facilitate adaptive management as the predicted versus actual results can be evaluated to ensure implemented projects are achieving expected outcomes.

In order to be methodical and ensure that the highest priority projects were submitted, the following process was used:

- o In advance of the watershed meeting, stakeholders were asked to submit their top three priority projects using an online form developed by TNC specifically for this watershed planning process.
  - Each project submission included fields which tied the project to identified root causes and major actions, and
  - Each project submitter was asked to include specific performance measures that could be used to evaluate the success of the project itself as well as success of the project on addressing a root cause(s) and priority issue(s).
- o Jean-Paul Calixte with the Natural Resources Conservation Service partnered with TNC to develop a GIS-based map showing a point location of each project (Figure 1). The project locations were identified using latitude and longitude coordinates provided by the stakeholder proposing a project. It is important to note that many projects are not adequately represented by a single point since they span larger geographic areas and, in some cases, multiple projects within a proposed project. Future work on the watershed

planning should strive to create accurate boundaries of each project represented by polygons on the map. The map was distributed to all stakeholders prior to the September 10, 2014 joint meeting of the Perdido Bay and Pensacola Bay stakeholders.

- o At the watershed meeting, attendees broke out into groups to review the maps and spreadsheet of the proposed projects, to identify geographic and project type gaps, and to reconcile any questions on project locations. The attendees reconvened into one group and reported on their break out group findings regarding project gaps and next steps (Appendix C–Meeting Notes dated September 10, 2014).

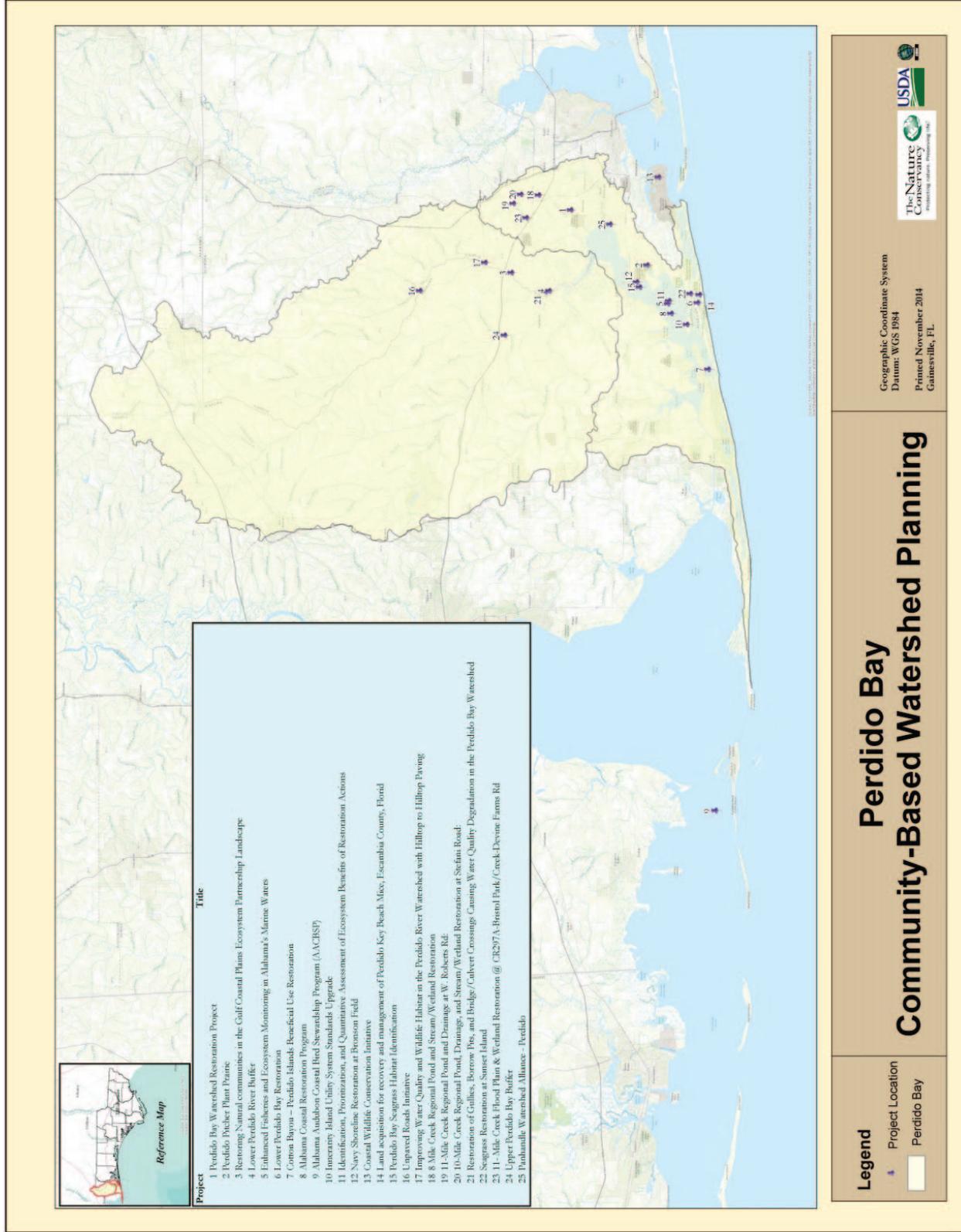
Twenty-five projects totaling 91 different actions were submitted during the first round of project nominations (Appendix F–Project Table). Projects ranged from single focus projects such as stabilizing dirt roads, to multiple projects designed to restore a sub-basin within the watershed. The following is a breakdown of suggested projects by Major Action:

- o Protect, restore, create and/or manage natural habitat and resources and increase buffer areas–33
- o Increase cooperation and coordination for management, monitoring, funding, implementation, outreach, enforcement–6
- o Reduce impacts to groundwater and ensure adequate fresh water availability
- o Reduce and treat stormwater–44
- o Reduce nutrient loading–4
- o Reduce sedimentation–4

*Note that the above grouping is by Major Action, but numerous proposed projects would have positive impact on more than one Major Action.*

One of the key principles behind the watershed planning effort is to develop the suite of projects necessary to improve the health of the watershed and protect it for future generations, regardless of potential funding sources. Once a comprehensive set of projects has been identified for each watershed, the projects can then be grouped, separated, and/or phased as necessary to apply for relevant funding sources. Potential funding sources include RESTORE, NFWF’s Gulf Environmental Benefit Fund and other NFWF grants, federal and state grants (e.g., EPA 319, FEMA, NRCS, Florida Wildlife Legacy Initiative, and others). The project list will be refined as additional watershed meetings are held.

Figure 1. Perdido Bay Watershed Project Map



Geographic Coordinate System  
 Datum: WGS 1984  
 Printed November 2014  
 Gainesville, FL



# Perdido Bay Community-Based Watershed Planning

**Legend**  
 Project Location  
 Perdido Bay

# Current Status and Recommended Next Steps

As discussed above, the stakeholders have identified the priority issues facing the watershed, their understanding of the root causes creating those issues, major actions needed to address the root causes, and have begun to identify the projects necessary to implement the major actions. In addition, TNC has been working with the stakeholders in the Perdido and Pensacola Bay watersheds to pilot the Resource Investment Optimization System (RIOS) to evaluate the model's usefulness to helping with the identification and priority setting for watershed projects.

The RIOS model is being used to conduct spatial analysis to provide a science-based framework for spatially identifying what types of projects are best positioned to address multiple activities to help solve the issues of concern in the Perdido Bay and Pensacola Bay watersheds. RIOS, designed to support this type of stakeholder process, provides a planning tool to prioritize watershed and coastal projects by identifying where land protection, restoration, or improved management activities are likely to yield the greatest benefits for people and nature. RIOS is a free and open source software tool managed by the Natural Capital Project (NatCap), and co-developed by NatCap, TNC, World Wildlife Fund and the University of Minnesota. RIOS will help answer two core questions:

1. What set of investments (which activities, and where) will give the greatest returns towards multiple objectives?
2. How much improvement in objectives can we expect from making the set of investments identified through a scientific analysis?

Applying RIOS to the Perdido and Pensacola Bay watersheds as a pilot project will provide a demonstration for how the RIOS planning tool might support a stakeholder process for developing watershed plans in other Gulf coast counties and watershed groups across Florida and beyond to help inform priorities related to future RESTORE funds, NFWF funds, or other opportunities. These pilot projects will also test and refine the new RIOS coastal module to support integrated watershed and coastal planning processes for multiple benefits.

## 1) TNC Recommendations

In order to complete the planning process TNC recommends the following actions:

- o Northwest Florida Water Management District updates the Perdido Bay SWIM plan (2012), as needed, to ensure all priority issues are identified and addressed. This action is dependent on funding received to update the SWIM plans. The Perdido Bay SWIM Plan is one of the most recently updated plans of all of the watershed plans for the watershed planning facilitated by TNC and, therefore, may not need updating. If updates are not funded then this watershed planning process will continue to use the existing SWIM plan until such time that updates are conducted.
- o In addition, a focus was placed on identifying ‘priority action areas’ (“hot spots”) that, if prioritized and restored, would make the most difference in restoring the watershed.
- o Complete the identification of priority projects by conducting a technical review of the current list of watershed projects and a “gaps” analysis to determine where and what type of projects are still needed to address the issues and root causes of each watershed.
- o Develop a science-based project prioritization process that uses the best available science to help make decisions on those projects that best address the issues.
- o Create a long-term organizational structure (i.e., estuary program) in each watershed to continue the watershed planning effort.
- o Pursue funding for the projects by matching each project and/or group of projects to potential funding sources (e.g., RESTORE, federal/state grants, public private partnerships, etc.).

## 2) The Path Forward

The following two proposals were submitted in November, 2014 in response to the initial round of RESTORE Council-Selected Restoration Component (Bucket 2) funding. If funded, these projects will significantly advance the watershed planning effort.

1. *Florida’s Northwest Florida Estuaries and Watersheds* – This project will advance the watershed planning process by continuing the stakeholder outreach, updating the Perdido and other Panhandle SWIM Plans, funding the design and permitting of priority project(s) in each estuary, implementation of priority project(s), and monitoring project success.
2. *EPA’s Gulf of Mexico Estuary Program* – This project will provide funding to create Estuary Programs for up to 12 estuaries in the Gulf of Mexico. All five Florida Panhandle watersheds (Perdido, Pensacola, Choctawhatchee, St Andrew/St Joe and Apalachicola to St Marks) are included in the proposal. This proposal would satisfy the last objectives of

the watershed planning process stated above by creating the long term partnerships in each watershed via the creation of Estuary Programs.

Together, these proposals would create and support an effective, and much requested and needed, science and community-based process for long term restoration and management of the Gulf's remarkable natural resources and coastal communities. In addition to supporting the selection of these two proposals by the Gulf Coast Ecosystem Restoration Council, TNC will be conducting the following to continue the watershed planning process:

- o Convene additional watershed meetings to identify gaps where additional science or project identification is needed to address an identified issue.
- o Develop a science-based prioritization process for the projects identified by the stakeholders and detailed in each first edition of the watershed plans.
- o Work with the EPA to convene a workshop for the watershed stakeholders and representatives from Florida's Gulf Coast and Mobile Bay National Estuary Programs to facilitate the discussion on creating estuary programs in each of the panhandle and Springs Coast watersheds and learn about the various organizational structures of existing NEPs and lessons learned.
- o Present the results from the Resource Investment and Optimization System (RIOS) decision-support tool analyses to the watershed stakeholder groups. The results of the analyses will help to further evaluate the relative benefits and costs of the projects identified in the watershed planning process. This tool might then be used to advance project identification and implementation decisions in the other watersheds and regions in the Gulf.

# Appendix A

## Deepwater Horizon Related Funding Opportunities

### RESTORE Act (Clean Water Act Fines) Allowed Uses of Funding:

<http://www.treasury.gov/services/restore-act/Documents/Final-Restore-Act.pdf>

- o Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
- o Mitigation of damage to fish, wildlife, and natural resources.
- o Implementation of a federally approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring.
- o Workforce development and job creation.
- o Improvements to or on State parks located in coastal areas affected by the Deepwater Horizon oil spill.
- o Infrastructure projects benefitting the economy or ecological resources, including port infrastructure.
- o Coastal flood protection and related infrastructure.
- o Planning assistance.
- o Administrative costs of complying with the above

### The RESTORE funds are divided into five components:

1. “Bucket 1” 35% of RESTORE funds divided equally among the five states. In Florida, these funds are allocated directly to, and will be spent by, the 23 Gulf of Mexico coastal counties.
2. “Bucket 2” 30% of RESTORE funds competitively awarded by the Gulf Coast Ecosystem Restoration Council for Gulf restoration projects. In Florida, the Governor decides which projects to nominate for consideration by the Restoration Council.
3. “Bucket 3” 30% of RESTORE funds allocated by formula to fund implementation of State Expenditure Plans (SEP). In Florida, the 23 Gulf Coastal Counties formed the Gulf Consortium to draft the SEP which the Governor reviews and submits to the Council for approval.
4. “Bucket 4” 2.5% NOAA Science Program (for Gulf of Mexico research and monitoring)
5. “Bucket 5” 2.5% State Centers of Excellence (for Gulf of Mexico research and monitoring)

### NFWF GEBF (Criminal Penalties) Criteria:

<http://www.nfwf.org/gulf/Pages/fundingpriorities.aspx#.U6GfxPldWt4> and <http://www.nfwf.org/gulf/Pages/GEBF-Florida.aspx>

- o Restore and maintain the ecological functions of landscape-scale coastal habitats, including barrier islands, beaches and coastal marshes, and ensure their viability and resilience against existing and future threats
- o Restore and maintain the ecological integrity of priority coastal bays and estuaries
- o Replenish and protect living resources including oysters, red snapper and other reef fish, Gulf Coast bird populations, sea turtles and marine mammals
- o Natural resource restoration efforts on marine and coastal environments that improve water quality and other critical habitat elements, strengthen management of important fish and wildlife populations, and enhance the resiliency of coastal resources and communities by implementing outcomes-based projects that maximize environmental benefits

### Natural Resource Damage Assessment (Environmental and loss of use payment):

[http://www.dep.state.fl.us/deepwaterhorizon/about\\_restoration.htm](http://www.dep.state.fl.us/deepwaterhorizon/about_restoration.htm)

- o The Oil Pollution Act of 1990 (OPA) makes parties responsible for oil spills liable to the public and the environment. The environment and the public have a right to be made whole again following an injury to natural resources from an oil spill incident. Natural Resource Damage Assessment (NRDA) is a legal process to determine the type and amount of restoration needed to compensate the public for harm to natural resources and their human uses that occur as a result of an oil spill incident or a hazardous substance release. Natural resources include land, air, water, fish, wildlife, biota, groundwater and drinking water supplies. Natural resources also include habitats and individual biological resources such as species or communities.

### State of Florida Priorities:

[http://www.dep.state.fl.us/deepwaterhorizon/projects\\_restore\\_act.htm](http://www.dep.state.fl.us/deepwaterhorizon/projects_restore_act.htm)

The State of Florida and its 23 Gulf Coastal Counties have a great deal of decision-making power for a significant amount of RESTORE funds. In order to provide focus for project recommendations, Florida identified the following priorities for RESTORE Act-funded projects:

- o Stormwater / Wastewater infrastructure projects
- o Community resilience / Living shorelines
- o Water quality projects including those which achieve water quality benefits provided by the preservation of buffer lands around military bases
- o Implementation of agriculture best management practices, or
- o Fish and wildlife habitat and management

# Appendix B

## Stakeholder Participants

### Perdido Bay Community-Based Watershed Meetings

Stakeholders who attended one or more of the following meetings

May 1, 2013, August 6, 2013, November 13, 2013, September 10, 2014

Note: Affiliations reflect those noted at the time of attendance and may have since changed

ORGANIZATION	NAME
Alabama Department of Environmental Management	Scott Brown
Alabama Department of Environmental Management Water Division- Water Quality Branch	Jason Wilkins
Alabama Department of Environmental Management, Coastal Nonpoint Pollution Control Program	Randy C. Shaneyfelt
Alabama State Lands Division	Phillip Hinesley
Aquatic Ecosystem Solutions	Carter Henne
Army Corps of Engineers	Clif Payne
Army Corps of Engineers, Mobile District, Regulatory Division, South Alabama Branch	James “Eric” Buckelew
Atkins	Brad Rosenblatt
Atkins	Cheryl Cullison,
Atkins	Eric Schneider
Atkins & Santa Rosa County’s RESTORE Consultant	Jeff Helms
Baldwin County Planning & Zoning	Celena Boykin
Bream Fishermen Association	J.D. Brown
Bream Fishermen Association/Panhandle Watershed Alliance	Barbara Albrecht
Center for Environmental Diagnostics and Bioremediation	Jeff A. Eble, Ph.D.
Center of Independent Living	Gloria Horning
Center of Independent Living	Sherri Meyers
Citizen	Bill Young
City of Orange Beach, AL	Phillip West

City of Pensacola	Brad Hinote
Dauphin Island Sea Lab	Ken Heck
Dewberry	Mike Hanson
Earth Ethics Inc.	Mary Gutierrez
Ecology and Environment	Paul Johnson
Ecology and Environment	Woody Speed
Eglin Air Force Base	John Oliveros
Eglin Air Force Base Natural Resources Wildlife Management	Rodney K Felix, Jr
Eglin Air Force Base Range and Aerospace Sustainment	Tom Heffernan
Emerald Coast Surfrider	Michael Sturdevant
Emerald Coast Utilities Authority - Utility Services & Planning	Tim Haag
Environmental Protection Agency	Mike Lewis
Escambia County	Brent Wipf
Escambia County	Chips Kirschenfeld
Escambia County	Grover Robinson
Escambia County	Keith Wilkins
Escambia County	Matthew Kelly
Escambia County	Robert Turpin
Escambia County	Timothy Day
Escambia County CED/CRA	Glenn Griffith
Escambia County Department of Health	Louvi Donado
Escambia County Engineering Dept	Chris Curb
Escambia County Extension	Carrie Stevenson
Escambia County Florida SeaGrant	Rick O'Connor
Escambia County Marine Resources	Gracie Barnes
Escambia County Marine Resources	Shelly Marshall
Escambia County Natural Resources Conservation	Eddie Cooper
Escambia County NPDES Program	Dana Morton
Escambia County Public Works	Joy Jones
Escambia County RESTORE Committee/Sustainable Town Concepts	Christian Wagley
Escambia County Water Quality/Land Management	Mollie Taylor

