Committing To Our Future

Volume 2

Preliminary Action Plans for the Greater Charlotte Harbor Watershed

- *Peace River & Watershed*
- *Myakka River & Watershed*
- *Coastal Venice/Lemon Bay/Gasparilla Sound/Cape Haze*
- *Charlotte Harbor Proper*
- *Pine Island Sound/Matlacha Pass*
- *Estero Bay & Watershed*
- *Tidal Caloosahatchee River & Watershed*

November 1999

CHARLOTTE HARBOR National Estuary Program

Comments, *please!*

Thank you for reviewing this *Draft Comprehensive Conservation and Management Plan*. The Charlotte Harbor National Estuary Program would appreciate your written comments as we continue to evaluate harbor and watershed restoration strategies for the Greater Charlotte Harbor Watershed. To reply, simply remove this page and fax or mail to:

Charlotte Harbor National Estuary Program
4980 Bayline Drive, 4th Floor
N. Fort Myers, FL 33917-3909

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Fax: (941) 656-7724
Telephone: (941) 995-1777

Your name: _____
Address: _____
(with zip code) _____
Phone: _____

General Comments:

Specific comments on text or Action Plans may be noted in the margins of this document.

Specific questions:

Do you agree with the goals for harbor and watershed restoration presented in the "Introduction" chapter in Volume 1? What goals would you change or add?

Which specific actions do you consider the highest priority? (Indicate your top five choices using the assigned codes.)

What specific changes or additions would you recommend to accomplish harbor and watershed restoration goals?

How can we improve the format, readability, and design of this plan?

Thank you!

Committing To Our Future

Volume 2

Preliminary Action Plans for the Greater Charlotte Harbor Watershed

The Draft Action Plans and text in this document are provided for review by the Greater Charlotte Harbor Watershed community. *Committing To Our Future* was produced by the Charlotte Harbor National Estuary Program, and recommendations by reviewers will be considered for incorporation into the final plan, to be published and available to citizens in the summer of 2000. We welcome your comments and inquiries and encourage your use of the section titled "Comments, please" that appears at the beginning of the book.

November 1999

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Introduction

INTRODUCTION

Management programs have two phases: first, creating the management plan and second, conducting projects to implement the elements of the management plan. The *Comprehensive Conservation and Management Plan* for the Greater Charlotte Harbor Watershed is described in *Volume 1*. The plan outlines the goals and objectives for the region's natural resource management and identifies the priority actions that are needed. *Volume 1* also describes the monitoring and management programs that are necessary to measure implementation progress and to exchange technical information. The *early action demonstration projects* conducted to address immediate technical and educational demands are summarized and an education strategy is detailed. Finally, the first volume of this document credits the people and organizations who worked to make the plan a reality.

Our commitment to the *Comprehensive Conservation and Management Plan* will be reflected in the actions that are taken to improve, protect, and restore our natural resources. Implementation of the priority action requires many organizations to work together and to provide the staff, funding, and expertise for complex projects. This part, *Volume II*, describes the projects that are currently underway or are planned by the many area organizations who manage natural resources.

These preliminary implementation projects are diverse. Some projects focus on research and information collection. Others focus on public education or enforcement of existing laws. Many projects involve more than one organization and are examples of the partnerships that are essential to address complex issues and to finance efficient solutions.

The projects in this book are organized by regional category and then by the sponsoring organization. The four regional categories used to organize the preliminary implementation projects are:

- Regionwide;
- Caloosahatchee/Estero Basins;
- Lower Peace and Myakka Basins (including Lemon Bay and Venice); and,
- Upper Peace and Myakka Basins.

Within each regional category, each organization is listed in alphabetical order and their projects are grouped together. More than 40 organizations submitted descriptions that are included here as preliminary implementation projects. The project descriptions were written by the organizations who are planning or undertaking the project. Many of the organizations are municipal governments while others are regional, state, or federal agencies. Not-for-profit organizations also contributed projects that are important for monitoring, research, and education. All together, these projects are the first phase of the long-term implementation of the management plan that is needed.

Each project description contains the essential information about its strategy, funding, partners, and status. Some of the projects are already underway; others will be implemented if the appropriate staff and funds are authorized and the public supports its implementation. The organizations who have projects included in this volume provided them on a voluntary basis. The information was reviewed by the Charlotte Harbor NEP committee members who provided detailed comments and suggestions. The appearance of these final projects is owed to the many managers and reviewers who dedicated their time to this effort.

Despite the large number of projects included in this document, there is still more to be done. First, many of the projects described in the following sections do not have the funding, staff, and information they need be fully implemented. Therefore, we will need to work together to accomplish all of the planned projects. Additionally, there are portions of the *priority actions* described in *Volume 1* that are not fulfilled by any of these preliminary projects. Information collection, analysis, partnerships, and education initiatives are needed in addition to the projects described here. So, the *management conference*, citizens, private organizations, and public agencies must continue to identify staff and financial resources to implement the management plan.

At least once every two years we will measure our implementation progress for our *Comprehensive Conservation and Management Plan*. As the program proceeds, we will extend our technical and financial capacities to address the region's issues. We must show our commitment to the future by pursuing the implementation of these and many other projects to achieve the goals of the *Comprehensive Conservation and Management Plan*.

Regionwide

Preliminary Action Plans

Regionwide

Watershed Management Program Watershed Approach

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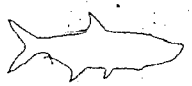
Quantifiable Objectives Addressed: WQ-2 & WQ-3

Priority Actions Addressed: WQ-C, WQ-D, WQ-O

Project Description: The Watershed Management Program in the Florida Department of Environmental Protection (FDEP), Division of Water Resource Management is developing a watershed management approach that integrates Division activities. This approach involves a five-year basin cycle that rotates through each of the states basins. Each cycle includes five phases. The five phases are: 1) preliminary basin assessment; 2) strategic monitoring; 3) data analysis and total maximum daily load (TMDL) development; 4) management action plan development; and 5) implementation. Under the watershed management program, basin assessments for the Peace River Basin, Myakka River Basin, Caloosahatchee River Basin, and the Charlotte Harbor areas would be prepared. These basin assessments will identify which waters are impaired. Please note that the rule describing how to determine if a water segment is impaired has not been written as of July 99. Then, in conjunction with the development of Pollutant Load Reduction Goals (PLRGs) for surface water improvement and management (SWIM) waters, TMDLs will be developed for the impaired waters. A TMDL is the Total Maximum Daily Load for the water segment - the largest amount of a substance that can be discharged into the water segment and the water segment still meet water quality standards.

Strategy for Implementation: Phase one will start with a compilation of all data available for the basin and a review of the data to determine if any of the waters in the basin are impaired. Data deficiencies or supplemental information needs identified in phase 1 will be addressed in phases 2 and 3. This will require coordination and cooperation among a number of local, state, and federal agencies. Total maximum daily load (TMDL) development in phase 3 will incorporate pollutant load reduction goals (PLRGs) and other basin efforts to determine point and non point sources (including air deposition) and their effect upon water quality. A variety of methods (including models) will be used to develop TMDLs that addresses each pollutant that prevents water quality standards from being met. In phase 4, the TMDL is then allocated between point sources, nonpoint sources, background, uncertainty and future uses. Recent legislation (Florida Statute 403.067) describes the responsibilities of the Florida Department of Environmental Protection (FDEP), water management districts (WMDs), and DACS in the implementation phase of TMDLs. As part of the rotating cycle, basins would be revisited every five years and it may require more than one cycle to complete all of the TMDLs in a given basin.

Responsible Partner and Project Coordinator: The Watershed Management Program at the Department of Environmental Protection (DEP) in Tallahassee is responsible for the basin assessments, TMDL development, and implementation. As of yet, a basin coordinator has not been named for any of the basins covered by the Charlotte Harbor program. Some useful contacts are Debby Scerno (813) 744-6100 ext. 489 (Program Representative for the Southwest District) and Daryll Joyner (850) 488-3603 (Program Administrator). Ecosystem Management contacts include Bruce Boler (941) 332-6975 in the South District.



Other Project Partners: Extensive cooperation with the Department of Environmental Protection's (DEP) South and Southwest Districts is anticipated along with incorporation of the South Florida and Southwest Florida Water Managements Districts' pollutant load reduction goals (PLRGs). Cooperation is also anticipated with the many stake holders in the Charlotte Harbor Watershed.

Geographic Area: Peace River Basin, Myakka River Basin, Caloosahatchee River Basin, and the Charlotte Harbor areas.

Expected Benefits and/or Drawbacks: Eventual improved water quality is the expected benefit. The drawback is that we cannot be certain by what year.

Project Timeline/Schedule: The Department's current total maximum daily load (TMDL) schedule calls for a five-year cycle for basin assessment, TMDL determination, and TMDL implementation. We expect to take two full cycles to develop TMDLs for a basin group, with the high priority waters being addressed in the first cycle and low priority waters addressed in the second cycle. TMDL development will begin in 2003, with the majority of development occurring between 2005 and 2011. Implementation will, of course, take longer but we plan to complete TMDL implementation plans by 2012. Some of the TMDLs may be done sooner as the Southwest Florida Water Management District (SWFWMD) is working on pollutant load reduction goals (PLRGs) for surface water improvement and management (SWIM) water bodies, which the Department may use for establishing TMDLs. It is likely that some additional effort will be required to convert PLRGS into TMDLs and will be project specific.

Status: The Watershed Management approach with a five year cycle for basin assessment has not been implemented at this time. Revisions to the statewide fixed status and trends station network funded by the Department was implemented in October 1998. As described earlier, the watershed approach represents an ongoing process of assessment, targeted studies, and implementation of strategies directed toward restoring and maintaining designated uses. In general, all of the actions associated with the water quality objectives are expected to assist the TMDL program to some extent. The majority of the problems that TMDLs will have to address are those of nonpoint source contributions to watersheds. Since many of the actions are related to reducing nonpoint source contributions (septic tanks, stormwater, atmospheric deposition, etc.), it is expected that these actions will assist the TMDL program. As a result of implementing management activities to address these actions, water quality improvement may be seen in impaired waters before TMDL development begins.

Resources/Funding
Available:
Needed:
Potential Funding and/or Collaboration Opportunities: Various federal and state funding sources provide money for watershed management activities.

Reference Documents: The web site www.ebase.dep.state.fl.us contains copies of the program documents on basin management.

Comments: In order to establish a load, information is needed on water quantity as well as water quality. Therefore it is likely that we will need to collect flow data where gaps occur (HA-B). In addition, groundwater and surface water interactions will need to be investigated (HA-C). Although most total maximum daily loads (TMDLs) will be concerned with how much of a substance can be discharged, some may be related to hydrologic alterations and thus relate to HA-A and/or HA-F.

Actions associated with education of the public (WQ-B, WQ-I, and WQ-L) are also an interest of the TMDL program, as the public can make a big difference in their own yards (as well as in the community as a whole) in reducing pollutant loadings.

Team Permitting – Net Ecosystem Benefit Planning and Permitting Process

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Quantifiable Objectives Addressed: HA-2, HA-3, FW-1, FW-2, FW-4

Priority Actions Addressed: HA-D, HA-F, FW-S, FW-T

Project Description: Pursuant to Section 403.075(1), Florida Statutes, the legislature has provided for a voluntary ecosystem management process which includes the coordination of the planning activities of state and other governmental units, land management, environmental permitting and regulatory programs, and voluntary programs, together with the needs of the business community, private landowners and the public, as partners in a streamlined and effective program for the protection of the environment.

As part of the team permitting request, a permittee is required to provide "net ecosystem benefits" which are environmental outcomes that are better than that which would have been achieved in the traditional permitting process.

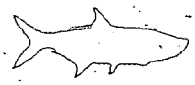
Strategy for Implementation: The Team Permitting/Net Ecosystem Benefit voluntary process will be publicized and advocated for use by large scale development projects involving large acreages, and are generally multi-jurisdictional and multi-disciplinary in nature. Applicants, agencies and representatives of the public will work to refine a list of "Net Ecosystem Benefits" to be implemented, which will offset environmental impacts in the watershed. Currently, efforts are underway to identify environmental conditions within the watershed where potential impacts could be offset by implementation of this program.

Refined Net Ecosystem Benefits will be examined throughout the permitting process and decisions will be made and incorporated into legally implementable documents such as permits, development orders, conservation easements, or agreements. Opportunities for Net Ecosystem Benefit include, but are not limited to:

- A holistic focus on ecosystem-wide impacts and benefits;
- Establishment and long-term protection of greenways, the Integrated Habitat Network of reestablished and protected wildlife corridors and riparian systems;
- Restoration of upland habitat and connections; and
- Restoration of historic water flow and hydrology in the Peace River system.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection

Other Project Partners: Other State agencies, water management districts, regional planning councils, local governments, environmental organizations, federal agencies, the development community, private citizens and landowners.



Geographic Area: The entire Charlotte Harbor watershed.

Expected Benefits and/or Drawbacks: Projects developed with the Team Permitting – Net Ecosystem Benefit program will substantially contribute toward the achievement of NEP goals and objectives. Permitting of the projects should minimize and remediate long term impacts in a more creative, effective manner than standard permitting criteria.

Project Timeline/Schedule: As needed for particular projects.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed: Program staff.
Potential: This is an inclusive planning and permitting process that is particularly effective at involving the public, local units, and state and regional agencies early in the project planning process so that the project can be design in a more environmentally appropriate manner, rather than simply permitted and mitigated.

Reference Documents: Section 403.0752, Florida Statutes.

Comments:

Florida Greenways and Trails Program

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Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-S, FW-U

Project Description: The Office of Greenways and Trails (OGT) is charged with creating a statewide system of greenways and trails with recreational connections between urban and rural areas and ecological linkages between state and national parks, forests and other protected areas, and rivers and wetland systems.

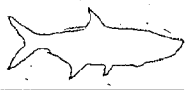
Strategy and Implementation: In September of 1998, the Florida Greenways and Trails Coordinating Council adopted a five year plan for creating a statewide system of greenways and trails, entitled *Connecting Florida's Communities with Greenways and Trails (Plan).* As part of the Florida Forever Legislation, the 1999 Legislature authorized the Department of Environmental Protection to carry out the recommendations in the Plan. Office of Greenways and Trails (OGT) has a land acquisition program, a trail development grant program, a program for designating greenways and trails into the statewide system, and provides technical assistance to government agencies and non-profit organizations.

Responsible Partner and Project Coordinator: Department of Environmental Protection, Office of Greenways and Trails.

Other Project Partners: Federal, State, and Local Government Agencies, Water Management Districts, Environmental/Conservation Organizations, Greenways and Trails Support Organizations, Civic Organizations, Private Landowners, Recreational User Groups.

Geographic Area: Statewide.

Expected Benefits and/or Drawbacks: A statewide system of interconnected greenways and trails can protect critical ecological functions and native biological diversity, conserve historic and cultural resources, protect working landscapes, and provide outstanding recreational opportunities.



Project Timeline/Schedule: The Greenways and Trails Program is ongoing. Rules governing the land acquisition program and the designation program are expected to be adopted by November, 1999. Proposals for land acquisition will be accepted for a 60 day period each year. The dates are yet to be determined. Proposals for designating lands into the statewide system will be accepted any time after the program begins, which is expected to be by the end of 1999. Rules for the Recreational Trails Program (RTP) are in the process of being developed. Applications for RTP funding will be accepted for a day period each year. The dates are yet to be determined.

Status: Ongoing.

Resources/Funding
Available: The Greenways and Trails acquisition program receives approximately $4.5 million annually. The program is funded by bonds issued from the sale of documentary stamps authorized under the Florida Forever Act. The Recreational Trails Program receives approximately $1.5 million per year through Transportation Equity Act for the 21st Century.
Needed:
Potential:

Reference Documents: Five Year Implementation Plan, entitled *Connecting Florida's Communities with Greenways and Trails; Florida Forever* Act; Chapter 260, Florida Statutes; Rule 62S-1, Florida Administrative Code.

Comments: There has already been a discussion about a conservation land corridor from 10,000 Islands to Tampa Bay.

Fisheries Habitat Conservation Program

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Quantifiable Objectives Addressed: HA-3, HA-4, FW-1, FW-2, FW-3, FW-4

Priority Actions Addressed: HA-M, FW-A, FW-C, FW-L, FW-P, FW-Q, FW-R

Project Description: The National Marine Fisheries Service (NMFS) Southeast Region Habitat Conservation Division provides technical advise and recommendations to Federal and state agencies and private individuals concerning expected impacts of water development activities upon marine and estuarine fisheries' habitat.

Strategy for Implementation: We primarily are involved with the wetland regulatory and civil works programs of the U.S. Army Corps of Engineers. Our assessment and reporting authority is provided by the Clean Water Act, Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). In 1996, amendments to the MSFCMA required that the NMFS describe and identify "essential fish habitat" (EFH) for species managed under Federal fishery management plans. Federal agencies are required to consult with NMFS when any activity proposed to be permitted, funded, or undertaken by a Federal agency may have adverse impacts on designated EFH. The NMFS will provide EFH Conservation Recommendations to the Federal action agency. The NMFS is also required to provide EFH Conservation Recommendations to state agencies when NMFS receives information about a state activity that would adversely affect EFH.

Responsible Partner and Project Coordinator: Gulf of Mexico Fishery Management Council (Wayne Swingle)

Other Project Partners: U.S. Army Corps of Engineers, Jacksonville District, Regulatory Division; Environmental Protection Agency; U.S. Fish & Wildlife Service.

Geographic Area: Coastal United States from North Carolina to Florida and Puerto Rico and the U.S. Virgin Islands. Includes the Greater Charlotte Harbor Watershed.

Expected Benefits and/or Drawbacks: Conservation and enhancement of fishery habitat by ensuring compliance with applicable laws and incorporation of appropriate avoidance, minimization and mitigation of habitat losses and degradation resulting from proposed alterations and modifications authorized, constructed, or funded by Federal agencies are expected to contribute to the Hydrologic Alterations, Water Quality, and Fish and Wildlife Habitat goals of the Charlotte Harbor National Estuary Program (NEP).

Project Timeline/Schedule: The Habitat Conservation Program is an on-going program of the National Marine Fisheries Service, Southeast Region. Interim final rules which specify the procedures for implementation of the Essential Fish Habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) were published in the Federal Register on December 19, 1997. Essential Fish Habitat Consultation provisions of the MSFCMA became effective in early 1999.

Status: On-going.

Resources/Funding

Available: Staff of the National Marine Fisheries Service, Southeast Region Habitat Conservation Division staff currently consists of 17 biologists and 8.5 support personnel located in Beaufort, NC; Charleston, SC; Panama City, FL; Miami, FL; Baton Rouge, LA; Galveston, TX and the Regional Office located in St. Petersburg, Florida. A staff Fishery Biologist, located in St. Petersburg, Florida, is responsible for reviewing activities undertaken, permitted, authorized, or funded by Federal agencies and recommending measures for avoiding, mitigating, or offsetting the impact of the activity on living marine resources and Essential Fish Habitat in 30 counties of Florida including the greater Charlotte Harbor area. The Region Habitat Conservation Division operates on a budget of approximately $1.4 million. Direct labor and benefits consume most of these funds, and the rest is in contracts, travel, rents, utilities, supplies, etc. There is little discretionary money available.

Needed: This staffing level is essentially the same as when the program was initiated in the early 1970s. Any additional resources/funding, as they became available, would likely be spread across the Region Habitat Conservation Division's organization.

Potential: National Marine Fisheries Service Restoration Center's Community Based Restoration Program provides funding ($20-40K per project per year) to support habitat restoration at the local or community level.

Reference Documents: Gulf of Mexico Fishery Management Council, 1998. Public hearing draft generic amendment for addressing Essential Fish Habitat requirements in the following fishery management plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, United States Waters; Red Drum Fishery of the Gulf of Mexico; Reef Fish Fishery of the Gulf of Mexico; Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic; Stone Crab Fishery of the Gulf of Mexico; Spiny Lobster in the Gulf of Mexico and South Atlantic; Coral and Coral Reefs of the Gulf of Mexico (includes environmental assessment). Gulf of Mexico Fishery Management Council: Tampa, FL.

Essential Fish Habitat Rules: http:www.nmfs.gov; Gulf of Mexico Essential Fish Habitat: http://galveston.ssp.nmfs; National Marine Fisheries Service, Southeast Region: http://caldera.sero.nmfs.gov.

Comments:

Conservation Financial Assistance

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Quantifiable Objectives Addressed: HA-2,WQ-6

Priority Actions Addressed: HA-D, WQ-E, WQ-N

Project Description: The Natural Resources Conservation Service (NRCS) provides financial assistance to farmers and ranchers through a variety of conservation programs. The Environmental Quality Incentives Program focuses its assistance on locally identified conservation priority areas where agricultural improvements will help meet water quality improvement goals. The Wetlands Reserve Program provides money to purchase conservation easements and restore wetlands that have been damaged for agricultural production. The Wildlife Habitat Incentive Program provides cost sharing assistance to help landowners improve wildlife habitat on private lands.

Strategy for Implementation: The Natural Resources Conservation Service (NRCS) utilizes its network of county level field offices to administer these programs. Technical and administrative supervision are provided by the State Office in Gainesville. Field offices utilize a variety of outreach methods, including meetings, mailings and workshops to provide information about the program to potential participants.

Responsible Partner and Project Coordinator: Niles Glasgow, State Conservationist, P.O. Box 141510, Gainesville, FL 32614.

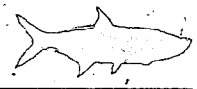
Other Project Partners: Local Soil and Water Conservation Districts, Florida Department of Agriculture and Consumer Services, farmers and ranchers.

Geographic Area: Statewide.

Expected Benefits and/ or Drawbacks: This action will encourage efficient use of water and will help restore groundwater to historic seasonal levels where it has been lowered by excessive pumping for irrigation. This action will also install best management practices (BMPs), which will reduce non point source pollution by nutrients and sediments from agricultural fields.

Project Timeline/Schedule: Each individual office develops a schedule annually prioritizing and scheduling their activities for the year.

Status: Ongoing.



Resources/Funding
Available: For the past several years approximately $500,000 annually has been available for Conservation Financial Assistance in the Charlotte Harbor NEP study area.

Needed: Based upon workload analyses conducted by the individual field offices, there is a need for approximately double the current funding.
Potential: There appears to be some potential for increased funding associated with special projects or programs.

Reference Documents: Natural Resources Conservation Service (NRCS) Florida Business Plan.

Comments: See "Technical Assistance" project description.

Conservation Technical Assistance

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Quantifiable Objectives Addressed: HA-2,WQ-6

Priority Actions Addressed: HA-D, WQ-E, WQ-N

Project Description: The Natural Resources Conservation Service (NRCS) provides technical assistance to farmers and ranchers through county level field offices. These field offices plan and install Best Management Practices (BMPs) on cropland, grazing land and groveland. The BMPs ensure proper utilization of nutrients, irrigation water and forage. This reduces runoff of sediments and excess nutrients to water bodies, reduces overpumping of groundwater and surface water and helps maintain the environmental quality of grazing lands.

Strategy for Implementation: Natural Resources Conservation Service (NRCS) utilizes a number of technical disciplines to accomplish its mission. Resource soil scientists provide site specific soil interpretation for land users and managers. Range scientists work with ranchers to fine tune their grazing plans in order to maximize production while protecting water quality and wildlife habitat. Mobile irrigation laboratories conduct detailed evaluations of irrigation systems in order to optimize water utilization and minimize water runoff. Soil conservationists work with farmers to develop conservation plans, which ensure proper utilization of nutrients

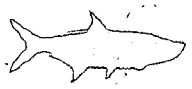
Responsible Partner and Project Coordinator: T. Niles Glasgow, State Conservationist, P.O. Box 141510, Gainesville, FL 32614.

Other Project Partners: Local Soil and Water Conservation Districts, Florida Department of Agriculture and Consumer Services, farmers and ranchers.

Geographic Area: Statewide. Approximately 15 staff years devoted to the Charlotte Harbor NEP study area.

Expected Benefits and/ or Drawbacks: This action will encourage efficient use of water and will help restore groundwater to historic seasonal levels where it has been lowered by excessive pumping for irrigation. This action will also install Best Management Practices (BMPs), which will reduce non point source pollution by nutrients and sediments from agricultural fields.

Project Timeline/Schedule: Each individual office develops a schedule annually prioritizing and scheduling their activities for the year.



Status: Ongoing.

Resources/Funding
Available: Approximately $900,000 has been available for Conservation Technical Assistance for the past several years.
Needed: Based upon workload analyses conducted by the individual field offices, there is a need for approximately double the current funding.
Potential: There appears to be some potential for increased funding associated with special projects or programs.

Reference Documents: Natural Resources Conservation Service (NRCS) Florida Business Plan.

Comments: See "Financial Assistance" project description.

Fish and Wildlife Habitat Improvements and Programs

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Quantifiable Objectives Addressed: FW-2, FW-3, FW-4

Priority Actions Addressed: FW-B, FW-C, FW-O, FW-P, FW-Q, FW-R, FW-T, FW-V

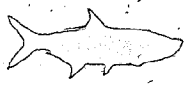
Project Description: Modify hardened shorelines to improve fish and wildlife habitat; restore disturbed areas and eliminate invasive exotic vegetation; terminate new and existing channels in deep water to protect seagrasses; enhance fish and wildlife habitat along canals where vertical seawalls are in place; ensure uniform compliance and enforcement of environmental regulations and permitting criteria; promote programs to improve the quality and quantity of fish and shellfish resources; improve public awareness of habitat and wildlife issues; and, identify and map oyster bars in the Charlotte Harbor study area.

Strategy for Implementation: The Corps will continue to encourage the use of softened shorelines whenever possible. The Corps will encourage permittees to use artificial means to provide a source for fish and wildlife where softened shorelines are not possible. The Corps will continue to strive to ensure uniform compliance and enforcement of environmental regulations and permitting criteria. The Corps will work with other state and local agencies to promote the development and enhancement of programs to improve the quality and quantity of fish and shellfish resources. The Corps supports the development and implementation of programs to improve public awareness of habitat and wildlife issues. The Corps will work with other State and Federal agencies and within its guiding rules, regulations and laws. The Corps will provide assistance whenever possible, but must emphasize that its role in accomplishing the identification of oyster bars is secondary to other organizations, such as the National Marine Fisheries Service and the Fish and Wildlife Service. The Corps will work with other Federal, State and local agencies to encourage the use of softened shorelines. The Corps will also work with private citizens who wish to revert from a hardened shoreline to a softened shoreline to increase or provide fish and wildlife habitat.

Responsible Partner and Project Coordinator: Corps Environmental Restoration - George Strain, (904) 232-3833; Corps Regulatory Division - Dr. John Hall, (904) 232-1666.

Other Project Partners: Florida Fish & Wildlife Conservation Commission; Florida Department of Environmental Protection; National Marine Fisheries Service; U.S. Fish and Wildlife Service; Water Management Districts; counties.

Geographic Area: Entire Charlotte Harbor National Estuary Program study area.



Expected Benefits and/or Drawbacks: Implementation of these goals will greatly improve the fish and wildlife habitat in the Charlotte Harbor area as well as making the public more aware of habitat considerations when requesting permits to install boat docks and seawalls, or to cut and trim vegetation along the shoreline.

Project Timeline/Schedule: Varies and is an on-going function of the Corps' regulatory program.

Status: In progress, planned, and ongoing.

Resources/Funding
Available: Funds come from annual Federal appropriations.
Needed:
Potential:

Reference Documents: River and Harbor Act of 1899, as amended; www.saj.usace.army.mil; Water Resources Development Act of 1996.

Comments:

Clean Water Act Section 320 National Estuary Program

Contact Person: Bob Howard
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FAX Number: (404) 562-9343
E-mail Address: howard.bob@epa.gov

Quantifiable Objectives Addressed: HA, WQ, FW

Priority Actions Addressed: HA-A, HA-B, HA-C, HA-D, HA-E, HA-F, HA-G, HA-H, HA-I, HA-J, HA-K, HA-L, HA-M, HA-O, HA-P, HA-Q, WQ-A, WQ-B, WQ-C, WQ-D, WQ-E, WQ-F, WQ-G, WQ-H, WQ-I, WQ-J, WQ-K, WQ-L, WQ-M, WQ-N, WQ-O, WQ-P, WQ-Q, FW-A, FW-B, FW-C, FW-D, FW-E, FW-F, FW-G, FW-H, FW-I, FW-J, FW-K, FW-L, FW-M, FW-N, FW-O, FW-P, FW-Q, FW-R, FW-S, FW-T, FW-U, FW-V

Project Description: The U.S. Environmental Protection Agency (EPA) provides broad support for the development and implementation of the *Comprehensive Conservation and Management Plans* (CCMPs) for the National Estuary Programs (NEP) through Section 320 of the Clean Water Act. This support is both financial and technical. EPA will continue to support the NEP consistent with the CCMP and NEP guidelines.

Strategy for Implementation: Environmental Protection Agency (EPA) will continue financial support of the Charlotte Harbor National Estuary Program, technical assistance to the Charlotte Harbor NEP, and advocacy for the program and CCMP within and outside the EPA.

Responsible Partner and Project Coordinator: Southwest Florida Regional Planning Council, Wayne E. Daltry, Executive Director.

Other Project Partners: Southwest Florida Water Management District, Department of Environmental Protection, local governments, and other NEP program contributors.

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: The Clean Water Act (CWA) section 320 program funding will provide resources to manage the implementation of the CCMP. Major funding for implementation of specific action plans will rest with other responsible parties.

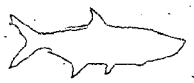
Project Timeline/Schedule: Ongoing, annual appropriations.

Status: The draft *Comprehensive Conservation and Management Plan* (CCMP) is projected to be completed by the end of calendar year 1999.

Resources/Funding
Available: Federal share to date: $1,781, 500; FY 1999 funding ~ $550,000; Future funding ~ $300,000/ year for CCMP implementation.
Needed:
Potential: 25% cash or in kind local match.

Reference Documents: Numerous Environmental Protection Agency (EPA) and other publications regarding the program are available.

Comments:



Water Quality Modeling and Total Maximum Daily Load Development

Contact Person: Jim Greenfield
Title:
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Mailing Address: 61 Forsyth St. SW, Atlanta GA 30303
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E-mail Address: Greenfield.jim@epa.gov

Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: WQ-C

Project Description: The State of Florida, with the assistance of the Environmental Protection Agency (EPA), performs water quality modeling and develops total maximum daily loads (TMDLs) for the Clean Water Act (CWA) 303(d) listed waters.

Strategy for Implementation: The Environmental Protection Agency (EPA) will work with the State of Florida to complete water quality modeling and development of total maximum daily loads (TMDLs) for the National Estuary Program (NEP) area watersheds. The EPA will give consideration for priority attention to NEP area waters.

Responsible Partner and Project Coordinator: State of Florida, Department of Environmental Protection.

Other Project Partners:

Geographic Area: NEP-wide with emphasis on CWA 303(d) listed waters.

Expected Benefits and/or Drawbacks: Completion of modeling and development of total maximum daily loads (TMDLs) will allow development and issuance of non-point source discharge elimination system (NPDES) permits and development and implementation of non-point source control plans sufficient to attain and maintain area water quality standards. Timeframes are tight and technical resources to perform the work are limited.

Project Timeline/Schedule: Ongoing, annual appropriations.

Status: The State and Environmental Protection Agency (EPA) are currently working with the NEP office regarding modeling and total maximum daily load (TMDL) development.

Resources/Funding
Available: EPA funding.
Needed:
Potential:

Reference Documents: Numerous Environmental Protection Agency (EPA) publications regarding the program are available.

Comments:

Wetlands Regulatory Program

Contact Person: Haynes Johnson
Title: Life Scientist
Agency/Organization: U.S. Environmental Protection Agency
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FAX Number: (404) 562-9343
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Quantifiable Objectives Addressed: FW-1, FW-2, FW-3

Priority Actions Addressed: FW-B, FW-C, FW-D, FW-E, FW-F, FW-G, FW-H, FW-I, FW-J, FW-K, FW-M, FW-O, FW-P, FW-Q

Project Description: The Environmental Protection Agency (EPA) overviews state, Department of Environmental Protection (DEP) and the Southwest Florida Water Management District (SWFWMD), and federal, Army Corps of Engineers (ACOE), wetlands programs. EPA provides financial assistance for wetlands related projects. EPA supports advanced identification of wetlands unsuitable for filling.

Strategy for Implementation: Priority support for wetland activities in the NEP program area is provided. Screening for projects of significant impact to the Aquatic Resources of National Importance. Secondary and cumulative impacts are considered as well as direct impacts. Impacts in excess of three acres are assessed using currently accepted quasi-quantifiable methodology (WRAP).

Responsible Partner and Project Coordinator: Army Corps of Engineers (ACOE), Joe Bachelor, Team Leader, (813) 840-2908.

Other Project Partners: United States Fish and Wildlife Service (USFWS), Natural Resource Conservation Service (NRCS), National Marine Fisheries Service (NMFS), Department of Environmental Protection (DEP), and the Southwest Florida Water Management District (SWFWMD).

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: The program ameliorates impacts to wetlands in the basin. Heavy workload and limited support resources are a drawback.

Project Timeline/Schedule: Ongoing.

Status: Department of Environmental Protection (DEP) Ecosystem Management Approach to phosphate mining in the Peace River Basin and opening dead-end residential canals are ongoing interagency efforts in this basin.

Resources/Funding
Available: EPA funding.
Needed:
Potential:

Reference Documents: Regulatory authority from the Clean Water Act, Section 404. See Outreach Specialist, Gail Williams-Harrison, (404) 562-9410.

Comments:

Nonpoint Source Program

Contact Person: Drew Kendall
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E-mail Address: kendall.drew@epa.gov

Quantifiable Objectives Addressed: HA-3, HA-4, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: HA-F, HA-L, HA-M, HA-Q, WQ-B, WQ-E, WQ-F, WQ-H, WQ-I, WQ-N, WQ-Q

Project Description: The Environmental Protection Agency (EPA) provides grant funds to the Florida Department of Environmental Protection (FDEP) to support the State program addressing nonpoint sources of pollution. The State uses such funds to support internal program operations and to provide a source of funds for on the ground nonpoint source control projects as well as other nonpoint source program activities. EPA provides program guidance and technical direction as appropriate.

Strategy for Implementation: The Environmental Protection Agency (EPA) continued support of the State 319 program, EPA technical assistance to the Charlotte Harbor NEP for preparing nonpoint source project proposals for funding consideration by the Florida Department of Environmental Protection (FDEP) and EPA advocacy for nonpoint source control projects identified as part of the NEP *Comprehensive Conservation and Management Plan.*

Responsible Partner and Project Coordinator: State of Florida, Department of Environmental Protection, Eric Livingston, State 319 Nonpoint Source Coordinator, (850) 921-9915.

Other Project Partners: Southwest Florida Water Management District, U.S. Department of Agriculture, U.S. Natural Resources Conservation Service, U.S. Forest Service, Florida Cooperative Extension Service, local governments, non-profit organizations, stormwater utilities, among others.

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: Section 319 program is a source of funds and expertise to address nonpoint pollution sources. Insufficient resources to meet State priority needs. Lack of Charlotte Harbor watersheds being identified as Unified Watershed Assessment high priorities.

Project Timeline/Schedule: Ongoing, annual appropriations.

Status: No specific projects proposed for Charlotte Harbor NEP study area for FY 1999 Section 319 funds. Statewide Florida Yards & Neighborhoods program is proposed to continue to receive funding.

Resources/Funding
Available: $7.8 million.
Needed: Unknown.
Potential: 40% cash or in-kind local match.

References: Section 319, Clean Water Act. Numerous Environmental Protection Agency (EPA), Florida Department of Environmental Protections (DEP) and other publications regarding the program are available.

Comments:

Coastal Nonpoint Program

Contact Person: Bob Howard
Title: EPA CZARA 6217 Program Manager
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4, WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: HA-A, HA-F, HA-M, HA-O, HA-P, HA-Q, WQ-B, WQ-E, WQ-F, WQ-H, WQ-I, WQ-J, WQ-N, WQ-Q

Project Description: The National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) jointly manage the Coastal Zone Act Reauthorization Amendments (CZARA), 6217 Coastal Nonpoint Program. This program requires States to develop and implement programs that provide enforceable mechanisms and policies to assure nonpoint source control management practices are implemented in the coastal zone. EPA and NOAA perform program reviews and approvals and provide guidance and technical direction as appropriate.

Strategy for Implementation: The National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) will work with the State of Florida Nonpoint Source Program to attain full approval of the State 6217 program. NOAA and EPA will perform periodic reviews of the program to assure program objectives are met. EPA will work to assure coordination between the 6217 program and the NEP.

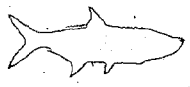
Responsible Partner and Project: State of Florida, Department of Environmental Protection, Eric Livingston, State 319 Nonpoint Source Coordinator, (850) 921-9915.

Other Project Partners: The National Oceanic and Atmospheric Administration (NOAA), Office of Coastal Resource Management, Ed Kruse, Manager, Southern and Caribbean Region.

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: the Coastal Zone Act Reauthorization Amendments (CZARA), Section 6217 provides the impetus for establishing enforceable mechanisms and policies for coastal nonpoint source controls. There is limited direct funding related to 6217 with major funding anticipated through Clean Water Act (CWA) 319 funds. The Charlotte Harbor NEP area has limited priority for 319 funding through the Unified Watershed Assessment process.

Project Timeline/Schedule: Ongoing, annual appropriations.



Status: The State 6217 program has been conditionally approved with efforts underway to get full approval.

Resources/Funding
Available: Changes from year to year.
Needed: Unknown
Potential: 25% cash or in kind local match.

Reference Documents: Numerous National Oceanic and Atmospheric Administration (NOAA) and Environmental Protection Agency (EPA) publications regarding the program are available.

Comments:

Water Quality Standards Program Overview

Contact Person: Fritz Wagener
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Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-N

Project Description: Water quality standards provide the basis for assuring uses of waters of the U. S. are protected. States develop and adopt such standards. The Environmental Protection Agency (EPA) performs a review of the State of Florida water quality standards and assists the State in establishing standards and use classifications sufficient to meet national and state water quality objectives. Where State standards or use classifications are insufficient to meet federal program requirements and the State fails to make necessary corrections, EPA establishes such standards or classifications. Efforts related to nutrients will be highlighted in the future.

Strategy for Implementation: Environmental Protection Agency (EPA) will work with the State of Florida to review water quality standards and use designations on a triennial basis.

Responsible Partner and Project Coordinator: State of Florida, Department of Environmental Protection, Nancy Turner, (850)921-9436, turner_n@dep.state.fl.us.

Other Project Partners:

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: Establishment of water quality standards and use designations is fundamental to the state and federal programs for protection of water quality.

Project Timeline/Schedule: Ongoing, triennial reviews.

Status: Current triennial review expected to be completed in 2000.

Resources/Funding
Available:
Needed: Unknown.
Potential:

Reference Documents: Numerous EPA publications regarding the program are available.

Comments:

National Pollutant Discharge Elimination System (NPDES) Permit Program

Contact Person: Roosevelt Childress
Title: Chief, Surface Water Permits Section
Agency/Organization: U. S. Environmental Protection Agency
Mailing Address: 61 Forsyth St. SW, Atlanta GA 30303
Telephone Number: (404)562-9279
FAX Number: (404)562-8692
E-mail Address: Childress.roosevelt@epa.gov

Quantifiable Objectives Addressed: WQ-3, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: WQ-N

Project Description: The National Pollutant Discharge Elimination Program (NPDES) is the primary program to control point sources water discharges. The State of Florida issues permits to all dischargers. The Environmental Protection Agency (EPA) overviews the State of Florida NPDES permit program. This overview involves a review of all major NPDES permits prior to issuance and an annual review of the overall State program including compliance activities. This annual review results in a written evaluation of the program.

Strategy for Implementation: The Environmental Protection Agency (EPA) will work with the State of Florida to review the State's National Pollutant Discharge Elimination Program (NPDES) major permits and permit compliance actions in the NEP area. Special attention will be given to reviewing NPDES permit actions and State program implementation for the NEP study area.

Responsible Partner and Project Coordinator: State of Florida, Department of Environmental Protection, Dr. Abdul Ahmadi.

Other Project Partners:

Geographic Area: NEP-wide.

Expected Benefits and/or Drawbacks: Issuance of and compliance with quality National Pollutant Discharge Elimination Program (NPDES) permits is the principal mechanism to assure water quality standards are maintained related to point source dischargers.

Project Timeline/Schedule: On-going, annual review.

Status: In progress, ongoing.

Resources/Funding
Available:
Needed: Unknown.
Potential:

Reference Documents: Numerous Environmental Protection Agency (EPA) publications regarding the program are available.

Comments:

Investigation of Atmospheric Deposition of Nutrients

Contact Person: John Ackermann
Title: Environmental Scientist
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Mailing Address: 61 Forsyth St. SW, Atlanta GA 30303
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FAX Number: (404)562-9019
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Quantifiable Objectives Addressed: WQ-1, WQ-2

Priority Actions Addressed: WQ-D

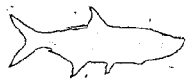
Project Description: The Environmental Protection Agency (EPA) provides grant funds to the Charlotte Harbor NEP to help support the quantitative monitoring and modeling of multimedia (air and water) aspects of pollution which can have adverse impacts on the ecological systems of Charlotte Harbor Bays and Sounds. Studies at other estuaries, including Tampa Bay, Florida, have shown that atmospheric deposition of nitrogen compounds can contribute a significant part of the loading of nutrients to the watershed and to the estuarine water bodies. Nutrient loading can contribute to degradation of water quality through eutrophication, which can lead to excessive algal growth and other subsequent impacts on the aquatic ecosystems. Charlotte Harbor NEP develops and submits a workplan that is reviewed and approved by EPA prior to the award of funds. EPA provides program guidance and technical direction as appropriate.

Strategy for Implementation: Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration's (NOAA's) technical guidance to the Charlotte Harbor NEP will promote the use of up-to-date quantitative methods, so that results can be compared to studies in other estuaries. Oxides of nitrogen, plus ammonia and related compounds, will be monitored for wet deposition and for dry deposition estimations. Careful siting of monitors, in-kind contribution to frequent sample collection with controlled techniques, and analyses coordinated with national laboratories will contribute to the validity of the data obtained. The results are needed as part of the information to develop management strategies, such as non-point source control projects, as part of the NEP *Comprehensive Conservation and Management Plan.*

Responsible Partner and Project Coordinator: Charlotte Harbor National Estuary Program, David R. Moldal, Environmental Administrator/Planner, (941) 995-1777.

Other Project Partners: EPA's Great Waters program, National Oceanic and Atmospheric Administration's (NOAA's) Air Resources Lab, Lee County, and other local governments, among others.

Geographic Area: Monitoring site in Lee County, modeling and analysis will be applicable NEP-wide.



Expected Benefits and/or Drawbacks: Evaluation of local aspects of air emissions which contribute to nutrient loading can be utilized in Charlotte Harbor NEP planning. That part of nutrient loading which comes from long-distance transport will benefit from regional efforts to reduce atmospheric emissions of nitrogen compounds.

Project Timeline/Schedule: Intensive sampling for one year beginning in summer, 1999 is funded; a second year of intensive work, and then ongoing but less intense monitoring are desirable, depending upon available funds.

Status: Funding was provided to establish the site and obtain quantitative monitoring equipment and for one year of frequent sampling and associated chemical analyses. The site and equipment are expected to be operational in mid-summer, 1999. Specific projects in atmospheric deposition have not yet been proposed for Charlotte Harbor NEP study area for FY 2000 and beyond. The site is being set up so that it may continue, if funded, as part of an ongoing national network that monitors atmospheric deposition.

Resources/Funding Available: $100,000.
Needed: Unknown.
Potential: In-kind local contribution.

Reference Documents: EPA's publications—"*Deposition of Air Pollutants to the Great Waters, First Report to Congress*", May 1994, and "*Second Report To Congress*", June, 1997, (Third Report is expected in summer, 1999). Guidance/protocol documents for the National Atmospheric Deposition Program (NADP) and the Atmospheric Integrated Research Monitoring Network (AIRMoN).

Comments:

Waterway Management for the West Coast Inland Navigation District

Contact Person: Chuck Listowski
Title: Executive Director
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Quantifiable Objectives Addressed: FW-1, FW-2, FW-3, FW-4

Priority Actions Addressed: FW-A, FW-D, FW-E, FW-F, FW-G, FW-H, FW-J, FW-L, FW-O, FW-Q, FW-T

Project Description: The West Coast Inland Navigation District is empowered and authorized to undertake programs intended to alleviate problems associated with its waterways including, but not limited to:

- Acting as a local sponsor for any project designated as a "Section 107, River and Harbor Act of 1960" project authorized by the U.S. Army Corps of Engineers;
- Sponsor and provide assistance and support to member counties and local governments in planning and carrying out beach renourishment and inlet management projects;
- Aid and cooperate with federal, state, regional and local governments in planning and carrying out public navigation, regional anchorage management, public recreation, inlet management, public education and boating safety projects related to the waterway;
- Enter into cooperative agreements with federal, state, regional and local governments to pay part of the costs of acquisition, planning, development, construction, operation and maintenance of such projects; and
- Enter into *ecosystem management agreements* with the Florida Department of Environmental Protection.

Florida's coasts have been transformed over the past two decades as population growth and unprecedented demand for individual shore access to bays and estuaries have led to the creation of residential canal developments. Thousands of miles of channels and basins have been dredged as a by-product of this urbanization process. These navigable waterways are being stressed by boat traffic and canal-side activities. Southwest Florida's boating population is increasing at twice the State's rate of change and the region's coastal population is experiencing double the national growth rate. Resource managers, scientists and informed users agree that a holistic, placed based region-wide system is needed to deal with waterway problems associated with channel maintenance, habitat restoration, traffic and signage and boat maintenance. Such a system can ensure safe, environmentally sustainable waterways for the boating public. Implementation of this system provides continued opportunity to demonstrate the feasibility of non-regulatory approach to waterway management on a regional basis.

Strategy for Implementation: The overall goal of this management initiative is to preserve the ecological and recreational values of Southwest Florida waterways. Achieving success requires the following:

- Fitting channel maintenance to boat draft and use requirements;
- Minimizing impacts on surrounding bay habitats;
- Prioritizing and evaluating management alternatives on a regional basis;
- Developing maintenance standards for secondary/arterial waterways;
- Developing map and other information products for boaters and shore residents to encourage environmental awareness and stewardship by users of the neighborhood waters and boat access channels;
- Providing waterway communities and boating organizations with information and technical support to enable them to take an active role in managing their waterways;
- Providing and maintaining appropriate channel marking where needed;
- Sponsoring and providing assistance and support to member counties and local governments in planning and carrying out beach renourishment and inlet management projects; and
- Aiding and cooperating with federal, state, regional and local governments in planning and carrying out public navigation, regional anchorage management, public recreation, inlet management, public education and boating safety projects related to the waterway.

Responsible Partner and Project Coordinator: West Coast Inland Navigation District, Chuck Listowski, Executive Director.

Other Project Partners: U.S. Fish and Wildlife Service; U.S. Army Corps of Engineers; U.S. Environmental Protection Agency; Florida Department of Environmental Protection; Florida Fish and Wildlife Conservation Commission; South Florida Water Management District; Southwest Florida Water Management District; Southwest Florida Regional Planning Council; and Manatee County, Sarasota County, Charlotte County, Lee County and local municipalities within these counties.

Geographic Area: Manatee, Sarasota, Charlotte, and Lee Counties.

Expected Benefits and/or Drawbacks: To preserve the ecological and recreational values of southwest Florida waterways.

Project Timeline/Schedule: On-going.

Status: On-going.

Resources/Funding
Available: $1,515,351 for 1999, included in property tax millage yearly.
Needed:
Potential Funding and/or Collaboration Opportunities: Not known at this time.

Reference Documents: "*A Regional Waterway Systems Management Strategy For Southwest Florida*", Gusatavo A. Antonini and Paul Box, Florida Sea Grant College Program; Section 374, Florida Statutes.

Comments:

Caloosahatchee River and Estero Bay Watersheds

Preliminary Action Plans

Pine Island Watershed Natural Resource Assessment Geographic Information System (GIS)

Contact Person: Peter Ordway
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E-mail Address: pordway1@coconet.com

Quantifiable Objectives Addressed: WQ-6, FW-1, FW-3, FW-4

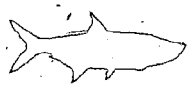
Priority Actions Addressed: WQ-B, WQ-C, WQ-D, WQ-F, FW-A, FW-C, FW-H, FW-S, FW-T, FW-U

Project Description: Survey and observation data, as well as other information, will be entered into the existing Pine Island Geographic Information System (GIS). This will be used to achieve the objectives and priority actions listed above, and as described in the strategy section below. Analysis of GIS coverages will, among other things, indicate the location of mosquito ditches with respect to environmentally sensitive wetlands. This will allow the Calusa Land Trust and other cooperating environmental groups to identify the mosquito ditches necessary to be removed, in order to restore natural flow. GIS can also be used to identify areas of possible exotic vegetation, however, ground-truthing is required before a definite management plan is developed for removal of the exotics.

Strategy for implementation: 1) Following a survey of the Pine Island watershed by Calusa Land Trust volunteers and consultation with the Aquatic Preserve staff, observed potential sources of surface and ground water pollution will be entered as a theme into the existing Pine Island Geographic Information System (GIS).

2) Using data from the U.S Fish and Wildlife Service (USFWS), the Florida Aquatic Preserve staff, the Florida Audubon Society and observations of Calusa Land Trust volunteers, active rookeries on Pine Island and the smaller islands surrounding Pine Island will be entered as a theme in the Pine Island GIS.

3) The most recent aerial photographs available for Pine Island and Little Pine Island will be analyzed by a trained ecologist and mapped using the Florida Land Use/Cover Classification System, (FLUCCS). The resulting habitat and land use polygons will then be digitized and made into an Arcview shape file. Volunteers from the Calusa Land Trust will be given training, and used to ground-truth the accuracy of the habitat polygons created from aerial photographs.



4) Once a current land use map has been placed in the Pine Island Natural Resource GIS, a review will be used to determine the acreage and types of agricultural land and the proximity to the waters of the Charlotte Harbor Estuary. State and county agricultural sources will be consulted to provide an approximation of the nutrient, herbicide and pesticide loading for the acreage under cultivation. The GIS will also be used to determine the extent and population density of the residential canals on Pine Island served by older septic systems that may be producing non-point source contamination of the estuary. Consulting soil scientists and aquatic biologists will be asked to determine whether water quality monitoring is feasible or advisable. If monitoring is deemed necessary, the Pine Island portion of the Charlotte Harbor National Estuary Program (NEP) - sponsored Department of Environmental Protection (DEP) Volunteer Water Quality Monitoring program will be expanded to use the already trained Calusa Land Trust volunteers to collect water samples on a schedule and at locations devised by the aforementioned technical experts. Water samples will be analyzed, and the results of the testing made a part of the Pine Island GIS, as well as being reported to the appropriate state and county agencies.

5) Other private and public entities currently involved in active land preservation activities in the Pine Island portion of the Charlotte Harbor Estuary will be consulted about what GIS coverages or themes they have which could be made available for inclusion in a Pine Island Natural Resource GIS. They will also be asked to suggest other themes/coverages that they would like to see developed and included. Input from these organizations will be used to expand the database of the GIS. (See section on Other Project Partners for the other entities.)

6) The Natural Resources GIS will be made available to the public on the Internet, either as a part of the Calusa Land Trust web site or as a separate web site dedicated to the NEP.

7) The Natural Resources GIS could be expanded to the central and northern portions of the estuary should utility and interest warrant.

Responsible Partners and Project Coordinator:

Other Project Partners: Potential - U.S. Fish and Wildlife Service, Florida Marine Research Institute (FMRI), South Florida Water Management District, Charlotte Harbor Aquatic and State Buffer Preserves, Cayo Costa State Park, Southwest Florida Regional Planning Council (RPC), Lee County Department of Parks and Recreation, Sanibel-Captiva Conservation Foundation, The Conservancy of Southwest Florida.

Geographic Area: Pine Island, south Charlotte Harbor, Matlacha Pass, San Carlos Bay, Pine Island Sound.

Expected benefits and/or drawbacks: Using existing coverages of protected lands in the Pine Island region, a current land use/land cover overlay will allow quantification of the acreage of specific natural habitats that are already protected. By showing the location of targeted natural habitats not yet protected, organizations involved in acquisition of environmentally threatened lands will have a guide for prioritizing future acquisitions based on relative scarcity of threatened natural habitats. The organizations then will be better able to make long-term land protection goals based on knowledge of specific habitat locations. The habitat mapping will allow land stewardship planning to aid in location and in eventual removal of exotic vegetation and replanting with native species. Information about extent and location of mosquito ditches will be useful in future planning of hydraulic alteration to restore historical seasonal water flow.

Analysis of the acreage of cultivated land and the proximity to the Charlotte Harbor Estuary along with estimates of possible contaminate loading and soils information will help technical experts to decide where a program of water quality monitoring might be desirable. An analysis of the extent and population of the residential canals not served by a central wastewater facility will provide necessary data upon which to make a decision about monitoring the bacterial contamination at the outflow points of the canals into the Charlotte Harbor Estuary.

In 1988 ecologist Kevin Erwin completed a habitat mapping of the coastal Lee County in which he tabulated the acreage of some 35 habitats in each of the sections in the study area that include the lands of Pine Island and Little Pine Island. While never digitized, the tabular listing of the acreage of each habitat will allow a comparison of land cover change that has taken place over the past twelve years.

The availability of geographically oriented environmental information about Charlotte Harbor available on the internet will provide a source for public information and can help raise the awareness of the public to the fragile nature of the estuarine ecosystem.

Project Timeline/Schedule: Parts of the project needing only volunteers for implementation are underway (watershed survey, location of rookeries, updating current Geographic Information System [GIS] themes).

Status: The Calusa Land Trust has been working on a Pine Island Geographic Information System (GIS) for several years. Through purchase and donation some 1,500 acres of environmentally sensitive land have been acquired, which are managed through a stewardship program that involves exotic removal and planting native species in their place. Public information and education activities include a newsletter, nature trail and canoe trail field trips, and the design of an internet site, which will be aimed at increasing public awareness of the natural region in which we live, is in process. The Calusa Land Trust is a 501 (c) (3) private non-profit organization. We have over 700 members and rely on their interest and generosity for support of acquisition and stewardship goals.

Resources/Funding

Available: Geographic Information System (GIS) coverage of the preserved lands in the region, as well as a lot of other information supplied by the Florida Marine Research Institute. Arc Info and Arcview software, a digitizing table and a Trimble Global Positioning System mapping system. Thirty volunteers, half of whom have trained in monitoring water quality.

Needed: The Calusa Land Trust has no paid staff. There is a need to hire consultants to perform various phases of the project. The most important first step will be to have the aerial photographs mapped into land cover/land use polygons and digitized into an Arcview shapefile. In the water monitoring stage of the project, consultants will be needed to develop a monitoring design. Funds for analysis of the collected water samples will be needed unless a project partner can be found who would be willing to do it. Consultation and training in GIS design and implementation hopefully will be provided by the Southwest Florida Regional Planning Council's GIS department.

Potential:

Reference Documents: *Lee County Coastal Study: A Report to the Lee County, Florida* Department of Community Development by Kevin L. Erwin, *et. al.* The two-volume study was published in 1988. The Coastal Study contains a vast amount of detail about the state of the Lee County portion of the Charlotte Harbor Estuary. *The Nature Lover's Guide to Pine Island* produced by the Calusa Land Trust in November 1998.

Comments: In 1998 the Southwest Florida Regional Planning Council hosted a daylong meeting on the subject of Land Acquisition for Conservation. All of the Federal, State, County and private groups who are involved in the subject were invited and over 40 attended. The stated purpose of the meeting was to ensure that all the participating groups would be aware of what others were doing, and thus not be competing for the same land parcels. A representative of each group reported on the group's current achievements, and a compilation was to have been distributed.

Stormwater Utility Program (SWUP)/Utility Expansion Plan (UEP)

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Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-E/WQ-M, WQ-F, WQ-G, WQ-N

Project Description: In 1990, the City of Cape Coral implemented a Stormwater Utility Program. Monies from this fund were to be used to improve canal dredging, stormwater pipe repair and replacement, swale and catch basin repair and replacement, water quality monitoring and public education. Capital improvement projects funded included drainage systems in the downtown area, along Santa Barbara Boulevard, and the Viscaya Industrial Area.

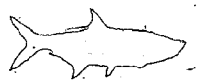
Construction activities (i.e. erosion control, best management practices) have been monitored by city staff due to the vast number of canals within the City. Cape Coral implemented the Utility Expansion Plan (phasing in sanitary sewer) in 1993, and is continuing this program as the city increases in population.

In October 1997, the City (along with Lee County and other municipalities) began the first year of their federal National Pollutant Discharge Elimination System (NPDES) Permit. The City had already been performing the majority of the required tasks. The City of Cape Coral has realized that due to the extensive canal system, water and stormwater quality issues are paramount to maintaining quality of life for residents both within the city and subsequently those downstream.

Strategy for Implementation: WQ-B: Both the Stormwater and Environmental Resources Divisions (ERD) provide speakers for civic organizations and a variety of brochures related to best management practices and citizen impacts on water quality. Articles for citizen newsletters and local papers are also distributed. The ERD has a "CanalWatch" volunteer group that helps to monitor surface water quality and has constructed the "Lake Kennedy Alternatives" as a demonstration project for alternatives to seawalls on freshwater canals.

WQ-E/WQ-M: As mentioned above, all capital improvement projects have improved drainage in both flow rates and water quality discharged to U.S. waters. Construction activities are monitored and erosion control is required and enforced.

WQ-F, WQ-G: Septic systems are being phased out as population in areas reaches 40% of the buildout population. The majority of the southeastern section of the City has had sanitary sewer installed, and the next expansion phase is currently underway.



WQ-N: As the City of Cape Coral is primarily residential, citizen education is paramount in reducing non-point source runoff. This is accomplished as stated in WQ-B. Other reductions will occur with improved development practices, and continued work by our stormwater personnel.

Responsible Partner and Project Coordinator: Connie Jarvis, City of Cape Coral, Environmental Resource Manager.

Other Project Partners: N/A.

Geographic Area: The City of Cape Coral (incorporated area).

Expected Benefits and/or Drawbacks: Improvement/maintenance of water quality as population increases.

Project Timeline/Schedule:

Status: This program is currently in progress.

Resources/Funding
Available: Funding for this project is the Stormwater Utility Fund and the Utility Assessment Program.
Needed: N/A.
Potential:

Reference Documents:

Comments:

Cape Coral Dual Water System

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Title: Environmental Resources Manager
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Cape Coral, FL 33915-0027
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Quantifiable Objectives Addressed: HA-2, WQ-3

Priority Actions Addressed: HA-D, HA-E, WQ-P

Project Description: In 1992, the City of Cape Coral implemented the Dual Water System Project. Water from the water reclamation facilities would be treated and utilized as irrigation water. The freshwater canal system would be utilized to supplement this in times of higher demand.

Strategy for Implementation: The irrigation system was initially put in areas with sanitary sewer already provided. Subsequently, the dual water system has been installed in conjunction with the Sewer Expansion Project.

Responsible Partner and Project Coordinator: David Waldie, City of Cape Coral, Utilities Director.

Other Project Partners: N/A.

Geographic Area: The City of Cape Coral (incorporated area).

Expected Benefits and/or Drawbacks: Utilization of reclaimed water and decreased irrigation costs to residents. The drawback is that citizens will continue to use turf grasses instead of native planting/xeriscaping practices.

Project Timeline/Schedule:

Status: This program is currently in progress.

Resources/Funding
Available: Funding for this project is paid for by affected residents using the Utility Assessment Program.
Needed: N/A.
Potential:

Reference Documents:

Comments:

Storm Water Management Program (SWMP) / Surface Water Management Master Plan (SWMMP)

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Title: Environmental Resources Manager
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Fort Myers, FL 33902-2217
Telephone Number: (941) 332-6851
FAX Number: (941) 332-6604
E-mail Address: None

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-E , WQ-G, WQ-N, WQ-Q

Project Description: From 1978 through 1983, the U.S. EPA funded a series of studies and projects collectively known as the Nationwide Urban Runoff Program (NURP). The data collected during the NURP study showed that storm water sometimes contained very high quantities of conventional and toxic pollutants. As a result of these and other studies the EPA promulgated the "stormwater application rule" and the "stormwater implementation rule" in 1992. These rules would set in place the National Pollutant Discharge Elimination System (NPDES) permitting program for municipalities over 100,000 in population.

The City of Fort Myers has created and is implementing a Storm Water Management Program (SWMP) to comply with the federal regulations in the spirit of contributing to the betterment of the Nation's waters. The goal of reducing pollutants in the city's storm water discharge to the Greater Charlotte Harbor Watershed is to be achieved through education and regulation, inspections, proper maintenance of the drainage system and municipal facilities, monitoring, basin master planning and capital improvement projects. The SWMP is a "living" document that will evolve over time as ongoing monitoring data is analyzed and best professional judgement dictate modifications to better achieve the ultimate goal of pollution reduction in the city's storm water runoff.

Strategy for Implementation: WQ-B: The City has a public education program for schools, senior citizens and other citizen groups. Using a graphic interactive presentation this program demonstrates how non-point sources of pollution such as waste oil, pesticides, fertilizers and other pollutants are carried in storm water runoff to surface water bodies. This program demonstrates and promotes the use of best management practices in residential, agricultural and industrial applications.

The Storm Water Division Inspection program disseminates information on National Pollutant Discharge Elimination System (NPDES) non-point source regulations and requirements. Environmental Protection Agency (EPA) literature, names and phone numbers, web page addresses and other pertinent information on NPDES are made available to appropriate personnel at inspected facilities. Cases are also referred to the Lee County Small Quantity Generator Pollution Prevention Program.

The City participated in a Pollution Prevention Conference (in January 1999) hosted by Lee County's Department of Natural Resources. The City manned a booth that featured non-point source pollution prevention and recycling information. The City also presented two seminars (at that conference) on NPDES non-point source regulation requirements for the industrial sector. The City will participate in future conferences.

Storm Water Division staff members have attended the Department of Environmental Protection (DEP) sponsored course on Storm Water Erosion and Sediment Control. Information and materials obtained in that course is being used in-house to train pertinent staff on that subject. The City in partnership with Lee County held a workshop for developers, contractors, design engineers etc. on June 22, 1999. Other workshops will be scheduled periodically in the future.

Articles about recycling and proper waste disposal periodically appear in the City's newspaper "Fort Myers Today". The Public Works department coordinates with Lee County's Solid Waste Division to advertise the household hazardous waste collection days by posting signs in the City owned buildings and printing announcements in the City's newspaper.

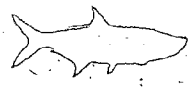
WQ-E: The City of Fort Myers is currently replacing the drainage system on West First Street adjacent to the Caloosahatchee River. Another drainage improvement project (of Winkler Canal) is due to start in October of 1999. Both projects have incorporated structural Best Management Practices (BMPs) for pollutant removal from storm water runoff to the maximum extent practicable in their design and meet the approval of South Florida Water Management District (SFWMD).

The City of Fort Myers Comprehensive Plan contains policies regarding storm water management. Storm water runoff is regulated through the Growth Management Codes, which include SFWMD rules and regulations. The City, through these land development regulations, regulates all new development, requiring that post-development runoff not exceed pre-development runoff.

The City of Fort Myers Surface Water Management Master Plan (SWMMP) will guide future surface water improvement projects. The plan outlines suggested capital improvement projects designed to improve drainage and/or drainage systems throughout the City. Projects will be prioritized in order of the most critical drainage needs, health and safety considerations as well as water quality improvements. All plans will included structural BMPs to the maximum extent practical and comply with SFWMD requirements for approval.

WQ-G: The City of Fort Myers Public Works Department has hired a consulting firm to conduct a study to identify areas within the City not presently served by central sanitary sewers. The study is estimated to take approximately 200 days. Upon completion of this study, the City will proceed with strategies to address areas without sanitary sewers.

The City is in Phase II of a five-phase program to replace the oldest of the City's wastewater collection and transmission systems. Phase III of that program is due to begin in the later part of 1999. Each project is scheduled to last fifteen months.



WQ-N: The City's Stormwater Management Plan actively addresses the following issues:

- Minimize the adverse impact of storm water runoff draining to the Caloosahatchee River Estuary, by reducing non-point sources of pollution within the City of Fort Myers;
- Proper maintenance of city's drainage system;
- Storm water pollution prevention practices at municipal facilities;
- Storm water management incorporated in development planning procedures;
- Spill response;
- Field Screening of storm sewer system;
- Public reporting/Illicit discharges and connections investigations/Enforcement;
- Reduction of the use of pesticides, herbicides, and fertilizers;
- Proper disposal of waste oil and hazardous waste;
- Address sanitary sewer seepage;
- Industrial facilities inspections;
- Construction planning and inspections;
- Education and public awareness; and
- Monitoring activities.

WQ-Q: Storm Water Division staff members inspect Marinas and any other industrial facilities discharging storm water to federal waters and/or the city's drainage system. Inspections are geared to ensure compliance with EPA NPDES regulations, State of Florida Surface Water Quality Standards and the City's Stormwater Management Ordinance.

Responsible Partner and Project Coordinator: Robert Tewis, City of Ft. Myers, Environmental Resource Manager.

Other Project Partners: N/A.

Geographic Area: The City of Fort Myers (incorporated area).

Expected Benefits and/or Drawbacks: The Storm Water Management Program over time will significantly reduce non-point sources of pollution in storm water runoff discharging to the Caloosahatchee River Estuary. The reduction of non-point source pollutants will contribute to preserving and improving the surface water quality of this estuary. The City of Fort Myers considers this estuary a most valued resource for both it's citizens and for attracting visitors to this community.

Project Timeline/Schedule: The West First Street Drainage Improvement Project is in progress and due to be completed in the summer of the year 2000. The Winkler Drainage Improvement Project is due to start during the fall of 1999 and completed in the fall of 2000. The study to identify and provide central sewer service to un-served areas in the City is in progress and due to be complete in the spring of 2000. Phase II Sewer Main Replacement project is in progress and projected to be complete in August 2000. Phase III is due to start fall of 1999 and scheduled to last fifteen months. The Storm Water Management Program has been implemented and will continue indefinitely.

Status: This program is currently in progress.

Resources/Funding
Available: Funding for this project is currently being drawn from the City's General Fund.
Needed: N/A.
Potential: The City is currently conducting a "Study For Storm Water Utility Implementation". If a Storm Water Utility is established (as a result of this study) it will provide a funding source for the Storm Water Division to continued implemention of the City's Storm Water Management Plan (SWMP) and for capital improvement projects of the Surface Water Management Master Plan (SWMMP). Establishing a Storm Water Utility is crucial for providing funds to continue this program as it currently exists and to expand to the full scope of the SWMP.

Reference Documents:

Comments:

Sanibel Island Surface Water Management Plan

Contact Person: Robert K. Loflin, Ph.D.
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FAX Number: (941) 472-3065
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Quantifiable Objectives Addressed: HA-2, HA-3, HA-4, FW-4

Priority Actions Addressed: HA-C, FW-A

Project Description: This project involves partnerships with the Sanibel-Captiva Conservation Foundation (SCCF), the J.N. "Ding" Darling National Wildlife Refuge, and private property owners in wetland subdivisions on Sanibel Island. This project involves restoring the historically present hydroperiod in the freshwater interior wetlands of Sanibel through the construction of a weir at Tarpon Bay.

Strategy for Implementation: The weir was constructed in 1996 and the strict weir control policy limits opening of gates to real flood conditions, not just the presence of standing water in yards of wetland subdivisions within the basin. This new weir raised the control elevation of these wetlands from 2.5' to 3.2' providing more inundation during wet periods and a higher quality wildlife habitat. The higher water levels coupled with Brazilian-pepper (*Schinus terebinthifolius*) removal is restoring the area along the Sanibel River to the historically present open savannah-like marsh.

Responsible Partner and Project Coordinator: Robert K. Loflin, Ph.D.

Other Project Partners: The Sanibel-Captiva Conservation Foundation (SCCF), U.S. Fish and Wildlife Service (USFWS), all private property owners on the west end of Sanibel.

Geographic Area: Sanibel Island.

Expected Benefits and/or Drawbacks: Restoration of wildlife habitat and a functioning, rare freshwater barrier island ecosystem.

Project Timeline/Schedule: Start: circa 1992; Completion: ongoing water management program.

Status: In progress.

Resources/Funding
Available: Local assistance from the South Florida Water Management District (SFWMD).
Needed:
Potential:

Reference Documents:

Comments: Careful, ongoing management and adherence to the weir control policy requires continued public and City Council support to be successful.