Florida Department of Environmental Protection	Brad Hartshorn
Florida Department of Environmental Protection	David Colbert
Florida Department of Environmental Protection	Stephen Cioccia
Florida Department of Environmental Protection Big Lagoon State Park	Anne Harvey
Florida Department of Environmental Protection Coastal and Aquatic Managed Areas	Becky Prado
Florida Department of Environmental Protection Coastal and Aquatic Managed Areas	Beth Fugate
Florida Department of Environmental Protection Coastal and Aquatic Managed Areas	Jessica L. Kanen
Florida Fish & Wildlife Conservation Commission	Andrew Lee
Florida Fish & Wildlife Conservation Commission	Kent Smith
Florida Fish & Wildlife Conservation Commission	Maria Merrill
Florida Fish & Wildlife Conservation Commission, Marine & Estuarine Subsection, Biological Scientist	Katie Konchar
Florida Fish and Wildlife Conservation Commission-Aquatic Habitat Conservation & Restoration Section	Ron Mezich
Friends of Perdido Bay	Jacqueline Lane
Gulf Coastal Plain Ecosystem Partnership	Vernon Compton
Gulf Island National Seashore	Steven A. McCoy
Gulf Islands National Seashore, Chief of Science and Resource Stewardship	Cassity Bromley
Keep Pensacola Beautiful	Jill Cleaver
Leidos/Eglin AFB	Amanda Hansen
MW Consulting; CSA Ocean Sciences	Peggy Mathews
National Oceanic and Atmospheric Administration	Heidi Stiller
National Oceanic and Atmospheric Administration	Laurie Rounds
National Oceanic and Atmospheric Administration Restoration Center (AL/MS)	Dan Van Nostrand
National Wildlife Federation	Jessica Koelsch
Naval Air Station Pensacola	Stephanie Oram
Northwest Florida State College	Meredith Fingarson
Northwest Florida Water Management District	John Crowe

Northwest Florida Water Management District	Ken Friedman
Northwest Florida Water Management District	Linda Chaisson
Northwest Florida Water Management District	Paul Thorpe
Northwest Florida Water Management District	Steve Brown
Ocean Conservancy	Michelle Erenberg
Okaloosa County	Jim Triflio
Okaloosa ORAC	Steve Sippee
Panhandle Watershed Alliance	JJ Bachant-Brown
Perdido Key Association	Bob Stender
Poarch Band of Creek Indians	James W. Smith
Santa Rosa County	Sheila Harris
Santa Rosa County Public Works	Roger Blaylock
Santa Rosa County Sea Grant	Christina Verlinde
Taylor Engineering	Duncan Greer
Taylor Engineering	Matthew Trammell, P.E.
The Nature Conservancy	Josh Goldstein
The Nature Conservancy-AL	Judy Haner
The Nature Conservancy-AL	Kellyn Garrison
The Nature Conservancy-AL	Mary Kate Stubljär
The Nature Conservancy-FL	Anne Birch
The Nature Conservancy-FL	Debbie Keller
The Nature Conservancy-FL	Janet Bowman
Town of Perdido Beach	Patsy W. Parker
Town of Perdido Beach/Baldwin County Environmental Advisory Board	Robert H. Gross
U.S. Geological Survey Florida Water Science Center	Eduardo Patino
U.S. Geological Survey Tallahassee Field Office	Ron Knapp
University of West Florida	Nicole Jetter
University of West Florida Center for Environmental Diagnostics and Bioremediation	Dr. Jane Caffrey
US Fish and Wildlife Service	Channing St. Aubin
US Fish and Wildlife Service	Debbie DeVore

US Fish and Wildlife Service	Debbie DeVore
US Fish and Wildlife Service	Jennifer Pritchett
US Fish and Wildlife Service	Melody Ray-Culp
US Fish and Wildlife Service Alabama Ecological Services Field Office	Bill Pearson
US Fish and Wildlife Service, Grand Bay Coastal Resources Center Northern Gulf Coastal Program Coordinator	Patric Harper
USDA-Natural Resource Conservation Service	David Elliott
USDA-Natural Resource Conservation Service	Jean-Paul Calixte
USDA-Natural Resource Conservation Service Alabama	Luis Cruz-Arroyo
USDA-Natural Resource Conservation Service Baldwin County	Joey Koptis
USDA-Natural Resource Conservation Service Baldwin County	Rhonda Bryars
USDA-Natural Resource Conservation Service Escambia County	Josh McElhany
USDA-Natural Resource Conservation Service, Alabama West Team Office	Charlie Ramsey
West Florida Regional Planning Council	Terry Joseph
West Florida Regional Planning Council, Comprehensive Planning Division	Mike Reistad

# Appendix C

## Stakeholder Meetings Notes

Joint Meeting of the Perdido and Pensacola Bays Community-Based Watersheds Joint Meeting

September 10, 2014, 9:00-3:30 CDT

Sanders Beach-Corinne Jones Community Center, 913 South I St, Pensacola, FL 32502

Hosted By Escambia County and Facilitated by The Nature Conservancy

### AGENDA

*Note times may be flexible to provide for more discussion, as needed.*

**Watershed Plan Objective:** Create a unified holistic vision for the watersheds by collectively identifying and prioritizing a suite of projects and actions that solve the most pressing environmental issues affecting these watersheds and the Gulf, irrespective of the funding source or political jurisdiction.

**Meeting Objective:** Review projects needed to address watershed plan issues in the Perdido and Pensacola Bays watersheds

24

Time	Topic	Objectives
9:00-9:45 Anne Birch, TNC	Welcome & Introductions	Greetings and overview on meeting agenda and process to finalize plans.
9:45-10:15 Josh Goldstein, TNC	Resource Investment Optimization System (RIOS)	Overview of RIOS and objectives
10:15-11:45 Jean-Paul Calixte, NRCS & Anne Birch	Review Responses to Priority Projects in Perdido Bay Watershed PowerPoint and Map on wall Discussion	<input type="checkbox"/> Potential gaps based on Root Causes <input type="checkbox"/> Opportunities for project consolidation.

<p><b>11:45-12:30</b></p> <p>Anne Birch</p>	<p>Review Responses to Priority Projects in Pensacola Bay Watershed</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review projects identified by all stakeholders who submitted pre-meeting information.</li> <li><input type="checkbox"/> Discuss potential gaps based on Root Causes</li> </ul>
<p><b>12:30-1:15 LUNCH</b></p>		
<p><b>1:15-2:15</b></p>	<p>Pensacola Bay Watershed Review (con't)</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review projects identified by all stakeholders who submitted pre-meeting information.</li> <li><input type="checkbox"/> Discuss potential gaps based on Root Causes</li> </ul>
<p><b>2:15-3:15</b></p> <p>Anne Birch</p>	<p>Projects Assessment and prioritization</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Metrics discussion</li> <li><input type="checkbox"/> Prioritize top projects, time permitting.</li> </ul>
<p><b>3:15-3:30</b></p>	<p>Moving Forward and Adjourn</p>	<p>Review Next Steps in Watershed Planning</p>

## Joint Meeting of the Perdido and Pensacola Bays Community-Based Watersheds

September 10, 2014, 9:00-3:30 CDT

Sanders Beach-Corinne Jones Community Center, 913 South I St, Pensacola, FL 32502

Hosted By Escambia County and Facilitated by The Nature Conservancy

### MEETING NOTES

This was a combined meeting of the Perdido and Pensacola Bays watershed Community-Based Watershed planning process facilitated by The Nature Conservancy (TNC) and attended by 63 stakeholders. Thank you to the staff at the Community Center for their assistance with the meeting logistics. The meeting objective was to review the proposed projects stakeholders submitted to TNC's online form specifically for this phase of the watershed planning process (not RESTORE) and identify gaps in projects, look for opportunities for project consolidation, and discuss a project prioritization process. The proposed projects were to address the watershed's issues and root causes identified by the stakeholders during past meetings.

Anne Birch provided a PowerPoint that described the watershed planning process and status to date and reviewed the agenda for the meeting. Jean-Paul Calixte, Natural Resource Conservation Service, reviewed the maps he created showing the locations of the proposed projects submitted to TNC's online form specifically for the watershed planning process (not RESTORE). The attendees broke out into groups to review the maps and spreadsheet of the proposed projects to identify geographic and project type gaps and reconcile any questions on project locations. The attendees reconvened into one group and reported on their break out group findings. The following are notes from the break out groups and follow-up discussion with the full group. The meeting attendees are listed on the last page of these notes.

The following are the notes from the meeting's discussions.

#### Corrections/Edits:

- o #'s 17, 27 & 29 corrected on the map
- o #13 is a subset of #28 – combine into #28 – Tim Haag will provide text to combine
- o 3, 9 & 13: needed a corrected lat/long

#### Gaps Identified:

- o 60% watershed in AL but no project submittals – NRCS in AL, EQUIP funds could be leveraged
- o Few inland projects but many of the root causes are inland

- o Riparian buffer zones acquisition
- o 303 (d) listed water bodies – TMDLs don't appear to all have projects
- o Santa Rosa Sound – assess seagrass where water quality improvements via LS and seawall replacement
- o Ag BMP's
- o Projects by the Cities i.e., City of Gulf Breeze, Milton, Navarre
- o East Bay sewer expansion
- o Baywoods Gully program – lots of erosion
- o Scenic highway area blow outs – Graveyard Creek and Olive Road stormwater ponds not designed to handle storm events
- o Hurlburt Field projects?
- o Assessments/threats to system based on field review of all portions of the watershed. Good example to follow is the Yellow River Assess. – conduct rapid assessment to ensure address all key threats in watershed
- o Long-term monitoring
- o Projects that address root causes of impaired waters
- o Species tropicalization

#### Discussion Notes:

- o Leave projects as separate but list in plan under a project type
- o Maintain distinct projects and lump when \$ source makes sense to do so
- o Look upstream for impaired waters
- o Look at land protection and riparian buffer projects in AL
- o Oyster shell recycling – keep separate; partial supply for restoration projects
- o 17 & 36 are close but separate one is small and one is several miles long
- o Use NRCS offices in AL to make connections
- o Create incentives to apply private property activities, ex. sea turtle lighting
- o Look for projects that help incentivize to prevent problems rather than having to always look for solution to problem once it happens
- o Prevention versus cures – do a financial comparison
- o Hold mtg. in AL to include them more

- o SRC develop higher standard for flooding than Escambia
- o AL water resources conference - time when AL legislators work on water legislation – get FL delegates to this conference
- o Integrate lessons learned as projects implemented: success criteria ex. cost/unit effort
- o Collaborate and communicate lessons learned
- o List metrics associated with projects to connect to root causes
- o ID prior steps needed for projects to succeed, ex. seagrasses may need water quality fixed first
- o Take time to tease apart existing projects and combine projects as feasible and makes sense to do so
- o Look at regional sedimentation projects
- o Prioritize within project categories and look at how many root causes a project addresses
- o Ask Kelly Samek if there's any overlap with the watershed projects proposed and the NFWF round 2 projects
- o Online repository of studies
- o Provide one location to upload all plans so watershed stakeholders can see latest iterations of the plan + see other watershed plans

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28

### Perdido Specific Notes on Projects

- o List #'s 16 & 17 under same category: dirt road paving/erosion/sedimentation (Note there's a gap in AL for these types of projects)
- o #1 also includes sedimentation but leave separate
- o 9&13: leave separate but list in plan under shorebird conservation project type
- o 3, 9 & 13: needed a corrected lat/long – Jean-Paul is correcting
- o 14 & 22: leave separate but list in plan under land protection project type + include AL if possible
- o 6 & 22: leave separate but list in plan under seagrass conservation project type
- o 18, 19, 20 & 24: similar type projects – #24 is large scale and should be kept separate
- o Look upstream for impaired waters
- o Look at land protection and riparian buffer projects in AL
- o Maintain distinct projects and lump when \$ source makes sense to do so

### Stakeholders Missing from the Group

Please send suggestion of stakeholder groups that may have an interest in attending future meetings to Anne Birch at [abirch@tnc.org](mailto:abirch@tnc.org).

## Perdido Bay Community-Based Watershed 'Round 3' Planning Meeting

November 21, 2013 9:00-3:00 CT

Escambia County Central Office Complex, 3363 West Park Place, Pensacola, FL 32505

Hosted By Escambia County and Facilitated by The Nature Conservancy

### AGENDA

#### Plan Objective:

Create a unified holistic vision for the Perdido Bay watershed by collectively identifying and prioritizing a suite of projects and actions that solve the most pressing environmental issues affecting these watersheds and the Gulf, irrespective of the funding source or political jurisdiction.

#### Goals for the watershed planning process:

1. Gulf Consortium adopts the watershed approach as part of the state's RESTORE expenditure plan, rolling up this and other watershed plans as an essential element of the state plan
2. Stakeholders continue to collaborate within and across jurisdictions to implement the watershed plan, seeking funding from public and private funding, grants and other sources
3. Stakeholders establish internal priorities consistent with the watershed plan

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29

#### Draft Agenda

Welcome, introductions, overview of the meeting goals and agenda

- o Coastal Community Resilience – demo of the Coastal Resilience 2.0 web tool
- o Review GIS data layers
- o Review and agree on Watershed Issues from the Draft Perdido Bay Community-Based Watershed Plan per the August meeting (refer to attached draft plan)

Identify the root causes of each issue

Identifying root causes will help to focus and prioritize projects on the most important activities to improve the watershed

Review data maps showing impaired waters/TMDL's, natural resources and many other data layers

LUNCH – estimated timing in agenda

Presentation on the USGS South Florida Information Access (SOFIA) portal – Ron Knapp

<http://sofia.usgs.gov>

Identify the types of projects/actions for each root cause to filter and prioritize proposed projects

- o Restoration type projects to fix existing issues (e.g., septic tank retrofit, road stabilization) projects that ensure the watershed will maintain good water quality and not degrade over time
- o Preventative type projects to avoid future impairments (e.g., land protection, management and habitat restoration)
- o Coastal Resilience

Review Draft Watershed Plan metrics

- o Discuss the type of metrics that could be used to monitor success for each category

Public Comment, Wrap-up and Next Steps

## Perdido Bay Community-Based Watershed 'Round 3' Planning Meeting

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### MEETING NOTES

#### Plan Objective:

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- o Stakeholders establish internal priorities consistent with the watershed plan

Attending: 49 people attended representing federal, state, and county agencies, tribal interests, nonprofit organizations, business interests, and individuals. See separate list of those who attended.

Following the Pensacola and Perdido Round 2 meetings a suggestion was made to identify the Root Causes of the Issues. Based on this recommendation, subsequent Round 2 meetings for the other 3 watersheds included identifying Root Causes as part of the agenda. The Round 3 meetings for the Pensacola and Perdido watersheds needed to 'catch-up' to this point and identify the Root Causes of the issues.

#### Coastal Community Resilience – demo of the Coastal Resilience 2.0 web tool:

- o Anne provided a short demo of the web site <http://www.coastalresilience.org>.
- o We encourage you to check out the site. To get to the Gulf of Mexico directly follow this link <http://maps.coastalresilience.org/gulfmex/>. There is a lot of information available and several different ways to look at the data to help assess changes and vulnerability of coastal communities to sea level rise and look at restoration scenarios.
- o It's important to read the information (click on the "i" next to layers) for the data sets to correctly interpret the information in the tool.

- o The ‘Community Planning’ app allows local communities to input more site specific data into the tool. Let Anne know if you’d like more information on this capability.
- o The tool can be used on Explorer, Chrome, Fire.fox, tablets, etc.
- o Anne is setting-up a WebEx for after the first of the year for those who would like to see the tool operate.

In the afternoon Ron Knapp, Chief of the USGS Field Office in Tallahassee, made a presentation on the USGS South Florida Information Access (SOFIA) portal <http://sofia.usgs.gov> to raise awareness of the portal and the information available to users. His PowerPoint is provided as a separate document.

### Next Steps for Future Meetings

- o Review and analyze data maps showing impaired waters/TMDLs, natural resources, submitted project locations, and other relevant data layers to better understand where the “Hot Spot” areas might be for addressing priority Root Causes.
- o Identify which type of project (Fix or Prevent) is needed to address the priority Root Causes to start prioritizing proposed projects and identifying gaps where new projects are needed
- o Review Draft Watershed Plan metrics
  - o Discuss the type of metrics that could be used to monitor success for each category
- o Develop criteria for selecting projects

Thank you to Robert Turpin, Mollie Taylor and Gracie Burns and the Escambia County staff for taking care of the meeting logistics and making sure we didn’t go hungry by bringing in fruit that was local and organic and an abundance of incredible food – you definitely met the bar set by Christine Verlinde!

Thank you again to Brent Wipf for compiling all of the GIS information and to Meredith Fingarson for helping with the meeting notes!

These meetings would not be possible with the amazing support of the partners and without each of your interest and time in participating in the watershed planning process. Thank you!

## Outcome of Stakeholder Discussions on Root Causes and Types of Projects to address Root Causes

### MAJOR ISSUE

Sedimentation & Quality

### ROOT CAUSES TO BE ADDRESSED

- o Unpaved roads – construction and maintenance, especially stream crossings (AL/FL)
- o Removal woody material
- o Removal riparian zone
- o Shoreline hardening and coastal erosion
- o Destablization riparian zone
- o Boat wakes
- o Lack and implementation and monitoring of Ag & silviculture BMP's (AL/FL)
- o Suspended solids paper mill
- o Lack instream BMP (i.e., does not exist for instream like exists for terrestrial)
- o Driving along stream banks
- o Lack appropriate regulations and communication between permitting agencies (e.g., log jam and woody material removal)
- o Need for updated regulations
- o Lack resources to enforce regulations
- o Construction stormwater BMP – land use changes and intensification
- o Development in sensitive areas e.g., low lying areas adjacent to waterways (tribs, creeks, streams) and lack adequate buffers
- o Sand and gravel mining and lack application BMP
- o Need for coordination across fed, state and local agencies
- o Loss urban tree canopy and replacement of canopy and with appropriate species
- o Need connect dots for decision makers of landscape activity (need to address education/elevate awareness for decision-makers)
- o Coastal development
- o Lack adequate stormwater treatment – enforce existing regulations
- o Ineffective sediment and erosion control measures (enforcement and inspections not well funded for individual construction sites)

## TYPES OF PROJECTS

- o Vegetative replacement
- o Phyto-remediation
- o Require bonds for development to remediate environmental issues related to development actions as they occur and for all developments
- o Hilltop to hilltop paving (Forestry has mapped this in FL; AL identified areas, not prioritized)
- o Spatially map locations of unpaved roads in FL and AL
- o Forestry planning workshops for dirt road planning and recovery/restoration after use (e.g., AL does this)
- o Include dirt road construction in the SHARP logger program (FL Div. Forestry)
- o Effective BMP development, implementation and education for all land uses
- o Revisit and educate on legacy and grandfathered areas
- o Incentivize stormwater retrofit
- o Living shorelines where needed and appropriate
- o Rapid identification and treatment of invasive species
- o River assessments to ID problem areas and funded action plan
- o Catch basins & educate maintenance crews (Tuscaloosa)

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34

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## MAJOR ISSUE

Water Quality

Nutrients

- o Wastewater
  - Nitrogen, Phosphorus, Carbon, Dissolved Oxygen
  - Septic tank abatement and inspection
  - Sewer upgrades, expansion, collection system
  - Water quality monitoring

Turbidity

Pathogens

Chemicals

Non-woody debris/material

## ROOT CAUSES TO BE ADDRESSED

- o Removal riparian buffer and coastal marsh
- o Non-point source runoff
- o Sedimentation – could be moved under WQ
- o Land application spray fields infiltrate groundwater
- o Over nitrification too close to waters – homeowners, golf courses, ag.
- o Industrial wastewater
- o Legacy wastewater treatment plants – old technology
- o Lack nutrient management plans and lack adequate application of plans for feed lots – CAFO's (confined animal feeding operations), and lack monitoring e.g., after storm events
- o Ag BMP not required and/or not enforced (e.g., cotton, soybeans)
- o Effluent disposal
- o Land use changes that reduce water quality
- o Livestock access to riparian areas (main focus on EQUIP in AL – cost shares to landowners)
- o Feral hog along river bottoms
- o Deer cleaning in river bodies – carcass contamination (education=solution)
- o High intensity areas fish cleaning (e.g., marinas)
- o Not using/lack of pump out stations
- o Hydrocarbons near marinas
- o Marine construction materials
- o Leaching chemicals telephone poles and chemicals used in dock materials and use used poles in marine waters
- o Loss emergent and aquatic vegetation
- o Leaching from legacy underground storage tanks
- o Legacy issues from cattle dip vats
- o Industrial waste (pathogens)
- o Shift in consortia healthy microbes due to impairment and longevity of waters and sediments
- o Atmospheric deposition mercury
- o Industrial effluent

- o Engineered/bioaccumulative nano materials (silver) – sunscreens, cosmetics – check if in these waters
- o Derelict fishing gear
- o Littering and debris from construction vehicles
- o Need for recycling of pharmaceuticals
- o Lack of/ use of household haz waste, household materials recycling
- o Leaching landfills (groundwater contamination)
- o Stream dams – amount and quality water flow
- o ‘Legacy’ dams
- o Over application, wrong place, quantity, timing, wrong product of fertilizer/herbicide/ Insecticide/organophosphates
- o Biological contamination – invasive species
- o Septic tanks – lack maintenance, inappropriate location and drainage field, no access to sewer and/or expensive to tie into sewer
- o Lack available sewer hook-ups
- o State lowered DO levels for rivers and creeks
- o State raised amount nutrients levels allowed
- o Dredge and fill activities

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36

## TYPES OF PROJECTS

- o Dam removal
- o Fertilizer ordinances
- o Sanitary sewer projects to reduce # septic tanks
- o Use LiDAR maps and other tech. in new developments to avoid low areas –apply technology to inform
- o Incentivize Ag. and rural areas BMP’s – make connection land uses to Gulf
- o Advocate more \$ in Farm Bill to pay for existing programs
- o Haz. waste/household ‘haz’ waste/pharmaceutical recycling – regular accessible collection days/ locations
- o Funding for land acquisition and conservation
- o Affordable conversion septic to sewer/‘free tap fee’/cost share with developers (advertised//

encouraged)

- o Living shorelines where needed and appropriate
- o Habitat restoration, conservation and management (estuarine, terrestrial, riverine) -appropriate timing in relation to impact to restoration success
- o Bridge replacement plans that plan for SLR, species corridors
- o Motorized vessel exclusion zones with increased access for non-motorized vessels
- o Boater and coastal homeowner education about personal impacts to water quality
- o Clean marinas and incentivize NPEB = Net Positive Envir. Benefit
- o Incentivize urban redevelopment/infill
- o Enhance public transportation system

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## MAJOR ISSUE

### Stormwater

- o Point and Non-point Sources
- o Urban and Residential
- o Public Works
- o Agriculture
- o Silviculture (AL)
- o Land fill and Superfund/Haz waste sites seepage

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37

## ROOT CAUSES TO BE ADDRESSED

- o Wrong culvert/stormwater structure size/configuration/capacity for treatment
- o “Vintage” culverts/stormwater structure – need repair/replacement
- o Erosion and inappropriate grass cuttings/landscaping practices
- o Improper maintenance of stormwater facilities/systems (e.g., outfalls)
- o Inadequate resources for maintenance
- o Residential and commercial dumping into sewer drainage (grass clippings, oil change, pool clean outs)
- o Grandfathered in developments without adequate stormwater treatment
- o Stormwater projects not ‘glamorous’ to public

- o Lack of treatment at point origin
- o Over application, wrong place, quantity, timing, wrong product of fertilizer/herbicide/Insecticide/organophosphates
- o Lack recognition of and predictive modeling for cumulative impacts
- o Unpermitted development
- o Lack oversight and accountability of as-built conditions
- o Land development rules encourage sprawl and maximizes impervious surfaces
- o Reduction landscape to absorb increased stormwater
- o Reduced urban tree canopy
- o Reduced riparian buffers/wetlands
- o Lack adequate regulation & enforcement for conserving isolated wetlands
- o Inappropriate armoring and/or stabilization and/or inappropriate placement
- o Hardened ditches –loss vegetation, increased volume of water entering wetlands
- o Lack incentives and education, obstacles to using natural infrastructure
- o Inadequate drainage impact fees/funding
- o Inadequate/unknown level of maintenance of private stormwater ponds – not clearly defined maintenance entity
- o Need for oversight and accountability and funds
- o Inadequate street design/aging infrastructure/no drainage system (pre-regulations) that causes flooding

### TYPES OF PROJECTS

- o Making stormwater sexy – integrate natural stream design
- o Utilize CR tools for SLR and storm preparedness
- o Stormwater marking/education
- o Fertilizer ordinances
- o Sanitary sewer projects to reduce # septic tanks
- o Use LiDAR maps and other tech. in new developments to avoid low areas –apply technology to inform
- o Advocate more \$ in Farm Bill to pay for existing programs
- o Funding for land acquisition and conservation

- o Habitat restoration, conservation and management (estuarine, terrestrial, riverine) -appropriate timing in relation to impact to restoration success
  - o Incentivize urban redevelopment/infill
  - o Retrofit stormwater projects (e.g., culverts)
  - o Increase stormwater retention capacity in regional stormwater plans
  - o Increase urban tree canopy
- 

## MAJOR ISSUE

Restore, and create natural habitat and resources and Increase buffer areas

- o Restoration and Protection
  - Seagrass, oyster, salt marsh
  - Restore riparian buffers
  - Restoration terrestrial systems
  - Sediment quality
  - Establish clear goals and objectives
  - Stream 'log jams', with careful consideration of how they also are beneficial
  - Competing interests of restoration goals
- o Lack of Land Use Regulations/Zoning (AL) and Enforcement (FL/AL)
  - Development in "fragile areas"
  - Land use changes
  - Development of fragile systems
- o Need for assessments
- o Loss of Shoreline
- o Development
- o Private/Public/Tribal Lands

- o Lack of Public Access
  - Enforcement of Uses
  - Appreciation of the natural resources
- o Competing Uses
- o Degraded Urban Stream System
  - Habitat Loss
  - Sedimentation
  - Threatened and Endangered Species
  - Invasive Species
  - Shrimp fisheries
  - Heavy metal legacy issues
- o Biological/ecological integrity indices monitoring

### ROOT CAUSES TO BE ADDRESSED

- o Lack of Rx fire
- o Coastal development loss habitat/loss biodiversity/fragmentation
- o Invasive exotics
- o Inappropriate bridge design and removal riparian zones (reduce ability meandering creeks/rivers)
- o impaired water quality impacts on estuarine habitats/species
- o Historic impact clams/benthic community due to effluent from paper mills and overfishing
- o Removal/decline instream habitat deadhead logging and poor infrastructure designs– removal woody material - and smothering of habitat
- o Removal/decline headwater wetlands due to development, inadequate low water stream crossings
- o Loss habitat, conversation, competing uses (development, ag, recreation, other)
- o Personal watercraft/motorized vessels increased traffic cause shoreline erosion
- o Water quality and SAV loss = reduced shrimp fishery
- o ICW dredging = loss shoreline
- o Decreased funding land conservation/protection and management

- o insufficient funding for restoration and management
- o Insufficient funding for bridge maintenance
- o Allocation of available funding and lack sufficient funding – competing uses of \$ - lack prioritization for natural resource
- o Lack public support for prioritized spending on conservation, management and restoration
- o Lack integration and understanding of environment and economy interests
- o Lack compatible silvicultural practices for wildlife management
- o Devalued environment to quality of life, afraid of nature
- o Lack of education about importance and value nature, specific to issues in the watersheds
- o Lack political will
- o Economic system not value full suite of ecosystem services/natural systems
- o Environment back seat to economic development
- o ‘Nintendo Generation’ – lost connection with and value for natural world
- o Overvalue coastal areas for development
- o Subsidized risk management (flood insurance, etc.)
- o Continued development of repetitive loss areas

## TYPES OF PROJECTS

- o Farm Bill
- o Living shoreline
- o Habitat restoration, management
- o Funding for management of conservation lands
- o Funding education natural resources
- o Land acquisition/restoration/Wildlife corridors
- o Invasive species management
- o BMP for instream habitat management
- o Recruit private lands in habitat restoration and management plans
- o Regular watershed planning
- o Habitat/river assessments
- o Bridges (see previous)

- o Increase acreage for Rx fire
  - o Reduce impediments to implementing Rx fire
  - o Restore channelized streams
- 

## MAJOR ISSUE

Insufficient cooperation and coordination for monitoring, funding, implementation, outreach

- o Cooperative Comprehensive Monitoring
  - Spans across all issues and requires cooperative efforts
  - Success of Projects
  - Change of Systems
  - Ongoing funding for operation and maintenance
  - Accountability
- o Collaboration across the system
  - AL, FL, Counties (Escambia & Baldwin, AL & Escambia, FL), Tribal (AL) interests & consultation
- o Funding
  - Sustainability
- o Education and Outreach
- o Sequencing of project implementation

## ROOT CAUSES TO BE ADDRESSED

- o Lack of centralized data repository
- o Different water quality standards/methods across jurisdictions
- o Different management rules/goals across jurisdictions
- o Planning on political boundaries versus natural boundaries
- o Monitoring data/resources (people, equipment) not valued, especially long-term
- o Insufficient operational boundaries within and between agencies to look at watershed and big picture – public and private

- o Lack funding – initiate and sustained
- o Lack expertise for awareness for need to protect
- o Agency compartmentalization limits within agency cooperation
- o Difficulty to partnering and sharing information/data

## TYPES OF PROJECTS

- o Identify restrictions that prevent working within operational boundaries and across agencies to look at watershed and big picture – public and private
- o Continue as watershed workgroups/alliance/BARC (St Johns Alliance as ex.) – needs funding and agency support/value
- o FWRMC (Florida Water Resource Management Council) – a group reinitiated by FDEP & WMD in the past 2 years <http://www.dep.state.fl.us/water/monitoring/council/>
- o Water Atlas
- o Pilot projects that can serve as models – could be low budget, high visibility
- o Develop watershed standards across jurisdictions for entire watershed
- o Regional stormwater planning
- o Develop ecosystem education center/program

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## MAJOR ISSUE

### Impacts to Groundwater

- o Salination
- o Nutrients
- o Reduced groundwater monitoring

## ROOT CAUSES TO BE ADDRESSED

- o Land application spray fields infiltrate groundwater in improper spoil types
- o Leaching landfills (groundwater contamination)
- o Increased coastal development
- o Groundwater removal – competing uses
- o Inappropriate land uses in aquifer recharge zones
- o Lack of adequate aquifer protection zones/lack of knowledge of adequate zones around well

heads/wellfields and long-term protection of aquifer

- o Reduced funding for groundwater monitoring
- o Oil and gas drilling impacts (N. Escambia Co.) – is this known?
- o Not value water as limited resource and over use (development, ag, etc.) = over pumping of wells – saltwater intrusion (lack appropriate valuation)
- o Lack understanding/knowledge capacity aquifer
- o Impacts from SLR, change in precip, CC
- o Remnant legacy contamination?

### TYPES OF PROJECTS

- o Use grey water
- o Remediation superfund and legacy sites
- o Land acquisition/conservation
- o Water conservation
- o Standards for Instream flows – maintain baseline flow
- o Public education
- o Incentivize conservation of water use and water recharge areas
- o Increase wellfield protection areas

## Perdido Bay Watershed Planning Meeting

August 6, 2013 1:00-4:00 CST

Pensacola Civic Center

Hosted by Escambia County/Facilitated by The Nature Conservancy

### AGENDA

Meeting Objective: Create a unified holistic vision for the Perdido Bay watershed by collectively identifying and prioritizing a suite of projects and actions that solve the most pressing environmental issues affecting the watershed and the Gulf, irrespective of the funding source or political jurisdiction.

#### Goals for the meeting products:

- o Gulf Consortium/Gulf States Caucus adopts the watershed approach as part of the state's RESTORE expenditure plan, rolling up this and other watershed plans to be a critical element of the state plan
- o Stakeholders continue to collaborate within and across jurisdictions to implement the plan, seeking funding from public and private grants and other sources
- o Stakeholders establish internal priorities consistent with the plan

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45

#### Agenda

1:00-1:45

- o Welcome and introductions
- o Overview of the meeting goals and agenda
- o Develop a vision statement for the watershed

1:45-2:00

- o Review the watershed impacts from the first meeting and agree on the list of impacts that must be addressed to reach the vision

2:00-2:15

- o Identify the types/categories of projects used to filter proposed projects (e.g. hydrologic restoration and/or septic to sewer might be project categories under the nutrients issue)

2:15-2:45

- o Develop the set of metrics that will be used to monitor success for each category
- o short term such as number of homes hooked up to sewer, miles of dirt roads stabilized
- o long term such as water quality improvements

2:45-3:15

- o Review the existing projects in the watershed that have already been submitted to FDEP
- o Identify applicable category
- o Quantify the impacts of the project to addressing the solution, where feasible

3:15-3:45

- o Identify additional projects and/or needs that will help address the agreed on watershed impacts

3:45-4:00

- o Public comment
- o Wrap-up and next steps

## Perdido Bay Watershed Planning Meeting

August 6, 2013 1:00-4:00 CST

Pensacola Civic Center

Hosted by Escambia County/Facilitated by The Nature Conservancy

### MEETING NOTES

The following are notes from the “Round 2” Perdido Bay watershed meeting. The agenda, with meeting goals and objectives, is provided as an attachment at the end of the document.

### VISION BRAINSTORMING

A short brainstorming session was held as a way for everyone to hear and understand each other’s thoughts and viewpoints on their vision for the Perdido Bay watershed. A vision statement was not developed; this can be done at a later date. The following are notes on the ideas presented.

Overall thoughts: Active management, information exchange, cross-state interaction, unimpaired waters, upstream engagement, resilience to climate change/SLR/storm hazards, innovative approaches, long-term health

- o Improved communication
  - Implement Research and Studies
  - Summarize prior research
  - Forum for active information exchange
  - Active management through a state partnership or working group
  - Reestablish the Perdido Ecosystem Restoration Group (PERG) as a forum for the stakeholder collaboration
- o Ecosystem Health
  - Fewer Health Advisories
  - No impaired waters - impaired waters are restored and off the 303d list
  - Restore to historic conditions (needs to be defined)
  - Re-establish fishery and vegetation (SAV)
- o Entire watershed geography is engaged in process, i.e. beyond just the “Coastal Counties”

- o Support Eleven Mile Creek Bacteria Prevention and Control Plan
- o Attenuate run-off within watershed
  - Innovative approaches
- o Identify local “indicator organisms”
- o Point source vs. non-point source assessments
- o Improved understanding of discharge to receiving wetlands

### Watershed Issues/Challenges

Watershed issues were identified using with the issues identified by the Water Management District as a start. Any additional clarification of the issues by the group is noted under each.

- o Need for assessments
- o Lack of Land Use Regulations/Zoning (AL) and Enforcement (FL/AL)
  - Development in “fragile areas”
  - Land use changes
  - Development of fragile systems
- o Stormwater Runoff
  - Point and Non-point Sources
  - Sedimentation and quality
  - Urban
    - Residential
    - Public Works
  - Agriculture
  - Silviculture (AL)
  - Land fill seepage
- o Wastewater
  - Nitrogen, Phosphorus, Carbon, Dissolved Oxygen
  - Septic tank abatement

- Sewer upgrades/expansion/collection system
- o Restoration and Protection
  - Seagrass, oyster, salt marsh
  - Restore riparian buffers
  - Sediment quality
  - Establish clear goals and objectives
  - Stream ‘log jams’, with careful consideration of how they also are beneficial
  - Competing interests of restoration goals
- o Loss of Shoreline
- o Degraded Urban Stream System
  - Habitat Loss
  - Sedimentation
  - Threatened and Endangered Species
  - Invasive Species
  - Shrimp fisheries
  - Heavy metal legacy issues
- o Groundwater Withdraw
  - Salination
  - Nutrients
- o Development
- o Private/Public Property
- o Lack of Public Access
  - Enforcement of Uses
  - Appreciation of the natural resources
- o Competing Uses

## Issues Across all Projects

- o Cooperative Comprehensive Monitoring
  - spans across all issues and requires cooperative efforts
  - Success of Projects
  - Change of Systems
  - Ongoing funding for operation and maintenance
  - Accountability
- o Collaboration across the system
  - AL, FL, Counties (Escambia & Baldwin, AL & Escambia, FL), Tribal (AL) interests
- o Funding
  - Sustainability
- o Education and Outreach
- o Sequencing of project implementation

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50

## Project Categories

The five project categories below were identified by the group to help vet the existing FDEP RESTORE project list and for identifying new projects to address the above issues. The group brainstormed on possible metrics to track success. The metrics are listed under each category. The metrics will need to be further refined.