Eradication of Melaleuca and Brazilian Pepper From Sanibel Island

Contact Person: Robert K. Loflin, Ph.D.
Title: Natural Resources Director
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Telephone Number: (941) 472-3700
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Quantifiable Objectives Addressed: WQ-1, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: The project involves partnerships with the Sanibel-Captiva Conservation Foundation (SCCF), the J.N. "Ding" Darling National Wildlife Refuge and all private property owners on Sanibel Island. This project involves the removal of the noxious exotic pest trees Brazilian-pepper (*Schinus terebinthifolius*) and Melaleuca (*Melaleuca quinquenervia*) and the re-establishment of native vegetation island-wide.

Strategy for Implementation: Involves a zone-by-zone removal of Brazilian-pepper utilizing city funds and incentives to private property owners leading to mandatory removal regulations in each zone. Melaleuca is already mandatory for removal island-wide and is under maintenance control.

Responsible Partner and Project Coordinator: Robert K. Loflin, Ph.D.

Other Project Partners: The Sanibel-Captiva Conservation Foundation (SCCF), U.S. Fish and Wildlife Service (USFWS), all private property owners on Sanibel.

Geographic Area: Sanibel Island.

Expected Benefits and/or Drawbacks: Restoration of wildlife habitat and a functioning rare, freshwater barrier island ecosystem.

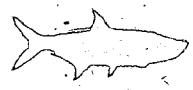
Project Timeline/Schedule: Start: circa 1980; Completion: 2010 (goal).

Status: 25% complete.

Resources/Funding
Available: Local assistance from Tourist Bed Tax funds for beach parks.
Needed: Approximately $600,000 to complete.
Potential:

Reference Documents:

Comments: This is a very large (11,000+ acres), multi-year project requiring continued public and City Council support to be successful.



Environmental Restoration of Approximately 1600 Acres of Conservation Lands Along the Sanibel River Corridor

Contact Person: Robert K. Loflin, Ph.D.
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Mailing Address: 800 Dunlop Rd., Sanibel, FL 33957
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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: Involves partnerships with the Sanibel-Captiva Conservation Foundation (SCCF), the J.N. "Ding" Darling National Wildlife Refuge, and several State and Federal environmental restoration grant programs on conservation lands consisting primarily of freshwater wetlands with long narrow upland ridges lying parallel to the Sanibel River on Sanibel Island. This project involves removal of old fill road ditches and near monocultures of the noxious exotic pest tree Brazilian-pepper (*Schinus terebinthifolius*) and the re-establishment through management utilizing prescribed fire and natural recruitment of the historically present savannah-like freshwater marsh system dominated by saltmarsh cordgrass (*Spartina bakeri*), giant leather fern (*Acrostichum danaeifolium*), sawgrass (*Cladium jamaicense*), and cabbage palm (*Sabal palmetto*) with numerous species of tropical hardwood hammock vegetation on the higher ridges. Old oxbows and meanders along the river are to be restored and straight-dredged channels recontoured.

Strategy for Implementation: The project is approximately two-thirds of the way complete with additional need for $2 million in grant monies to complete. The project will only be successful with continual monitoring, maintenance, and active management.

Responsible Partner and Project Coordinator: Robert K. Loflin, Ph.D.

Other Project Partners: The Sanibel-Captiva Conservation Foundation (SCCF), U.S. Fish and Wildlife Service (USFWS), Department of Environmental Protection (DEP).

Geographic Area: Sanibel River corridor on Sanibel Island.

Expected Benefits and/or Drawbacks: Restoration of wildlife habitat and a functioning rare, freshwater barrier island wetland system.

Project Timeline/Schedule: Start: circa 1990; Completion: dependent upon future grant funding availability.

Status: Two-thirds complete.

Resources/Funding
Available: Numerous state and federal grants.
Needed: Approximately $2,000,000 to complete.
Potential: Various State and Federal grant programs.

Reference Documents:

Comments: This is one of the largest non-mitigation restoration projects in southwest Florida.

Sanibel Environmentally Sensitive Lands Acquisition Program

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Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-S, FW-U

Project Description: City conservation lands purchase program focusing on undevelopable and wetland privately-owned lots especially in the Sanibel Gardens and Tarpon Bay wetland subdivisions.

Strategy for Implementation: Annual purchases of environmentally sensitive land particularly in the Sanibel River corridor since 1986. Acquisition properties include privately-held lands in excess of five acres adjacent to existing conservation lands along the Sanibel River corridor or next to the J.N. "Ding" Darling National Wildlife Reguge. Undeveloped privately-held lands within the Tarpon Bay and Sanibel River subdivisions that cannot be purchased directly from willing sellers are to be acquired alternatively via eminent domain proceedings.

Responsible Partner and Project Coordinator: Robert K. Loflin, Ph.D.

Other Project Partners: Sanibel-Captiva Conservation Foundation (SCCF), U.S. Fish and Wildlife Service (USFWS).

Geographic Area: Sanibel Island.

Expected Benefits and/or Drawbacks: Preservation of wildlife habitat and functioning parts of the barrier island ecosystem.

Project Timeline/Schedule: Start: circa 1986; Completion: ongoing.

Status: In progress.

Resources/Funding
Available: Primarily funded by City general funds to tune of $500,000-$750,000/year plus grants from Florida Community Trust (Preservation 2000) and hopefully from the Lee County 20/20 program.
Needed: $4.5 million.
Potential:

Reference Documents:

Comments: There are approximately 350 acres protected from development to date; budget tightening puts the entire program in jeopardy. This project requires strong and vocal-continued public support as well as outside matching funds to complete the needed purchases.

Sanibel Island Beach Management Plan Implementation

Contact Person: **Robert K. Loflin, Ph.D.**
Title: Natural Resources Director
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Telephone Number: (941) 472-3700
FAX Number: (941) 472-3065
E-mail Address: loflinr@ci.sanibel.fl.us

Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-S, FW-U

Project Description: Protect the natural condition of Sanibel beaches.

Strategy for Implementation: Accomplished by preventing the placement of hardened structures, promoting native dune vegetation on public and private properties, construction of dune walkovers to protect dune in heavily-utilized areas, prevention of excessive dune vegetation by trimming and mowing, protection of shorebird and sea turtle nesting areas, strict sea turtle-related beach lighting ordinances. Includes salaried biologist position paid for by 50% of beach parking funds.

Responsible Partner and Project Coordinator: Robert K. Loflin, Ph.D.

Other Project Partners: Sanibel-Captiva Conservation Foundation (SCCF), U.S. Fish and Wildlife Service (USFWS).

Geographic Area: Sanibel Island.

Expected Benefits and/or Drawbacks: Preservation of beach wildlife habitat and aesthetic nature of Sanibel beaches, which has a significant economic value in repeat visitors looking for something other than bare sand, buildings and concrete.

Project Timeline/Schedule: Start: circa 1983; Completion: ongoing.

Status: In progress.

Resources/Funding
Available: About $60,000/year.
Needed: $120,000/year.
Potential:

Reference Documents:

Comments: This project requires strong and vocal continued public support as well as outside matching funds to continue protection of beaches.

Project Pod

Contact Person: Joël Bellucci
Title: Director
Agency/Organization: Estero Bay Marine Laboratory
Mailing Address: 5250 Estero Blvd. Apt. #5, Fort Myers Beach, FL 33931
Telephone Number: (941) 765-9093
FAX Number: (941) 765-9094
E-mail Address: dolphman@peganet.com

Quantifiable Objectives Addressed: FW-2

Priority Actions: FW-T

Project Description: Photo-identification study of Atlantic bottlenose dolphin (*Tursiops truncatus*) in Estero Bay, Florida. Public education on marine mammal conservation issues.

Strategy for Implementation: Monitoring and cataloging of Atlantic bottlenose dolphin based on identification of dorsal fin characteristics. The study is authorized for Level B harassment of *Tursiops*. The project also includes presentations in classrooms as well as at public forums specifically targeting dolphin/eco-tour guides as well as personal watercraft and pontoon boat vendors to advocate low-impact, non-harassing observation of marine mammals.

Responsible Partner and Project Coordinator: Joël Bellucci, Director, Estero Bay Marine Laboratory.

Other Project Partners: At this time, there are no other project partners. This status may change in the future, however.

Geographic Area: Estero Bay study area.

Expected Benefits and/or Drawbacks: Increased awareness of conservation issues as well as the communication of responsible wildlife observational strategies.

Project Timeline/Schedule: Started in June 1995. Ongoing project.

Status: In progress.

Resources/Funding
Available: Private donations.
Needed: Future funding for continued study. At least $20,000/year is necessary to properly fund this study. A variety of grant applications will be sent out in order to secure additional funding.
Potential:

Reference Documents: Website: http://www.cetaceans.org; interpretive panel on dolphin biology and conservation; appearances on various local television programs.

Comments: The ongoing challenge is to convey an observe-from-a-distance philosophy as well as to communicate the dangers of feeding and otherwise interacting with wild dolphin. From a research standpoint, the challenge is to coordinate the data from this study with that of other studies being conducted along the west coast of Florida.

Water Quality Sampling in the Caloosahatchee River and Estuary

Contact Person: Matthew J. Giles
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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3

Priority Actions Addressed: WQ-C, WQ-D

Project Description: Obtain baseline water quality data from the lower Caloosahatchee River and adjacent estuary. This data can be used to establish spatial and temporal long-term comparisons of water quality standards.

Strategy for Implementation: Center for Environmental Studies (CES) scientists will collect water samples at eight different sites in the Caloosahatchee River at two depths (one-half meter below the surface and one-half meter above the bottom). CES will follow the South Florida Water Management District's (SFWMD) water sampling protocol. Six water quality parameters will be measured in the field using a *Hydrolab* Mini-Sonde. These parameters include salinity, temperature, conductivity, redox, dissolved oxygen, and secchi depth. Twelve parameters will be measured by the Lee County Environmental Laboratory using South Florida Water Management District's (SFWMD's) comparable methodology. These tests include nitrite (NO3), nitrate (NO2), ammonium (NH4), total Kjedahl nitrogen (TKN), total phosphorus (TP), Chlorophyll-*a*, ortho-phosphate (O-PO4), turbidity, color, total suspended solids (TSS), silicate, and total organic carbon (TOC).

Responsible Partner and Project Coordinator: Florida Center for Environmental Studies, Matthew J. Giles.

Other Project Partners: South Florida Water Management District, Tomma K. Barnes.

Geographic Area: Lower Caloosahatchee River, just upstream of S-79 (Franklin Lock) to Shell Point.

Expected Benefits and/ or Drawbacks: Create a baseline water quality database for evaluating the health of the lower Caloosahatchee River and estuary.

Project Timeline/Schedule: Authorized by the South Florida Water Management District, beginning in April 1999 and continuing through March 2000.

Status: In progress.

Resources/Funding
Available: Currently funded by the South Florida Water Management District, funding runs out in March of 2000.
Needed: $60,000 dollars per year for continuation.
Potential: Not applicable.

Reference Documents: Jones, R.D., Boyer, J.N., *An Integrated Water Quality Monitoring Program for the Southwest Florida Estuaries*, 1999.

Comments:

Biological Assessment and Monitoring of Streams: Stream Condition Index and Biorecon

Contact Person: Bruce Boler / Albert S. Walton, Jr.
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Quantifiable Objectives Addressed: WQ-1, WQ-6, WQ-7

Priority Actions Addressed: WQ-B, WQ-C, WQ-N

Project Description: Streams within boundaries of Department of Environmental Protection (DEP) South District are sampled to determine the health of the biological communities.

Strategy for Implementation: This project uses the biological community present in a stream to determine whether a stream has acceptable water quality. Both the Steam Condition Index (SCI) and Biorecon compare the aquatic macroinvertebrates in a stream to those in nearby streams known to have good water quality.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Punta Gorda Office, Albert Walton, Environmental Specialist II.

Other Project Partners: Department of Environmental Protection (DEP) Central Lab based in Tallahassee.

Geographic Area: Caloosahatchee, Peace River, and southwest coast watersheds. Exact sample locations vary; number of sites vary.

Expected Benefits and/or Drawbacks: This will help identify water bodies that do not meet standards, and indicate areas where natural or site-specific conditions make certain standards inappropriate.

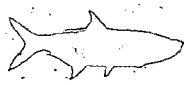
Project Timeline/Schedule: Project started in 1993, and is expected to continue indefinitely. This project will end when resources are diverted to a different project.

Status: In progress, reports on several sites have been completed.

Resources/Funding
Available: Continuing program of the Department of Environmental Protection (DEP).
Needed:
Potential:

Reference Documents: http://www2.dep.state.fl.us/water; reports (eco-summaries) will be available from the Department of Environmental Protection (DEP) web site when final formatting is approved.

Comments:



Caloosahatchee River Total Maximum Daily Load (TMDL) Study

Contact Person: Bruce Boler / Ron McGregor
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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3

Priority Actions Addressed: WQ-D

Project Description: River and tributary stations between the Franklin and Moorehaven locks will be sampled. Parameters to be sampled are total phosphorus, nitrate, nitrite, and total Kjedahl nitrogen (TKN). The sites will be sampled monthly. The sample sites are tributary inflow sites to the River. This project is being carried out in coordination with the South Florida Water Management District staff.

Strategy for Implementation: Monthly sampling of four river and 19 tributary sites for physical-chemical parameters and macroinvertebrates (Total Maximum Daily Load [TMDL] parameters). The project is a one year study.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) South District, Punta Gorda Office, Albert Walton, Project Coordinator.

Other Project Partners:

Geographic Area: Caloosahatchee River Basin between the Franklin and Moorehaven locks.

Expected Benefits and/or Drawbacks: The public will have access to a larger data base on the river; Total Maximum Daily Load (TMDL) objectives will be assisted.

Project Timeline/Schedule: Start - February 1999; End - January 2000.

Status: In progress.

Resources/Funding
Available: Funding is not needed, as the project is being carried out using existing Florida Department of Environmental Protection (DEP) resources.
Needed:
Potential:

Reference Documents:

Comments:

Citizen Support Organization (CSO)-Estero Bay Buddies

Contact Person: **Bruce Boler / Heather Stafford**
Title: Ecosystem Management Coordinator
Agency/Organization: Florida Department of Environmental Protection
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E-mail Address: Bruce.Boler@dep.state.fl.us

Quantifiable Objectives Addressed: WQ-7, FW-2

Priority Actions Addressed: WQ-B, FW-T

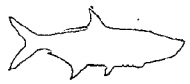
Project Description: The Estero Bay Buddies (EBB) was incorporated in January 1999 as a non-profit Florida corporation, composed of a Board of Directors and citizen members, that is under contract to provide support for the Estero Bay Aquatic & State Buffer Preserves, in accordance with Section 370.0205 of the Florida Statutes. The purpose for which the corporation was formed is to preserve and maintain aquatic and State buffer preserve areas in the Estero Bay area through assisting in the implementation of preserve resource management plans, publicizing the advantages of conserving and improving aquatic and State buffer preserves, raising funds for preservation and management of the preserve, and providing volunteers to aid in management activities. Volunteers will be able to participate in the following activities: resource monitoring, conducting guided nature walks, constructing and maintaining nature trails, removing exotic and invasive vegetation, assisting with educational programs and public outreach, and encouraging stewardship of the preserves on the part of the general public. The Citizen Support Organization (CSO) is organized for charitable, educational, and scientific purposes and shall operate in such a manner as will qualify it as a tax exempt organization under Section 501(c)(3) of the Internal Revenue Code. The Estero Bay Buddies' (EBBs') mission is to support the protection, conservation, restoration, management, responsible public use, and the enhancement of the resources of the coastal and aquatic ecosystems of the Estero Bay estuary.

Strategy for Implementation: Application for 501(c)(3) status will be pursued and a series of meetings will be held for the general public. Building a general membership and fundraising activities will be implemented.

Responsible Partner and Project Coordinator: DEP/Estero Bay Aquatic and State Buffer Preserves, Bureau of Coastal and Aquatic Managed Areas, Heather Stafford, Manager, 700-1 Fisherman's Wharf, Fort Myers Beach, FL, (941) 463-3240, fax (941) 463-3634, Heather.Stafford@dep.state.fl.us; Carla Kappmeyer-Sherwin, Public Outreach Coordinator, DEP Liaison, Burnt Store Road office.

Other Project Partners:

Geographic Area: Estero Bay Aquatic & State Buffer Preserve, Estero Bay watershed.



Expected Benefits and/or Drawbacks: Benefits to the community include the following: restoration of local environment, more unified voice in dealing with government, opportunities for citizen feedback and volunteer participation in projects, opportunities for local fundraising which may bring matching funds, education opportunities, and a greater sense of community. Citizen Support Organizations are a voice for the aquatic and State buffer preserves within the community. They create links to the community which benefit the community as well as the Preserves i.e., increased public access and compatible recreational activities, in balance with resource protection. The Estero Bay Buddies (EBB) will also be an important vehicle for funding which may not be directly available to a government agency, and has the capacity of obtaining additional support from the legislature.

Project Timeline/Schedule: In January 1998, an introductory meeting was held for the general public which defined local interest and need. In February 1998, a Steering Committee was formed and members drafted a Citizen Support Organization (CSO) during the March and April meetings. Articles of Incorporation were drafted, revised, and approved by the Steering Committee in April and May. By-laws were drafted and revised by a By-laws Subcommittee in June and July and approved by the Steering Committee in August. The Steering Committee nominated individuals to serve on the initial Board of Directors at the November, 1998 meeting. The Board was elected and Officers were appointed at the January, 1999 meeting. The Board will convene in February and by-laws will be adopted.

Status: In progress.

Resources/Funding
Available: Funds will be raised through membership dues.
Needed:
Potential:

Reference Documents:

Comments:

Estero Bay Buffer Preserve Exotic Plant Removal Project

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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: The wetlands of the Estero Bay Buffer Preserve contain areas of exotic vegetation infestation. This vegetation eliminates the native plant species and consequently reduces the habitat value and water quality benefits the native plants provide. The removal of the exotic species allows the native plants to re-vegetate the area.

Strategy for Implementation: The areas of exotic vegetation were located and mapped. A strategy for eradication was formulated. The manager of the Buffer Preserve requested funding to initiate the work. The funding was obtained and the work has begun on the first phase of the total project. Melaleuca (*Melaleuca quinquinervia*) has been cleared and the areas it was removed from are being monitored for re-sprouts. Any new growth will be treated with herbicide on six-month intervals. Additional work will be performed as staffing and funds allow.

Responsible Partner and Project Coordinator: Heather Stafford, Estero Bay Aquatic and State Buffer Preserves (EBASBP), 700-1 Fisherman's Wharf, Fort Myers Beach, Florida 33931.

Other Project Partners: Gordon Romeis, Environmental Administrator, Department of Environmental Protection (DEP) South District, (941) 332-6975.

Geographic Area: The Estero Bay Aquatic and State and Buffer Preserve is located in south Lee County. The preserve includes 5,494 acres with 450 acres impacted by exotic vegetation.

Expected Benefits and/or Drawbacks: It is expected that the project will enhance the habitat value and water quality functions of the wetland system.

Project Timeline/Schedule: The initial clearing of exotic vegetation included in Phase I of the project has been completed; a herbicide treatment for re-sprouts is scheduled; funds are needed to complete this project.

Status: Work must continue to complete the removal of the exotic vegetation and seed sources.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents:

Comments:

Invasive Pest Plant Management At Estero Bay State Buffer Preserve (EBSBP)

Contact Person: Bruce Boler / Heather Stafford
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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: Invasive, non-native plants are spreading at an exponential rate within the Estero Bay Aquatic and State Buffer Preserve (EBASBP). Melaleuca (*Melaleuca quinquinervia*) trees are invading the entire 1,000 acres of the Buffer's upland habitats, displacing native plant communities, negatively altering habitat values and lowering diversity of native plant and wildlife species. The EBASBP Management Plan (1997) outlines a multi-step perpetual maintenance program designed to promote native habitat and species diversity.

Strategy for Implementation: Removal of invasive Melaleuca and maintenance of native plant communities in Estero Bay Aquatic and State Buffer Preserve (EBASBP) is a three-stage process consisting of: A) Physical removal, by cutting and herbicide treatment, of non-native trees and shrubs; B) Follow-up herbicide treatments of re-sprouts and seedlings of non-native trees and shrubs; and C) Prescribed burning of cleared tracts according to protocols that will encourage the historic plant community while suppressing non-native plant re-invasion.

Responsible Partner and Project Coordinator: Heather Stafford, Manager, Department of Environmental Protection (DEP) / EBASBP, Office of Coastal and Aquatic Managed Areas, 700-1 Fisherman's Wharf, Fort Myers Beach, Florida, (941) 463-3240, Fax (941) 463-3634, Heather.Stafford@dep.state.fl.us.

Other Project Partners: Department of Environmental Protection (DEP) Ecosystem Management and Restoration Trust Fund; Florida Exotic Pest Plant Council; Southwest Florida Invasive Species Working Group; DEP Bureau of Invasive Plant Management (BIPM); Florida Department of Corrections; Florida Division of Forestry; U.S. Department of Agriculture (WHIP Program); South Florida Water Management District.

Geographic Area: Estero Bay watershed, southwest Lee County, Florida.

Expected Benefits and/or Drawbacks: As a result of removal and perpetual management of invasive plants on the Buffer, we expect the following benefits: restoration of historic canopy and mid-story vegetation in treatment areas; increased diversity and ecological function of plant communities and wildlife populations; restoration of historic hydrological conditions (sheetflow) in the treatment areas; lower wildfire incidence due to fuel reduction and regular use of prescribed fire; and an increase in awareness, appreciation, and visitation to the buffer by the local community residents.

Project Timeline/Schedule: The current schedule calls for cutting, herbicide treatment and first round of prescribed fire to be completed by the year 2003.

Status: About one-third of the 1,000 acres of the Buffer's upland habitats are currently cut or under a contract commitment.

Resources/Funding
Available: Annual field office operating budget Conservation and Recreational Lands Program (CARL), Department of Corrections crews, Bureau of Invasive Plant Management (BIPM) funds.
Needed: Management funds for donated tracts of lands within and adjacent to the CARL boundary. If not purchased by the CARL Program, funding is not available.
Potential: Escrow account set up specifically to fund management activities such as invasive, exotic plant control. Potential proposal to remove all Melaleuca from the site for the production of fuel chips.

Reference Documents: Estero Bay State Buffer Preserve Management Plan, 1997.

Comments:

Natural Resources Monitoring Programs at Estero Bay Aquatic and State Buffer Preserve (EBA&SBP)

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Quantifiable Objectives Addressed: WQ-1

Priority Actions Addressed: WQ-D

Project Description: The Estero Bay Aquatic & State Buffer Preserve (EBASBP) field office is currently conducting, under the Charlotte Harbor NEP grant awarded to Judy Ott, monthly volunteer water quality monitoring at five designated Estero Bay Aquatic Preserve sites. We are willing to modify the monitoring as needed to fill data gaps.

Strategy for Implementation: Water quality parameters at selected Estero Bay sites are sampled monthly as part of a Charlotte Harbor National Estuary Program (NEP) -funded regional project.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) / Estero Bay Aquatic and State Buffer Preserves, Heather Stafford, Manager, Office of Coastal and Aquatic Managed Areas, 700-1 Fisherman's Wharf, Fort Myers Beach, FL, (941) 463-3240, fax (941) 463-3634, Heather.Stafford@dep.state.fl.us

Other Project Partners: Charlotte Harbor NEP.

Geographic Area: Matanzas Pass; Estero Bay watershed; and Estero Bay Aquatic Preserve; Estero Bay watershed.

Expected Benefits and/or Drawbacks: Coordinated regional water quality database. No drawbacks.

Project Timeline/Schedule: Current through end of grant funding.

Status: All ongoing.

Resources/Funding
Available: Annual field operating budget and the Charlotte Harbor NEP.
Needed: The study is to expand upon existing one year's worth of data; volunteers and the Department of Environmental Protection staff's ability to continue after grant ends.
Potential: Additional funding may be provided by Florida Department of Environmental Protection in order to continue monitoring beyond grant funding, but is not in place at this time.

Reference Documents:

Comments: The Estero Bay Aquatic and State Buffer Preserves (EBA&SBP) staff conduct several other ongoing, perpetual, or principally for internal evaluation monitoring projects, such as monitoring bald eagles and colonial wading birds.

Pollution Prevention (P2) Stormwater Pollution Reduction

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Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-N

Project Description: P2 is "Pollution Prevention", which means the steps taken by a potential generator of contamination or pollution, to eliminate or reduce the contamination or pollution before it is discharged to the environment. The Department of Environmental Protection (DEP) Pollution Prevention Programs performs free, non-regulatory facility audits and provides information and assistance to help businesses prevent pollution through source reduction, waste minimization, and on-site recycling. Some, but not all, counties have their own pollution prevention programs. Others can include distribution of pollution prevention information through the Hazardous Waste Conditionally Exempt Small Quantity Generator (CESQG) verification programs. The DEP P2 program offers technical support to existing programs, promotes creation of new programs through training and technical support, and provides assistance to business in all areas.

The goal of this project is to prevent the contamination of stormwater by preventing the release of the contaminants at the source. DEP will partner with other local agencies and organizations to aggressively promote, identify and assist the Charlotte Harbor National Estuary Program (NEP in Charlotte Harbor; the Caloosahatchee River Basin; and the Estero River Basin areas with area businesses in reducing stormwater pollution. Proposed partners include the Florida Manufacturing Technology Center (MTC), City of Fort Myers, Collier County Environmental Pollution Prevention Partnership, the Lee County P2 Program, and the Charlotte County CESQG Verification Program (until the P2 program is established).

Strategy for Implementation: The Department of Environmental Protection (DEP)/Enterprise Florida Memorandum of Understanding (MOU) creates a partnership to promote improved environmental awareness for local businesses. This MOU establishes a DEP/Enterprise Florida Environmental Integration Services Program (EISP) that provides for DEP/Manufacturing Technology Center (MTC) cross-training, the DEP expert and industry incentive support of MTC, the MTC education and marketing support of the DEP and other initiatives. The EISP provides implementation tools, services and assessments for manufacturing companies, and identifies opportunities for implementing self-audits and strategies for pollution prevention and waste minimization. The MTC staff have been cross-trained in Pollution Prevention (P2) work with facilities so they can identify opportunities and assist in motivating management to institute changes. The EISP will be the principal framework for implementing South District actions.

Authorized by the Pollution Prevention Act of 1991, the DEP P2 Program's goal is to increase the use of multi-media P2 as the preferred method of reducing pollution from industrial processes. The Program provides free, non-regulatory information and assistance regarding source reduction, waste minimization, and on-site recycling, including on-site technical assistance. The Program also maintains a P2 Resource Center, publishes a quarterly newsletter (*P2 Links)*, provides free P2 training for local governments, hosts an annual statewide Pollution Prevention Conference for organizations and industries, and is considering integrating P2 into rules and regulations in the future. Further, the program provides an opportunity for enforcement case facilities to work with the DEP to develop and implement P2 projects in lieu of fines. Additional information concerning the P2 Program can be found on the Program's Web site at http://www.FDEP.state.fl.us/waste/programs/p2. To accomplish the South District's P2 Stormwater Pollution Reduction project objectives, the following initiatives will undertaken in 1998/1999:

- MTC to develop/publish/distribute materials and market the DEP P2 during course of regular visits to at least ten businesses per week.
- MTC to incorporate information regarding the EISP and DEP/MTC relationship into marketing materials and promotional brochures.
- MTC to distribute materials/brochures during and at trade shows/conferences.
- MTC to add environmental parameters to assessment guideline sheets and forms.
- MTC to conduct at least one workshop in cooperation with the DEP focusing on stormwater P2 and other related issues.
- MTC to document number of business contacts and information/materials distributed (company names may be kept confidential) in an annual report to the DEP.
- DEP to assist MTC in developing marketing/promotional/informational materials and assessment parameters.
- DEP to provide additional P2 information and other environmental materials as needed by the MTC.
- DEP staff to accompany the MTC staff on site inspections as requested.
- DEP staff to assist in developing stormwater P2 workshops.
- DEP staff to participate in additional workshops that focus on pollution prevention or compliance education.
- DEP to host annual statewide Pollution Prevention Conference (Second Annual Conference was held June, 1998; Third Annual Conference was held in June 1999.)

The strategy for preventing contamination of stormwater is developing educational materials, conducting workshops, and performing on-site facility assessments. The MTC can promote these efforts through its regular site visits.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) South District, Laura Comer, Pollution Prevention (P2) Coordinator.

Other Project Partners: Department of Environmental Protection (DEP) South District, Environmental Resource Permit (Lucy Blair); DEP Pollution Prevention (P2) Program (Julie Abcarian, Tallahassee); Manufacturing Technology Center (MTC) (Bonita Springs); City of Fort Myers; Collier County Environmental Pollution Prevention Program (Allen Ruth); Lee County Pollution Prevention Program (Dale Nottingham); Charlotte County Conditionally Exempt Small Quantity Generators (ESQG) Verification Program (Dan Frey); Operation BayWorks; Department of Environmental Protection (DEP) Bureau of Submerged Lands & Environmental Resources (Doug Fry, Michael Bateman, and Eric Livingston, Tallahassee); Environmental Protection Agency (EPA).

Geographic Area: South Florida, Caloosahatchee River area (Charlotte Harbor NEP area).

Expected Benefits and/or Drawbacks: The reduction of toxic contaminants to the Caloosahatchee River.

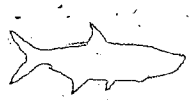
Project Timeline/Schedule: Start date in the South District has not been determined yet. The P2 Program is ongoing in other areas; Environmental Integration Services Program (EISP) Memorandum of Understanding (MOU) August, 1997; Third Annual Pollution Prevention Conference - June 9-11, 1999 in Jacksonville.

Status: Planned. There is a similar program already in progress in the Tampa Bay area; with Suncoast Manufacturing Technology Center (MTC) there is a good likelihood of completion of actions outlined above.

Resources/Funding
Available: Unknown.
Needed: Unknown.
Potential: The EISP was funded via a National Institute of Standards and Technology (NIST) matching grant through 1998; MTC will be looking at program fees and other sources for future funding.

Reference Documents: http://www.FDEP.state.fl.us/waste/programs/p2.

Comments: The Environmental Integration Services Program (EISP) appears to be a good model program that should be continued if successful; legislative approval of six pollution prevention positions which were filled in early 1999 (one for each Department of Environmental Protection Pollution Prevention [P2] District Office), should facilitate the South District's P2 Stormwater Pollution Reduction objectives.



Public Access Facilities in Estero Bay State Buffer Preserve (EBSBP)

Contact Person: Bruce Boler / Heather Stafford
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E-mail Address: Bruce.Boler@dep.state.fl.us

Quantifiable Objectives Addressed: FW-1, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: A four-mile footpath hiking trail is planned for the Winkler Point Public Access Area of the Estero Bay State Buffer Preserve (EBSBP).

Strategy for Implementation: Concurrent with invasive plant removal efforts at Winkler Point is the construction of a four-mile loop footpath trail through the intact and restored parts of the flatwoods forests and marshes. The trail route will feature views of two ponds - a small, marsh-rimmed freshwater pond and a larger, brackish tidal pond fringed with mangroves. These ponds, and the route in general, offer excellent landscape and wildlife viewing opportunities. The wetland shore of each pond will be bolstered with a short boardwalk viewing platform to protect the sensitive shoreline vegetation and enhance viewing opportunities.

Responsible Partner and Project Coordinator: Heather Stafford, Manager, Department of Environmental Protection (DEP) / Estero Bay Aquatic and State Buffer Preserves (EBASPB), Office of Coastal and Aquatic Managed Areas, 700-1 Fisherman's Wharf, Fort Myers Beach, FL, (941) 463-3240 , fax (941) 463-3634, Heather.Stafford@.dep.state.fl.us.

Other Project Partners: Charlotte Harbor National Estuary Program (NEP); Early-Action Mini-Grant Award Program, 1999; DEP Office of Greenways and Trails; Post, Buckley, Schuh & Jernigan, Inc.

Geographic Area: Winkler Point Public Access Area, Estero Bay State Buffer Preserve (EBSBP), Estero Bay watershed.

Expected Benefits and/or Drawbacks: Anticipated benefits from the Estero Bay State Buffer Preserve (EBSBP) public access program with a footpath hiking trail include: increased visitation by visitors seeking appropriate outdoor recreation opportunities; increased knowledge of wetland ecology and wildlife habitat requirements; and an increased support for Department of Environmental Protection (DEP) management actions as the Winkler Point area recovers from invasive plant infestations.

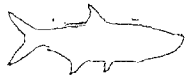
Project Timeline/Schedule: The first phase of the footpath hiking trail (about two miles, approximately halfway with one or both boardwalks at that time) will be completed about one year from the Charlotte Harbor NEP Mini-Grant award date, summer 2000. The trail and boardwalks will be fully completed, concurrent with the invasives clearing, before 2003.

Status: Ongoing.

Resources/Funding
Available: See above. Annual field office operating budget Conservation and Recreational Lands Program (CARL).
Needed: Volunteers to help blaze and maintain the trail.
Potential: Educational tour guide opportunities, donation of services, and materials.

Reference Documents: Estero Bay State Buffer Preserve Management Plan, 1997.

Comments:



Cayo Costa State Park

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 2,360-acre barrier island site (1,766 upland, 50 wetland, and 544 submerged acres) on Charlotte Harbor in Lee County. Natural communities include marine unconsolidated substrate (beach), beach dune, coastal strand, coastal berm, maritime hammock, mesic flatwoods, marine tidal swamp, depression marsh, shell mound, overwash plain, marine tidal marsh, and ruderal/developed sites.

Strategy for Implementation: Resource management activities include invasive/exotic plant removal and the use of prescribed fire on pyric communities. Resource monitoring includes a vascular plant reference collection, shorebird nest monitoring, sea turtle nest monitoring, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Division of Recreation and Parks (DRP), Reginald Norman, Park Manager, Barrier Islands Geopark.

Other Project Partners: Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) Tallahassee, Fran Mainella, John Baust, Dana Bryan; DEP DRP Osprey, Mike Murphy, District 4 Chief.

Geographic Area: A barrier island at Charlotte Harbor, south of Boca Grande Pass.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

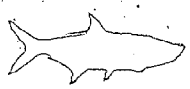
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Cayo Costa State Park Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See the park management plan.



Koreshan State Historic Site

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 156-acre site on the Estero River in Lee County. Natural communities include mesic flatwoods, scrubby flatwoods, blackwater stream, and ruderal/developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal and the use of prescribed fire on pyric communities. Resource monitoring includes gopher tortoise burrow surveys, a vascular plant reference collection, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Division of Recreation and Parks (DRP), Jeanne Parks, Park Manager.

Other Project Partners: Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) Tallahassee, Fran Mainella, John Baust, Dana Bryan; DEP DRP Osprey, Mike Murphy, District 4 Chief.

Geographic Area: On the Estero River at U.S. Highway 41.

Expected Benefits and/or Drawbacks: Benefits include the preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year to year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Koreshan State Historic Site Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See the park management plan.

Mound Key State Archeological Site

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 149-acre site at the mouth of Estero Bay in Lee County. Natural communities include estuarine tidal marsh, shell mound, thorn scrub, and ruderal sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal. Resource monitoring includes gopher tortoise burrow surveys, a vascular plant reference collection, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Jeanne Parks, Park Manager, Department of Environmental Protection (DEP) Division of Recreation and Parks (DRP).

Other Project Partners: Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) Tallahassee, Fran Mainella, John Baust, Dana Bryan; Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) Osprey, Mike Murphy, District 4 Chief.

Geographic Area: A shell mound in Estero Bay.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for state parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Mound Key State Archeological Site Unit Management Plan, approved 1998; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See the site management plan.

The Nature Lover's Guide To Pine Island

Contact Person: Bruce Boler/Carla Kappmeyer-Sherwin
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Quantifiable Objectives Addressed: All HA, all WQ, FW-1, FW-2, FW-4

Priority Actions Addressed: FW-A, FW-C, FW-S, FW-T, FW-U

Project Description: The Nature Lover's Guide To Pine Island was written and produced by volunteers of the Calusa Land Trust and Nature Preserve of Pine Island, Inc. It is available at the Museum of the Islands and several businesses in St. James City and Matlacha. This book provides an overview of Pine Island's history (historical and cultural), as well as information concerning wildlife and natural resources, recreation, land preservation, the Calusa Land Trust, Charlotte Harbor Aquatic and State Buffer Preserves (CHASBP), Little Pine Island, and the Wetland Restoration conducted by Mariner Properties Development, Inc. Funds raised from the sales of the Guide will be used for the purchase of land and the preservation of environmentally sensitive Pine Island habitats. Two sections, "The Aquatic and State Buffer Preserves" and "Little Pine Island", included in Chapter 21: Other Pine Island Preserves under Pine Island Future, introduce the reader to the following: the CHASBP, the value of estuarine resources and the importance of preserving land bordering estuaries, coastal wetlands, the salt marsh ecosystem, the threat of exotic, invasive pest plants, and an extensive wetland restoration project.

Strategy for Implementation: It is intended that the publication be revised and expanded at least annually to reflect additional Trust research as well as the acquisition of additional Trust properties.

Responsible Partner and Project Coordinator: Phillip G. Buchanan, Editor and Board Member of the Calusa Land Trust, The Calusa Land Trust and Nature Preserve of Pine Island, Inc.

Other Project Partners: Carla Kappmeyer-Sherwin, Public Outreach Coordinator, Department of Environmental Protection (DEP)/Charlotte Harbor Aquatic and State Buffer Preserves (CHASBP), reviewed The Nature Lover's Guide To Pine Island and contributed two sections of the book including "The Aquatic and State Buffer Preserves" and "Little Pine Island".

Geographic Area: Pine Island (Bokeelia and St. James City) and Matlacha.

Expected Benefits and/or Drawbacks: The Nature Lover's Guide To Pine Island will instill a greater appreciation of Pine Island and its resources. The Guide encourages responsible public access, in balance with resource protection, and provides information about recreational opportunities including hiking on nature trails, archeological tours, fishing, and canoeing, etc. The Guide will increase community awareness and may serve as an impetus to greater public involvement in resource protection. New residents and seasonal residents are provided with basic, background information essential to understanding Pine Island and what they can do to help preserve it. Most importantly, the Guide should increase membership in the Calusa Land Trust, and sales of the book will raise funds for land acquisition, preservation, and habitat restoration.

Project Timeline/Schedule: March 8, 1998: Reviewed first draft of The Nature Lover's Guide To Pine Island; August 27, 1998: Wrote and revised sections on "The Aquatic and State Buffer Preserves" and "Little Pine Island"; November 1998: The Guide is published, assembled, and made available to the public at a number of distribution centers throughout Pine Island; and January 1998: Approximately 600 copies of the book had been sold (at the cost of $20.00 per book) by the end of January 1998.

Status: Ongoing.

Resources/Funding
Available: The Calusa Land Trust and Nature Preserve of Pine Island, Inc.; Geographical Information System (GIS) equipment and software were provided to the Trust through a grant from the Conservation Technology Support Program.
Needed:
Potential:

Reference Documents:

Comments:

Lovers Key State Recreation Area

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 751-acre barrier island site on Charlotte Harbor in Lee County. Natural communities include marine unconsolidated substrate (beach), beach dune, maritime hammock, marine tidal swamp, and ruderal/developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal. Resource monitoring includes a vascular plant reference collection, shorebird nest monitoring, wading bird rookery monitoring, sea turtle nest monitoring, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Division of Recreation and Parks (DRP), Jim Gibson, Park Manager.

Other Project Partners: Department of Environmental Protection (DEP) Division of Recreation and Parks (DRP) Tallahassee, Fran Mainella, John Baust, Dana Bryan; FDEP DRP Osprey, Mike Murphy, District 4 Chief.

Geographic Area: A barrier island on Estero Bay.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Lovers Key State Recreation Area Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See the area management plan.

Treasures of the Sea

Contact Person: Terry Cain
Title: Project Manager
Agency/Organization: Fort Myers Beach Marine Resources Task Force
Mailing Address: 144 Bay Mar Drive Fort Myers Beach, FL 33931
Telephone Number: (941) 463-4935
FAX Number: (941) 765-0909
E-mail Address: N/A

Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-T

Project Description: "Treasures of the Sea" is a project to introduce people to the mangrove forest, the estuary, and the beach through field trips that will include flora and fauna identification, conservation, and preservation. The project informs residents and visitors to Estero Island, Fort Myers Beach about the dynamics of a barrier island and the care needed to protect natural resources and habitats.

Strategy for Implementation: The Town of Fort Myers Beach staff will receive reservations from participants for the field trips brought to the participants attention by flyers, newspaper articles, the Chamber of Commerce, condominium associations, hotels/motels, and realtors. Groups of 15 to 20 participants will be scheduled for a two-hour field trip (beach, mangrove forest, or bay) with a one-hour discussion and video time in the local historic Mound House with a naturalist. Quarter-fold brochures with illustrations and identification information of local flora and fauna will be handed out. Pre and post questionnaires will be filled out by each participant to survey knowledge gained, knowledge wished to be gained, and what to do to improve the present project.

Responsible Partner and Project Coordinator: Fort Myers Beach Marine Resources Task Force, Terry Cain, Project Coordinator; Town of Fort Myers Beach.

Other Project Partners: Charlotte Harbor National Estuary Program (NEP).

Geographic Area: Estero Bay study area.

Expected Benefits and/or Drawbacks: An increased understanding of natural resources will enable proper management and restoration to the heavily impacted habitats of Fort Myers Beach.

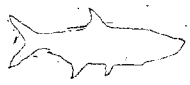
Project Timeline/Schedule: February 1999 to May 2000.

Status: Underway.

Resources/Funding
Available: Charlotte Harbor NEP funding.
Needed:
Potential: Funding to continue this project past year 2000 will be in the form of grants and possible buy-in through hotels and motels.

Reference Documents: *Beachcomber's Guide to Florida Marine Life,* William S. Alevizon; *Florida Wildlife Viewing Guide,* Susan Cerulean and Ann Morrow.

Comments:



Lee County Artificial Reef Program

Contact Person: Roland Ottolini/ Steve Boutelle
Title: Division Director/ Senior Environmental Planner
Agency/Organization: Lee County Natural Resources Division
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Telephone Number: (941) 479-8181
FAX Number: (941) 479-8108
E-mail Address: ottolire@bocc.co.lee.fl.us or boutelsj@bocc.co.lee.fl.us.

Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-R

Project Description: Siting, design, permitting and construction of artificial reefs offshore of the Lee County coastline to increase fisheries habitat. Materials typically include limerock boulders, concrete rubble, slabs, culverts, power poles, and piling, steel vessels, and experimental assembled structures. Monitoring includes analysis of structural integrity and species counts.

Strategy for Implementation: Reefs are constructed in accordance with the Lee County Artificial Reef Plan. Sites are permitted through all applicable Federal and State agencies. Materials are limited to those that will provide long-term (50 year minimum) benefits as defined by the Lee County Artificial Reef Plan. Monitoring of species and material stability is in compliance with grant and permit requirement.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Steve Boutelle.

Other Project Partners: Florida Department of Environmental Protection (DEP) – Office of Fisheries Management and Assistance Services, Jon Dodrill, (850) 922-4340.

Geographic Area: Primarily in the Gulf of Mexico, offshore of Lee County coastline, some have been constructed in interior bay waters.

Expected Benefits and/or Drawbacks: Appropriate construction provides increased habitat complexity and species diversity. Reefs create fishing and diving recreational opportunities.

Project Timeline/Schedule: Varies per project.

Status: 14 permitted sites, two new sites in progress.

Resources/Funding
Available: $25,000 Lee County.
Needed:
Potential: Department of Environmental Protection grant funding.

Reference Documents: Permits are maintained for each site. Lee County has a list of sites for public information. Information has been posted on the Lee County web site: www.lee-county.com. See also, "Artificial Reef Plan".

Comments:

Lakes Park Flow-Way/ Filter Marsh

Contact Person: Roland Ottolini/ Tony Pellicer
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FAX Number: (941) 479-8108
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Quantifiable Objectives Addressed: WQ-1, WQ-3, WQ-4, WQ-6.

Priority Actions Addressed: WQ-E, WQ-N

Project Description: Create meandering flow-way through a portion of Lakes Park to enhance water quality of the stormwater discharge to Hendry Creek. Project to include littoral plantings along bank for filtration and absorption of pollutants. Joint project between Lee County and private development (Reflection Lakes). Project size is approximately 40 acres, treating surface water runoff from approximately 1,800 acres of commercial, residential and golf course properties adjacent to the park.

Strategy for Implementation: Preliminary design complete. Private development will construct upstream phase (50% of project) on own property. Lee County is to construct downstream phase. Maintenance is to be provided by both parties. Monitoring is to be conducted by Lee County.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Tony Pellicer.

Other Project Partners: Engle Homes Southwest Florida, Inc., Naples, Florida.

Geographic Area: Hendry Creek watershed, just upstream of Gladiolus Drive crossing, Lee County.

Expected Benefits and/or Drawbacks: Reduce excessive sediment, nutrient and metal loading into Hendry Creek. Will require considerable monitoring and maintenance effort, which is not currently funded. Unsure of overall efficiency of proposed flow-way in reducing pollutants.

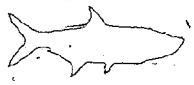
Project Timeline/Schedule: Private developer to begin construction in spring 1999. The County portion has not been bid.

Status: Private portion currently under construction.

Resources/Funding
Available: $2 million for capital improvements.
Needed: Maintenance and monitoring funds.
Potential: Monitoring of project will provide needed information related to the effectiveness of the operation strategy. This includes the removal or harvesting of wetland plant species to manage the system as in its growth stage. The effectiveness of the process and the use of the project as a source of plant materials for other restoration projects are definite opportunities.

Reference Documents: Lee County Surface Water Management Plan, Hendry Creek, June 1991, Johnson Engineering, Inc.; Lakes Park Marsh Flow-way Preliminary Report, January 1996, Boylan Environmental Consultants

Comments: Harvesting wetland plants in similar systems has not been used extensively. The use of the project area as a source of plant material and keeping the system in a growth state to maintain optimum pollutant removal is a true opportunity.



National Pollutant Discharge Elimination System (NPDES) Implementation

Contact Person: Roland Ottolini/ Tony Pellicer
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Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-C, WQ-D, WQ-E, WQ-I, WQ-N

Project Description: Lee County is the lead applicant for the national pollutant discharge elimination system (NPDES) stormwater permit. The permit addresses the operation and maintenance of the Municipal Separate Storm Sewer System (MS4); monitoring, public education and enforcement activities to prohibit illicit discharges. Florida Yards and Neighborhoods is only a small portion of the total education program.

Strategy for Implementation: Lee County passed an amendment to the Land Development Code, establishing Clean Water Provisions (Article VII) to provide legal authority to comply with the permit conditions (enforcement). In addition, there is a requirement to monitor activities to assure compliance with national pollutant discharge elimination system (NPDES) permit requirements. This requires industrial and construction site inspection and reporting (*i.e.* monitoring). The permit also requires Lee County to perform dry weather screening to detect and prohibit illicit discharges. Wet weather monitoring is performed to detect and quantify discharges, this compliments the surface water and sediment monitoring currently performed. The total program is designed to educate the general and professional public on storm water pollution prevention methods.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Tony Pellicer.

Other Project Partners: Lee County Department of Transportation (DOT), Co-applicants (including Florida DOT).

Geographic Area: Lee County.

Expected Benefits and/or Drawbacks: The benefit is improved water quality and public education. Drawback is the additional cost of doing business. A drawback is increased budget expenses to achieve implementation.

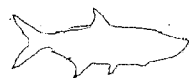
Project Timeline/Schedule: The permit began October 1, 1997. An annual report is required each year describing activities and accomplishments on the preceding year.

Status: In progress.

Resources/Funding
Available: Lee County
Needed: Staffing and monitoring resources.
Potential: The distribution of educational materials and public support for clean water programs is needed. No grant funding is available.

Reference Documents: National pollutant discharge elimination system (NPDES) Permit FLS000035, EPA Home Page.

Comments: Educating the professional, construction, municipal and general public in the best management practices is the challenge. The opportunity is to improve water quality.



Small Quantity Hazardous Waste Generator Program

Contact Person: Roland Ottolini/ Dale Nottingham
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Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-B, WQ-N, WQ-Q

Project Description: Public education program designed to inform the small business community in identifying, proper handling and disposal of hazardous wastes.

Strategy for Implementation: Program includes the distribution of informative newspaper and site visits to individual businesses. The program assesses small quantity generators of hazardous waste and provides assistance in achieving compliance with hazardous waste management regulations.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Dale Nottingham.

Other Project Partners: Not applicable.

Geographic Area: Lee County.

Expected Benefits and/or Drawbacks: Reduces improper handling of hazardous wastes and the potential for contamination of water resources.

Project Timeline/Schedule: Continuous, monthly newsletter, inspect 20% of all non-exempt businesses each year.

Status: Organizing hazardous waste seminar in February 1999.

Resources/Funding
Available: Funded by an assessment on the appropriate occupation licenses.
Needed:
Potential:

Reference Documents:

Comments:

Stormwater System Inventory

Contact Person: Roland Ottolini/ Brad Vance
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E-mail Address: ottolire@bocc.co.lee.fl.us

Quantifiable Objectives Addressed: HA-2, HA-3

Priority Actions Addressed: HA-F, HA-L, HA-M, WQ-E, WQ-N

Project Description: Locate, identify, and record, on a geographic information system (GIS), information regarding stormwater facilities in Lee County. Data to include type of conveyance (*e.g.* natural or man-made), reach length, type of crossing (*e.g.* pipe, box culvert, bridge), elevation (*e.g.* invert, edge of pavement), maintenance records, etc.

Strategy for Implementation: Utilize Surface Water Management Plan as base information, field verify changes or additions, review by maintenance entity (Lee County Department of Transportation-Operations), review by engineering community, distribute to development review department for tracking changes due to new development, redistribute annually with updates.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Brad Vance.

Other Project Partners: N/A.

Geographic Area: Lee County watersheds, excluding cities and islands.

Expected Benefits and/or Drawbacks: Identifies stormwater system for management, maintenance, and emergency operations. This project will help locate sources of pollutants when identified in a particular watershed.

Project Timeline/Schedule: Annual updates.

Status: Initial set of plans and data completed and reviewed by Lee County Department of Transportation-Operations. Copy of documents delivered to County Development Review.

Resources/Funding
Available: $100,000 per year.
Needed:
Potential:

Reference Documents: Lee County Surface Water Management Plan, Johnson Engineering Inc., Lee County geographic information system, Property Appraisers Office.

Comments:

Lee County Estuarine Monitoring Program

Contact Person: Keith A. Kibbey
Title: Environmental Laboratory Director
Agency/Organization: Lee County Natural Resources Division, Environmental Lab
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Telephone Number: (941) 278-7070
FAX Number: (941) 939-4850
E-mail Address: LCEL@Hotmail.com

Quantifiable Objectives Addressed: WQ-1,WQ-2,WQ-4.

Priority Actions Addressed: WQ-A, WQ-D

Project Description: The Program was established to provide information to assess and evaluate water quality health of the estuary.

Strategy for Implementation: Programs were established to provide information on the health of the estuary, and to determine if conditions were improving or not. In addition, information will be available for total maximum daily load (TMDL) calculations. Quarterly monitoring of 14 fixed sites in Estero Bay and 14 fixed sites around Pine Island. Analysis include: nutrients, chlorophyll, fecal coliform, pH, dissolved oxygen, turbidity, Biochemical Oxygen Demand, temperature, and salinity. This information will be used in TMDL calculations by the Florida Department of Environmental Protection (DEP).

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Environmental Lab, Keith A. Kibbey.

Other Project Partners:

Geographic Area: Estero Bay, Pine Island Sound, Matlatcha Pass, South Charlotte Harbor, San Carlos Bay.

Expected Benefits and/or Drawbacks: These are the only established monitoring programs in these areas.

Project Timeline/Schedule: Estero Bay monitoring started March 1991, Pine Island monitoring started July 1996.

Status: In progress.

Resources/Funding
Available: The project is currently funded by Lee County.
Needed: Additional or supplemental funding is needed to increase sample frequency to monthly.
Potential: Department of Environmental Protection (DEP), South Florida Water Management District, and Charlotte Harbor NEP.

Reference Documents:

Comments: Would like to increase sample frequency to monthly.

Lee County Ambient Surface Water Monitoring Program

Contact Person: Keith A. Kibbey
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E-mail Address: LCEL@Hotmail.com

Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3,WQ-4

Priority Actions Addressed: WQ-D (Note - this is a coordinated effort with the Florida Department of Environmental Protection to establish total maximum daily loads (TMDLs). The Program is modified to meet their specifications), WQ-E, WQ-F, WQ-N

Project Description: The Program was established to provide information on storm water runoff, in conjunction with Lee County's Stormwater Master Plan. Information can be used for loading calculations by basin for total maximum daily loads (TMDLs) and pollutant load reduction goals (PLRGs).

Strategy for Implementation: Monthly monitoring of 70 fixed sites within watersheds throughout Lee County. Analysis include: nutrients, fecal coliform, pH, dissolved oxygen, temperature, turbidity, total suspended solids, chloride, biochemical oxygen demand, arsenic, copper, lead, zinc, and conductivity.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Environmental Lab, Keith A. Kibbey.

Other Project Partners: N/A.

Geographic Area: Sub basin watersheds throughout Lee County.

Expected Benefits and/or Drawbacks: This is the only established monitoring program in these areas. Data will allow us to evaluate water quality changes in conjunction with land use changes, and make good decisions on best management practice (BMP) implementation, or land use changes.

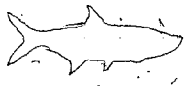
Project Timeline/Schedule: Six-Mile Cypress monitoring started June 1989, others were added through May 1996.

Status: In progress.

Resources/Funding
Available: The project is currently funded by Lee County.
Needed:
Potential:

Reference Documents: Lee County Stormwater Master Plan.

Comments:



Lee County Conservation Land Acquisition and Stewardship Committee (CLASAC)

Contact Person: Roland Ottolini/ Lynda Riley
Title: Division Director/ Program Coordinator
Agency/Organization: Lee County Natural Resources Division/County Lands Division
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Telephone Number: (941) 479-8181/ (941) 479-8505
FAX Number: (941) 479-8108/ (941) 479-8535
E-mail Address: ottolire@bocc.co.lee.fl.us

Quantifiable Objectives Addressed: HA-3, WQ-3, WQ-6, FW-1, FW-2, FW-4

Priority Actions Addressed: HA-F, HA-L, WQ-E, WQ-N, FW-S, FW-U

Project Description: In 1996, voters approved a referendum to raise real property taxes to fund the purchase of environmentally sensitive lands to place in public trust for preservation. Over $11 million per year is generated for the acquisition of properties of willing sellers. Each proposal goes through a ranking process based on environmental significance, water resource value, management potential, contiguity to other preserve areas, development potential, and selling price.

Strategy for Implementation: Parcels are submitted by willing sellers through application. The ranking subcommittee and Lee County staff reviews and ranks parcels and submits to full committee for approval. Committee recommendations go to the Board of County Commissioners for approval and direct to negotiations for purchase.

Responsible Partner and Project Coordinator: Lee County Office of County Lands, Lynda Riley

Other Project Partners: Florida Department of Environmental Protection, South Florida Water Management District, The Conservancy of Southwest Florida, and The Calusa Land Trust.

Geographic Area: Lee County.

Expected Benefits and/or Drawbacks: Purchase of lands along important flow-way corridors eliminates encroachment by development thereby reducing potential flood impacts and preserving the water quality benefits of a natural system.

Project Timeline/Schedule: Continuous, funding sunsets in ten years from inception (2006).

Status: Since February 1997, Conservation Land Acquisition And Stewardship Committee (CLASAC) has reviewed 114 parcels. Of these, CLASAC has selected 44 to be pursued for acquisition. As of July 1999, six parcels had been acquired totaling 480 acres at a cost of $3.35 million.

Resources/Funding
Available: Approximately $12 million per year.
Needed:
Potential:

Reference Documents:

Comments:

Derelict Vessel Removal Program

Contact Person: Roland Ottolini/ Steve Boutelle
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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-Q

Project Description: Identification and removal of derelict vessels.

Strategy for Implementation: Vessels are reported to the Florida Marine Patrol for investigation and legal action. Upon legal closure of ownership investigation, vessels are submitted to Lee County for removal.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Steve Boutelle.

Other Project Partners: Florida Department of Environmental Protection (DEP), Florida Marine Patrol; West Coast Inland Navigation District (WCIND).

Geographic Area: Lee County navigable waters.

Expected Benefits and/or Drawbacks: Removal and disposal of vessels also removes a potential source of marine debris and water quality contaminants. Contamination can occur during the investigative phase of the process.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: $25,000 Lee County
Needed: Variable
Potential: Florida Department of Environmental Protection (DEP), Florida Marine Patrol; West Coast Inland Navigation District (WCIND) grant funding.

Reference Documents: Florida Statute 376.15.

Comments:

Kehl Canal Weir

Contact Person: Roland Ottolini/ Bob Howard
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Quantifiable Objectives Addressed: HA-2, HA-3

Priority Actions Addressed: HA-L

Project Description: Replace temporary weir structure with fixed crest concrete weir with motor operated gates. Provides greater control of water levels for enhanced flood control and water conservation. Increased retention capability provides water quality enhancements through settlement of suspended solids and pollutant uptake by aquatic vegetation.

Strategy for Implementation: Design, permit, and construct the weir. Develop operating guidelines and schedule.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Bob Howard.

Other Project Partners: South Florida Water Management District (SFWMD), Ft. Myers Service Center/ Jacque Rippe.

Geographic Area: Kehl Canal extension of Imperial River, just upstream of Bonita Grande Drive.

Expected Benefits and/or Drawbacks: Will allow for gradual drawdown of pool prior to effects of major storm event. Will also enhance ability to maintain historic wet season water table for water conservation.

Project Timeline/Schedule: Construction to be completed in March 1999.

Status: Under construction.

Resources/Funding
Available: $600,000 for capital improvements.
Needed:
Potential: South Florida Water Management District grant.

Reference Documents: South Lee County Watershed Plan, Volume I (Interim), 1998, Johnson Engineering, Inc.

Comments:

Vessel Management

Contact Person: **Roland Ottolini/ Steve Boutelle**
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Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-J, FW-K, FW-M, FW-O

Project Description: Lee County has a vessel control ordinance to manage vessel speed in areas defined by Lee County Ordinance 90-50, as amended. Lee County also actively promotes the use of, and marks the deepest water available for navigation in public waterways.

Strategy for Implementation: Lee County has installed and will continue to improve channel-marking systems in public waterways. Channels are developed as a means to improve the ability to navigate areas while reducing boating impacts to shallow resources such as seagrass beds, via unintentional groundings.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Steve Boutelle.

Other Project Partners: West Coast Inland Navigation District (WCIND), United States Coast Guard (USCG).

Geographic Area: Lee County navigable public waters.

Expected Benefits and/or Drawbacks: Reduced impacts to submerged resources; reduced property damage and personal injury.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Lee County.
Needed:
Potential: West Coast Inland Navigation District grant funding.

Reference Documents: U.S. Coast Guard "Private Aids to Navigation" permits.

Comments:

Manatee Protection Plan

Contact Person: Roland Ottolini/ Steve Boutelle
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Quantifiable Objectives Addressed: FW-2, FW-3,

Priority Actions Addressed: FW-D, FW-E, FW-G, FW-L, FW-N, FW-T

Project Description: Lee County is one of 13 Counties designated by the State of Florida to develop and implement a comprehensive manatee protection plan. The plan will include elements of boat speed regulation, habitat protection, education, enforcement, marina siting, and marine enforcement coordination.

Strategy for Implementation: Draft plan is done in part and is to be completed by project partners within the next two years. Implementation strategy to be outlined as part of plan.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Steve Boutelle.

Other Project Partners: Florida Department of Environmental Protection (DEP), Office of Protected Species Management; Southwest Florida Regional Planning Council; West Coast Inland Navigation District (WCIND).

Geographic Area: Lee County navigable waters.

Expected Benefits and/or Drawbacks: Expect improved protection for manatees and their critical habitat; secondary benefits for other organisms utilizing the same habitats. Some vessel regulations may impede navigational and recreational use of coastal waters.

Project Timeline/Schedule: Vessel regulations expected by December 1999. Balance of plan anticipated by June 2001.

Status: Partial draft completed.

Resources/Funding:
Available: Lee County.
Needed: $167,000 capital costs, $20,000 per year operating costs.
Potential: Department of Environmental Protection and West Coast Inland Navigation District (WCIND) grant funding.

Reference Documents:

Comments

Beach Renourishment/Monitoring Program

Contact Person: Roland Ottolini/ Steve Boutelle
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Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-B, FW-T

Project Description: Beach renourishment provides storm protection, recreational, environmental, and economic benefits to Lee County. Of the 47 miles of beach in Lee County, over 15 miles have been designated as critically eroding. Renourishment of our beaches improves habitat for shore and wading birds, sea turtles, mollusks and other creatures. Lee County monitoring includes beach profile surveys to determine erosion rates and compaction testing for sea turtle nesting criteria. Turtle Time, Sanibel Captiva Conservation Foundation (SCCF), and Florida Parks Service monitor turtle nesting activity.

Strategy for Implementation: Beach profile surveys are typically required every six months as part of the renourishment permit. Florida Department of Environmental Protection (DEP) is also providing "LIDAR" survey of the entire coastline of Florida, which utilizes laser technology to define shoreline topography and bathymetry. Compaction testing is done just before turtle nesting season to determine if beach tilling is necessary for turtle nesting success. Turtle Time, Sanibel Captiva Conservation Foundation (SCCF), and Florida Parks Service provides daily monitoring of nesting activity throughout the season. The Lee County Coastal Advisory Council has created a brochure on beaches, which also describes the benefits beaches have for our environment.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Steve Boutelle.

Other Project Partners: Captiva Erosion Prevention District, City of Sanibel, Town of Fort Myers Beach, Turtle Time/ Eve Haverfield, Florida Department of Environmental Protection (DEP)/Robyn Trindell, and Sanibel Captiva Conservation Foundation (SCCF)/Kristie Anders.

Geographic Area: Lee County sandy coastline.

Expected Benefits and/or Drawbacks: Provides restoration of lost habitat due to erosion.

Project Timeline/Schedule: Varies by project.

Status: Continuous.

Resources/Funding
Available: Lee County Beach Renourishment Trust Fund.
Needed:
Potential: Florida Department of Environmental Protection (DEP) Beaches and Coastal Systems.

Reference Documents:

Comments:

Hydrologic Data Network

Contact Person: Roland Ottolini/ Wanda Wooten
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Quantifiable Objectives Addressed: HA-2, HA-3

Priority Actions Addressed: HA-B, HA-C, HA-F, HA-H, HA-L

Project Description: Collection of Lee County rainfall, stage, and groundwater level data and report. Provides valuable calibration information for hydrologic models such as "HECRAS" and "HEC1". Also provides early warning data for possible flood emergency. Groundwater data is used to establish wet season water table levels for use by engineering and environmental consultants to establish control elevations for stormwater management facilities. Reduces potential of lowering natural groundwater levels thereby conserving water resources.

Strategy for Implementation: Continue collection of Lee County rainfall, stage and groundwater level data and report. Add stations in areas of limited coverage. Convert to real-time data where practical.

Responsible Partner and Project Coordinator: Lee County Natural Resources Division, Wanda Wooten.

Other Project Partners: South Florida Water Management District (SFWMD), Florida Department of Environmental Protection (DEP), and U.S. Geological Survey (USGS) also provide hydrologic data to supplement the information. Coordination is made on sites to avoid duplication

Geographic Area: Lee County watersheds.

Expected Benefits and/or Drawbacks: Calibrate models for greater accuracy, establish and preserve historic groundwater levels. Limited coverage does not reflect the large variability in meteorologic conditions.

Project Timeline/Schedule: Continuous.

Status: Two (2) additional stage recorders installed in Fiscal Year 1999.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents: Data set available on Lee County website (www.lee-county.com/natureso.htm).

Comments: Investigating the utilization of weather radar information along with rain gage data for actual storm simulation in hydrologic models.

Habitat Management and Ecology Program: Prescribed Burning, Wetland and Upland Enhancement, Monitoring, and Applied Research of Native Flora and Fauna

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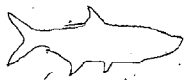
Quantifiable Objectives Addressed: WQ-6, FW-1, FW-2, FW-4

Priority Actions Addressed: WQ-B, WQ-N, FW-A, FW-C, FW-R, FW-S, FW-T

Project Description: Sanibel-Captiva Conservation Foundation (SCCF) was established in 1967 for the specific purpose of acquiring and preserving native wildlife habitat. SCCF currently owns more than 1,500 acres of wetland and upland habitats in the Charlotte Harbor NEP area and is actively managing these lands through invasive plant removal, prescribed burning, enhancing wetlands by restoring hydroperiods and creating deep water refuge, and enhancing uplands by shrub management, installing cavity-nesting bird boxes, and planting native species of subtropical trees and shrubs. Monitoring and research of plant, fish and wildlife communities is an integral part of the program.

Strategy for Implementation: The Habitat Management and Ecology Program is staffed by a full-time ecologist, a full-time technician and a half-time technician who implement management programs. Prescribed burning is conducted on a three to five year rotation in the freshwater cordgrass/sawgrass/leather fern wetlands when feasible to mimic natural fire regimes and to maintain open habitat for aquatic fauna and wading birds. Wetland enhancement consists of creating deepwater pools for fish and invertebrates in areas that were previously covered with Brazilian pepper. Uplands are less frequently burned depending on habitat type and location to maintain native plant communities. More than 45 nest boxes have been installed to supplement loss of cavity trees in upland ridges scattered across approximately 180 acres. We plan to install additional boxes during 1999 and 2000 in newly restored habitats and hope to continue this program until all restoration areas have available nesting habitat for owls, woodpeckers, flycatchers, and bats. Monitoring consists of general wildlife surveys, small mammal trapping, fish surveys, and frog call surveys to estimate recovery of native indicator species such as the Sanibel Island rice rat, marsh killifish, and green tree frogs among others. We are in need of funding to continue and expand our monitoring programs. We intend to monitor macroinvertebrates and "large" mammal (bobcat, river otters, raccoons, and marsh rabbits) populations in the future. Shorebird nesting areas are identified by staff and volunteers each year on Sanibel and protected by installing Florida Fish & Wildlife Conservation Commission signs and fencing.

Responsible Partner and Project Coordinator: We are currently working with the City of Sanibel Natural Resources Department, Rob Loflin, Director; and the J.N. "Ding" Darling National Wildlife Refuge/U.S. Fish and Wildlife Service, Louis Hinds, Manager; on the overall conservation lands management program on Sanibel and some prescribed burning activities. A Cooperative Agreement (signed December 1996) between these partners helps facilitate cooperation on large projects. Most of our fish and wildlife monitoring is done by Sanibel-Captiva Conservation Foundation (SCCF) staff. Upland and wetland enhancements are also done by SCCF staff with management plans approved by, and some financial support from, the U.S. Natural Resources Conservation Service (NRCS), Tim Eckert, North Ft. Myers office.



Other Project Partners: Plant community monitoring is supplemented by a volunteer group known as the "Weeds and Seeds" botanical club. Bird monitoring is supplemented by the Sanibel-Captiva Chapter of the Audubon Society and other volunteers. The U.S. Fish and Wildlife Service's South Florida Coastal Ecosystem Program has provided funding in 1998 for some of the upland and wetland plantings on restored parcels. The Charlotte Harbor National Estuary Program is funding an Early Action Demonstration Grant that includes installing 20 nest boxes and native subtropical plants and educational signage on one of our 45 parcels of conservation land.

Geographic Area: Sanibel-Captiva Area of Pine Island Sound Basin.

Expected Benefits and/or Drawbacks: All activities should benefit the listed goals/objectives and action plans mentioned. Drawbacks are mostly related to prescribed burning near residential areas (smoke complaints) and funding sources for research projects.

Project Timeline/Schedule: This program has been ongoing for more than 20 years but was accelerated and expanded in August of 1996 when a full-time land manager/ecologist was hired by Sanibel-Captiva Conservation Foundation (SCCF) through a three-year grant from the Bruning Foundation of Illinois. The program will continue as long as the position and activities are funded by SCCF and outside grants.

Status: We have completed wetland/upland enhancement on about 325 acres of Sanibel-Captiva Conservation Foundation (SCCF) habitat and these areas are under maintenance and monitoring. Fish, frog, bird and small mammal surveys have been implemented and will continue. The remaining conservation areas are in progress of or planned for initial restoration, enhancement, or monitoring. The habitat management and ecology program is an ongoing effort as part of proper stewardship of conservation lands.

Resources/Funding:
Available: Sanibel-Captiva Conservation Foundation (SCCF) Stewardship Endowment Fund = $8,500 to $10,000 per year; Charlotte Harbor NEP Early Action Grant = $6,450 total for materials, 1999 only; Natural Resources Conservation Service Grant = $17,000 to implement plans, August 1998 to August 2003; Bruning Foundation = $55,000 in 1998.
Needed: Minimum additional $50,000 per year for Staffing & Program Implementation.
Potential: Bruning Foundation & Private Donations; Government & research grants; Charlotte Harbor NEP Program; Universities and the Florida Center for Environmental Studies.