The Conservancy is facilitating two more watershed meetings on August 13 & 14 for the Choctawhatchee Bay and St Andrew/St Joe Bays watersheds, respectively. Following those meetings TNC will consolidate all of the Project Category suggestions from the four round 2 watershed meetings (Perdido, Pensacola, Choctawhatchee, and St Andrew/St Joe Bays) to arrive at a suggested list to use for all the watersheds. In this way there is consistency across the regions that will allow for roll-up of similar type projects over a larger geographic region. Identification of large regional-scale projects will appeal to RESTORE and other funding sources.

During the Pensacola Bay Watershed Round 2 meeting held on August 7<sup>th</sup>, the group did a trial vetting of a few projects using the categories they identified during that meeting. The remainder of the project was identified as ‘homework’ once Anne sends the spreadsheet out, as described above. The same process will be applied to the Perdido Bay project list. The spreadsheet of projects and consolidated project categories, with instructions on how to fill it out, will be sent to the group following the Choctawhatchee

Bay and St Andrew/St Joe Bays watersheds meetings and project category consolidation.

The 5 categories and draft metrics identified during the Perdido Bay meeting are as follows:

1. Water Quality Impairments

o Baseline assessments and research needed

– H<sub>2</sub>O/Sediment Quality/Quantity

i. Metrics

1. Economic impact of polluted water body
2. Return of loss uses

□ Stormwater

i. Metrics

1. # of Impairments reduced
2. Miles of dirt roads paved
3. WQ Regulation exceedances (State/Regional/National)
4. Reduce Impervious
  - a. LID Practices
5. Acres of Land Protected (Undeveloped/Conserved/Preservation/Buffers)
6. Treatment Volume
  - a. Calculation of impact (N/P) reduction

– Wastewater

i. Metric

1. Reduced regulation violations
2. Reduced number of Septic Systems
3. Reduced density of Septic Systems
4. TRES/ Toxicity
5. Gal. of Reuse
  - a. From this able to calculate impact of nutrient (N/P) reduction

- Land Protection
  - i. Metrics
    - 1. Acquisition/Maintenance of Critical Areas
    - 2. Riparian Buffer (Linear Ft. increased)
  
- 1. Community Resilience
  - Lack of Regulation/Enforcement
    - i. Metrics
      - 1. Land Use Assessment
      - 2. Regional/County Comprehensive Plans include CC/SLR adaptation strategies
        - a. Watershed Management Plans
        - b. Sediment Management Plans
          - i. Littoral Shelf expanding
      - 3. MS/AL Seagrass Community Vulnerability and Resilience Index (look at for ideas)
  - Miles of Unhardened/Natural Shoreline
    - 1. % of soft/natural Shoreline
  
- 2. Agricultural/Silviculture BMPs
  - i. Metrics
    - 1. # of Acres in Conservation Tillage
    - 2. Ag BMP inventory
    - 3. % of BMP Compliance
    - 4. FL Forestry Service Assessment
    - 5. AL Forestry Rotational Fly-overs

3. Habitat and Wildlife/Fishery Management
  - Stream, Seagrass, and Habitat Restoration
    - i. Metrics
      1. Linear Feet/Acres of Habitat Restored
      2. Long term over short term metrics – work on these
      3. Fishery Production
      4. Landings Data and Independent monitoring
      5. Stream Condition Indices
      6. Threatened and Endangered species recovery
      7. Environment Sensitivity Index
      8. Invasive Species Reduction
      9. Biological Condition/ Bio Criteria per population
      10. # of Acres Conserved in Watershed (Public/Private)

4. Public Access
  - i. Metric
    1. # of Sites increased
    2. Type of Access
      - a. Carbon Footprint per access/use
      - b. Ecotourism
    3. Site Capacity
    4. Distribution of Access
    5. Use and Satisfaction Survey
      - a. Demographic Served
    6. Private Capacity
    7. Economic Impact
      - a. By improved recreation experience

## Perdido Bay/Big Lagoon Watershed Planning Workshop

May 1, 2013, 9:00-12:00 CST

Escambia County Central Office Complex 3363 West Park Place Pensacola, FL 32505

Hosted by Escambia County/Facilitated by The Nature Conservancy

### AGENDA and MEETING NOTES

#### Meeting Goals:

1. Develop a unified vision for a watershed scale plan and corresponding projects in the Perdido Bay/Big Lagoon system
2. Identify specific projects to meet this vision that direct resources that improve the system's water quality and quantity, restore and conserve habitats and living marine resources, and help to support and increase the region's economy and jobs.
3. Assemble project information into a Perdido Bay/Big Lagoon Watershed Plan for Alabama and Escambia County to jointly submit to FDEP for consideration of RESTORE funding

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54

#### Draft Agenda

- o Welcome and introductions – Anne Birch
- o Overview of the planning goal and process - Anne
- o Watershed status and overview - Brad Hartshorn, FDEP
- o Overview of US Fish and Wildlife Gulf Vision – Debbie DeVore
- o Attendee's project ideas
- o Discussion of how projects integrate with watershed needs
- o Plan development process
- o Next Steps

#### Meeting Notes

*Sent to stakeholders in an email message on May 1, 2013*

Thank you to those who could make today's meeting. We had excellent discussions at the county facility, blowing in the wind, and finally at Piccadilly's! For those who missed the excitement, the county had a mandatory HazMat related evacuation of the facility ~ an hour into our meeting that closed down the facility for the day. We heard that everyone is Ok and hopefully that remains the case. It left us stranded...some of us for a bit longer than expected. A big thank you to *Robert the Rescuer* for sticking it out

with Susan and me and treating us to lunch...at Piccadilly's of course!

Attached is the meeting sign-in sheet. The following are very brief notes and TO DO's at the end.

- o Everyone expressed support for using the watershed plan process as the unifying approach to identifying projects at a regional scale (scale preferred by FDEP and the Gulf Council) for consideration of RESTORE funding, as well as other funding sources.
- o Brad Hartshorn presented information on the Impaired Waters TMDL process and timeline. Mercury in fish tissue (a gulf-wide issue), fecal coliform (need to tease out contribution levels from human-related sources (e.g., dogs, ag.) relative to wildlife sources), Dissolved Oxygen, and nutrients (total nitrogen and total phosphorus) were the primary impairments.
- o Debbie DeVore, USFWS, presented on the FWS vision document in review that integrates conservation and science needs across the Gulf system. The watershed planning process aligns nicely with the FWS plan. The plan is in review by the Service's Director. Once approved the next steps are to develop strategies and identify priority areas for on the ground conservation.
- o Debbie also talked about the need to consider long-term conservation needs that will sustain the environment and economy and look at how RESTORE funding could be used to set up Trust Funds, endowments and other long-term funding processes, rather than only looking at the short-term use the money now 'fixes'.
- o This watershed plan process is not meant to supplant existing plans such as the ecosystem restoration plans developed by FDEP or the SWIM plans by the WMDs but rather is a way to merge the watershed issues and proposed solutions from these plans with new project ideas that specifically address the RESTORE criteria in a condensed format
- o TNC is also helping to facilitate development of watershed plans for Pensacola Bay (Escambia and Santa Rosa counties) and Choctawhatchee Bay (Okaloosa and Walton counties).
- o The SWFL region (Citrus to Collier counties) has already adopted the *Southwest Florida Regional Ecosystem Restoration Plan*, a watershed scale plan that was developed by the 3 NEP's in that region - Tampa Bay, Sarasota Bay, and Charlotte Harbor.
- o 15 of the 23 FL Gulf Coast Counties are part of at least one of these 4 plans. Ideally the entire FL gulf coastline would be identified in a watershed plan. The remaining 8 counties lie within the area east of Choc. Bay to just north of Levy County.
- o The potential is to combine all of the plans to collectively serve as the county consortium's plan presented to the state. This requires buy in of the process from the consortium and the state. Keith Wilkins with Escambia County and Darryl Boudreau with TNC will be presenting the watershed planning process to the consortium at their May 17<sup>th</sup> meeting in Key Largo. If it's

adopted there will need to be funding allocated to hire a 'watershed position' to write all of the plans and roll them up into the state plan.

- o Assuming the entire FL gulf coast is within a watershed plan there's a need to also look across plans for similar project concepts (e.g. oyster restoration, stabilization of unpaved roads) that would make sense consolidate and fund jointly across a larger region or gulf-wide level and not just within a specific watershed.
- o Attendees presented project ideas for consideration. There was a wide variety suggested including, but not limited to (these are what I can remember), marine and freshwater ecological restoration, land protection, living shorelines, unpaved road stabilization, community outreach, education, public access to lands and waters, green link corridors, freshwater threats assessments, dump site clean-up, ICW spoil deposition, barge mooring buoys, oyster shell recycling, habitat mapping.
- o We agreed that the Big Lagoon should be included in the Perdido Bay watershed plan, not the Pensacola since FDEP views it this way. Projects originally submitted for the Big Lagoon through the Pensacola Bay plan will be moved into the Perdido plan
- o All submitted projects will be vetted and prioritized by the group to make sure that projects included in the plan address the watershed issues. This means that not every project proposed may make it into the plan. The group understood and was OK with this. The prioritization process was not developed yet.
- o The group is excited about working together as a diverse group of partners that also across state lines and we talked about the possibility of a formal structure such as an MOU that would help strengthen the ability to seek and receive grant funds. Cooperative Invasive Species Management Area (CISMA) are in place and successful through the state and could serve as a model. Debbie will send the group examples of some of the MOU's. Maybe call the group Cooperative Watershed Management Area. The state already works with the CISMA's so they are familiar with the structure...worth looking into as an option.

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56

### TO DO

- o Who's missing? Send Anne the entity and contact name and information of who else should be at the table for subsequent meetings?
- o Debbie distribute examples of existing MOU's from the Cooperative Invasive Species Management Program (CISMA) to the group for review
- o Send Anne your project description sheets by no later than May 15<sup>th</sup>
- o Anne will scan project description sheets and email to all

- o Keith and Darryl will report back to the group following the May 17<sup>th</sup> Consortium meeting on whether the Consortium and state agree to adopt the watershed plan process and next steps.
- o Arrange another meeting date.

# Appendix D

## Watershed Overview and General Issues

This Appendix is excerpts from the Florida Department of Environmental Protection’s “Learn about your Watershed” website <http://www.protectingourwater.org/watersheds/map/perdido> and the Northwest Florida Water Management District’s Perdido Bay SWIM Plan (2012). Figure 2 is a map of the Perdido Bay watershed from the SWIM plan. A copy of the SWIM Plan can be obtained by contacting the Northwest Florida Water Management District at (850) 539-5999.

### Perdido Bay Watershed Overview

The Perdido Bay watershed consists of 842 square miles in Alabama and 371 square miles in Florida, for a total of approximately 1,213 square miles. The major water features of the watershed include the Perdido River, Perdido Bay, Rocky Branch, Brushy Creek, Eightmile Creek, Marcus Bayou, Elevenmile Creek, Alligator Creek, Buckeye Branch, Freeman Springs Branch, Lake Fan, Black Lake, Reeder Lake, Alligator Bayou, Wicker Lakes, Cow Devil Creek, Tee Lake, Crescent Lake, and Tarkiln Bayou. The Perdido River Watershed Area is approximately 920 mi<sup>2</sup> with 679.5 mi<sup>2</sup> in Alabama and 240.5 mi<sup>2</sup> in Florida.

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58

The Perdido River and Perdido Bay form the north-south boundary between Florida and Alabama. The headwaters of the Perdido River are located near Bay Minette in Alabama at the confluence of Fletcher and Perdido Creeks. Surface waters, including lakes, streams, salt marshes, and freshwater wetlands, occupy 35,661 acres, or about 16 percent of the total watershed area.

The Perdido River is 65 miles long and in Florida is designated an Outstanding Florida Waters river. The river ranges from 30 yards across in its upstream segments to about 100 yards across near the mouth. It is a sand-bottom river in its upper reaches and a blackwater stream in its lower reaches. River flow is rainfall driven and fluctuates greatly on a seasonal basis. Larger tributary watersheds are the Styx River, Blackwater River, and Dyas Creek in Alabama, and Brushy Creek, Boggy Creek, McDavid Creek, and Jacks Branch in Florida. The River Styx and the Blackwater River enter the Perdido River close to its mouth, providing substantial freshwater discharge to both Perdido River and Perdido Bay. The Perdido River discharges into Perdido Bay about 15 miles west of Pensacola. Bayou Marcus and Elevenmile Creek in Florida and Soldier Creek and Palmetto Creek in Alabama, along with several smaller creeks, also discharge into the bay.

Perdido Bay, which covers 28 square miles, is a relatively shallow estuary, deeper on the Alabama side of the bay than on the Florida side. About 17 miles long and 2 to 4 miles wide, the bay averages 7 feet in depth. Wind speed, wind direction, tidal fluctuation, and freshwater discharges from tributaries control

circulation and water elevations in the bay. The lowest freshwater flows to the bay occur during the fall and the highest in winter and spring.

The principal land uses in the watershed are upland forest, urban development, and agriculture. Major timber companies (including those in Alabama) in the watershed are International Paper Corporation, DuPont Champion, and Scott Paper Company. Facilities associated with the Naval Air Station Pensacola and the U.S. Navy's Naval Education and Training Professional Development Technology Center are also located in the watershed.

The Perdido River and waterbodies within the boundaries of Big Lagoon State Recreation Area, Gulf Islands National Seashore, and Perdido Key State Recreation Area are designated as Outstanding Florida Waters (OFWs). The watershed also contains a number of conservation areas that provide habitat for numerous rare and imperiled species. The Perdido Pitcher Plant Prairie, a unique savannah-type system, is home to the white top pitcher plant. The prairie is approximately 7,661 acres in size, with 4,070 acres in state ownership as part of the Tarkiln Bayou Preserve State Park. The Betty and Crawford Rainwater Perdido River Nature Preserve, owned by The Nature Conservancy, protects 2,331 acres along the Perdido River, including 8 miles of riverfront. Perdido Key State Park, Gulf Islands National Seashore, and Big Lagoon State Park contain fragile coastal dune, scrub, and estuarine marsh ecosystems.

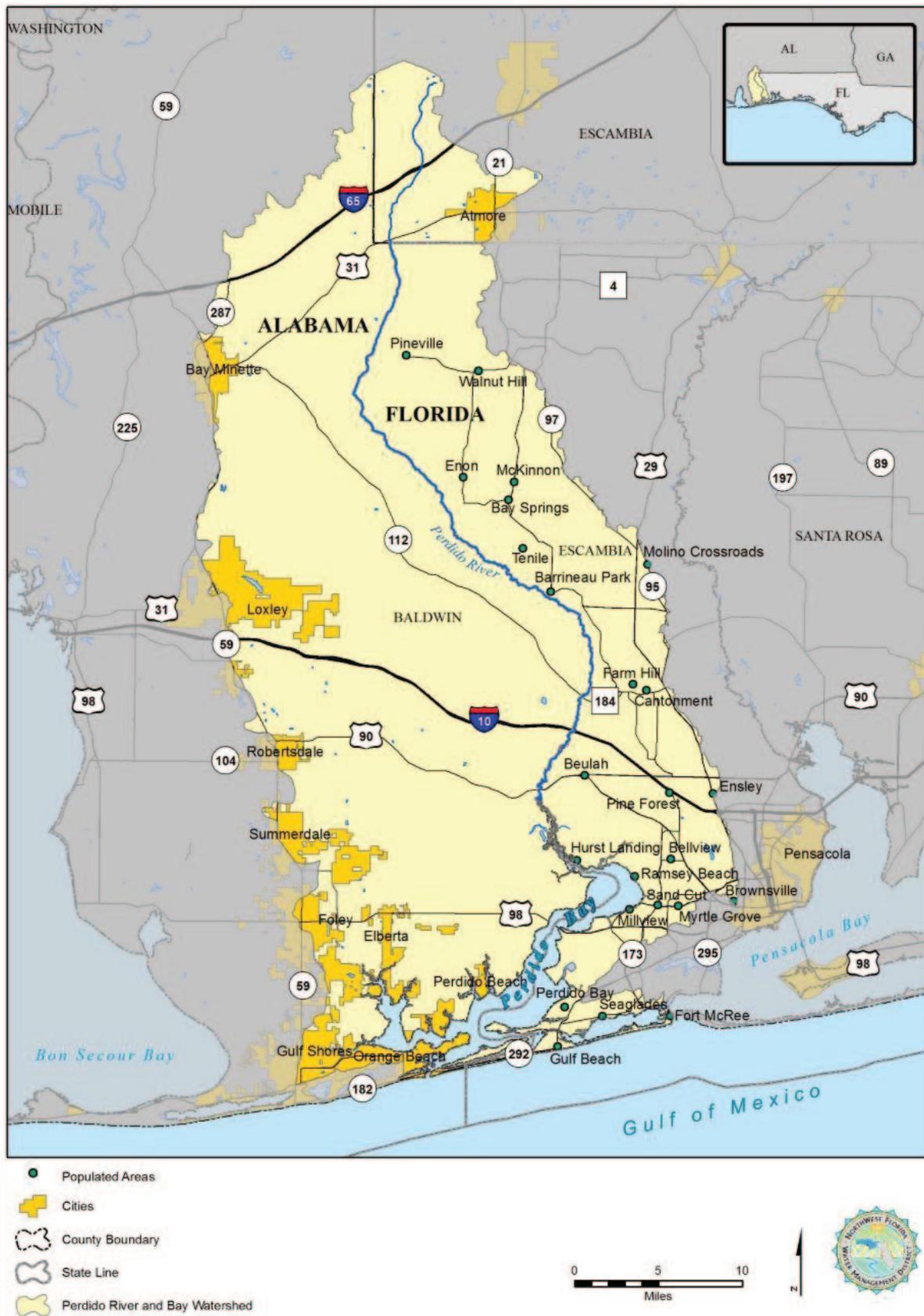
Figure 2 is a map of the Perdido River and Bay watershed from the Northwest Florida Water Management District's Draft Surface Water Improvement and Management Plan (2012). Note that the watershed includes Escambia County in Florida and Escambia and Baldwin Counties in Alabama.