Reference Documents: Sanibel-Captiva Conservation Foundation (SCCF) Annual Report for 1998 on Web Page http//www.sccf.org; Ceilley, D.W. and D.E. Ceilley, 1999 (in press). Survey of Freshwater Fishes in the Hydric Flatwoods of Flint Pen Strand, Lee Co., South Florida Water Management District Technical Report; "Stewardship Update" Monthly Newsletter.

Comments: Our mission statement is "The Sanibel-Captiva Conservation Foundation, Inc. is a not-for-profit organization dedicated to the preservation of natural resources and wildlife habitat on and around Sanibel and Captiva." Our biggest challenge today is to properly manage existing conservation lands for the benefit of native wildlife communities (documented through monitoring and research) in an ecosystem that has been severely altered by habitat fragmentation, hydrologic disturbance, fire suppression, and the introduction of non-native plant and animal species.

Invasive Exotic Plant Removal and Long-term Control Program

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-C

Project Description: Sanibel-Captiva Conservation Foundation (SCCF) currently owns approximately 1,500 acres of conservation land including about 1,000 acres on Sanibel. SCCF also owns and manages coastal islands (Albright, Patterson, York and Coconut Islands and part of Buck Key) and tidal mangrove swamps totaling approximately 500 acres. Until 1996, only about 200 acres of this was free of invasive exotic plants. Since then, another 325 acres has been cleared of dense stands of Brazilian pepper, Australian pine and other exotics, and last year 288 acres were re-treated for exotic plant control.

Strategy for Implementation: Sanibel-Captiva Conservation Foundation (SCCF) has an ongoing invasive exotic plant removal program that includes mechanical removal of dense exotic plants, follow-up treatment of exotic plants (using Garlon-4 and vegetable base oils) in native plant dominated areas, and re-treatment on a semi-annual basis to maintain control of exotics in the long-term. High priority areas have been identified and are restored or will be restored in the near future. After initial removal of exotics, continuous monitoring and re-treatment is needed to maintain native wetland and upland habitats free of exotics. This re-treatment and monitoring is the responsibility of SCCF's restoration ecologist who was hired under a grant from the Bruning Foundation in August 1996. The program is supported through the Stewardship Endowment Fund, the Bruning Foundation grant, and other grants and donations when available.

Responsible Partner and Project Coordinator: We are currently working with the City of Sanibel/Natural Resources Department (Rob Loflin, Director) and the J.N. "Ding" Darling National Wildlife Refuge/U.S. Fish and Wildlife Service (USFWS) (Louis Hinds, Manager) through a Cooperative Agreement for the overall land management program for Sanibel. We have been successful at obtaining "Partners for Fish and Wildlife" grants from the USFWS (Layne Hamilton) since 1994 at $10,000 per year to assist in the effort to control exotics. We do not know if this funding will continue. In 1998 we were awarded a $30,000 grant from the USFWS South Florida Coastal Ecosystem Program (Kalani Cairns) to remove exotics and re-plant native species. We were also successful in receiving a $58,000 grant with the City of Sanibel (Dan Clark) as partner, from the Florida Department of Environmental Protection's Bureau of Aquatic Plant Mgmt. (Greg Jubinsky) for exotic plant removal from a 58 acre wetland & upland system disturbed by mosquito ditches and spoil piles. The U.S. Department of Agriculture, Natural Resource Conservation Service (Tim Eckert) is also providing assistance through the Wildlife Habitat Improvement Program.

Other Project Partners: The City of Sanibel provides cost-sharing incentives for selected zones; The Terra Foundation of Sanibel (previous support in 1996-97); Small number of volunteers have assisted in spraying in some areas; SCA-AmeriCorps volunteer in 1997 (program discontinued in Washington, D.C.); The Calusa Land Trust & Nature Preserve of Pine Island is assisting with exotic plant control on York and Coconut Islands.

Geographic Area: Sanibel-Captiva Area of the Pine Island Sound Basin.

Expected Benefits and/or Drawbacks: All activities should benefit the listed goals/objectives and action plans by directly removing invasive species that degrade natural habitats and ecosystem functions and by removing seed sources of re-infestation. The drawbacks are: 1) The perception by some residents that exotic plants are desirable (e. g. Australian pines along beaches, parks and roadways); and 2) Many local plant suppliers still promote and sell invasive exotic species of plants.

Project Timeline/Schedule: The exotic plant removal program has been ongoing for more than 15 years as a part-time effort but is now a major program area. The Habitat Management Program and Ecology Program were established in August 1996 when a full-time land manager/ecologist was hired by Sanibel-Captiva Conservation Foundation (SCCF) through a three-year grant from the Bruning Foundation of Illinois. In 1998, we completed the removal of exotics from our 262-acre Center Tract, including the first property acquired by SCCF in 1968. Another 100 acres of SCCF land was cleared of exotic plants in 1998 through our cooperative agreement with the City of Sanibel. The program will continue as long as the position and activities are funded by SCCF and outside grants.

Status: We have completed initial heavy exotic removal on about 325 acres of Sanibel-Captiva Conservation Foundation (SCCF) habitat and these areas are under maintenance and monitoring. The remaining conservation areas are in progress of or planned for initial restoration, enhancement, or monitoring. The short-term (two to three year) goals at this time are: 1) Remove spoil piles and mosquito ditches on a recently restored 58-acre portion of the Center Tract; 2) Complete the removal of heavy exotic infestations in the Sanibel River Corridor (more than 300 SCCF acres remain infested) and recently purchased York and Coconut Islands; and 3) In 1999 SCCF purchased another 167 acres of platted (undeveloped) land in the Sanibel River Corridor and will begin restoration by removing all invasive exotic plants.

Resources/Funding
Available: Sanibel-Captiva Conservation Foundation (SCCF) Stewardship Endowment Fund = $15,000 per year; Charlotte Harbor NEP Early Action Grant = $1,100 total for materials, 1999 only.
Needed: At least $30,000 to maintain existing exotic control level in 1999 (excluding staff costs); Approximately $450,000 to $500,000 to complete initial exotic plant removal, and another $45,000 for herbicides, mix, and equipment maintenance for re-treatment.
Potential: Bruning Foundation; Private Donations; Charlotte Harbor NEP; Government (Florida Department of Environmental Protection [DEP], Natural Resources Conservation Service, U.S. Fish & Wildlife Service, Lee County, etc.); grants; City of Sanibel.

Reference Documents: Sanibel-Captiva Conservation Foundation (SCCF) Annual Report for 1998 on Web Page: http://www.sccf.org; SCCF Report on Sanibel River Corridor Restoration Project, December 1998 sent to Department of Environmental Protection and City of Sanibel; "Stewardship Update" Monthly Newsletter.

Comments: Our biggest challenge today is to properly manage existing conservation lands for the benefit of native wildlife communities in an ecosystem that has been severely altered by habitat fragmentation, hydrologic disturbance, fire suppression and the introduction of non-native plant and animal species. Removal of exotic plants and their seed source is a long-term challenge for everyone in south Florida and successful partnerships are critical for success.

Captiva Cruises Partnership

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Quantifiable Objectives Addressed: HA-1, FW-2, WQ-6

Priority Actions Addressed: HA-K, WQ-B, FW-D

Project Description: The partnership between the Sanibel-Captiva Conservation Foundation (SCCF) and Captiva Cruises melds the expertise of both groups for net gain for both. SCCF provides volunteer training and guidelines for docents narrating natural history cruises throughout the Pine Island Sound area. A portion of ticket proceeds is given to SCCF to fund Environmental Education projects. Docents undergo 80 hours of training utilizing expertise ranging from the Department of Environmental Protection (DEP) to Mote Marine Lab's dolphin researchers and from SCCF's native plant nursery to public speaking techniques. Customers get a higher quality program through well-informed narrators and that translates into more business for Captiva Cruises, as word of mouth is the single most effective advertisement.

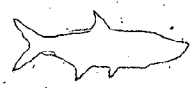
Strategy for Implementation: Identify viable partnerships pairing expertise of agencies and not-for-profits with commercial operations that could stand to gain from expertise of agencies. For example, because of the training opportunities given to volunteer narrators, visitors now understand that alteration of water in the form of now-dry fresh water springs has had an adverse effect on manatee populations.

Responsible Partner and Project Coordinator: The Sanibel-Captiva Conservation Foundation's education director- Kristie Seaman Anders.

Other Project Partners: Captiva Cruises, Paul F. McCarthy president.

Geographic Area: Pine Island Sound and adjacent barrier islands including Boca Grande, Cabbage Key, Captiva, Sanibel, and Useppa.

Expected Benefits and/or Drawbacks: Increase awareness among visitors and residents of the Pine Island Sound area regarding effects on wildlife of alteration of water, and increase awareness about effects of degradation of habitat on fish and wildlife populations, particularly mangrove and sea grass areas.



Project Timeline/Schedule: Initial contract called for education director to design training materials and develop training schedule - 200 hours; volunteer recruitment and training classes - 100 hours. Every other year training sessions to refresh established docents and intake of new people, ongoing training and communications at least monthly. Program self-sufficient enough to perpetuate.

Status: Initial program and three cycles of training and re-training have taken place. Program is in progress.

Resources/Funding
Available: Initial funding provided by Captiva Cruises $15,000; Annually generates approximately $10,000 for Sanibel-Captiva Conservation Foundation's (SCCF's) education programs.
Needed:
Potential:

Reference Documents: www.sccf.org.

Comments: Easily duplicated in any vacation destination where a for-profit and not-for-profit can see mutual goals of providing a high quality educational experience for clientele.

Resident Environmental Orientation

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Quantifiable Objectives Addressed: HA-1, FW-2, WQ-6

Priority Actions Addressed: HA-K, WQ-B, FW-D

Project Description: All residents are invited to participate in an orientation - a one-day class on conservation history, current conservation activities and evolution of environmental regulation as it pertains to City of Sanibel and the island of Captiva.

Strategy for Implementation: Recruit residents to participate in a one-day orientation on environment and regulation pertaining to protection of natural resources, water quality, and wildlife habitat. Organize presentations by like-minded organizations and agencies to diversify presentations.

Responsible Partner and Project Coordinator: Sanibel-Captiva Conservation Foundation's education director, Kristie Anders.

Other Project Partners: Clinic for Rehabilitation of Wildlife (CROW), City of Sanibel, Landscaping for Wildlife at Native Plant Nursery of Sanibel-Captiva Conservation Foundation (SCCF), occasionally J.N. "Ding" Darling National Wildlife Refuge.

Geographic Area: Sanibel and Captiva and adjacent Gulf and bay waters.

Expected Benefits and/or Drawbacks: Better informed residents, mitigation through education.

Project Timeline/Schedule: Initiated in 1986, evolved into current format in 1995.

Status: Ongoing with an adaptation in fall of 1998, called "Sound Living" where vehicle to transport group via boat through Pine Island Sound. This program is offered on a continuous basis.

Resources/Funding
Available: $250/session for trolley, driver, lunch and materials.
Needed: Currently funded by Sanibel-Captiva Conservation Foundation (SCCF), "Sound Living" funded with Charlotte Harbor NEP early action grant.
Potential: Corporate sponsor, tuition.

Reference Documents: www.sccf.org.

Comments:

Realtors' Environmental Orientation

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Quantifiable Objectives Addressed: HA-1, FW-2, WQ-6

Priority Actions Addressed: HA-K, WQ-B, FW-D

Project Description: Realtors newly joining the Professional Realtors Association on the islands of Sanibel and Captiva are required by the professional group to attend an education/orientation day. A stop at Sanibel-Captiva Conservation Foundation (SCCF) is part of the required training.

Strategy for Implementation: Develop a partnership with local realtors association, contact education chair, establish benefits of new realtors attending such a program, establish a routine for intake of new members. On the islands, training is offered quarterly. A better informed realtor can better serve their clients. Realtors help new residents form first opinions about the land and water where they live. Misinformation can lead to violation of regulations and misunderstandings. Well-informed can prevent misunderstandings and violations. (Sanibel-Captiva Conservation Foundation discovered a majority of realtors selling properties on the islands do not live there).

Responsible Partner and Project Coordinator: Sanibel-Captiva Conservation Foundation's education director, Kristie Anders.

Other Project Partners: The Sanibel and Captiva Islands Association of Realtors.

Geographic Area: Sanibel, Captiva, and adjacent waters.

Expected Benefits and/or Drawbacks: Better informed new residents and realtors who sell the land.

Project Timeline/Schedule: Partnership for training initiated in 1993, still continues today.

Status: In progress.

Resources/Funding
Available: Twenty-five staff hours annually, donated by Sanibel-Captiva Conservation Foundation (SCCF).
Needed:
Potential:

Reference Documents:

Comments: The realtors' orientation consists of a synopsis of the Island's conservation history, the land acquisition and management strategy of Sanibel-Captiva Conservation Foundation (SCCF), and the basis for logical zoning of land using natural systems as the key to density assignments.

Realtor Education Workshops

Contact Person Name: **Kristie Anders**
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E-mail Address: kanders@sccf.org

Quantifiable Objectives Addressed: HA-1, FW-2, WQ-6.

Priority Actions Addressed: HA-K, WQ-B, FW-D

Project Description: Ongoing environmental education workshops provided to licensed realtors selling properties on Sanibel and Captiva. Issues include upland habitat management as it effects water quality, docks and mangrove trimming regulations, advantages to wildlife habitat preservation, and environmental regulations.

Strategy for Implementation: Survey realtors to establish education needs, determine which can be provided through environmental education workshops, plan workshop with speakers, advertise and promote, deliver workshop, evaluate.

Responsible Partner and Project Coordinator: The Sanibel Captiva Conservation Foundation's (SCCF) education director, Kristie Anders.

Other Project Partners: The Sanibel and Captiva Island Association of Realtors.

Geographic Area: Barrier islands and adjacent waters of Pine Island Sound.

Expected Benefits and/or Drawbacks: Consider realtors as educators informing new residents and advising property owners, understand need and cause of degrading water quality, decline in fish and wildlife habitat, and alteration of hydrology.

Project Timeline/Schedule: Implemented several years ago. Provides ongoing training on an annual basis during "off-season."

Status: In progress; future plans include getting workshops certified by the State Realtor Board to qualify for in-service training hours for participants. A tuition will be charged, if needed.

Resources/Funding
Available: Hours donated by Sanibel-Captiva Conservation Foundation (SCCF) for presenters. Also we seek out in-kind donations for the trolley, boat, etc.
Needed:
Potential:

Reference Documents:

Comments: Expansion of this program can be implemented if accredited by the State Realtors Board as continuing education, as a certain number of credits are required each year to maintain license. Sanibel-Captiva Conservation Foundation (SCCF) working on accreditation with local education committee of the Realtors Association.

Landscaping For Wildlife

Contact Person: Kathryn Boone
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Quantifiable Objectives Addressed: FW-2, FW-3, WQ-4

Priority Actions: FW-A, FW-P, FW-S, FW-T, WQ-I

Project Description: "Landscaping for Wildlife" is a home certification program that teaches property owners how to create landscapes that provide a safe and healthy environment for our native wildlife. The principles include alternative to pesticides, a core planting which is at least 75% native species, removal of exotic pest plants, and conservation of water in the landscape. Homeowners and businesses receive an on-site consultation which addresses their specific needs and issues pertaining to their landscape. Their landscape is evaluated and goals are established to create a landscape for wildlife. Once the goals have been achieved, the homeowner or business is presented with a plaque indicating they have "Landscaped for Wildlife". Staff also provides ongoing educational programs such as, lecture and slide shows, guest speakers, and landscape tours. Landscape designs and site plans are reviewed by the staff and appropriate recommendations are made to best preserve and enhance for wildlife.

Strategy for Implementation:

For Priority Action FW-A:

1. Develop plans to reduce coverage in areas containing or linking significant habitats. Through on-site consultations and written materials, homeowner and businesses will be encouraged and advised on how to remove exotic pest plants and to replace them with appropriate native vegetation.
2. Develop and implement incentive programs to encourage removal of exotics and the maintenance of native vegetation on private lands. The incentive would be the certification of those properties complying with these objectives as "Landscapes for Wildlife". During on-site inspections exotic pest plants will be identified and methods of removal will be discussed. Native plants will be identified and their importance to wildlife emphasized and maintenance practices will be discussed.

For Priority Action FW-P:

1. Encourage the planting of appropriate native vegetation along developed shorelines, and allow trimming and maintenance by property owners. This will be accomplished through on-site recommendations, workshops and written material to educate the property owner.

For Priority Action FW-S:

1. Promote private stewardship of vital habitat through technical assistance to landowners, local governments and other parties.

For Priority Action FW-T:

1. Increase conservation of buffer areas around mangroves to reduce pressures to cut and hedge mangroves through educational materials, on-site consultations and by being a watchdog in the community.
2. Develop and implement information and education programs for developers, contractors, and builders on effective means of reducing habitat impacts. Provide them with educational materials, on-site consultations, and critiquing site plans to best preserve wildlife.

For Priority Action WQ-I:

1. Improve education of homeowners as to the methods they can easily implement to reduce sources of pollution. For example, reducing or eliminating the use of pesticides and fertilizers used in the landscape.
2. Make the business community aware of kinds of activities and programs they can undertake to reduce non-point storm water sources from their property.
3. Develop programs for providing training for landscape contractors.
4. Provide on-site irrigation evaluations, teaching homeowners to reduce the amount of irrigation.
5. Promote xeriscaping.

Responsible Partner and Project Coordinator:

Other Project Partners: Island Water Association (contract ends June 1999).

Geographic Area: On and around Sanibel and Captiva Islands.

Expected Benefits and/or Drawbacks: Increased acreage of wildlife habitat, fewer pesticides in the environment, conservation of natural resources (primarily water), eradication of exotic pest plants, all positive benefits.

Project Timeline/Schedule: Immediately. Ongoing project.

Status: In progress.

Resources/Funding
Available: Island Water Association Grant, $33,600 per year. This grant ends on June 30, 1999 and cannot be renewed. Landscaping for Wildlife Endowment Fund support July 1, 1999 - June 30, 2000, $15,500.
Needed: Additional $50,000 per year for staff and program implementation.
Potential: Charlotte Harbor NEP.

Reference Documents: "Landscaping for Wildlife Booklet," "Commonsense Pest Control," Webpage: www.sccf.org.

Comments: To preserve and enhance native landscapes on and around Sanibel and Captiva islands. To increase the number of acres of wildlife habitat by helping property owners to create safe landscapes that can support wildlife. We can eliminate exotic pest plants in those areas and reduce the amount of pesticides in the environment. We can also help to conserve water by eliminating the need for irrigation systems.

Three Dimensional (3-D) Circulation Model

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Quantifiable Objectives Addressed: HA-4

Priority Actions Addressed: HA-O

Project Description: This project will develop a coupled circulation/water quality model of the Charlotte Harbor estuarine system in three phases.

Strategy for Implementation: During Phase I, a preliminary three dimensional (3-D) circulation model will be developed and calibrated with available hydrodynamic data, and the applied to address the impact of Caloosahatchee River Estuary on circulation in Pine Island Sound, with particular focus on the effect of the Sanibel Causeway. During Phase II, available water quality data will be reviewed and analyzed, and a preliminary 3-D water quality model will be developed. A preliminary assessment of the effects of the Sanibel Causeway on Circulation and salinity will also be accomplished. During Phase III, the coupled hydrodynamics and water quality models will be calibrated and applied to address the impact of nutrient loading from Caloosahatchee Watershed on the water quality in the Caloosahatchee Estuary, San Carlos Bay, and Pine Island Sound. The hydrodynamic model will be delivered to the South Florida Water Management District (SFWMD) during Phase II, and the water quality model will be delivered to SFWMD during Phase III.

The initial focus of this project is to develop a modeling system that will enable managers to assess the impact of the Sanibel Causeway and Caloosahatchee watershed inflows on the circulation and salinity in Pine Island Sound area. With further data collection, model calibration and verification efforts, the model will be refined and used as a tool to synthesize field data to provide an understanding of the estuarine system, and predict the potential impact of various management practices on the estuarine system. The model will be built upon existing cutting-edge modeling technology (developed while studying other estuaries in Florida and elsewhere) and will use all available field data collected by U.S. Geological Survey, Southwest Florida Water Management District, SFWMD, Manasota Water Authority, and various Counties.

Responsible Partner and Project Coordinator: Dan Haunert, Planning Department, South Florida Water Management District (SFWMD), West Palm Beach.

Other Project Partners: Y. Peter Sheng, University of Florida Coastal and oceanographic Engineering Department, Gainesville, Florida.

Geographic Area: Three dimensional (3-D) Circulation Model: Charlotte Harbor.

Expected Benefits and/or Drawbacks: The project will result in a better understanding of the hydrology of the Charlotte Harbor estuarine system. In addition, the model will allow for better informed resource management decisions.

Project Timeline/Schedule: Phase I – 1999 / Phase II – 1999-2000 / Phase III – 2000.

Status: In progress.

Resources/Funding
Available: Phase 1 funded.
Needed: Phase II and III funding dependent on South Florida Water Management District (SFWMD) budget approval.
Potential:

Reference Documents : See sfwmd.gov web page for further details.

Comments:

Alternative Water Supply Funding Program

Contact Person: Jane Bucca
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Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D

Project Description: This program provides funding to those entities willing to explore cost-effective, safe, and appropriate alternative water supplies.

The program is governed by state legislation requiring the Water Management Districts to share some of their ad valorem tax revenues with water supply entities. The project provides funding support for alternatives water supply projects such as aquifer storage and recovery (ASR) or reuse, and the project must be a capital project; that means no retro fit projects, studies, etc.

The funded project must be built in 12 months. The District has provided funding support to about 20 projects each year at $200,000-$300,000 each.

Strategy for Implementation: To be eligible, entities shall comply with the following:

- Be a public or private provider or user.
- Project must service one or more resource caution areas.
- Be operational for at least one year at the time of application and produce certification from Florida Secretary of State.
- Submit a completed and signed application packet and fourteen collated copies (15 total).
- Have satisfied the administrative requirements of previous funding received from the district.
- Agree and be able to match at least 50% of the total capital or infrastructure costs for the construction of an alternative water supply system.
- Submit a proposed Minority/Women Business Enterprise (M/WBE) Utilization Plan indicating the percentage of work to be performed and statements of intent signed by each selected M/WBE firm, and /or
- Submit documentation to clarify geographical, policy and/or legal constraints that prohibit the applicant from complying with the Minority/Women Business Enterprises provisions.
- Letter from the local government comprehensive plan.
- Local government must require all appropriate new facilities within the project service area to connect and use the project's alternative water supplies.
- Funding support shall be applied only for the payment of capital or infrastructure costs for the construction of alternative water supply systems.

District staff will review each application for consistency with District planning objectives and review the overall application. Staff does not provide subjective evaluations or comments on the contents or quality of any funding application; that is a role of the committee as a whole. The alternative water supply selection committee will rank the eligible projects based on project eligibility criteria and guidelines.

The District shall ensure the proper use of funding and compliance with the requirements of the funding agreement by conducting reviews and other checks or audit of funding records.

Responsible Partner and Project Coordinator: Jane Bucca, Planning Department, South Florida Water Management District (SFWMD), West Palm Beach.

Other Project Partners:

Geographic Area: Within South Florida Water Management District (SFWMD) boundaries.

Expected Benefits and/or Drawbacks: Alternative water supply systems.

Project Timeline/Schedule: Applications are usually due in April each year.

Status: Continuous.

Resources/Funding
Available: South Florida Water Management District (SFWMD) will provide up to 50% of the total construction costs of a capital project.
Needed:
Potential:

Reference Documents: http://www.sfwmd.gov.

Comments: For application information contact South Florida Water Management District (SFWMD).

MIKE/SHE for Modeling Surface and Groundwater Interactions

Contact Person: Clyde Dabbs
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3

Priority Actions Addressed: HA-C

Project Description: The MIKE/SHE model was developed as a tool to enable District staff to more accurately assess different hydrologic systems involving significant interactions between surface water and groundwater. The MIKE/SHE model is a versatile modeling tool with a modular structure to facilitate program modifications. It can be quickly and easily applied to different geographic locations and hydrologic systems to assess a variety of water management scenarios, and can be used for local scale simulations with fine spatial and temporal resolution. The model has the capability of simulating all major components of the hydrologic cycle, including irrigation, flow control structures, well fields, lakes, canals, etc. Evapotranspiration (ET), ground water recharge, and other processes are modeled as a function of land use, soil type, meteorological processes, and water use conditions.

Strategy for Implementation: The model represents the performance of a real system through a series of equations which describe the physical processes that occur in that system; they represent a simplified version of the real world that may be used to predict the behavior of the modeled system under various conditions. The model will be used to simulate the potential impact of 1995 estimated water demands and projected 2020 water demands on the environment and ground water sources in the Caloosahatchee Water Management Plan (CWMP) Planning Area, during a one-in-ten year drought condition and average rainfall conditions.

The Integrated Surface Water/Ground Water Model will be used to identify potential impacts of water use on the environment and water resources. The integrated model developed for the Caloosahatchee Water Management Plan is restricted to the freshwater portion of the basin, which stretches from Lake Okeechobee downstream to the Franklin Lock (S-79). The integrated model will be developed using 1500 feet by 1500 feet grid cell discretization over the entire catchment area. The model incorporated the effects of irrigation on agricultural lands within the basin. A detailed surface water component to simulate surface water delivery functions and interactions with shallow ground water has been incorporated. The model area encompasses approximately 1,050 square miles (2,720 square km). The area encompassed by the model is divided into cells by a model grid (defined by a system of rows and columns). MIKE/SHE is modular in nature and comprises a number of components, which may be combined to describe flow within the entire land-based part of the hydrological cycle or tailored to studies focusing on parts of the hydrological system. For the Caloosahatchee watershed, the close link between river/canals and aquifers required that both surface and sub-surface components be included.

The time scale of the surface water regime and the groundwater regime are different. The model allows use of different time steps for calculation of river/canal flow and groundwater flow. The maximum time step for the river hydraulics computations is on the order of minutes, (often specified between five and 15 minutes). The overland flow computations are solved in time steps in the order of hours (six-hour time steps would be typical). Time steps for the groundwater flow calculations are in the order of days or weeks. (A typical simulation would employ daily time steps). The exchange of flow between the components is simulated on each coincident time step of the model. The ground water component of the models generate two principal types of output typical of ground water models, computed head (water levels), which result from the conditions simulated, and water budgets for each active cell. The water budget shows the inflows and outflows for each of the cells. Due to the integrated nature of the model, additional output depicting the status of the unsaturated zone and flow in river/canals is generated.

Responsible Partner and Project Coordinator: The project is a collaborative effort between the District and the Danish Hydrologic Institute.

Project Manager: Clyde Dabbs, P.G., Senior Hydrogeologist, Planning Department, South Florida Water Management District (SFWMD), Fort Myers.

Other Project Partners:

Geographic Area: Caloosahatchee Basin.

Expected Benefits and/or Drawbacks: A better understanding of the interactions between surface water and groundwater.

Project Timeline/Schedule: Completion of Calibrated Model: March 1,1999.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents: http:\\www.dhi.dk; http://141.232.1.11/org/exo/cwmp/html/model.html.

Comments:

Caloosahatchee Water Management Plan

Contact Person: Clyde Dabbs
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FAX Number: 941-338-2936
E-mail Address: cdabbsjr@sfwmd.gov

Quantifiable Objectives Addressed: HA-2

Priority Actions Addressed: HA-A, HA-B, HA-D, HA-F

Project Description: The purpose of the Caloosahatchee Water Management Plan is to provide a framework for future water use decisions to provide adequate water supply for urban areas, agriculture, and the environment through 2020. The plan estimates the future water supply needs of urban areas and agriculture, weighs those demands against historically used water resources, and identifies areas where these demands cannot be met. One of the goals of the plan is to *Sustain the Natural System*. This includes identifying current and historic low, high, average, and median flows into the estuary.

Strategy for Implementation: Based on research, the district proposed the following criteria to measure success in the estuary:

- Monthly flow to the estuary should be less than 300 cubic feet second (cfs) no more than 16% of the time;
- Monthly flow to the estuary should be greater than 2800 cfs no more than 6% of the time; and
- Monthly flow to the estuary should be greater than 4500 cfs no more than 1.6% of the time.

This performance measure was used to evaluate alternatives developed in the plan by simulating discharges to the estuary and looking at potential environmental impact. The alternative that performed closest to the target is deemed to have performed best under this criteria. Within the MIKE/SHE model, flow out of the model area (through Franklin Lock) is considered as flow to the estuary.

Responsible Partner and Project Coordinator: Caloosahatchee Water Management Plan (CWMP) Coordinator - Clyde Dabbs, Planning Department, South Florida Water Management District, Fort Myers

Other Project Partners: Local governments, water suppliers, and water users.

Geographic Area: Caloosahatchee Water Management Plan (CWMP) - Caloosahatchee River and Basin

Expected Benefits and/or Drawbacks:

Project Timeline/Schedule: Plan completion in December 1999.

Status: In progress.

Resources/Funding:
Available: South Florida Water Management District funding.
Needed:
Potential:

Reference Documents: http://www.sfwmd.gov.

Comments:

Save Our Rivers

Contact Person: Tomma Barnes
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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S, FW-U

Project Description: The District's Save Our Rivers land acquisition program is a multipurpose tool that preserves rare and unique resources, protects areas of special local interest, and prepares the ground for the water resource management needs of the 21st century.

Strategy for Implementation: The District uses money from the Water Management Trust Fund and Preservation 2000 to acquire fee title or other interest in lands needed to manage, protect, and conserve the State's water resources. As part of its process in acquiring these lands, the District must consider the property's manageability, surface and ground water systems, and the formation of corridors for the critical interaction of wildlife populations. In managing these public lands, the District ensures the maintenance of water resources, fish and wildlife populations, and native plant communities in an environmentally acceptable manner. The District also opens these lands for appropriate recreational use consistent with their environmental sensitivity.

Responsible Partner and Project Coordinator: Fred Davis, Director, Land Stewardship Division, South Florida Water Management District (SFWMD), West Palm Beach; William Malone, Director, Construction and Land Management Department, SFWMD West Palm Beach. The Water Management Lands Trust Fund and The Florida Preservation Trust Fund (P2000), both administered by Florida Department of Environmental Protection, provide funding.

Other Project Partners: Other government agencies and the private sector may assist the District with the care of these lands through the design in implementation of appropriate stewardship programs.

Geographic Area: The Save Our Rivers program is state-wide. The South Florida Water Management District manages the program within their boundaries.

Expected Benefits and/or Drawbacks: Land acquired and managed for conservation.

Project Timeline/Schedule: Started in 1981.

Status: Continuous.

Resources/Funding
Available: Water Management Trust Fund and Preservation 2000.
Needed:
Potential:

Reference Documents: http://www.sfwmd.gov

Comments:

Lower West Coast Water Supply Plan

Contact Person Name: Mark Elsner
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FAX Number:
E-mail Address: melsner@sfwmd.gov

Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-B

Project Description: The Lower West Coast (LWC) Water Supply Plan is a state-required regional water supply plan that serves as a guide for addressing future water demands in southwest Florida. The purpose of the plan is to set a framework around which future water use decisions on the LWC Planning Area can take place. The LWC Planning Area is approximately 4,300 square miles and includes all of Lee County, most of Collier and Hendry counties, and portions of Charlotte, Glades, Dade, and Monroe counties.

The plan is to be used as a tool to guide decisions regarding planning, research, funding, and regulatory issues related to water supply in the LWC Planning Area. The goal of the plan is to assure the availability of an adequate supply of water for all competing uses in the Lower West Coast Planning Area deemed reasonable and beneficial while maintaining the functions of the natural systems. The plan will include three documents: a planning document, a background document, and appendices.

The major factors influencing the plan are those that influence the availability of water. These include:

1) dependency upon rainfall within the planning area;
2) limited surface water sources;
3) protection of water resources and associated natural systems; and
4) pressure on these resources from increasing urban and agricultural demands.

The plan is updated every five years.

Strategy for Implementation: The plan makes future water demand projections and sets a water use framework which is implemented by the District through regulatory, research, planning, construction, operational, land management, and acquisition actions. The plan will also be implemented through actions taken by other governmental entities and public or private organizations.

Responsible Partner and Project Coordinator: Mark Elsner, Project Manager/ Supervising Senior Planner, South Florida Water Management District, West Palm Beach, Florida.

Other Project Partners: Local governments, water suppliers, and water users.

Geographic Area: Lower west Coast of Florida (approximately 4,300 square miles and includes all of Lee County, most of Collier and Hendry counties, and portions of Charlotte, Glades, Dade, and Monroe counties).

Expected Benefits and/or Drawbacks: Projection of water demands and recommendations for certain actions take place within the planning horizon – between now and the year 2010.

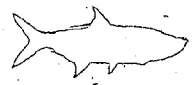
Project Timeline/Schedule: To be completed in 2000.

Status: In progress.

Resources/Funding
Available: South Florida Water Management District funding.
Needed:
Potential:

Reference Documents: http://www.sfwmd.gov.

Comments:



Turtle Time, Inc. Education and Monitoring Activities

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-T

Project Description: Monitoring of all sea turtle activity from Bowditch Point, Estero Island to the Lee-Collier County line each morning from May 1 through October 31. This includes identifying all nesting and non-nesting emergences, protecting nests from predators and people-related activities, checking the beach and nests at night to ensure that no visible lights will disorient nesting turtles or their hatchlings, removing dead or injured turtles from the beach or waters, conducting necropsies to determine cause of death. All scientific data is submitted to the Florida Marine Research Institute of the Department of Environmental Protection (DEP) and the U.S. Fish and Wildlife Service (USFWS). In addition, during turtle season and outside of season, many educational programs are provided to school children of all ages from kindergarten to high school, including special programs for hearing impaired children, clubs, law enforcement, visitors, condo associations, libraries, marine related businesses, etc., throughout Lee County. Turtle Time participates in may local environmental fairs, has a permanent exhibit at the Ostego Bay Foundation on Fort Myers Beach, and provides yearly sea turtle exhibits at Lee County libraries. Turtle Time has supervised several high school students for their school/community service projects. Seventy-five volunteers assist in the monitoring of marine turtle activity on Estero Island, Big Hickory Island and Bonita Beach (Little Hickory Island).

Strategy for Implementation: Public awareness programs presented to schools, agencies, clubs, and visitors; World Wide Web outreach program, etc.

Responsible Partner and Project Coordinator: Turtle Time, Inc., Eve Haverfield, Director.

Other Project Partners: Turtle Time volunteer Eve Haverfield assists Lee County Environmental Services (Lee County Government) with the Lee County sea turtle lighting regulation.

Geographic Area: The Estero Bay study area.

Expected Benefits and/or Drawbacks: To increase awareness of the conservation and recovery of marine turtles and their habitat.

Project Timeline/Schedule: Ongoing.

Status: In process.

Resources/Funding
Available: Private donations.
Needed: Funds for field equipment - posts, tape, screens, laptop computer ($3,500).
Potential: West Coast Inland Navigational District (WCIND).

Reference Documents: Webpage: http://www.swflorida.com/turtletime; interactive CD-ROM; Educational brochures in English, Spanish and German; art-quality posters; "New Visitor" flyers to all beach front hotels/condos; light-switch stickers (reminders to beach residents concerning lights and sea turtles); interpretive panels at various Lee County beach parks; sea turtle signage on all beach accesses; visitor and convention bureau environmental booklet; Department of Environmental Protection (DEP) Marine Turtle Permit #003.

Comments: Advancing the recovery process of endangered and threatened marine turtles despite increasing environmental stresses.

Exotic Species Control On Sanibel Island

Contact Person: Louis S. Hinds, III
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U.S. Department of the Interior
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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: In 1996, the J.N. "Ding" Darling National Wildlife Refuge (Refuge) entered into a Cooperative Agreement with the City of Sanibel (City) and the Sanibel-Captiva Conservation Foundation (SCCF) for the purpose of joining resources to better conduct habitat management projects through a landscape-level perspective. Objectives include: 1) To achieve elimination or control of invasive exotic plants that threaten native floral and faunal biodiversity by mechanically treating areas of heavy infestation and thereby restore native plant communities and reduce seed source problems on Sanibel Island; and 2) To foster effective and coordinated federal government, local government and private entity partnership approaches to ecosystem management through native vegetative community restoration throughout all infested habitats on Sanibel Island.

We received $25,000 in Challenge Cost Share funds for the purchase of a medium-sized bulldozer (D-4) to be used in clearing invasive exotic plants on ecosystems of Sanibel Island. Partners contributed $25,000 toward the bulldozer (66.6% cost share). The bulldozer has already been purchased and will be dedicated to exotic species control by partners.

The project involves mechanical clearing of invasive exotic plants via root-raking in heavily infested parcels under multiple ownerships (see attached map) on a schedule prioritized by project partners. The proposed, partnered bulldozer purchase will facilitate coordinated invasive exotic species elimination and control across all affected ecosystems of Sanibel Island.

Strategy for Implementation: The Refuge, the City of Sanibel, and Sanibel-Captiva Conservation Foundation (SCCF) cost-shared the purchase of a medium-sized bulldozer. The partners will develop annual rotation schedules for equipment use and equipment operator's schedule. The strategy also calls for hiring and equipment operator, cost-shared by each partner including SCCF and the City of Sanibel, to match future equipment operator salary costs.

Treated parcels will be evaluated in the short-term by respective supervisors on an annual basis. Supervisors will survey their respective parcels for acreage of post-treatment exotic plant infestation development. These can be ranked annually based on the proportion of infested acreage of the total parcel acreage size, access and logistical obstacles. Long-term evaluation will be conducted by establishing trends in annual average proportions of re-infestation acreage in all treated parcels.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service (USFWS), J.N. "Ding" Darling NWR, Louis S. Hinds III, Refuge Manager.

Other Project Partners: The City of Sanibel and the Sanibel-Captiva Conservation Foundation (SCCF).

Geographic Area: Refuge, City of Sanibel and the Sanibel-Captiva Conservation Foundation (SCCF) natural areas on Sanibel Island.

Expected Benefits and/or Drawbacks: A coordinated invasive exotic species control program that involves non-federal partners will enhance landscape-level native habitat restoration efforts. Benefits would accrue to endangered and threatened species and resident and migratory birds by providing off-refuge nesting, roosting, and foraging habitat. Landscape-level restoration enhances the concept of metapopulations viability by potentially creating a local recruitment "source" (as opposed to a population "sink") for important locally breeding birds. Such efforts will also potentially provide for expansion of rare and endangered plant populations on the island as potential habitat is opened.

Project Timeline/Schedule: Challenge cost-share grant was submitted in October, 1997 for funding in Fiscal Year 1998. The bulldozer was purchased in Fiscal Year 1999.

Status: Purchase completed Fiscal Year 1999, implementation ongoing.

Resources/Funding
Available: The three partners have contributed $25,000 each and requested $25,000 in Challenge Cost Share funds towards the purchase.
Needed: Operations and Maintenance funds of $15,000/year (Refuge's share of future equipment operator salary cost and maintenance for bulldozer).
Potential: $15,000/year matching funds from each partner including Sanibel-Captiva Conservation Foundation and City of Sanibel to match future equipment operator salary cost and maintenance for bulldozer.

Reference Documents: FY 1998 Challenge Cost Share Project Proposal submitted to U.S. Fish & Wildlife Service, Southeast Region (for purchase of bulldozer), South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.1, 2.1, 3.1, 4.1, 5.1, 6.1 and 7.1). This project compliments Sanibel Island's "Pepper Busters" program, a privately-funded initiative, whose members have conducted many high visibility Brazilian-pepper removal projects on the Island. These projects have enlightened and educated the local citizenry about the problems of invasive exotic plants and have begun to swing local public opinion in favor of intensive invasive exotic plant control. We are hopeful that this initiative will carry throughout south Florida. Even if the Refuge does not hire an equipment operator, we still need to develop a means of providing an operator and funding the position.

Partners For Fish and Wildlife Program/Challenge Grant Cost-Share

Contact Person: Paula Hulupa
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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: The U.S. Fish and Wildlife Service's (USFWS) Partners for Fish and Wildlife Program (Partners) was established to develop partnerships with private landowners, local governments and non-governmental organizations to restore, enhance and protect wildlife habitat beyond our agency's borders. The Partners program is implemented in south Florida by the Service's South Florida Ecosystem Team. Projects are ranked based on established criteria including: 1) Projects that reestablish original wetland vegetation and hydrology on at least 70% of the project site, non-wetland sites that provide benefits to threatened and endangered species, unique habitat types, or are important for ecosystem restoration purposes pursuant to the Multi-Species Recovery Plan of Florida (i.e., endangered species habitat corridor links, exotic species control, etc.) receive first priority; and 2) Projects that establish wetland vegetation and hydrology different from what originally occurred but at least partially restore original functions and values receive second priority.

Challenge Cost-Share projects are submitted to the USFWS Southeast Region (Region 4) by the requesting field stations to fund mutually beneficial fish and wildlife conservation projects on private and public lands. Federal dollars are matched (50% minimum including "in-kind" contributions) by non-federal public and private institutions, organizations and individuals. The focus is to encourage mutual shared interest and participation that will increase public awareness and participation in communities for resource conservation. These Challenge Cost-Share projects are reviewed, prioritized and selected by the Geographic Assistant Regional Director for each area (our area being "Area III") for the applicable fiscal year allocation.

Strategy for Implementation: The Service recently selected a South Florida Ecosystem Private Lands Biologist stationed at the Florida Panther National Wildlife Refuge (NWR) in Naples, Florida. This biologist will be charged with continuing the prioritization of annual ecosystem restoration and enhancement projects and associated cooperative agreements including those submitted from the Charlotte Harbor NEP study area.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service (USFWS), Florida Panther National Wildlife Refuge (NWR), Paula Hulupa, Private Lands Biologist. Layne Hamilton, Assistant Manager at J.N. "Ding" Darling NWR will continue to work with the Partners program through Fiscal Year 1999.

Other Project Partners: Ranchers, farmers, residential community planners, non-governmental conservation organizations, and local government natural resource managers in the Charlotte Harbor NEP study area and the South Florida ecosystem.

Geographic Area: South Florida Ecosystem, Charlotte Harbor NEP study area.

Expected Benefits and/or Drawbacks: Ecosystem-wide restoration and enhancement projects with a landscape-level approach should enhance the opportunity to restore ecosystem functions, processes and values across political boundaries. Longevity of restoration and enhancement projects are extended through cooperative agreements that entail maintenance for specified periods of time.

Project Timeline/Schedule: Ongoing since 1994. The private lands biologist position was filled in early Fiscal Year 1999. Funding requests will be allotted on an annual basis to projects selected from established criteria.

Status: Ongoing.

Resources/Funding
Available: Partners for Fish and Wildlife Habitat Restoration 1121 budget element, Refuge Challenge Cost Share 1261 funds, Migratory Bird Management and North American Waterfowl Management Plan 1230 funds and North American Wetlands Conservation Act grant funds. At least 70% of allocated project funds must be used in actual on-the-ground project implementation.
Needed: Currently, $53,000/year is used to fund Partners projects in south Florida. An estimated $100,000/year will be required to fund Partners projects (including overhead, salary, travel, etc.) within the Charlotte Harbor NEP study area.
Potential: Some funding sources will vary with partner willingness and potential and Refuge Challenge Cost Share prioritization. Other Service funding sources that may be instrumental in supporting private lands habitat projects in the future include 1113 Endangered Species Recovery funds and 1332 Fish and Wildlife Assistance funds. Federal Aid/Farm Bill conservation programs, including the Wetland Reserve Program (WRP), may also provide viable funding sources.

Reference Documents: South Florida Partners for Fish and Wildlife Program (policy guidelines); U.S. Fish and Wildlife Service - Region 4 Partners for Fish and Wildlife webpage, South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.1, 1.2, 1.4, 2.2, 2.3, 2.4, 3.1, 3.2, 4.1, 4.2, 4.3, 4.4, 5.1, 5.3, 6.1, 6.4, 7.1, and 7.4). There exists a significant need in south Florida for an increased private lands conservation initiative. South Florida represents one of the fastest growing population centers in the United States. Many counties (i.e., Lee, Charlotte Hendry, and Glades) have little if any public-owned natural areas. Future projects in southwest Florida should continue to emphasize restoration of unique/rare habitats, riparian zones, areas adjacent to or related to the direct health of a National Wildlife Refuge, and or provide an opportunity to restore an area and provide public outreach about the South Florida Ecosystem and the Service.

J. N. "Ding" Darling National Wildlife Refuge Exotic Plant Control Plan

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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: J. N. "Ding" Darling NWR is primarily infested with two invasive, exotic species (Brazilian-pepper and Australian pine) and approximately a dozen less-invasive exotic plant species. The exotic plants out-compete many of the native plants in the unique West Indian hardwood hammocks on the refuge. Many state-listed threatened and endangered plants occur in these areas. These two invasive exotic species are currently listed as "Category I invasive exotics" by the Florida Exotic Pest Plant Council.

The majority of our refuge's exotic species control focuses on Brazilian-pepper control. Annual plans are developed that identify treatment areas (Brazilian-pepper control units) and schedule their herbicide treatment. Minimum amounts of herbicide to be applied in control units and employee responsibilities during treatment are also outlined in the plan. Exotic plant control on the refuge consists of herbicide application (basal bark and foliar spraying), mechanical removal (dozing and mowing), manual removal (hand-pulling seedlings and small trees), and prescribed burning. Due to inaccessible locations and the large number of exotic plants, control is tedious, labor-intensive, and time consuming. Exotic plant control must be very selective to protect the unique native plant communities.

At the end of each performance year, a record of the treatment accomplished for each unit is completed. The annual plans and performance records are filed with the Exotic Plant Control Plan. The objective of the Exotic Plant Control Plan is to achieve a "maintenance level of control" where annual spot treatments are scheduled to re-treat areas with less than 100 percent kills and re-sprouts.

Strategy for Implementation: Annual plans are developed that identify treatment areas (Brazilian-pepper control units) and schedule their herbicide treatment. In burn units, theses plans follow prescribed burns (on a scheduled three-year rotation) as access and visibility is improved. A vessel will be required to transport heavy equipment to refuge-administered spoil islands for control efforts. Minimum amounts of herbicide to be applied in control units and employee responsibilities during treatment are also outlined in the plan. At the end of each performance year a record of the treatment accomplished for each unit is completed. The annual plans and performance records are filed with the Exotic Plant Control Plan.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service, J.N. "Ding" Darling National Wildlife Refuge (NWR), Louis S. Hinds III, Refuge Manager.

Other Project Partners: City of Sanibel, Lee County Tourism Development Council.
Geographic Area: J.N. "Ding" Darling National Wildlife Refuge (NWR), Sanibel Island.

Expected Benefits and/or Drawbacks: Objectives include: To protect and enhance the biotic integrity of native subtropical habitats existing on the refuge and promote biodiversity conservation for protecting native flora and fauna including federal trust resources (i.e., threatened and endangered species and migratory birds) through the control of invasive exotic plants.

Project Timeline/Schedule: Ongoing.

Status: Ongoing.

Resources/Funding
Available: $68,000 based on 1998 expenses (including $50,000 [salaries], $9,000 [chemicals], $7,000 [equipment contracts], $900 [supplies], and $1,100 [exotic tree removal]).
Needed: $50,000/year for implementation of Exotic Species Control Plan (salaries & chemicals) $100,000 funding for purchase of heavy equipment transport vessel to allow exotic species control on refuge-administered spoil islands.
Potential: Collaboration among state and local government agencies and private landowners to join in the control efforts to restore habitat and reduce seed sources. The U.S. Fish and Wildlife Service provides mechanisms to assist other entities in protecting diverse, native resources through our Partners for Wildlife Program. Potential grant funds from other, yet to be identified, sources.

Reference Documents: J. N. "Ding" Darling National Wildlife Refuge Exotic Plant Control Plan, South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.1, 2.1, 3.1, 4.1, 5.1, 6.1, and 7.1). Natural resource agencies responsible for controlling invasive exotic plants have come to terms with the fact that complete eradication of these plants is not feasible. An effective control strategy will only be realized when and if state, county, and city government agencies and private landowners join in the control efforts to reduce the resulting habitat degradation and existing seed sources that prevail within their political boundaries. The U.S. Fish and Wildlife Service provides mechanisms to assist other entities in protecting diverse, native resources through our Partners For Wildlife Program. As the exotic plant problem on the refuge is brought under control, some positions may eventually be utilized off-refuge to assist with exotic plant control on other refuges, public lands, private lands, and various conservation lands within the ecosystem.

Refuge Boundary Buffer Establishment for Land Acquisition of the J.N. "Ding" Darling National Wildlife Refuge Complex

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-K

Project Description: The J.N. "Ding" Darling National Wildlife Refuge's (NWR's) acquisition expansion area covers approximately 14,000 acres within Charlotte and Lee Counties near Ft. Myers, Florida. Subsequent to acquisition of parcels within the proposed expansion area, the refuge will plan and implement a signage program to protect bird rookeries and shallow water areas containing seagrasses and pursue management agreements with the State of Florida to identify "no motor zones" and "limited access zones" (including idle speed zones) in shallow areas adjacent to parcels to establish buffers.

Strategy for Implementation: The Refuge has submitted a Preliminary Project Proposal for the Proposed Expansion of the J. N. "Ding" Darling National Wildlife Refuge Complex that is currently under review at the Service's Southeast Region. Upon approval, the Service's Washington D.C. office will review and consider the project for approval. After approval, public comment will be solicited and a land protection plan and an Environmental Assessment prepared for the expansion of the refuges. Following approval, parcels that are available from willing sellers will be identified and prioritized for acquisition. Upon receiving title to acquired lands, the refuge will schedule refuge boundary posting and buffer signage at active rookery and roost sites. Buffer signage will include buffer posting out to 100 meters from parcels as per current recommendations in the scientific literature. Buffer posting will require establishing management agreements with the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida on identified parcels to manage for public purposes all lands titled in the Board (including islands, tidal lands, and sovereignty submerged lands) in those identified parcels. These management agreements will be pursued as per Chapter 253.03, Florida Statutes and the National Wildlife Refuge Administration Act, 16 U.S.C. § 668dd et seq. The refuge will coordinate this activity with the Department of Environmental Protection (DEP) which regulates signage in sovereignty submerged lands of Florida.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service (USFWS), J.N. "Ding" Darling NWR, Louis S. Hinds III, Refuge Manager.

Other Project Partners: Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, Florida Department of Environmental Protection (DEP), Florida Fish & Wildlife Conservation Commission, and the Charlotte Harbor National Estuary Program.

Geographic Area: J.N. "Ding" Darling National Wildlife Refuge (NWR) complex including Pine Island NWR, Matlacha Pass NWR, and Caloosahatchee NWR.

Expected Benefits and/or Drawbacks: "No motor zones", "limited access zones" and buffer posting establishment will protect seagrass beds and other marine resources in shallow water areas adjacent to acquired parcels and migratory birds using area rookeries and roosts.

Project Timeline/Schedule: Preliminary Project Proposal has been submitted and is being reviewed. The Environmental Assessment will not likely be completed until 2001. Acquisition will depend on parcels being available from willing seller and prioritization for acquisition.

Status: Preliminary Project Proposal has been submitted and is being reviewed.

Resources/Funding
Available: None.
Needed: $50,000/year funding for watercraft and two to three temporary hire positions, $20,000 for equipment (jet pump, signage, posts, fuel, etc.), $5,000/year for annual maintenance.
Potential: None.

Reference Documents: Preliminary Project Proposal for the Proposed Expansion of the J. N. "Ding" Darling National Wildlife Refuge Complex, South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.6, 2.3, 2.4, 2.6, 4.6, 6.6). As the first few parcels are acquired, a pilot monitoring project will be implemented to compare posted parcels vs. non-posted control parcels to investigate if buffer posting is effective and justifiable for future acquired parcels. This pilot-monitoring project can be conducted by an intern, undergraduate, or graduate student from a local university.

Interagency Task Force Participation

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-L

Project Description: Refuge wildlife officers, including collateral duty enforcement officers, will participate in an interagency task force with law enforcement officers from other agencies to coordinate and reduce conflicts, increase public awareness regarding violations and impacts to resources, and to interact in workshops with enforcement officers, attorneys, and judges to address environmental issues and enforcement.

Strategy for Implementation: Refuge law enforcement officials will coordinate law enforcement needs and strategies with other task force participants in the Charlotte Harbor NEP study area.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service (USFWS), J.N. "Ding" Darling NWR, Louis S. Hinds III, Refuge Manager.

Other Project Partners: County Sheriffs, Florida Marine Patrol, Florida Fish & Wildlife Conservation Commission, Florida State's Attorney Office, U.S. Coast Guard, City of Sanibel.

Geographic Area: Charlotte Harbor NEP study area.

Expected Benefits and/or Drawbacks: Increased coordination of enforcement activities in environmentally sensitive areas, reduced violations of existing wildlife and habitat laws.

Project Timeline/Schedule: Not identified yet.

Status: Planned.

Resources/Funding
Available: None.
Needed: $125,000 first year (including new vessel, new position itself and signs), $65,000/year thereafter (salaries and overhead).
Potential: See "Other Project Partners" above.

Reference Documents: South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.5, 2.5, 3.5, 4.5, 5.5, 6.5). Unregulated public use adversely affects endangered species, migratory birds and other wildlife. In acquiring new land parcels, the Service will coordinate with the State of Florida to seek concurrent law enforcement jurisdiction over the area.

Tarpon Bay Recreation Area Channel Dredging/Extension

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-O

Project Description: The U.S. Fish and Wildlife Service will procure required permits from the Department of Environmental Protection (DEP) to dredge and extend the Tarpon Bay Recreation Area boat launching ramp channel to allow low impact water craft traffic (canoes, kayaks, small outboard engine boats) and to protect shallow benthic habitats from associated propeller-scarring and turbidity. Channel dredging will be planned so as to provide for a maximum 5-foot draft allowance at mean low tide (-0.4 feet national geodetic vertical datum [NGVD]).

Strategy for Implementation: Refuge staff will develop a Florida Department of Environmental Protection Environmental Resource Permit Application detailing the project description and objectives, project justifications, construction specifications and illustrations, equipment requirements and use, time-lines, etc. Upon receipt of permit, the Refuge will plan, implement and coordinate construction activities with a contractor and provide oversight to permitted channel enhancement activities.

Responsible Partner and Project Coordinator: U. S. Fish and Wildlife Service, J.N. "Ding" Darling National Wildlife Refuge (NWR), Louis S. Hinds III, Refuge Manager.

Other Project Partners: Tarpon Bay Recreation, Inc., Florida Department of Environmental Protection.

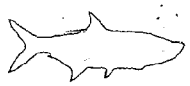
Geographic Area: J.N. "Ding" Darling National Wildlife Refuge (NWR), Sanibel Island at Tarpon Bay Recreation Area boat launching ramp.

Expected Benefits and/or Drawbacks: Reduced boat impacts to benthic habitats, improved water quality (reduced turbidity).

Project Timeline/Schedule: Application procedures and channel enhancement/dredging to be initiated/completed during Fiscal Year 2000.

Status: Planned.

Resources/Funding



Available: None.
Needed: $50,000.
Potential: Funds to complete this project will be identified through the U.S. Fish and Wildlife Service annual budget request to Congress. Additionally, partnership opportunities will be investigated.

Reference Documents: South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.6 and 6.3). This area of the Refuge is opened to boating and fishing, including certain commercial net fishing (i.e., cast-netting, bait shrimp trawling). During 1993, several city, state, and Refuge regulations were implemented that increased the protection of the resources in this environmentally sensitive area. This project will complement those actions.

Wildlife Drive Water Control Structure Rehabilitation Project

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-R

Project Description: Increased tidal flushing and nutrient and biota exchange between the tidally-influenced estuary and the refuge's east and west impoundments will promote the establishment of an adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region. Water management will attempt to mimic regional hydrologic cycles (i.e., tidal cycles) and make habitats available during critical periods. This project also addresses essential fish habitat associated with the Magnuson-Stevens Sustainable Fisheries Act (Act). The Act is administered by the National Marine Fisheries Service (NMFS) and requires federal agencies to consult with the Secretary of Commerce, through the NMFS on any activities that may adversely affect essential fish habitat.

Currently, the West Impoundment is opened only during summer months when salinities, dissolved oxygen levels, or water levels exceed planned management objectives. The East impoundment is open to tidal flows for seven or eight months each year (generally October-May). This allows for the exchange of nutrients and larval, immature, and adult fin- and shellfish between the impoundment and the estuary. Water control structures (WCS) are opened during the summer only to reduce flooding associated with precipitation, or to reduce salinities and raise water levels during an extended drought.

However, to allow for increased access for marine organisms and for nutrient exchange as well as to rehabilitate the ecological function of impounded wetlands without compromising mosquito control activities, we must consider increasing volume flows through refuge WCS to increase tidal influence.

Therefore, WCS need to be replaced with larger structure capable of providing increased flow volumes to meet management objectives. Objectives of the proposed project (entitled the "Wildlife Drive Water Control Structure Rehabilitation Project") include: 1) To replace five WCS (structures #1, #4, #5, #6 and #7) serving impounded intertidal estuarine wetlands of the J.N. "Ding" Darling National Wildlife Refuge (NWR); 2) To improve tidal flushing, water conveyance and flow volumes of WCS #1, #4, #5, #6 and #7) within the east and west impoundments of the J.N. "Ding" Darling NWR; and 3) To add WCS #8 to allow flushing the far western reaches of the West impoundment.

Strategy for Implementation: The refuge has already submitted a Department of Environmental Protection Environmental Resources Permit for replacing structures #1, #4, #5, #6 and #7 in this project. The refuge plans to submit a Florida Department of Environmental Protection Environmental Resources Permit Application for water control structure (WCS) #8 during fiscal year 2000. The entire construction period is estimated at five to seven months. Water flow will not be affected during the majority of the work as only two WCS will be replaced at any given time and these impoundments are closed off to tidal flow to prevent salt marsh mosquito breeding during this time of year anyway. The Wildlife Drive will be closed off to vehicular traffic during the construction period with the exception of guided tram tours allowed in those areas where construction is either not yet initiated or already completed.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service, J.N. "Ding" Darling National Wildlife Refuge (NWR), Louis S. Hinds III, Refuge Manager.

Other Project Partners: Lee County Electric Cooperative.

Geographic Area: J.N. "Ding" Darling NWR, Sanibel Island.

Expected Benefits and/or Drawbacks: Improve tidal flushing and nutrient/biota exchange with the tidal estuary.

Project Timeline/Schedule: The entire construction period is estimated at five to seven months beginning in spring 1999. Plans include first priority replacement of water control structures (WCS) #1 and #5 in the East Impoundment. Also, WCS #2 will be removed and permanently closed off. This structure is no longer needed. WCS #4, #6, #7, and #8 in the West Impoundment are scheduled to be replaced in spring/summer 2000 or thereafter.

Status: In progress.

Resources/Funding
Available: During 1998, the Refuge received a commitment for $490,000 for the replacement of four water control structures (WCSs) from the Land and Water Conservation Fund (LWCF).
Needed: $125,000 for WCS #8.
Potential: None.

Reference Documents: South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.2, 2.2, 3.2, 4.2, 5.3, 6.2, 6.4, 7.2). Water flow will not be affected during the majority of the work as only two water control structures (WCS) will be replaced at any given time and these impoundments are closed off to tidal flow to prevent salt marsh mosquito breeding during this time of year anyway. The Wildlife Drive will be closed off to vehicular traffic during the construction period with the exception of guided tram tours allowed in those areas where construction is either not yet initiated or already completed. Removed culvert material will be donated for use as artificial reefs.

J.N. "Ding" Darling Water Control Structures (NWR) Annual Water Management Plan

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-R

Project Description: Increased tidal flushing and nutrient and biota exchange between the tidally-influenced estuary and the refuge's West Impoundment and restoration of these natural processes will promote the establishment of an adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region. Regional hydrologic cycles shaped the life history strategies that wetland invertebrates have evolved in. Management will attempt to mimic regional hydrologic cycles (i.e., tidal cycles) and make habitats available during critical periods while not compromising mosquito control activities during the mosquito breeding season. This project also addresses essential fish habitat associated with the Magnuson-Stevens Sustainable Fisheries Act (Act). The Act is administered by the National Marine Fisheries Service (NMFS) and requires federal agencies to consult with the Secretary of Commerce, through the NMFS on any activities that may adversely affect essential fish habitat.

Impacts of wetland impoundment on indigenous marsh/mangrove fish and crustacean species (including snook, tarpon, striped mullet, red and black drum, shrimp, and blue crab) have resulted either from direct death of mangrove or salt marsh grasses following prolonged impoundment flooding, limited access to passive/active migration, or loss of feeding sites or preferred food organisms. Cumulative fish and wildlife impacts from standing water associated with impounding marsh and mangrove forest communities are directly associated with vegetative and hydrologic changes. Sediment and organic material accretion, tidal water column reduction, and water quality declines associated with eutrophication in subtropical/tropical climates cause available aquatic habitat to decline in quality and quantity. Consequently, only those aquatic organisms adapted to eutrophic, anoxic conditions tend to survive. It is likely, therefore, without major anthropogenic energy subsidies, species diversity will decline in impounded mangrove forest aquatic communities, with periodic mass mortalities of sensitive aquatic organisms.

Typically, in pristine estuarine intertidal wetlands, species diversity is low but productivity is high. Estuarine-dependent species comprise more than 95% of commercial fishery harvests from the Gulf of Mexico. Many important recreational sportfish also depend on estuaries during some part of their life cycle. Studies on structural marsh management have consistently shown significant decreases in production of most economically important marine fisheries. This is related to the lack

of access of the fisheries and macroinvertebrates communities, compounded by the lack of nutrient exchange in impounded areas that are divorced from the estuarine system. Resident crustaceans or fish populations that require intertidal substrate exposure to atmosphere as part of their life cycle can be eliminated in the absence of tidal influence.

Strategy for Implementation: Annual impoundment wetland management plans should include provisions to allow access for marine organisms and for nutrient exchange. Therefore, this plan calls for opening the impoundment for four months (February-May) to allow for the exchange of nutrients and larval, immature, and adult fin- and shellfish between the impoundment and the estuary. This strategy allows for tidally-influenced nutrient and biotic exchange without compromising mosquito control and coincides with the period when the highest available tidal oscillation or "spring tides" occur. In summer months, water control structures will be opened only to reduce flooding associated with precipitation, to reduce salinity levels, increase dissolved oxygen levels when hypoxic conditions persist, or to raise water levels during an extended drought.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service (USFWS), J.N. "Ding" Darling National Wildlife Refuge (NWR), Louis S. Hinds III, Refuge Manager.

Other Project Partners: Lee County Mosquito Control District.

Geographic Area: J.N. "Ding" Darling National Wildlife Refuge (NWR), Sanibel Island.

Expected Benefits and/or Drawbacks: Increased tidal flushing and nutrient/biota exchange between the tidally-influenced estuary and the refuge's West Impoundment and restoration of these natural processes will promote the establishment of an adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region.

Project Timeline/Schedule: To be implemented in February 1999 and annually thereafter.

Status: Planned.

Resources/Funding
Available: Portion of annual base salary for GS-11 Wildlife Biologist ($19.21/hour * 40.0 hours = $768.40/week).
Needed: Continued annual funding needed to update/develop annual water management plans.
Potential: None.

Reference Documents: J.N. "Ding" Darling National Wildlife Refuge (NWR) Annual Water Management Plan; Environmental Protection Agency (EPA) 1998 SAB Report: Ecological impacts and evaluation criteria for use of structures in marsh management, South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objectives 1.2, 2.2, 3.2, 4.2, 5.3, 6.2, 6.4, and 7.2).

Expansion of the Acquisition Boundary of the J.N. "Ding" Darling National Wildlife Refuge Complex

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Quantifiable Objectives Addressed: FW-1

Priority Actions: FW-S

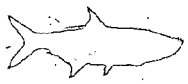
Project Description: The U.S. Fish and Wildlife Service (USFWS), Southeast Region, proposes to expand the acquisition boundaries of the J. N. "Ding" Darling National Wildlife Refuge Complex for Pine Island National Wildlife Refuge (NWR) (3,882 acres), Matlacha Pass NWR (6,953 acres), and Caloosahatchee NWR (2,978 acres). In the early 1990s, the J. N. "Ding" Darling NWR went through the preliminary project proposal process for boundary expansion. The Final Environmental Assessment was approved in July 1994. This current proposed expansion area covers 13,813 acres within Charlotte and Lee Counties near Ft. Myers, Florida. The acquisition boundary expansion will expedite the refuge's ability to protect coastal wetland habitats primarily consisting of estuarine intertidal wetlands dominated by mangrove forests, seagrasses and salt marshes, freshwater wetlands, beach and dune areas, and West Indian hardwood hammocks. Acquisition within the expansion area will contribute to meeting high priority habitat protection goals of the Charlotte Harbor NEP study area.

Strategy for Implementation: The Refuge has submitted a Preliminary Project Proposal for the Proposed Expansion of the J. N. "Ding" Darling National Wildlife Refuge Complex which is currently under review at the Service's Southeast Region. Upon approval, the Service's Washington D.C. office will review and consider for approval. After approval, public comment will be solicited and a land protection plan and an Environmental Assessment will be prepared for the expansion of the refuges. Following approval, parcels that are available from willing sellers will be identified and prioritized for acquisition.

Responsible Partner and Project Coordinator: U.S. Fish and Wildlife Service, J.N. "Ding" Darling National Wildlife Refuge (NWR), Louis S. Hinds III, Refuge Manager.

Other Project Partners: Interagency management agreements may be required to protect some parcels. Partners may include the State of Florida, Army Corps of Engineers, Department of Environmental Protection, Sanibel-Captiva Conservation Foundation, Lee County Conservation 2020, Trust for Public Lands, Calusa Land Trust and others (all potential partners not identified yet).

Geographic Area: Pine Island Sound, Matlacha Pass, and the Caloosahatchee River.



Expected Benefits and/or Drawbacks: Protection, enhancement and restoration of environmentally sensitive lands and associated flora and fauna, federal trust resources and their habitats, including federally listed endangered and threatened species and migratory birds.

Project Timeline/Schedule: Submitted for review and approval to Service's Southeast Region in April 1998. Final approval expected by December 1999.

Status: In review.

Resources/Funding

Available: Funding for fee title land acquisition would be sought through the Land and Water Conservation Fund as authorized by the Fish and Wildlife Act of 1956, as amended (16 USC § 742j), Migratory Bird Conservation Act, Endangered Species Act, etc.

Needed: Funds will be needed to survey the new acquisition boundaries, post those boundaries, identify archeological sites, and remove invasive exotic plants. Management funding will be requested through the "Refuge Operational Needs" System once lands have been acquired. It is estimated that $250,000/year will be necessary to convey new lands and waters into the administrative and management control of the Service. These funds will be used to procure supplies, services and seasonal/part-time staff to accomplish complex protection and wildlife management objectives.

Potential: Although the method of acquisition is often unpredictable, (due to circumstances such as seller's preference, cost, changing land values, etc.) it is anticipated that many of the needed property interests for the proposed refuge additions can be acquired through interagency management agreements and partnership/collaborative purchases.

Reference Documents: Preliminary Project Proposal for the Proposed Expansion of the J. N. "Ding" Darling National Wildlife Refuge Complex, South Florida Ecosystem Team's Ecosystem Plan.

Comments: Addresses South Florida Ecosystem Team's Ecosystem Plan (Objective 1.3 [strategy 1.3.1]). Unregulated public use adversely affects endangered species, migratory birds and other wildlife. In acquiring these lands, the Service will coordinate with the State of Florida to seek concurrent law enforcement jurisdiction over sovereign submerged lands within refuges acquisition boundary.

Central and Southern Flood Control Restudy

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-B, HA-H, HA-L, HA-M, HA-N, HA-O

Project Description: Restore ground water levels to improve or mitigate for hydrologic alterations in Estero Bay; prevent or reduce future impacts to the hydrology of the Charlotte Harbor watershed; support modeling to determine the best remedy to improve hydrologic benefits to reconstructing the Sanibel Causeway; identify gaps in flow data; and, insure that the Charlotte Harbor NEP office is represented and involved in the restudy of the central and south Florida project.

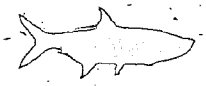
Strategy for Implementation: The Charlotte Harbor National Estuary Program (NEP) has a responsibility to audit any results and findings on the effects of management of the Caloosahatchee system. The Corps of Engineers will work within its rules, regulations and applicable laws to assist State and local agencies in the restoration of ground water levels and wetlands. While aware of wetland losses throughout the State, the Corps cannot initiate restoration actions on its own. Before navigation projects are undertaken, an Environmental Impact Statement or an Environmental Assessment is prepared to outline the project's impacts and offer alternatives as well as mitigation measures needed to reduce those impacts. These documents are available for public review and comment to insure input from the largest audience possible. Flow data are collected at a real-time flow data station located on the Caloosahatchee River.

Responsible Partner and Project Coordinator: Corps Hydrology - John Hashtak, (904) 232-2105; Corps Restudy - Stuart Appelbaum, (904) 232-1877; Counties and Water Management Districts.

Other Project Partners: U.S. Fish and Wildlife Service; U.S. Environmental Protection Agency; National Park Service; U.S. Geological Survey; State of Florida; counties; Southwest Florida Water Management District; South Florida Water Management District.

Geographic Area: All of the State of Florida, from the Kissimmee River Watershed south to the keys.

Expected Benefits and/or Drawbacks: Benefits - Improved hydrologic flow throughout the central and south Florida project area.



Project Timeline/Schedule: Varies from five to twenty-five years, depending on scope of work and portion of the project on which work is performed.

Status: Planned, in progress, and under review and consideration.

Resources/Funding
Available: FY 2000 and beyond.
Needed:
Potential:

Reference Documents: Water Resource Development Acts (past, present and future); www.saj.usace.army.mil; www.swfwmd.state.fl.us; www.sfwmd.gov; www.restudy.org.

Comments:

Support of Planning Model Development in the Caloosahatchee River Basin

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-A, HA-B, HA-C, HA-D, HA-F

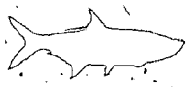
Project Description: This study is designed to develop better surface-water/ground-water model parameters by analysis, processing of field data and statistical techniques, and the review of results from the South Florida Water Management District (SFWMD) model runs.

Strategy for Implementation: Discharge, seepage, and water level data collected in adjacent canals to the Caloosahatchee river and along the river itself, will be used to estimate the spatial and temporal variability in ground-water/surface-water leakage coefficients. Acoustic technology and slope-driven flow tubes will be used to collect flow and water level gradient information used to quantify the mean, variance, and correlation length scale of the frictional resistance coefficients. Double-ring infiltrometer tests will be used to define the areal variability of the unsaturated zone within the model area. Surface-geophysical methods (seismic reflections techniques and ground-penetrating radar) will be used to describe the areal variability of aquifer characteristics. When adequate data sets have been collected for discharge, seepage, water level, infiltration rate, or aquifer conductivity, the variance and correlation function of the parameter will be computed as a function of spacing. The variance in the parameter can be used to generate uncertainty analyzes in multiple model runs. Based on these preliminary project data sets, and preexisting information, two ground-water/surface-water models will be developed. One model will be the planning model to evaluate water management alternatives and the other will be for the calibration and testing of input parameters. The planning model will be constructed by the SFWMD using the MIKE-SHE code developed by the Danish Institute of Hydrology, and the calibration/testing model will be constructed by the USGS using the MODBRANCH code.

Responsible Partner and Project Coordinator: Pamela Telis, Hydrologist, U.S. Geological Survey.

Other Project Partners: South Florida Water Management District (SFWMD).

Geographic Area: Caloosahatchee River watershed.



Expected Benefits and/or Drawbacks: The objective of this project is to refine the South Florida Water Management District (SFWMD) numerical planning model of surface-water/ground-water interactions within the Caloosahatchee River Basin. All the techniques and methods developed through this study will be applicable for future model development projects in other locations nationwide.

Project Timeline/Schedule: April 1, 1998 – September 2000.

Status: On-going.

Resources/Funding
Available: Funded in cooperation with the South Florida Water Management District (SFWMD).
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov.

Comments:

Effects of Pumpage and Seasonal Stresses on the Saltwater Interface in the Lower Tamiami Aquifer Near Bonita Springs, Florida

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-C, HA-D, HA-H

Project Description: The proposed work will define the hydraulic characteristics of the surficial-aquifer system, quantify the seasonal stresses, and identify the processes that affect the saltwater intrusion in the Bonita Springs area.

Strategy for Implementation: The project will be conducted by studying the geohydrology and water budget, pumpage and movement of ground water, and seasonal stresses within the study area. The lateral hydraulic conductivity of the surficial and Lower Tamiami aquifers will be defined by aquifer tests. Existing aquifer test data from the United States Geological Survey (USGS) and South Florida Water Management District (SFWMD) sources will be analyzed and if data deficiencies are identified, additional aquifer tests will be conducted. Recharge, unknown pumpage, vertical leakance, and specific yield of the surficial aquifer will be estimated by calibrating a three-dimensional, ground-water flow model of the area of interest. The model will be solved with MODFLOW and will be calibrated to a one-to-two-year period of water levels that were collected during prolonged periods of rainfall and drought.

Responsible Partner and Project Coordinator: Pamela Telis, Hydrologist, USGS.

Other Project Partners: South Florida Water Management District (SFWMD).

Geographic Area: Lee and Collier Counties.

Expected Benefits and/or Drawbacks: The main objective of this project is to provide a tool to estimate the effects that current and future ground water pumpage in the Bonita Springs area can have on the location of the saltwater interface.

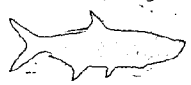
Project Timeline/Schedule: April 1, 1999 – September 2001.

Status: New project.

Resources/Funding
Available: Funded in cooperation with South Florida Water Management District (SFWMD).
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov.

Comments:



Real-Time Ground Water Monitoring Sub-Network

Contact Person: Scott Prinos
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-4

Priority Actions Addressed: HA-C, HA-D, HA-H

Project Description: The study area will encompass all of south Florida, but focuses primarily on Lee and Collier Counties in southwestern Florida, which have been subjected to frequent water-use restrictions. Through this project a real-time indicator-well network will be selected and an automated report describing current ground water conditions will be designed. This automated report will make use of statistical, graphical, and visualization techniques to aid water managers in the assessment of ground water conditions.

Strategy for Implementation: An indicator-well network will be selected to detect statistically atypical ground water conditions within the study area. The response of each aquifer during periods when water restrictions were imposed will be analyzed to determine influential factors, such as precipitation and withdrawal rates. Comparative analysis of water level data from both individual and multiple stations will be made to identify statistically atypical water level conditions and provide an indication of the magnitude of the statistical anomaly. Statistical and data-processing techniques will be incorporated into a World Wide Web report that will portray hydrologic data in tabular and graphical format, describing current conditions and comparisons to data from recent years.

Responsible Partner and Project Coordinator: Scott Prinos, Hydrologist, USGS.

Other Project Partners: South Florida Water Management (SFWMD).

Geographic Area: South Florida, with emphasis on Lee and Collier Counties.

Expected Benefits and/or Drawbacks: The principal objective of this project is to design an automated report to provide timely and detailed analytical information on the current levels of ground water within the study area. The project will make use of data from a USGS real-time ground water monitoring sub-network, which will be selected as part of this study. A secondary objective of the study is to provide interim evaluation of those areas of southwestern Florida chronically affected by water-use restrictions imposed by regulatory agencies.

Project Timeline/Schedule: October 1, 1998 – September 30, 2000.

Status: On-going.

Resources/Funding
Available: Funded in cooperation with the South Florida Water Management District.
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov.

Comments:

Delineation of Saltwater Intrusion in Lee and Collier Counties

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-C, HA-D

Project Description: This project will include all coastal Lee and Collier Counties, and will delineate the farthest inland extent of the saltwater interface within the surficial and intermediate aquifer systems. The population of Lee and Collier counties is increasing rapidly, causing increased demand on the water resources of the region. Additional pumping of fresh groundwater from coastal well fields may cause inland movement of saltwater into the aquifers. A scientific understanding of the location of the saltwater interface will enable water resource managers to better limit the extent of saltwater intrusion.

Strategy for Implementation: The ability to determine and monitor the saltwater interface on a regional scale is possible using a combination of techniques. These techniques include: 1) evaluation of well construction using video of well casings; 2) water sample collection and chloride analyzes; 3) borehole geophysics; 4) surface geophysics; and 5) oxygen and/or strontium isotope analyzes. The data from all these techniques will be analyzed to determine the current location of the saltwater interface and to determine the adequacy of the present monitoring network.

Responsible Partner and Project Coordinator: David Schmerge, Hydrologist, U.S. Geological Survey.

Other Project Partners: South Florida Water Management District (SFWMD).

Geographic Area: Coastal areas of Lee and Collier Counties.

Expected Benefits and/or Drawbacks: The objectives of this project are to: 1) develop a comprehensive data set of chloride and well construction information for wells throughout the region, to be used to delineate the saltwater interface; 2) map the farthest inland extent of the saltwater interface within the surficial aquifer system (water table and Lower Tamiami) and the intermediate aquifer system (sandstone and Mid Hawthorne); and 3) indicate to cooperators where additional saltwater tracking wells and surface geophysical sites are needed to monitor the future movement of the saltwater interface.

Project Timeline/Schedule: October 1, 1998 – September 2001.

Status: New project.

Resources/Funding
Available: Funded in cooperation with the South Florida Water Management District (SFWMD).
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov.

Comments:

Stormwater Runoff Effects on Tributary Flows into Estero Bay

Contact Person: Eduardo Patino
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FAX Number: (305) 717-5801
E-mail Address: epatino@usgs.gov

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-A, HA-B, HA-F

Project Description: This study is designed to include a compilation of historical rainfall and discharge information along the watersheds of tributaries flowing into Estero Bay, and the analysis of effects that storm-water runoff has had on the flow characteristics of these tributaries over time.

Strategy for Implementation: As a first step, current relations existing between storm-water runoff and flows at tributaries discharging into Estero Bay will be defined by analyzing changes in tributary flows in relation to rainfall events. Rainfall data will be obtained from local State and County agencies and discharge data will be extracted from the United States Geological Survey (USGS) database. Second, correlation analyzes between rainfall data at available sites will be performed in order to fill-in the gaps and/or extrapolate information to areas where data is sparse or unavailable from the historical perspective. Third, the same correlation analyzes used in step one, will be performed on historical data to determine the changes that have occurred over time in the relation between storm-water runoff and flows into Estero Bay, due to the increasing changes of land use within the watershed. It may be necessary to add one or two sites to cover all significant tributaries discharging into the bay.

Responsible Partner and Project Coordinator: Eduardo Patino, Hydrologist, U.S. Geological Survey.

Other Project Partners:

Geographic Area: Drainage basins to Estero Bay tributaries, Lee County.

Expected Benefits and/or Drawbacks: It is necessary to determine the impact that land use changes within the drainage basins of Estero Bay tributaries has had in the past, and continues to have on the amount and quality of freshwater the bay receives.

Project Timeline/Schedule: October 1999 – September 2001.

Status: Planning stages.

Resources/Funding
Available: Funding is needed.
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov; E. Patino, 1996, Gaging Flows in Northeastern Florida Bay, U.S. Geological Survey Fact Sheet, FS-130-96.

Comments: Most tributaries discharging freshwater into Estero Bay are currently monitored for water level and discharge by the U.S. Geological Survey, Fort Myers Field Office.

Groundwater and Surface Water Monitoring Networks

Contact Person: Keith B. Overton
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FAX Number: (305) 717-5801
E-mail Address: koverton@usgs.gov

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-A, HA-B

Project Description: These networks are designed to monitor surface water stages and calculate discharges at selected streams, and to monitor groundwater levels at selected wells in southwest Florida.

Strategy for Implementation: A number of groundwater and surface water monitoring stations are continuously monitored and serviced on a monthly basis. Time series data for most groundwater stations are stored on one-hour intervals, and 15-minute intervals for surface water. Selected sites are connected to satellite telemetry and transmit data on a real-time basis.

Responsible Partner and Project Coordinator: Keith Overton, Chief, Fort Myers U.S. Geological Survey (USGS) Field Office.

Other Project Partners: Partners include the South Florida Water Management District (SFWMD), Lee County, and the City of Cape Coral.

Geographic Area: Lee, Hendry and Collier counties, with some work done in Martin and St. Lucie Counties.

Expected Benefits and/or Drawbacks: The main objective of this project is to provide groundwater levels, surface water stages, and discharges for seasonal and long-term trend analysis, and to provide real-time data for regulation.

Project Timeline/Schedule: On-going.

Status: On-going.

Resources/Funding
Available: Using South Florida Water Management District (SFWMD), Lee County, City of Cape Coral, and U.S. Geological Survey matching funds.
Needed:
Potential:

Reference Documents: www-sflorida.er.usgs.gov.

Comments:

Flow and Salinity Patterns at Selected Points Within Estuaries of the Charlotte Harbor NEP Study Area

Contact Person: Eduardo Patino
Title: Hydrologist
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Telephone Number: (305) 717-5823
FAX Number: (305) 717-5801
E-mail Address: epatino@usgs.gov

Quantifiable Objectives Addressed: HA-4

Priority Actions Addressed: HA-B, HA-O

Project Description: This project is designed to fill-in the data gaps along the coastline of estuaries inside the Charlotte Harbor National Estuary Program (NEP) study area and at selected points within these estuaries, in support of the development and calibration of hydrodynamic models. The study will make use of the latest in acoustic technology, which provides for the accurate measurement of water velocity through tide cycles. Salinity and temperature will also be measured at selected sites in order to describe the effects of freshwater and tidal flows on salinity.

Strategy for Implementation: Permanent instrumentation housings will be constructed and will include the collection of the following parameters: 1) Field Parameters: water level; water velocity (acoustic sensor); temperature/salinity (two depths); and periodic discharge measurements with an Acoustic Doppler Current Profiler (ADCP) for the calibration of the velocity data collected by the acoustic sensor, and the calculation of discharge time-series for each selected site; and 2) Processed Parameters: Discharge time-series. All field data (except periodic ADCP measurements) and processed data will be stored in the U.S. Geological Survey (USGS) Miami Subdistrict office database on 15-minute intervals, and made available in electronic format.

Responsible Partner and Project Coordinator: Eduardo Patino, Hydrologist, U.S. Geological Survey.

Other Project Partners: South Florida Water Management District (SFWMD) and U.S. Army Corps of Engineers.

Geographic Area: Selected sites in estuarine water bodies from Charlotte Harbor to Estero Bay (Charlotte and Lee Counties).

Expected Benefits and/or Drawbacks: The main objectives of this project are to fill-in information gaps by providing additional data sets at selected locations, and to describe flow and salinity patterns of the estuaries within the NEP study area in relation to freshwater inflows and tidal flow action from the Gulf of Mexico. Data from this study will be used to describe current flow patterns along the Sanibel and Gasparilla Causeways in order to monitor the effects of proposed alterations.

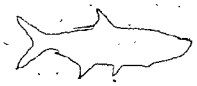
Project Timeline/Schedule: October 1999 – undetermined.

Status: Planning stage.

Resources/Funding
Available:
Needed: Funding is needed.
Potential:

Reference Documents: www-sflorida.er.usgs.gov; E. Patino, 1996, Gaging Flows in Northeastern Florida Bay, U.S. Geological Survey Fact Sheet, FS-130-96.

Comments: Similar work currently being done in Florida Bay as part of the U.S. Geological Survey South Florida Ecosystem Program, and in the St. Lucie River Estuary in cooperation with South Florida Water Management District (SFWMD). Coordination with SFWMD modeling efforts would be required.



Marine Research and Education

Contact Person: Susan Hassett
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E-mail Address: hassett@ix.netcom.com

Quantifiable Objectives Addressed: WQ-1, WQ-4, FW-1, FW-2

Priority Actions Addressed: WQ-A, WQ-B, WQ-Q, FW-D, FW-G, FW-I, FW-T, FW-V

Project Description: The Volunteer Scientific Research Team, Inc. (VSR Team) provides education in marine research and ecology to recreational divers that allows them to assist in data collection for scientists and government agencies for the conservation and preservation of our marine resources. The training workshops are offered to the general public and modified for presentation at schools and libraries. All the information collected by the team is also offered for public review in various formats, from educational exhibits to the internet.

Strategy for Implementation: The Volunteer Scientific Research (VSR) Team organizes volunteer projects to provide assistance in monitoring efforts conducted by the Lee County Department of Environmental Services. These monitoring projects include SCUBA-assisted fish surveys on the artificial reefs, estuarine surveys, seagrass surveys, and mapping surveys. Water quality data is also collected during site surveys, and rapid bioassessment surveys may be completed in estuarine environments. During surveys, sites are also cleared of marine debris. Marine debris removal projects occur annually, as well, in cooperation with organizations such as Keep Lee County Beautiful and the Marine Conservation Foundation.

The VSR Team assists in providing the resources for marine biology workshops presented through the City of Cape Coral Parks and Recreation Department by Susan Hassett, team educator, on a seasonal basis. Workshop topics include estuaries (which provides information about both the flora and fauna, the ecological significance and conservation issues), fish identification and population monitoring, sea turtle ecology, and dolphin biology and behavior. The classes are designed to provide information and training to volunteers who later may participate in monitoring efforts conducted by the VSR Team in cooperation with the Lee County Department of Environmental Services.

Finally, educational exhibits portraying the unique habitats and marine fauna found in the Charlotte Harbor NEP area are displayed by the VSR Team at local schools, libraries, nature centers, and other environmental functions. These displays offer results of team activities as well as ecological information. In addition, the volunteers monitor the exhibit and distribute ecological information, boater information, and maps

Responsible Partner and Project Coordinator: Volunteer Scientific Research (VSR) Team, Susan Hassett, Marine Educator.

Other Project Partners: Volunteer Scientific Research (VSR) Team, Lorrie Sommer, and Lee County Department of Environmental Services, Chris Koepfer.

Geographic Area: Lee County.

Expected Benefits and/or Drawbacks: Public education will motivate conservation practices suggested in the literature provided; volunteer activity will provide further conservation of resources, as well as monitoring manpower for the county scientist to enable them to better manage those resources.

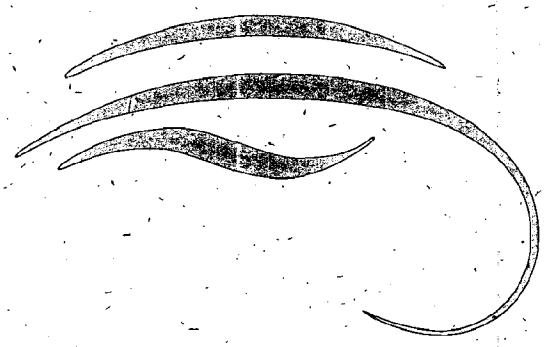
Project Timeline: Ongoing.

Status: In progress.

Resources/Funding
Available: The Volunteer Scientific Research (VSR) Team provides funds for all team-sponsored activities through team fundraising efforts.
Needed:
Potential:

Reference Documents:

Comments:



Lower Peace and Myakka River Watersheds

Preliminary Action Plans

U.S. 41 Water Quality Improvement

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E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-N

Project Description: The project will direct the first flush from the roadway where treatment will occur. This project catches water that would otherwise flow into the tidal canals.

Strategy for Implementation: Generate public interest in the project, apply for matching funds from state agencies, design, build.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Florida Department of Transportation (DOT), Metropolitan Planning Organization, Chamber of Commerce, and surrounding businesses.

Geographic Area: U.S. 41 corridor in Greater Port Charlotte from Harbor Boulevard to Tarpon Boulevard.

Expected Benefits and/or Drawbacks: Benefits include Improved water quality, pollutants targeted will be total dissolved solids (TDS) & total suspended solids (TSS) primarily, beautification. Drawbacks include the loss of parking spaces.

Project Timeline/Schedule: Fiscal Year 2003 - 2004.

Status: In progress, planned phase approach.

Resources/Funding
Available: $1,000,000.
Needed: $2,000,000.
Potential: $500,000 - Southwest Florida Water Management District, $500,000 - Department of Transportation.

Reference Documents: Charlotte County Master Stormwater Management Plan.

Comments:

Three Lakes

Contact Person: Michael Tisch
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FAX Number: (941) 637-9265
E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-6, FW-2

Priority Actions Addressed: WQ-N

Project Description: Improve flooding level of service and enhances water quality and wetland habitat. This project will excavate three lakes that were designed and permitted, but never built. Drainage is very poor in this area currently.

Strategy for Implementation: Currently under construction.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Southwest Florida Water Management District.

Geographic Area: Greater Port Charlotte, Alligator Bay-bordered by Edgewater Drive, Collingswood Boulevard, Pellam Boulevard, and Placid Avenue.

Expected Benefits and/or Drawbacks: Flood protection, water quality enhancement, creation of wetland and transitional habitat.

Project Timeline/Schedule: started construction – August 1998, end construction – January 2001.

Status: In progress.

Resources/Funding
Available: $700,000.
Needed:
Potential:

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:

East Spring Lake

Contact Person: Michael Tisch
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E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: HA-4, FW-2, FW-4

Priority Actions Addressed: HA-K, FW-A, FW-M

Project Description: This project will create a saltwater wetland / stormwater treatment system on four small islands. These islands were created when General Development Corporation dredged the canals many years ago. The idea is to scrape down three of the islands and leave one as a control. The islands will be scraped to different elevations to determine optimal habitat.

Strategy for Implementation: Submit for joint funding with state agencies, design, build.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: East Spring Lake, Alligator Bay, Charlotte Harbor at East Spring Lake and Edgewater Drive in Port Charlotte.

Expected Benefits and/or Drawbacks: The project will create a habitat that is attractive to the wildlife population and helps improve water quality.

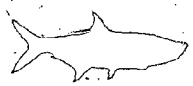
Project Timeline/Schedule: FY 2002.

Status: Planned.

Resources/Funding
Available: $197,500..
Needed:
Potential: $197,500, Southwest Florida Water Management District.

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:



Greater Port Charlotte Canal Water Quality Enhancement

Contact Person: Michael Tisch
Title: Stormwater Maintenance Engineer
Agency/Organization: Charlotte County Public Works
Mailing Address: 7000 Florida Street, Punta Gorda, FL 33950
Telephone Number: (941) 575-3660
FAX Number: (941) 637-9265
E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-C, WQ-D, WQ-N

Project Description: Enhance the water quality within the canal system by the addition of flocculents to precipitate out nutrients, total dissolved solids, and total suspended solids. The contaminants attach themselves to an electronically charged molecule, and form a floc, which then settles to the bottom.

Strategy for Implementation: Obtain matching funds, apply alum to canals, get public involved in project.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: Canal system within Greater Port Charlotte (Little Alligator Basin and Fordam-Niagra Basin) Alligator Bay with Charlotte Harbor as the receiving water body.

Expected Benefits and/or Drawbacks: Benefits are increased water quality in the canal system. Drawbacks include benthic habitat degeneration, and sedimentation.

Project Timeline/Schedule: FY 2000.

Status: Planned.

Resources/Funding
Available: $32,000.
Needed:
Potential: $32,000 - Southwest Florida Water Management District.

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:

Video: Stormwater Runoff...A Mixed Blessing

Contact Person: Michael Tisch
Title: Stormwater Maintenance Engineer
Agency/Organization: Charlotte County Public Works
Mailing Address: 7000 Florida Street, Punta Gorda, FL 33950
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E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B

Project Description: The Charlotte County Stormwater Utility has produced a video on stormwater runoff. The runtime is approximately fifteen minutes. The video will be distributed to public schools and libraries in Charlotte County.

Strategy for Implementation: Film additional video, produce and distribute videos. The video will air on the public access channel "Comcast" in Charlotte County.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Comcast Cable.

Geographic Area: Comcast Charlotte County coverage area—areas serviced by cable in Charlotte County.

Expected Benefits and/or Drawbacks: Enhanced public awareness of water quality issues, and the impacts of stormwater runoff.

Project Timeline/Schedule: Broadcasting to start in May 1999.

Status: In progress.

Resources/Funding
Available: $10,000.
Needed:
Potential:

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:

Charlotte County Master Stormwater Plan

Contact Person: Michael Tisch
Title: Stormwater Maintenance Engineer
Agency/Organization: Charlotte County Public Works
Mailing Address: 7000 Florida Street, Punta Gorda, FL 33950
Telephone Number: (941) 575-3660
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E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-B, WQ-N

Project Description: To present an organized plan for surface water improvements in Charlotte County.

Strategy for Implementation: Follow recommendations in Stormwater Master Plan.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Michael Tisch).

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks:

Project Timeline/Schedule: Started in 1994, completed 1999.

Status: In progress.

Resources/Funding
Available: General Fund.
Needed:
Potential:

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:

South Gulf Cove Water Quality Enhancement

Contact Person: Michael Tisch
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Agency/Organization: Charlotte County Public Works
Mailing Address: 7000 Florida Street, Punta Gorda, FL 33950
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E-mail Address: ccpw.mtisch@langco.com

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-B, WQ-N

Project Description: Project will concentrate on improving dissolved oxygen in dead end canals.

Strategy for Implementation: Gather information on similar projects done elsewhere, develop project prototype, and field test prototype.

Responsible Partner and Project Coordinator: Charlotte County Public Works - Stormwater Utility (Mjchael Tisch).

Other Project Partners:

Geographic Area: South Gulf Cove, Charlotte Harbor.

Expected Benefits and/or Drawbacks: Expected benefits include increasing levels of dissolved oxygen in isolated areas of dead end canals that have no circulation. Drawbacks - difficult to find information on projects of this nature.

Project Timeline/Schedule: Pilot project 1999.

Status: In progress.

Resources/Funding
Available: $25,000.
Needed:
Potential: West County Stormwater Utility.

Reference Documents: Charlotte County Master Stormwater Plan.

Comments:

Land Use and Transportation Buildout Scenario

Contact Person: Lisa B. Beever, PhD
Title: Metropolitan Planning Organization Director
Agency/Organization: Charlotte County-Punta Gorda Metropolitan Planning Organization
Mailing Address: 28000 Airport Road, A-6, Punta Gorda, FL 33982
Telephone Number: (941) 639-4676
FAX Number: (941) 639-8153
E-mail Address: CCMPO@Peganet.Com

Quantifiable Objectives Addressed: HA-4, FW-1

Priority Actions: HA-M, FW-S

Project Description: Traffic models are used to identify long-term transportation needs and the associated impacts. By analyzing land uses allowable under the Comprehensive Plan Land Use Element, $14 billion in road and bridge needs are anticipated. This long-term needs include a bridge across Charlotte Harbor (analogous to the Sunshine Skyway Bridge over Tampa Bay).

Strategy for Implementation: The Buildout analysis has provided justification for changes in land use policy through the Charlotte County Comprehensive Plan Land Use Element. In addition this information provides justification for acquiring identified Conservation and Recreation Lands (CARL) and Save Our Rivers (SOR) proposals in Charlotte County.

Responsible Partner and Project Coordinator: Charlotte County-Punta Gorda Metropolitan Planning Organization, Lisa B. Beever.

Other Project Partners: Charlotte County Community Development Department.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: By allowing more mixed use development, purchase of conservation lands, and implementation of a transit system, the need for 14 bridge lanes over and around Charlotte Harbor as well as $8 billion in road needs are eliminated.

Project Timeline/Schedule: Analysis complete.

Status: A similar analysis for Zoning Ordinance/Map Buildout has been prepared. The technical report outline results is expected in 1999.

Resources/Funding
Available: N/A.
Needed:
Potential:

Reference Documents: Alternative Land-use Buildout and Staging Scenarios: Potential Benefits of the Charlotte County Congestion Management System, Technical Report 97-2.

Comments:

Long Range Transportation Plan

Contact Person: Lisa B. Beever, PhD
Title: Metropolitan Planning Organization Director
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Mailing Address: 28000 Airport Road, A-6
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Telephone Number: (941) 639-4676
FAX Number: (941) 639-8153
E-mail Address: CCMPO@Peganet.Com

Quantifiable Objectives Addressed: HA-3

Priority Actions Addressed: HA-M

Project Name:

Project Description: A Long Range Transportation Plan (LRTP) is required from every Metropolitan Planning Organization (MPO) in the country by the Transportation Equity Act for the 21st Century, (TEA21) and its predecessor, the Intermodal Surface Transportation Efficiency Act (ISTEA). The LRTP has a 20-year horizon and identifies all transportation needs and transportation projects that can be funded. Project selection criteria adopted by the MPO Board delays projects with environmental impacts and accelerates projects with environmental benefits and projects which promote infill development.

Strategy for Implementation: The Long Range Transportation Plan (LRTP) is implemented primarily through adoption of project priorities that are funded through the State Work Program.

Responsible Partner and Project: Charlotte County-Punta Gorda Metropolitan Planning Organization (MPO) Lisa B. Beever, MPO Director.

Other Project Partners: Florida Department of Transportation, David A. Twiddy, District Secretary.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawback: Reduce hydrologic impacts by choosing road and bridge projects which impact hydrology least, especially by directing funding in highly altered systems and away from more natural systems. In doing so, secondary and cumulative impacts are reduced.

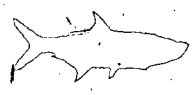
Project Timeline/Schedule: 1995 Long Range Transportation Plan (LRTP) adopted and in process of being updated by 2001.

Status: Implementation annually with adoption of transportation project priorities.

Resources/Funding
Available: Planning $30,000 per year; Capital $8,000,000 per year.
Needed:
Potential:

Reference Documents: 1995 Charlotte County - Punta Gorda Long Range Transportation Plan; 1997 Charlotte County Comprehensive Plan Transportation Element; WW3.peganet.net/ccmpo.

Comments: Ability to reduce road and bridge needs, particularly outside urbanized areas, is strongly related to environmental and land use policy.



Encourage Efficient Use and Reuse of Water

Contact Person: Michael Saunders
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Port Charlotte, FL 33954
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FAX Number: (941) 743-4530
E-mail Address: ccutech@sunline.net

Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D, HA-E

Project Description: Charlotte County Utilities has upgraded its East Port Water Reclamation Facility for advanced treatment and now supplies three golf courses and two mobile home parks.

Strategy for Implementation: Charlotte County Utilities will continue to promote and add reuse water users when possible and when economically feasible.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection, Southwest Florida Water Management District.

Other Project Partners: Golf courses, developers, etc.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: Reduces groundwater withdrawal, recharges groundwater table, utilizes treatment plant effluent, reduces use of surface water supply.

Project Timeline/Schedule: Started in 1996, project is ongoing with no completion date.

Status: In progress.

Resources/Funding
Available: To be determined.
Needed: To be determined.
Potential: Southwest Florida Water Management District.

Reference Documents:

Comments:

Charlotte County Central Sewer Expansion

Contact Person: Michael Saunders
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E-mail Address: ccutech@sunline.net

Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-G

Project Description: Charlotte County Utilities is currently expanding sanitary sewer service to 3,700 existing properties, 2,300 of which are occupied. We will continue to identify areas and expand sanitary sewer service when economically feasible.

Strategy for Implementation: Program has started and will continue over five-year period. If successful, it may be extended.

Responsible Partner and Project Coordinator: Charlotte County Utilities.

Other Project Partners: Florida Department of Environmental Protection (Dr. Abdul Ahmadi).

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: Reduce the number of existing septic tanks (70% are pre-1983). Provide new inventory of serviced properties for new construction.

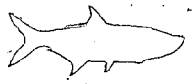
Project Timeline/Schedule: Started construction. Completion in 2003.

Status: In progress.

Resources/Funding
Available: Available for a five year program.
Needed: None.
Potential: None.

Reference Documents:

Comments: Charlotte County had a failed sewer expansion program due to a large cost to customers. It will continue to be difficult to provide sanitary sewer service without large financial impacts to the customers.



Promoting Reclaim Water in Charlotte County

Contact Person: Michael Saunders
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Mailing Address: 20101 Peachland Boulevard, Suite 301
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E-mail Address: ccutech@sunline.net

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-P

Project Description: Charlotte County Utilities (CCU), through public presentations, continues to promote public acceptance of reuse water. To possible users, CCU offers an economic advantage with its extremely low cost.

Strategy for Implementation: Continue to promote existing success towards expansion of the program.

Responsible Partner and Project Coordinator: Charlotte County Utilities.

Other Project Partners: Florida Department of Environmental Protection.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: Benefits - provides effluent disposal for plant, helps reduce groundwater use, replenishes the groundwater table, and reduces use of surface water. Drawbacks - requires significant storage area in the rainy season; public disappointment when the program is not available.

Project Timeline/Schedule: Ongoing.

Status: Ongoing.

Resources/Funding
Available: To be determined.
Needed: To be determined.
Potential: To be determined.

Reference Documents:

Comments: Expanding major transmission system is expensive and is not offset by revenues.

Environmental Information Center (EIC)

Contact Person: Bill Byle
Title: Natural Resources Planning Supervisor
Agency/Organization: Charlotte County Natural Resources Planning Section
Mailing Address: 18500 Murdock Circle, Port Charlotte FL 33948
Telephone Number: (941)743-1919
FAX Number: (941)743-1598
E-mail Address: cccdev01@peganet.com

Quantifiable Objectives Addressed: HA-3, WQ-4, WQ-6, FW-2, FW-3

Priority Actions Addressed: HA-D, HA-I, HA-K, WQ-B, FW-D, FW-T, FW-I

Project Description: This project was created by the Natural Resources Planning Section as a distribution center of information on numerous environmental concerns including but not limited to water use consumption, water quality issues, endangered and threatened species etc.

1. Identify an area that is frequented by large portions of the population and establish a user friendly display area that allows for easy access and quick reference.
2. Quickly informs local citizens of environmental issues through the distribution of local state and federal agencies and special interest group's maps, handouts, pamphlets, and brochures.

Strategy for Implementation: The Environmental Information Center brochure racks restocked by designated county staff on an as needed basis.

Responsible Partner and Project Coordinator: Charlotte County Natural Resources Planning Supervisor (Bill Byle)

Other Project Partners: Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission, Water Management District, Cooperative Extension Service, Florida Sea Grant Program, Florida Power and Light, Marine Patrol, Peace River/Manasota Regional Water Supply Authority, Charlotte County Utilities and Stormwater Departments.

Geographic Area: Includes areas in Charlotte County and associated watersheds.

Expected Benefits and/or Drawbacks: Allows the general public easy access to a wide variety of environmental issues, projects etc. The one drawback is that it is time consuming to keep stocked and will only be as good as the information provided.

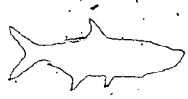
Project Timeline/Schedule: Ongoing and updated as necessary.

Status: In progress.

Resources/Funding
Available:
Needed: None required at this time.
Potential: The opportunities are endless.

Reference Documents: Charlotte County Comprehensive Management Plan.

Comments: At the current time this project is the sole responsibility of the Natural Resources Planning Section. It may become necessary in the future to obtain a grant for current literature to be supplied directly to the County to help maintain a complete environmental database of current handouts, brochures, and publications.



Development Review Process

Contact Person: Joan Bertinelli
Title: Natural Resources Planner III
Agency/Organization: Charlotte County Natural Resources Planning Section
Mailing Address: 18500 Murdock Circle, Port Charlotte, FL 33948
Telephone Number: (941) 743-1919, (941) 743-1223
FAX Number: (941) 743-1598
E-mail Address:

Quantifiable Objectives Addressed: HA-3, HA-4, WQ-3, FW-2

Priority Actions Addressed: HA-B, HA-M, WQ-N, FW-L, FW-Q

Project Description: The Natural Resources Planning Section (NRPS) reviews many of the proposed (transportation) projects. When provided to the section for review, site inspections are scheduled and environmental assessments are performed. NRPS works as a liaison between county and other regulating agencies. Recommendations are made as necessary regarding the proposed wetland or species impacts.

Strategy for Implementation: Review processes follow format outlined in Project Description above.

Responsible Partner and Project Coordinator: Charlotte County Natural Resources Planner III (Joan F. Bertinelli)

Other Project Partners: Army Corp. of Engineers (Notice for Public Comment), Southwest Florida Water Management District, Department of Environmental Protection, Department of Transportation.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: The ability to comment on these projects prior to the issuance of permits allows the department to evaluate past and future development. This enables changes in designs and methods that may have had negative effects on the system.

Project Timeline/Schedule: Each review has its own time schedule.

Status: Completed and in progress.

Resources/Funding:
Available:
Needed: N/A.
Potential: N/A.

Reference Documents: N/A

Comments: A challenge we face is that the proposed project is not usually reviewed until after the conceptual design has been completed.

Charlotte County's Speaker Bureau Program

Contact Person: Bill Byle
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Agency/Organization: Charlotte County Natural Resources Planning Section
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E-mail Address: ccc01@peganet.com

Quantifiable Objectives Addressed: HA-3, HA-4, FW-2, FW-3, WQ-1, WQ-4, WQ-5, WQ-6, WQ- 7

Priority Actions Addressed: HA-K, FW-T, HA-K

Project Description: Any citizen or group may request a presentation from any of the County departments on particular issues or concerns. Presentations by Natural Resource staff typically cover county environmental issues, natural history of native vegetation, wildlife and ecosystems.

Strategy for Implementation: Presentations can be arranged at the request of local residents or groups through the Charlotte County Action Center for any topic, current issues, or special concern items in which County is involved.

Responsible Partner and Project Coordinator: Charlotte County Action Center (Pam Alexander, Action Center Representative).

Other Project Partners: All Charlotte County Departments.

Geographic Area: While programs are done throughout the Charlotte Harbor National Estuary Program study area, most are done within the County.

Expected Benefits and/or Drawbacks: Inform the interested parties of the importance of protecting our natural resources through presentations of updated data and information. Allows the county to reach special interest groups through a defined program. Allows for smaller group participation and discussion. Allows information to be provided in a well-organized educational manner.

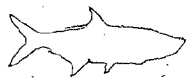
Project Timeline/Schedule: On-going.

Status: Scheduled as necessary.

Resources/Funding
Available:
Needed: None required.
Potential:

Reference Documents: Would be on an as needed to present basis. May require slides, handouts new publications etc.

Comments:



Support Study of Horse Creek Outstanding Florida Water Designation

Contact Person: Bill Byle
Title: Natural Resources Planning Supervisor
Agency/Organization: Charlotte County Natural Resources Planning Section
Mailing Address: 18500 Murdock Circle, Pt. Charlotte FL 33948
Telephone Number: (941)743-1223
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E-mail Address: ccc01@peganet.com

Quantifiable Objectives Addressed: WQ-1, WQ-4, WQ-5, WQ-6, WQ-7

Priority Actions Addressed: WQ-B

Project Description: The Natural Resources Planning Section is taking a pro-active approach to promoting a consensus for this designation. The Natural Resources Planning Section is publicly promoting this designation by working with interested parties, news articles, writing editorials, holding and attending public workshops etc. in order to address Charlotte County concerns and to educate the public to this specific designation.

Strategy for Implementation: Provide this topic as part of the Guest Speaker List. Continue to work with the media in getting water quality information to the public. Increase public awareness of potential sources of pollution, and potential agencies responsible for enforcement.

Responsible Partner and Project Coordinator: Charlotte County Natural Resources Planning Section (Bill Byle)

Other Project Partners: To be determined.

Geographic Area: Entire length of Horse Creek, including appropriate contiguous wetlands and major tributaries.

Expected Benefits and/or Drawbacks: Maintain the hydrologic integrity of the Horse Creek Basin to maintain itself and water quality and quantity to Charlotte Harbor.

Project Timeline/Schedule: Designation by the year 2000.

Status: In progress.

Resources/Funding
Available:
Needed: N/A.
Potential:

Reference Documents:

Comments: The County sees the importance of maintaining the existing system. The buffering that will be required along the system will ensure the quality of the communities.

Charlotte County Exotic Eradication and Control Program

Contact Person: Joan Bertinelli
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Agency/Organization: Charlotte County Natural Resources Planning Section
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Telephone Number: (941)743-1919
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E-mail Address:

Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A

Project Description: The Natural Resources Planning Section (NRPS) has been directed to provide a program that would target those properties owned by the County. Although the County does not require the removal of exotics nuisance species, the Charlotte County Code does recommend removal of these species during the developmental process.

Strategy for Implementation:

1) Continue to identify problem areas and record the data of them on the Habitat Inventory Map.
2) Assess and prioritize these areas.
3) Implement a plan to fund the removal of these species (i.e. the need to establish mitigation banks in the affected areas).
4) Identify those financial opportunities.
5) County codes prohibit planting invasive exotic vegetation.

Responsible Partner and Project Coordinator: Natural Resources Planning Section (Bill Byle, Joan Bertinelli).

Other Project Partners: Charlotte County Division of Environmental Services, Southwest Florida Water Management District, Charlotte Harbor Environmental Center, Florida Department of Environmental Protection (DEP), and Florida Division of Forestry.

Geographic Area: This would be a county-wide assessment but priority would be given to those areas which would create the greatest environmental benefit.

Expected Benefits and/or Drawbacks: This program would reduce the coverage of exotic nuisance vegetation and allow for an increase in both native plant species and habitat value, thus fulfilling the Goal #1 of the Charlotte County Comprehensive Plan.

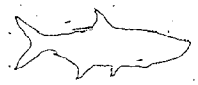
Project Timeline/Schedule: On-going.

Status: In progress.

Resources/Funding
Available: Department of Environmental Protection, Pollution Recovery Trust Fund.
Needed: Yes.
Potential: Multiple Service Taxing Districts, U.S. Fish and Wildlife Service.

Reference Documents: County Code 3-5-391, 3-5-403, County Ordinance 98-46. County permits required.

Comments: There are numerous public and private lands with exotic/nuisance species. Both properties would have to be worked on simultaneously in order to reduce the problem satisfactorily.



Artificial Shoreline Structure Prohibition

Contact Person: Bill Byle
Title: Natural Resources Planning Supervisor
Agency/Organization: Charlotte County Natural Resources Planning Section
Mailing Address: 18500 Murdock Circle, Port Charlotte FL 33948
Telephone Number: (941)743-1919
FAX Number: (941)743-1598
E-mail Address: ccc01@peganet.com

Quantifiable Objectives Addressed: FW- 2

Priority Actions Addressed: FW-B

Project Description: Charlotte County Comprehensive Plan and Ordinance 98-42 prohibits the construction of artificial shoreline structures except in extreme emergency situations.

Strategy for Implementation: Construction of such structures require building permits. Zoning information designate areas that these structures are prohibited. Natural Resource staff recommend denial or approval on a case-by-case basis.

Responsible Partner and Project Coordinator: Charlotte County, Planning Supervisor, Tom Smith.

Other Project Partners: Florida Department of Environmental Protection, U.S. Army Corps of Engineers.

Geographic Area: County-wide in Charlotte County.

Expected Benefits and/or Drawbacks: Benefits: Maintenance of natural shoreline features and functions. Drawbacks: Sometimes unpopular and may increase risk to subject property.

Project Timeline/Schedule: Current.

Status: Current.

Resources/Funding
Available:
Needed: None.
Potential:

Reference Documents: Shoreline Protection Ordinance 98-42.

Comments:

Manatee/Seagrass Task Force

Contact Person: Joan Bertinelli
Title: Natural Resources Planner III
Agency/Organization: Charlotte County Natural Resources Planning Section
Mailing Address: 18500 Murdock Circle, Port Charlotte FL 33948
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FAX Number: (941) 743-1598
E-mail Address:

Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-D, FW-E, FW-F, FW-G, FW-I, FW-J, FW-K, FW-M, FW-R

Project Description: The Manatee/Seagrass Task Force was established to identify those areas sensitive to manatees and seagrasses which require protection. Some of these areas require boaters to be educated and to use the best management practices available. This may include No Speed Zones, No Wake Zones and trolling methods. The formation of the Manatee/Seagrass Task Force specifically addresses the Charlotte County Comprehensive Plan Policies 1.10.7 through 1.10.10.

Strategy for Implementation: The Task Force must complete the draft Manatee/Seagrass Protection Plan. The plan must then be adopted by the Board of County Commissioners. Part of this plan includes an education process. The education will include programs within the school system and with adults in the homeowner's association, production and distribution of literature, public service announcements and videos.

Responsible Partner and Project Coordinator: Charlotte County Natural Resources Planning Section (Joan Bertinelli).

Other Project Partners: Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission, Mote Marine Laboratory, U.S. Fish and Wildlife Service and City of Punta Gorda.

Geographic Area: Charlotte Harbor tidally-connected waters.

Expected Benefits and/or Drawbacks: Increase boater awareness of potential damage to the marine communities by educating boaters to those areas in need of protection. Increased "no-wake" zones produce both benefits and drawbacks.

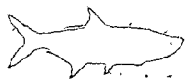
Project Timeline/Schedule: Within the next year, the Manatee/Seagrass Protection Plan will be completed and some of the recommendations will be implemented.

Status: In progress.

Resources/Funding
Available:
Needed: No initial funding.
Potential: Funding may be required for materials, handouts and signage. There seems to be a limit as to who will pay for the signage. This signage will be required to inform boaters of the shallow areas and sensitive habitats.

Reference Documents: Surface Water & Wetland Protection Ordinance. Publications and permits may be required.

Comments:



Hydrologic Restoration of Charlotte Harbor Flatwoods (Zemel Road Southwest Parcel)

Contact Person: Bill Byle
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Quantifiable Objectives Addressed: HA-2, HA-3, HA-4

Priority Actions Addressed: HA-F, HA-H

Project Description: Acquisition of 330 acre parcel to expand the Flatwoods Conservation Area. This parcel is strategically located to allow for restoration of the historic sheet flow from the Webb Wildlife Area to Charlotte Harbor.

Strategy for Implementation: Conduct hydrologic design study and modify drainage feature to stop diversion of surface water by U.S. Highway 41 canals, Gator Slough Canal, and Zemel Canal, and redirect flows across Zemel Road Southwest site.

Responsible Partner and Project Coordinator: Conservation and Recreation Lands (CARL), South Florida Water Management District (SFWMD), Southwest Florida Water Management District (SWFWMD), Bill Byle, Project Coordinator.

Other Project Partners: Conservation and Recreation Lands (CARL), South Florida Water Management District (SFWMD), and Southwest Florida Water Management District (SWFWMD).

Geographic Area: Area west of Webb Preserve, south of Alligator Creek, and north of Gator Slough Canal to Charlotte Harbor.

Expected Benefits and/or Drawbacks: Restoration of quality, quantity, and timing of freshwater flow to estuary (to restore ecological integrity and productivity).

Project Timeline/Schedule: Funding proposals submitted to the Water Management Districts December 1998. Design study: 1999 - 2000, Construction 2001-2005.

Status: Design study grants being reviewed by Southwest Florida Water Management District and South Florida Water Management District.

Resources/Funding
Available: Design study funds from South Florida Water Management District (SFWMD), and Southwest Florida Water Management District (SWFWMD).
Needed:
Potential:

Reference Documents:

Comments:

Charlotte County Environmental Regulatory Program

Contact Person: Bill Byle
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Quantifiable Objectives Addressed: FW - 2

Priority Actions Addressed: FW-C

Project Description: Inter-agency agreement between local, state, and federal agencies (partners below) to coordinate review of development project allows Charlotte County to make recommendations for this to be a condition of wetland permits.

Strategy for Implementation: County requires the applicant to provide wetland permit from State and Federal Agencies.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection, Water Management Districts, U.S. Army Corps of Engineers.

Other Project Partners: County Departments, Mosquito Control, Public Works, Cooperative Extension Service, Charlotte Harbor Environmental Center.

Geographic Area: Charlotte County.

Expected Benefits and/or Drawbacks: Insures wetland mitigation/compensation is conducted within the County.

Project Timeline/Schedule: On-going.

Status: On-going.

Resources/Funding
Available: Permit fees.
Needed:
Potential:

Reference Documents:

Comments:

Environmental Lands Acquisition Advisory Committee (ELAAC)

Contact Person: Bill Byle
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E-mail Address: cccdev01@peganet.com

Quantifiable Objectives Addressed: FW-1 (Achieve 25% increase in conservation lands)

Priority Actions Addressed: FW-S, FW-U

Project Description: Committee appointed by County Commission created to identify and evaluate environmentally important lands and recommend which lands the county should attempt to protect through acquisition, leases, easements, etc. Members are selected by organization they represent.

Strategy for Implementation: Committee meets monthly to evaluate potential acquisitions identified by Environmental Lands Acquisition Advisory Committee (ELAAC) Map Subcommittee and others. Sites are initially identified based on criteria are field evaluated by County ecologists and ranked for further consideration by the policy committee. Owners of property that pass field evaluation are contacted to establish willingness to sell. The willing seller list and costs are presented to the County Commission for authorization to purchase.

Responsible Partner and Project Coordinator: Environmental Lands Acquisition Advisory Committee, Jack Hanlon, ELAAC Chairman, Bill Byle (County liaison).

Other Project Partners: Florida Communities Trust, Florida Department of Environmental Protection CARL Program, Water Management District Save Our Rivers Program

Geographic Area: County-wide in Charlotte County.

Expected Benefits and/or Drawbacks: Maintenance and protection of natural resource base that supports much of local economy.

Project Timeline/Schedule: On-going.

Status: In progress.

Resources/Funding
Available: see "Other Project Partners", above.
Needed: Funds sufficient to secure matching grants.
Potential: County bond program.

Reference Documents:

Comments:

Artificial Reef Program

Contact Person: Richard Novak
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Agency/Organization: Florida Sea Grant Extension Program
Mailing Address: 6900 Florida St., Punta Gorda, FL 33950
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FAX Number: (941) 637-6719
E-mail Address: novak@gov.ifas.uf.edu

Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-P, FW-R

Project Description: Strategic placement of reef balls and/or other suitable reef building materials in tidal waters of Charlotte County and associated Gulf of Mexico.

Strategy for Implementation: Identify areas suitable for reef features that comply with local, state and federal regulations.

Responsible Partner and Project Coordinator: Charlotte Harbor Reef Association, Richard Novak, Coordinator.

Other Project Partners: Coastal Conservation Association (Florida and Charlotte County Chapters).

Geographic Area: Tidal waters of Charlotte County and associated Gulf of Mexico.

Expected Benefits and/or Drawbacks: Restoration of fisheries habitat that supports a large segment of local economy.

Project Timeline/Schedule: Charlotte County Chapter formed August, 1997.

Status: In progress.

Resources/Funding
Available: National Marine Fisheries Service, Florida Department of Environmental Protection.
Needed:
Potential:

Reference Documents:

Comments:

Reclaimed Water Education in Charlotte County

Contact Person: Joy Duperault
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Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D

Project Description: Enhance existing education programs designed to inform and promote public awareness as to the importance of efficient water use, including the use of reclaimed water where available.

Strategy for Implementation: Work with appropriate agencies such as the Charlotte County Utilities to augment or expand existing education in the Charlotte Harbor area. Development, creation, promotion and delivery of speaker's bureau/ program; development, creation, scheduling of, moving and maintenance of portable exhibit(s) displaying water conservation information and reclaimed water facts; development, creation, and distribution of posters for school children to bring home, along with possible outreach program to schools about water conservation.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: The Southwest Florida Water Management District (SWFWMD); Charlotte County: Charlotte County Utilities, Charlotte County Public Schools, The Peace River/ Manasota Regional Water Supply Authority, other grantors.

Geographic Area: Charlotte Harbor Proper basin and portions of the Lemon Bay/Gasparilla Sound basin. This project could be transferred to all other basins within the watershed, especially if funding for demonstration workshops could be obtained.

Expected Benefits and/or Drawbacks: Reduced demands on surface and groundwater resources to provide for projected growth.

Project Timeline/Schedule: A one-year, renewable and transferable project, depending upon funding.

Status: Potential. We currently partner with the Southwest Florida Water Management District (SWFWMD) though a variety of programs, including Surface Water Improvement and Management (SWIM), for basin education that includes the distribution of SWFWMD materials about these and other topics. In addition, we currently offer as many programs which include water conservation as possible, given the restraints of current projects/ funding. We facilitated a survey to research public perception of reclaimed water in conjunction with the Charlotte County Utilities in 1995 (funded by the SWFWMD) which offered valuable information for the development of specific educational goals for reclaimed water use in the county, but did not seek further funding for the implementation of this education due to the fact that Charlotte County voted to cut off the proposed sewer expansion project. This in turn cut availability of reclaimed water for all but golf course and limited mobile home park use.

Resources/Funding
Available: Currently not funded.
Needed: Year One: $20,000- $30,000. Year Two: $15,000.
Potential: The Southwest Florida Water Management District, both Peace Basin educational funding and Charlotte Harbor Surface Water Improvement and Management (SWIM) program; Charlotte County through the utility department; possible future National Estuary Program (NEP) grants; Peace River/Manasota Regional Water Supply Authority; Charlotte County Public Schools, other grantors.

Reference Documents:

Comments:

Feasibility Study of Lemon Lake Restoration at Amberjack Slough

Contact Person: Bobbi Rodgers
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-F

Project Description: The historic brackish water flow from Lemon Bay to Lemon Lake through Lemon Creek has been altered by channelization and filling. Culverts do exist, however, it is believed that the flow is restricted such as to reduce the flow into Lemon Lake.

Strategy for Implementation: This proposed project would assess the relevance of the above changes to the hydrology of Amberjack Slough, evaluate the feasibility of culverts to restore this historical flow, and determine the mechanisms to fund this restoration project.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC)/Bobbi Rodgers.

Other Project Partners: Southwest Florida Water Management District (SWFWMD); Department of Environmental Protection (DEP); Charlotte County Government.

Geographic Area: Amberjack Slough/Lemon Bay/Gasparilla Sound Basin.

Expected Benefits and/or Drawbacks: Restore more natural water flow into Lemon Bay and Lemon Lake.

Project Timeline/Schedule: To be determined.

Status: Proposed.

Resources/Funding
Available: Currently not funded.
Needed: To be determined.
Potential: To be determined.

Reference Documents:

Comments: This area is in a residential/golf course area, and residents may be concerned about any changes to their system.

Partial Restoration of Huckaby Creek, Phase I

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-F

Project Description: Huckaby Creek was dredged and channelized in the 1960s for stormwater conveyance. The construction of this canal has resulted in an earthen plug in Huckaby Creek and a spoil berm along the entire length of the canal. This berm inhabits proper sheet flow from the uplands of Tippecanoe Scrub to Huckaby Creek and Tippecanoe Bay.

Strategy for Implementation: A more historical sheet flow is anticipated by the removal of the earthen berm. This will be accomplished by pushing the berm into a straightened portion of the canal thus restoring historic grades and topography along Huckaby Creek.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Bobbi Rodgers.

Other Project Partners: Charlotte County; Southwest Florida Water Management District (SWFWMD); Department of Environmental Protection (DEP).

Geographic Area: Huckaby Creek/Tippecanoe Bay/Charlotte Harbor.

Expected Benefits and/or Drawbacks: Restore more natural water flow into Charlotte Harbor.

Project Timeline/Schedule: This in-progress project should be completed in 1999. Related project: after the completion of Phase I in 1999, partial restoration of Huckaby Creek (Phase II), will begin as additional funding becomes available.

Status: See above.

Resources/Funding
Available: Florida Pollution Recovery Program, Charlotte County.
Needed:
Potential:

Reference Documents:

Comments:

Freshwater Flow Education

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-I

Project Description: To create and distribute public service announcements and a video which explains water resource issues, including the importance of maintaining minimum freshwater flows in tributaries and to the estuarine complex.

Strategy for Implementation: To identify public perception of freshwater flows, and to use this information to develop and create public service announcements and a video which will highlight efforts to manage water resources, including the National Estuary Program's (NEP) actions with regard to establishing and maintaining minimum seasonal flows in major basins of the watershed.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Charlotte Harbor National Estuary Program (NEP); Environmental Protection Agency (EPA); Southwest Florida Water Management District (SWFWMD); area media, especially television broadcasters; other grantors.

Geographic Area: Peace River basin, Myakka River basin, Charlotte Harbor Proper basin, Lemon Bay/ Gasparilla Sound basin, and Coastal Venice basin (all watershed areas within the Southwest Florida Water Management District).

Expected Benefits and/or Drawbacks: Increased public awareness of issues and benefits to be derived from restoring and maintaining adequate surface water flows.

Project Timeline/Schedule: A two-year project. Year One: Conduct survey to establish public perception in the listed areas; Year Two: Develop text for public service announcements and video, create and distribute public service announcements, contract with consultant to create video, promote video.

Status: Potential.

Resources/Funding
Available: Not currently funded.
Needed: Depends upon length of video; estimate: $50,000.
Potential: See above partners.

Reference Documents:

Comments:

Freshwater Flow Exhibits

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-J

Project Description: To create portable displays which explain the Charlotte Harbor watershed water resources, including the importance of maintaining minimum flows into rivers and the estuary.

Strategy for Implementation: Use information gained from the survey of public perception outlined in the proposed "Freshwater Flow Education" project in order to develop traveling displays which will highlight efforts to manage water resources, including the National Estuary Program's (NEP) actions with regard to establishing and maintaining minimum seasonal flows in major basins of the watershed; schedule these displays and coordinate their travel and set-up; and maintain fact sheet information in the displays which can be taken by the audience.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc., Joy Duperault, Executive Director.

Other Project Partners: Charlotte Harbor National Estuary Program (NEP); Environmental Protection Agency (EPA); Southwest Florida Water Management District (SWFWMD); area libraries, malls, and other places of potential exhibit location; other grantors.

Geographic Area: Peace River basin, Myakka River basin, Charlotte Harbor Proper basin, Lemon Bay/ Gasparilla Sound basin, and Coastal Venice basin (all watershed areas within the Southwest Florida Water Management District).

Expected Benefits and/or Drawbacks: Increased public awareness of issues and benefits to be derived from restoring and maintaining adequate surface water flows.

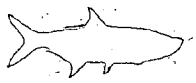
Project Timeline/Schedule: One-year project (assuming the survey mentioned above has been completed): Develop exhibit text and gather graphics/ photos; create exhibits; schedule and coordinate assemblage and travel of exhibits; and maintain/send out inventory of fact sheets for exhibit distribution.

Status: Potential.

Resources/Funding
Available: Not currently funded.
Needed: $12,000- $17,000 Estimated cost.
Potential: See partners above.

Reference Documents:

Comments:



Water Use Education

Contact Person: Joy Duperault
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-K

Project Description: To create an education plan and a coordinated overall effort to educate the public - including audiences from industry, agriculture and commerce - about water use and the importance of minimum flows.

Strategy for Implementation: To identify target groups who are needful of and interested in learning about water resources, use of water in the region, and the importance of maintaining freshwater flows in riverine and estuarine systems found here; to develop a coordinated program which will inform the public of the issues using an unbiased platform of information; to identify a focal point (area coordinator) within each of the sub-basins of the Southwest Florida Water Management District (SWFWMD) portion of the watershed who will be responsible for selecting target groups there and carrying out the program; to coordinate the program with state and local agencies/ government for best use of resources, participation and possible financial support; and to develop a speaker program in conjunction with appropriate agencies, which can be taken to targeted area groups by coordinated volunteers or other organizations there.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Charlotte Harbor National Estuary Program (NEP); Environmental Protection Agency (EPA); Southwest Florida Water Management District; Peace River/Manasota Regional Water Supply Authority; Charlotte County; other grantors.

Geographic Area: Peace River basin, Myakka River basin, Charlotte Harbor Proper basin, Lemon Bay/ Gasparilla Sound basin, and Coastal Venice basin (all watershed areas within the SWFWMD).

Expected Benefits and/or Drawbacks: Increased public awareness of water resource issues and benefits to be derived from restoring and maintaining adequate surface water flows, and from conservation practices.

Project Timeline/Schedule: A similar project is/ has been on-going for a number of years, especially in the Charlotte Harbor Proper sub-basin, under several funding sources (Southwest Florida Water Management District, Florida Advisory Council on Environmental Education, National Estuary Program, Charlotte County) and will continue with an intensity which matches funding levels. In order to conduct the above-described project, a minimum of one year of funding with subsequent funding for additional phases will be necessary.

Proposal: Year One - Identify target groups; identify sub-basin coordinators; coordinate with state and local agencies/ government; develop draft of speaker program; receive approval, create.
Year Two & following - Recruit and coordinate volunteers; implement speaker program throughout project area; maintain relationships with media, agencies, and government; continue coordination of volunteers at focal points; continue to seek additional funding.

Status: Some of this work is in progress: Charlotte Harbor Environmental Center is funded annually by the Southwest Florida Water Management District for a variety of environmental education programs including water conservation and demonstration projects.

Resources/Funding
Available: Currently funded by both Southwest Florida Water Management District and Charlotte Harbor NEP.
Needed: Year I: $32,000- 40,000; Year II: $20,000- 24,000.
Potential: See above partners.

Reference Documents:

Comments:

Charlotte County Mitigation Sites

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Quantifiable Objectives Addressed: HA-3

Priority Actions Addressed: HA-M

Project Description: The Charlotte Harbor Environmental Center, Inc. (CHEC) manages several properties within Charlotte County. All of these sites are available for the mitigation of hydrological alterations and water quality impacts including, but not limited to future roadway improvement projects.

Strategy for Implementation: To accept mitigation projects on public lands, such as removal of exotic vegetation in wetland areas, construction of wetland demonstration sites on retention ponds, and replanting of native vegetation and monitoring.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Charlotte County, Department of Environmental Protection (DEP), Southwest Florida Water Management District (SWFWMD), Florida Department of Transportation (FDOT), U.S. Army Corps of Engineers (ACOE), Environmental Protection Agency (EPA).

Geographic Area: Charlotte County/Charlotte Harbor Proper Basin.

Expected Benefits and/or Drawbacks: A reevaluation of the methods used in assessing past and future hydrological alterations which have or could result from roadway and transportation projects within the Charlotte Harbor National Estuary Program (NEP).

Project Timeline/Schedule: To be determined.

Status: To be determined.

Resources/Funding
Available: To be determined as mitigation projects arise.
Needed: To be determined.
Potential: To be determined.

Reference Documents:

Comments:

Water Quality Education

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Quantifiable Objectives Addressed: WQ-1, WQ-4, WQ-5, WQ-6, WQ-7

Priority Actions Addressed: WQ-B

Project Description: Promote general public awareness on water quality issues and demonstration projects.

Strategy for Implementation: Develop a school curriculum and guest speaker programs; prepare and distribute new resident education packages; support and enhance local and regional Florida Yards & Neighborhoods programs; gather/ develop and distribute information materials for developers, engineering firms and other contractors; expand and provide coordination of volunteer water quality monitoring programs; work with media in releasing water resource information to the public; increase public awareness of potential sources of pollution, and awareness of possible agencies responsible for enforcement; implement "River Keeper" types of programs in conjunction with volunteer and educational programs; and coordinate volunteer participation in restoration and demonstration projects for wetlands and other aquatic sites.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Currently we partner primarily with both the Southwest Florida Water Management District (SWFWMD) and the Charlotte Harbor National Estuary Program (NEP) to accomplish some of these tasks. Other partners have been Charlotte County, Department of Environmental Protection (DEP), and other grantors. These would continue to be primary partners, as well as new sources of funding as they are discovered.

Geographic Area: Peace River basin, Myakka River basin, Charlotte Harbor Proper basin, Lemon Bay/ Gasparilla Sound basin, and Coastal Venice basin— all watershed areas within the Southwest Florida Water Management District (SWFWMD). Areas south of the SWFWMD boundary have other providers and Charlotte Harbor Environmental Center has not attempted often nor been very successful in obtaining funding to work there.

Expected Benefits and/or Drawbacks: Provisions of mechanisms for greater public awareness.

Project Timeline/Schedule: This work has been conducted since 1994. New or expanded projects will require various timelines and funding levels to complete. This type of work never ends; projects usually end when funding is no longer available.

Status: Again, some work is in progress, other work is potential.

Resources/Funding
Available: Currently funded through Southwest Florida Water Management District (SWFWMD), Charlotte Harbor NEP, and other grants.
Needed: Undetermined; depends upon structure and timeframe of actual proposal.
Potential: See "Other Project Partners" listed above.

Reference Documents:

Comments:

Septic Tank and Drainage System Education

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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4

Priority Actions Addressed: WQ-F

Project Description: To work with local agencies and septic system installation companies for public education regarding proper maintenance of septic systems and the impact of dysfunctional systems on groundwater resources, including media releases, scheduled public displays and presentation to homeowner groups, distribution of flyers, etc., for overall public education on the topic.

Strategy for Implementation: Identify target areas and groups, determine the best method of reaching these groups; develop/ create tools for outreach; coordinate with agencies for focused education; and work with area media to publish appropriate information on a regular basis.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Southwest Florida Water Management District (SWFWMD); Charlotte County Utilities and other private utility companies who have customers on septic; Charlotte County Planning & Zoning Department; local environmental health units; septic installation companies; area libraries, malls, and other public places where information may be displayed or distributed; other grantors.

Geographic Area: Charlotte Harbor Proper Basin.

Expected Benefits and/or Drawbacks: Reduction of pollutant loads to meet established goals.

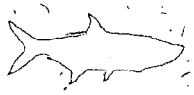
Project Timeline/Schedule: One-year project which could be continued and transferred to other basins in the watershed.

Status: Potential. We have worked with the Southwest Florida Water Management District (SWFWMD) and Charlotte County Utilities before to create public education programs, and would examine all avenues for potential partners. Additionally, this information could be incorporated into the new resident packages (see Charlotte Harbor Environmental Center "New Residents Education Program") and could be a combination program with WQ-M, "Composting Toilets Education".

Resources/Funding
Available: Not currently funded.
Needed: Undetermined - depends upon number of target groups and types of tools developed for education. This could be a relatively inexpensive project around $10,000.
Potential: Please see "Other Project Partners" listed above.

Reference Documents:

Comments:



Florida Yards and Neighborhoods Program

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Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-I

Project Description: Continue active implementation of the program in Charlotte County, and assist other watershed communities to begin or expand their programs by demonstrating outreach techniques, assisting with Master Gardener training, offering duplicate program materials and ideas.

Strategy for Implementation: Identify needful communities (counties); meet with Cooperative Extension Service staff for coordination of assistance; possibly augment Master Gardener training with workshops on related topics; demonstrate methods for a successful program, including best practices for outreach and community education; offer duplicate Florida Yards & Neighborhoods (FY&N) presentation materials if desired and ideas for continued funding sources.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: University of Florida/Institute of Food and Agricultural Sciences (IFAS) Cooperative Extension Services; Southwest Florida Water Management District (SWFWMD); Florida Native Plant Society Chapters; local community colleges and native plant nurseries; other grantors.

Geographic Area: The Florida Yards & Neighborhoods (FY&N) Program is a county-based project. Sarasota County has the program; Lee County is currently embarking upon their program. Polk County is desirous of having this program, and Hardee and DeSoto may not have the resources to have their own but certainly a partnership can be developed.

Expected Benefits and/or Drawbacks: Reduction of the use of water and reduction in stormwater run-off pollution from residential and commercial areas.

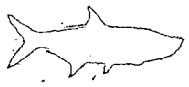
Project Timeline/Schedule: This is a continuing program; certainly specific milestones can be scheduled for new expansion projects.

Status: In progress in Charlotte County through National Estuary Program (NEP) support ($12,927 in FY 89-99), in-kind match from the Charlotte County Cooperative Extension Service (CES), and through funding from the Southwest Florida Water Management District's (SWFWMD)/Surface Water Improvement and Management (SWIM) program ($6,500 in 1999). In progress in Sarasota County through a partnership with the Sarasota Bay NEP and their CES. Seeking funding in Polk County through the Cooperative Extension Service. All parties seek funding for continuation each year. The Charlotte County program is proving to be quite successful with a goal of 100 yards achieving Florida Yards and Neighborhoods (FY&N) certification in FY 1998-1999.

Resources/Funding
Available: See above notes.
Needed: Approximately $20,000 per year per program (county).
Potential: See above notes, partners.

Reference Documents:

Comments:



Composting Toilet Implementation and Education

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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-M

Project Description: A working composting toilet is located at Tippecanoe Scrub, a site managed by the Charlotte Harbor Environmental Center (CHEC). This could be a demonstration site to show that composting toilets are viable alternatives to septic systems in limited situations, and to educate the public to environmentally friendly water consumption/reduction methods.

Strategy for Implementation: Tippecanoe Scrub is currently used for environmental education and could easily be used to develop public awareness of composting toilets. Education could include identification of target groups, determining the best method of reaching these audiences, and creating tools for outreach to these groups. Workshops, demonstrations and other educational sessions could make use of the Cluvus Multrum composting toilet at Tippecanoe Scrub.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Charlotte County, Florida State Department of Health, and Southwest Florida Water Management District (SWFWMD), Charlotte County Cooperative Extension Service (University of Florida, Institute of Food and Agricultural Sciences), Charlotte County Planning and Zoning Department, composting toilet vendors, area libraries and malls, other places where information may be displayed or distributed, other grantors.

Geographic Area: Entire watershed

Expected Benefits and/or Drawbacks: Benefits are reduction of both water consumption and nutrient loading from wastewater treatment facilities. Drawbacks are high initial costs of composting unit and installation along with any monitoring and/or maintenance.

Project Timeline/Schedule: Per grantor needs, it could be a one-year project, or it could be funded per event after program development.

Status: Composting toilet is in place; potential program development.

Resources/Funding
Available: Not currently funded.
Needed: Depends upon actual project, $5,000 to $10,000.
Potential: Please see partners listed above.

Reference Documents:

Comments:

Coordination of Water Quality Monitoring Program in Charlotte Harbor, Peace River and Myakka River

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Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-B, WQ-C, WQ-D

Project Description: Currently, several agencies are monitoring the water in the above referenced water bodies.

Strategy for Implementation: The data currently being gathered need to be compiled in a consistent manner. This would improve the environmental integrity of the Charlotte Harbor Study area.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Department of Environmental Protection (DEP), Southwest Florida Water Management District (SWFWMD), Charlotte County.

Geographic Area: Charlotte Harbor National Estuary Program (NEP) study area.

Expected Benefits and/or Drawbacks: To obtain consistent information of the water quality for the Charlotte Harbor Study area.

Project Timeline/Schedule: To be determined.

Status: To be determined.