### Issues

Overall, water quality in main stem of the Perdido River is good, although water quality problems have been observed in several tributaries and in Perdido Bay. The major surface water quality issues identified in the Perdido Bay Cooperative Management Project and Perdido Ecosystem Management Strategies Plan (FDEP, 2006) have been nutrient pollution in Perdido Bay, discharge of International Paper effluent on Elevenmile Creek and Perdido Bay, unpaved road soil erosion and sedimentation in streams, loss of seagrasses, non-point stormwater runoff, and agriculture and forestry runoff.

The erosion of dirt roads and subsequent deposition of dirt in streams is a problem in many freshwater streams in the watershed. In 1991, Escambia County had 282 miles of unpaved dirt roads and uses more than 100,000 cubic yards of fill material per year to grade these roads. Most of the material washed off the roadways and frequently entered streams or stormwater drainage systems. Escambia County is working to address this with a program to pave dirt roads from hilltop to hilltop. Baldwin County, Alabama has also been addressing this and expects most dirt roads to be paved by 2020 (FDEP, 2006).

**Figure 2. Perdido River and Bay Watershed Project Map**



There is extensive shoreline residential development in the lower part of Perdido Bay in Alabama and Florida; these areas have nonpoint source pollution issues from yard and street runoff.

In Alabama, almost all of the impairments of the Perdido River and its tributaries relate to mercury levels, with the exception of Brushy Creek which is impaired due to organic enrichment (ADEM, 2010). Water quality degradation, particularly sedimentation and nutrient enrichment related to agriculture, silviculture and urbanization of the watershed, has been identified in the Alabama Comprehensive Wildlife Conservation Strategy (2005) as a major problem affecting species and habitat. Sub-basins covering approximately 17% of the Alabama watershed are listed as impaired.

In Florida, there are 33 verified water quality impairments among 27 waterbodies in the Perdido watershed under DEP's TMDL program (FDEP, 2009). Impairments pertain to levels of mercury in fish, fecal coliform, dissolved oxygen, turbidity, biological oxygen demand, unionized ammonia and nutrients (FDEP, 2009). Mercury was the most common exceedance, occurring in 22 waterbodies. Impaired sub-basins cover about 79,918 acres of land, which amounts to 36% of the Florida of the watershed. The verified list will be revised in December 2011 (Espy,

2011). Six additional waterbody segments containing eight impairments are proposed to be added, while 15 impairments are proposed to be delisted (FDEP, 2011). TMDLs have been developed for Tenmile Creek and Elevenmile Creek for fecal coliform. These waterbodies do not yet meet water quality standards.

There are no verified impairments for biology; however, very low Stream Condition Index (SCI) scores indicate that Dry Creek and McDavid Creek have very poor habitat quality (FDEP, 2005). Agricultural land use practices are described as having degraded these stream corridors (FDEP, 2005). Agricultural conversion of riparian headwaters is clearly visible on aerial photographs, particularly in the vicinities of Walnut Hill and Molino. FDEP (2006, 2008) conclude that elevated nutrient levels in groundwater may be contributing to nutrient enrichment within nearby surface waterbodies, particularly within Perdido Bay. The 2008 Integrated Water Quality Assessment for Florida (FDEP 2008) indicates that ground water in the unconfined aquifer of the Perdido Bay planning unit is high in nutrients. Values exceed surface water criteria or guidance levels for nitrate+nitrite, total nitrate, and orthophosphate. High phosphorous and low dissolved oxygen were found in unconfined groundwater in the Perdido River planning unit. The sampling distribution for these observations, however, was limited. Sources of the high nutrients in groundwater have not been determined. Potential nutrient sources are agricultural and silvicultural land uses, stormwater ponds, septic tanks, wastewater discharges, and landfills. Natural conditions may contribute to elevated phosphorus and low dissolved oxygen.

There are close to 14,000 on-site sewage treatment and disposal systems, or septic systems, in the Florida watershed (Figure 10). They may be contributing to reduced water quality in the unconfined aquifer, in streams, or in Perdido Bay.

The Florida Department of Health has issued a fish consumption advisory for the Perdido River. Meals consisting of Bluegill, redear sunfish, largemouth bass, bowfin, and gar should be limited as recommended due to the presence of mercury in fish. The advisory also covers many species of fish from all coastal waters (FDOH, 2011).

Perdido Bay is affected by water quality problems described above, as well as by shoreline development. According to Lewis (draft 2011), the extent of seagrass coverage in estuarine and nearshore areas associated with the watershed has been shrinking for many years. Seagrass acreage declined 76 percent in Perdido Bay since 1940, dropping from 1,162 acres to 277 acres in 2002. In Big Lagoon, seagrasses declined 20 percent between 1960 and 1992, from 670 to 538 acres. Combining those areas, seagrass habitat has been reduced 44 percent over the period 1972 to 2008, with acreage estimated at 750 in 2008 (Lewis, 2011). FDEP (2001) found that seagrass communities in Big Lagoon continue to be impacted by poor water quality, as indicated by epiphytic algae and reduced light penetration.

Alteration and hardening along the shoreline of Perdido Bay affects water quality, intertidal habitats, and shoreline stability. High-density residential development and numerous docks on the lower bay are apparent in aerial photography. Affected areas are in the upper part of Wolf Bay at Moccasin Bayou and Hammock Bay, Bayou La Launch, Arnica Bay, Terry Cove, Cotton Bayou, Bayou Saint John, Big Lagoon and water side areas of Lillian, Perdido Beach, Josephine, Orange Beach, Innerarity Point, the bay side of Perdido Key, and the entire shoreline of Ono Island. Such development is more prevalent in Alabama than in Florida.

Substantial physical impact and alteration to tributary stream systems is evident in the Perdido River and Bay watershed. These include direct effects from impoundments, which results in loss and fragmentation of stream habitat and altered flow patterns. Additionally, scouring and bank destabilization result from urbanization within the stream catchments. Development within the Ten Mile Creek basin, for example, has resulted in pronounced stream degradation, bank destabilization, and water quality impacts. The basin has thus been the focus of recent stormwater retrofit and stream restoration activity on the part of the county. In addition to increasing storm flows, headwater development with substantial impervious surface area can also depress stream base flows. This, in turn, can further impact the viability of the habitat.

Remote sensing analysis of tributaries suggests that many headwaters and associated downstream reaches no longer have typical stream or wetland signatures. Clearing and impoundment and/or fire suppression and large-scale appear to have affected most headwater streams in the landscape. Land clearing increases

runoff, erosion potential and reduces natural filtering of runoff. Stream impoundments and clearing severely alter hydrology and native habitat, reducing recharge and stream flow and compromising the water cleansing capacity provided by headwaters. Cleared riparian areas are often vulnerable to colonization by invasive non-native species such as Chinese privet (*Ligustrum sinense*) and Chinese tallow (*Sapium sebiferum*) (Ray, 2011).

Logjams appear to have become more prevalent in recent years. As of 2010, there were nine different logjams visible on aerial photographs along the Perdido River, distributed from a few miles upstream of Brushy Creek down to almost US Highway 90. There were none visible on 2004 aerial photographs, taken just before Hurricane Ivan. Several historic and current factors may contribute: large scale land clearing, harvest of Atlantic white cedar, conversion to pine plantation, and boat wakes on the lower to middle river. These actions may decrease bank stability, resulting in loss of riparian vegetation, vertical banks with exposed soil, and a wider and shallower river channel. These conditions may increase the destabilizing effects of tropical storms and hurricanes. While log jams may span the width of the river and impede navigation, they also provide habitat for flora and fauna. They provide structural habitat for fish and wildlife, provide substrate for wood-degrading microorganisms which in turn are prey for a host of species, and cause riffles which aerate the water, thereby increasing oxygen content (Ray, 2011; Albrecht, 2011).

Severe bank erosion and resulting stream sedimentation is a problem at recreational sites on the Perdido River. The District is in the process of stabilizing the river bank and restoring riparian vegetation at a public use site known as “The Pipes” on the District’s Perdido River Water Management Area.

The Alabama Comprehensive Wildlife Conservation Strategy (2005) recognized habitat degradation and alteration from river dredging and drainage of bottomland forests and swamps as significant problems affecting species and habitats. The report *Conserving Alabama’s Coastal Habitats: Acquisition and Restoration Priorities of Mobile and Baldwin Counties* (2006) identifies threats to the Perdido River and Bay conservation area as altered hydrologic regime, degraded water quality, altered fire regime, incompatible forestry practices and urbanization/development. Restoration opportunities mentioned were prescribed fire, exotic/invasive species control, dirt road mitigation, and restoration of submerged aquatic vegetation (seagrasses).

Digital flood data indicate that 49,845 acres (22 percent) of Florida’s portion of the watershed are delineated as Special Flood Hazard Area (in Figure 11). Lands prone to flooding that have the greatest potential for economic damage are developed areas in the lower watershed around Perdido Bay and the Gulf of Mexico, including Perdido Key and neighborhoods along Bayou Marcus Creek, Eightmile Creek, and Elevenmile Creek.

Virtually all of the Perdido River's major tributaries and many feeder streams are vulnerable to flooding. Storm surges from tropical storms and hurricanes could potentially inundate areas on the coast and surrounding Perdido Bay, and the lower portions of Elevenmile, Eightmile, and Bayou Marcus creeks.

To facilitate protection of floodplain, wetland, and coastal resources, improved flood maps and elevation data are being developed by the District under the Risk Mapping, Assessment, and Planning (Risk MAP) program, in cooperation with the Federal Emergency Management Agency (FEMA). Under Risk MAP, the District is developing a watershed level plan in cooperation with Escambia County, Florida, and the State of Alabama to identify flood hazard mapping needs, flood risks, and, to a limited extent, projects to mitigate flood hazards. The plan developed under Risk MAP will be linked to this SWIM plan. The primary products developed through Risk MAP will be more detailed flood maps for priority areas based on an assessment of community mapping needs, although other possible outcomes include future flood hazard mitigation plans as specific flood hazards are identified through mapping. This process and SWIM are mutually supportive, with complementary objectives, such as avoidance of adverse impacts and development of multipurpose stormwater facilities, among others.

Land acquisition programs, as noted above, protect important riverine and coastal floodplain functions, as well as habitat and water quality. Restoration efforts implemented through SWIM and wetland mitigation have helped restore natural hydrology, with benefits for flood protection, habitat, and water quality. The new ERP program also addresses flood protection by protecting natural flows in an integrated manner with water quality. Escambia County has been addressing urban flooding through its stormwater management program (Hatch Mott MacDonald, 2003). Since 1991, 129 local flood problems have been alleviated in the Perdido watershed at a cost of approximately \$30 million (Curb, 2011).

# Appendix E

## Stakeholder Identified Priority Issues, Root Causes, Major Actions and Project Types

Priority Issues: 1. Water Quality 2. Natural Resource Protection, Restoration And Management 3. Education And Outreach 4. Coastal Community Resilience		
Major Actions (formerly called Issues. Revised to Major Action needed to address a priority issue)	Root Causes to be addressed	Types of Projects
<b>Reduce Sedimentation</b>	<p>The root causes were grouped into the bolded bullet headings. The root causes as stated during the stakeholder meetings are under these headings and have not been altered.</p> <p><b>Erosion</b></p> <ul style="list-style-type: none"> <li>o dirt roads</li> <li>o gullies</li> <li>o borrow Pits</li> <li>o removal of shoreline and riparian vegetation (e.g., seawalls)</li> <li>o loss of natural habitat on sloping areas</li> <li>o woody material removal from system/improper activity/log jams (stream BMPs lacking)</li> <li>o seagrass</li> <li>o loss of urban tree canopy</li> <li>o driving along stream banks</li> </ul> <p><b>Ineffective or unused BMPs, regulations &amp; development codes</b></p> <ul style="list-style-type: none"> <li>o agriculture</li> <li>o commercial/residential development</li> <li>o sand/gravel mines</li> <li>o inspection/enforcement</li> <li>o lack funding and commitment of post-implementation monitoring</li> <li>o need connect dots for decision makers of landscape activity (need to address education/ elevate awareness for decision-makers)</li> <li>o improper beach (re)nourishment</li> <li>o paper mill suspended solids</li> <li>o boat wakes</li> </ul> <p><b>Ineffective Stormwater system (also a major action)</b></p> <ul style="list-style-type: none"> <li>o increased water over short time (impervious surfaces direct water to increase rate flow and sedimentation)</li> <li>o no systems in older developments</li> </ul>	<ul style="list-style-type: none"> <li>o Vegetative replacement</li> <li>o Phyto-remediation</li> <li>o Require bonds for development to remediate environmental issues related to development actions as they occur and for all developments</li> <li>o Hilltop to hilltop paving (Forestry has mapped this in FL; AL identified areas, not prioritized)</li> <li>o Spatially map locations of unpaved roads in FL and AL</li> <li>o Forestry planning workshops for dirt road planning and recovery/restoration after use (e.g., AL does this)</li> <li>o Include dirt road construction in the SHARP logger program (FL Div. Forestry)</li> <li>o Effective BMP development, implementation and education for all land uses</li> <li>o Revisit and educate on legacy and grandfathered areas</li> <li>o Incentivize stormwater retrofit</li> <li>o Living shorelines where needed and appropriate</li> <li>o Rapid identification and treatment of invasive species</li> <li>o River assessments to ID problem areas and funded action plan</li> <li>o Catch basins &amp; educate maintenance crews (Tuscaloosa)</li> </ul>

## Reduce Nutrient Loading

### Ineffective or unused BMPs, regulations & development codes

- o golf courses
- o stores
- o residential and commercial
- o agriculture
- o CAFOs
- o point sources in AL/FL
- o state raised amount nutrients levels allowed
- o landfills and disposal sites leaching into groundwater
- o feral hog along river bottoms
- o deer cleaning in river bodies – carcass contamination (education=solution)
- o not using/lack of pump out stations
- o fish cleaning stations improperly located

### Ineffective Stormwater system (also a major action)

- o yard waste
- o detergents

### Atmospheric deposition

### Loss of vegetation, riparian Buffers and/or wetlands (also major action)

- o loss of habitat/buffers (also major action)

### Invasive Species

### Domestic Wastewater

- o septic tank (leaks, improperly located, etc)
- o sewer systems (I&I, lift station failure)
- o effluent / waste disposal

### Quantity and timing of freshwater flow

- o stream dams – amount and quality water flow

- o Dam removal
- o Fertilizer ordinances
- o Sanitary sewer projects to reduce # septic tanks
- o Use LiDAR maps and other tech. in new developments to avoid low areas –apply technology to inform
- o Incentivize Ag. and rural areas BMP's – make connection land uses to Gulf
- o Advocate more \$ in Farm Bill to pay for existing programs
- o Haz. waste/household 'haz' waste/ pharmaceutical recycling – regular accessible collection days/locations
- o Funding for land acquisition and conservation
- o Affordable conversion septic to sewer/'free tap fee'/cost share with developers (advertised//encouraged)
- o Living shorelines where needed and appropriate
- o Habitat restoration, conservation and management (estuarine, terrestrial, riverine) -appropriate timing in relation to impact to restoration success
- o Bridge replacement plans that plan for SLR, species corridors
- o Motorized vessel exclusion zones with increased access for non-motorized vessels
- o Boater and coastal homeowner education about personal impacts to water quality
- o Clean marinas and incentivize NPEB = Net Positive Envir. Benefit
- o Incentivize urban redevelopment/infill
- o Enhance public transportation system

## Reduce and Treat Stormwater

### Ineffective or unused BMPs, regulations & development codes

- o no stormwater treatment
- o improperly designed systems
- o interconnections with sewer
- o loss of permeable land and developed land not maximizing use of open/green space
- o development in recharge areas
- o increased density of development
- o pet waste
- o lack of regulatory oversight
- o lack of predictive modeling for cumulative impacts
- o overuse of irrigation systems - illicit discharges
- o inappropriate dumping
- o multiple regulatory codes and layers that are contradictory
- o variances lack consistency
- o lack communication between agencies
- o contaminants (pesticides, fertilizers, hazardous materials) getting into stormwater system
- o lack water conservation
- o lack adequate regulation & enforcement for conserving isolated wetlands
- o livestock waste and access to riparian areas
- o lack incentives and education, obstacles to using natural infrastructure

### Lack of Adequate Funding

- o lack of maintenance of stormwater systems (residential, commercial and industrial inadequate impact/utility fees)

### Loss of vegetation, riparian Buffers and/or wetlands (also major action)

- o hardened ditches –loss vegetation, increased volume of water entering wetlands
- o reduced riparian buffers/wetlands
- o inappropriate armoring and/or stabilization

- o Making stormwater sexy – integrate natural stream design
- o Utilize CR tools for SLR and storm preparedness
- o Stormwater marking/education
- o Fertilizer ordinances
- o Sanitary sewer projects to reduce # septic tanks
- o Use LiDAR maps and other tech. in new developments to avoid low areas –apply technology to inform
- o Advocate more \$ in Farm Bill to pay for existing programs
- o Funding for land acquisition and conservation
- o Habitat restoration, conservation and management (estuarine, terrestrial, riverine) -appropriate timing in relation to impact to restoration success
- o Incentivize urban redevelopment/infill
- o Retrofit stormwater projects (e.g., culverts)
- o Increase stormwater retention capacity in regional stormwater plans
- o Increase urban tree canopy

**Protect, Restore, Create and Manage natural resources and increase buffer areas**

**Lack of Adequate Funding**

- o land purchases/easements
- o land management activities (e.g., invasive species and Rx fire)
- o restoration activities (land and water)

**Ineffective or unused BMPs, regulations & development codes**

- o lack of adequate LDRs/development codes
- o lack compatible silvicultural practices for wildlife management
- o fragmentation of natural habitats leading to loss of corridors and connections/sprawl
- o lack of, inadequate or improper stream/creek crossing designs/construction
- o legacy seawalls placement/engineering controls
- o removal riparian vegetation
- o removal in-stream woody material
- o monoculture revegetation
- o changes in estuarine shoreline - transition of habitats
- o loss of wetlands
- o streamlined regulations
- o ICW dredging
- o overvalue coastal areas for development
- o personal watercraft/motorized vessels increased traffic cause shoreline erosion
- o increased noise & light pollution
- o subsidized risk management (flood insurance, etc.) Continued development of repetitive loss areas
- o lack integration and understanding of environment and economy interests (also major action)
- o 'Nintendo Generation' – lost connection with and value for natural world

**Contamination**

- o increased sedimentation
- o increased nutrient loading
- o industrial effluent

**Environmental changes / issues**

- o sea level rise, increase in severe storm events, subsidence
- o feral animals