Resources/Funding
Available:
Needed: Approximately $40,000-$70,000 per year.
Potential:

Reference Documents:

Comments: A watershed-wide water quality monitoring program to be coordinated by the water management districts has been recommended.

Identification and Removal of Invasive Exotic Species From Within the Charlotte Harbor NEP Study Area

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A

Project Description: Charlotte Harbor Environmental Center (CHEC) has been and will continue to identify, locate, and remove invasive exotic vegetation found within its managed properties.

Strategy for Implementation: Exotic vegetation is identified on Charlotte Harbor Environmental Center-managed properties through the use of aerial photographs and field observations. Once locations are identified and the property broken into workable zones that can be monitored at future dates, Charlotte Harbor Environmental Center volunteers and staff conduct weekly work-parties to cut, pull and treat these exotics using approved herbicide application. Areas are checked and re-treated at regular intervals.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Charlotte County; U.S. Fish and Wildlife Service (USFWS); Florida Fish and Wildlife Conservation Commission; Mosquito Control District; Southwest Florida Water Management District (SWFWMD); local residents; various mitigation projects, e.g., Florida Department of Transportation (FDOT).

Geographic Area: Lemon Bay/Gasparilla Sound and Charlotte Harbor Proper Basins.

Expected Benefits and/or Drawbacks: Increased habitat and reduction of invasive exotic vegetation coverage.

Project Timeline/Schedule: On-going since at least 1998.

Status: On-going.

Resources/Funding
Available: Charlotte County, Surface Water Improvement and Management (SWIM) (99-00).
Needed: Additional funding for further removal.
Potential: See above Project Partners.

Reference Documents:

Comments:

Natural Shoreline Education

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-B

Project Description: Develop and promote information/ materials/ education programs which offer ideas and concepts related to natural shorelines: how existing hardened shorelines may be altered, how to effectively keep natural shorelines in place, how to use native plants to create attractive natural shoreline areas which enhance wildlife habitat and offer aesthetic beauty, and how rip-rap and other reef-like elements can enhance marine ecosystems.

Strategy for Implementation: Work with agencies responsible for shoreline development to coordinate and infuse "natural-options" with their pre-construction work by offering to act as the educational "consultant" as they proceed with permitting, modification, and new development projects; work with existing homeowner groups who live in canal areas; and promote these concepts through the media and through traditional public outreach methods such as brochures in libraries, exhibits in public places, speaker presentations at demonstration sites, etc.

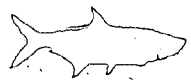
Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: University of Florida Institute of Food and Agricultural Sciences (IFAS)/ Cooperative Extension Service (CES)/Sea Grant Program; Local Zoning & Permitting Departments; marine trade associations; Beaches and Shores Advisory Committees; area homeowner groups; area libraries, malls, and other public places; other grantors.

Geographic Area: Charlotte Harbor Proper Basin.

Expected Benefits and/or Drawbacks: Improved diversity of structure and increased estuarine/ marine habitat along modified shorelines.

Project Timeline/Schedule: One-year pilot program, with funding to be sought for continuing years.



Status: Some of this type of education is offered currently through the Charlotte County Cooperative Extension Service (CES) Sea Grant agent, Rich Novak, specifically with a group who creates reef balls for placement in the harbor. We would work with these groups to expand their educational reach to private homeowners in the coastal regions of the watershed.

Resources/Funding
Available: Unaware of the extent of current funding through the Cooperative Extension Service.
Needed: Not sure, $7,500 - $10,000 per year.
Potential: Please see above listed partners.

Reference Documents:

Comments:

Partial Restoration of Huckaby Creek, Phase II

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-C

Project Description: Huckaby Creek was dredged and channelized in the 1960s for stormwater conveyance. The construction of this canal has resulted in an earthen plug in Huckaby Creek and a spoil berm along the entire length of the canal. This berm inhibits proper sheet flow from the uplands of Tippecanoe Scrub to Huckaby Creek and Tippecanoe Bay. The spoil berm has also provided optimum conditions for invasive exotic infestation and erosion problems resulting in downstream deposition of sediments and water quality degradation.

Strategy for Implementation: This project will restore a portion of the natural water flow into Huckaby Creek by filling portions of the man-made canal with the original spoil located along the canal, removal of exotic vegetation, with subsequent restoration of the adjacent salt and freshwater marshes and pine flatwoods.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Florida Fish and Wildlife Conservation Commission; Southwest Florida Water Management District (SWFWMD); U.S. Army Corps of Engineers (ACOE); Department of Environmental Protection (DEP); Mosquito Control District; Charlotte County.

Geographic Area: Huckaby Creek/Tippecanoe Bay/Charlotte Harbor.

Expected Benefits and/or Drawbacks: Improved hydrological function and increased native vegetation.

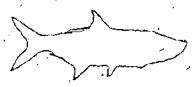
Project Timeline/Schedule: Phase I of this project began in 1998 and was completed in 1999. Phase II (mostly exotic removal and re-planting of native species) will begin in 1999. Related project: see "Partial Restoration of Huckaby Creek, Phase I".

Status: See above.

Resources/Funding
Available: Florida Pollution Recovery Program, Charlotte County.
Needed:
Potential:

Reference Documents:

Comments:



Environmental Boating Education

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Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-D

Project Description: A speaker bureau/ slide presentation which can be delivered to clubs and organizations to educate about environmentally-friendly boating practices in the Charlotte Harbor watershed, especially to teach about protection of seagrass beds.

Strategy for Implementation: Develop slide programs for each of the major estuarine areas that show habitat losses associated with prop damage, demonstrate how boaters can avoid damage to seagrass beds; train volunteer speakers to make these presentations at local civic and business groups, and local schools, as well as boating and fishing associations; and integrate the presentation into area environmentally responsible boating courses.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Florida Boater Improvement Program; West Coast Inland Navigational District (WCIND); University of Florida, Institute of Food and Agricultural Sciences (IFAS)/ Sea Grant Program; boating and fishing organizations; marine trade associations; U.S. Coast Guard (USCG) and Auxiliary; Department of Environmental Protection (DEP); Florida Fish & Wildlife Conservation Commission volunteers; boating and environmental groups; area schools; other grantors.

Geographic Area: Charlotte Harbor Proper Basin, Coastal Venice Basin, Lemon Bay/ Gasparilla Sound Basin, Pine Island Sound Basin, Estero Bay Basin.

Expected Benefits and/or Drawbacks: Increase boater awareness of potential damage to marine habitats; and reduction in damage to marine habitats.

Project Timeline/Schedule: One year - develop program within three months of funding; create program within four months of funding; recruit and train volunteers within five months of funding; promote program, month five; present program beginning month six; and continue presentations as long as there is funding.

Status: Potential.

Resources/Funding
Available: Not currently funded.
Needed: $10,000- $15,000.
Potential: Please see above listed partners.

Reference Documents:

Comments:

Seagrass Exhibits

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-I

Project Description: Development and installation of portable, semi-permanent displays with information about environmental responsibility for marine habitats, especially seagrasses, which can be set up at malls and other public locations.

Strategy for Implementation: Develop portable displays with the following information: the importance of seagrass beds, how to avoid damage to seagrass beds; how to remove a boat from a seagrass bed; maps showing specific seagrass beds, oyster bars, major navigational channels, ramps and marinas, as well as areas to be avoided based upon draft of boat and tide levels in the locality; and areas known to be frequented by manatees and manatee slow-speed zones. Schedule displays in public places throughout the watershed, such as libraries, public buildings, malls and schools.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: University of Florida, Institute of Food and Agricultural Sciences (IFAS)/Sea Grant Program; Department of Environmental Protection (DEP); Florida Boater Improvement Program; West Coast Inland Navigational District (WCIND); marine trade associations; Save-the-Manatee Club; Charlotte Harbor National Estuary Program (NEP); area malls, libraries and other public places; other grantors.

Geographic Area: Charlotte Harbor Proper Basin, Coastal Venice Basin, Lemon Bay/ Gasparilla Sound Basin, Pine Island Sound Basin, Estero Bay Basin.

Expected Benefits and/or Drawbacks: Increased public awareness and reduced amounts of habitat damage caused by lack of specific knowledge by the general boating public.

Project Timeline/Schedule: One year, including development/creation of the exhibits, scheduling at public places, and moving the exhibit throughout the year.

Status: Potential.

Resources/Funding
Available: Not currently funded.
Needed: Depending upon exhibit style, between $15,000 and $25,000.
Potential: See partners listed above.

Reference Documents:

Comments:

Habitat Inventory, Monitoring, and Protection of Charlotte Harbor Environmental Center Managed Sites In Charlotte County

Contact Person:	**Bobbi Rodgers**
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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S

Project Description: Charlotte Harbor Environmental Center, Inc. (CHEC) currently manages Tippecanoe Scrub, Abmerjack Slough, Cedar Point Environmental Park, and East Port Water Facility.

Strategy for Implementation: In each of the above properties, key habitats have been identified for protection, and are inventoried for flora (using vegetation transects), fauna (through a trapping program), and/or water quality on a monthly basis. With funding, monitoring programs can be expanded and enhanced, and technical assistance to other parties can be promoted through on-site visits.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Bobbi Rodgers, Environmental Resources Manager.

Other Project Partners: Private property owners; Department of Environmental Protection (DEP), Southwest Water Management District (SWFWMD); Charlotte County; Florida Fish and Wildlife Conservation Commission; U.S. Fish and Wildlife Service (USFWS); other grantors.

Geographic Area: Charlotte Harbor Proper Basin, Lemon Bay/Gasparilla Sound Basin.

Expected Benefits and/or Drawbacks: Maintain and preserve critical wildlife habitats. Through monitoring of these habitats, exotic species (both vegetation and wildlife) can be distinguished and removed, and any listed species may be noted and protected. Determining the quality of on-site bodies helps to identify any potential problems.

Project Timeline/Schedule: Annual timeline with regard to county sites and other grant work is scheduled per project requirements. While limited monitoring began at these sites in 1995, monthly monitoring began in 1998.

Status: Identification completed/in-progress, monitoring/technical assistance to be determined.

Resources/Funding
Available: Currently funded by Charlotte County.
Needed: To be determined.
Potential: See existing partners.

Reference Documents:

Comments:

Habitat and Wildlife Education

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-T

Project Description: Continue programs which improve public awareness of habitat and wildlife issues, particularly those found in the watershed such as coastal, floodplain, and upland systems where listed species live and/or where concerns such as exotic species, fire management, hydrologic alteration and/or other preservation management issues are present. Other target audiences may include nearby residents, homeowners groups, college or high school classes, elected officials and other community leaders.

Strategy for Implementation: Continue implementation of public education programs; continue schools environmental education program; support development of comprehensive environmental science curricula at all levels of education throughout the watershed; develop and implement education programs for developers, contractors, and builders regarding effective means of reducing impact on habitats.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: Watershed public school systems; Southwest Florida Water Management District (SWFWMD); Charlotte Harbor National Estuary Program (NEP); Department of Environmental Protection (DEP); Florida Fish and Wildlife Conservation Commission; other grantors.

Geographic Area: Peace River Basin, Charlotte Harbor Proper, Myakka River Basin, Lemon Bay/ Gasparilla Sound Basin.

Expected Benefits and/or Drawbacks: Increased public awareness of habitat and wildlife issues, and increased support and participation.

Project Timeline/Schedule: Continuing program begun in 1987; implement workshops for educators and developers within a one-year period.

Status: Continuing and new work.

Resources/Funding
Available: Currently funded through Southwest Florida Water Management District (SWFWMD)/Surface Water Improvement and Management (SWIM), Charlotte Harbor NEP, Venice Foundation, Charlotte County, City of Punta Gorda, and Charlotte County Public Schools.
Needed: Additional funding for new work.
Potential: See all partners listed above.

Reference Documents:

Comments:

Watershed Environmental Education

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Quantifiable Objectives Addressed: FW1, FW2, FW3, FW4

Priority Actions Addressed: FW-T

Project Description: To offer environmental education programs to citizens and visitors of the watershed which will promote a greater understanding of the values of our natural resources and the methods which citizens can use to conserve or protect them.

Strategy for Implementation: Continue to develop and offer a variety of environmental education programs, using various methods such as slide presentations, workshops, lectures, hands-on field experiences, exchange trips, exhibits, special events, and study programs on the following topics:

Fishes of Charlotte Harbor; Mangrove Ecosystems; Pollution: air, water, soil; Prehistoric use of water resources; Project Wet & Aquatic Wet; Project Learning Tree & Project Wild; Rivers & Lakes Education; Schoolyard Habitats; Seagrasses Exploration; Student Exchange Programs; Teacher Exchange Programs; Teacher Watershed Workshops; Teacher Estuarine Workshops; Nature Photo Displays; Water Resources Field Trips; Natural Resources in the Watershed; Wetland Soils Workshops; Rookeries Survey & Education; Exotic Plants in the Watershed; Exotic Animals in the Watershed; Aquatic Weed Control; Mosquito Control; Solid Waste Management in the Watershed; and Fishes of Upper Basin Lakes.

Responsible Partner and Project Coordinator: Charlotte Harbor Environmental Center, Inc. (CHEC), Joy Duperault, Executive Director.

Other Project Partners: The Southwest Florida Water Management District (SWFWMD); Charlotte County & The City of Punta Gorda; Charlotte County Public Schools; Charlotte Harbor National Estuary Program (NEP); Florida Boater Improvement Program; other grantors.

Geographic Area: All areas of the watershed within the Southwest Florida Water Management District (SWFWMD).

Expected Benefits and/or Drawbacks: Increased awareness and sense of ownership of environmental resources for preservation and protection strategies/implementation (i.e., a better-educated public may have resulted in a better plan for central sewer expansion in 1996).

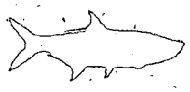
Project Timeline/Schedule: On-going; each different project has timelines according to the specific grant or funding source needs.

Status: On-going program since 1987.

Resources/Funding
Available: Currently funded by partners listed above and by other grantors not listed.
Needed: Per project.
Potential: See above.

Reference Documents:

Comments:



Septic Tank Alternatives Study

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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4

Priority Actions: WQ-F

Project Description: The City of North Port's Comprehensive Plan, adopted in 1998, devoted several policies to the issue of septic tanks, which are proliferating in this platted lands City of over 75 square miles. Besides addressing the usage of septic tanks, the Comprehensive Plan also calls for the development of a Water and Sewer Master Plan to formulate a framework for the provision of municipal water and sewer service throughout the City (discussed as a separate Action Plan Project). Specifically, two policies in the Stormwater Management Element address a septic tank usage study. The policies read as follows:

> **Policy 3.3:** Prior to 2000, the City shall analyze the feasibility of prohibiting septic tank installation within the 100-year floodplain, as delineated by Federal Emergency Management Agency, Flood Insurance Rate Map (FIRM); and other potential disposal methods which may serve as desirable alternatives to septic tanks.
>
> **Policy 3.4:** Prior to 2000, the City shall amend its Unified Land Development Code to provide for incentives and disincentives intended to reduce the desirability of septic tank installation within the 100-year floodplain, as delineated by the Federal Emergency Management Agency FIRM.

Strategy for Implementation: The City will have to develop a framework, or scope of services, for whomever conducts the study. The Study should result in, as stated in the policies, a listing of alternative methods of solid waste disposal in areas not served by municipal water and sewer services. The study should further analyze what areas have the highest densities of septic tanks, with an analysis of their impact upon the aquifers, natural habitats, fish and wildlife, and human health. The study should also result in the establishment of incentives and disincentives for septic tank usage within the 100-year floodplain. The findings of this study should be included within the Water and Sewer Master Plan, as amended.

Responsible Partner and Project Coordinator: City of North Port Community Development and Utilities Departments.

Other Project Partners: The City's Contract Engineer, Florida Department of Health, Southwest Florida Water Management District (SWFWMD), Department of Community Affairs (DCA), Department of Environmental Protection (DEP), and Environmental Protection Agency (EPA).

Geographic Area: City of North Port.

Expected Benefits and/or Drawbacks: Establish alternatives, or more environmentally safe, methods of solid waste storage within the 100-year floodplain. The ultimate benefit would be the substantial reduction of existing septic tanks, and a reduction in the number of new tanks being placed within the 100-year floodplain.

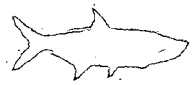
Project Timeline/Schedule: The project is expected to begin in 1999, and end by October 2000.

Status: Planned.

Resources/Funding
Available: Not identified.
Needed:
Potential: Grants, professional scientific studies, college projects, etc.

Reference Documents: City of North Port Comprehensive Plan.

Comments: Because of the large size of this platted community, septic tanks have become the primary form of solid waste disposal for the City. The increased use of septic systems could have a negative impact upon environmental and human health in the area. The development of septic drain fields also impacts the natural function of the floodplain and could exacerbate flooding problems. Therefore, this study in conjunction with the development of a line extension program within the Water and Sewer Mater Plan, should benefit both humans and the environment.



City of North Port Water and Sewer Master Plan - Implementation

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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-G

Project Description: The City of North Port's Comprehensive Plan, adopted in 1998, clearly states the City's vision concerning the provision of municipal water and sewer by stating that at the time of buildout the entire City, with the exception of the Residential Estates area, Myakka State Forest, and other conservation/open space areas. This is a strong statement when considering the fact that North Port covers over 75 square miles and is predominately platted for single family residential development. Because of the City's immense size and the population growth that it is experiencing, the provision of municipal water and sewer is lagging behind and septic systems continue to proliferate. In order to determine the priority locations, types of service, and financing for the provision of these services, the Comprehensive Plan further called for the development of a Water and Sewer Master Plan. City staff and the City's consulting Engineer are currently working on this project, which is expected to be complete by the summer of 1999. Implementation of the program will likely begin in late 1999 or 2000. In determining priority areas to receive municipal water and sewer service several guidelines were examined which include:

- whether the project is needed to protect public health and safety (including the environment);
- provide facilities and services to preserve or achieve full use of existing facilities, and increase efficiency;
- prevents or reduces future improvement costs;
- promotes in-fill, economic development or educational facilities; and
- provides service to developed areas lacking full service.

Strategy for Implementation: Upon completion of the Water and Sewer Master Plan, the City will begin the process of providing service to the areas receiving the highest priority rankings, which must ultimately be approved by the City Council. At this stage in drafting the Master Plan no specific strategies have been agreed upon for implementation and financing of the project.

Responsible Partner and Project Coordinator: The City's project coordinator will likely be the City's Utility Department in conjunction with the City's Consulting Engineer and approved sub-contractors.

Other Project Partners: Other project partners could include the Southwest Florida Water Management District (SWFWMD), Department of Environmental Protection (DEP), Department of Community Affairs (DCA), Florida Department of Health, Environmental Protection Agency (EPA).

Geographic Area: The entire City of North Port excluding the Residential Estates area, the Myakka State Forest, and designated conservation/open space areas.

Expected Benefits and/or Drawbacks: The Master Plan will be beneficial in that it will utilize a scientific methodology for the extension of municipal water and sewer throughout the majority of the City's 75 square miles. The environmental benefits include the reduction in the number of private wells and septic tanks throughout the City which will reduce the direct consumption of groundwater and which will enhance the water quality of area surface waters and aquifers. The immense size of the City and the cost of extending services will likely be the greatest drawbacks.

Project Timeline/Schedule: The Water and Sewer Master Plan is a 20 year plan that will be updated every five years, as necessary.

Status: Development of the Master Plan is still in progress, but will be completed by the summer of 1999. The planned start of implementation should begin in late 1999/2000.

Resources/Funding
Available: The financial portion of the Master Plan is still being developed at this time.
Needed:
Potential:

Reference Documents: City of North Port Comprehensive Plan, City of North Port Water and Wastewater Master Plan (1994).

Comments: Implementation of the new Water and Wastewater Master Plan will be one of the largest projects ever undertaken by the City. The reduction in the use of septic systems and private water wells, and the expansion of a gray water program will not only benefit the citizens, but the environment of the area as well.

Myakkahatchee Creek Preservation Corridor

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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-T

Project Description: Since 1988, North Port City staff, at the direction of the City Commission, has been engaged in an extremely ambitious project: the acquisition of a preservation and public recreation corridor along the entire, undeveloped length of the Myakkahatchee Creek from U.S. Highway 41 to the northern City limits, a distance of approximately 6.5 to 7 miles. Three goals provide the rationale for this acquisition project:

1) Protection of water quality within the Myakkahatchee Creek: the Creek is a potable water source for the City. The ongoing threat to this water supply is the inevitable development of lots in the floodplain of the Creek, the great majority of which are not served by the central sewer. At a *minimum*, protection of the water supply will require the acquisition of a protective buffer or corridor two lots wide for the entire length of the undeveloped portion of the Creek above the City's water treatment plant. Preservation of the Creek's water quality is also a regional issue, since it feeds into the State-protected Myakka River and Charlotte Harbor.

2) Resource-based, non-consumptive recreational opportunities for the public: Preservation of the Creek corridor presents the City, in partnership with the Sarasota County Parks and Recreation Department and various state and federal grantor agencies, the opportunity to create a seven-mile long linear park and greenway, with ample opportunities for people to enjoy picnicking, hiking, canoeing, birdwatching, and other activities in an essentially unspoiled setting.

3) Flood hazard mitigation through reduction of housing density in the Creek floodplain: The City has endured many pointed reminders, most notably during the flood of June-July 1992, of the Myakkahatchee Creek's tendency to flood. Unfortunately, General Development Corporation platted residential lots right up to the Creek banks. The total number of lots vulnerable to seasonal flooding in the Creek floodplain is a debatable issue. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), last updated in 1981, depicts a considerably smaller floodplain than the City's consultant, Camp, Dresser & McKee (CDM), found when they used computer software and more recent data to re-define the flood hazard zone in 1992. In addition to a much larger floodplain, CDM determined that even the expenditure of millions of dollars would fall far short of eliminating flooding, both in the Creek floodplain and elsewhere in the City.

Whatever the actual boundaries of the Creek floodplain may be, it *is* certain that if lots near the Creek are allowed to be developed, three results will almost certainly ensue: 1) homeowners will incur millions of dollars in property damage and loss over time as the Creek continues in its flooding cycle; 2) City government will spend a great deal of money attempting to reduce losses to homeowners; and 3) the flooding potential will worsen as floodwaters are shifted from higher, newly-developed properties to other areas, particularly those down-stream.

In keeping with a world-wide shift away from "flood control" (a vain hope at best) and toward flood *management*, the City's land acquisition program is helping us avoid these consequences by reducing the presence of people and their property in the Creek floodplain.

Strategy for Implementation: Fee-simple acquisition has been pursued, with some success, by the City; although matching grants have helped in the past, most of the cost burden of future acquisitions will likely fall on the City; cost-sharing on a regional basis would, of course, be preferable. Although no barriers related to regulation and monitoring are associated with acquisition and preservation of these properties, assemblage of financial and human resources to manage the preservation corridor is a concern. Currently, the City has an interlocal agreement with the Sarasota County Parks & Recreation Department by which the County is responsible for management. However, the County's resources are limited.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Tampa District Office.

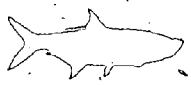
Other Project Partners: The Southwest Florida Water Management District (SWFWMD), Sarasota County (see above).

Geographic Area: Myakkahatchee Creek corridor from U.S. Highway 41 northward to the northern City limits. The project, as well as the entire City of North Port, is located in the Myakka River drainage basin. Jurisdictionally, the Manasota Basin Board of the Southwest Florida Water Management District (SWFWMD) has charge of this area.

Expected Benefits and/or Drawbacks: Please see discussions under Project Description and Strategy for Implementation, above.

Project Timeline/Schedule: The City would like to complete this project as soon as possible, since it has occupied a fair share of staff resources for 10 years thus far.

Status: The City has purchased, with the aid of grants, approximately 180 acres. However, the City is much closer to realizing it's goal than this number would suggest because it already owns a considerable amount of other property in the floodplain. These creek-front properties total 536 additional acres. Most of these lands were deeded to the North Port Water Control District by General Development Corporation in 1993, and later became the property of the City upon the dissolution of the District. Thus, altogether, lands in City ownership on the Creek, whether purchased with grants or otherwise titled to the City, total approximately 716 acres.



Some 30 lots remain to be purchased in the first tier (i.e., lots immediately fronting on both banks of the Creek). The option of purchasing a "second-tier" (properties one lot removed from the Creek, but well within the area of seasonal inundation) has been discussed. In rough numbers, acquisition of the second tier would add approximately 170, 80- by 120-foot lots to the corridor project.

Resources/Funding
Available: $50,000
Needed: 1st tier, approximately $195,000; 2nd tier, an additional $1,105,000 (approximate).
Potential: $425,000

Reference Documents: Grant proposals (Florida Recreation Development Assistance Program (two grants), Land and Water Conservation Fund (one grant), the Florida Boating Improvement Program (one grant), and Preservation 2000 (P-2000)/Florida Communities Trust (three grants); the City of North Port Comprehensive Plan.

Comments: The Creek preservation corridor is one of the most important undertakings the City has ever attempted, since its completion will go far to guarantee the quality of the City's secondary potable water source. In 1999, the City, in partnership with the Southwest Florida Water Management District (SWFWMD), will attempt to determine the feasibility of Aquifer Storage and Recovery as a means of maximizing the quantity of water that can be withdrawn from the Creek. This and related efforts are based upon the City's conviction that the surface waters of the Myakkahatchee Creek will remain a vital component of North Port's potable water supply for years to come.

North Port Conservation Land Banking

Contact Person: Samuel K. Jones, AICP
Title: Community Development Director
Agency/Organization: City of North Port/Department of Community Development
Mailing Address: 5650 North Port Boulevard, North Port, FL 34287
Telephone Number: (941) 423-3144
FAX Number (941) 423-3179
E-mail Address: Npplanning@acun.com

Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-A, FW-S, FW-U

Project Description: The City of North Port is one of the larger platted lands communities in Southwest Florida, covering approximately 75 square miles. When the City was platted, lots were placed right up to the banks of the Myakkahatchee Creek, which is a tributary of the Myakka River and, hence, Charlotte Harbor. The creek is a natural drainage conduit from lands to the north via the Big Slough. In fact, the creek and the lands immediately adjacent to it are designated as the 100-year floodplain by the Federal Emergency Management Agency (FEMA). The creek also serves as the City's primary source of potable water.

The City has been actively trying to purchase the first tier of platted lots on each side of the creek for quite some time, and has been quite successful in this endeavor, although there are still a number of lots to be acquired. The City's Comprehensive Plan has devoted numerous policies in the Future Land Use, Stormwater Drainage, and the Conservation and Coastal Management Elements to protection of the creek corridor. In fact, the Comprehensive Plan calls for the acquisition of the second tier of lots adjacent to the creek. Besides outright acquisition of land, the Comprehensive Plan identifies other methods, such as transfer of development rights, to gain control of these properties. Another concept that was considered was the establishment of a "mitigation bank" within the creek corridor. In concept the mitigation bank would work in two ways: 1) Developers of commercial or industrial properties who must remove a large number of trees, destroy wetlands, or severely alter the environmental integrity of a site somewhere within the City would be offered the option to purchase one of the remaining properties along the creek which would then be dedicated to the City as a conservation/preservation land; and 2) Developers of a site within the City could restore wetlands, remove exotic species, remove roadways, or replant native vegetation on City-owned properties within the corridor.

Strategy for Implementation: Identify the properties within the creek corridor (first and second tier of lots at the least) that still must be acquired. Survey the properties to identify those which have experienced the highest degree of degradation or exotic invasion, and map them accordingly. Determine, based upon development trends, what platted roadways could be removed. Develop, through the City's Unified Land Development Code, a methodology for initiating and managing the mitigation banking process.

Responsible Partner and Project Coordinator: City of North Port Community Development and Public Works Departments.

Other Project Partners: The City's Contract Engineer, Southwest Florida Water Management District (SWFWMD), Florida Fish and Wildlife Conservation Commission, Department of Community Affairs (DCA), Department of Environmental Protection (DEP), Environmental Protection Agency (EPA), the Trust for Public Lands, the National Audubon Society, the Nature Conservancy, private businesses.

Geographic Area: The first and second tier of residential lots along both sides of the Myakkahatchee Creek from the City's northern city limits to U.S. 41. The project could be expanded beyond the first and second tier of lots, as necessary.

Expected Benefits and/or Drawbacks: Benefits include reduction in the number of platted residential lots fronting the creek, enhanced function of the floodplain, reduction of existing septic tanks, and a reduction in the number of new tanks being placed within the 100-year floodplain, increase in the acreage within the City devoted to preservation/conservation, restoration of native vegetation, increased native wildlife habitat, protection of a potable water source, and pollution reduction. The major drawback will be getting developers to buy into the mitigation bank concept.

Project Timeline/Schedule: The project is expected to be in place by the year 2001.

Status: Planned.

Resources/Funding
Available: Not identified.
Needed:
Potential: Grants, professional scientific studies, college projects, etc.

Reference Documents: North Port Comprehensive Plan, North Port Unified Land Development Code.

Comments: Although the City has initiated a program, in conjunction with the Department of Environmental Protection (DEP) and Southwest Florida Water Management District (SWFWMD), for creek land purchases, a mitigation banking program would supplement this program with purchases or environmental restoration activities paid for by developers.

Punta Gorda Nature Park Restoration, Phase I

Contact Person: James M. Stilwell
Title: Environmental Planner
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Mailing Address: 326 West Marion Avenue, Punta Gorda, FL 33950
Telephone Number: (941) 575-3324
FAX Number: (941) 575-3347
E-mail Address: Comdev@sunline.net

Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-P, FW-R

Project Description: The City of Punta Gorda has removed exotic vegetation from a significantly disturbed historic wetland and replanted it with appropriate wetland vegetation. The restoration included the connection of an extensive mosquito ditch network to an adjacent saltwater canal. This connection established tidal inundation to nearly ten acres of wetlands cut off by the exotic growth.

Strategy for Implementation: The vegetation (*e.g.* Australian pines) has been removed, the area graded, and a tidal connection made. The area has been planted with 7,000 wetland and transitional plants at appropriate elevations. The planting will be monitored for survival and exotics periodically removed from the site.

Responsible Partner and Project Coordinator: The City of Punta Gorda is now the responsible partner; James M. Stilwell, Environmental Planner.

Other Project Partners: Florida Communities Trust, Florida Recreation Development Assistance Program (FRDAP), Peace River Basin Board of the Southwest Florida Water Management District (SWFWMD), Charlotte Harbor NEP, and Charlotte Harbor Environmental Center.

Geographic Area: The project is located near the center of a large residential community in Punta Gorda, at the intersection of Bal Harbor Boulevard and Aqui Esta Drive in Section 3, Township 41S, Range 22E. The restored area is directly connected to Charlotte Harbor.

Expected Benefits and/or Drawbacks: 1) Elimination of one acre of noxious exotic vegetation; 2) restoration of one acre of saltwater wetlands; 3) enhancement of ten acres of tidal marsh; and 4) increased enhancement of fish and wildlife habitat.

Project Timeline/Schedule: The project began in June of 1998 and Phase II is continuing as time and funding become available.

Status: Planting was completed. Annual monitoring for vegetation survival with replacement planting as necessary. Annual maintenance and exotic removal. Maintain tidal connection.

Resources/Funding
Available: City Park Maintenance Funds.
Needed: N/A.
Potential: N/A.

Reference Documents: N/A.

Comments: The Punta Gorda Nature Park wetland restoration project has been a tremendous success with little or no vegetation mortality and minimal new exotic invasion. Time will reveal benefits associated with restoration of tidal inundation to the ten acres of historic wetland.

Punta Gorda Nature Park Restoration, Phase II

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Quantifiable Objectives Addressed: FW-4, FW-2

Priority Actions Addressed: FW-A, FW-C

Project Description: The City of Punta Gorda recently completed the initial phase of construction of a nature park. This project includes the removal of all exotic vegetation on the 20-acre site. At this time, exotic removal is approximately 50% complete.

Strategy for Implementation: Exotic vegetation is removed as funding or prisoner labor is available. All exotic removal must be done by hand to avoid damage to surrounding wetlands.

Responsible Partner and Project Coordinator: City of Punta Gorda, Public Works Department, Project Coordinator, Mary Cornwell.

Other Project Partners: Charlotte Harbor Environmental Center and Florida Department of Corrections.

Geographic Area: The Punta Gorda Nature Park is located in the center of a large residential community in the City of Punta Gorda, at the intersection of Bal Harbor Boulevard and Aqui Esta Drive in Section 13, Township 41S, Range 22E.

Expected Benefits and/or Drawbacks: The benefits will be the restoration and enhancement of approximately 20 acres of native habitat including salt marsh and upland pine palmetto flatwoods.

Project Timeline/Schedule: The exotic removal is scheduled to be completed within five years.

Status: The removal is approximately 50% complete. The wetland restoration included in the Punta Gorda Nature Park Restoration, Phase I is complete.

Resources/Funding
Available: City Park Maintenance Funds/Prisoner Labor.
Needed: N/A.
Potential: N/A.

Reference Documents: N/A.

Comments: The City has made a commitment to eliminate exotic vegetation at this 20-acre site.

Punta Gorda Reef Ball Project

Contact Person: James M. Stilwell
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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-P

Project Description: The City is currently working with the Charlotte Harbor Reef Association to install artificial habitat (*i.e.* concrete reef balls) under 90 docks in the man-made canals of Punta Gorda, as well as under the City's three fishing piers.

Strategy for Implementation: Reef balls are designed to create a variety of habitat niches for attachment organisms and fishes. Permitting has been completed and installation will begin in June 1999. Project completion is anticipated to take six months.

Responsible Partner and Project Coordinator: Charlotte Harbor Reef Association, Jerry Jensen; City of Punta Gorda, Richard Benson and James Stilwell.

Other Project Partners: Individual homeowners within Punta Gorda. Future deployment of reef balls may include Florida Sea Grant.

Geographic Area: Various locations throughout the Punta Gorda canal system, the fishing piers at the Nature Park, Gilchrist Park, and Laishley Park.

Expected Benefits and/or Drawbacks: Additional fish and invertebrate shallow water estuarine habitat.

Project Timeline/Schedule: The initial phase will start in June and likely be completed in 1999.

Status: The project has been reviewed by the Department of Environmental Protection and permit authorization has been received.

Resources/Funding
Available: City of Punta Gorda, Charlotte Harbor Reef Association, Charlotte Harbor NEP.
Needed: N/A.
Potential: N/A.

Reference Documents: N/A.

Comments: N/A.

City of Punta Gorda Irrigation Sensor Rebate Program

Contact Person: Bill Harper/James M. Stilwell
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Telephone Number: (941) 575-5050
FAX Number: (941) 575-5044
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Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D

Project Description: Retrofit pre-1992 irrigation systems with sensor to interrupt irrigation when rain or moisture is present. Florida Statutes and City Ordinance are required on all new installations. This project encourages voluntary retrofits for existing systems.

Strategy for Implementation: The City will provide information to customers to encourage voluntary participation.

Responsible Partner and Project Coordinator: City of Punta Gorda Utilities Department, Bill Harper.

Other Project Partners: Southwest Florida Water Management District (cooperative funder).

Geographic Area: Punta Gorda water service area. Conservation will affect Shell Creek Reservoir withdrawals.

Expected Benefits and/or Drawbacks: Projected scope 862 units with estimated 5.0 mg "annual" savings. Possible drawback is low participation.

Project Timeline/Schedule: Available by May 1999 and ending July 1, 2000.

Status: Approved and budgeted – materials under development. Release anticipated May 1999.

Resources/Funding
Available: $40,000 Budgeted by City FY99.
Needed: N/A.
Potential: 50% Reimbursement by Southwest Florida Water Management District (SWFWMD) after expenditure.

Reference Documents: N/A.

Comments: N/A.

City of Punta Gorda – Burnt Store Isles Stormwater Treatment Retrofit

Contact Person: James M. Stilwell
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Quantifiable Objectives Addressed: WQ-4, WQ-6

Priority Actions Addressed: WQ-E, WQ-N

Project Description: The City of Punta Gorda proposes to complete a stormwater treatment retrofit project in order to replace an antiquated and ineffective boat lock to protect water quality in this residential community. The current drainage system utilizes grass swales with no designed treatment capacity.

Strategy for Implementation: The retrofit has been designed and engineered by City staff. The project will be implemented upon acceptance by Florida Department of Environmental Protection. The swale/filtration system and weir structures will be constructed beginning in late 1999 and completed in 2000.

Responsible Partner and Project Coordinator: City of Punta Gorda project coordinator is Steve Adams, City Engineer.

Other Project Partners: Burnt Store Isles Canal Maintenance Assessment District.

Geographic Area: The project will treat stormwater runoff within the Burnt Store Isles residential community.

Expected Benefits and/or Drawbacks: Water quality improvement and/or protection for surface water of Alligator Creek and Charlotte Harbor.

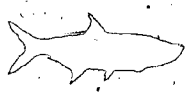
Project Timeline/Schedule: The project will be started in late 1999 and completed in six to twelve months.

Status: The project is currently being reviewed by Florida Department of Environmental Protection staff.

Resources/Funding
Available: City of Punta Gorda/Burnt Store Isles Canal Maintenance Assessment District.
Needed: N/A.
Potential: N/A

Reference Documents: Florida Department of Environmental Protection Application #08-0128882-001.

Comments: N/A.



City of Punta Gorda Manatee Protection Plan

Contact Person: James M. Stilwell
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Agency/Organization: City of Punta Gorda
Mailing Address: 326 West Marion Avenue, Punta Gorda, FL 33950
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FAX Number: (941) 575-3347
E-mail Address: comdev@sunline.net

Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-F, FW-G, FW-L, FW-N, FW-Q

Project Description: The plan provides a mechanism for enforcement of slow speed, minimum wake zones throughout the Punta Gorda canal system, as well as within the shoreline areas, to the six foot depth contours.

Strategy for Implementation: The plan has been implemented. Enforcement of speed zones and restricted areas will be provided by Police Marine Officers.

Responsible Partner and Project Coordinator: The enforcement component is implemented through the Police Department, Chief Dan Libby; signage and channel marking through Canal Maintenance, Richard Benson; supervisor and public information administrator, Jim Stilwell, Environmental Planner.

Other Project Partners: N/A.

Geographic Area: The plan encompasses all waters within the jurisdictional authority of the City of Punta Gorda.

Expected Benefits and/or Drawbacks: Benefits include manatee protection, as well as protection of submerged aquatic resources and shoreline riparian habitat. The plan also protects private property within the canal system and encourages safe, responsible boating.

Project Timeline/Schedule: The plan is complete, continued implementation and enforcement are required.

Status: Enforcement capability is in place, including boat, motor, trailer, and a full time marine officer. Public education brochures have been printed and distributed with vessel registration renewals.

Resources/Funding
Available: City of Punta Gorda.
Needed: Continued Public Education Information.
Potential: N/A.

Reference Documents: City of Punta Gorda Manatee Protection Plan.

Comments: N/A

Punta Gorda Geographic Information System

Contact Person: James A. Reed, II
Title: Economic Facilitator/Geographic Information System (GIS) Manager
Agency/Organization: City of Punta Gorda
Mailing Address: 326 West Marion Avenue, Punta Gorda, FL 33950
Telephone Number: (941) 575-3324
FAX Number: (941) 575-3347
E-mail Address: Comdev@sunline.net

Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-A, FW-C, FW-H, FW-V

Project Description: The City is developing a Geographic Information System (GIS) to assist staff and the public. The system consists of high quality and informative graphics, along with limitless geographic analysis. Specifically, existing land use and the natural environment will be inventoried. This will be organized to analyze as a benchmark to track changes, especially with natural environmental sites, and how they relate to human needs (single-family homes, marinas, etc.).

Strategy for Implementation: The City is currently in the process of implementing the system and will continue as information and funding is available.

Responsible Partner and Project Coordinator: City of Punta Gorda, Geographic Information System (GIS) Specialist, James Reed.

Other Project Partners: Charlotte County.

Geographic Area: City of Punta Gorda, Charlotte County area and Charlotte Harbor.

Expected Benefits and/or Drawbacks: Better information, high quality graphics, detailed land uses, that will allow better informed decision making for future City projects, programs, and policies.

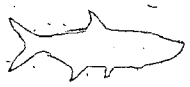
Project Timeline/Schedule: Continuing implementation as technology and funding are available.

Status: Basic equipment has been purchased and baseline information gathered.

Resources/Funding
Available: City of Punta Gorda.
Needed: N/A.
Potential: N/A.

Reference Documents: N/A.

Comments: This project will eventually create the database for all future land use decisions in the City of Punta Gorda.



Punta Gorda Aquifer Storage and Recovery Project

Contact Person: Steven E. Lampert
Title: Utility Director
Agency/Organization: City of Punta Gorda
Mailing Address: 30999 Bermont Road, Punta Gorda, FL 33982
Telephone Number: (941) 639-1883
FAX Number: (941) 639-9416
E-mail Address: utility@ci.punta-gorda.fl.us

Quantifiable Objectives Addressed: HA-1

Priority Actions Addressed: HA-A, HA-B

Project Description: Install multiple aquifer storage and recovery (ASR) wells at City of Punta Gorda wastewater treatment plant site for storage/recovery of treated potable water from the City's water supply reservoir. Storage proposed during periods of year where water is readily available. Recovery during drought conditions or emergency situations.

Strategy for Implementation: City has installed a 700-foot feasibility well. Testing underway. Modifications to well proposed in first quarter of 1999. Additional cycle test planned. If feasible, additional aquifer storage and recovery (ASR) wells will be budgeted.

Responsible Partner and Project Coordinator: City of Punta Gorda, Steve Lampert, Utilities Director.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Bart Weiss, and Florida Department of Environmental Protection.

Geographic Area: City of Punta Gorda.

Expected Benefits and/or Drawbacks: Benefits – Allow recovery of water from Shell Creek during time of excess. Recovery of treated water from aquifer storage and recovery (ASR) during drought/low flow conditions in Shell Creek. Activity will further goals of promoting natural seasonal flows to occur.

Project Timeline/Schedule: Feasibility well completed. Cycle test in FY 1999. If feasible, possible additional aquifer storage and recovery (ASR) wells in FY 2001.

Status: Feasibility well ongoing. Future wells planned.

Resources/Funding
Available: City of Punta Gorda Utility Fund.
Needed: N/A.
Potential: Southwest Florida Water Management District (SWFWMD) cooperative grants.

Reference Documents: Southwest Florida Water Management District (SWFWMD).

Comments: If aquifer storage and recovery (ASR) proves feasible, many positive issues could be realized.

Punta Gorda Central Sewer Expansion

Contact Person: Steven E. Lampert
Title: Utility Director
Agency/Organization: City of Punta Gorda
Mailing Address: 30999 Bermont Road, Punta Gorda, FL 33982
Telephone Number: (941) 639-1883
FAX Number: (941) 639-9416
E-mail Address: utility@ci.punta-gorda.fl.us

Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-G

Project Description: Install central sewer system to areas of Charlotte County surrounding the City of Punta Gorda near tidal bodies of water. The City has an existing wastewater transmission system that is located near these areas in the County, south of the Peace River. The City's existing wastewater treatment plant will accommodate the additional volume of wastewater.

Strategy for Implementation: Complete Master Plan for study area. Address critical issues with effected residents and Charlotte County government. Address funding issues. Develop construction plans. Obtain permits.

Responsible Partner and Project Coordinator: City of Punta Gorda, Steve Lampert, Utilities Director.

Other Project Partners: Charlotte County.

Geographic Area: Priority areas include the subdivision of Charlotte Park and Solona area that are located near Charlotte Harbor.

Expected Benefits and/or Drawbacks: Benefits – Place high-density residential area known to have failing septic systems on a central sewer system which will improve water quality in Charlotte Harbor. Drawbacks – public acceptance.

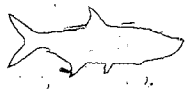
Project Timeline/Schedule: Master Plan work FY 1999. Governmental review late 1999. Possible phased approach for design/construction in FY 2000 or later depending on political acceptance.

Status: Master Plan work began in February 1999.

Resources/Funding
Available: City of Punta Gorda Utility Fund.
Needed: N/A.
Potential: State Revolving Fund.

Reference Documents: City of Punta Gorda Comprehensive Plan. Charlotte County Comprehensive Plan.

Comments: Reduce septic tank pollution to Charlotte Harbor. Area targeted is highly developed, low elevation, poor soils, and adjacent to tidal canals. Public/political acceptance could be problematic.



Venice Area Native Vegetation Protection

Contact Person: Don Caillouette
Title: Planning Manager
Agency/Organization: City of Venice
Mailing Address: 401 West Venice Avenue, Venice, Florida 34285
Telephone Number: 941-486-2626
FAX Number: 941-480-3031
E-mail Address: DCAILLO@ci.venice.fl.us

Quantifiable Objectives Addressed: FW-1, FW-2, FW-3, FW-4

Priority Actions Addressed: FW-A

Project Description: Impacts to native habitat are evaluated and mitigated during the development review process. When permits are submitted to City staff, the effects on native habitat are considered and permit requirements can include avoiding the destruction of native plants and trees.

Strategy for Implementation: Using the legal authority of the conservation element of the local comprehensive plan, the City has two objectives addressing habitat and native vegetation, with supporting policies. Also, the City enhances native plant protection through an interlocal agreement with Sarasota County regarding implementing tree protection through ordinance #91-3.

Responsible Partner and Project Coordinator: Medard Kopczynski, Director of Growth Management.

Other Project Partners: Sarasota County; Florida Fish and Wildlife Conservation Commission; Florida Department of Agriculture.

Geographic Area: City of Venice.

Expected Benefits and/or Drawbacks: Maintains habitat for native wildlife.

Project Timeline/Schedule: Ongoing since 1991.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents: City of Venice Comprehensive Plan and City Ordinance #91-3.

Comments:

Venice Stormwater Management

Contact Person: Don Caillouette
Title: Planning Manager
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Telephone Number: 941-486-2626
FAX Number: 941-480-3031
E-mail Address: DCAILLO@ci.venice.fl.us

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-B

Project Description: Beginning and continuing the replacement of drainage pipes and culverts with swales, french drains, and catchment basins in areas where improved water quality is needed.

Strategy for Implementation: The Public Works Director is the person/agency charged with the responsibility for the Stormwater Utility system. The stormwater plan includes implementing the seven urban best management practices of the Section 208 (Clean Water Act) Plan for Southwest Florida; identifying additional lands for stormwater retention projects; enforcing the National Pollutant Discharge Elimination System (NPDES) permit, particularly in regard to concurrency; and, undertaking additional assessments where directed, such as the feasibility study for using stormwater retention waters as irrigation waters.

Responsible Partner and Project Coordinator: Pat Collins, City Engineer.

Other Project Partners: Sarasota County (for shared watersheds of Shakett, Curry, and Hatchett Creeks).

Geographic Area: City of Venice. Primary receiving waters are Dona and Roberts Bay, Gulf of Mexico, and the West Coast Inland Navigation District waterway.

Expected Benefits and/or Drawbacks: Improved water quality and improved timing of flows; the major drawbacks are that the older parts of the City are compact, with little opportunity ford the creation of significantly sized retention systems. Additionally, coordination with Sarasota County is necessary to implement portions of the program.

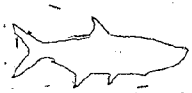
Project Timeline/Schedule: The Utility District was established in 1995, with the first monitoring reports provided in 1996; the national pollutant discharge elimination system (NPDES) permit renewal is due on January 1, 2000.

Status: In progress.

Resources/Funding
Available: Utility.
Needed: Land Acquisition funds and construction funds for projects shared with County.
Potential: Manasota Basin Board and Southwest Florida Water Management District; County Stormwater Utility District.

Reference Documents: City of Venice Comprehensive Plan; National Pollutant Discharge Elimination System permit; Ordinances 95-12 and 96-60.

Comments:



City of Venice Public Information and Education

Contact Person: Don Caillouette
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Agency/Organization: City of Venice
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Telephone Number: 941-486-2626
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E-mail Address: DCAILLO@ci.venice.fl.us

Quantifiable Objectives Addressed: FW-1, FW-2, FW-3, FW-4

Priority Actions Addressed: FW-D, FW-E, FW-F, FW-G, FW-L, FW-Q, FW-T, HA-K, WQ-B, WQ-I

Project Description: Assist lead agencies in public information and education.

Strategy for Implementation: The City has the capacity to assist in the various programs described in the education objectives. Besides the City's own workshops and speakers bureau, the various City enforcement agencies have a public information function which is preferred to be used prior to enforcement actions, but enforcement of the law is expected and pursued. The need for enforcement is lessened if a consistent system of education and information is provided. City staff has as part of their job descriptions providing information to the public and participating in public education programs relevant to their tasks, consistent with City priorities. This is not expected to be unique to the City of Venice.

Responsible Partner and Project Coordinator: Medard Kopczynski, Director of Growth Management; Joseph Slapp, Chief of Police.

Other Project Partners: Any agency with a public information component that involves partnering with cities.

Geographic Area: City of Venice.

Expected Benefits and/or Drawbacks: Reduction in enforcement actions which increasing voluntary compliance with objectives.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Specific to any program underway; general operating budget.
Needed
Potential:

Reference Documents: City of Venice Comprehensive Plan.

Comments:

Venice Intracoastal Waterway Park

Contact Person: **Don Caillouette**
Title: Planning Manager
Agency/Organization: City of Venice
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Telephone Number: 941-486-2626
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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-P, FW-R, FW-S

Project Description: The Intracoastal Waterway divides the City into two parts as the waterway connects Dona and Roberts Bays to the north with Lemon Bay to the south. The current waterway design is as an engineering work for navigation, with little attention to aesthetics, water quality or recreational multi-use opportunities. The opportunity to improve shoreline and submerged lands for aquatic habitat is provided through the increased attention being given to City planning for this area.

Strategy for Implementation: The City is expecting to undertake an enhanced role in the development of the West Coast Inland Navigation District (WCIND) waterway as a linear park. Part of the activities will be determined further as the City proceeds with its sector planning for the Venice Central area. The priority actions referenced (FW-P, FW-R, FW-S) provide further detail that the City will try to accommodate through partnering with the Charlotte Harbor NEP.

Responsible Partner and Project Coordinator: Medard Kopczynski, Director of Growth Management.

Other Project Partners: Sarasota County, Florida Department of Environmental Protection, West Coast Inland Navigation District.

Geographic Area: City of Venice.

Expected Benefits and/or Drawbacks: The benefit is through increased habitat in an artificial waterway. Drawbacks lie in the continued requirements for navigation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential

Reference Documents: City of Venice Comprehensive Plan.

Comments:

Venice Wastewater Reuse

Contact Person: Don Caillouette
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Quantifiable Objectives Addressed: HA1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-D, WQ-P

Project Description: Expansion of the use of wastewater effluent from the sanitary sewer plan for irrigation purposes and for water quality improvement.

Strategy for Implementation: The Public Works Director is the person/agency charged with the responsibility for the sanitary sewer system. The system (two separate plants) depends upon wastewater reuse, primarily for irrigation at golf courses, Venice Airport open space, residential properties, and "hay crop" spray fields. Permitted reuse capacity varies throughout the year, with a peak of 2.95 million gallons per day (both plants combined); there is a storage area for peaks that may exist beyond permitted irrigation levels; once peaks subside, the stored water is treated and then reused.

Responsible Partner and Project Coordinator: Larry Heath, Public Works Director

Other Project Partners: Sarasota County (2002).

Geographic Area: City of Venice. Groundwater systems that contribute to the Gulf of Mexico, West Coast Inland Navigation District (WCIND) canal, and Dona and Roberts Bay. Curry Creek is an approved outfall for one plant during wet weather conditions.

Expected Benefits and/or Drawbacks: Improved water quality and reduction in demand for water resources. Aging through leads to increased infiltration into the system.

Project Timeline/Schedule: The City established its Utility in 1960 (through purchase of private utility.) The City 201 plan was approved in 1987, its Level Of Service (LOS) established in 1989, and its concurrency management ordinance went into effect in 1994. By 2001 the 20 year plan for recycling will be developed, reuse will be expanded as supply allows, and the aging island treatment plant will be phased out by 2002 in conjunction with Sarasota County plant expansion.

Status: In progress.

Resources/Funding
Available: Utility fees.
Needed:
Potential:

Reference Documents: City of Venice Comprehensive Plan, Sanitary Sewer Element.

Comments:

Hydroperiod Restoration

Contact Person Name: Don Caillouette
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-F

Project Description: Natural drainage pattern re-engineering in Blackburn Canal-Shakett Creek, Curry Creek, and Hatchett Creek watersheds.

Strategy for Implementation: The major strategy for this issue requires coordination. Within the City, this primarily involves coordinating the stormwater utility with the transportation element. For Blackburn Canal which is outside of the City, the City will act as an advocate for restoration within the County's planning framework. For the basins shared with the County, a coordinated stormwater plan will be needed, and is expected to be in the form of an interlocal agreement. An updated study of the impacts of channelization on natural drainage, coordinated with Sarasota county and the Southwest Florida Water Management District (SWFWMD), is expected by 2000.

Responsible Partner and Project Coordinator: Pat Collins, City Engineer; Medard Kopczynski, Director of Growth Management.

Other Project Partners: Sarasota County and Southwest Florida Water Management District (SWFWMD).

Geographic Area: City of Venice; Artificial watershed of Blackburn Canal-Shakett Creek; Curry, and Hatchett Creek.

Expected Benefits and/or Drawbacks: Improved water quantity flows, coordinated with improved retention for restoring the hydroperiod.

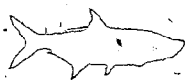
Project Timeline/Schedule:

Status: Ongoing.

Resources/Funding
Available: Utility fees.
Needed:
Potential:

Reference Documents: City of Venice Comprehensive Plan.

Comments:



Venice Well Plugging

Contact Person: Don Caillouette
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-G

Project Description: Identification of abandoned wells in the Venice area. Once identified, abandoned wells are reported to the Southwest Florida Water Management District for inclusion in the District's well plugging program.

Strategy for Implementation: The major strategy for this issue requires coordination with Sarasota County and the Southwest Florida Water Management District (SWFWMD) in a well plugging program. Such a program has been underway, but success has not been achieved in restoring quality to groundwater sources. The program needs to continue, in order to identify additional leaking wells and to examine additional strategies for groundwater recovery. As such wells are discovered, notice is provided to SWFWMD.

Responsible Partner and Project Coordinator: Larry Heath, Public Works Director.

Other Project Partners: Sarasota County, Southwest Florida Water Management District, United States Geological Survey.

Geographic Area: City of Venice.

Expected Benefits and/or Drawbacks: Improved groundwater quality; reduction in sources of intrusion.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding is provided through Southwest Florida Water Management District (SWFWMD).
Needed:
Potential:

Reference Documents: City of Venice Comprehensive Plan.

Comments:

Venice Expansion of Sanitary Sewerage

Contact Person: Don Caillouette
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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-F, WQ-G

Project Description: Expansion of sanitary sewers to replace septic tank systems in unserved areas.

Strategy for Implementation: The City has very few properties served with septic tanks, and these are in older areas slated for redevelopment. There are enclaves of unincorporated County lands within the City that are served by septic tanks. The City repeatedly offers to serve these lands with sanitary sewer service, contingent upon their annexation. The City is also capable of serving some of the surrounding lands, with the same type of agreement.

Responsible Partner and Project Coordinator: Larry Heath, Public Works Director.

Other Project Partners: Sarasota County.

Geographic Area: City of Venice, and unincorporated enclaves.

Expected Benefits and/or Drawbacks: Improved surface water quality, reduction in human health risks directly and through contact with groundwater fed surface water bodies.

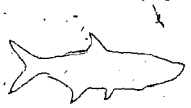
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Sanitary Sewerage Utility.
Needed:
Potential:

Reference Documents: City of Venice Comprehensive Plan.

Comments:



Clean Marina Program (CMP) Assessment

Contact Person: **Bruce Boler**
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FAX Number: (941) 332-6969
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Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-Q

Project Description: The Department of Environmental Protection (DEP) Pollution Prevention Program (P2) and Manufacturing Technology Center (MTC) programs are available to provide pollution prevention assessments and technical assistance to marinas and information to users upon request. Pollution prevention means the steps taken by a potential generator of contamination or pollution to eliminate or reduce the contamination or pollution before it is discharged to the environment.

Strategy for Implementation: The Clean Marina Program (CMP), a statewide, multi-agency/industry program launched in early 1999, will assist marinas in improving the environmental quality of Florida's waterways through:

- Education and Awareness
- Award recognition
- Marina Environmental Measures incentive grants
- Marina self-audits
- "Clean Marina" designation

Boatyards will be included in 2000.

The Department of Environmental Protection (DEP) will also support these efforts through:

- Pollution Prevention assessments
- Technical Assistance
- Coordination of marina permit processors and sovereign submerged lands authorization staff with South District Environmental Resource Permitting staff and Department of Environmental Protection (DEP), Bureau of Submerged Lands and Environmental Resources (BSLER).

The Department of Environmental Protection (DEP), now working with the appropriate local agencies (local tanks program, emergency response, fire departments, sewer departments, etc.) will:

- Evaluate marina and port fueling facilities reporting landward-source petroleum discharges
- Require appropriate corrective actions.
- Make every reasonable effort to identify sources of discovered ongoing discharges to surface waters.
- Work with the responsible party to contain, remove and abate the discharge.

Responsible Partner and Project Coordinator: Laura Comer, Pollution Prevention (P2) Program, Department of Environmental Protection (DEP) South District.

Other Project Partners: Department of Environmental Protection (DEP) Pollution Prevention (P2) Program (Julie Abcarian, Tallahassee); DEP Clean Marina Program, Waterways Management, Law Enforcement (Jan DeLaney, Tallahassee); DEP South District, Ecosystem Management (Bruce Boler); DEP South District Environmental Resources Permitting (Lucy Blair); DEP South District Waste Management (Phil Barbecue); DEP Tanks (Mike Sole, Tallahassee); DEP Bureau of Submerged Lands and Environmental Resources (BSLER) (Doug Fry, Tallahassee); Florida Marine Research Institute (FMRI) Education and Outreach; Florida Department of Community Affairs (DCA); Florida Fish and Wildlife Conservation Commission; Marine Industry Association of Florida (Bob Kin); Florida Manufacturing and Technology Centers (MTCs), Bonita Springs; Local Marina Operators/Users; Marina Operators Association of America; Florida Sea Grant Program; Small Business Development Centers (SBDC); Local Governments.

Geographic Area: Statewide, including the Charlotte Harbor National Estuary Program (NEP).

Expected Benefits and/or Drawbacks: Reduction of toxic contaminants to the NEP area.

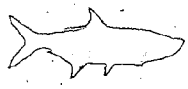
Project Timeline/Schedule: Development started in 1996; implementation is to begin early in 1999.

Status: Planned.

Resources/Funding
Available: The Environmental Protection Agency (EPA) grant for development and implementation; the Department of Community Affairs (DCA) is to assist in production of materials. The Environmental Integration Services Program (EISP) was funded via a National Institute of Standards and Technology (NIST) matching grant through 1998.
Needed:
Potential: The Manufacturing & Technology Center (MTC) will be looking at program fees and other sources for future funding.

Reference Documents: http://www.FDEP.state.fl.us/law/clean-marina.

Comments: The Environmental Integration Services Program (EISP) appears to be a good model program that should be continued if successful; legislative approval of six pollution prevention engineer positions (one for each Department of Environmental Protection [DEP] District Office), starting in FY 1999, should enhance and facilitate pollution prevention (P2) stormwater pollution reduction objectives. Priority ranking of sites eligible for State funded restoration assistance is based on a threat to drinking water supplies, not discharges to non-potable surface waters (F.S. 376). The Department of Environmental Protection (DEP), South District has no authority to raise or lower priority ranking score. Mike Sole, DEP Tallahassee, is the priority ranking contact person.



Exotic Pest Plant Public Awareness Campaign

Contact Person: Bruce Boler
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Telephone Number: (941) 332-6975
FAX Number: (941) 332-6969
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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A

Project Description: The South District of the Florida Department of Environmental Protection (DEP) is producing a series of public service announcements which will educate the public regarding the problems associated with exotic pest plants. The viewers will be given a source for further information regarding how to eliminate the targeted plant species that are Brazilian-pepper (*Schinus terebinthifolius*), Australian pine, (*Casuarina spp.*) and Melaleuca (*Melaleuca quinquinervia*).

Strategy for Implementation: Funding has been obtained to complete the production of the videos and to air them on local stations.

Responsible Partner and Project Coordinator: Gordon Romeis, Department of Environmental Protection (DEP) South District, (941) 332-6975.

Other Project Partners: Exotic Pest Plant Council; Agricultural Extension Service.

Geographic Area: Charlotte, Lee, and Collier Counties.

Expected Benefits and/or Drawbacks: Public awareness of the cause and extent of the exotic pest plant invasion in Florida. The involvement of the public in the removal of exotic vegetation from private lands is a desired outcome of this project.

Project Timeline/Schedule: The public service announcements will be completed by summer of 1999 with the initial television airing to take place immediately thereafter. Additional tapes will be distributed to other areas with the target plant species so that others will have opportunity to air them. It may prove beneficial to air the video series again in the local area however funding will have to be provided to accomplish this.

Status: This project is currently in development.

Resources/Funding
Available: Sufficient funds for the public service announcement development and the initial airing schedule have been secured.
Needed: Additional funds to air the spots for an extended period of time and to air them in other areas will be needed.
Potential: Possible funding sources include: the water management districts (WMDs), Department of Environmental Protection (DEP) Bureau of Aquatic Plant Management, Agricultural Extension Service, Department of the Interior.

Reference Documents:

Comments:

Florida Department of Environmental Protection Lakes Bioassessment Program

Contact Person: Bruce Boler
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E-mail Address: Bruce.Boler@dep.state.fl.us

Quantifiable Objectives Addressed: WQ1, WQ2

Priority Actions Addressed: WQ-B, WQ-N

Project Description: Sample lakes to determine best attainable biological integrity conditions within various eco-regions, for the purpose of developing biocriteria for assessing impairment due to non-point sources of pollution. Bioassessments involve field sampling of aquatic biological communities to characterize community structure in terms of diversity and pollution tolerance. They include measuring water quality indicators such as dissolved oxygen, evaluating habitat conditions and land use within the watershed, and determining the health of aquatic insect communities. To determine if a community has been negatively impacted by human activities, we compare its characteristics to those of the reference communities - those believed to be natural or relatively not impacted by humans.

Strategy for Implementation: Lakes are sampled during two index periods (winter [February and March] and summer [August and September]). Different lakes are assessed each year. The following components are sampled: physicochemical water quality, sediments, fecal coliform, chlorophyll *a*, algal growth potential, phytoplankton and macroinvertebrates.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), South District, Punta Gorda Branch Office and Laboratory, Bob Rutter, Project Coordinator.

Other Project Partners: Environmental Protection Agency (EPA).

Geographic Area: Department of Environmental Protection (DEP) South Florida District: counties include Charlotte, Collier, Glades, Hendry, Highlands, Lee, and Monroe.

Expected Benefits and/or Drawbacks: Bioassessment information will be available for a variety of lakes. The development of biocriteria for assessing impairment due to non-point sources of pollution in Florida lakes.

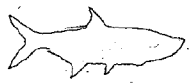
Project Timeline/Schedule: The program began in 1994 and is ongoing.

Status: In progress.

Resources/Funding
Available: Department of Environmental Protection (DEP), Environmental Protection Agency.
Needed:
Potential:

Reference Documents: Annual reports are prepared that present results and impairment ratings.

Comments:



Surface Water Ambient Monitoring Program (SWAMP)

Contact Person: Bruce Boler / Ron McGregor
Title: Ecosystem Management Coordinator / Environmental Manager
Agency/Organization: Florida Department of Environmental Protection
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E-mail Address: Bruce.Boler@dep.state.fl.us

Quantifiable Objectives Addressed: WQ-1

Priority Actions Addressed: WQ-C

Project Description: A number of stations within the Charlotte Harbor National Estuary Program (NEP) were sampled as part of the Surface Water Assessment and Monitoring Program (SWAMP).

Strategy for Implementation: Quarterly sampling for physical-chemical parameters was conducted at the following sites:

Caloosahatchee. River at Alva; Caloosahatchee River at Redfish Point; Peace River at U.S.41; Peace River off Colony Point; Charlotte Harbor at marker 1; Myakka River at marker 8; Charlotte Harbor at mid harbor; Charlotte Harbor at marker 4; Lemon Bay at markers 36, 26, 17A, 11; Shell Creek at Washington Loop Road; Myakka River at Snook Haven and Border Drive; Oyster Creek at 775; Buck Creek at 775; Ainger Creek at 775; Gottried Creek at 776; Olman Waterway at Edgewater Drive; Elkam Waterway at Edgewater Drive; Pellam Waterway at Edgewater Drive; West Springlake at Edgewater Drive; Sunrise Waterway at Edgewater Drive; Horse Creek at SR 72; Peace River at SR 70; Peace River at Brownsville; Oak Creek at CR 634.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) South District, Punta Gorda Office, Ron McGregor, Project Coordinator.

Other Project Partners: None.

Geographic Area: Sites were scattered throughout the entire Charlotte Harbor watershed.

Expected Benefits and/or Drawbacks: Data contributed to the 305(b) report.

Project Timeline/Schedule: Some stations have data back to 1975; most start in 1995 and end in October 1998.

Status: Completed.

Resources/Funding
Available: Department of Environmental Protection (DEP) South District.
Needed:
Potential:

Reference Documents: Department of Environmental Protection (DEP) 305(b) Report.

Comments:

Alligator Creek Hydrological Restoration Project

Contact Person: Robert W. Repenning
Title: Environmental Specialist III
Agency/Organization: Florida Department of Environmental Protection (FDEP) / Charlotte Harbor Aquatic and State Buffer Preserve
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Telephone Number: (941) 575-5861
FAX Number: (941) 575-5863
E-mail Address: Robert.Repenning@dep.state.fl.us

Quantifiable Objectives Addressed: HA-3, FW-4

Priority Actions Addressed: FW-A, FW-C, FW-B

Project Description: This project has the following goals: establish a wetland restoration plan for a 1,200 acre parcel on state buffer preserve lands and plan, design, and permit two demonstration mini projects to be implemented by the Charlotte Harbor Aquatic State Buffer Preserve (CHASBP). The Surface Water Improvement and Management (SWIM) Program of the Southwest Florida Water Management District (SWFWMD) funded this project on state land.

Strategy for Implementation: The contract has been awarded and permits have been obtained for the demonstration projects. These projects will re-isolate two isolated wetlands by blocking drainage ditches that drain the area.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Robert Repenning.

Other Project Partners: South Florida Water Management District (SFWMD).

Geographic Area: Charlotte Harbor Aquatic & State Buffer Preserve and east side of the Harbor south of Punta Gorda.

Expected Benefits and/or Drawbacks: Protection of a valuable wetland area.

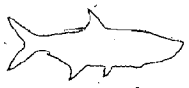
Project Timeline/Schedule: One ditch block was put in place during June 1999. The wetland has rehydrated and a natural slough reestablished. The final report will show drainage alterations to area.

Status: In implementation phase.

Resources/Funding
Available: The project is funded by the South Florida Water Management District.
Needed:
Potential:

Reference Documents:

Comments:



Charlotte Harbor Buffer Preserve Land Acquisition

Contact Person: Robert W. Repenning
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E-mail Address: Robert.Repenning@dep.state.fl.us

Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-S, FW-U

Project Description: This land acquisition project was established to provide a buffer between upland development and open waters of the Charlotte Harbor State Buffer Preserve. Land acquired since 1978 has been added to the buffer preserve. Since October 1996, 1583 acres of coastal lands have been acquired by the state. The Buffer includes land donated by the Nature Conservancy. Lee County is acquiring, through their conservation lands program, land adjacent to the buffer preserve lands.

Strategy for Implementation: Acquisition will continue under the Forever Florida Act.

Responsible Partner and Project Coordinator: Greg Brock, Department of Environmental Protection (DEP), Division of State Lands, Tallahassee is in charge of the acquisition program. Robert Repenning, program coordinator for the Charlotte Harbor Aquatic & State Buffer Preserve office is the local contact.

Other Project Partners: The Nature Conservancy donated 226 acres to the project.

Geographic Area: Land around Charlotte Harbor in Lee and Charlotte Counties and in Matlacha Pass.

Expected Benefits and/or Drawbacks: Unwilling sellers on some parcels are precluding purchase.

Project Timeline/Schedule:

Status: In progress.

Resources/Funding
Available: Yes.
Needed:
Potential:

Reference Documents: Conservation and Recreational Lands Program (CARL) Annual Report.

Comments:

Charlotte Harbor State Buffer Preserve Management Activities

Contact Person: Robert W. Repenning
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FAX Number: (941) 575-5863
E-mail Address: Robert.Repenning@dep.state.fl.us

Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A, FW-C

Project Description: On-going management of the buffer preserve staff continue to remove exotic plants from native habitats. To date, nearly 100 acres have been cleared and this will continue. Work on hydrological restoration, fire management of uplands, and establishment of resource inventories are in progress.