- o Farm Bill
- o Living shoreline
- o Habitat restoration, management
- o Funding for management of conservation lands
- o Funding education natural resources
- o Land acquisition/restoration/Wildlife corridors
- o Invasive species management
- o BMP for instream habitat management
- o Recruit private lands in habitat restoration and management plans
- o Regular watershed planning
- o Habitat/river assessments
- o Bridges (see previous)
- o Increase acreage for Rx fire
- o Reduce impediments to implementing Rx fire
- o Restore channelized streams

Increase cooperation and coordination for management, monitoring, funding, implementation, outreach, enforcement

Ineffective or unused BMPs, regulations & development codes

- o capacity for long-term maintenance and Enforcement
- o conflicting regulations/standards
- o accountability of agencies that issue permits/retrofit/follow-up
- o lack coordinated outreach among agencies/organizations
- o lack trust
- o lack personnel
- o fiefdoms/ Silos
- o federal/state legislation needs to complement each other and base on lessons learned
- o lack understanding of watersheds are 3D -Insufficient operational boundaries within and between agencies to look at watershed and big picture – public and private
- o lack of centralized data repository

Lack of environmental awareness

- o loss of connection to nature
- o loss value/understanding nature
- o fear of nature
- o broader community outreach
- o nature ADA accessible

Lack of adequate funding

- o targeted
- o monitoring data/resources (people, equipment) not valued, especially long-term

- o Identify restrictions that prevent working within operational boundaries and across agencies to look at watershed and big picture – public and private
- o Continue as watershed workgroups/alliance/BARC (St Johns Alliance as ex.) – needs funding and agency support/value
- o FWRMC (Florida Water Resource Management Council) – a group reinitiated by FDEP & WMD in the past 2 years <http://www.dep.state.fl.us/water/monitoring/council/>
- o Water Atlas
- o Pilot projects that can serve as models – could be low budget, high visibility
- o Develop watershed standards across jurisdictions for entire watershed
- o Regional stormwater planning
- o Develop ecosystem education center/program

<p><b>Reduce impacts to groundwater and ensure adequate fresh water availability</b></p>	<p><b>Contamination</b></p> <ul style="list-style-type: none"> <li>o land application spray fields infiltrate groundwater in improper spoil types</li> <li>o leaching landfills (groundwater contamination)</li> <li>o lack of adequate aquifer protection zones/lack of knowledge of adequate zones around well heads/wellfields and long-term protection of aquifer</li> <li>o oil and gas drilling impacts (N. Escambia Co.) – is this known?</li> <li>o remnant legacy contamination?</li> </ul> <p><b>Ineffective or unused BMPs, regulations &amp; development codes</b></p> <ul style="list-style-type: none"> <li>o increased coastal development</li> </ul> <p><b>Water Supply</b></p> <ul style="list-style-type: none"> <li>o groundwater removal – competing uses</li> <li>o not value water as limited resource and over use (development, ag, etc.) = over pumping of wells – saltwater intrusion (lack appropriate valuation)</li> <li>o lack understanding/knowledge capacity aquifer</li> <li>o overuse</li> </ul> <p><b>Lack of adequate funding</b></p> <ul style="list-style-type: none"> <li>o reduced funding for groundwater monitoring</li> </ul> <p><b>Environmental Changes / Issues</b></p> <ul style="list-style-type: none"> <li>o impacts from SLR, change in precip, CC</li> </ul>	<ul style="list-style-type: none"> <li>o Use grey water</li> <li>o Remediation superfund and legacy sites</li> <li>o Land acquisition/conservation</li> <li>o Water conservation</li> <li>o Standards for Instream flows – maintain baseline flow</li> <li>o Public education</li> <li>o Incentivize conservation of water use and water recharge areas</li> <li>o Increase wellfield protection areas</li> </ul>
<p><b>Increase Economic Diversification</b></p>	<p>Note: this Major Action was identified during other watershed meetings and are inserted here as a placeholder in the event the Perdido stakeholders address this Major Action as they identify projects</p>	

# Appendix F

## Perdido Watershed Project List

Note: Due to space limitations the following information provided by the stakeholders on their projects was omitted from the table.

- o Alignment with Federal RESTORE Priorities
- o Alignment with Federal RESTORE Objective
- o Alignment with State RESTORE Priorities

A complete table of the information submitted for each project is available upon request to Anne Birch at [abirch@tnc.org](mailto:abirch@tnc.org).

<b>Project Map #</b>	1
<b>Latitude</b>	30.478596
<b>Longitude</b>	-87.326586
<b>Project Title</b>	Perdido Bay Watershed Restoration Project
<b>Location Description</b>	Perdido Bay Watershed, lat/long midpoint
<b>Project Description</b>	Consists of 63 multifaceted restoration projects that address one or more of the 5 strategy goals & 5 recommended types of restoration projects in FL. Includes 14 estuarine habitat restoration & living shoreline projects, 39 water quality & stormwater improvement projects, 3 sewage infrastructure & septic tank abatement projects and 7 land management restoration projects. Several projects have been designed & are already permitted.
<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
<b>Root Causes</b>	Contamination, Domestic wastewater, Erosion, Ineffective stormwater systems, Lack of adequate funding, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow, Water reuse
<b>Proposed Metric(s)</b>	Result in fewer Health Advisories Decrease in nutrient loading as measured by FDEP Reduce sedimentation Increase acres of land protected Calculation of impact (N/P) reduction
<b>Project Contact Name</b>	Taylor “Chips” Kirschenfeld
<b>Project Cost</b>	>\$1 million

Project Map #	2
Latitude	30.37166
Longitude	-87.40429
Project Title	Perdido Pitcher Plant Prairie
Location Description	Hwy 98 to Gulf Beach Hwy. and Bauer Road to Blue angel Pkwy. Escambia County
Project Description	OPurchase remaining 2,412 acres of partially completed Florida forever project, now operated by the Florida Park Service as Tarkiln Bayou Preserve State Park.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce and treat stormwater., Reduce sedimentation., Reduce impacts to groundwater.
Root Causes	Environmental changes / issues, Erosion, Invasive species, Lack of adequate funding, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow
Proposed Metric(s)	Increase acres under land management protection by 2412
Project Contact Name	Manley K. Fuller
Project Cost	>\$1 million

Project Map #	3
Latitude	30.20506
Longitude	-87.333768
Project Title	Restoring Natural communities in the Gulf Coastal Plains Ecosystem Partnership Landscape
Location Description	GCPEP landscape of over 1 million acres in Longleaf Alliance
Project Description	GCPEP landscape is a Significant Landscape for longleaf pine conservation & recovery. The partnership of public & private entities, established in 1996, has a long track record with longleaf pine ecosystem restoration. This project allows that good work to advance by addressing key gaps identified in Gulf Coastal Plain restoration, especially related to prescribed fire, invasive species control, ecological monitoring, & building a stronger base of qualified longleaf fire practitioners. The advances made in longleaf pine restoration & management, particularly related to prescribed fire, have had a positive impact on the natural resources of the area. Provides staff and equipment funding to increase prescribed fire, invasive control & ecological monitor across 1 million acres for 6 years.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach., Reduce impacts to groundwater.
Root Causes	Environmental changes / issues, Erosion, Invasive species, Lack of adequate funding, Lack of communication among diverse stakeholders, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow
Proposed Metric(s)	Increase plant species across landscape. Control additional acres infested with exotic invasive plants. Hazardous fuel reduction in fire dependant communities. Increase receptiveness for longleaf pine regeneration. Increase public and private lands under on-site longleaf forest. Improve breeding habitat for red-cockaded woodpecker, gopher tortoise and commensals. Provide seed source for use by public and private parties for restoration.
Project Contact Name	Vernon Compton
Project Cost	>\$1 million

Project Map #	4
Latitude	30.509294
Longitude	-87.440355
Project Title	Lower Perdido River Buffer
Location Description	Along E bank of Perdido River (Florida) and S of US Hwy 90, W/NW of Pensacola. Lat/Long point is near middle of remaining unprotected lands.
Project Description	<p>Note: This material is adapted from that in the Florida Forever Five Year Plan. The Perdido River is a blackwater stream with its origins in southern Alabama. It has a low relief and is exceptionally winding, typical of many rivers in the lower Gulf Coastal Plain. It has no substantial springs, but rather depends on headwater wetlands, tributaries and incident rainfall for most of its flow. The river is about 100 yards wide at its mouth on Perdido Bay, but upstream is only about 30 yards wide or less. The Lower Perdido River Buffer includes land on the eastern (Florida) side of the river from roughly the center of Escambia County (near Barrineau Park) downstream to the river's mouth on Perdido Bay. The project will preserve a riparian and floodplain area along one of the state's "Outstanding Florida Waters" that currently has low levels of development, while providing recreational access points. The project will be conserved through conservation easements, keeping land in private ownership – and in productive agriculture – and on the local tax rolls while protecting it from development and ensuring public access for outdoor recreation. Several small access points to the river are to be acquired in fee simple. The project has approximately 5,053 acres of functional wetlands that will be protected. Approximately 2,094 acres have been identified that provide groundwater recharge and ca. 1,056 acres of forest have been identified that would maintain groundwater recharge functions. There are nine rare species documented from the project area. The project also meets the Florida Forever goal of increasing natural resource-based public recreational and educational opportunities. Using conservation easements that allow silviculture is consistent with the Florida Forever goal of preserving forestland for sustainable management of natural resources. The Perdido River appears to be mostly free of major structural alterations and point sources of pollution that can substantially affect either flow or water quality. As such, no major restoration efforts along the immediate river corridor are deemed necessary. But, areas of minor structural alterations (e.g., houses, boat ramps, highway crossings) should be periodically examined to determine whether any are contributing erosion, siltation, contamination or pollution. Additionally the adoption of Silvicultural Best Management Practices by the landowner should limit fertilizer, pesticide and herbicide run-off into the river and downstream estuary, but regular monitoring of water quality should occur. This is a single-owner project held by International Paper. The specific locations of the small access sites are to be determined during the negotiation process. In May 2006, the Northwest Florida WMD purchased 5,456 acres within the project boundary so that only 2,331 acres now remain to be protected.</p>

<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
<b>Root Causes</b>	Contamination, Environmental changes / issues, Erosion, Invasive species, Lack of adequate funding, Lack of environmental awareness, Limited economic diversity, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow, Water supply
<b>Proposed Metric(s)</b>	Monitor yearly for improved water quality using established parameters; Determine species/community change, track sea level rise and other climate related change, CO <sub>2</sub> sequestration by forestlands; Measure turbidity and monitor yearly; EPPC Category 1 invasive exotics, treatment of infestations. Monitor by regional CISMAs; Increase in acres protected/year vs. previous five years (2009-2013); Number of visitors to environmental education programs and informational/interpretive signs installed. Conduct surveys on visitor experiences; New jobs added/maintained (e.g., military bases), hunting/ fishing licenses sold, fisheries productivity (e.g., shellfish harvesting), acres of timberland with forest product revenue, ecotourism expenditure; Base line of vegetative cover, riparian corridors, seagrass beds, etc. Monitor yearly for change. Number/size of clear cuts and forest restoration on working lands and Silvicultural BMPs; Use flow (cubic feet/second) and stream velocity devices. Aerial and remote imagery to measure variability in seasonal and headwater wetlands; Acres of recharge lands for Floridan, intermediate and surficial aquifers. Recharge rate (inches/year) multiplied by acres of variable recharge type (soil, geology, depth to aquifer) estimate gallons of water recharged. Acres of total watershed/headwater wetlands and riparian areas for municipal water supply. District plans for well fields and areas targeted for alternative water supply.
<b>Project Contact Name</b>	Richard Hilsenbeck
<b>Project Cost</b>	>\$1 million

<b>Project Map #</b>	5
<b>Latitude</b>	30.342043
<b>Longitude</b>	-87.458631
<b>Project Title</b>	Enhanced Fisheries and Ecosystem Monitoring in Alabama's Marine Waters
<b>Location Description</b>	Overall project includes Alabama estuaries and offshore to continental shelf edge. Point represents central area in Perdido Bay for smaller portion of study.
<b>Project Description</b>	This project will use sampling programs to monitor the long-term sustainability of the marine resources. The project will expand or supplement current programs to provide fishery independent and dependent data to conduct a comprehensive suite of statistical and modeling analyses to characterize the impacts and longevity of the DWH disaster and the recovery of the ecosystem by natural processes and associated restoration projects. Projects include offshore reef fish monitoring, benthic surveys, an inshore baitfish survey, a regional fish movement network, plankton survey, fishery dependent blue crab survey, finfish survey, habitat mapping, fish life history work and continuous water quality assessment. Implementing these interrelated projects will provide the rigorous and robust data required to quantify the recovery of the resources, assist single-species stock assessments and significantly enhance the data infrastructure required for ecosystem-based assessments to improve management moving forward. Note that total project cost is \$9,306,000 but includes a large study area. This project cost estimate is based on a cost per acre of \$1.42 with a bay area of about 32,000 acres.
<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
<b>Root Causes</b>	Environmental changes / issues
<b>Proposed Metric(s)</b>	This project will expand existing data for assessment of impacts of the Deepwater Horizon disaster through fishery independent and dependent surveys. The project will use established SEAMAP and standardized protocols. Project will give communities confidence in the health of marine environment and resources.
<b>Project Contact Name</b>	Phillip Hinesley/Chris Blankenship
<b>Project Cost</b>	<\$100,000

Project Map #	6
Latitude	30.300503
Longitude	-87.457683
Project Title	Lower Perdido Bay Restoration
Location Description	Geographic boundaries includes an estimated 2,000 ft of shoreline as well as 157 acres of seagrass habitat in Perdido Bay at Boggy Point and Rabbit Island. Lat/logn point represents shoreline at Rabbit Island site.
Project Description	Coastal and submerged resources of Mobile Bay have been significantly impacted by coastal development, stormwater runoff, altered hydrology, erosion, and fisheries operations. More than 50% of seagrass beds in Mobile County & 80% of seagrass beds in Baldwin County have been lost in the last 60 years. In 2009, the Alabama Chapter of The Nature Conservancy worked with federal and state agencies to designate a –No Motor Zone” to help protect seagrass beds from further boat impacts in lower Perdido Bay. We have also worked with Dauphin Island Sea Lab to restore prop scars from boat activities and educate the public on these sensitive habitats in the same area. This project involves restoration, enhancement and protection activities for an estimated 2000 ft. of shoreline, using living shoreline/reef breakwater techniques, as well as protection efforts for 157 acres of seagrass habitat. Almost 1500 linear feet of reef will be deployed at Boggy Point and Rabbit Island to help reduce shoreline erosion and provide for the potential reestablishment of emergent marsh. In addition to potential shoreline benefits, the reefs are anticipated to enhance local water quality and provide fisheries benefits. The project will provide a substrate for oyster larvae and other encrusting organisms to settle and colonize; serve as nursery habitat for commercially and recreationally important finfish and shellfish; dampen wave energy and decrease erosion; and help stabilize sediments and decrease turbidity, providing suitable intertidal areas and associated food sources for shorebird foraging. The current signage to mark the protected seagrass beds has not been effective or durable. Installation of spar navigation buoys delimiting the –No Motor Zone” and seagrass beds will be more effective and safer for boaters. The lands also contain habitats that support diversity of wildlife, including coastal & wading birds, waterfowl, nursery habitat for coastal finfish & shellfish such as speckled sea trout, redfish, Atlantic croaker, shrimp, blue crabs. The area is home to many T&E species, including the West Indian manatee. Several islands support coastal, shore and wading birds roosting and foraging, including tricolor herons, reddish egrets, little blue herons, snowy egrets, white ibis and brown pelicans. Great blue herons, great egrets, clapper rails, willets & woodcock also forage in the marsh. Migratory waterfowl & Neotropical migrants also frequent the area.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas.

<b>Root Causes</b>	Environmental changes / issues, Erosion, Ineffective or unused BMPs, regulations & development codes, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands
<b>Proposed Metric(s)</b>	Acres of seagrass beds in lower Perdido Bay protected by navigation buoys. Linear feet of shoreline protected with living shoreline/reef techniques. Long term, area of emergent marsh reestablished, enhanced water quality and colonization of oyster larvae and other encrusting organisms.
<b>Project Contact Name</b>	Phillip Hinesely/Judy Haner
<b>Project Cost</b>	>\$1 million

<b>Project Map #</b>	7
<b>Latitude</b>	30.280783
<b>Longitude</b>	-87.555111
<b>Project Title</b>	Cotton Bayou – Perdido Islands Beneficial Use Restoration
<b>Location Description</b>	Point represents central location in lower Perdido Bay. The project’s geographic boundaries include Robinson Island, Bird Island and Cotton Bayou’s channel and basin
<b>Project Description</b>	Beaches along the Gulf Coast of Alabama are significant to both the area’s ecosystem and economy. They provide important habitat for birds and endangered species, including the Alabama beach mouse and species of sea turtles. These beaches also contribute to the area’s economy, attracting visitors to Alabama’s coast to participate in recreational activities, including birding. These habitats were gravely impacted by the Deepwater Horizon oil spill in April 2010. To ensure Alabama’s full ecological and economic recovery from this disaster, it is essential to restore critical coastal ecosystems including beach habitat. Beach habitat on Robinson and Bird islands in Perdido Bay, AL is used by Neotropical migratory bird species as staging areas as they migrate across the Gulf of Mexico throughout the year. Due to these characteristics, Robinson Island is recognized as a Bird Sanctuary and both islands reside within Lower Perdido Bay, one of Alabama’s Gulf Ecological Management Sites. Eroding shorelines on both islands have resulted in a loss of beach habitats, negatively impacting the lucrative ecotourism draw of birding on the islands. Our project will address habitat deterioration and associated ecological and economic impacts in Perdido Bay. Our project has two main objects: 1) Restore eroded beach habitat on Robinson and Bird islands and 2) restore Cotton Bayou’s channel and basin for commercial boating access. The U.S. Army Corps of Engineers in cooperation with partners will dredge Cotton Bayou to its historic depth and use the dredged material for beneficial use to create roughly 3.3 acres of beach habitat on Robinson and Bird islands. This project will benefit the ecosystem by creating essential beach habitat that is used by animal species impacted by the oil spill. The project will also benefit Alabama’s coastal economy, attracting birders to the Gulf Coast, improving the access of charter fishermen to Perdido Bay, increasing the promotion of local tourism and in turn offsetting impacts of the oil spill on this area.
<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas.
<b>Root Causes</b>	Environmental changes / issues, Erosion
<b>Proposed Metric(s)</b>	Short term metric includes cubic yards of dredged material from Cotton Bayou channel used for restoration of Robinson and Bird Island. Acres of increased habitat created on islands. Long-term metrics include increase in use of beach habitat and increased numbers of birders and charter fishermen in Perdido Bay.
<b>Project Contact Name</b>	Phillip Hinesley/Jody Thompson
<b>Project Cost</b>	>\$1 million