Strategy for Implementation: Inventory of the extent of the problem on the buffer preserve is ongoing, access to sites may require bridges which will require permits, monitoring of sites and re-treatment is ongoing.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Charlotte Harbor Aquatic & State Buffer Preserve (CHASBP), contact same as above.

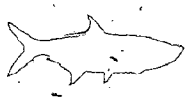
Other Project Partners: Volunteers.

Geographic Area: Approximately 38,000 acres of coastal lands in Lee and Charlotte Counties local watersheds of Matlacha Pass, Charlotte Harbor, and Gasparilla Sound.

Expected Benefits and/or Drawbacks: The drawback is a continued spread of exotic plant species. The benefit is the removal of exotic plants has allowed re-establishment of native plant communities.

Project Timeline/Schedule: Active management of the Buffer Preserve began in 1982 with the hiring of the first manager and continues today.

Status: In progress.



Resources/Funding

Available: The yearly budget supports a work crew of six plus materials. The 1998-99 budget for the Buffer Preserve was $266,498 which supported seven field crew members and a biologist for the Buffer. Additional $88,000 was received for interim management of newly acquired land, as well as, $20,000 profit generated for the unit by the Little Pine Island Mitigation Bank. Level funding was obtained for the 1999-00 budget year. Some interim money and additional mitigation bank funds are to come this year but exact figures are not available.

Needed: Several million dollars. The Cape Coral Unit alone has $976,000 worth of exotic work needed. Recently a contract was put out on clearing exotics from the Cape Coral Unit. The cost was $976,000. Only $100,000 was available for this project. Hydrological restoration projects are extremely costly. Two small projects, funded by the Southwest Florida Water Management District (SWFWMD), are "in the works" at a cost of $100,000. It is estimated that total restoration costs will be in the millions.

Potential: The Department of Environmental Protection (DEP), United States Fish and Wildlife Service (USFWS), water management districts (WMDs), and mitigation projects.

Reference Documents: Charlotte Harbor State Buffer Preserve Management Plan.

Comments:

Citizen Support Organization (CSO)
The Friends Of The Charlotte Harbor Aquatic Preserves, Inc.

Contact Person:	**Carla Kappmeyer-Sherwin**
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Agency/Organization:	Florida Department of Environmental Protection (FDEP)/ Charlotte Harbor Aquatic & State Buffer Preserves
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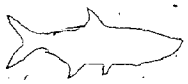
Quantifiable Objectives Addressed: HA, FW, WQ

Priority Actions Addressed: WQ-B, WQ-I, WQ-N, FW-A, FW-B, FW-D, FW-E, FW-I, FW-K, FW-P, FW-S, FW-T, FW-U

Project Description: The Friends of the Charlotte Harbor Aquatic Preserves, Inc. (FCHAP) was incorporated in December 1998 as a non-profit Florida corporation, composed of a Board of Directors and citizen members, which is under contract to provide support for the Charlotte Harbor Aquatic and State Buffer Preserves (CHASBP), in accordance with Section 370.0205 of the Florida Statutes. The purpose for which the corporation is formed is to preserve and maintain Aquatic and State Buffer Preserves areas in the greater Charlotte Harbor area including Lemon Bay, Cape Haze, Gasparilla Sound/Charlotte Harbor, Pine Island Sound, and Matlacha Pass through assisting in the implementation of Preserve resource management plans, publicizing the advantages of conserving and improving Aquatic and State Buffer Preserves, raising funds for preservation and management of the Preserves, and providing volunteers to aid in management activities. Volunteers will be able to participate in the following activities: resource monitoring, conducting guided nature walks, constructing and maintaining nature trails, removing exotic invasive vegetation, assisting with educational programs and public outreach, and encouraging stewardship of the Preserves on the part of the general public. The Citizen Support Organization is organized for charitable, educational, and scientific purposes and shall operate in such a manner as will qualify it as a tax exempt organization under Section 501(c)(3) of the Internal Revenue Code. The Friends of the Charlotte Harbor Aquatic Preserves' mission is to support the protection, conservation, restoration, management, responsible public use, and the enhancement of the resources of the coastal and aquatic ecosystems of the Charlotte Harbor estuaries including Lemon Bay, Gasparilla Sound/Charlotte Harbor, Cape Haze, Pine Island Sound, and Matlacha Pass.

Strategy for Implementation: Application for 501(c)(3) status will be pursued and a series of meetings will be held for the general public. Building a general membership, the establishment of local chapters (Lemon Bay, Englewood), Gasparilla Sound/Charlotte Harbor (Boca Grande, Port Charlotte, Punta Gorda), and Pine Island Sound - Matlacha Pass (Pine Island, Matlacha, Sanibel), etc., and fundraising activities will be implemented.



Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)/ Charlotte Harbor Aquatic & State Buffer Preserve, Bob Repenning, Program Coordinator, Registered Agent of the Friends of the Charlotte Harbor Aquatic Preserves; Carla Kappmeyer-Sherwin, Public Outreach Coordinator, Department of Environmental Protection (DEP) Liaison.

Other Project Partners: Community groups, organizations, institutions, and government agencies involved in environmental protection.

Geographic Area: Charlotte, Lee, and Sarasota Counties; Charlotte Harbor Aquatic and State Buffer Preserve (CHASBP).

Expected Benefits and/or Drawbacks: Benefits to the community include the following: restoration of local environment, more unified voice in dealing with government, opportunities for citizen feedback and volunteer participation in projects, opportunities for local fundraising which may bring matching funds, education opportunities, and a greater sense of community. Citizen Support Organizations or "Friends" groups are a voice for the Aquatic and State Buffer Preserves within the community. They create links to the community, that benefit the community as well as the Preserves, i.e., increased public access and compatible recreational activities, in balance with resource protection. The Friends of the Charlotte Harbor Aquatic Preserves will also be an important vehicle for funding which may not be directly available to a government agency, and has the capability of obtaining additional support from the legislature.

Project Timeline/Schedule: In January 1998, an introductory meeting was held for the general public which defined local interest and need. In February 1998, a Steering Committee was formed and members drafted a citizen support organization mission statement, goals, and objectives and officially named the citizen support organization during the March and April meetings. Articles of Incorporation were drafted, revised, and approved by the Steering Committee in April and May. By-laws were drafted and revised by a By-laws Subcommittee in June and July and approved by the Steering Committee in August. The Steering Committee nominated individuals to serve on the initial Board of Directors at the November 1998 meeting and elected the Board at the January 1999 meeting. The Board will convene in February. Officers (President, Vice-President, Secretary, and Treasurer) will be appointed and By-laws will be adopted.

Status: In progress.

Resources/Funding
Available: Funds will be raised through membership dues.
Needed:
Potential:

Reference Documents:

Comments:

Evaluation of Biological/Physical Impacts of Anchorages

Contact Person: Judy Ott
Title: Ecosystem Management Coordinator/Estuary Resource Management Coordinator
Agency/Organization: Florida Department of Environmental Protection (FDEP)/ Charlotte Harbor Aquatic & Buffer Preserves
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Quantifiable Objectives Addressed: WQ-1, WQ-4, WQ-6, FW-2, FW-3

Priority Actions Addressed: FW-B, WQ-B, WQ-C, WQ-D, WQ-Q, FW-D, FW-K, FW-R, FW-T, FW- V

Project Description: The proposed project requires a completed grant application and future grant support. The purpose of the project would be to determine a method for evaluating baseline biological and physical conditions at anchorages in the estuaries in the Charlotte Harbor National Estuary Program against which potential cumulative effects of increased anchorage may be evaluated. The resulting monitoring method would include the types of parameters, methods, sampling locations and frequencies needed to adequately assess estuary resource conditions. The specific monitoring methods could be designed to assist with gathering additional resource information needed to fill existing data gaps. Additionally, the monitoring activities and results would be used to educate the public about environmentally responsible boating and anchoring practices.

Strategy for Implementation: Seek a grant to support the proposed project to develop the method to evaluate potential biological and physical impacts from anchorages. The proposed project would require graduate student and field technician support to conduct a literature review, list current monitoring methods available, identify the most appropriate parameters and methods for evaluating estuary resource conditions, determine the sampling locations and frequencies, conduct initial monitoring, and assist existing Department of Environmental Protection (DEP) public outreach staff with sharing monitoring activities and results with the boating community.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)/ Charlotte Harbor Aquatic & Buffer Preserves (CHA&BP) staff, primarily Judy Ott.

Other Project Partners: Department of Environmental Protection (DEP) staff from the Charlotte Harbor Aquatic & State Buffer Preserve offices and Estero Bay Aquatic & Buffer Preserves.

Geographic Area: Potentially, Gasparilla Sound, Charlotte Harbor, Pine Island Sound and Estero Bay. The monitoring activities may also be conducted within other areas of the Charlotte Harbor NEP in the future, and could be used as well in other NEPs in the southeastern U.S.

Expected Benefits and/or Drawbacks: Benefits include developing a protocol that could be used region-wide for assessing potential biological and physical resource impacts from increasing boat use and assessing existing baseline conditions at selected anchorages to measure potential future change against. Drawbacks include lack of secured support for the proposed project.

Project Timeline/Schedule: One year from date grant support is secured.

Status: Proposed.

Resources/Funding
Available: None.
Needed: Approximately $45,000.
Potential:

Reference Documents:

Comments: Opportunities include developing a needed monitoring strategy that to date is not widely available, and to begin collecting baseline resource data on selected anchorages. Challenges include securing the grant support for the project and managing the project if grant support is secured.

Charlotte Harbor State Buffer Preserve Public Education

Contact Person: Carla Kappmeyer-Sherwin
Title: Public Outreach Coordinator
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Quantifiable Objectives Addressed: HA, WQ, FW

Priority Actions Addressed: HA-J, WQ-B, WQ-N, FW-A, FW-B, FW-I, FW-S, FW-T, FW-U

Project Description: Plans are in the initial organizational phase for the construction of a kiosk, for which the design and labor are to be donated by the Department of Environmental Protection (DEP) volunteers as an in-kind service. Grant sources will be researched to provide the funds necessary for the design, creation, and production of professional interpretive panels that would be portable and interchangeable within the kiosk. Interpretive panels will illustrate and explain basic concepts central to understanding Florida ecology such as the land and sea connection, biodiversity and the importance of green corridors, food webs, fire ecology, endangered species and the preservation of habitat, and the threat of exotic, invasive pest plants to wildlife habitat.

Guided nature walks, which were initially conducted for two seasons on the Charlotte Harbor State Buffer Preserve from November 1989 through May 1991 as a "A Walk in the Pine Flatwoods" and have continued under the direction of the Charlotte Harbor Environmental Center (CHEC), will be resumed in the fall of 1999 on newly opened trails of the Preserve and/or on recently acquired additions to the State Buffer Preserve. The Little Pine Island "Walk in the Wetlands" program, initiated in February 1990 and scheduled through April 1991, will be resumed sometime in 2001 after Mariner Properties Development, Inc. has completed extensive wetland restoration, trails have been created, and public access is opened.

Strategy for Implementation: See above.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)/ Charlotte Harbor Aquatic and State Buffer Preserves (CHA&BP), Carla Kappmeyer-Sherwin, Public Outreach Coordinator; Bob Repenning, Program Coordinator.

Other Project Partners: Charlotte Harbor Environmental Center, Mariner Properties Development, Inc., Charlotte Harbor National Estuary Program (NEP).

Geographic Area: Charlotte Harbor State Buffer Preserve, Charlotte and Lee Counties.

Expected Benefits and/or Drawbacks: Visitors to the Charlotte Harbor State Buffer Preserve who examine the kiosk will be provided with several key ecological concepts and basic resouree information which are important to southwest Florida. The kiosk and the interpretive panels will be designed with the following factors taken into consideration: attracting power, holding power, and teaching power. Visitors will have the opportunity to learn and to gain a better understanding of Florida ecological principles and the problems that threaten our natural resources. The effectiveness of the exhibit may result in visitors spending more time at the kiosk, becoming more involved with panel material, and greater recall of the information presented. Those visitors who are residents (permanent or seasonal), may be motivated to take action and/or become involved in public participation with respect to local and regional coastal decision-making, resource management, and resource protection.

Guided nature walks directly involve visitors and allow them to experience important Florida habitats such as the pine flatwoods, the high marsh, mangrove forest, and coastal hammocks. Visitors are able to see firsthand and learn about Florida ecosystems, fire ecology, and the role of the estuary in Florida ecology, etc. Guided nature walks provide greater public access and encourage responsible public access, in balance with resource protection and compatible recreational activities such as bird watching and kayaking. Visitors, particularly those who are residents, are more likely to develop a greater appreciation of the resources and are more likely to take action in support of resource management and resource protection.

Project Timeline/Schedule: Planning for the kiosk and interpretive panels will be initiated at the end of July 1999. A manual for volunteer trail guides is currently being revised and will be completed by the end of February.

Status: Planned and in progress.

Resources/Funding
Available: To be determined.
Needed: To be determined.
Potential:

Reference Documents:

Comments:

Public Education Programs

Contact Person: Carla Kappmeyer-Sherwin
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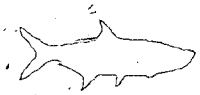
Quantifiable Objectives Addressed: HA, FW, WQ

Priority Actions Addressed: HA-D, WQ-B, WQ-F, WQ-N, FW-B, FW-D, FW-I, FW-P, FW-T

Project Description: Two adult environmental education courses reaching the general public and/or target resource user groups were conducted during the spring of 1997. Lemon Bay Seashore Explore, a six-week seashore ecology course, explored diverse Florida habitats including barrier island beaches, tropical hardwood hammocks, pine flatwoods, mangrove forest, and tidal creeks. Classes were held at a local public library on Monday evenings followed by Saturday morning field trips. Thirty-two area residents completed the course. The eight-week course,"Inshore Fishing", introduced the ecology of the estuary, detailing relationships of life cycles and productivity of species such as mullet, snapper, and tarpon. Thirty-five residents from Cape Coral and Ft. Myers including several members of a local angler's club attended this course. These courses were previously developed and taught twice through a 1995 Florida Advisory Council On Environmental Education (FACEE) Grant, awarded to the Rookery Bay National Estuarine Research Reserve (RBNERR) in cooperation with Charlotte Harbor Aquatic & State Buffer Preserve. These courses are very popular and are offered periodically.

Resource protection through the U.S. Coast Guard (USCG) Auxiliary, an informal presentation to area Coast Guard Auxiliaries, introduces Auxiliary members to the Aquatic Preserves and provides the instructors of the Boating Skills and Seamanship courses with the Department of Environmental Protection (DEP) educational materials emphasizing the importance of estuarine resources and what boaters can do to help protect seagrasses and other submerged resources, water quality, and manatees. The courses, which are offered regularly, reach many new residents and boaters who are unfamiliar with our shallow, inshore waters and invaluable natural resources.

KEEP IT CLEAN explores the land and sea-connection and examines the impact of non-point source water pollution and stormwater runoff on our rivers, estuaries, and watersheds. Individuals, homeowner, condominium and civic associations, service organizations, recreational target groups, students, and the general public are encouraged to take positive steps (in the household, the backyard, as waterfront property owners, in the community, and when boating, golfing, and engaging in recreational activities) toward becoming a "water-wise" community. KEEP IT CLEAN challenges all of us to share in the responsibility for managing Florida's protected coastal areas. An interactive slide presentation is followed by the distribution of an accompanying seventy-page citizen's guide, Keep It Clean: A Citizen's Guide To Protecting Our Estuary, an Environmental Audit for Marine Educators, and Hands On Activities for Students in Grades (K-12). In 1996 several members of Waterway Estates, a North Ft. Myers homeowner's association of approximately 320 waterfront homes, conducted a successful door-to-door campaign with the goal of improving water quality, shoreline habitat, and submerged bottoms in canals located on the Caloosahatchee River. Keep It Clean books were hand-delivered by block distributors to homeowners as well as several commercial lawn care services. Individuals were urged to take actions that would have positive impacts such as encouraging the growth of mangroves and refraining from using the canals to dispose of grass clippings, citrus waste, and other organic matter.



Strategy for Implementation: Adult Environmental Education courses are offered periodically. Resource Protection Through the U.S. Coast Guard Auxiliary and KEEP IT CLEAN presentations are available on request.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) / Charlotte Harbor Aquatic and State Buffer Preserves (CHA&BP), Carla Kappmeyer-Sherwin, Public Outreach Coordinator.

Other Project Partners: Rookery Bay National Estuarine Research Reserve (RBNERR) and the South Florida Water Management District (SFWMD) for the KEEP IT CLEAN Program; United States Coast Guard (USCG) Auxiliary for the Resource Protection through the USCG Auxiliary program.

Geographic Area: Communities within Charlotte, Lee, and Sarasota Counties.

Expected Benefits and/or Drawbacks: Adult Environmental Education courses connect citizens to their local environment, enhance resource appreciation, and encourage participants to share in the responsibility for protecting our estuaries through individual actions and increased public involvement. Inshore Fishing and Resource Protection through the U.S. Coast Guard Auxiliary target boaters and avid fishermen educating these two audiences on the adverse consequences of direct actions (prop dredging, marine debris, manatee collisions). Lemon Bay Seashore Explore, Inshore Fishing, and the KEEP IT CLEAN program ingrain an environmental ethic regarding impacts on water quality, estuaries, fisheries and wildlife caused by human activities (stormwater runoff, wetland development, dredging, etc.) Pre-tests, post-tests, and evaluations give an indication of knowledge gained, actions that individuals may take, and changes in attitude and behavior. There was an immediate, positive response to the KEEP IT CLEAN door-to-door campaign in Waterway Estates. Residents stopped throwing organic debris into the canals adjoining their homes. Organizers took their project a step further, distributing the Florida Sea Grant publication What Responsible Boaters Can Do To Keep Florida's Waters Clean, to a nearby marina located on the Caloosahatchee River. This educational campaign was highly effective because it was initiated by a concerned citizen who used a neighborhood-based strategy in the implementation.

Project Timeline/Schedule: Lemon Bay Seashore Explore, April 28 - June 14, 1997; Inshore Fishing, May 1 - June 19, 1997; Resource Protection Through the U.S. Coast Guard Auxiliary was initiated in November 1997; KEEP IT CLEAN presentations were initiated in January 1993; "Friends and Neighbors of Waterway Estates Who All Share The Same Backyard", an educational campaign and door-to-door distribution of Keep It Clean A Citizen's Guide To Protecting Our Estuary to 320 waterfront property homeowners in North Ft. Myers, was conducted from October through December of 1996.

Status: Ongoing.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents:

Comments:

Coastal Management Workshops

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Quantifiable Objectives Addressed: FW, HA, WQ

Priority Actions Addressed: FW-R, FW-T, HA-K; WQ-B

Project Description: A series of one-day training workshops are offered to environmental professionals involved in planning, regulation, research, and resource management and to specific target resource user groups. Coastal management issues are the focus of the workshops. The format includes technical presentations by invited speakers, field training, and panel discussions. These workshops are based on those that were first modeled in Florida by Rookery Bay National Estuarine Research Reserve (RBNERR). Charlotte Harbor Aquatic and State Buffer Preserves (CHASBP) sponsors two workshops per year in cooperation with the Florida Coastal Management Program. The goal is "To enhance informed decision-making on coastal issues by facilitating the exchange of technical information (basic and applied sciences) to audiences that have the resources and ability to influence the management of coastal resources." The CHASBP has sponsored the following six workshops:

Seagrass Issues (July 19, 1996). Quantifiable objectives (QOs) addressed include the following: WQ-1, WQ-2, WQ-3, FW-2, and FW-3. Priority actions (PAs) addressed include the following: WQ-N, FW-K; the effect of light reduction on shoal grass and the problem of seagrass shading by docks were also discussed.

Water Use in Southwest Florida (November 15, 1996). QOs addressed included the following: HA-1, HA-2, WQ-1, WQ-2, WQ-3, WQ-6. PAs addressed included HA-A, HA-B, HA-C, HA-D, HA-E, HA-I, HA-K, WQ-B, WQ-E, WQ-G, WQ-N, WQ-P.

Archaeological Resources (August 22, 1997). QOs addressed included FW-2 and FW-4; PAs included FW-A.

Artificial Reefs (October 24, 1997). QO addressed was FW-2; PAs addressed included FW-P and FW-R.

Reports From The Field (August 28, 1998). An overview of the Charlotte Harbor National Estuary Program was one of the presentations at this open, invitational workshop. QOs addressed include the following: HA-3, Water Quality (WQ) Quantifiable Objective was addressed in general. FW-1, FW-2, and FW-4 were addressed. PAs addressed included HA-B, HA-H, WQ-B, FW-A, FW-C, FW-P, FW-S, FW-T, and FW-U.

Shellfishing (October 30, 1998). QOs addressed included WQ-1, WQ-4, and FW-2. PAs included WQ-A, WQ-E, WQ-F, WQ-G, WQ-N, and FW-R.

Strategy for Implementation: Sponsor bi-yearly workshops in study area.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) / Charlotte Harbor Aquatic & State Buffer Preserve, Carla Kappmeyer-Sherwin, Public Outreach Coordinator.

Other Project Partners: Florida Department of Community Affairs (DCA)/Florida Coastal Management Program, Community Program Administrator.

Geographic Area: Charlotte County, Punta Gorda, and Lee County, Ft. Myers.

Expected Benefits and/or Drawbacks: Environmental professionals and individuals representing various user groups complete evaluation forms and clearly identify the benefits of attending workshops by listing short and/or long-term actions which they could implement based on the training. Networking opportunities and inter-agency coordination are significant benefits. Workshops disseminate information, and in some cases have the potential to generate ideas and discussion which may result in policy changes towards better coastal management.

Project Timeline/Schedule: The Charlotte Harbor Aquatic & State Buffer Preserve Field Office conducts two Coastal Management Workshops annually. They were initiated in July, 1996. Six workshops have been completed to date.

Status: The 1999 Coastal Management Workshops are to be announced. Project on-going.

Resources/Funding
Available: The Florida Coastal Management Program.
Needed:
Potential:

Reference Documents:

Comments:

South Florida Coastal Ecosystem Restoration Initiative / Cape Haze Peninsula Melaleuca Removal Project / Education and Public Outreach

Contact Person: Carla Kappmeyer-Sherwin
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Quantifiable Objectives Addressed: FW-1, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: An education and public outreach campaign was initiated in July 1997 and is currently in the second year. A professional display, the Threat of Exotic Pest Plants to Wildlife Habitat, was created by the Charlotte Harbor Aquatic and State Buffer Preserves (CHASBP) Field Office with funds provided by the United States Fish and Wildlife Service (USFWS), South Florida Coastal Ecosystem Program, Vero Beach. The display is exhibited for two-week periods in libraries, government buildings, colleges, and environmental and community centers in Charlotte, Lee, Sarasota, and Collier Counties. As of February 1999, it has potentially reached over 90,000 people. The display provides information and educational materials on controlling Melaleuca (*Melaleuca quinquinervia*), Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina spp.*), and less well known invasive species such as ear-leaf acacia as well as native landscaping information. Two exotic pest plant workshops were held for the public in the spring and fall of 1998. Those attending were introduced to lesser known invasives and exotic plant control measures on public lands. Area Pepper Busters joined agency staff and presented successful pepper control programs in homeowner associations and grass roots community campaigns.

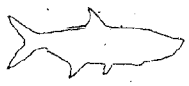
Strategy for Implementation: Workshops offered and display updated periodically.

Responsible Partner and Project Coordinator: Carla Kappmeyer-Sherwin, Public Outreach Coordinator, Department of Environmental Protection (DEP)/Charlotte Harbor Aquatic & State Buffer Preserve.

Other Project Partners: Kalani Cairns, Supervisory Fish and Wildlife Biologist U.S. Fish & Wildlife Service (USFWS), South Florida Coastal Ecosystem Program, Vero Beach Field Office.

Geographic Area: Charlotte County (Punta Gorda and Port Charlotte), Lee County (Ft. Myers, Cape Coral, Sanibel, Pine Island, and Bonita Springs), Sarasota County (Englewood), Collier County (Naples).

Expected Benefits and/or Drawbacks: Through a continuing rotation of the traveling exhibit, "Threat of Exotic Pest Plants to Wildlife Habitat", residents are provided with background informa-



tion on the problems caused by exotic, invasive pest-plants and technical information on the identification of plants and herbicide management. Native landscaping and butterfly gardening information is also distributed which may result in improved habitat benefiting wildlife. Staff track the amount of materials taken at specific locations. Evaluation surveys returned by individuals who view the display provide public feedback. Completed surveys indicate how individuals intend to use the information and what actions they have taken or plan to take to assist exotic plant control efforts. Those attending the exotic pest plant workshops include representatives of homeowner and civic associations and members of garden clubs who will further distribute the information, organizing their own control projects and new "Pepper Buster" groups. This public education campaign has also reached new residents who are unfamiliar with the problem. Individuals taking action in their own backyards, neighborhoods, and communities will contribute to the continued health of the public lands bordering the waters of the Charlotte Harbor National Estuary Program study area.

Project Timeline/Schedule: The display, "Threat of Exotic Pest Plants to Wildlife Habitat", was completed in June 1997. It has been displayed publicly since the beginning of July 1997. A Spring 1998 Exotic Pest Plant Workshop was held on April 4, 1998 followed by a Fall 1998 Exotic Pest Plant Workshop on December 5, 1998.

Status: Planned public outreach includes the scheduling of two Exotic Pest Plant Workshops per year at different locations. The traveling exhibit is ongoing.

Resources/Funding
Available: U.S. Fish & Wildlife Service (USFWS)/South Florida Coastal Ecosystem Program.
Needed:
Potential:

Reference Documents:

Comments:

Aquatic Preserve Management Maps

Contact Person: Judy Ott
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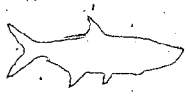
Quantifiable Objectives Addressed: WQ-1, WQ-4, WQ-6, WQ-7; FW-2 FW-3

Priority Actions Addressed: WQ-B, FW-B, FW-D, FW-T

Project Description: Resource management base maps are being developed for five of the Aquatic Preserve estuaries in the Charlotte Harbor National Estuary (NEP) using true color aerial photography provided by the Southwest Florida Water Management District (SWFWMD). Using aerial photography flown for seagrass mapping by the SWFWMD in 1995, "wall sized" photo mosaic maps of Charlotte Harbor/Gasparilla Sound/Cape Haze and Lemon Bay have been developed. Photo mosaic maps of Pine Island Sound and Matlacha Pass will be developed pending availability of aerial photography for the Lee County areas of the NEP. The scale of the aerial photos used for the resource base maps is 1" = 2,000'. The scale is adequate to identify general locations of seagrasses, adjacent shoreline uses, tributaries, etc. and overlay locations of on-going and needed resource management activities such as water quality and seagrass monitoring sites, aquaculture and artificial reef locations and resource problem areas, such as seagrass areas with heavy propeller scar damage. The maps serve as a visual reference for resource management needs and activities. The maps also are an effective educational tool which can be used to demonstrate on-going resource management needs and activities (such as areas of seagrass loss and damage due to boating impacts).

Strategy for Implementation: Resource management aerial photo base maps were completed for Charlotte Harbor/Gasparilla Sound/Cape Haze and Lemon Bay in 1996. Development of resource management aerial photo base maps for Pine Island Sound and Matlacha Pass depends on availability of aerial photos in true color at a similar scale (approximately 1" = 2,000') for the Lee County estuaries at an unspecified time in the future. Past efforts to extend the Southwest Florida Water Management District (SWFWMD) aerial photography flights for seagrasses in Charlotte County south into Lee County with assistance from the South Florida Water Management District have been unsuccessful due to constraints on coordinating contracting and funding.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)/ Charlotte Harbor Aquatic & Buffer Preserves (CHA&BP) staff in Bokeelia, including Judy Ott, developed the resource management aerial photo base maps for Charlotte Harbor/Gasparilla Sound/ Cape Haze and Lemon Bay. The aerial photos used for the resource base maps were provided by Southwest Florida Water Management District (SWFWMD)/Surface Water Improvement and Management (SWIM) program staff in Tampa, including Dr. Ray Kurz, as part of the SWFWMD ongoing seagrass mapping activities.



Other Project Partners: Potentially, South Florida Water Management District/Surface Water Improvement & Management (SWIM).

Geographic Area: Charlotte Harbor, Gasparilla Sound, Cape Haze, Pine Island Sound and Matlacha Pass Aquatic Preserve Estuaries and adjacent coastal areas.

Expected Benefits and/or Drawbacks: Benefits include large scale visual representation of resources, management activities and potential resource problem areas that can be used for resource management and educational activities. Disadvantages include lack of aerial photography for Pine Island Sound and Matlacha Pass.

Project Timeline/Schedule: Resource management aerial photo base maps for Charlotte Harbor/Gasparilla Sound/Cape Haze and Lemon Bay were completed in 1996 and are currently being used for management and educational activities. Dates for completion of Pine Island Sound and Matlacha Pass base maps are undetermined and depend on availability of seagrass aerial photography for Lee County, for which no support has been identified.

Status: Resource management aerial photo base maps for Charlotte Harbor/Gasparilla Sound/Cape Haze and Lemon Bay are already completed and being used. The status of the Pine Island Sound and Matlacha Pass resource base maps is undetermined because no support has been planned for flying, interpreting or ground-truthing seagrass aerial photography for Lee County.

Resources/Funding
Available: No additional funding is needed for the Charlotte Harbor/Gasparilla South Haze and Lemon Bay resource management aerial photo base maps. Currently, no funding is available for the seagrass aerial photography for the Lee County estuaries of Pine Island Sound and Matlacha Pass.
Needed: Approximately $5,000 - $10,000 would be needed to conduct the aerial photography flights, photo interpretation and ground truthing for the Aquatic Preserve estuaries in Lee County.
Potential: The Southwest Florida Water Management District (SWFWMD) has conducted aerial photography flights, photo interpretation and ground truthing for seagrasses in Charlotte County approximately every two to four years since 1992. Several years in the past, the SWFWMD has offered to provide technical assistance for developing cooperative contracts with the South Florida Water Management District to extend the aerial photography and photo interpretation activities into Lee County, but to date, the extended coverage has not occurred.

Reference Documents: No documentation is needed to create the photo mosaic resource management base maps. Protocols for the seagrass aerial photography, photo interpretation and ground truthing are available from the Southwest Florida Water Management District/Surface Water Improvement & Management (SWIM).

Comments: Opportunities include having consistent, uniform seagrass photography and resource management aerial photo base maps throughout the Charlotte Harbor NEP Estuaries. Challenges include coordinating grant, funding and/or contractual support between regional governmental agencies to support the uniform aerial photography flights, photo interpretation and ground truthing.

Southwest Florida Anchorages Monitoring

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Quantifiable Objectives Addressed: WQ-6, FW-2, FW-3

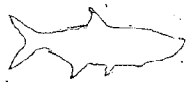
Priority Actions Addressed: WQ-B, WQ-Q, FW-D, FW-F, FW-G, FW-M

Project Description: Initial, general site description and boating use information is collected for selected anchorages in the Aquatic Preserve estuaries in the Charlotte Harbor National Estuary Program (NEP). Within the NEP, there are 20 anchorages identified in the "Guide to Anchorages in Southwest Florida" developed by the Boaters Action & Information League, with support from the Regional Harbor Board. The primary function of the Regional Harbor Board is to develop and implement a non-regulatory approach to boat mooring and anchorage in southwest Florida. Beginning in 1995, each year three-to-four of the anchorages are monitored for water depth, bottom substrate, presence/absence of seagrasses, navigation markers, shore side services and number of boats present. To date, ten anchorages within the NEP have been monitored, including: Stump Pass, Boca Grande, Pelican Bay, Cabbage Key, Useppa, Matlacha, Roosevelt Channel, York Island, Sanibel West and Matanzas Pass. The information is used to make maps of the anchorages using Geographic Information System (GIS) capabilities. The maps are developed in a placemat format and used to educate boaters about safe and resource-friendly use of the anchorages. The information is also used to help identify additional monitoring needed to assess long-term resource conditions in and adjacent to the anchorages.

Strategy for Implementation: The anchorage monitoring protocol was developed by Dr. Gus Antonini at the University of Florida and modified and implemented by the Technical Advisory Committee (TAC) of the Regional Harbor Board. The anchorage monitoring is conducted by interagency staff from the Department of Environmental Protection (DEP) Estero Bay Aquatic & Buffer Preserves (EBA&BP) and Charlotte Harbor Aquatic & Buffer Preserves (CHA&BP) and Charlotte County Sea Grant.

Responsible Partner and Project Coordinator: Dr. Gus Antonini, University of Florida.

Other Project Partners: Department of Environmental Protection (DEP)/Estero Bay Aquatic & Buffer Preserve staff (primarily Heather Stafford); Department of Environmental Protection (DEP)/ Charlotte Harbor Aquatic and Buffer Preserve staff (primarily Judy Ott); and Charlotte County Sea Grant staff (primarily Rich Novak).



Geographic Area: Lemon Bay, Gasparilla Sound, Charlotte Harbor, Pine Island Sound, Matlacha Pass, San Carlos Bay, and Estero Bay.

Expected Benefits and/or Drawbacks: Benefits include base line physical conditions, boating use and shoreline services at selected anchorages, education of boaters and identification of future resource monitoring needs.

Project Timeline/Schedule: Initial anchorage monitoring in the NEP began in 1995, with three-to-four anchorages completed each year and three-to-four scheduled to be monitored in the fall of 1999.

Status: Initiated in 1995 and on-going.

Resources/Funding
Available: The Department of Environmental Protection (DEP)/EBA&BP and Charlotte Harbor Aquatic & State Buffer Preserve staff, boat and equipment support will be available for the fall 1999 anchorage monitoring. For additional information, please contact Dr. Gus Antonini at the University of Florida.
Needed:
Potential:

Reference Documents:

Comments: Opportunities include acquiring physical conditions and boating use at selected anchorages, educating boaters and identifying future resource monitoring needs. Challenges include developing and implementing a long-term resource monitoring strategy for the anchorages as boating use increases.

Buffer Preserve Three Lakes Nature Trail

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Quantifiable Objectives Addressed: FW-4

Priority Actions Addressed: FW-A, FW-B, FW-C, FW-T

Project Description: This project is a public education and exotic plant removal project. The Three Lakes Trail will extend the available interpretive trails available to the public at the Charlotte Harbor State Buffer preserve and Charlotte Harbor Environmental Center (CHEC). Fifty acres will be cleared of exotics and a three-quarter mile trail with interpretive signage will be created.

Strategy for Implementation: Regulatory permits have been obtained and work begun on the project which should be completed by June 1999. Photo points have been established in the project area to document the work performed.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection, the Charlotte Harbor National Estuary Program (NEP) grant support, contact Robert Repenning. Hans Wilson of Dexter Bender & Associates donated sign engineer drawings of bridges for the permitting.

Other Project Partners: The Charlotte Harbor Environmental Center has provided volunteer support. Hans Wilson provided the engineering design for the bridges and boardwalks.

Geographic Area: The project is in the Alligator Creek Watershed in South Punta Gorda on State Buffer Preserve Lands.

Expected Benefits and/or Drawbacks: Increased public awareness of the threat of exotic pest plants to Florida and clearing of 50 acres of exotic vegetation.

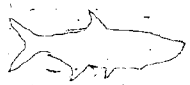
Project Timeline/Schedule: The project is slated for completion by September 30, 1999.

Status: In progress.

Resources/Funding
Available: $32,357.50
Needed:
Potential:

Reference Documents: A copy of the permit for this project and grant scope of work is available from the Charlotte Harbor Aquatic & State Buffer Preserve Office.

Comments:



Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN)

Contact Person:	**Judy Ott**
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Quantifiable Objectives Addressed: HA-2, WQ-1, WQ-4, WQ-6, WQ-7, FW-2

Priority Actions Addressed: HA-B, HA-J, WQ-B, WQ-C, WQ-D, WQ-F, WQ-Q, FW-D, FW-T, FW-V

Project Description: Through the Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN), water quality is monitored once a month, synoptically, at 35 - 40 sites throughout the Charlotte Harbor National Estuary Program (NEP) Aquatic Preserve Estuaries by trained volunteers. On the first Monday of each month at sunrise, approximately 75 volunteers sample these fixed sampling sites for 19 physical, chemical and biological parameters. The parameters include: weather and water surface conditions, water and secchi depth, water temperature, dissolved oxygen, pH and color, chlorophyll, phosphorus, nitrogen, and fecal coliform bacteria. The chlorophyll, nutrient and bacteria samples are collected in precleaned bottles by the volunteers and transported to the Department of Environmental Protection (DEP) South District Laboratory in Punta Gorda for analysis. All other parameters are measured on site by the volunteers. The monitoring program has an approved quality assurance plan and field procedures manual. Volunteers receive initial classroom and field training and participate twice a year in quality assurance practices sessions. Annual reports are prepared summarizing the results, along with tables and graphs of the data. The data is available in on Access software. A fact sheet and display describing the monitoring program are available. The project study design could be modified in the future, within logistical constraints for safe volunteer involvement, to include additional parameters needed to fill data gaps of concern to the Charlotte Harbor NEP.

Strategy for Implementation: Continued agency support for volunteer recruiting, training and quality assurance activities is critical to sustain the water monitoring network. Continued Department of Environmental Protection (DEP), South District Laboratory staff support is critical to sustain laboratory analysis of nutrient, chlorophyll and bacterial samples. The Southwest Florida Water Management District (SWFWMD) and NEP grants allowed for purchase of original field equipment and supplies for the volunteers and laboratory supplies and part-time staff assistance. A current NEP grant will allow for purchase of replacement field and laboratory supplies and part-time laboratory assistance through June 2000. A long-term support strategy for the Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) will be developed during 1999.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)/

Charlotte Harbor Aquatic & Buffer Preserves staff, primarily Judy Ott, coordinate the overall Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) program and grant, as well as the volunteers and monitoring activities in Pine Island Sound and Matlacha Pass.

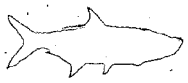
Other Project Partners: Charlotte Harbor Environmental Center (CHEC) staff, primarily Bobbi Rodgers, coordinate Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) volunteers and activities in Lemon Bay, and previously in northern Charlotte Harbor. Department of Environmental Protection (DEP)/ Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) staff, primarily Betty Gilpin, coordinate volunteers and activities in northern Charlotte Harbor and assist with laboratory analysis of samples. Department of Environmental Protection (DEP) South District Laboratory staff, primarily Dave Winkler, conduct laboratory analysis of samples. Florida Department of Environmental Protection (FDEP)/Estero Bay Aquatic & Buffer Preserve (EBA&BP) staff, primarily Heather Stafford, coordinate Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) volunteers and activities in Estero Bay.

Geographic Area: The 40 sampling sites are distributed throughout the NEP Estuaries and adjacent tributary mouths, including: Lemon Bay, Gasparilla Sound, Cape Haze, Charlotte Harbor, Pine Island Sound, Matlacha Pass, San Carlos Bay and Estero Bay.

Expected Benefits and/or Drawbacks: Benefits include widely distributed, monthly, synoptic, technically sound, reasonably priced water quality data throughout the NEP estuaries. The data can be used to assess baseline water quality conditions, potential problem areas, resource management needs and future monitoring needs. The water-monitoring network also provides significant, visible opportunities for public involvement in resource monitoring and management activities, as well opportunities for developing a sense of community and stewardship. The volunteers and data also serve important educational functions for citizens and elected officials. Drawbacks include the significant amount of agency staff time needed to recruit, train and support the volunteers and a lack of permanent support for supplies and staff.

Project Timeline/Schedule: The Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) evolved from volunteer water monitoring in Lemon Bay that was begun by Three Creeks Watch in 1992. In December 1996, volunteer water monitoring began in northern Charlotte Harbor, based on a similar protocol with modified field and training procedures, with grant support to the Charlotte Harbor Environmental Center from the Southwest Florida Water Management District (SWFWMD). Beginning in mid-1997, the volunteer water-monitoring program was expanded to include sites throughout the NEP estuaries, a quality assurance plan and regular quality assurance practice sessions. The expanded program is managed by the Department of Environmental Protection (DEP)/Charlotte Harbor Aquatic & State Buffer Preserve Office with two grants from the NEP. An annual report for the 1997 data was completed in early 1998 and an annual report for the 1998 data is pending for spring 1999. The NEP grant support has been extended through June 2000 to allow for additional supplies to be purchased, data to be collected, and reports to be completed.

Status: On-going, with current quality assurance and field procedures, since December 1996. Staff and funding support available through June 2000.



Resources/Funding

Available: Available staff support includes part-time Department of Environmental Protection (DEP) project management, volunteer coordination and laboratory support. Procured grants includes NEP support for field supplies and part-time laboratory assistance for 1997-1999 (~$24,000) and for 1999-2000 (~$24,000).

Needed: Long-term support for project management and volunteer coordination staff. (~$45,000/year) and field and laboratory supplies (~$15,000/year).

Potential:

Reference Documents: Quality Assurance Plan, Field Procedures and First Annual Report for the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network are available.

Comments: The two most significant opportunities the Charlotte Harbor Volunteer Water Quality Monitoring Network (CHEVWQMN) provides include: 1) development of a uniform, estuary wide water quality data base which, to date, has been lacking; and 2) the strong sense of stewardship and community developed by the volunteer water monitors, as well as the wealth of knowledge the volunteers have shared with each other and the project managers. The biggest challenge is the amount of time and energy project and grant management and volunteer coordination activities require.

Don Pedro Island State Recreation Area

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 180-acre barrier island site on Charlotte Harbor in Charlotte County. Natural communities include marine unconsolidated substrate (beach), beach dune, coastal grassland, maritime hammock, and developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal and the use of prescribed fire on pyric communities. Resource monitoring includes a vascular plant reference collection, shorebird nest monitoring, sea turtle nest monitoring, pitfall trapping, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)-Division of Recreation and Parks (DRP), Reginald Norman, Park Manager, Barrier Islands Geopark.

Other Project Partners: Department of Environmental Protection (DEP)-Division of Recreation and Parks Tallahassee, Fran Mainella, John Baust, Dana Bryan; DEP Division of Recreation and Parks Osprey, Mike Murphy, District 4 Chief.

Geographic Area: Don Pedro island on Lemon Bay.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: On-going.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Don Pedro Island State Recreation Area Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See management plan.

Gasparilla Island State Recreation Area

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 144-acre barrier island site in Charlotte County. Natural communities include marine consolidated, marine unconsolidated substrate (beach), beach dune, coastal strand, maritime hammock, estuarine/marine tidal swamp, and natural/developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal. Resource monitoring includes a vascular plant reference collection, shorebird nest monitoring, sea turtle nest monitoring, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP)-Department of Recreation and Parks (DRP), Reginald Norman, Park Manager, Barrier Islands Geopark.

Other Project Partners: Department of Environmental Protection (DEP) Division of Recreation and Parks Tallahassee, Fran Mainella, John Baust, Dana Bryan; DEP Division of Recreation and Parks Osprey, Mike Murphy, District 4 Chief.

Geographic Area: Gasparilla Island, north of Boca Grande Pass; Gasparilla Sound in Charlotte Harbor.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Gasparilla Island State Recreation Area Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See management plan.

Stump Pass State Recreation Area

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 245-acre barrier island site (213 upland acres and 32 submerged acres) on Lemon Bay in Charlotte County. Natural communities include marine unconsolidated substrate (beach), beach dune, coastal strand, maritime hammock, estuarine tidal swamp, and ruderal sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal. Resource monitoring includes a vascular plant reference collection, shorebird nest monitoring, sea turtle nest monitoring, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP), Reginald Norman, Park Manager, Barrier Islands Geopark.

Other Project Partners: Department of Environmental Protection (DEP) Division of Recreation and Parks-Tallahassee, Fran Mainella, John Baust, Dana Bryan; Department of Environmental Protection (DEP), Division of Recreation and Parks-Osprey, Mike Murphy, District 4 Chief.

Geographic Area: Manasota Key on Lemon Bay.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

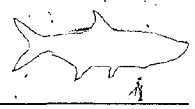
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Funding for State parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Port Charlotte Beach (Stump Pass) State Recreation Area Unit Management Plan, approved 1997; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: See area management plan.



Myakka River State Park

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2 and FW-4

Priority Actions Addressed: FW-A and FW-T

Project Description: Management of a 36,953-acre site (28,704 trustees; 8,249 Southwest Florida Water Management District [SWFWMD]) in the Myakka River watershed in Sarasota and Manatee Counties. Natural communities include dry prairie, mesic flatwoods, prairie hammock, scrubby flatwoods, basin swamp, baygall, depression marsh, dome, floodplain marsh, hydric hammock, river floodplain lake, blackwater stream, and ruderal/developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal, use of prescribed fire in pyric communities, restoration of dry prairie, and restoration of hydrology. Resource monitoring includes wetland hydrology, vegetation monitoring (pre and post burn), surficial aquifer, vascular plant reference collection, gopher tortoise survey, rain gauges, river gauge, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (FDEP), Division of Recreation and Parks (Robert Dye, Park Manager).

Other Project Partners: Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (Fran Mainella, John Baust, Dana Bryan - Tallahassee), Florida Department of Environmental Protection Division of Recreation and Parks (Mike Murphy, District 4 Chief, Osprey).

Geographic Area: Myakka River basin in Sarasota and Manatee Counties.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.
Resources/Funding:
Available: Funding for state parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Myakka River State Park Unit Management Plan, draft 1999: Chapter 258.001-157, Florida Statutes, Part 1; Parks: Park Brochure.

Comments: See management plan.

Beker B (Wingate Creek)

Contact Person: Chris Becker
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 569-acre site on the upper Myakka River in Manatee County. Natural communities include sand pine scrub, mesic flatwoods, sandhill, xeric hammock, baygall, bottomland forest, depression marsh, and blackwater stream as well as ruderal sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal and the use of prescribed fire on pyric communities. Resource monitoring includes gopher tortoise burrow surveys, a vascular plant reference collection, water quality monitoring, small mammal trapping, pitfall trapping, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (FDEP), Division of Recreation and Parks (Robert Perry, Park Manager, Manatee River Basin Geopark.)

Other Project Partners: Florida Department of Environmental Protection, Division of Recreation and Parks (Fran Mainella, John Baust, Dana Bryan - Tallahassee); Florida Department of Environmental Protection, Division of Recreation and Parks (Mike Murphy, District 4 Chief, Osprey).

Geographic Area: The Myakka River on State Road 64.

Expected Benefits and/or Drawbacks: Benefits include preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding:
Available: Funding for state parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Beker Unit Management Plan, approved 1998; Chapter 258.001-157, Florida Statutes, Part 1, Parks.

Comments: A tree die-off in Flatford Swamp (less than 1/2 mile downstream, and migrating towards the park) is a threat. Negative impacts from phosphate mining upstream are also a concern.

Paynes Creek State Historic Site

Contact Person:	**Chris Becker**
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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-T

Project Description: Management of a 367-acre site on the upper Peace River in Hardee County. Natural communities include scrubby flatwoods, mesic flatwoods, scrub, xeric hammock, baygall, bottomland forest, floodplain swamp, hydric hammock, seepage stream, and blackwater stream as well as developed sites.

Strategy for Implementation: Resource management activities include invasive exotic plant removal and the use of prescribed fire on pyric communities. Resource monitoring includes gopher tortoise burrow surveys, a vascular plant reference collection, pitfall trapping, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (FDEP), Division of Recreation and Parks (Chuck McIntire, Park Manager).

Other Project Partners: Florida Department of Environmental Protection, Division of Recreation and Parks (Fran Mainella, John Baust, Dana Bryan - Tallahassee); Florida Department of Environmental Protection,Division of Recreation and Parks (Mike Murphy, District 4 Chief, Osprey).

Geographic Area: Peace River Watershed, Bowling Green.

Expected Benefits and/or Drawbacks: Benefits include the preservation of native habitats, exotic removal, resource monitoring, nature study, public education and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding:
Available: Funding for state parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: Paynes Creek Unit Management Plan, approved 1998; Chapter 258.001-157, Florida Statutes, Part 1, Parks; Park Brochure.

Comments: Negative impacts from phosphate mining upstream are a concern.

Myakka Wild and Scenic River

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A , FW-B, FW-L, FW-Q, FW-T

Project Description: The 34 miles of the Myakka River in Sarasota County was designated by the Florida Legislature as a Wild and Scenic River in 1985. This designation provides for the permanent preservation, management, and administration of the river by Florida Department of Environmental Protection (FDEP) Division of Recreation and Parks with the advice of the Myakka River Management Coordinating Council.

Strategy for Implementation: Resource management activities include invasive exotic plant removal on private and public land. Resource monitoring includes monthly wildlife surveys and water quality monitoring, wading bird rookery monitoring, and a vertebrate field observation database.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection Division of Recreation and Parks (Chris Becker, Environmental Specialist II) or Florida Department of Environmental Protection, 3804 Coconut Palm Drive, Tampa, Florida, 33619, tel. 813/744-6100 ext. 433 (Dianne McCommons Beck, Environmental Specialist II).

Other Project Partners: Florida Department of Environmental Protection Division of Recreation and Parks (Fran Mainella, John Baust, Dana Bryan - Tallahassee); Florida Department of Environmental Protection Division of Recreation and Parks (Mike Murphy, District 4 Chief, Osprey); Florida Department of Environmental Protection Southwest District Sarasota County; Southwest Florida Water Management District; Friends of Myakka, Inc.; Myakka River Management Coordinating Council.

Geographic Area: The Myakka River within the boundaries of Sarasota County.

Expected Benefits and/or Drawbacks: Benefits include the protection of river resource values, native habitats, exotic removal, resource monitoring, nature study, public education, and recreation.

Project Timeline/Schedule: Ongoing.

Status: In progress.
Available: Funding for state parks is appropriated by the State Legislature (it varies from year-to-year). Grant funding is also sought for specific projects.
Needed:
Potential:

Reference Documents: 258.501, Florida Statute, "Myakka River Wild and Scenic Designation and Preservation Act"; Chapter 62D-15, Florida Administrative Code; "Myakka River Wild and Scenic River Rule"; Myakka Wild and Scenic River Management Plan, 1990 Brochure; Sarasota County's Myakka River Protection Ordinance No. 98-025; Sarasota County's Myakka River Protection Plan

Comments: Challenges include manatee protection, land conversion, tree die-off in upper watershed, dredging, and rule compliance.

Peace River Regional Water Supply Facility
Water Use Permit Renewal Project

Contact Person:	**Samuel S. Stone/Patrick Lehman**
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Quantifiable Objectives Addressed: HA-1

Priority Actions Addressed: HA-A

Project Description: Using 20 years of hydrobiological data collected on the lower Peace River upper Charlotte Harbor, the Authority and the Southwest Florida Water Management District (SWFWMD) determined that the existing schedule for the diversion of fresh water by the Peace River Facility needed to be revised. The existing diversion schedule at that time allowed diversion of Peace River water up to 10% if the river minimum was above 100 cubic feet per second (CFS) during March, April and May and above 130 CFS for the remaining nine months. Together Southwest Florida Water Management District (SWFWMD) and the Authority evaluated the existing data and agreed to revise the diversion schedule to 130 CFS minimum flow for all 12 months.

Strategy for Implementation: The Southwest Florida Water Management District (SWFWMD) included the revised diversion schedule into the proposed water use permit (WUP) for implementation by the Authority. This permit was reviewed and accepted by the Authority. The permit also included the existing and an expanded hydrobiological monitoring program to monitor the effects of this revised diversion schedule.

Responsible Partner and Project Coordinator: Patrick Lehman was the project manager for the Authority and Sid Flannery for Southwest Florida Water Management District (SWFWMD).

Other Project Partners: None.

Geographic Area: The geographic area to be impacted by this project is the Peace River at Arcadia including the lower Peace River and upper Charlotte Harbor.

Expected Benefits and/or Drawbacks: Protect the Charlotte Harbor estuary. Help ensure that a proper amount of fresh water inflow is delivered to maintain a balanced and productive ecosystem.

Project Timeline/Schedule: The permit renewal process was started in mid 1994 and was completed in March 1996. Implementation of the revised diversion schedule started in March 1996 and is on going.

Status: On going.

Resources/Funding
Available: Funds are available from the Peace River Facility operating budget.
Needed: None.
Potential: None.

Reference Documents: Water use permit (WUP) No. 2010420.03 and the Peace River Facility water use permit (WUP) renewal application dated 10/28/94.

Comments: None.

Peace River Water Authority
Water Conservation Public Outreach and Education Program

Contact Person:	**Samuel S. Stone/Patrick Lehman**
Title:	Facility Coordinator/Executive Director
Agency/Organization:	Peace River/Manasota Regional Water Supply Authority
Mailing Address:	1645 Barber Road, Suite A, Sarasota, FL 34240
Telephone Number:	(941) 993-4565 (941) 316-1776
FAX Number:	(941) 993-4568 (941) 316-1772
E-mail Address:	peariv@cyberstreet.com or peacemana@aol.com

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-D, HA-I, HA-J, HA-K

Project Description: Through tours of the Peace River Facility and a public speakers program the Peace River Water Authority will make contact with school age children and adults to educate them about the treatment of water, resource management, minimum levels of various water bodies, and conservation of our water resources.

Strategy for Implementation:

1. The Authority will advertise and promote tours of the Peace River Facility by way of the public media and in conjunction with our other member utilities. During those tours children and adults will be shown how water is treated, stored, and delivered to the public at the Peace River Facility. In addition the Authority will discuss the reasons and means to conserve water. The Authority will also participate in better water week, government day and other similar functions to educate the public about water treatment and water conservation. Civic organizations and adult community groups will also be contacted to suggest plant tours or a guest speaker to attend their organizational meetings so they can learn more about water resources.
2. This work will be accomplished by the use of videos, portable displays, brochures, and public announcements through the media.

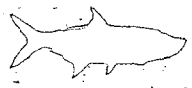
Responsible Partner and Project Coordinator: The Peace River Manasota Regional Water Supply Authority, Environmental Affairs Coordinator, Samuel Stone.

Other Project Partners: Sarasota County, North Port, Charlotte County, and DeSoto County utility departments; Southwest Florida Water Management District (SWFWMD) and Charlotte Harbor Environmental Center.

Geographic Area: The geographic area to be impacted by this project is the lower Peace River basin in DeSoto County, Charlotte Harbor proper and the Myakka River Basin.

Expected Benefits and/or Drawbacks: Protect the Charlotte Harbor estuary. Improve the public's knowledge about water resources and reduce public use thereby helping to ensure that a proper amount of fresh water inflow is delivered to maintain a balanced and productive ecosystem.

Project Timeline/Schedule: Some of this work is already ongoing but this effort will be expanded greatly by the Authority beginning in November 1999. Once started, this program should continue for years to come.



Status: Currently this expanded program is in the planning stages, but should be well underway by November 1999.

Resources/Funding
Available: Funds are available from the Peace River Facility operating budget.
Needed: None.
Potential: None.

Reference Documents: None are available at this time.

Comments: None.

Peace River Water Quality Monitoring Project

Contact Person:	**Samuel S. Stone/Patrick Lehman**
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Quantifiable Objectives Addressed: WQ-2

Priority Actions Addressed: WQ-D

Project Description: Sample the Peace River and its major tributaries on a monthly basis. Analyze the data on an annual basis to develop trends and determine pollutant loads being delivered to the Charlotte Harbor estuary. Sam Stone is project coordinator for the Authority, whereas Alton Cheatham is the project manager for the Charlotte Harbor Environmental Center, and Gerold Morrison is in charge of data analysis and reporting while working for the Department of Environmental Protection (DEP).

Strategy for Implementation: Samples from eleven stations are collected from the Peace River basin on a monthly basis. These stations are located as far north as the Peace Creek and downstream to Shell Creek, primarily where the U.S. Geological Survey gauging stations are located. Twenty different parameters are analyzed, including nutrients. Annually these data are evaluated, analyzed to determine any trends and to establish pollutant loads for possible future modeling efforts. Data are then made available to regulatory agencies and scientist through reports and storet and to the public through educational programs.

Responsible Partner and Project Coordinator: Peace River Manasota Regional Water Supply Authority Environmental Affairs Coordinator, Samuel Stone.

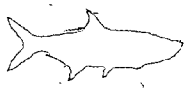
Other Project Partners: Peace River and Manasota Basin Boards, Southwest Florida Water Management District (SWFWMD) agricultural ground water quality monitoring program (AGWQMP), Department of Environmental Protection (DEP) Ecosystem Management and the Charlotte Harbor NEP are currently cooperating on this project.

Geographic Area: The Peace River basin.

Expected Benefits and/or Drawbacks: Provide a long-term water quality database in order to determine pollutant loads and future total maximum daily loads (TMDLs). Encourage greater interagency cooperation and educate the public through field trips and lectures.

Project Timeline/Schedule: This project is half way through its second year and funding is being obtained for year three.

Status: In progress.



Resources/Funding
Available: Funds are available from the Peace River Manasota Regional Water Supply Authority, Charlotte Harbor NEP, Department of Environmental Protection (DEP), Southwest Florida Water Management District (SWFWMD), Charlotte Harbor Environmental Center and the Peace River and Manasota Basin Boards.
Needed: None.
Potential: None.

Reference Documents: Charlotte Harbor NEP Early Action Demonstration Project Application.

Comments: None.

Peace River Hydrobiological Monitoring Program (HBMP)

Contact Person:	**Samuel S. Stone/Patrick Lehman**
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Quantifiable Objectives Addressed: WQ-2

Priority Actions Addressed: WQ-D

Project Description: Monitor withdrawals from the Peace River, evaluate ecological relationships to freshwater inflows, and monitor water quality and biological variables to determine if ecological changes are occurring and are related to changes in fresh water inflows.

Strategy for Implementation: Sample sixteen fixed station locations, four moving salinity based stations and collect nursery fish samples on a monthly basis. Every two years, perform first and last vegetation surveys, transect vegetation surveys at three locations and aerial photo interpretation for vegetation communities. The benthic studies are accomplished based on various river flow conditions over a two or three-year period. All these data are reported to the District on an annual basis. A year three and year five summary report is provided to the District containing the results of a thorough analysis of the data for trends as it relates to the withdrawal of fresh water from the Peace River.

Responsible Partner and Project Coordinator: Peace River Manasota Regional Water Supply Authority Environmental Affairs Coordinator, Samuel Stone.

Other Project Partners: Southwest Florida Water Management District (SWFWMD) and the U.S. Geological Survey (USGS) are other project partners.

Geographic Area: The lower Peace River and upper Charlotte Harbor.

Expected Benefits and/or Drawbacks: Provide a long-term water quality database in order to determine future total maximum daily loads (TMDLs) and determine the impacts of fresh water withdrawals.

Project Timeline/Schedule: This project has been under way since 1976 and is expected to continue at least through the year 2016.

Status: In progress.

Resources/Funding
Available: Funds are available from the Peace River Manasota Regional Water Supply Authority, U.S. Geological Survey and Southwest Florida Water Management District (SWFWMD).
Needed: None.
Potential: None.

Reference Documents: Peace River facility water use permit (WUP) No. 2010420.03.

Comments: None.

The Peace River Water Authority's Regional Transmission Pipeline Educational Trails

Contact Person: Samuel S. Stone / Patrick Lehman
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Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-T

Project Description: As part of the Peace River Option, a new regional transmission pipeline will be constructed from the Peace River Facility in DeSoto County to the Carlton Water Treatment Facility in Sarasota County. Running parallel to this new pipeline and other existing pipelines, the Authority is planning to include a trail for public use and include on this trail areas that could be used for habitat education of the public.

Strategy for Implementation: The new regional pipeline will be constructed for a distance of about 23 miles passing through several different types of habitat. In some cases the habitat will minimally be disturbed but some other types will require mitigation. In addition to the new pipeline, existing pipelines currently extend about seven miles toward the Port Charlotte area. Using multiple signs at selected habitat locations, the Authority could describe the habitats, their benefits, and in some cases, the methods used to replace or repair these habitats after construction.

Responsible Partner and Project Coordinator: Peace River/Manasota Regional Water Supply Authority Environmental Affairs Coordinator, Samuel Stone.

Other Project Partners: None at this time.

Geographic Area: The lower Peace River and Myakka River basin.

Expected Benefits and/or Drawbacks: Provide a long-term public educational demonstration project showing the importance of different habitats, teaching the public how to identify different habitats and how habitats can be restored or repaired after construction.

Project Timeline/Schedule: This project could begin at the planning stage in mid - 1999 and be completed in mid - 2001 with ongoing maintenance occurring as needed indefinitely.

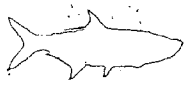
Status: Currently in the early planning stages.

Resources/Funding Available: Funds are available from the Peace River Manasota Regional Water Supply Authority.

Needed: Unknown.
Potential: Southwest Florida Water Management District (SWFWMD), Florida Department of Transportation, Department of Environmental Protection, Charlotte Harbor Environmental Center, North Port, Sarasota County, Charlotte County, DeSoto County, Charlotte County Metropolitan Planning Organization (MPO) and Charlotte Harbor NEP.

Reference Documents: None.

Comments: None.



Water Conservation Program

Contact Person: Karen F. Burnett, P.G.
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-K, WQ-B

Project Description: Various public education programs and materials on responsible water use, water resources, and water conservation.

Strategy for Implementation:

1. Continue to regulate, through County ordinances, the installation of water conservation equipment on all new construction, mandatory water use restrictions, and mandatory installation of rain sensor devices on all new and existing lawn sprinkler/irrigation systems.
2. Continue to use an inverted utility rate structure, which charges significantly higher rates for above normal water consumption.
3. Continue educational programs on water conservation for school-age children, including special presentations, a water conservation poster contest, grants for educational water-conserving gardens at schools, teacher training, etc.
4. Continue distribution of existing public awareness materials, such as "Sensible Sprinkling, Water Conservation for Sarasota County," "The Water Wheel," "Your Guide to Home Water Conservation," "The Sarasota County Water Conservation Calendar," the Southwest Florida Water Management District (SWFWMD) "Plant Guide," and water conservation bulletins from the American Water Works Association (AWWA), such as "Fifty Five Facts, Figures, and Follies of Water Conservation."
5. Continue to have water conservation exhibits at public events, such as the Sarasota County Government "EXPO."
6. Continue to provide proactive customer services, such as contact about an unusually high bill (could be the result of a leak), residential customer water audits, and conservation information as bill inserts and messages on bills.
7. Continue to participate in the Water Conservation Speakers Bureau, and work in partnership with the Sarasota County Extension Service and the Florida House Learning Center.
8. Continue the water efficient toilet (WET) rebate program to promote the replacement of high-volume toilets with a 1.6-gallon or less per flush.
9. Continue to distribute leak-detecting dye tablets with water conservation information at special events.
10. Continue to retrofit County facilities with water-saving toilets, lavatories, and showerheads.

Responsible Partner and Project Coordinator: Sarasota County Utilities (941) 316-1546.

Other Project Partners: N/A.

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Responsible use and protection of the County's water resources.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: N/A
Needed:
Potential:

Reference Documents: Various County brochures, presentations, and other educational materials.

Comments: N/A.

Expansion of the Reuse Distribution System

Contact Person: Karen F. Burnett, P.G.
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E-mail Address: kburnett@sarasota.co.fl.us

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-P

Project Description: The Southwest Florida Water Management District (SWFWMD) has helped pay for reuse transmission lines. SWFWMD has not paid for distribution lines. Reuse transmission lines are now in place and SWFWMD funds are needed to make reuse economically available by constructing distribution lines. Targeted uses are not yet identified. Staff are currently reviewing options for the December 1999 cooperative funding cycle.

Strategy for Implementation: Submit distribution line projects to Southwest Florida Water Management District (SWFWMD) for cooperative funding.

Responsible Partner and Project Coordinator: Lori Ann Carroll, Reuse Coordinator, Sarasota County Utilities (941) 316-1526.

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Make reuse economically feasible, which will increase customers.

Project Timeline/Schedule: December 1999 is the next cooperative funding cycle.

Status: Planned.

Resources/Funding
Available: To be determined.
Needed: To be determined.
Potential:

Reference Documents: N/A.

Comments: N/A.

T. Mabry Carlton, Jr. Memorial Reserve and Pinelands Reserve Monitoring and Stewardship Programs

Contact Person: Karen F. Burnett, P.G.
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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-A

Project Description: Resource Management Division, Sarasota County Natural Resources, is currently responsible for the control of exotic/nuisance plant and animal species in permitted mitigation areas and non-permitted natural areas in the Myakka River watershed. The Division implements management plans that require exotic/nuisance species control for both the Carlton and Pinelands Reserves. Some of this management and maintenance is also done for compliance with Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection (DEP), and U.S. Army Corps of Engineers (ACOE) permits on the Reserves and adjacent properties.

Strategy for Implementation: Approved land management plans have been implemented for these County-owned properties. Exotic/nuisance plant control should be coordinated with adjacent property owners for economy and effective broad-scale management. Sarasota County Natural Resources, Resource Management Division, sets annual goals for exotic/nuisance plant and animal removal based on the number of acres of habitat inspected for exotic/nuisance species, number of feral hogs removed, number of feral hogs remaining, and available funding.

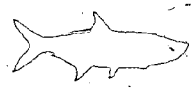
Responsible Partner and Project Coordinator: Ron Van Fleet, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941) 378-6142.

Other Project Partners: Florida Department of Transportation (DOT), Southwest Florida Water Management District (SWFWMD), Department of Environmental Protection (DEP) (Myakka State Park), and private landowners, (especially ranchers and other agriculturalists).

Geographic Area: Sarasota County area of the Charlotte Harbor NEP study area; T. Mabry Carlton, Jr. Memorial Reserve and Pinelands Reserve.

Expected Benefits and/or Drawbacks: Benefits include a broad-scale approach for reduction of long-term maintenance costs, and control/impediment of rapid colonization of exotic/nuisance plant and animal species in natural areas.

Project Timeline/Schedule: Exotic/nuisance plant and animal control on the Carlton and Pinelands Reserves continues in perpetuity; permit conditions require perpetual maintenance of permitted sites, even after agency sign off.



Status: In progress.

Resources/Funding
Available: Sarasota County budget.
Needed: $500,000; this is an annual estimate that should decrease each year as the problem areas recover with native, desirable plants.
Potential: Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection, and potentially others.

Reference Documents: Dredge and Fill, management and storage of surface waters (MSSW), and other permits from Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection, and the Army Corps of Engineers (ACOE); Sarasota County Comprehensive Plan (APOXSEE).

Comments: Challenge to coordinate landowners that are not actively managing for exotics. Seed source for exotics on adjacent properties may be thriving. Some exotic animals, such as feral hogs, may be encouraged on adjacent properties.

Sarasota County Ambient Water Quality Monitoring Program

Contact Person: Karen F. Burnett, P.G.
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FAX Number: (941) 378-6136
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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: WQ-D, WQ-E

Project Description: Pollution Control Division will continue to ensure that discharges are in compliance with State rule. Forty stations segmented in Sarasota Bat (25 stations), Lemon Bay (5 stations), Upper Myakka River (five stations), and Lower Myakka River (five stations) are monitored monthly for the following water quality parameters: temperature, pH, salinity, specific conductance, biological oxygen demand, color, turbidity, total suspended solids, dissolved nitrate (NO2), dissolved nitrite (NO3), inorganic nitrogen (NO2+, NO3, N), dissolved and total ammonia, dissolved inorganic nitrogen, total Kjedahl nitrogen (TKN), total nitrogen (TN), orthophosphate, total phosphorus (TP), chlorophyll-*a*, and secchi depth.

Strategy for Implementation: Sarasota County Natural Resources currently monitors water quality parameters at 40 stations segmented in Sarasota Bay (25 stations), Lemon Bay (five stations), Upper Myakka River (five stations), and Lower Myakka River (five stations).

Responsible Partner and Project Coordinator: J. Kent Kimes, P.E., Manager, Pollution Control Division, Sarasota County Natural Resources, (941) 378-6128.

Other Project Partners: N/A.

Geographic Area: Sarasota County; Sarasota Bay, Lemon Bay, Upper Myakka River, and Lower Myakka River.

Expected Benefits and/or Drawbacks: Benefit: Data compilation to support establishment of total maximum daily loads (TMDLs) for Sarasota County. This water quality monitoring program is geographically imcomplete. Drawbacks: Lack of monitoring data to support total maximum daily loads (TMDLs); total maximum daily loads (TMDLs) have not been established for Sarasota County. Corresponding flow data, tributary flow, and chemical analyses may be needed to determine total maximum daily loads (TMDLs).

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Sarasota County program; Natural Resources budget is $125,000; Work is subcontracted out; Contract administration performed by County staff.
Needed:
Potential:

Reference Documents: Data stored in EXCEL format.

Comments: N/A.

Sarasota County Septic Tank Replacement Program

Contact Person: Karen F. Burnett, P.G.
Title: Manager, Resource Management Division
Agency/Organization: Sarasota County Natural Resources
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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-4, WQ-6

Priority Actions Addressed: WQ-G

Project Description: Replace septic tanks in Sarasota County with alternative on-site systems or connect to central sewer systems.

Strategy for Implementation: Survey to determine septic tanks that do not meet current water-quality standards and rules. Determine the most economic means of replacing septic tanks that are not in compliance. Replace identified noncompliant septic tanks.

Responsible Partner and Project Coordinator: Hugh Henkel, Water Resources Coordinator, Utilities Technical Services, Sarasota County Utilities (941) 316-7992

Other Project Partners: State of Florida, Southwest Florida Water Management District, Federal Government.

Geographic Area: Sarasota County; first priority area is the Phillippi Creek area (not in the Charlotte Harbor NEP study area).

Expected Benefits and/or Drawbacks: Reduction of sewage, bacterial, and nutrient pollution entering waters in Sarasota County from septic tanks. Cost of the program to the individual homeowners (hook-up fees, impact fees, septic system upgrade or replacement) is a drawback.

Project Timeline/Schedule: Began in July 1998; completion of first phase by 2010.

Status: In progress.

Resources/Funding
Available: $30 million.
Needed: $70 million.
Potential: State of Florida, Federal Government.

Reference Documents: N/A.

Comments: N/A.

Florida Yards and Neighborhoods Program

Contact Person: Karen F. Burnett, P.G.
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Quantifiable Objectives Addressed: WQ-3.

Priority Actions Addressed: WQ-I

Project Description: Reduction of nonpoint source pollution from residential and commercial properties.

Strategy for Implementation: In Sarasota County currently 177 residents are enrolled in the Florida Yards and Neighborhoods Program; 16 Sarasota County yards are certified as model Florida yards.

Responsible Partner and Project Coordinator: J. Kent Kimes, P.E., Manager, Pollution Control Division, Sarasota County Natural Resources, (941) 378-6128.

Other Project Partners: Sarasota County Cooperative Extension Service; Sarasota Bay NEP.

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Reduction of nutrient loading in water bodies from runoff; reduction in the use of fertilizers and pesticides; water conservation. Only the coordinator's position is currently funded through State funds. The program relies on grant funding from a variety of sources, and extensive volunteer assistance.

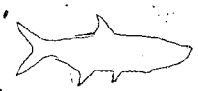
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: current grants from the Department of Environmental Protection, Environmental Protection Agency, the Southwest Florida Water Management District (SWFWMD), Sarasota Bay NEP.
Needed: N/A.
Potential: State funds through the University of Florida; additional grants.

Reference Documents: Publications by the Sarasota County Cooperative Extension Service and the Sarasota Bay NEP.

Comments: Sarasota County national pollutant discharge elimination system (NPDES) Program in the Pollution Control Division is currently working with industrial facilities to determine permit compliance through a proactive inspection program and educational activities. Public education is one of several elements mandated by the Environmental Protection Agency NPDES permit held by Sarasota County. The Pollution Control Division maintains logs and records of citizen complaints and pollution incidents. Pollution Control provides 24-hour on-call response to pollution incidents and illicit discharges.



South Lido Park Atmospheric Deposition Monitoring Station

Contact Person: Karen F. Burnett, P.G.
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Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-O

Project Description: Sarasota County Pollution Control Division is not the lead on this project; Sarasota Bay NEP contracted technical services, purchased equipment, and contracted for operation of the monitoring equipment with Mote Marine Research Institute.

Strategy for Implementation: Pollution Control Division is available to assist in the study, design, and review of the draft report.

Responsible Partner and Project Coordinator: J. Kent Kimes, P.E., Manager, Pollution Control Division, Sarasota County Natural Resources, (941) 378-6128.

Other Project Partners: Sarasota Bay NEP.

Geographic Area: Sarasota County; South Lido Park, Sarasota Bay (not in the Charlotte Harbor NEP area), but the airshed is part of the study area.

Expected Benefits and/or Drawbacks: Determine levels of pollution associated with atmospheric deposition; identify sources. Data from this and other air quality monitoring sites will be modeled to predict the contributions of atmospheric deposition of nitrogen to area waterbodies. This data may be directly applicable to the Charlotte Harbor NEP area. A similar monitoring site located in the Charlotte Harbor NEP watershed would be beneficial.

Project Timeline/Schedule: N/A.

Status: In progress.

Resources/Funding
Available: Sarasota Bay NEP budget.
Needed:
Potential:

Reference Documents: N/A.

Comments: Pollution Control Air Quality Section staff can provide technical assistance.

Habitat Improvement: Modification of Previously Hardened Natural Shorelines

Contact Person: Karen F. Burnett, P.G.
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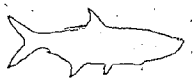
Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-B

Project Description: Modify previously existing natural shorelines that have been hardened with vertical seawalls within aquatic preserves and adjacent riverine systems to improve habitat.

1) "Use of riprap and artificial reef structures along existing seawalls." Sarasota County Resource Protection Services does not encourage these habitat improvement activities for the following reasons: the Sarasota County Comprehensive Plan, under specific management guidelines for bay waters, the Myakka River, tidal marshes, seagrass beds, and mangrove swamps, strictly prohibits filling. As such, any projects that have the effect of filling are recommended for denial under Sarasota County Ordinance No. 72-84, as amended, the dredge and fill ordinance. These proposals would include both the placement of rock/toe scour revetments located waterward of any jurisdictional wetland boundary as determined under Chapter 62-340, Florida Administrative Code, and the placement of any artificial reef structures either on the waterbody floor or suspended from a dock or bulkhead. Over time, such suspended structures over the bay can be expected to succumb to the forces of mass and gravity, and settle on the bay bottom, resulting in filling. These artificial reef structures also fail to provide habitat for post-larval growth or will encourage "oyster beds" to be located at and within boat mooring areas.
2) "Develop public education and awareness programs." Sarasota County Government has produced numerous handouts and brochures for public dissemination, including: the "Bay Repair Kit" and "Sharing the Shoreline, A Handbook for Coastal Residents." Continued efforts should be made at every level of our public education system, including elementary, secondary, and college levels.
3) "Review and improve the existing permit process to reduce hurdles" and "Develop and encourage incentive programs for private land owners." Sarasota County Resource Protection Services regulates all shorelines and water areas in the county to the crest elevation of existing shoreline structures. As such, proposed modifications are regulated under Sarasota County Ordinance No. 72-84, as amended, and fall under management guidelines pursuant to the Sarasota County Comprehensive Plan. Since 1985, Sarasota County has restricted new seawall construction in all natural waterbodies. In artificially created waterbodies (e.g. canals), shoreline structures are authorized landward of estuarine habitats and vegetated littoral shelves. Whenever possible, existing vertical walls are removed and replaced with vegetated littoral shelves and sloping revetments and/or retaining walls. The County prohibits filling waterward of existing seawalls with toe/scour revetments or any other fill material under minor work category of permits pursuant to Sarasota County Ordinance No. 72-84, as amended (see #1 above).



Strategy for Implementation: Continue existing regulatory programs that encourage and require shoreline "softening" techniques, the planting of littoral shelves, and the protection of existing planted wetland vegetation.

Responsible Partner and Project Coordinator: Laird Wreford, Manager, or George Tatge, Environmental Supervisor, Resource Protection Services, Sarasota County Development Services (941) 378-6113.

Other Project Partners: Department of Environmental Protection (DEP), U.S. Army Corps of Engineers, Charlotte Harbor NEP, Sarasota Bay NEP, West Coast Inland Navigation District, and Southwest Florida Water Management District.

Geographic Area: Sarasota County area of the Charlotte Harbor NEP; Lemon Bay, Gottfried Creek, Alligator Creek, Forked Creek.

Expected Benefits and/or Drawbacks: Improved biodiversity of shoreline habitats.

Project Timeline/Schedule: In progress.

Status: In progress.

Resources/Funding
Available: Sarasota County program; budgeted.
Needed:
Potential:

Reference Documents: Sarasota County Ordinance No. 72-84, as amended, and the environmental element of the Sarasota County Comprehensive Plan.

Comments: Department of Environmental Protection (DEP) exemptions for seawall repair are in conflict with County ordinances, and provide loopholes for replacement of existing seawalls. DEP exemption criteria should be revised.

Habitat Protection While Boating

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Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-D

Project Description: Present information to the public about damage to seagrass beds, the time it takes seagrass beds to recover from damage, the value of seagrass beds to marine habitat and nursery areas, and if available, information on the economic impact of seagrass bed damage.

Strategy for Implementation: After literature search, include data in brochures and presentations. Stress the economic value of sea grass beds, if possible. Separate brochures or presentations should be developed. Train volunteers to make presentations. Contact fishing clubs, U.S. Coast Guard Auxiliary, and waterfront property owner and condominium associations to make presentations.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941)378-6142.

Other Project Partners: Florida Sea Grant Program, Florida Department of Environmental Protection, Charlotte Harbor NEP, U.S. Coast Guard.

Geographic Area: Sarasota County; Lower Myakka River, Lemon Bay, and coastal Venice.

Expected Benefits and/or Drawbacks: Reduce damage to marine habitats through boater education.

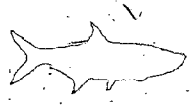
Project Timeline/Schedule: Proposed Project. Start literature search as soon as possible. Assemble pertinent data to be available for use in 2001. Specific brochures to be printed by the end of 2001.

Status: Proposed Project.

Resources/Funding
Available: To be determined.
Needed:
Potential:

Reference Documents:

Comments: N/A.



Educational Signage at Boat Ramps

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Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-F

Project Description: Placement of appropriate signs, such as at Indian Mound Park, Lemon Bay. Highly detailed map placed at the boat ramp with a larger map of the area would be appropriate. Placement of educational signage at identified boat ramps in the Charlotte Harbor NEP watershed showing locations of seagrass beds, oyster beds, or other areas of special marine concern. Brochures may also be placed in a covered holder at appropriate boat ramps.

Strategy for Implementation: Work in cooperation with Resource Protection Services, Sarasota County Development Services, and Sarasota County Parks and Recreation to map areas, develop signs, and identify most appropriate and effective placement.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941) 378-6142.

Other Project Partners: Sarasota County Parks and Recreation, West Coast Inland Navigation District (WCIND), and the National Oceanic and Atmospheric Administration (NOAA).

Geographic Area: Coastal Venice, Myakka River watershed, and Lemon Bay.

Expected Benefits and/or Drawbacks: Protection of marine habitats and natural resources through public education and responsible boating practices.

Project Timeline/Schedule: N/A.

Status: Planned; a few signs are already in place.

Resources/Funding
Available: Sarasota County budget.
Needed:
Potential: West Coast Inland Navigation District (WCIND).

Reference Documents: N/A.

Comments: N/A.

Boaters' Guide for Upper Lemon Bay and Venice

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-G

Project Description: Develop, produce, and distribute a boaters' guide for upper Lemon Bay and coastal Venice.

Strategy for Implementation: Obtain navigational charts for the intended areas. Obtain information from Florida Marine Research Institute (FMRI), Endangered Species (for manatee frequency). Obtain most current seagrass maps from FMRI. Obtain information on available marinas in the areas. All of the information obtained will be placed and overlaid by a geographic information system (GIS) technician to produce a map with depth, seagrass beds, marinas, and manatee areas, no wake zones, and boating safety tips identified.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941)378-6142.

Other Project Partners: Florida Marine Research Institute (FMRI), West Coast Inland Navigation District (WCIND), and Florida Marine Patrol (FMP).

Geographic Area: Sarasota County; Coastal Venice basin, Myakka River basin, and the Lemon Bay basin.

Expected Benefits and/or Drawbacks: Protection of seagrass beds; less seagrass bed scarring; less boats aground, environmental awareness; avoid habitat destruction.

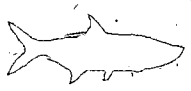
Project Timeline/Schedule: To be determined.

Status: Planned; not initiated.

Resources/Funding
Available: Florida Sea Grant Program.
Needed:
Potential: Marina owners; Sarasota County.

Reference Documents: Nautical charts, Florida Marine Research Institute (FMRI) seagrass charts; FMRI annual manatee reports.

Comments: Funding; once funding is provided, implementation should be fairly easy.



Resource Management Division Geographical Information System (GIS) Program

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-H

Project Description: Collection of rectified infrared (IR) aerial data for approximately 100 square miles in eastern Sarasota County to document changes in wetlands and other habitats. ArcView geographic information system (GIS) software is used to document large-scale habitat changes over time.

Strategy for Implementation: Secure additional funding to do coastal infrared (IR) flight when the Resource Management Division does the annual flight. Determine what features need to be identified on a digitized map. Produce a geographic information system (GIS) map and load onto the Internet (Sarasota County Natural Resources webpage).

Responsible Partner and Project Coordinator: Ron Van Fleet, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources (941)378-6142.

Other Project Partners: Florida Sea Grant Program, Sarasota Bay NEP, Charlotte Harbor NEP, Florida Department of Environmental Protection, National Oceanographic and Atmospheric Administration (NOAA).

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: If done on an annual basis as our maps are done, this could serve as a monitoring tool; only drawback is the cost.

Project Timeline/Schedule: As soon as possible; then annually.

Status: To be determined.

Resources/Funding
Available: To be determined.
Needed:
Potential:

Reference Documents: National Oceanic and Atmospheric Administration (NOAA) photos and existing similar websites.

Comments: The Southwest Florida Water Management District collects aerial data each November when the canopy is decreased to verify topographic elevations. Resource Management aerial data are collected annually in April or May to document vegetation changes. Because there are different goals for the data collection requiring aerial photography to be flown at different times of the year, coordination between these two agencies is unlikely.

Sarasota County Public Information

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-I

Project Description: Develop new videotapes relating to seagrass beds, responsible boating, and potential damage to boat engines and associated costs of irresponsible boating practices. Develop permanent display boards for maps and information on seagrass beds and responsible boating practices for boat ramp areas.

Strategy for Implementation: Identify appropriate areas for existing County-owned kiosks to play existing loop videotapes on hazards to manatees, seagrass beds, and oyster bars from boat props. Use semi-permanent displays for different marinas, boat shows, civic events, etc. Develop new videotapes showing boat damage and associated costs to boat owners resulting from irresponsible boating practices.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources (941) 378-6142.

Other Project Partners: West Coast Inland Navigation District (WCIND), Florida Department of Environmental Protection, and the National Estuary Programs.

Geographic Area: Coastal Venice, Myakka River watershed, Lemon Bay.

Expected Benefits and/or Drawbacks: Protection of marine habitats and natural resources through increased public education.

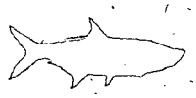
Project Timeline/Schedule: To be determined.

Status: To be determined.

Resources/Funding
Available: To be determined.
Needed:
Potential: West Coast Inland Navigation District (WCIND), and Charlotte Harbor NEP.

Reference Documents: N/A.

Comments: N/A.



Water Resource Marking Program

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Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-J, FW-K

Project Description: Placement of signage or markers for shallow water areas and "no motor" or "limited access zones" where appropriate.

Strategy for Implementation: Proceed cautiously with marker program; when the Sarasota Bay National Estuary Program researched this issue, it was found that in some cases marking of shallow areas actually increased seagrass scarring. There are probably few, if any, areas in Sarasota County where these zones are needed or would be effective. Proper channel marking and law enforcement of marked zones are very effective. Most problems in Sarasota County are boats speeding through shallow, slow speed manatee zones.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources (941) 378-6142.

Other Project Partners: West Coast Inland Navigation District (WCIND), National Oceanographic and Atmospheric Administration.

Geographic Area: Coastal Venice, Myakka River, and Lemon Bay.

Expected Benefits and/or Drawbacks: Protection of shallow areas, seagrass beds, habitats, and natural resources through effective use of channel and shoal markers. Proceed cautiously with marker work; research area and potential response to markers. Channel markers can be very effective in some cases.

Project Timeline/Schedule: Ongoing.

Status: Ongoing; in progress.

Resources/Funding
Available: West Coast Inland Navigation District (WCIND).
Needed:
Potential:

Reference Documents: Sarasota Bay National Estuary Program reports and publications.

Comments: N/A.

Habitat Improvement: Improve Law Enforcement and Provide Consistent Regulatory Authority Throughout the Charlotte Harbor NEP Area

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Quantifiable Objectives Addressed: FW-2, FW-3, FW-4

Priority Actions Addressed: FW-Q

Project Description:

1) "Identify areas of noncompliance with local, State, and Federal rules and regulations." Sarasota County Ordinance No. 72-84, as amended, and the environmental element of the Sarasota County Comprehensive Plan, with rules and regulations from other governmental agencies (regional, State, and Federal,) provide the framework for the permitting and enforcement (of unpermitted or noncompliant permits) in Sarasota County within the bays, rivers, streams, and creeks. Sarasota County Ordinance No. 98-025, the Myakka River Protection Ordinance, provides additional regulation and protection of this waterbody. Additional staff are needed to determine compliance with authorized activities and in pursuing enforcement actions for unauthorized activities. Law enforcement personnel are also needed to further increase criminal enforcement activities associated with boating safety and poaching/illegal takes within the area and waterways.
2) "Work with regulatory agencies in developing protocols in their development of annual reports which track the effectiveness of permit compliance within the Charlotte Harbor NEP study area." Sarasota County Government monitors the effectiveness of the programs that they administer in connection with the annual budget process by using performance standards and measures established for each program area. Should the Charlotte Harbor NEP provide performance standards to the governmental agencies, these standards would have to be adopted by the respective governments. Given that currently each government agency uses different permit/enforcement criteria, the performance criteria would have to be specifically suited to each agency.

Strategy for Implementation: Develop and hold workshops in consensus on law and environmental regulation, consistency of regulation and enforcement, and why these issues are so important to habitat and wildlife protection.

Responsible Partner and Project Coordinator: Laird Wreford, Manager, or George Tatge, Environmental Supervisor, Resource Protection Services, Sarasota County Development Services, (941)378-6113.

Other Project Partners: Florida Department of Environmental Protection (DEP), U.S. Army Corps of Engineers, Southwest Florida Water Management District, Charlotte Harbor NEP, Sarasota Bay NEP, DEP Lemon Bay Aquatic Preserve, Sarasota County Sheriff's Office, Florida Marine Patrol, U.S. Fish and Wildlife Service, and U.S. National Marine Fisheries.

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Improved customer service (reduced regulatory duplication), consistent permit criteria and enforcement.

Project Timeline/Schedule: Proposed project.

Status: Proposed project.

Resources/Funding
Available:
Needed: Taxing authority; fee based.
Potential:

Reference Documents: N/A.

Comments: Each authority/government entity has regulatory authority. These regulations have been adopted by the respective executive branches of government after much public input. These laws would have to be revised after further public input, and approved by the respective governments. When this occurs, management oversight would be needed to ensure consistent administration and enforcement.

Proposed Acquisition of the Verna, Eastern Ranchlands, and Myakkahatchee Creek Environmentally Sensitive Lands

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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S

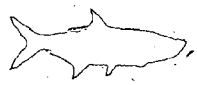
Project Description: Eighteen environmentally sensitive priority protection sites have been identified. Three identified sites within the Charlotte Harbor NEP area (the Verna, Eastern Ranchlands, and Myakkahatchee Creek sites) contain large, undeveloped, platted subdivisions. Sarasota County is pursuing acquisition of other priority protection sites within the Charlotte Harbor NEP area that are not platted.

Strategy for Implementation: Pursue fee-simple acquisition or conservation easements of 18 identified priority protection environmentally sensitive lands. On March 9, 1999, Sarasota County voters approved a referendum to implement an increase in ad valorem property tax (up to 0.25 mill per year) for 20 years to fund the acquisition, protection, and management of environmentally sensitive lands. Voters also approved a second referendum that authorizes the County to pursue up to $53 million in bonds for this program. The County proposed fee-simple acquisition of the Verna and Myakkahatchee Creek sites. The City of North Port is also acquiring property along Myakkahatchee Creek for protection.

Pursue matching funds and grants for acquisition, protection and management of environmentally sensitive lands. Contract with an experienced, qualified acquisition agent for negotiations with property owners, pursuit of matching or grant funds, surveys, appraisals, and development of acquisition contracts. Provide staff coordination and expertise to the Environmentally Sensitive Lands Oversight Committee that was established by County Ordinance No. 99-004. The Board of County Commissioners will approve the millage recommendations of the Committee on an annual basis. Hire additional County staff for program oversight and land management activities. Develop detailed land management plans for each site acquired. Continue to provide public education on the benefits derived from protection and management of environmentally sensitive lands.

Responsible Partner and Project Coordinator: Gary Comp, General Manager, Sarasota County Natural Resources, (941) 378-6113.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection, U.S. Fish and Wildlife Service, Florida Department of Community Affairs.



Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Protection of habitats, natural resources, and drinking water.

Project Timeline/Schedule: Referenda establishing funding for an environmentally sensitive lands acquisition program and authorizing pursuit of bonding options were approved by Sarasota County voters on March 9, 1999. This is a 20-year program. A contract for the acquisition agent is expected to be finalized by early FY 00. The Environmentally Sensitive Lands Oversight Committee is established and meeting on a regular basis.

Status: In progress. Some funding is currently available through the County's one-cent sales tax; three environmentally sensitive sites have been purchased 1998-1999.

Resources/Funding
Available: Approximately $5 million in FY 00 from the approved increase in ad valorem property tax.
Needed: N/A.
Potential: Matching funds from the Florida Forever Program, Florida Communities Trust grants, and Southwest Florida Water Management District (SWFWMD)/Save Our Rivers funding will be pursued.

Reference Documents: Sarasota County Environmentally Sensitive Lands report; Sarasota County Comprehensive Plan (APOXSEE).

Comments: Passage of the funding referendum on March 9, 1999.

Sea Turtle Protection Program

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-T

Project Description: Sarasota County Ordinance No. 97-082, as amended, mandates sea turtle protection and lighting restrictions during the nesting season.

Strategy for Implementation: Volunteer turtle patrols are more frequent and more thorough than in previous years. More educational programs are being presented to schools, beachfront property owners, condo associations, civic associations, and motel guests. Table tents are being distributed to restaurants to help the public become more aware of the beach light restrictions and other hazards to nesting sea turtles and hatchlings.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941)378-6142.

Other Project Partners: Southwest Florida Water Management District, Sarasota County Environmental Services Business Center.

Geographic Area: Sarasota County.

Expected Benefits and/or Drawbacks: Greater community support for all types of environmental conservation programs.

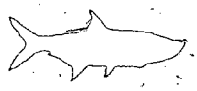
Project Timeline/Schedule: Began around 1980.

Status: In progress.

Resources/Funding
Available: $10,000 grant for public education for the sea turtle protection program.
Needed: Unknown.
Potential:

Reference Documents: Sarasota County Environmentally Sensitive Lands reports, brochure, and other educational materials; Sea Turtle Protection brochures and other educational materials.

Comments: N/A.



Sarasota County Environmentally Sensitive Lands Protection Program

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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-U

Project Description: Three sites identified for acquisition are in the Charlotte Harbor NEP study area. These are the Verna, eastern ranchlands, and Myakkahatchee Creek sites, that contain large, platted subdivisions. On March 9, 1999, Sarasota County voters approved a referendum to implement an increase in ad valorem property tax (up to .25 mill per year) for 20 years to fund the acquisition, protection, and management of environmentally sensitive lands. Voters also approved a second referendum that authorizes the County to pursue up to $53 million in bonds for this program.

Strategy for Implementation: The County proposes fee-simple purchase of the Verna and Myakkahatchee Creek sites, and conservation easements in the eastern ranchlands. Pursue matching funds and grants for acquisition, protection and management of environmentally sensitive lands. Contract with an experienced, qualified acquisition agent for negotiations with property owners, pursuit of matching or grant funds, surveys, appraisals, and development of acquisition contracts. Provide staff coordination and expertise to the Environmentally Sensitive Lands Oversight Committee that was established by County Ordinance No. 99-004. The Board of County Commissioners will approve the millage recommendations of the Committee on an annual basis. Hire additional County staff for program oversight and land management activities. Develop detailed land management plans for each site acquired. Continue to provide public education on the benefits derived from protection and management of environmentally sensitive lands.

Responsible Partner and Project Coordinator: Gary Comp, General Manager, Sarasota County Natural Resources, (941)378-6113.

Other Project Partners: City of North Port, Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection, Florida Department of Community Affairs (FDCA).

Geographic Area: Eastern Sarasota County.

Expected Benefits and/or Drawbacks: Protection of habitats, natural resources, and drinking water.

Project Timeline/Schedule: Referenda establishing funding for an environmentally sensitive lands acquisition program and authorizing pursuit of bonding options were approved by Sarasota County voters on March 9, 1999. This is a 20-year program. A contract for an acquisition agent is expected to be finalized by early FY 00. The Environmentally Sensitive Lands Oversight Committee is established and meeting on a regular basis.

Status: In progress.

Resources/Funding
Available: Approximately $5 million in FY 00 from the approved increase in ad valorem property tax.
Needed: At least $70 million to acquire all sites currently identified and participating in this voluntary program.
Potential: Florida Communities Trust (FCT) grant applications for FY 00 have been submitted for two sites (Lemon Bay Preserve site and North River Road site) in the Charlotte Harbor NEP area. The County is seeking up to $2.2 million in matching funds from FCT. Also, a cooperative agreement with Southwest Florida Water Management District (SWFWMD) is being developed for the acquisition of sites currently identified as environmentally sensitive lands by SWFWMD/Save Our Rivers and Sarasota County. Matching funds through the Florida Forever Program will also be pursued.

Reference Documents: Sarasota County Environmentally Sensitive Lands reports; Sarasota County Comprehensive Plan (APOXSEE).

Comments: N/A.

Restoration of Oyster Resources in the Coastal Venice, Myakka River, and Lemon Bay Basins

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-V

Project Description: Delineate current oyster areas with a global positioning system; determine which areas are suitable for planting using salinity, temperature, dissolved oxygen, and substrate measurements; use culch or oyster seed on the selected areas; have long-term monitoring of results by density analyses.

Strategy for Implementation: Observe by boat and quadrant the oyster bed areas; search all salinity, temperature, dissolved oxygen, and substrate data for suitable areas to be enhanced. Coordinate with the Southwest Florida Water Management District (SWFWMD) surveys to make best use of staff resources.

Responsible Partner and Project Coordinator: Michael Barker, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources (941)378-6142.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection (Shellfish Environmental Assessment Section), Florida Marine Research Institute.

Geographic Area: Sarasota County; coastal Venice basin, Myakka River basin, and Lemon Bay basin.

Expected Benefits and/or Drawbacks: Creation of habitat; localized improvement of water quality; enhanced local benthic communities; enhanced local fish communities.

Project Timeline/Schedule: To be determined.

Status: Proposed project.

Resources/Funding
Available: To be determined.
Needed:
Potential:

Reference Documents: N/A.

Comments: Given time and funds, this activity might be coordinated with the Southwest Florida Water Management District (SWFWMD) surveys in Lemon Bay. The work may also be contracted. Some internal staff time may be devoted to this activity. Equipment and expertise is available internally, but staff time is the critical factor.

Myakka River Floodplain Study

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Quantifiable Objectives Addressed: HA-4

Priority Actions Addressed: HA-B

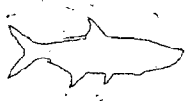
Project Description: Sarasota County Stormwater Utility will be performing detailed study of the Myakka River in FY00. This study will involve a determination of the 2-, 5-, 10-, 25-, and 100-year floodplains for the Myakka River under existing conditions at that time. This floodplain information will be used, as appropriate, to update the Flood Insurance Rate Maps and to assist in flood protection primarily through floodplain protection. As such, it is not anticipated that a significant Capital Improvement Program will be developed and evaluated for the Myakka River to address flooding. As an alternative, the "restoration" activities proposed by Quantifiable Objective HA-4.b (and the *Wild and Scenic Management Plan for the Myakka River*) may be evaluated to quantify associated flood stage implications, if any. Accordingly, this floodplain study is expected to assist in addressing priority actions HA-C, HA-F, HA-H, and HA-M with respect to the Myakka River.

Strategy for Implementation: In FY00, the Planning Section is scheduled to conduct a detailed riverine floodplain study of the Myakka River. This study will be performed using in-house resources with the assistance of a technical advisor, Stormwater Management Resource Technologies, Inc. Information that is needed to ensure the quality of this study includes one-foot contour aerials or maps and continuous streamflow/rainfall data. It would be beneficial if the Florida Water Management Districts and the U.S. Geological Survey could augment the existing databases, as needed, between now and the project initiation.

Responsible Partner and Project Coordinator: Sandra Newell, P.E., Manager, Stormwater Utility, Sarasota County Transportation, (941)378-6148.

Other Project Partners: Stormwater Management Resource Technologies, Inc. Preliminary discussions have been held between the Sarasota County Stormwater Utility and Charlotte County Stormwater on the opportunity for a cost-sharing agreement for this study that would expand the detailed scope to include both counties. Further discussions along these lines are anticipated with invitations to the City of North Port and Manatee County. Grant requests have also been made for this study, and will continue to be made for funding assistance from the Manasota Basin Board.

Geographic Area: This floodplain study will consider the entire Myakka River watershed from a hydrologic perspective. However, the level of detail for the hydraulic analysis will be limited to unincorporated Sarasota County unless inter-municipal agreement(s) can be consummated.



Expected Benefits and/or Drawbacks: Benefits include an accurate description of the riverine floodplain for the Myakka River to assist regulatory and possibly real property acquisition priorities. In addition, minimum finished floor elevations for portions of the watershed situated upstream of the tidal surge will be established. Proposed "restoration" activities may also be evaluated with respect to their effect on flood stages, if any.

Project Timeline/Schedule: Project will start July 1, 2000 and be completed by approximately May 2001.

Status: The project will be initiated on July 1, 2000.

Resources/Funding
Available: Sarasota County Stormwater Utility.
Needed: Funding from Manasota Basin Board.
Potential: Charlotte County, Manatee County, and City of North Port.

Reference Documents: N/A.

Comments: N/A.

Identify Reuse Customers

Contact Person: Karen F. Burnett, P.G.
Title: Manager, Resource Management Division
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E-mail Address: kburnett@co.sarasota.fl.us

Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D

Project Description: Work with the Southwest Florida Water Management District (SWFWMD) to identify new reuse customers and identify possible funding to assist in bringing new customers on line.

Strategy for Implementation: Require permit holders to coordinate with Sarasota County prior to the renewal or creation of a new water use permit for irrigation.

Responsible Partner and Project Coordinator: Lori Ann Carroll, Reuse Coordinator, Sarasota County Utilities (941)316-1533.

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: Sarasota County Utilities service area.

Expected Benefits and/or Drawbacks: Reduction of groundwater withdrawal.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available:
Needed: To be determined.
Potential: Southwest Florida Water Management District (SWFWMD).

Reference Documents: N/A.

Comments: N/A.

T. Mabry Carlton, Jr. Memorial Reserve Water Use Permit Monitoring Program

Contact Person:	**Karen F. Burnett, P.G.**
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-F, HA-H

Project Description: Resource Management Division, Sarasota County Natural Resources has been collecting surface water and groundwater data as part of a long-term monitoring program on the Carlton Reserve. The Division currently has a detailed database for rainfall, evapotranspiration, wetland water levels, wetland vegetation, groundwater level data and groundwater quality for the surficial, intermediate, and Floridan aquifer systems, and surface-water flow for the Myakka River floodplain. Data are still being collected for the County's Water Use Permit monitoring program.

Strategy for Implementation:

1) Inventory all groundwater and other relevant information that is being collected in the region.
2) Identify new areas that need to be sampled to fill in data gaps.
3) Coordinate with outside agencies concerning the addition of other appropriate parameters or sites to their monitoring programs.
4) Research grant opportunities to pay for step #3. If funding is approved, begin new monitoring program.
5) Conduct preliminary modeling with currently available data.
6) Conduct additional modeling when new data become available.
7) Develop recommendations for natural resource conservation.
8) Publish results to allow extensive use of information by the public.

Responsible Partner and Project Coordinator: Ron Van Fleet, Environmental Supervisor, Resource Management Division, Sarasota County Natural Resources, (941)378-6128.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection (DEP), U.S. Army Corps of Engineers (ACOE).

Geographic Area: Sarasota County; Myakka River watershed.

Expected Benefits and/or Drawbacks: Data could be used to plan for water resources (human consumption and other uses), to establish baseline conditions for watershed habitats, and increase understanding of local ecosystem functions and values.

Project Timeline/Schedule: T. Mabry Carlton, Jr. Memorial Reserve Water Use Permit Program, 1991 to present.

Status: In progress.

Resources/Funding
Available: Sarasota County program; budgeted.
Needed: $100,000 to expand the telemetry system to include more sites and measure other useful parameters.
Potential: U. S. Geological Survey, Southwest Florida Water Management District (SWFWMD)..

Reference Documents: T. Mabry Carlton, Jr. Memorial Reserve water use permit from the Southwest Florida Water Management District), Army Corps of Engineers (ACOE), Department of Environmental Protection (DEP), dredge and fill and management and storage of surface waters (MSSW) permits.

Comments: Challenge to coordinate with other agencies and private entities to share data and to assist with reporting and data collection consistency.

Strategic Land Acquisition/Conservation/ Preservation Plan For Southwest Florida

Contact Person: David Y. Burr
Title: Planning Director
Agency/Organization: Southwest Florida Regional Planning Council
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E-mail Address: dburr@swfrpc.org

Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: FW-H, FW-U

Project Description: The passage of the Environmentally Endangered Lands program in 1972 was Florida's first statewide acquisition program. This program was implemented due to the recognition that our natural resources were vital to our economy and quality of life, or sustainability. Since that time there have been a number of public and private initiatives, including the Federal purchase of Big Cypress, the Environmentally Endangered Lands (EEL) program (which related to the Florida Green Plan), the Conservation and Recreational land Program (CARL), and Preservation 2000.

We have made significant progress in preserving and conserving our strategic natural resources. What remains in the puzzle are the more remote natural resources that will receive future development pressure, smaller and more isolated rare and unique communities, and the links and connections between our existing preserves that form corridors and greenways. In other words, our major regionally significant natural resources have been identified for acquisition, preservation or conservation within public and private acquisition programs and have been set aside within developments. Future work should include the connections of the dots and the filling of any gaps in the strategic system.

Also being recognized is that publicly sponsored acquisition programs can not alone provide for the sustainability of our natural resources, and that other tools are necessary. These tools include conservation easements, purchase of development rights, regulation and private initiatives. Another expected outcome for this plan is regional actions to assist in the coordination of the various programs to increase efficiency in natural resource protection and provide a plan of action that can quickly respond to the availability of funding and/or other initiatives.

Strategy for Implementation: It is proposed that the Strategic Regional Policy Plan be amended to provide Goals, Objectives and Actions to implement the plan. Since the Council does not have dedicated funding for the actions monies must be sought through grant programs to assure implementation.

Proposed actions include:

- To help eliminate possible duplication or competition on a tract of land between entities, provide a clearinghouse and inventory of lands included in all land acquisition programs in a central location so various entities can see if any other entities were involved in a specific location. A future Web Site would be a useful tool and provide easy access.

- Support continued acquisition of lands targeted for conservation and recreation by Public Land Acquisition Programs including Conservation and Recreational Land Program (CARL), Save Our Rivers (SOR), Florida Communities Trust, Lee County Conservation Lands Acquisition and Stewardship Advisory Committee, Corkscrew Regional Ecosystem Watershed (CREW), Water Resources Development Act and other efforts in the region.

- Support continued acquisition of lands targeted for conservation and recreation by Private Environmental Land Trust Programs in the Region.

- Facilitate and assist in the coordination of all land acquisition programs in the Southwest Florida Region by sponsoring periodic meetings of all public and private initiatives.

- Create a map depicting land that has been set aside for conservation purposes within approved developments.

- Working with the various entities and utilizing the following Criteria and Guidelines, create a planning map of land needed for recreation, hunting/fishing, flood control, forestry activities, etc.; to provide support for future populations and to protect existing ecosystems, which are not included in any current program, or have not already been set aside as conservation areas within approved development.

- Assist in the preparation of applications of existing programs for funding of land acquisitions for lands shown on the above-mentioned planning map.

- Investigate the potential of forming a new Programs, Land Trusts, or encourage existing Land Trusts, to focus on land acquisition, and other land conservation techniques within portions of Southwest Florida not currently within a program and depicted on the above mentioned map.

- Because we do not have all the money necessary, other methods rather than just fee simple acquisition are needed; to cover all these methods, perhaps a better title be a Land Conservation or Preservation Plan.

- Encourage citizen organizations within the watershed to refocus on land conservation strategies as a proactive method in addressing environmental protection issues.

Responsible Partner and Project Coordinator: Southwest Florida Regional Planning Council Contact: David Y. Burr, Planning Director

Other Project Partners: Federal - U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency; State - Department of Environmental Protection, Florida Fish & Wildlife Conservation Commission, Governor's Commission For Sustainable South Florida; Regional Agencies - South Florida Water Management District, Southwest Florida Water Management District, Corkscrew Regional Ecosystem Watershed (CREW); Local Governments - Charlotte County, Lee Co./ Conservation Lands Acquisition and Stewardship Advisory Committee (CLASSAC), City of Ft. Myers, City of Cape Coral, Rick Sosnowski, City of Sanibel, Town of Fort Myers Beach, Collier County, City of Naples, Sarasota County, Hendry County, Glades County; Organizations - Audubon, Calusa Land Trust, Sanibel-Captiva Conservation Foundation, Conservancy of Southwest Florida., Gaspirilla Island Conservation and Improvement Association, The Nature Conservancy, Trust for Public Lands, Southwest Florida Land Preservation Trust, Myakka River Conservancy, Buckingham Conservancy, Lemon Bay Conservancy, and North Captiva Group,

Geographic Area: Sarasota, Charlotte, Glades, Hendry, Lee and Collier Counties.

Expected Benefits and/or Drawbacks: To have all needed lands acquired or contained within a land/conservation program, which includes a long term management component, to insure sustainability of our natural resources and quality of life.

Project Timeline/Schedule: Started 1998. Ongoing until complete.

Status: Ongoing.

Resources/Funding
Available:
Needed: $100,000.
Potential: Not known at this time.

Reference Documents: "Strategic Land Acquisition/Conservation/Preservation Plan For Southwest Florida."

Comments:

Managing Selected Anchorages and Harbors - Southwest Florida

Contact Person:	David Y. Burr
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Quantifiable Objectives Addressed: WQ-6, FW-3

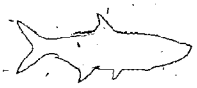
Priority Actions Addressed: WQ-B, WQ-Q, FW-D, FW-G, FW-L, FW-T, FW-H

Project Description: This effort began when the Boater's Action and Information League (BAIL) requested assistance from Sea Grant, the West Coast Inland Navigation District (WCIND) and the Southwest Florida Regional Planning Council (SWFRPC). The purpose of the research was for the self-improvement of the individual cruising boater, by identifying the better anchorages, assess better boating practices in these anchorages, and publish the results. This led to the "Anchorage Guide to Southwest Florida", that encompassed the Counties of Charlotte, Collier, Lee, Manatee, and Sarasota.

The development of the anchorage guide led to the realization that the "quilt" of federal, state, and local regulations had become increasingly complex, and if trends continued, a significant component of our recreation-based economy could atrophy. This trend can be noted in other Florida Coastal waters which are more urbanized. This realization in turn led to an effort to determine what performance based anchorage management could accomplish, using our anchorage area as a prototype.

Preliminary steps were taken through the voluntary Anchorage Advisory Committee, sponsored by Southwest Florida Regional Planning Council (SWFRPC). This Committee undertook discussions with the Florida Department of Environmental Protection (DEP) to discover how to undertake such a prototype effort. The result was a five party memorandum (DEP, West Coast Inland Navigation District, Boaters Action and Information League, Sea Grant, and the Southwest Florida Regional Planning Council) of understanding that established the fifteen member Regional Harbor Board (RHB), with one representative from each signatory, one representative appointed from each of the five County Boards of County Commissioners, and one selected from volunteers from each County's private boating enthusiasts. Since its establishment on July 1995, the RHB has added members from cities that have anchorages and harbors.

The Regional Harbor Board was established for the purpose of preserving the ecological and recreational values of southwest Florida waterways in a manner that maintains the widest possible degree of freedom for users through a regional management framework for southwest Florida that is non-regulatory in nature and relies heavily upon active participation by boaters. In furtherance of these purposes the Harbor Board has been actively inventorying and monitoring the recreational and ecological values of anchorages in southwest Florida, while working with boaters and local authorities to ensure that these values are maintained and enhanced. The RHB meets on a monthly basis.



Strategy for Implementation: The region's coastal waters are the backbone of its recreational industry. A significant component of that industry is boating, with one boat for every 11 persons (or so). Some of the boats provide overnight accommodations, which in turn leads to overnight stays, or anchoring. However, some anchoring activities can harm the sensitive coastal habitat, while some sites lead to conflicts with other boating activities, resource users, or nearby upland users. Presuming that all legitimate users of coastal resources may be accommodated within an open coordinating management program, the Regional Harbor Board has several missions:

1. Establish a "Best Anchorage Practices" program as a "non-regulatory" approach;
2. Research and establish environmental baselines for anchorages; monitor these anchorages for benchmarks to determine if conditions degrade (act to reverse degradation);
3. Develop "Anchorage Management Plans" for high impact locations:
4. Mediate disputes over anchorage management;
5. Educate boaters on sage, environmentally friendly navigation;
6. Develop and keep up to date charts and guides for local and visiting boaters.

The prototype Regional Harbor Board has a comparable historical analogy in the creation of the Appalachian Trail. Like the lands that compose the trail, our inland waterways are a rare resource that can be lost through overuse and over management. The trail system has been established as a confederation and is managed by local and regional non profit associations in cooperation with Federal, State, and local governmental regulatory agencies, and with private and public owners. One outcome of a successful prototype RHB could, and perhaps should, be the development of a similar gulf coast system for our public cruising waters.

Responsible Partner and Project Coordinator: Partner: Southwest Florida Regional Planning Council; Coordinator: David Y. Burr, Planning Director

Other Project Partners: Florida Department of Environmental Protection, the Boaters' Action and Information League, Florida SeaGrant College Program, and the West Coast Inland Navigation District.

Geographic Area: Manatee, Sarasota, Charlotte, Glades, Hendry, Lee and Collier Counties.

Expected Benefits and/or Drawbacks: *Boating is part of the economy.* Where the use is sustaining and can be assured to not degrade other parts of the community, it behooves the community welfare that this activity continues. This approach provides and opportunities to get past the bad publicity some actions have received. Imposed management is more difficult than cooperative management. This is the opportunity to have boaters develop and implement a community ethic that would in turn reduce your costs and liabilities and increase effectiveness in management.

Local sovereignty. Like all interest groups, boaters lobby Tallahassee and Washington. The rights of navigation have been enforce and reinforced time and again, but the "Judges" interpret what those rights are, and who wins. Areas with no litigation are the true winners. This option provides for the continued authorities of the community without the boaters lobbying for state or federal override because the "quilt" has become unmanageable.

Partnering. The State of Florida has enough to do and does not want to establish "one size fits all" boating and anchoring regulations. They support this approach for a prototype effort.

Project Timeline/Schedule: Started July 1995 - July 2000.

Status: Ongoing.

Resources/Funding
Available: $12,000 from West Coast Inland Navigation District, per year.
Needed: $12,000/year.
Potential: This program is expected to become a part of a larger overall program to provide technical planning assistance to the WCIND for Regional Waterway Management.

Reference Documents:
- "A Guide to Anchorages in Southwest Florida"
- "Regional Harbor Board Principles of Anchorage Management"
- "Southwest Florida Anchorage Selection Guide"
- "Feasibility of a Non-Regulatory Approach to Bay Water Anchorage Management for Sustainable Recreational Use", by Dr. Gustavo Antonini et al.
- "Anchorage Management: Issues and Opportunities in Southwest Florida", by Richard Hamann et al.
- "A System for Evaluating Anchorage Management in Southwest Florida", By Dr. Gustavo Antonini et al.
- http://gnv.ifas.ufl.edu/~seaweb/HOMEPAGE/BOARD.HTML

Comments:

Upper Peace and Myakka River Watersheds

Preliminary Action Plans

-Lake Hancock Restoration Project

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Quantifiable Objectives Addressed: HA-3

Pribrity Actions Addressed: HA-F

Project Description: The water quality of Lake Hancock should be improved through the removal or inactivation of the muck component from lake sediments, and the installation and maintenance of filtration marshes at appropriate locations around the lake and at its discharge point., Lake Hancock received wastewater discharges from industrial facilities and the City of Lakeland for decades causing advanced eutrophication of the lake. Previously permitted discharges from the City of Lakeland have ended and improved treatment has occurred on the industrial discharges (through Lake Lena Run into Lake Hancock). Sediment from these discharges remain a problem. Although eutrophication has slowed, water quality discharges from the lake have not improved. Removal of the sediments in Lake Hancock, creation of filtration marshes at its discharge and more advance treatment of waters from lakes to the North is needed. Further, the Upper Saddle Creek/ Peace River Initiative is a component of Peace River Restoration that directly affects the quality and quantity of waters discharging to Lake Hancock and then to the Peace River. While Upper Saddle Creek Project is substantially funded, restoration of Lake Hancock currently is not. Efforts are now under way by the Florida Fish and Wildlife Conservation Commission, the Florida Department of Environmental Protection (DEP), the Southwest Florida Water Management District (SWFWMD), and others to develop an action plan for its restoration. Federal involvement is essential to define the proper restoration goals to improve water quality and quantity discharges to the Charlotte Harbor National Estuary Program. A restoration initiative must also consider Charlotte Harbor National Estuary concerns, Preservation 2000/Save Our Rivers land acquisition efforts, local commercial fisheries, limited potable water supplies for a growing population, the Integrated Habitat Network and Greenways program, and phosphate mine permit issues.

Strategy for Implementation: Federal participation in State restoration efforts through regulation of U.S. Army Corps of Engineers (ACOE) permits and cooperative funding for restoration. Cooperative funding could be shared with local government who are attempting to acquire lands that could be used for treatment as well as funding from the regional water management district and the State of Florida.

Responsible Partner and Project Coordinator: Florida Fish & Wildlife Conservation Commission, Lieutenant Colonel Gregory Holder.

Other Project Partners: Lake Hancock Advisory Group, Army Corps of Engineers (ACOE); Southwest Florida Water Management District (SWFWMD); Central Florida Regional Planning Council; Polk County; U.S. Geological Survey, Water Resources Division; U.S. Department of Agriculture, Natural Resource Conservation Service; University of South Florida, Department of Civil Engineering; University of Florida, Center for Wetlands.

Geographic Area: Upper Peace River Watershed and Lake Hancock (immediately north of the City of Bartow).

Expected Benefits and/or Drawbacks: See description above.

Project Timeline/Schedule: Upon implementation; approximately three to five years for restoration and five years of monitoring to meet state permit guidelines, additional schedule to be determined.

Status: Planned.

Resources/Funding
Available:
Needed: Funds to implement restoration.
Potential: Polk County Conservation Lands Acquisition Selection Advisory Committee Program; Department of Environmental Protection (DEP), Southwest Florida Water Management District (SWFWMD).

Reference Documents:

Comments:

Lake Hollingsworth Sediment Removal Project And Lake Parker Southwest Outfall Retrofit

Contact Person: Gene Medley
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Agency/Organization: City of Lakeland
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Telephone Number: (941) 603-6307
FAX Number: (941) 603-6308
E-mail Address: gmedl@city.lakeland.net

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B, WQ-E, WQ-F

Project Description: Removal of 3.6 million cubic yards of organic sediments from the lake bottom using hydraulic dredge. Disposal of dredged material on 70-acre upland disposal site using chemical dewatering process. Lakeland has an active public education and awareness program.

Strategy for Implementation: Diagnostic/feasibility study conducted in 1992-94. Study components included paleolimnological coring and analysis, sediment mapping, development of nutrient and water budgets, eutrophication modeling, and water quality sampling. A pilot dredging and chemical dewatering project was conducted in 1995. Final design and permitting was completed in 1996. Dredging began in January 1997.

Responsible Partner and Project Coordinator: City of Lakeland/Gene Medley.

Other Project Partners: U.S. Environmental Protection Agency, Southwest Florida Water Management District, Polk County.

Geographic Area: Northwest Polk County, Headwaters - Peace River.

Expected Benefits and/or Drawbacks: Restore lake bathymetry, improve water quality including increased water clarity and a reduction in primary production.

Project Timeline/Schedule: Begin Dredging: January 1997; Complete Dredging: July 2000

Status: Dredging in progress.

Resources/Funding
Available: Diagnostic/Feasibility Study $172,951; Sediment Removal Feasibility/Pilot $139,750; Dredging Design & Permitting. $303,077; Construction/Dredging $10,073,197; Total $10,688,975.
Needed: None.
Potential: N/A.

Reference Documents: The Lake Hollingsworth Diagnostic/Feasibility Study - Volumes I & II, 1994, City of Lakeland Florida Department of Environmental Protections Administrative Order No. 4053MO4302. U.S. Army Corps of Engineers Permit No. 199603917 (IP-ME).

Comments: New methods to dewater dredged sediments and reduce required disposal volume are used in the project. These include chemical flocculation, and static and rotary screening.

Lake Parker Southwest Outfall Retrofit

Contact Person: Gene Medley
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E-mail Address: gmedl@city.lakeland.net

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-E, WQ-N

Project Description: Construct stormwater pond system to treat stormwater runoff from a 595-acre urbanized watershed discharging into Lake Parker. This sub-basin includes the outfall from Lake Mirror to Lake Parker.

Strategy for Implementation: A permit application for construction has been submitted to the Southwest Florida Water Management District (SWFWMD). The City of Lakeland is considering implementation of a stormwater utility to fund water improvement projects. Funding for construction has been included in the City of Lakeland's Comprehensive Lakes Management Plan, but has not been placed in the City's five-year capital improvement budget.

Responsible Partner and Project Coordinator: City of Lakeland Lakes Program/Gene Medley.

Other Project Partners: Southwest Florida Water Management District (SWFWMD).

Geographic Area: Lake Parker, Saddle Creek Watershed, Peace River Basin.

Expected Benefits and/or Drawbacks: The construction of treatment ponds will reduce sediment, trash, nutrient and pollutant loading to Lake Parker. Based on a nutrient budget developed during a diagnostic study of the lake (Southwest Florida Water Management District (SWFWMD), 1993), the southwest sub-basin contributes 20% and 12% of the external nitrogen and phosphorus loading to the lake, respectively.

Project Timeline/Schedule: Construction of the ponds is scheduled for FY 2000-2001 in the City of Lakeland Comprehensive Lakes Management Plan. Implementation of the plan is contingent on passage of a stormwater utility or other dedicated funding source this year.

Status: Planned.

Resources/Funding
Available: Construction - None.
Needed: $1,000,000.
Potential: Peace River Basin Cooperative Funding Program.

Reference Documents: "Lake Parker Diagnostic Feasibility Study", 1993. Southwest Florida Water Management District; "Lake Parker Southwest Basin Feasibility Study", 1995. CH2MHill; "City of Lakeland Comprehensive Lakes Management Plan", 1996. City of Lakeland.

Comments: This project is the first of several lake and watershed management recommendations prescribed in the Lake Parker Diagnostic/Feasibility Study.

Multiple Stormwater Quality Improvement Projects

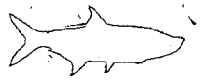
Contact Person: Mike Britt, P.E.
Title: Lakes Manager
Agency/Organization: City of Winter Haven
Mailing Address: 550 7th Street, SW Winter Haven, FL 33880
Telephone Number: (941) 291-5850
FAX Number: (941) 291-5211
E-mail Address: N/A.

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-E, WQ-N

Project Description: The City of Winter Haven has just adopted a stormwater utility that will be used solely for the treatment of stormwater prior to entering lakes in Winter Haven. Most of these lakes eventually discharge into the Peace River system. The City has initially identified 30 projects for funding over the next 25 years which would treat stormwater into every lake in the city (31 lakes). Projects are currently underway in conjunction with the Southwest Florida Water Management District (SWFWMD), Florida Fish and Wildlife Conservation Commission and the Department of Environmental Protection (DEP) for projects on Lakes Howard (2) and May. The Stormwater Quality Improvement Plan gives information on all of the proposed projects, their costs, the anticipated time of completion, and the expected pollutant loading reduction. The following is a list of all the projects presently being considered under the Stormwater Quality Improvement Program, which have been funded:

Lake May Stormwater Treatment
Lake Hartridge Stormwater Treatment
Lake Lulu Alum Injection
Motor Pool Stormwater Retrofit
Lake Conine Alum Injection
East Lake Shipp Pond
Public Works Stormwater Treatment
Lake Spring Alum Treatment
South Lake Silver Stormwater Treatment
Lake Edylwild Alum Injection
Airport/21st Street Pond
West Lake Shipp Pond
Lake Elbert Alum Injection
Lake Cannon Stormwater Treatment
West Lake Howard Stormwater Treatment
Lake Howard In-Line Treatment
North Lake Howard Stormwater Treatment
Lake Maude Stormwater Treatment NW
Lake Otis Alum/Stormwater Treatment
Lake Maude Stormwater Treatment SW
Lake Maude Stormwater Treatment NE
Lake Deer Stormwater Treatment
North & West Lake Elbert Stormwater Treatment
Lake Idyl Alum Injection
South/East Lake Elbert Stormwater Treatment



Lake Martha Stormwater Treatment

Exiting Facilities:

Lake Howard Wetland Treatment
Lake Howard Alum Treatment
Lake Silver Pond
Lake Martha Pond
Howard Exfiltration

Strategy for Implementation: Each of the 30 projects identified has to be designed by an engineer and permitted prior to construction. Only a few of the proposed projects will need monitoring, however, monitoring for pollutant removal efficiencies may be performed for various projects. Future projects will probably be added to the list once a thorough assessment of stormwater pollution sources has been performed.

Responsible Partner and Project Coordinator: Mike Britt, Lakes Manager, City of Winter Haven.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Florida Fish and Wildlife Conservation Commission, and the Florida Department of Environmental Protection (DEP) are cooperating on a project on Lake Howard. The SWFWMD is cooperating on projects on Lake May and Howard. Future partners will be sought on a project-by-project basis.

Geographic Area: The City of Winter Haven consists of four major watershed areas that all discharge to the Peace River system.

Expected Benefits and/or Drawbacks: Benefits include pollutant load removal, improved water quality, improved aesthetics, and improved habitat. Drawbacks include maintenance and perpetual costs.

Project Timeline/Schedule: New projects will be constructed every year; larger projects will be built every two years.

Status: The wetland treatment project on the southwest side of Lake Howard is in the final stages of design and permitting. Construction should begin in the summer of 1999. The alum injection project on the northeast side of Lake Howard is in the 50% stage of design. The Lake May project will go out for consultant selection in a few weeks.

Resources/Funding

Available: The City's stormwater utility will contribute approximately $250,000 per year for stormwater quality improvement projects.

Needed: In order to perform projects in a timely manner, approximately $200,000 per year is needed.

Potential: All 30 projects identified would have opportunities for funding collaboration.

Reference Documents: City of Winter Haven Stormwater Quality Improvement.

Comments: The City of Winter Haven has a very small staff. The Lakes Division for the City is in charge of all of the water quality improvement projects and consists of one person. Managing multiple projects and performing maintenance on projects will definitely be a challenge. Some of the needs for the lakes in Winter Haven include data collection. Virtually no biological or diversity data exists for lakes in this area.

Ecosystem Management Water Quality Assessment Section Lakes Bioassessment

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Quantifiable Objectives Addressed: WQ-5

Priority Actions Addressed: WQ-H, WQ-J, WQ-K, WQ-L

Project Description: Assessment of water and sediment qualities, benthic macroinvertebrate population integrity and habitat assessment to evaluate overall water quality of the lake.

Strategy for Implementation: Part of an ongoing Florida Department of Environmental Protection (DEP) program, monitoring to be conducted in summer, 1999.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Bioassessment Program, Kate Orellana (DEP, Tampa).

Other Project Partners: None.

Geographic Area: Lake Hancock.

Expected Benefits and/or Drawbacks: Current water, sediment and macroinvertebrate data, comprehensive water quality evaluation, contribution to development of statewide lake condition index (LCI).

Project Timeline/Schedule: Monitoring to be conducted summer, 1999.

Status: Planned.

Resources/Funding
Available: Federal 319(h) funds granted to Department of Environmental Protection (DEP).
Needed:
Potential:

Reference Documents: Standard Operating Procedures for Biological Assessment, Department of Environmental Protection (DEP) Division of Administration and Technical Services, Biology Section, Tallahassee, July, 1996.

Comments:

Integrated Water Resources Monitoring (IWRM) Network Basin Assessment and Total Maximum Daily Load (TMDL) Development

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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3, WQ-5, WQ-6, WQ-7

Priority Actions Addressed: WQ-C, WQ-D

Project Description: Integrated water resources monitoring (IWRM) is a Florida Department of Environmental Protection (DEP)-coordinated interagency initiative intended to provide information on water quality trends throughout the state, to conduct basin assessments of all major watersheds in the state and for the establishment of total maximum daily loads (TMDLs) on a rotating five-year cycle. Agencies, such as the water management districts and counties, are under contract with Florida Department of Environmental Protection (FDEP) to conduct trend monitoring as of October 1998. They will start conducting the first year of basin assessment monitoring in each basin in October 1999 (Tier I). Ecosystem Management Water Quality Assessment Section (EMWQAS) staff will participate in targeted monitoring in each basin and the establishment of total maximum daily loads (TMDLs) (Tiers II and III) beginning October 2000. Florida Department of Environmental Protection (FDEP) assessment methodology is being used in all facets of integrated water resources monitoring (IWRM).

Section 303(d) of the Clean Water Act requires the determination of the Total Maximum Daily Load (TMDL) capacity of waters in the state which do not or only partially meet their designated uses due to poor water quality. The waters in this category are indicated in the State of Florida 305(b) water quality report and have been compiled into what is known as the "303(d) list". A portion of the State of Florida's 1998 303(d) list of waters that do not meet applicable water quality standards are presented in Table 3.1 of the Charlotte Harbor NEP Framework for Action. The Peace River has water segments which do not meet applicable water quality standards. The list is based on water segment assessments from the 1996 305(b) report. As required by Section 303(d) of the Federal Clean Water Act, the list identifies those waters for which total maximum daily loads (TMDLs) will be developed. For water segments that are surface water improvement and management (SWIM) waterbodies, TMDLs will be developed in cooperation with the appropriate water management district (WMD). For selected parameters, the TMDLs will be based on pollutant load reduction goals (PLRGs) which the WMDs plan to develop. As such, the list includes a specific year for TMDL development based on the WMD schedule for PLRG development (if available). The schedule for non-surface water improvement and management (SWIM) waters will be based on a new watershed management approach that rotates through the state on a five-year cycle. In a given basin, the plan is to develop TMDLs for high priority waters during the first rotation through the cycle and develop TMDLs for low priority waters during the second cycle.

Strategy for Implementation: Tier II targeted monitoring will be conducted by the Department of Environmental Protection (DEP). The main purpose of basin assessment monitoring of Tier II will be to identify waterbodies that have potential or known problems, to determine the extent and severity of the problems, to develop management plans to fix the problems, and to monitor special waterbodies of Florida (outstanding Florida waters [OFWs], etc.). Tier II monitoring will also set total maximum daily loads (TMDLs) for waterbodies that have been designated as requiring them. Major steps in the implementation of Tier II are:

- Supplement existing data to further characterize basin conditions;
- Investigate areas with identified or potential water quality problems;
- Evaluate the effectiveness of management actions;
- Collect data for TMDL development;
- Conduct monitoring to include point source and nonpoint source loading studies, intensive surveys in 303(d) listed waters, bioassessment, groundwater evaluations at VISA sites and parameter specific studies;
- Provide detailed assessment of pollutant sources, including the quanitification of nonpoint source loadings;
- Summarize available flow data, providing statistics on worst case conditions and noting differences in flow from long term averages;
- Summarize water quality data, noting seasonal variation, differences in water quality within the basin, compliance with water quality criteria, and overall ranking of water quality;
- Summarize results of intensive surveys, noting downstream trends and compliance with water quality criteria;
- Summarize results of bioassessments;
- Summarize results of any special studies, noting conclusions as appropriate;
- Complete an inventory and quantify major pollutant sources, including determination of nonpoint source loadings of key parameters; and
- Conduct modeling to determine assimmilative capacity, establish TMDLs and evaluate main management alternatives.

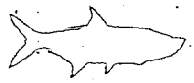
Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Daryll Joyner (DEP, Tallahassee).

Other Project Partners: Southwest Florida Water Management District (SWFWMD), Department of Environmental Protection (DEP), South District, and Department of Environmental Protection (DEP), Southwest District.

Geographic Area: Peace River Basin.

Expected Benefits and/or Drawbacks: Identification of problem areas within basin and the extent of degradation, development of total maximum daily loads (TMDLs) and a basin management plan.

Project Timeline/Schedule: High priority 303(d) waters to be monitored Oct. 1, 2002 through Sept. 30, 2004. Low priority 303(d) waters to be monitored from Oct. 1, 2007 through Sept. 30, 2009.



Status: Planned.

Resources/Funding Available: Department of Environmental Protection (DEP) funded project.
Needed:
Potential:

Reference Documents: Overview of the Florida Department of Environmental Protection's integrated water resources monitoring (IWRM) Efforts and the Design Plan of the Status Network, Florida Department of Environmental Protection (FDEP) Water Facilities Division, Watershed Management Program, Tallahassee, December, 1998.
http://www2.dep.state.fl.us/water/division/monitoring/index.htm

Comments:

Florida Department of Environmental Protection (FDEP) Southwest District Point Source Discharge Permitting Program

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Quantifiable Objectives Addressed: WQ-1, WQ-6, FW-2, WQ-D, WQ-P, FW-Q

Priority Actions Addressed: WQ-A, WQ-C, WQ-D

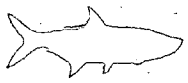
Project Description: Point source biology utilizes a number of techniques to estimate the impacts of point source discharges on the water quality of the receiving waters. These techniques include fifth year inspections, ambient and baseline monitoring, and whole effluent toxicity testing. The data generated by these methods help determine if a given discharge is in violation of Florida Surface Water Quality Standards, 62-302, Florida Administrative Code (FAC). Domestic and industrial wastewaters are potential point source pollution to surface water. The following are brief descriptions of the techniques implemented by point source biology.

FIFTH YEAR INSPECTION

Fifth year inspections (FYI-5) are used to determine whether or not a facility is in compliance with its permit in reference to surface water discharge. These inspections are conducted by the regulating agency on a five-year basis. This method is used to evaluate the following: water quality, toxicity, biological diversity, and bacteriological criteria. The combination of these parameters can determine if the discharge is impacting the environmental integrity of the receiving water.

The sampling sites usually monitored in an FYI-5 include and upstream and downstream site and a site located at the outfall. The following is an outline of the sampling parameters that are normally measured in an FYI-5:

a. Sample Depth
   Surface, mid, and near bottom; effluent.
b. Sampling parameters
   pH, dissolved oxygen, temperature, and specific conductance, chlorophyll-a, total suspended solids, turbidity, BOD5, total nitrogen, total Kjeldahl nitrogen, nitrite-nitrate, total ammonia, total phosphorus and ortho-phosphorous, fecal and total coliforms, and metal analysis.
c. Secchi Depth
   Secchi depth shall be monitored at each sampling location.
d. Ambient Conditions
   Air temperature, rainfall, cloud cover, and direction of receiving water flow.
e. Chain of Custody
   Time/date of sampling and name of persons who obtained the sample shall be recorded at each site.
f. Biological Assessment
   An assessment shall include percent coverage, productive and non-productive habitats, presence of nuisance species, and biological integrity.



AMBIENT MONITORING

Ambient monitoring is conducted either by the facility itself or by a consultant. This monitoring is usually performed on a quarterly basis. Ambient monitoring evaluates the impacts of the discharge on the water quality of the receiving body of water. Ambient monitoring is used to assess the following: water quality, biological diversity, and bacteriological criteria. Sediment chemistry and benthic macroinvertebrate data collection can also be included in this evaluation. This information is also helpful in determining water quality trends that may be associated with non-point source pollution. Ambient monitoring is a useful instrument in the regulatory decision-making process.

The sampling sites monitored in an ambient monitoring review usually include an upstream and downstream site, a control site, and another site located at the outfall. The following is an outline of the parameters that are normally included in an ambient monitoring report.

a. Sampling depths
   Surface, mid-depth and bottom.
b. Sampling Parameters
   1. Surface: pH, dissolved oxygen, temperature, and salinity.
   2. Mid-Depth: pH, dissolved oxygen, temperature, salinity, chlorophyll-a, total suspended solids, five day biological oxygen demand (BOD5), total nitrogen, total Kjeldahl nitrogen, nitrite-nitrate, total ammonia, total phosphorus, and ortho-phosphorous.
   3. Bottom: pH, dissolved oxygen, temperature and salinity.
c. Secchi Depth
   Shall be measured at all sites.
d. Ambient Conditions
   Air temperature, rainfall, cloud cover and flow direction of the receiving water.
e. Chain of Custody
   Time/date of sampling and name of persons who obtained the samples shall be recorded at each sampling site.

WHOLE EFFLUENT TOXICITY TESTING

Toxicity tests demonstrate the effect of an effluent sample on one or more test species, which in turn can help predict the potential toxicity of the receiving waters. A single test can test for either chronic or acute toxicity. Acute toxicity measures the lethality of the test organisms and chronic toxicity measures sublethal effects on growth and/or reproduction of the test organisms. The type and frequency of the testing is specified in each facility's permit. The tests may be conducted on site or by an approved laboratory.

Strategy for Implementation: See Project Description, above.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection, Southwest District, Technical Services, Charles Kovach, Environmental Specialist III.

Other Project Partners: Permitted facilities.

Geographic Area: District-wide, including the Charlotte Harbor Watershed.

Expected Benefits and/or Drawbacks: Detection of surface water quality impacts due to point source discharges. Maintenance of surface water quality.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding:
Available: Program staff.
Needed:
Potential:

Reference Documents: Surface Water Quality Standards, 62-302, Permits, 62-4, Wastewater facility permitting, 62-620, Water Quality Based Effluent Limitations, 62-650, and Wetlands Application, 62-611.

Comments:

Domestic Wastewater (DW) and Industrial Wastewater (IW) Permitting Programs

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Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-D, WQ-E

Project Description: The Southwest District (SWD) will continue to regulate existing and new point sources that discharge treated wastewaters into surface waters in the Charlotte Harbor NEP; and to regulate those systems discharging treated wastewaters onto land application sites that are adjacent to the NEP where the discharges migrate downgradient into the watershed. The Department of Environmental Protection (DEP) will continue to encourage the improved treatment of wastewaters and the reuse of those waters in all cases.

Strategy for Implementation: The Southwest District (SWD) will maintain water quality data for each source discharging into the watershed and will use the data in the permitting process to determine impacts to the surface waters of the NEP.

The Southwest District (SWD), Domestic Water (DW), and Industrial Water (IW) permitting programs will utilize surface water quality surveys to provide Water Quality Based Effluent Limitations on the existing sources. Nutrients and Bioassays will be of particular importance in the permitting of sources.

Responsible Partner and Project Coordinator: Steve Thompson, Permit Engineer, Department of Environmental Protection (DEP)-Southwest District (SWD), Domestic Wastewater Program, Henry Dominick, P.E., III, DEP SWD, Industrial Wastewater Program.

Other Project Partners: County and Municipal Governments, U.S. Environmental Protection Agency, Department of Health.

Geographic Area: District-wide, including the Peace River drainage basin beginning at the headwaters of the Saddle Creek, Lake Lowery, Winter Haven Chain-of-Lakes, and the Peace Creek Drainage Canals. Potentially, the Myakka River basin, NEP waterbodies, and coastal tributaries.

Expected Benefits and/or Drawbacks: The reduction of nutrients (nitrogen and phosphorus) that contribute to surface water quality degradation; also, the reduction of constituents that are determined to be toxic to aquatic organisms.

A drawback might be that the reuse of treated wastewaters might ultimately result in a reduction in total surface water flow to the Charlotte Harbor NEP.

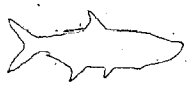
Project Timeline/Schedule: Ongoing - Facilities permitted today would have duration of five years time for monitoring and evaluation of surface water impacts. During the subsequent five year permitting cycle the Department would use the accumulated data to plan with the facility for furthering pollution load reductions.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents: Various domestic and industrial waste water discharge permits.

Comments:



Industrial Wastewater Compliance/Enforcement; Domestic Wastewater Compliance/Enforcement

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Quantifiable Objectives Addressed: WQ-1, WQ-6

Priority Actions Addressed: WQ-E

Project Description: The Industrial Wastewater Compliance/Enforcement Section is the State entity responsible for ensuring compliance with the applicable rules and statues which govern the processing and discharge of wastewater from industrial facilities. The Domestic Wastewater Compliance/Enforcement Section performs that same function for domestic wastewater from homes and businesses and from the plants that treat it. The tools at their disposal for accomplishing these missions are given under Strategy for Implementation below. The following rules are referenced:

Permits;
Water Policy;
Surface Water Quality Standards;
Domestic Wastewater Facilities;
Domestic Wastewater Treatment Plant Monitoring;
Collection Systems and Transmissions Facilities;
Reuse of Reclaimed Water and Land Application;
Wastewater Facility Permitting;
Domestic Wastewater Residuals;
Water Quality Based Effluent Limitations;
Industrial Wastewater Facilities; and
Treatment Classification and Staffing.