Project Map #	8
Latitude	30.280783
Longitude	-87.555111
Project Title	Alabama Coastal Restoration Program
Location Description	The overarching project includes all Alabama watersheds. The point location represents Perdido Bay, whose watershed and waters would be a smaller portion of the larger project.
Project Description	Coastal Alabama Restoration Program Phase One proposes to lay the foundation for restoring and improving future management of Alabama's watersheds that flow directly into Mississippi Sound, Mobile Bay, the Gulf of Mexico, and smaller bays of Baldwin County. In order to best determine habitat acquisition, restoration, and conservation priorities, the Mobile Bay National Estuary Program Management Conference, through its Science Advisory and Project Implementation Committees, are proposing the following steps: 1) Acquire high resolution mapping of the landscape of Alabama's two coastal counties and of current SAV of MS sound, Mobile Bay, and Gulf near shore waters. This activity will provide current data for identifying and inventorying high quality priority habitats for use in determining reference conditions/ areas in developing acquisition and restoration activities; 2) Identify streams, rivers and riparian buffers, wetlands, and intertidal marshes and flats that are in good, fair, and poor condition using the data acquired, Science Advisory Committee biological condition indices, and modeling. This activity will produce the acquisition, restoration, and conservation opportunities of coastal Alabama; 3) Develop watershed restoration plans for tidally influenced watersheds in Alabama (at the Hydrologic Unit Code 12 or HUC 12 scale); and 4) Couple these watershed plans with restoration, conservation and protection opportunities to determine priorities for restoration activities for the Gulf Environmental Benefit Fund and other RESTORE funding opportunities. Note that project cost is for the full project, but portions of the project related to Perdido Bay could be implemented for less.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Environmental changes / issues, Ineffective or unused BMPs, regulations & development codes, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	The short term conservation metrics of the Alabama Intertidal Watershed Restoration Program area scientifically based, data driven methodology for prioritizing acquisition and restoration activities and increased engagement of communities and local governments in restoration and watershed management planning. The long term metrics of this activity are to 1) increase availability of nursery habitat for those coastal marine living resources that depend on a healthy estuary for part of their lifecycle and 2) to protect nursery habitat by reducing the impacts of anthropogenic stress on these habitats to ensure their health and productivity into perpetuity.
Project Contact Name	Phillip Hinesley/Roberta Swann
Project Cost	>\$1 million

Project Map #	9
Latitude	30.275377
Longitude	-88.172649
Project Title	Alabama Audubon Coastal Bird Stewardship Program (AACBSP)
Location Description	Project area includes highest priority nesting, loafing and roosting sites identified in Mobile and Baldwin Counties. Point coordinate represents area in Perdido Bay
Project Description	Audubon, nationally and through independent chapters, will expand its network of high priority sites that are the focus of conservation implementation by Audubon and willing partners, across the northern Gulf of Mexico to ensure long-term stewardship and sustainability of priority waterbird populations. Birmingham and Mobile Bay Audubon Chapters (Alabama Audubon Chapters) will work within an adaptive management framework to implement bird stewardship, monitoring of populations and threats, and outreach to coastal human populations. Using an iterative approach, Audubon will assure Alabama coastal waterbirds, seabirds, and shorebirds are integral to recovery plans implemented on Alabama's Gulf Coast. Alabama Audubon chapters and partners will: improve existing shoreline and near-shore habitats that support waterbird populations; integrate existing conservation lands, future acquisitions, and appropriate parts of newly constructed lands into a system of sites managed to protect populations of coastal waterbirds; seek sustainable practices for beaches and habitat shared by birds, human residents and visitors; use professional staff and volunteer stewards to reduce threats to nesting, roosting and feeding birds, increasing their productivity and survival, to remedy harm to these populations exacted by the Deepwater Horizon oil spill. Work will be implemented in cooperation with the Alabama Department of Conservation and Natural Resources; Dauphin Island Sea Lab; Dauphin Island Parks & Beach Board; Dauphin Island Bird Sanctuaries; Weeks Bay Foundation; and others. Note that project cost includes totals for implementation in Mobile and Baldwin Counties. Unit cost for just Perdido Bay region is \$267.30 per acre.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Environmental changes / issues, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	1: Implement colony stewardship and monitoring for priority species at high priority nesting sites and expand monitoring for priority coastal waterbird species across near shore and island habitats. 2: Implement standardized, regular, coast-wide monitoring for all coastal waterbirds at 14 sites on mainland beaches and barrier islands. 3: Implement adaptive and best management practices for priority coastal waterbirds at all priority sites using data collected through stewardship and standardized monitoring. 4: Educate diverse audiences to increase understanding of the needs and value of coastal waterbirds and their habitats, focusing on humans visiting and residing in coastal habitats, as well as in local and regional habitat managers, decision-makers, law enforcement professionals, and media.
Project Contact Name	Phillip Hinesley/Suzanne Langley
Project Cost	>\$1 million

Project Map #	10
Latitude	30.315506
Longitude	-87.487993
Project Title	Innerarity Island Utility System Standards Upgrade
Location Description	Innerarity Island (southwest Escambia County, FL) - Middle of Project Area
Project Description	<p>This project entails assessment and upgrade of the wastewater collection and water distribution systems on Innerarity Island, in coastal southwest Escambia County, Florida, to bring the systems up to engineering standards so that the Emerald Coast Utilities Authority can assume public ownership, operation and maintenance. The existing systems are privately owned, and include wastewater collection and water distribution systems in very close proximity to coastal waters. The surface waters surrounding the Island are: Perdido Bay (an estuarine system on the Florida/Alabama state line); Old River (Intracoastal Waterway); and the nearby Gulf of Mexico. With the recent death of the utility system's owner, the future ownership and operation of the system is in question. Representatives of the deceased owner's estate have approached the ECUA to ask consideration of the special district utility to buy or assume ownership and operation of the system. The system is not constructed to current engineering standards and, as such, would have to be upgraded to these standards before the public utility assumes ownership, operation or responsibility of the system. The exact condition of the systems is unknown, but the ECUA accepts flows from the wastewater collection system, which apparently has serious inflow and infiltration (I&amp;I) problems based on wet weather flow data. A review of past communications between the now-deceased owner and the ECUA also points to some apparent deficiencies in the water distribution system.</p>
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading.
Root Causes	Domestic wastewater, Environmental changes / issues, Ineffective or unused BMPs, regulations & development codes, Lack of adequate funding
Proposed Metric(s)	<p>The existing utility system serving the proposed project area is deficient and not constructed to acceptable engineering standards. These deficiencies result in sanitary sewer overflows (SSO) that impact adjacent surface waters, which are part of the coastal estuarine system including Perdido Bay. As this utility system is currently under private ownership, current system-wide operating data is unavailable. However, based on wet weather flow data from the Emerald Coast Utilities Authority, which accepts and treats flows from the proposed project area, there appear to be serious inflow and infiltration (I&amp;I) problems associated with the existing system. The upgrade of the utility system, which would allow public ownership and operation of the system, would facilitate system monitoring and reduce I&amp;I and the associated SSOs. Appropriate surface water monitoring would demonstrate water quality improvements.</p>
Project Contact Name	Tim Haag
Project Cost	>\$1 million

Project Map #	11
Latitude	30.340806
Longitude	-87.454691
Project Title	Identification, Prioritization, and Quantitative Assessment of Ecosystem Benefits of Restoration Actions
Location Description	Principally the lower portion of the Perdido watershed, and the entire Perdido Bay watershed. Point represents central location in Perdido Bay.
Project Description	<p>This project establishes a program to identify and prioritize critical ecosystem restoration actions within the Perdido and Perdido Bay watersheds, and provide science-based quantitation of ecosystem benefits of restoration actions. The watersheds cover about 1200 square miles, and are bisected by the Alabama-Florida border. They drain a variety of land use/cover types, including upland forests, wetlands, agricultural areas, and urban development. Water and sediment quality impairment and degradation of biological resources consistent with point and nonpoint source pollution from residential, agricultural, and industrial sources is widespread throughout the area. Evidence of ecological degradation includes imbalances in natural plankton populations, benthic and fish communities, and adverse changes in trophic dynamics and the loss of aquatic habitat. This program will substantially reduce uncertainties and increase effectiveness in identification and prioritization of potential restoration actions, quantify ecosystem benefits from current and future restoration actions, and improve decision-making in adaptive management of restoration actions. These goals will be accomplished by (1) characterizing existing environmental/ecological watershed conditions by establishing a science-based, integrated monitoring network for water and sediment quality, physical/hydrologic characteristics, and benthic invertebrate, planktonic, and fish community structure; (2) creating a dynamic, robust GIS spatiotemporal database of chemical, biochemical, and biological indicators necessary for predicting and quantifying environmental and ecosystem benefits of restoration activities; (3) linking chemical, biochemical, and biological indicators of ecosystem degradation to defined sources of degradation; and (4) developing and implementing data interpretation and modeling protocols, employing the evolving database for prediction, confirmation, and long-term surveillance of restoration activities. This project will provide a science-based means for those funding, regulating, and implementing restoration actions to prioritize future restoration activities, assess ecosystem benefits of ongoing restoration actions, and predict the outcomes of adaptive management decisions for ongoing restoration actions. This will be a collaborative project between Auburn University's Environmental Engineering program, the Dauphin Island Sea Lab, Escambia County, Florida, and Baldwin County, Alabama.</p>
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.

<b>Root Causes</b>	Atmospheric deposition, Contamination, Domestic wastewater, Environmental changes / issues, Ineffective or unused BMPs, regulations & development codes, Ineffective stormwater systems, Lack of adequate funding, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands
<b>Proposed Metric(s)</b>	(1) establishment of a science-based, integrated monitoring network for water and sediment quality, physical/hydrologic characteristics, and benthic invertebrate, planktonic, and fish community structure; (2) creation of GIS spatiotemporal database of chemical, biochemical, and biological indicators necessary for predicting and quantifying environmental and ecosystem benefits of restoration activities; (3) linking chemical, biochemical, and biological indicators of ecosystem degradation to defined sources of degradation; and (4) development and implementation of data interpretation and modeling protocols, employing the evolving database for prediction, confirmation, and long-term surveillance of restoration activities. Long term metric includes improved science-based means for those funding, regulating, and implementing restoration actions to prioritize future restoration activities, assess ecosystem benefits of ongoing restoration actions, and predict the outcomes of adaptive management decisions for ongoing restoration actions.
<b>Project Contact Name</b>	Phillip Hinesley/Joel Hayworth
<b>Project Cost</b>	>\$1 million

Project Map #	12
Latitude	30.3861
Longitude	-87.4282
Project Title	Navy Shoreline Restoration at Bronson Field
Location Description	Navy shoreline on the eastern shore of Perdido Bay
Project Description	Beach renourishment and living shoreline additions on one-mile of Perdido Bay shoreline. Existing hard surface shoreline to be supplemented with living shoreline; existing eroded natural shoreline to be enhanced with renourishment project including soil/sand material and vegetation.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Erosion, Ineffective stormwater systems, Lack of adequate funding, Lack of communication among diverse stakeholders, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Water quality improvements; natural resources protection; restoration and management; education and outreach; community resilience; base buffering lands under protection of wetland mitigation credits available to support future development and infrastructure upgrades; Acres of endangered coastal property protected from sea level rise.
Project Contact Name	Mark Gibson
Project Cost	=<\$500,000

Project Map #	13
Latitude	30.35559
Longitude	-87.280587
Project Title	Coastal Wildlife Conservation Initiative
Location Description	middle of project area - includes all coastal areas in watershed
Project Description	<p>The Coastal Wildlife Conservation Initiative is an FWC-led multi-agency strategy which aims to develop an integrated approach that focuses on wildlife and habitat needs as well as socio-economic issues, and includes participation by partners and input from stakeholders. The Initiative will address threats to coastal wildlife and habitats, while considering human interests and uses of Florida's coastal areas. The goal is a statewide, cooperative process to: protect coastal wildlife populations, conserve and manage coastal ecosystems, and achieve balance between conservation and opportunities for recreation, commercial activities, and responsible development. The CWCI will build a collaborative forum for local, state and federal government agencies, conservation groups, and coastal businesses to work together to address threats to coastal wildlife while still meeting their economic and public use goals. The structure, consisting of local working groups and a guiding team, will allow for "bought-in" solutions to current and emerging issues on both a local and statewide scale. To begin achieving these goals, the CWCI has used grant funding in the past for a coordinator to lead the external development of the CWCI, and two additional grants to address sea level rise and to coordinate the management of Critical Wildlife Areas. The Critical Wildlife Area program identifies and manages sites critical for congregating wildlife, primarily shorebirds, seabirds, and waterbirds, during all or part of their life cycle. The Florida Shorebird Alliance is a statewide program for monitoring and conserving shorebirds, currently staffed by 2 full time people. However, stewardship of important sites and outreach to the public and property owners (including for rooftop sites) is largely done by volunteers from partner organizations. All of these functions, including those handled in-house and by partners, will require greater support in order to expand them. Funds would be used to hire a coordinator for the working groups, pay for shorebird stewards and technicians, and to offset salaries for sea level rise and CWCI coordinators for work in the Perdido Bay area.</p>
Major Actions	Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Lack of adequate funding, Lack of communication among diverse stakeholders
Proposed Metric(s)	<ol style="list-style-type: none"> <li>1. Number of participating organizations in stakeholder and partner working groups</li> <li>2. Action items identified by partners and</li> <li>3. Increased monitoring and outreach at sites important for congregating wildlife, particularly shorebirds.</li> </ol>
Project Contact Name	Melissa Tucker
Project Cost	=<\$1 million

Project Map #	14
Latitude	30.298
Longitude	-87.446
Project Title	Land acquisition for recovery and management of Perdido Key Beach Mice, Escambia County, Florida
Location Description	Bounded by Perdido Key Drive (SR292) to the south, River Road to the northwest, and Semmes Road to the north
Project Description	<p>The goal of obtaining lands is to reconnect habitat fragmented by development and provide corridors between existing populations of PKBM. The primary benefit is preservation of secondary and high elevation scrub dunes. Scrub dunes provide year-round habitat for PKBM and serve as refugia during hurricanes. In the last 15 years, research showed the beach mice that survive storm surge in the scrub dunes become the founders of the new beach mouse population that eventually re-occupy the primary dunes inundated by the storm. The Perdido Key beach mouse (<i>Peromyscus polionotus trissyllepsis</i>) was federally listed as an endangered species in 1985 under the Endangered Species Act. Critical habitat was designated concurrently and revised in 2006. The PKBM is classified as a Spotlight Species by USFWS. The PKBM also is listed as an endangered species by the FWC (Rule 68A-27.003, FAC). Fragmentation, adverse alteration, and loss of habitat from coastal development are considered to be the primary factors for the subspecies' decline. The Perdido Key beach mouse is one of the most critically endangered mammals in North America with habitat loss the primary threat to its continued existence. This 23.5-acre acquisition is part of an overall plan to enhance long-term recovery of the PKBM population and within designated critical habitat for the PKBM. Beach mice inhabit coastal dune ecosystems on Perdido Key. Dune habitat is generally categorized as primary dunes (characterized by grasses), secondary dunes (characterized by grasses and small woody plants), and scrub dunes (dominated by larger woody plants). Beach mice occupy scrub dunes on a permanent basis and studies have found no detectable differences between scrub and frontal dunes in beach mouse body mass, home range size, dispersal, reproduction, survival, food quality, and burrow site availability. Scrub habitat provides a stable level of food resources, which is crucial when food is scarce in the primary/secondary dunes. The Recovery Plan for the Perdido Key beach mice identifies the primary recovery objectives and criteria for PKBM such as acquiring, protecting, and restoring dune habitat. Federal recovery objectives are to stabilize populations by preventing further habitat deterioration and re-establish PKBM where they are extirpated. Recovery criteria include a minimum of three distinct, self-sustaining populations in critical habitat areas and a minimum of 50 percent of the critical habitat must be protected and occupied by beach mice. Maximizing the number of independent populations is critical to species survival. To reduce the risk of extinction it is important to establish multiple protected populations across the landscape. This project accomplishes these actions. PROJECT PARTNERS Escambia County, FWC, and USFWS</p>
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.

Root Causes	Invasive species, Lack of adequate funding, Lack of environmental awareness
Proposed Metric(s)	<ul style="list-style-type: none"> <li>· Acres of priority habitat created, restored, managed, and/or protected = 23.46 acres</li> <li>· Threatened and Endangered species recovery = 12.5 acres critical habitat, 3 acres suitable habitat for Perdido Key beach mouse</li> <li>· Regional/County Comprehensive Plans = CON 1.1.6 Habitat Protection. Escambia County will coordinate with the FDEP, FWC, and other state or federal agencies so as to provide the fullest protection to marine or wildlife habitats that may be impacted by existing or proposed development within the County. CON 1.1.7 Public Land Acquisition. Escambia County will seek to acquire additional areas for habitat protection and connected greenways. Additionally, Escambia County has partnered with USFWS and FWC to develop a Programmatic Habitat Conservation Plan to address endangered species management on Perdido Key. The plan is pending final approval from USFWS.</li> <li>· Invasive Species Reduction = Escambia County actively manages invasive species on publically owned properties not limited to popcorn trees, cogon grass and beach vitex</li> <li>· % of priority habitat areas restored, managed, and/or protected = Acquisition of this parcel will conserve approximately 5% of designated Perdido Key beach mouse critical habitat</li> <li>· Federal Priorities and Objectives = FP1, FP3, FP4/FO1, FO3, FO4, FO5, FO6, FO7</li> <li>· State Priorities = S5</li> <li>· Cost = \$2,300,000</li> </ul>
Project Contact Name	Timothy Day
Project Cost	>\$1 million

Project Map #	15
Latitude	30.381944
Longitude	-87.435556
Project Title	Perdido Bay Seagrass Habitat Identification
Location Description	Perdido Basin
Project Description	<p>Seagrass have been identified in this watershed plan as being a high valued target for restoration. The health of this estuary is directly dependent on healthy seagrass habitats. Seagrass meadows provide many ecosystem services, and are one of the most productive habitats on the planet. The important ecological and economic functions of seagrass beds have been widely acknowledged, notably to their importance to fisheries (Bell and Pollard, 1989). The FDEP estimates that up to 90% of all commercial and recreational important marine species are dependent on seagrass habitat at some point in their lifespan. Many of the projects proposed for funding specifically address projects affecting seagrass. Decreasing storm water pollutants and sedimentation will increase water quality. Improvement in water clarity will in turn, increase available seagrass habitat much in the same way it has in Tampa Bay. In addition, educating boaters with signage will decrease the frequency of propeller scarring. However, few projects have addressed the need to restore large depressions to increase suitable seagrass habitat. These depressions may have been caused as a result of old dredging activities or large vessel groundings. Depressions caused from dredging cause a tremendous amount of damage to the waterbody. The depressions often act as nutrient sinks similar to storm water retention ponds. The lack of vegetation in the bottom of the depressions do not sequester the nutrients nor stabilize the muck substrate. Phytoplankton blooms can stimulate from the nutrient source, and hydrogen sulfides are released from the bacteria that break down the organics in the mucky substrate. Seagrasses are dependent on a high quantity of light to survive. Previously dredged sites create conditions that make seagrass recolonization impossible due to the water depth alone. However, after filling the feature back to grade, the site would make prime seagrass habitat. It is the intent of this project to identify multiple areas that were historically seagrass habitat which were subsequently dredged or heavily damaged. The sites would be ranked on their potential for seagrass restoration success and cost analysis. Included is an example of site that would greatly benefit if restoration occurred. The basin wide review would include detailed specifications for individual features identifying: 1. size of feature (volume and area)2. location in relation to a sediment source3. estimated cost for restoration4. expected species of emergent and submerged vegetation that could be sup. Works Cited Bell, J.D., Pollard, D.A., 1989. Ecology of fish assemblages and fisheries associated with seagrasses. In: Larkum, A.W.D., McComb, A.J., Sheperd, S.A. (Eds.), Biology of Seagrasses. A Treatise on the Biology of Seagrasses with Spatial Relevance to the Austrailian Region, Aquatic Plant Studies 2. Elsevier, Amsterdam, pp. 565-609.</p>

<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas.
<b>Root Causes</b>	Environmental changes / issues, Erosion, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands
<b>Proposed Metric(s)</b>	The project will be considered successful if potential seagrass habitats are identified, and evaluated for seagrass habitat.
<b>Project Contact Name</b>	Carter Henne
<b>Project Cost</b>	<\$100,000

<b>Project Map #</b>	16
<b>Latitude</b>	30.690749
<b>Longitude</b>	-87.440563
<b>Project Title</b>	Unpaved Roads Initiative
<b>Location Description</b>	unpaved road approach to a bridge crossing the perdido river.
<b>Project Description</b>	<p>Sedimentation is a leading nonpoint source pollutant and may be the primary contributor of stream turbidity. The U.S. Environmental Protection Agency (USEPA) identified suspended sediment as the most important source of water quality impairment and aquatic habitat degradation (USEPA, 1994). In 2002, a report from the National Water Quality Inventory suggested that 84,503 miles of U.S. rivers are impaired by sedimentation (USEPA, 2002). Road systems typically occupy a relatively small portion of the landscape. However, their combined effect on water quality and aquatic ecosystems pales in comparison. Of the multiple sources that generate stream-bound sediment, one of the most pervasive is the road-stream crossing. Generally, the most direct interaction of roads and aquatic systems occurs at their intersections (road-stream crossing) or near proximity (road-stream proximity) (USFWS, 2005). Direct connection between roads and streams can result in the delivery of sediment, alteration of natural surface and subsurface hydrology, and the risk of exposure to toxic chemical materials (USFWS, 2005). When hydrologic phenomena or anthropogenic activities result in substantial increases in suspended particle concentrations, many aquatic organisms exposed to such conditions may be adversely affected (Neumann et al., 1982). Hardening of road-stream crossings will minimize the amount of sediment entering the stream, thus improving in-stream habitats for both fish and wildlife. This site is a large unpaved road that goes into a bridge that crosses the Perdido River. There is immediate evidence of sediment erosion from storm run-off on the east side of the road. The west side of the river is paved but has a denuded land adjacent to the road that has contributed to sedimentation in the river. The east road approach will need to be hardened using geogrid and crusher material for at least 0.5 miles and the west side will need to be re-vegetated.</p>
<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce sedimentation.
<b>Root Causes</b>	Environmental changes / issues, Erosion, Ineffective or unused BMPs, regulations & development codes, Loss of vegetation, riparian buffers, and/or wetlands
<b>Proposed Metric(s)</b>	SRI and BANCS can be used before and after restoration activities to determine how much sediment has been reduced by restoration. Freshwater community assemblage monitoring can also be implemented to determine the impacts of reduced sedimentation to nearby and downstream populations.
<b>Project Contact Name</b>	Jessica Graham
<b>Project Cost</b>	=<\$1 million

Project Map #	17
Latitude	30.5221
Longitude	-87.4472
Project Title	Improving Water Quality and Wildlife Habitat in the Perdido River Watershed with Hilltop to Hilltop Paving
Location Description	Perdido River Watershed portion of the GCPEP Landscape in northwest Florida and south Alabama
Project Description	Erosion and the resulting sediment loading from dirt roads have a negative impact on water quality and aquatic system habitat in the Perdido Bay Watershed. The proposed project is to work with Federal, State, and Local Government agencies to identify and prioritize dirt roads with the greatest erosion and sediment runoff problems. Paving would then be carried out hilltop to hilltop following the priority list, thus occurring across multiple ownerships and counties in the watershed.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation.
Root Causes	Contamination, Erosion, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Paving of priority dirt roads hilltop to hilltop will improve water quality through reduction of erosion and sediment loading currently having a negative impact in the Perdido Bay Watershed. Project success will be measured by the percentage of critical dirt roads stabilized through paving.
Project Contact Name	Vernon Compton
Project Cost	>\$1 million

Project Map #	18
Latitude	30.524139
Longitude	-87.305981
Project Title	8 Mile Creek Regional Pond and Stream/Wetland Restoration
Location Description	The Latitude and Longitude represent the locations of the proposed regional pond access off Blue Jay Way (Phoenix Trail Subdivision) North of Detroit Blvd, South of and including Bush Street (dirt road), West of and including the North portion of Redwing Drive, and Northeast of Kingfisher Lane and Sparrow Lane (Pine Springs Estates). The project extends further to the South to a culvert crossing at Interstate Circle.
Project Description	The project starts with acquisition of ROW on Bush Street for dirt road paving and drainage improvements and a 17 acre vacant parcel downgradient for a regional stormwater pond and wetland restoration. The project includes dirt road paving sediment reduction, a stormwater management facility to improve water quality and flood control, wetland restoration/creation at the upper end of a tributary feeding 8- Mile Creek, and a culvert crossing upgrade further downgradient from the primary project area. Wetland restoration, management, and preservation are a key focus to improve the water quality, stream and wetland floodplain habitat, by stream/channel enhancements, floodplain expansion, and invasive exotic species eradication.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation.
Root Causes	Environmental changes / issues, Erosion, Ineffective stormwater systems, Invasive species, Lack of adequate funding, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Project attempts to decrease turbidity, nutrient loading, H2O sediment quantity, and economic impact of polluted water bodies. Project attempts to return loss uses, measured by acres of land protected, Treatment Volume, tons of sediment captured, % of critical stormwater infrastructure needing upgrades, and acreages of previously untreated stormwater receiving treatment. Project also attempts to restore natural resources measured by the % of wetland acreage created, restored, managed, and/or protected. Stream Condition Index may also be a tool to measure success.
Project Contact Name	Chris Curb
Project Cost	>\$1 million

Project Map #	19
Latitude	30.559556
Longitude	-87.317461
Project Title	11-Mile Creek Regional Pond and Drainage at W. Roberts Rd:
Location Description	The Latitude and Longitude represents the approximate East side location of one possible regional pond site on W. Roberts Road, currently owned by FDOT. Escambia County has requested FDOT surplus the pond site to the County for this project.
Project Description	The project starts with the transfer of a 10 acre parcel from FDOT to Escambia County (request already made) for a regional stormwater pond to provide water quality improvements and flood control for untreated stormwater that currently drain into 11-Mile Creek. The stormwater management facility will provide nutrient loading and sediment reduction, help reduce velocities and flood stages in 11- Mile Creek, currently causing stream erosion and flood damage to properties along the creek. A piped drainage conveyance system to eliminate open concrete channel and piped drainage system that currently discharge to 11-Mile Creek. ROW acquisition will also be necessary along W. Robert Road for the improved conveyance system.
Major Actions	Reduce nutrient loading, Reduce and treat stormwater, Reduce sedimentation.
Root Causes	Environmental changes / issues, Erosion, Ineffective or unused BMPs, regulations & development codes, Ineffective stormwater systems, Lack of adequate funding, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow
Proposed Metric(s)	Project attempts to decrease turbidity, nutrient loading, H <sub>2</sub> O sediment quantity, and economic impact of polluted water bodies. Project attempts to return loss uses, measured by acres of land protected, Treatment Volume, tons of sediment captured, % of critical stormwater infrastructure needing upgrades, and acreages of previously untreated stormwater receiving treatment. Project also attempts to restore natural resources measured by the % of wetland acreage created, restored, managed, and/or protected. Stream Condition Index may also be a tool to measure success.
Project Contact Name	Chris Curb
Project Cost	=<\$1 million

Project Map #	20
Latitude	30.549025
Longitude	-87304711
Project Title	10-Mile Creek Regional Pond, Drainage, and Stream/Wetland Restoration at Stefani Road
Location Description	The Latitude and Longitude represents the approximate location of 1 to 3 possible regional ponds or an impoundment of the upper end of 10-Mile Creek to reduce velocities in 10-Mile Creek which is suffering extensive erosion.
Project Description	The project starts with the acquisition of a 29 acre parcel of land that has the headwaters of 10-Mile Creek and a tributary from the North area of Green Hills Rd that merge on this property; additional property acquisition surrounding this parcel may also be necessary. The properties will be used for 1 to 3 possible regional ponds or an impoundment of the creek to provide water quality improvements for untreated stormwater, flood control that currently drain into 10-Mile Creek and ultimately 11-Mile Creek. The stormwater management facilities will provide nutrient loading and sediment reduction, help reduce velocities and flood stages in 11-Mile Creek, and reduce velocities and attenuate flowrates currently causing extensive stream erosion to 10-Mile Creek and flood damage to properties along the creek. Wetland restoration, management, and preservation are a key focus of this project to improve the water quality, stream and wetland floodplain habitat, by stream/channel enhancements, floodplain expansion, and invasive exotic species eradication. The project also includes drainage conveyance improvements along the contributing roadways to channel the drainage to the stormwater facilities, including Stefani Road, Green Hills Road, Ware Road, Cool Creek Road, Edendale Lane, 10-Mile Road, Midway Drive, Ashland Avenue, Pasadena Street and Carlton Road. Since the Escambia County Extension Center is located on Stefani Road, this project could be also promoted through outreach and public education.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Environmental changes / issues, Erosion, Ineffective or unused BMPs, regulations & development codes, Ineffective stormwater systems, Invasive species, Lack of adequate funding, Lack of communication among diverse stakeholders, Lack of environmental awareness, Limited economic diversity, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow
Proposed Metric(s)	Project attempts to decrease turbidity, nutrient loading, H2O sediment quantity, and economic impact of polluted water bodies. Project attempts to return loss uses, measured by acres of land protected, Treatment Volume, tons of sediment captured, % of critical stormwater infrastructure needing upgrades, and acreages of previously untreated stormwater receiving treatment. Project also attempts to restore natural resources measured by the % of wetland acreage created, restored, managed, and/or protected. Stream Condition Index may also be a tool to measure success.
Project Contact Name	Chris Curb
Project Cost	>\$1 million

Project Map #	21
Latitude	30.70413
Longitude	-86.8816
Project Title	Restoration of Gullies, Borrow Pits, and Bridge/Culvert Crossings Causing Water Quality Degradation in the Perdido Bay Watershed
Location Description	Perdido Bay Watershed portion of the GCPEP Landscape.
Project Description	Erosion from gullies, borrow pits, and problem bridges/culverts lead to very large sediment loads in the watershed and degrade both water quality and wildlife habitat. A priority list of project area will be developed through work with government agencies and non-profit and community organizations. Repair and restoration work will then be conducted either by agencies or contracted out.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce and treat stormwater., Reduce sedimentation.
Root Causes	Erosion, Lack of adequate funding, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Percent of priority gullies, borrow pits, and bridge/culvert crossings causing water quality and habitat degradation that are addressed. The Perdido Bay Watershed Management Plan indicates this metric will be developed by identifying the areas that need to be addressed and then measuring progress in terms of % of the total area addressed.
Project Contact Name	Vernon Compton
Project Cost	>\$1 million

Project Map #	22
Latitude	30.31078
Longitude	-87.444625
Project Title	Seagrass Restoration at Sunset Island
Location Description	Sunset Island is a relic spoil island in the ICW west of the Theo Baars Bridge and South of Innerarity Point
Project Description	The seagrass beds south of Sunset Island will be expanded to provide increased benthic vegetated habitat. In addition, water quality will be improved. Educational signage and snorkeling ecotourism will be provided. An offshore oyster reef breakwater will be constructed to provide additional habitat and protect the seagrass area from wave energy.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce sedimentation.
Root Causes	Atmospheric deposition, Lack of environmental awareness, Limited economic diversity, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Success will be measured in seagrass coverage improvement and water quality improvement
Project Contact Name	Chips Kirschenfeld
Project Cost	>\$1 million

Project Map #	23
Latitude	30.70413
Longitude	-86.8816
Project Title	Restoring Natural Communities in the Gulf Coastal Plain Ecosystem Partnership Landscape
Location Description	Perdido Bay Watershed portion of the GCPEP Landscape
Project Description	A major issue identified in the Perdido Bay Watershed was urban streams that have been degraded. Overall habitat restoration in these areas and the control of invasive species were identified as priority needs. A team of restoration experts working for The Longleaf Alliance, the Ecosystem Support Team, will work with public and private landowners to accomplish this important habitat restoration work in the watershed by identifying invasive species control priorities and conducting invasive species eradication.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
Root Causes	Environmental changes / issues, Invasive species, Lack of adequate funding, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Project attempts to return loss uses, measured by acres of land protected, reduce sediment from scour measures in linear footage of creek bed restored and the attempts to restore natural resources measured by the % of wetland acreage created, restored, managed, and/or protected. Stream Condition Index may also be a tool to measure success.
Project Contact Name	Vernon Compton
Project Cost	=<\$1 million

<b>Project Map #</b>	24
<b>Latitude</b>	30.541289
<b>Longitude</b>	-87.337722
<b>Project Title</b>	11- Mile Creek Flood Plain & Wetland Restoration @ CR297A-Bristol Park/Creek-Devine Farms Rd
<b>Location Description</b>	The Latitude and Longitude represents the approximate center point of where two creeks merge into one tributary. The project is located along the 11-Mile Creek from CR 297A to Interstate 10, adjacent to Bristol Park, Bristol Creek, and Ashbury Hills Subdivisions. In this area 11-Mile creek also has a tributary that drains from a channel crossing at Devine Farms Road.
<b>Project Description</b>	This project will include property and/or easement acquisition in combination with property recently escheated to the County to provide channel and stream restoration improvements, including flood plain restoration. The project will also include an increase in flood plain storage to offset the impacts of development that has encroached into the natural flood plain of 11-Mile Creek. Wetland restoration, management, and preservation are a key focus of this project to improve stream and wetland floodplain habitat, by stream/channel enhancements, floodplain expansion, flood plain storage, and invasive exotic species eradication. The other focus of this project is to reduce the flood stage in 11-Mile Creek that has flooded multiple property owners along the creek in this area, repetitively; most recently 120+ homes flooded in the April 29/30. The project also includes the acquisition and rehabilitation of two stormwater ponds that are no longer functional due to failure and lack of maintenance. Due to large number of property owners impacted by this project an educational and public input component will be necessary.
<b>Major Actions</b>	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation., Increase cooperation and coordination for monitoring, funding, implementation, outreach.
<b>Root Causes</b>	Environmental changes / issues, Erosion, Ineffective or unused BMPs, regulations & development codes, Ineffective stormwater systems, Invasive species, Lack of adequate funding, Lack of communication among diverse stakeholders, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands, Quantity and timing of freshwater flow
<b>Proposed Metric(s)</b>	Restoration of critical habitat within the Perdido Bay Watershed will be measured through tracking of acres of priority habitat created, restored, and/or managed and acres of invasive species controlled in forests and along degraded urban stream systems.
<b>Project Contact Name</b>	Chris Curb
<b>Project Cost</b>	>\$1 million

Project Map #	25
Latitude	30.42336389
Longitude	-87347
Project Title	Panhandle Watershed Alliance - Perdido
Location Description	Private coastal properties
Project Description	The NW FL Program, Rebuild Northwest Florida ( <a href="http://www.rebuildnwf.org/">http://www.rebuildnwf.org/</a> ) provides home fortification and a strengthening mitigation program which matches costs at a 3:1 ratio. This proactive program includes an energy audit through a federal program and considers a range of criteria. If the homeowner elects to implement the program, a FEMA Grant which covers 75% of the costs will be applied to homeowners share of 25% of the total costs. Could the communities along the Gulf Coast develop a similar grant funded program which would mitigate the continued stressors of nutrient loading and stormwater run-off? This shoreline softening program would serve to encourage coastal land owners to replace/remove hardened bulkheads and return the shoreline interface with emergent grasses? This approach could be developed into a large scale phyto-remediation effort correlated to a new restoration method (low impact) which would serve to mitigate two of the biggest threats to our Area Waters by reducing nutrient loading from upland sources (stormwater run-off) and capture sediments and organic material which would help address and off-set sedimentation and fouling efforts impacting the remnants of our grass beds.
Major Actions	Protect, restore, create and/or manage natural habitat and resources, and increase buffer areas., Reduce nutrient loading., Reduce and treat stormwater., Reduce sedimentation.
Root Causes	Contamination, Environmental changes / issues, Erosion, Lack of environmental awareness, Loss of vegetation, riparian buffers, and/or wetlands
Proposed Metric(s)	Shoreline stabilization will reduce sedimentation, take up stormwater, and attenuate erosion via flooding and boat wakes.
Project Contact Name	Barbara Albrecht
Project Cost	=<\$500,000

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