Strategy for Implementation:

STEP 1. Ensure that all regulated wastewater discharges to the Greater Charlotte Harbor Watershed are covered under applicable permits and any other required Department authorization such as Administrative Orders, Consent Orders etc. which are attached to and become part of the permit.

STEP 2. Conduct inspections of all regulated facilities at least once per year in order to ensure compliance with the applicable permit and/or State standards.

STEP 3. Conduct timely and routine reviews of the applicable Discharge Monitoring Reports in order to ensure that the discharge water quality standards are being met.

STEP 4. Take appropriate action for all instances of noncompliance with permit and Consent Order provisos, compliance schedules and/or water quality standards in order to ensure that the facility returns to compliance in a timely manner.

Responsible Partner and Project Coordinator: Steve Thompson, Permit Engineer, Florida Department of Environmental Protection (DEP) Southwest District (SWD), Domestic Wastewater Program, Henry Dominick, P.E., III, DEP SWD, Industrial Wastewater Program.

Other Project Partners: County and Municipal Governments, U.S. Environmental Protection Agency, Department of Health

Geographic Area: Currently Peace River Basin, potentially Myakka River basin and Charlotte Harbor watershed.

Expected Benefits and/or Drawbacks: Wastewater dischargers have only limited effect on the water quality in the overall watershed. However, point source discharges may result in significant water quality impacts in some subbasins. Water Facilities staff will work to minimize any deleterious effects through aggressive regulation.

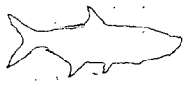
Project Timeline/Schedule: Continuous.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents: Permits, Consent Orders and Administrative Orders in effect with the dischargers to the Greater Charlotte Harbor Watershed. Lists of Permitted Industrial Wastewater Dischargers and Permitted Industrial Wastewater Dischargers are available.

Comments:



Reclaimed Water Use Development

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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B, WQ-P

Project Description: Florida Department of Environmental Protection (DEP) efforts have included providing technical expertise in assessing environmental impacts of reuse of reclaimed water (treated domestic wastewater). Other efforts have included flexibility in permitting of reuse of reclaimed water, where appropriate and practicable; and permitting of wastewater treatment plants and reuse systems, as well as feasibility and permitting of Aquifer Storage and Recovery (ASR). When reuse projects include surface water discharge proposals, water quality impact assessments are performed under existing national pollutant discharge elimination system (NPDES) permitting requirements and involve Department of Environmental Protection (DEP) Water Facilities staff in Tallahassee Water Quality Assessment Section and Tampa (Southwest District Water Facilities).

This is an ongoing effort and DEP staff will continue to participate in evaluations with Southwest Florida Water Management District (SWFWMD), Florida Fish and Wildlife Conservation Commission, and local governments, as part of routine permit review. Other DEP efforts include:

- Requiring all domestic wastewater treatment plant (WWTP) applicants and renewals, within designated water resource caution areas, to conduct reuse feasibility studies as a part of permit application and/or renewal process
- Pursuant to the Antidegradation Policy, requiring all (statewide) domestic WWTPs proposing new or expanded surface water discharges to complete reuse feasibility studies
- Encouraging all Industrial Wastewater permit applicants and permit renewals to address alternatives to (surface water) discharge of industrial wastewater, including evaluating the potential use of "reclaimed water" from domestic WWTPs as a possible water source for process cooling, or washing operations (Southwest Florida Water Management District [SWFWMD] responsibility), as a part of their permit application and/or renewal process; or recycling of industrial wastewater.
- Promoting reuse alternatives at conferences of water professionals.

Strategy for Implementation:

- Evaluate effectiveness and benefits of existing water reuse programs.
- Assess the net effects of reducing or eliminating existing discharges, or groundwater injections, with regard to impacts to surface and groundwater.
- Determine areas where reuse programs would be of potential greatest benefit.
- Evaluate potential actions with regard to public health concerns and perceptions concerning the use of reclaimed water.
- Implement and expand programs where they meet health and environmental standards and are economically practical.

Responsible Partner and Project Coordinator: Steve Thompson, Permitting Engineer, Department of Environmental Protection (DEP), Southwest District (SWD) Domestic Wastewater Program, Henry Dominick, Professional Engineer III, DEP Southwest District (SWD) Industrial Wastewater Program.

Other Project Partners:
Judy Richtar, P.G., Department of Environmental Protection (DEP), Southwest District (SWD) Technical Services; David York, DEP SWD Reuse Program - Tallahassee; Gerold Morrison, Environmental Manager, DEP Ecosystem Management SWD; Southwest Florida Water Management District (SWFWMD); Nitrogen Management Consortium; local governments.

Geographic Area: Currently the Peace River Basin.

Expected Benefits and/or Drawbacks: Reduction in new and increasing potable demands on surface and ground waters.

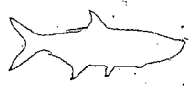
Project Timeline/Schedule: Ongoing.

Status: The Cities of Lake Wales and Bowling Green waste water treatment plant (WWTP) surface water discharges have been removed and incorporated into reclaimed water programs. Planned removals of surface water discharges are pending for the Cities of Wauchula and Arcadia.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents: Permits, memorandums of understanding, and consent orders.

Comments: Current Department of Environmental Protection (DEP) permitting process evaluates environmental impacts and relies on Southwest Florida Water Management District's (SWFWMD's) determination of freshwater needs or flows. As minimum flows are established, freshwater flows will be considered in assessing ambient water quality. Also, Department of Environmental Protection (DEP) can only require Industrial Wastewater recycling as a means to achieve antidegradation. Statutory authority is necessary to address reuse as a resource.



Environmentally Responsible Marinas and Boat Maintenance Practices

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Quantifiable Objectives Addressed: WQ-4, WQ-6

Priority Actions Addressed: WQ-B, WQ-N, WQ-Q

Project Description: Review model programs that promote environmentally responsible marina and boat maintenance practices; pursue public-private partnerships to maximize promotion and cost-sharing. The Florida Department of Environmental Protection (DEP) Florida Clean Marina Program (CMP) has led in the implementation of this action. In partnership with other agencies and industry, the CMP's marina component will be implemented in late 1998 or early 1999. The boatyard component will be implemented the following year. Additionally, the DEP Pollution Prevention (P2) Program is available to provide pollution prevention assessments and technical assistance upon request. Numerous other programs and educational materials also support this effort, and materials and procedures may result that would be very beneficial to DEP staff who process applications for marina permits and sovereign submerged lands authorizations. DEP staff working on this issue will coordinate with the Environmental Resource Permit (ERP) permitting staff in the Southwest District (SWD) office and with the Bureau of Submerged Lands and Environmental Resources (BSLER).

Strategy for Implementation: Department of Environmental Protection (DEP) is a lead agency via the DEP Pollution Prevention (P2) and Clean Marina Programs. Through the Environmental Integrated Services Program (EISP), the DEP P2 Program is actively promoted by Florida Manufacturing Technology Centers (MTCs) throughout the state (see action SW-2 for description of relationship and activities). DEP staff involved in this action, including staff from the Division of Waste Management, will coordinate with Bureau of Submerged Lands and Environmental Resources (BSLER) and Southwest District (SWD) Environmental Resource Permit (ERP) staff so that recommendations and solutions can be incorporated into Environmental Resource Permits and submerged lands authorizations. Products developed from this action will be shared with applicable DEP and Southwest Florida Water Management District (SWFWMD) ERP permitting staff, local governments, and the public.

Responsible Partner and Project Coordinator:
Department of Environmental Protection (DEP) Southwest District (SWD) Environmental Resource Permit (ERP) (Kent Edwards, Bob Stetler); DEP Bureau of Submerged Lands and Environmental Resources (BSLER) (Doug Fry, Tallahassee); DEP SWD Division of Waste Management (Bill Kutash); Clean Marina Program (Jan DeLaney, Tallahassee); DEP P2 Program (Julie Abcarian, Tallahassee).

Other Project Partners: Local marina operators.

Geographic Area: Statewide, including Charlotte Harbor National Estuary waterbodies.

Expected Benefits and/or Drawbacks: Maintenance of and improvement in water quality of marina basins and there associated waters of the state.

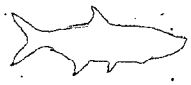
Project Timeline/ Schedule: Ongoing.

Status: 1989/1999 implementation.

Resources/Funding
Available: Environmental Protection Agency (EPA) grant for Clean Marina Program (CMP) development and implementation; Department of Community Affairs to assist in production of CMP materials; Department of Environmental Protection (DEP) staff.
Needed:
Potential:

Reference Documents: Website: http://www.FDEP.state.fl.us/law/clean-marina.
Materials in development: Marina *Environmental Measures*, *Good Boating Habits*, and videos for marinas and boaters.

Comments:



Pollution Prevention (P2)

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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-N

Project Description: Aggressively promote Pollution Prevention (P2) to business community and local governments to boost business participation.

Strategy for Implementation: Through the Environmental Integrated Services Program, the Florida Department of Environmental Protection (DEP) Pollution Prevention (P2) Program is actively promoted by Florida Manufacturing Technology Centers (MTCs) throughout the state. Clean Marina Program (CMP) and other agencies/programs also promote the Pollution Prevention (P2) program. The DEP P2 program relies heavily on its environmental and agency partners, such as the MTC, Small Business Development Centers (SBDCs) and CMP, to promote pollution prevention assistance within the business community.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Pollution Prevention (P2) Program (Julie Abcarian, Tallahassee), DEP Clean Marina Program (Jan DeLaney, Tallahassee), DEP Southwest District P2 Program (Ken Huntington, Tampa)

Other Project Partners: Small Business Development Centers (SBDCs), Suncoast Manufacturing Technology Centers (MTCs) (Bill Boone).

Geographic Area: Statewide, including Charlotte Harbor National Estuary waterbodies.

Expected Benefits and/or Drawbacks: Maintenance of and/or improved quality of air, surface and groundwaters.

Project Timeline/Schedule: Manufacturing Technology Centers' (MTCs) promotion of the Department of Environmental Protection (DEP) Pollution Prevention (P2) Program will be evaluated in early 1999 and additional marketing strategy recommendations, if needed, provided by March 1999.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents:

Comments: Manufacturing Technology Centers (MTCs) are not involved in marinas.

Landward-Source Petroleum Discharges

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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-Q

Project Description: Florida Department of Environmental Protection (DEP) and local governments will evaluate marina and port fueling facilities that frequently report landward-source petroleum discharges to determine if appropriate action has been taken to mitigate chronic discharges and to require appropriate corrective actions.

Implementation Strategy: In the event of the discovery of an ongoing discharge to any surface waters of the state, Department of Environmental Protection (DEP) Tanks Program, in conjunction with the appropriate local agencies (emergency response, fire departments, local utilities, etc.), will make every reasonable effort to identify the source of the discharge and work with the responsible party to contain, remove and abate the discharge.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Tanks Program (Mike Sole, Tallahassee), DEP Tanks Program Southwest District (SWD) (Laurel Culbreth, Tampa), DEP Waste Management SWD (Bill Kutash, Tampa).

Other Project Partners: Department of Environmental Protection (DEP) Clean Marina Programs (Jan DeLaney, Tallahassee), DEP Southwest District (SWD) Environmental Resources Permitting (Kent Edwards, Bob Stetler), DEP Bureau of Submerged Lands and Environmental Resources (BSLER) (Doug Fry, Tallahassee), local governments.

Geographic Area: Statewide, including Charlotte Harbor National Estuary waterbodies.

Expected Benefits and/or Drawbacks: Maintenance of water quality in surface and groundwaters of the state.

Project Timeline/Schedule: On-going.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents:

Comments: Priority ranking of sites eligible for State funded restoration assistance is based on a threat to drinking water supplies, not discharges to non-potable surface waters (F.S. 376). Department of Environmental Protection (DEP) Southwest District (SWD) has no authority to raise or lower priority-ranking score. Mike Sole, DEP Tallahassee, is priority ranking contact person.

Environmental Resources Permitting (ERP) Program/Clean Marina Program

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Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-F

Project Description: Florida Department of Environmental Protection (DEP) is a lead agency via the Clean Marina Program (CMP) which will result in the use of Best Management Practices (BMPs) by facilities. The Department regulates marina/dock/boat ramp construction through its Environmental Resource Permitting Program. The Department may require that signage alerting boaters to sensitive areas be installed as part of the permitting process. Signage has been developed by the Department that alerts and educates boaters about shallow bottoms and associated resources. These signs are typically required to be installed at marinas, private multislip docking facilities and boat ramps.

Strategy for Implementation: Implementation of the Clean Marina Program (CMP) which will assist marinas in improving the environmental quality of Florida's waterways via education and awareness, award recognition, best management practice (BMP) incentive grants and a "Clean Marina" designation. It will increase compliance of existing facilities with Department regulatory and proprietary requirements.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP), Southwest District (SWD) Submerged Lands and Environmental Resources (Bob Stetler); DEP Clean Marina Program (CMP) (Jan Delaney, Tallahassee).

Other Project Partners: Department of Environmental Protection (DEP) Southwest District (SWD) Industrial Wastewater Program (Henry Dominick); DEP Ecosystem Management (Gerold Morrison, Tampa); Southwest Florida Water Management District (SWFWMD); Florida Fish and Wildlife Conservation Commission (FFWCC – formerly Florida Game & Fresh Water Fish Commission); National Marine Fisheries Commission (NMFC); local governments.

Geographic Area: District-/state-wide, including Charlotte Harbor National Estuary Program water bodies.

Expected Benefits and/or Drawbacks: Public education and conservation regarding seagrasses and other marine bottom communities.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents:

Comments:

Environmental Resources Permitting/Alternative Shoreline Stabilization

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Quantifiable Objectives Addressed: FW-2

Priority Actions Addressed: FW-B, FW-Q

Project Description: Through the Environmental Resource Permitting Program, the Department often requires alternative approaches to shoreline stabilization. Softer approaches to shoreline stabilization have included the use of native vegetation, biodegradable geotextile fabric, and the use of rip rap at the toe of existing vertical seawalls to provide habitat and reduce wave energy and toe scour.

Strategy for Implementation: Educate citizens as to benefits of soft approaches to shoreline stabilization. Develop pilot/demonstration projects that incorporate various alternatives to a hardened shoreline.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (DEP) Southwest District Submerged Lands and Environmental Resources (Bob Stetler).

Other Project Partners: Department of Environmental Protection (DEP) Ecosystem Management (Gerold Morrison, Tampa); South West Florida Water Management District; Florida Fish and Wildlife Conservation Commission; National Marine Fisheries Commission; local governments.

Geographic Area: District/state wide, including Charlotte Harbor National Estuary Program waterbodies.

Expected Benefits and/or Drawbacks: Improvement and maintenance of altered shoreline habitat.

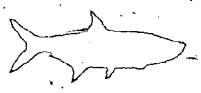
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Program staff.
Needed:
Potential:

Reference Documents: Various permits.

Comments:



Environmental Resources Permitting/Invasive Exotic Vegetative Removal

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Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-Q

Project Description: Through the Environmental Resource Permitting Program, the Department often requires mitigation to offset dredge and fill impacts in the permitting process. Mitigation has frequently included habitat enhancement through removal of invasive exotic vegetation. Subsequent monitoring and maintenance of these areas are also typical requirements. Invasive exotic vegetation is also removed from restoration sites by the Ecosystem Management ecological restoration staff for various projects throughout the district which are not associated with any environmental resource permits.

Strategy for Implementation: Identify and prioritize areas to be targeted for nuisance/exotic vegetation control. Increase compliance of existing facilities with Department regulatory and proprietary requirements. Continue to monitor success of these mitigation areas.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (DEP) Southwest District, Submerged Lands and Environmental Resources (Bob Stetler, Tampa), DEP Ecosystem Management (Gerold Morrison, Tampa).

Other Project Partners: Southwest Florida Water Management District; Florida Fish and Wildlife Conservation Commission; National Marine Fisheries Commission; local governments.

Geographic Area: Statewide, including the Charlotte Harbor National Estuary Program study area.

Expected Benefits and/or Drawbacks:

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/FundingAvailable:
Needed: Program staff.
Potential:

Reference Documents: Various permits.

Comments:

Reduce Propeller Damage to Seagrass Beds

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Quantifiable Objectives Addressed: FW-3, FW-2

Priority Actions Addressed: FW-D, FW-Q

Project Description: The Department regulates marina/dock/boat ramp construction through it's Environmental Resource Permitting Program. This regulatory program requires that staff consider potential impacts to resources such as seagrass beds when evaluating direct, secondary, and cumulative impacts relating to these facilities. Propeller damage to seagrass beds has been addressed through measures such as requirements for marking existing channels or best navigable water, incorporating draft restrictions on vessels using authorized facilities and citing of facilities within areas of sufficient depths and with adequate access to avoid seagrass impacts.

Strategy for Implementation: Implementation of the Clean Marina Program (CMP) which will assist marinas in improving the environmental quality of Florida's waterways via education and awareness, award recognition, Best Management Practice (BMP) incentive grants and a "Clean Marina" designation. Increase compliance of existing facilities with Department regulatory and proprietary requirements. Continue to monitor seagrass coverage.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (DEP) Clean Marina Program (CMP) (Jan DeLaney, Tallahassee); DEP Southwest District (SWD) Submerged Lands and Environmental Resources (Bob Stetler, Tampa); DEP Ecosystem Management (Gerold Morrison, Tampa).

Other Project Partners: Southwest Florida Water Management District; Florida Fish and Wildlife Conservation Commission; National Marine Fisheries Commission; local governments.

Geographic Area: Statewide, including the Charlotte Harbor National Estuary Program study area.

Expected Benefits and/or Drawbacks: Maintenance and improvement in sea grass coverage and habitat.

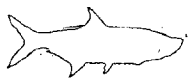
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents: Various permits.

Comments:



Greater Charlotte Harbor Ecosystem Management Area Initiative

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Quantifiable Objectives Addressed: FW-1, FW-2, HA-3, WQ-7

Priority Actions Addressed: FW-A, FW-B, FW-C, FW-S, FW-U, HA-F, HA-H, HA-M, HA-Q, WQ-J

Project Description: Develop a recovery approach which focuses on initial protection, working to secure existing populations of biodiversity, while promoting critical habitat areas that support healthy ecosystem functions. Recovery measures should be chosen based on those having the greatest potential for a rapid quality improvement. Long term recovery will involve the maintenance of a diversity of natural habitats that support co-adapted populations, including headwater areas and relatively intact lower-river regions. Restoration of areas impacted by previous human activities should focus first on stopping degradation, and secondly on habitat maintenance and improvement.

Strategy for Implementation:

- Active participation in various conservation/restoration initiatives, including:
  - Florida Statewide Greenways Program;
  - Peace River Comprehensive Watershed Management (CWM) Team;
  - Peace River CWM Natural Systems Workgroup Core/Corridor mapping project;
  - Myakka River CWM Team;
  - Southern Coastal CWM Team;
  - Charlotte Harbor National Estuary Program (NEP) Early Action Demonstration Project Proposal Review Workgroup;
  - Department of Transportation (DOT) Mitigation Program;
  - Phosphate Mine Permitting Teams;
  - Six Mile Creek Ecosystem Restoration Workgroup;
  - Upper Peace River Ecosystem Planning Committee;
  - Lake Hancock Advisory Council;
  - Myakka River Management Coordinating Council;
  - Myakkahatchee Creek Task Force;
- Participation in agency review and comment on Developments of Regional Impact; and
- Identification of and assistance in protection of biotic refuges and restoration/reclamation of disturbed habitats and watershed.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (DEP), Steve Thompson - Bartow; DEP, Dianne McCommons Beck, Tampa.

Other Project Partners: Southwest Florida Water Management District, Florida Fish and Wildlife Conservation Commission, Charlotte Harbor National Estuary Program (NEP), Department of Environmental Protection (DEP) Parks, Florida Department of Transportation, phosphate industry, counties and municipalities, Regional Planning Councils, not-for-profit conservation organizations, and the public.

Geographic Area: Charlotte Harbor NEP study area.

Expected Benefits and/or Drawbacks: Interagency coordination, agency/public coordination, and conservation and restoration of natural systems.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Program Staff.
Needed:
Potential: Various grant and other funding opportunities.

Reference Documents: Greater Charlotte Harbor Ecosystem Management Area (GCHEMA) Action Plan, Peace River Comprehensive Watershed Management (CWM) Plan, Myakka River Comprehensive Watershed Management (CWM) Plan, Southern Coastal Comprehensive Watershed Management (CWM) Plan, Florida Greenways and Trails Implementation Plan, Entering the Watershed (PRC), various state park management plans

Comments:

Six Mile Creek Watershed Restoration

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Quantifiable Objectives Addressed: HA-2, HA-3, HA-4, FW-1, FW-2

Priority Actions Addressed: HA-F, HA-Q

Project Description: Six-Mile Creek and its watershed were mined many years ago. What is left now is a recirculation ditch that was once a tributary to the Peace River and a mosaic landscape of abandoned clay-settling areas and reclaimed pasture. This project proposes to restore hydrologic connection of Six-Mile Creek, installing meanders where possible, and a lake and filtration marsh prior to ultimate discharge in to Peace River and restore ecological function of the ecosystem, as well as incorporate it into the Integrated Habitat Network.

Strategy for Implementation: Organization of a multi agency/industry workgroup to examine the future of they system in conjunction with the phosphate (PO4) industry leaving the immediate area. Develop and adopt a long-term plan, using implementation of short term projects to implement improvements of the system as is exists.

Responsible Partner and Project Coordinator: Florida Department of Environmental Protection (DEP), Steve Thompson, Bartow; DEP, Dianne McCommons Beck, Tampa.

Other Project Partners: Department of Environmental Protection (DEP) Bureau of Mine Reclamation; Florida Fish and Wildlife Conservation Commission; Southwest Florida Water Management District; Polk County; IMC-Agrico.

Geographic Area: Six-Mile Creek drainage basin – Upper Peace River watershed (near Bartow in Polk County).

Expected Benefits and/or Drawbacks: Partial restoration of mine-altered hydrology in the Peace River drainage basin with resulting water quality and wildlife habitat improvement. This project will create and Integrated Habitat Network for wildlife connecting an isolated habitat to the Peace River System.

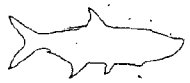
Project Timeline/Schedule: Planning was implemented in 1997. Additional planning is proposed for late 1999 and early 2000. The plan should be initiated in late 2000.

Status: Workgroup discussions started in 1998, but were discontinued due to start-up of the Ona/ Pine Level Mine Environmental Management permit process. The project potentially will continue in pursuit of Net Ecosystem Benefit as a result of the mine project.

Resources/Funding
Available: Agency program staff and project partners time.
Needed:
Potential: Money for the creation of wildlife habitat off phosphate owned lands.

Reference Documents: Greater Charlotte Harbor Ecosystem Management Area (GCHEMA) Action Plan.

Comments:



Mandatory Phosphate Reclamation & Permitting (Regulatory)

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Quantifiable Objectives Addressed: HA-2, HA-3, WQ-1, WQ-6, FW-1, FW-2, FW-4

Priority Actions Addressed: HA-B, HA-C, HA-D, HA-F, HA-H, HA-J, HA-P, WQ-B, WQ-E, WQ-H, WQ-J, WQ-K, WQ-N, WQ-P, FW-A, FW-C, FW-L, FW-Q, FW-R, FW-S, FW-T, FW-U

Project Description: Regulation of phosphate mining performed on or after July 1, 1975 pursuant to Chapters 378 and 373, Florida Statutes. Includes agency action on Reclamation plan, Dredge and Fill Permit, Environmental Resource Permit (combines Dredge and Fill and Management and Storage of Surface Waters permits) applications; as well as compliance and enforcement.

Strategy for Implementation: Regulatory requirement pursuant to the standards, criteria, and procedures of Chapters 378 and 373, Florida Statutes and applicable rules of Florida Administrative Code.

Responsible Partner and Project Coordinator: Mr. Orlando Rivera, Environmental Administrator, Mandatory Phosphate Section, Bureau of Mine Reclamation, Department of Environmental Protection (DEP).

Other Project Partners: The companies of the phosphate industry and Florida Phosphate Council; Joint permits issued with concurrence by U.S. Army Corps of Engineers; Commenting agencies include: U.S. Environmental Protection Agency; U.S. Fish & Wildlife Service; Florida Department of Community Affairs, Florida Fish and Wildlife Conservation Commission, Southwest Florida Water Management District, Tampa Bay Regional Planning Council, Central Florida Regional Planning Council, Hillsborough County, Polk County, Hardee County, Manatee County, and DeSoto County.

Geographic Area: The Central Florida Phosphate Mining District which includes parts of Hillsborough, Polk, Manatee, Hardee, and DeSoto counties and significant portions of the Peace, Alafia, Manatee, Little Manatee, and Myakka River basins.

Expected Benefits and/or Drawbacks: Permitting provides avoidance and/or minimization of impacts to existing wetlands, management of stormwater flows, restoration of impacted systems, and protection of water quality and quantity. Reclamation provides planned replacement of landscapes, watersheds, hydrology, habitats and land uses to those areas impacted by mining. Implemented in combination through a district-wide strategic plan, the two processes provide a comprehensive conservation mechanism.

Project Timeline/Schedule: Regulation of phosphate mining performed on or after July 1, 1975.- ongoing

Status: According to the 1997 Rate of Reclamation Report, total acres mined in the Central Florida district during the period July 1, 1975 through December 31, 1997 is 116,878 acres. As of this report, 63% (73,212 acres) have been reclaimed. Mining and reclamation are ongoing. Estimates of total industry ownership within the district are approximately 565,000 acres. The total estimate of mineable (economically recoverable, not "permit-able") acreage comprises approximately 1.3 million acres. The total current ownership is comprised of non-mandatory (pre-1975) lands, mandatory lands, and unmined reserves.

Resources/Funding
Available: Minerals Trust Fund from Severance Tax assessment.
Needed:
Potential:

Reference Documents: *A Regional Conceptual Reclamation Plan for the Southern Phosphate District of Florida* (Department of Environmental Protection [DEP] June 20, 1992); *Ongoing Projects and Programs which are Interrelated with the Implementation of the Integrated Habitat Network/Coordinated Development Area (aka Regional Conceptual Reclamation Plan)* (Department of Environmental Protection [DEP] June 11, 1993).

Comments:

Non-Mandatory Phosphate Reclamation (Grants Program)

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Quantifiable Objectives Addressed: HA-2, HA-3, WQ-1, WQ-6, FW-1, FW-2, FW-4

Priority Actions Addressed: HA-B, HA-C, HA-D, HA-F, HA-H, HA-J, HA-P, WQ-B, WQ-E, WQ-H, WQ-J, WQ-K, WQ-N, WQ-P, FW-A, FW-C, FW-L, FW-Q, FW-R, FW-S, FW-T, FW-U

Project Description: Identify non-mandatory lands, and provide guidelines for the reclamation, donation, or purchase of lands mined or disturbed by mining prior to July 1, 1975. Provide grants of funds to encourage the reclamation of the maximum number of acres of eligible lands, or the donation or purchase of lands, pursuant to the standards of Chapter 378, Florida Statutes, Chapter 3A-44, Florida Administrative Code: *Rules of the State Comptroller*, and Chapter 62C-17, Florida Administrative Code: *Master Reclamation Plan for Lands Disturbed by the Severance of Phosphate Prior to July 1, 1975.*

Strategy for Implementation: Applications for reclamation are submitted annually by landowners to the Department of Environmental Protection (DEP), Bureau of Mine Reclamation (BOMR). The BOMR reviews the applications pursuant to the appropriate standards of the statutes and rules, as well as annual funds available for reimbursement; and ranks the applications according to priority and available funds. The annual list of applications is presented to the Non-Mandatory Land Reclamation Committee (appointed by the Governor) for priority ranking. The committee's priority ranking is transmitted to the Secretary of the Department of Environmental Protection (DEP) for final approval. A complex system of contracts with landowners, compliance inspections, auditing of reimbursement requests and reimbursement to a set cap follows.

Responsible Partner and Project Coordinator: Mrs. Barbara Owens, Audit Administrator Reimbursement Section; Bureau of Mine Reclamation; Department of Environmental Protection

Other Project Partners: The companies of the phosphate industry and Florida Phosphate Council; private landowners; Non-Mandatory Land Reclamation Committee.

Geographic Area: Non-Mandatory lands exist within the portion of the central Florida Phosphate Mining District residing in Hillsborough and Polk counties. Drainage basin / watershed affected by these lands, or their reclamation, include the upper Peace River (including Saddle Creek & Lake Hancock).

Expected Benefits and/or Drawbacks: Eligibility for reclamation of non-mandatory land is in part determined by the effects of reclamation or non-reclamation on public health and safety, water quality and quantity, and wildlife habitat. Reclamation of non-mandatory lands is planned in accordance with the bureau's strategic plan for the mining district (also known as The Regional Conceptual Reclamation Plan).

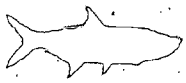
Project Timeline/Schedule: Ongoing - completion date dependent upon annual available funds and number of applications submitted.

Status: As of June 30, 1998, approximately 51% of eligible acres (total eligible acres 86,624) are under reclamation, reclamation is complete, or have been acquired. Another nine percent of the original total of eligible lands are considered no longer eligible due to "other" reclamation, disqualifying land usage, or conversion to mandatory status.

Resources/Funding
Available: Non-mandatory Land Reclamation Trust Fund (from Severance Tax assessment).
Needed:
Potential: Potential for partnering with Hillsborough and Polk counties in funding of acquisition of certain non-mandatory lands.

Reference Documents: *A Regional Conceptual Reclamation Plan for the Southern Phosphate District of Florida* (Department of Environmental Protection [DEP] June 20, 1992); *Ongoing Projects and Programs which are Interraleted with the Implementation of the Integrated Habitat Network / Coordinated Development Area (aka Regional Conceptual Reclamation Plan)* (DEP, June 11, 1993).

Comments:



Saddle Creek Restoration and Alternative Mitigation

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Quantifiable Objectives Addressed: HA-2, HA-3, WQ-1, WQ-6, FW-1, FW-2, FW-4

Priority Actions Addressed: HA-B, HA-C, HA-D, HA-F, HA-H, HA-J, HA-P, WQ-B, WQ-E, WQ-H, WQ-J, WQ-K, WQ-N, WQ-P, FW-A, FW-C, FW-L, FW-Q, FW-R, FW-S, FW-T, FW-U

Project Description: A long-range, progressive process utilizing mined land reclamation, permitted environmental impact mitigation, land planning, and landscape retrofitting in combination to replace portions of the disrupted Saddle Creek watershed with a more environmentally functional system.

Strategy for Implementation: The Tenoroc Fish Management Area, which consists of the 6,040 former Coronet phosphate mine, is now state owned and managed by the Florida Fish and Wildlife Conservation Commission. Together with the adjacent Saddle Creek Mine property, reclaimed through the Non-Mandatory Reclamation Program, these properties form an approximate 12,000 acre watershed core. Through the Polk County Parkway Memorandum of Understanding among the U.S. Army Corps of Engineers (ACOE), Florida Department of Environmental Protection (DEP), Florida Department of Transportation (DOT), Florida Fish and Wildlife Conservation Commission, and the Southwest Florida Water Management District (SWFWMD), mitigation for permitted highway impacts is being constructed in conjunction with non-mandatory reclamation on portions of Tenoroc fisheries management area utilizing pooled mitigation and reclamation funds. The multiparty Upper Peace River Ecosystem Planning Committee (UPREPC) is advisory to the process. Final construction plans are approved by a Selection Committee consisting of representatives of Army Corps of Engineers (ACOE), Southwest Florida Water Management District (SWFWMD), and the Department of Environmental Protection (DEP). DEP is responsible for administering the project.

Responsible Partner and Project Coordinators: Bill Hawkins, Field Project Manager, Department of Environmental Protection (DEP)/Bureau of Mine Reclamation (BOMR) (Homeland Field Office) 2001 Homeland - Garfield Road, Bartow, Florida 33830; Bud Cates, Project Administrator / Contract Manager, Tallahassee BOMR Office.

Other Project Partners: Army Corps of Engineers (ACOE), Southwest Florida Water Management District (SWFWMD), Florida Fish and Wildlife Conservation Commission, Polk County, Department of Transportation (DOT), interested local landowners, and environmental groups.

Geographic Area: Central core of the Saddle Creek watershed; the northernmost watershed portion of the Peace River basin.

Expected Benefits and/or Drawbacks: Replacement of appropriate quantity and quality of flow to Saddle Creek, and thus enhanced flows to the Peace River, through restructuring of mining-impacted watershed. Plan the restructuring so that historic flooding problem is not exacerbated. Replace wildlife habitat and ecological connectivity between the Green Swamp and upper Peace River. Replace isolated wetlands impacted by road construction in a productive context rather than back as isolated, urban wetlands. Provide enhanced recreational opportunities.

Project Timeline/Schedule: Reclamation/Restoration planning, data gathering, plan formalization: partially complete, ongoing.

Status: In progress.

Resources/Funding
Available: Mitigation and Non-Mandatory Reclamation funds (project specific).
Needed:
Potential: Southwest Florida Water Management District (SWFWMD)/Department of Transportation (DOT) Mitigation plan.

Reference Documents: *A Regional Conceptual Reclamation Plan for the Southern Phosphate District of Florida* (Department of Environmental Protection [DEP] June 20, 1992), *Memorandum of Understanding among the Army Corps of Engineers (ACOE), Florida Department of Environmental Protection (FDEP), Florida Department of Transportation (FDOT), Game and Fish Commission & Southwest Florida Water Management District (SWFWMD)* (November 28, 1995), *Saddle Creek Restoration & Alternative Mitigation Project /Phase 1: Conceptual Plan* (DEP October 9, 1997).

Comments:

Lake Howard Water Quality and Habitat Restoration Project

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Quantifiable Objectives Addressed: FW-1, FW-2

Priority Actions Addressed: WQ-B, WQ-E, WQ-N, FW-T

Project Description: This project will improve stormwater quality through suspended sediment reduction and wetland treatment of runoff prior to entering Lake Howard. It will also restore approximately eight acres of impacted wetland habitat adjacent to Lake Howard. Finally it will promote educational opportunities, create passive recreational opportunities and improve flood level flows.

Strategy for Implementation: Untreated stormwater runoff from 588 acres will be diverted into a created wetland treatment system that includes a "harvestable" vegetated sediment sump and a larger wetland retention area. Surrounding the wetland will be a maintenance road that will also serve as a walking pathway. A boardwalk will extend from the project to Lake Howard. Permits have been obtained from Florida Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers.

Responsible Partner and Project Coordinator: City of Winter Haven, Mike Britt, Lakes Manager.

Other Project Partners: Department of Environmental Protection (DEP) - Stormy Ingold, Southwest Florida Water Management District (SWFWMD) - Joann Macrina, Florida Fish and Wildlife Conservation Commission - Lothian Agers.

Geographic Area: Winter Haven Chain of Lakes.

Expected Benefits and/or Drawbacks: Improvement of water quality in Lake Howard.

Project Timeline/Schedule: Currently construction bids are being prepared. Project to be built tin 1999.

Status: In progress.

Resources/Funding
Available: $220,000 from Department of Environmental Protection (DEP), $240,000 from Southwest Florida Water Management District (SWFWMD), $230,000 from , Florida Fish and Wildlife Conservation Commission. Land acquisition by Florida Communities Trust and City of Winter Haven.
Needed:
Potential:

Reference Documents:

Comments:

Myakkahatchee Creek Environmental Park Restoration

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FAX Number: (813) 744-6090
E-mail Address: Dianne_McCommons-Beck@dep.state.fl.us

Quantifiable Objectives Addressed: HA-2, FW-1, FW-2, FW-4

Priority Actions Addressed: FW-A

Project Description: Twenty-five acres of disturbed floodplain will be restored along the Myakkahatchee Creek. The Floodplain here consists of historic wet prairie system/slough system that will be partially restored by this project.

Strategy for Implementation:

- Excavating fill material from four acres of disturbed uplands to create wetlands;
- Diverting water from Cold Spring Canal to flow through two acres of historic wet prairie to discharge into the creek;
- Clearing and removing exotic vegetation from 25 acres of disturbed wetlands;
- Treating remaining stumps with an appropriate herbicide to prevent regrowth;
- Planting native species within the four-acre restored area;
- Monitoring quarterly for five years to document ecological changes on the affected site; and
- Performing maintenance activities quarterly to ensure project success.

Responsible Partner and Project Coordinator: Department of Environmental Protection (DEP) Allen Burdett, Tampa.

Other Project Partners: Department of Environmental Protection (DEP), Dianne McCommons Beck, Tampa; City of North Port; Sarasota County.

Geographic Area: Myakkahatchee Creek (Big Slough) watershed; Lower Myakka River watershed.

Expected Benefits and/or Drawbacks: Exotic species control, surface water quality and wetland restoration, restoration of upland habitats, and listed species recovery plan.

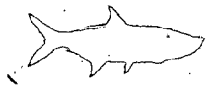
Project Timeline/Schedule: Open.

Status: Implementation pending.

Resources/Funding
Available: General Development Corporation Settlement, U.S. Fish and Wildlife Service.
Needed:
Potential:

Reference Documents: Grant No. SP 358, FO733; Management Plan Nos. 92-009-92A, 93-003-93A, 94-025-94A; Grant Proposal Agreement #, 1448-40181-98-G-126.

Comments:



Green Partners - A Partnership of Polk County Businesses

Contact Person:	**Robert Connors**
Title:	President
Agency/Organization:	Green Partners / A Partnership of Polk County Businesses
Mailing Address:	50 Environmental Loop, Winter Haven, FL 33880
Telephone Number:	(941) 499-2771
FAX Number:	None
E-mail Address:	See webpage address

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-B, WQ-E, WQ-N

Project Description: A non-profit 501 (c)(3) organization that provides assistance to business owners on environmentally friendly management practices through inspection and assessment of their facilities.

Strategy for Implementation: Program began the contacts with businesses to become partners in 1998.

Responsible Partner and Project Coordinator: Bill Fenton - Consultant (941) 682-0054.

Other Project Partners: Lakes Education/Action Drive (LE/AD), Polk County Board of County Commissioners, City of Winter Haven, and Florida Department of Environmental Protection.

Geographic Area: Polk County, including the Peace River Basin.

Expected Benefits and/or Drawbacks: To provide public information and assistance to allow facility owners to conduct business in an environmentally efficient way.

Project Timeline/Schedule: Program was initialed in 1998.

Status: In progress.

Resources/Funding
Available: Variable - based on Grants and partnership application fees.
Needed: $28,000 annually.
Potential: Grant sources.

Reference Documents: www.polk-county.com/greenpartners.

Comments: Program provides for an independent (i.e. non-regulatory) overview of business practices to encourage the use of environmentally effective management practices.

Local Phosphate Mining Regulations

Contact Person: Ronald D. Stowers
Title: County Engineer
Agency/Organization: Hardee Board of County Commissioners
Mailing Address: 412 West Orange Street, Rm. A-203 Courthouse Annex
Wauchula, FL 33873-2867
Telephone Number: (941) 767-1964
FAX Number: (941) 773-6284
E-mail Address: None

Quantifiable Objectives Addressed: FW-2, FW-3, FW-4.

Priority Actions Addressed: FW-Q

Project Description: This is an amendment to existing Hardee County phosphate mining regulations that will increase greater financial responsibility requirement, increase enforcement capabilities, and submittal of all regulatory tracking information to the County including copies of all information sent to the State or Federal agencies.

Strategy for Implementation:: Adoption of Ordinance 1999-02.

Responsible Partner and Project Coordinator: Hardee County Board of County Commissioners. Contact: Ronald D. Stowers, County Engineer.

Other Project Partners:

Geographic Area: Unincorporated Hardee County.

Expected Benefits and/or Drawbacks: Better tracking of regulatory requirements and insurance of better compliance and enforcement of phosphate mining activities.

Project Timeline/Schedule: Adoption by May 1999.

Status: In progress.

Resources/Funding
Available: Local
Needed:
Potential:

Reference Documents: Ordinance 1999-02.

Comments:

Hardee County Water and Sewer Study

Contact Person: Ronald D. Stowers
Title: County Engineer
Agency/Organization: Hardee Board of County Commissioners
Mailing Address: 412 West Orange Street, Rm. A-203 Courthouse Annex
Wauchula, FL 33873-2867
Telephone Number: (941) 767-1964
FAX Number: (941) 773-6284
E-mail Address: None

Quantifiable Objectives Addressed: HA-4, WQ-6

Priority Actions Addressed: HA-D, WQ-G

Project Description: Initiation of a water and sewer study of the unincorporated areas of the county to identify areas of the county that need water and sewer; identify options for providing such services; study feasibility of the County setting up a water and sewer authority, identification of funding source, proposed rate structure, and necessary capital facilities to be constructed. This study will look at various options including reuse.

Strategy for Implementation: 1) Feasibility study; 2) Identification of resources; and 3) Construction of facilities.

Responsible Partner and Project Coordinator: Hardee County Board of County Commissioners. Contact: Ronald D. Stowers, County Engineer.

Other Project Partners: N/A.

Geographic Area: Unincorporated Hardee County.

Expected Benefits and/or Drawbacks: Reduction of water consumption and elimination of septic tanks in those areas that would be served.

Project Timeline/Schedule: Water and Sewer study to be completed by August 1999.

Status: In progress.

Resources/Funding
Available: Local.
Needed: Study will identify funding requirements and funding sources.
Potential: Unknown at this time.

Reference Documents:

Comments:

Hardee County Xeriscaping
(Amendment of Hardee County Uniform Land Development Code)

Contact Person: **Ronald D. Stowers**
Title: County Engineer
Agency/Organization: Hardee Board of County Commissioners
Mailing Address: 412 West Orange Street, Rm. A-203 Courthouse Annex
Wauchula, FL 33873-2867
Telephone Number: (941) 767-1964
FAX Number: (941) 773-6284
E-mail Address: None

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-I

Project Description: Promote xeriscaping by amending the Hardee County Uniform Land Development Code to ensure xeriscaping is considered where buffering and/or canopy is required.

Strategy for Implementation: Adoption of an amendment to the existing Hardee County Uniform Land Development Code.

Responsible Partner and Project Coordinator: Hardee County Board of County Commissioners. Contact: Ronald D. Stowers, County Engineer.

Other Project Partners: N/A.

Geographic Area: Unincorporated Hardee County.

Expected Benefits and/or Drawbacks: Reduction of water consumption.

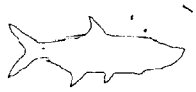
Project Timeline/Schedule: Adoption of amendment by February 2000.

Status: Planned.

Resources/Funding
Available: Local.
Needed:
Potential:

Reference Documents:

Comments:



Encouraging Pervious Surfaces
(Hardee County Unified Land Development Code)

Contact Person: **Ronald D. Stowers**
Title: County Engineer
Agency/Organization: Hardee Board of County Commissioners
Mailing Address: 412 West Orange Street, Rm. A-203 Courthouse Annex
Wauchula, FL 33873-2867
Telephone Number: (941) 767-1964
FAX Number: (941) 773-6284
E-mail Address: None

Quantifiable Objectives Addressed: WQ-2, WQ-3, WQ-6

Priority Actions Addressed: WQ-N

Project Description: The Hardee County Uniform Development Code allows for approval of the use of permeable surface instead of impervious surfaces for parking lots. The Board of County Commissioners will adopt a policy of encouraging greater use of the exception and directing the Hardee County Building and Zoning Department and the County Engineer to implement.

Strategy for Implementation: Adoption of policy by the Hardee County Board of County Commissioners.

Responsible Partner and Project Coordinator: Hardee County Board of County Commissioners. Contact: Ronald D. Stowers, County Engineer.

Other Project Partners: N/A.

Geographic Area: Unincorporated Hardee County.

Expected Benefits and/or Drawbacks: Reduction of non-point source runoff.

Project Timeline/Schedule: Adoption and implementation by April 1999.

Status: Planned.

Resources/Funding
Available: Local.
Needed:
Potential:

Reference Documents:

Comments:

Public Education on Polk County Lakes

Contact Person: Bill Fenton
Title: Consultant
Agency/Organization: Lakes Education/Action Drive (LE/AD)
Mailing Address: P.O. Box 1551 Lakeland, FL 33802
Telephone Number: (941) 688-2730
FAX Number: (941) 687-4627
E-mail Address: Cheryl_schwartz@rcid.dst.fl.us

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B

Project Description: LE/AD is non-profit organization dedicated to promoting public education relative to lakes issues, and encouraging residents to take advantage of the many excellent opportunities our lakes provide.

Strategy for Implementation: LE/AD sponsors public education events (Youth Days) twice per year, supports local school science fairs and provides workshops on environmental issues for the public. A quarterly newsletter (*LakeWatch*) is distributed to its members for information on upcoming events and to provide information on lake related issues. Lakeside exhibits and storm drain signs are utilized to increase awareness among users. An annual regional conference keeps all stakeholders informed.

Responsible Partner and Project Coordinator: Lakes Education/ Action Drive - Bill Fenton - Consultant (941) 688-2730.

Other Project Partners: City or Lakeland - Public Works Department, Polk County Board of County Commissioners (BoCC) -Natural Resources and Drainage Division, City of Haines City, City of Winter Haven - Lakes Management Section

Geographic Area: Lakeland area emphasis with involvement throughout Polk County.

Expected Benefits and/or Drawbacks: Provide public awareness of lake issues to reduce non-point sources of pollution.

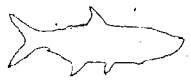
Project Timeline/Schedule: Program was established in 1985.

Status: In progress.

Resources/Funding
Available: Sponsorship, Memberships and grants - $40,000 annually.
Needed:
Potential: Program Corporate Sponsors include: Publix Super Market Charities, BCI Engineers, Chastain-Skillman, Inc., Envisors, Inc.

Reference Documents: LE/AD Website - www.le-ad.org, LE/AD Newsletter (LakeWatch).

Comments:



Manatee County Florida Yards and Neighborhoods Program

Contact Person: Allen Garner
Title: Manatee County Master Gardener
Agency/Organization: Manatee County Agriculture and Natural Resources Department
Mailing Address: P.O. Box 1000, Bradenton, Fl 34206-1000
Telephone Number: (941) 722-4524
FAX Number: (941) 721-6608
E-mail Address:

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-I

Project Description: One of the primary goals of the Florida Yards and Neighborhoods programs is to the greatest extent possible encourage, to the greatest extent possible, the planting of native, drought tolerant plant species in both yards and public areas. Such native species typically require far less water, fertilizers, and pesticides than commonly used non-native landscaping species, thus reducing both water consumption as well as non-point source pollutants in stormwater runoff.

Strategy for Implementation: The program is implemented through the Manatee County Master Gardener program out of the Agriculture and Natural Resources Department. The Planning Department encourages implementation of this program through coordination with developers to provide Florida Yards and Neighborhoods when landscaping model homes.

The Agriculture and Natural Resources Department has several ongoing programs to promote Florida Yards & Neighborhoods including:

- Florida Schoolyards - funded by the Tampa Bay NEP this program allows school children to do an environmental assessment of their school and then develop a program, such as stormwater attenuation, trails and gardens, to promote cleaner water.
- Homeowner Outreach - under this program, homeowners can fill out questionnaire about their landscaping to and receive yard certification.
- Demonstration Landscapes - there are six Florida Yards & Neighborhoods demonstration landscapes in the county.
- Manatee Government Access Television (MGATV) - programs are run regularly about Florida Yards & Neighborhoods.
- Classes - are presented at various locations throughout the county approximately once a week.

Responsible Partner and Project Coordinator: Manatee County Agriculture and Natural Resources Department/Allen Garner.

Other Project Partners: Manatee County Planning Department.

Geographic Area: Entire Manatee County.

Expected Benefits and/or Drawbacks: Improvement of water quality and reduction of water use through use of native and drought tolerant species.

Project Timeline/Schedule: Ongoing.

Status: Ongoing.

Resources/Funding
Available: Funding partners include: Manatee County Government General Fund Operating Budget for the Department of Agriculture and Natural Resources, which provide administrative oversight; the Sarasota Bay National Estuary Program; Tampa Bay Estuary Program.
Needed:
Potential:

Reference Documents: *A Guide to Environmentally Friendly Landscaping, Florida Yards and Neighborhoods Handbook.* University of Florida, Institute of Food and Agricultural Sciences, Bulletin #295.

Comments:

Interdepartmental Coordination with the U.S. Fish and Wildlife Service

Contact Person: Jim Lee
Title: Comprehensive Planning Administrator
Agency/Organization: Manatee County Planning Department
Mailing Address: P.O. Box 1000, Bradenton, FL 34206-1000
Telephone Number: (941) 749-3070
FAX Number: (941) 749-307
E-mail Address: Janet.Hoffman@co.manatee.fl.us

Quantifiable Objectives Addressed: FW-3

Priority Actions Addressed: FW-Q

Project Description: Manatee County has required that all development requests in areas of suspected wildlife habitat for listed species be sent for review to the U.S. Fish and Wildlife Service (FWS). This automatic referral to FWS for comment on impact to listed species provides additional support for environmental compliance and allows County development regulations to address protection of environmentally important species through specified management plans and actions appended to development permits.

Strategy for Implementation: Brian Pridgeon of the U.S. Fish & Wildlife Service is a listed member the Manatee County Development Review Committee (DRC) and is routed all development requests in the Charlotte Harbor NEP area and the rest of Manatee County for review for endangered, threatened and/or species of special concern.

Responsible Partner and Project Coordinator: Bob Schmitt, Planner On-Call Coordinator, P.O. Box 1000, Bradenton, FL 34206-1000, Phone # (941) 749-3070. Brian Pridgeon, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, 6620 Southpoint Drive South, Suite 310, Jacksonville, FL 32216, Phone # (813) 570-5398.

Other Project Partners: Florida Department of Environmental Protection, Southwest Florida Water Management District.

Geographic Area: All of Manatee County.

Expected Benefits and/or Drawbacks: Protection of listed species through intervention in development design and approval.

Project Timeline/Schedule: Ongoing.

Status: Ongoing.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents:

Comments:

Environmental Lands Management and Acquisition Committee (ELMAC)

Contact Person: **Charlie Hunsicker**
Title: Ecosystems Administrator
Agency/Organization: Manatee County Planning Department
Mailing Address: P. O. Box 1000, Bradenton, Fl 34206-1000
Telephone Number: (941) 749-3070
FAX Number: (941) 749-307
E-mail Address: Charlie.Hunsicker@co.manatee.fl.us

Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S

Project Description: Environmental Lands Management and Acquisition Committee (ELMAC) is a citizens action committee created in 1992 by the Manatee County Board of County Commissioners to whose mission it is to identify environmentally sensitive lands in Manatee County, identify protection strategies, including both fee simple acquisition and non-fee simple remedies, identify funding sources to implement protection strategies, and to assist in managing such identified properties.

Strategy for Implementation: The Environmental Lands Management and Acquisition Committee has developed criteria for rating the sensitivity of environmental lands. They are still in the process of identifying all sensitive lands in the County and have rated nearly 20 parcels for acquisition. Work continues on identifying funding strategies to protect and manage additional sensitive lands.

Responsible Partner and Project Coordinator: Charlie Hunsicker (see above).

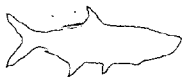
Other Project Partners: Appointees on the Environmental Lands Management and Acquisition Committee (ELMAC) include representatives from the Manatee County School District, the U.S. Forest service, the Manatee County Chamber of Commerce, the Natural Resources Conservation Service, and various environmental and recreational groups in the County.

Geographic Area: All of unincorporated Manatee County.

Expected Benefits and/or Drawbacks: Citizen Advisory Committee activities can develop and screen potential properties for acquisition meeting protection goals under FW-S, accelerating the process normally afforded from "top down" direction from elected representatives. Potential drawback, however, is that the process can develop unrealistic public expectations about the amount and pace of acquisitions possible.

Project Timeline/Schedule: Ongoing committee meeting once every two months or sooner, as needed.

Status:



Resources/Funding
Available:
Needed: Funding is needed to continue acquisition of properties outside of the Lake Manatee watershed (where an acquisition program has been in effect since 1982).

Potential: Public support for placing a referendum question on the ballot to create a dedicated funding source is high. The local match for leveraging state acquisition grants can sometimes be raised if the seller agrees to a bargain sale, below appraised value. The difference between the bargain sale amount and appraised value can be used towards a local match for state grant match, if properly identified as a donation for tax purposes in the closing documentation.

Reference Documents:

Comments:

Manatee Government Access TV (MGATV) Public Service Announcements

Contact Person : **Charlie Hunsicker**
Title: Ecosystems Administrator
Agency/Organization: Manatee County Planning Department
Mailing Address: P.O. Box 1000, Bradenton, Fl 34206-1000
Telephone Number: (941) 749-3070
FAX Number: (941) 749-3071
E-mail Address: Charlie.Hunsicker@co.manatee.fl.us

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-I

Project Description: Manatee Government Access Television (MGATV) runs public service announcements, including announcements regarding water conservation and the results of programs to keep surface waters clean. In 1998, programs supplied by the Southwest Florida Water Management District about water conservation and by the Tampa Bay National Estuary Program about desalinization were featured on our Government Access Channel. Also aired four times per year are the Peace River/Manasota Regional Water Supply Authority board meetings.

Strategy for Implementation: This is an ongoing process needing no monitoring.

Responsible Partner and Project Coordinator: This project is coordinated between the Public Works Department (John Zimmerman), Planning Department (Charlie Hunsicker), and the Community Services Department (Margie King).

Other Project Partners: Anyone distributing films on the merits of keeping waterways clean is welcome to submit them for airing.

Geographic Area: All of Manatee County.

Expected Benefits and/or Drawbacks: Better public education and awareness of water quality issues and the consequences of hydrologic alterations. While Manatee County is not presently funded to produce videos, Manatee Government Access (MGA) can serve as a viable public television outlet for materials produced by others on the Charlotte Harbor experience. Materials submitted directly to MGA, or through the management conference membership from Manatee County to MGA is the strategy available to distribute the video information. MGA staff meets regularly with the staff of Manatee County School Board educational broadcast channel to share public educational videos about the environment.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding:
Available: Funding for Manatee Government Access Television (MGATV) is made available through a dedicated cable television tax.
Needed:
Potential:

Reference Documents: N/A.

Comments:

Application of Innovative Wastewater Treatment Systems at Emerson Point Conservation Park

Contact Person: **Charlie Hunsicker**
Title: Ecosystems Manager
Agency/Organization: Manatee County Planning Department
Mailing Address: P. O. Box 1000, Bradenton, Fl 34206-1000
Telephone Number: (941) 749-3070
FAX Number: (941) 749-307
E-mail Address: Charlie.Hunsicker@co.manatee.fl.us

Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-E

Project Description: The overall purpose of this project is to demonstrate cost effective, state of the art methods for treating and disposing of sanitary wastes generated at a remote public conservation park where centralized collection and treatment of sewage is not a feasible option. The Emerson Point Conservation Park in Manatee County is situated in one of the most pristine areas of Tampa Bay, bordered on the north by the Terra Ceia Aquatic Preserve. To sustain the growth and health of lush seagrass beds in lower Tampa Bay, the Tampa Bay Estuary Program (TBEP) and the Southwest Florida Water Management District (SWFWMD)-Surface Water Improvement and Management (SWIM) programs have adopted the goal of capping nitrogen loading to lower Tampa Bay (including the Manatee River and Terra Ceia Bay) at the average pollutant loading level during the period 1992-1994. This "hold the line" nitrogen control strategy was subsequently adopted by the Florida Department of Environmental Protection (DEP) as the basis for the Total Maximum Daily Load (TMDL) of nitrogen for lower Tampa Bay and other major bay segments.

Specific Objectives of the proposed project include:

1. To evaluate the technical and cost feasibility of proven and innovative state of the art options for treating and disposing of sanitary wastes produced by the projected volume of visitors to the Emerson Point Conservation Park at two remote locations, an environmental classroom facility and a single family residence serving the park manager with the specific goal of completely eliminating nitrogen loading to Tampa Bay;
2. To develop detailed designs for the selected options under local conditions;
3. To construct treatment and disposal systems that will meet the challenging goal of zero discharge of nitrogen and control bacterial contamination to levels safe for swimming and shellfish harvesting;
4. To conduct extensive and detailed monitoring to verify that the constructed systems are achieving the established goals; and
5. To demonstrate cost-effective sanitary waste treatment systems and transfer the technology to park and recreational facilities and to the public at large.

Strategy for Implementation: 319(h) grant authority, if selected, the project is scheduled to begin in July 2000 and continue through November 2001 with additional monitoring to extend into 2004.

Responsible Partner and Project Coordinator: Manatee County Government (Charlie Hunsicker).

Other Project Partners: Tampa Bay Estuary Program, University of South Florida, Cooperative Extension Service, Department of Health, Manatee County School Board, Southwest Florida Water Management District, Terra Ceia Aquatic Preserve, U.S. Department of Agriculture Natural Resource Conservation Service, Environmental Lands Management and Acquisition Advisory Committee (ELMAC).

Geographic Area: Countywide, with specificity to near coastal watersheds and in the Myakka Watershed Basin, which will not be served by County central sewer systems.

Expected Benefits and/or Drawbacks: This project furthers the goals and objectives in *Charting the Course*, the Comprehensive Conservation and Management Plan for Tampa Bay, adopted by Manatee County and its partners in the Tampa Bay Estuary Program.

The need to develop and demonstrate new and innovative onsite wastewater treatment technologies is significant for the Tampa Bay estuary and to the State of Florida.

This project will demonstrate that on site wastewater treatment systems can produce zero nitrogen discharges in a cost effective manner under local conditions. The overall impact of this demonstration project is potentially far greater than the nitrogen loading reductions that will be achieved at the Emerson Point Conservation Park. Numerous recreational areas, individual homes, and developments will be able to adopt the new demonstrated approaches and learn from their success. This project will help to define best management practices for onsite wastewater treatment with transference to local jurisdictions in the Charlotte Harbor Watershed.. Local agencies responsible for regulating development will have a stronger scientific basis for requiring innovative technologies if needed for water quality protection.

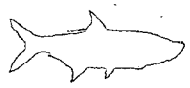
Project Timeline/Schedule: This project is scheduled to begin in December 1999, proceed to construction at the four test locations on or before January 2001, with performance monitoring beginning at facility completion and continuing for a two year period.

Status: Grant application pending.

Resources/Funding
Available: Manatee County - $84,000; Tampa Bay Estuary Program - $35,000; University of Florida - $24,528; Manatee County School Board - $5,000.
Needed: $142,870.
Potential: 319(h) grant (competitive application).

Reference Documents: To be developed.

Comments:



The Manatee County Stormwater Basin Study

Contact Person: Sia Mollanazar
Title: Stormwater Manager
Agency/Organization: Manatee County Transportation Department
Mailing Address: P. O. Box 1000, Bradenton, FL 34206-1000
Telephone Number: (941) 792-8811
FAX Number: (941) 745-3490
E-mail Address: Elaine.Apostol@co.manatee.fl.

Quantifiable Objectives Addressed: WQ-4, WQ-6

Priority Actions Addressed: WQ-N

Project Description: The Stormwater Basin Plan was developed by Camp Dresser McKee, Inc. for Manatee County.

Strategy for Implementation: Underway, Master Planning is leading to the development of 25 year floodplain mapping and land development regulations to limit development in floodprone areas.

Responsible Partner and Project Coordinator: Manatee County Government.

Other Project Partners: Southwest Florida Water Management District, providing financial aide and technical review expertise.

Geographic Area: Myakka River Watershed within Manatee County.

Expected Benefits and/or Drawbacks: Watershed mapping, flow estimation, and long range flood control improvements will be beneficial in maintaining productive stream flow relationships and provide useful data for any future development activities affecting water quality in the basin.

Project Timeline/Schedule:

Status: Continuing within the Myakka Basin and county-wide.

Resources/Funding
Available: Manatee County General Fund; Southwest Florida Water Management District Cooperative Funding Program.
Needed:
Potential:

Reference Documents:

Comments:

Protection of Wetlands, Floodplain, and Land Preservation

Contact Person: Christina Hummel
Title: Planner III
Agency/Organization: Polk County Board of County Commissioners (BoCC) Planning Department
Mailing Address: PO BOX 9005, Drawer CS06, Bartow, FL 33831-9005
Telephone Number: (941) 534-6460
FAX Number: (941) 534-6021
E-mail Address: ChristinaHummel@polk-county.net

Quantifiable Objectives Addressed: HA-3, FW-2

Priority Actions Addressed: HA-M

Project Description: The County has an ordinance relating to the protection and preservation of the water quality, recreation potential and wild life issues of Polk County's lakes and streams (89-74). The County also has an ordinance implementing the National Flood Insurance Program and prescribing minimum standards for the development in flood prone areas (88-04, 90-08). Within the County's comprehensive plan, there are several sections and policies pertaining to the protection of wetlands and flood plain. These policies focus on density transfers so that wetland and floodplain areas will not be over-built.

Strategy for Implementation: Certain County ordinances are implemented through the Comprehensive Land Use Plan. Several of the policies concerning wetlands and conservation will be updated and rewritten as a result of the evaluation and appraisal process. A new map for aquifer recharge areas will be adopted within the next year. Policies will be added to develop a wetland ranking system and standards for the protection of wetlands. The County is also investigating techniques that would promote transfer of density to on-site and off-site locations to minimize impacts to wetlands.

Responsible Partner and Project Coordinator: Christina Hummel - Planner III - CPA coordinator.

Other Project Partners: Polk County Natural Resources Division (buying lands that need to be protected); Department of Environmental Protection; Southwest Florida Water Management District.

Geographic Area: Polk County.

Expected Benefits and/or Drawbacks: Better protection of wetlands/sometimes hard to enforce.

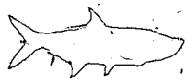
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents:

Comments:



IMC-Agrico Peace River Park, Off CR 640, Homeland

Contact Person: Christina Hummel
Title: Planner III
Agency/Organization: Polk County Board of County Commissioners (BoCC) Planning Department
Mailing Address: P.O. Box 9005, Drawer CS06, Bartow, FL 33831-9005
Telephone Number: (941) 534-6460
FAX Number: (941) 534-6021
E-mail Address: ChristinaHummel@polk-county.net

Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S

Project Description: The IMC-Agrico Peace River Park is a 460-acre tract located on the north side of CR 640 at the Peace River between Bartow and Ft. Meade. IMC Fertilizer Corporation donated it to Polk County in 1984. During FY 96-97, Polk County constructed a boardwalk and trails for nature study and hiking, picnic areas, and a canoe launch. During FY 97-98, Polk County constructed a new restroom, provided a shell parking area, blazed 11 miles of horse trails, and installed a new 16' x 24' picnic shelter. During FY 98-99, Polk County will pave a parking area and build a staircase to connect the new parking area with existing facilities at the boardwalk.

Strategy for Implementation: Polk County, IMC-Agrico, and the Polk County School Board are currently planning to initiate a program offering the opportunity for middle school students from across the County to take turns participating in weekly field trips to the boardwalk, Homeland Heritage Park, and the Mulberry Phosphate Museum. The park will be officially opened to the public in August of 1997.

Responsible Partner and Project Coordinator: Sheila Starling, Senior Planner, Polk County Parks and Recreation Division, Drawer CS07, P.O. Box 9005, Bartow, FL 33931-9005, (941) 534-4340.

Other Project Partners: IMC-Agrico, Inc., Polk County School Board.

Geographic Area: Polk County.

Expected Benefits and/or drawbacks: Enhancement of Public Recreation Lands.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available:
Needed:
Potential:

Reference Documents:

Comments: History of IMC-Agrico Peace River Park:

- Pre-1970 - The property is an active phosphate mine owned by Virginia-Carolina Mining.
- 1970 - The site is purchased by IMC Fertilizer.
- 1973 - Mining activity comes to a close.
- 1973 - 1983 - The mining site undergoes reclamation.
- 1984 - IMC Fertilizer donates the 470 acre property to Polk County for development as a park.
- 1984-1986 - The boardwalk is planned and the 7,500 linear foot route is laid out through the flood plain.
- 1987-1993 - Polk County seeks grant funding to construct the first phase of the boardwalk.
- 1993 - Polk County receives $100,000 grant from the Land and Water Conservation Fund to construct 1,500 feet of boardwalk, restroom, and two picnic shelters.
- 1994 - Construction begins on the boardwalk. Creative Marine, a dock building company from Winter Haven, is hired to install the pilings. Parks and Recreation Division staff begin constructing decks and rails after the piling installation is completed.
- 1994 - IMC-Agrico donates $10,000 for environmental permitting services.
- 1995 - Polk County School Board receives $50,000 grant from the Florida Advisory Council on Environmental Education (FACEE) to construct 500 additional feet of boardwalk and interpretive signs.
- 1995 - Polk County, Peace River Basin Board, Polk County School Board, and IMC-Agrico host a tree planting and river clean-up in the park that is attended by over 100 people.
- 1995 - Polk County receives $34,000 donation from U.S. Agri-Chemical for park improvements.
- 1995 - The reclamation area is opened for horseback riding.
- 1996 - Creative Marine Construction is hired by the School Board to construct the additional 500 feet of boardwalk financed through the Florida Advisory Committee on Environmental Education (FACEE) program. Phase One of the boardwalk is completed.
- 1996 - Polk County receives $24,000 from the Peace River Basin Board for park improvements.
- 1996 - Polk County receives $50,000 grant from the Florida Recreation Development Assistance Program for the development of equestrian trails and support facilities.
- 1997 - The boardwalk is host to field trips taken by Lincoln Academy and Lakeland Middle Academy, the first schools to officially visit the park and use the boardwalk as an educational resource.

Polk County, IMC-Agrico, and the Polk County School Board are currently planning to initiate a program offering the opportunity for middle school students from across the County to take turns participating in weekly field trips to the boardwalk, Homeland Heritage Park, and the Mulberry Phosphate Museum. The park will be officially opened to the public in August of 1997.

Environmental Lands Acquisition Program In Polk County

Contact Person:	**Gaye Sharpe**
Title:	Environmental Lands Coordinator
Agency/Organization:	Polk County Natural Resources and Drainage Division
Mailing Address:	4177 Ben Durrance Road, Bartow, FL 33830
Telephone Number:	(941) 534-7377
FAX Number:	(941) 534-7374
E-mail Address:	None

Quantifiable Objectives Addressed: FW-1, FW-2, FW-4, HA-3

Priority Actions Addressed: FW-T, FW-P, HA-M, FW-A, FW-U, FW-S, FW-C, WQ-J

Project Description: Identify and acquire environmentally sensitive lands within Polk County, mostly along the Peace River. Acquisition of the land adjacent to Banana Creek on Lake Hancock will allow for restoration of the historic wetland.

Strategy for Implementation: Purchase parcels along the Peace River watershed. Success of the program is measured by total acres preserved. To date, one parcel has been purchased, and some others are under consideration. Several other parcels were also purchased outside Peace River watershed. Acquisition of land adjacent to Lake Hancock is proposed. An inter-local agreement with Southwest Florida Water Management District was adopted by the Board of County Commissioners on January 26, 1999. The agreement is to provide for the joint funding, acquisition and management of the properties within the Peace River Corridor Project.

Responsible Partner and Project Coordinator: Polk County Natural Resources, Gaye Sharpe.

Other Project Partners: Polk County Planning - CPAS - Erik Petersen.

Geographic Area: Countywide, mainly along the Peace River corridor, specific lands identified within the Charlotte Harbor NEP study area.

Expected Benefits and/or Drawbacks: Preserve lands from development. Land use of these parcels will be changed to "Recreation" and "Open Space" so they might be used for parks and recreation. Allowable uses are to be specified in property-specific land management plans.

Project Timeline/Schedule: Ongoing. Parcels were purchased over the last two years. In the Comprehensive Plan Amendment 99A round, those parcels will be converted to recreation and open space land use.

Status: In progress.

Resources/Funding
Available: Funding will come from the 0.2 mil ad valorem levy for the Environmental Land Program.
Needed: Matching funds.
Potential: Southwest Florida Water Management District; Florida Forever; Florida Communities Trust Fund; and The Nature Conservancy.

Reference Documents: Polk County maintains maps of acquired properties in archived information.

Comments: The county is also preparing a grant application to Florida Communities Trust for 1,355 acres on the northwest side of Lake Hancock.

Polk County Volunteer Rainfall Monitoring Program

Contact Person: Hong Nguyen
Title: Laboratory Manager
Agency/Organization: Polk County Natural Resources and Drainage Division
Mailing Address: 4177 Ben Durrance Road - Bartow, FL 33830
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FAX Number: (941) 534 -7368
E-mail Address: Hongnguyen@Polk-County.Net

Quantifiable Objectives Addressed: HA-2

Priority Actions Addressed: HA-B, HA-C

Project Description: Daily rainfall data are recorded by 30 or more volunteers throughout Polk County and reported to the Natural Resources and Drainage Division on a monthly basis using a standard data reporting form.

Strategy for Implementation: This project has been implemented by providing rain gauges and data recording sheets to volunteers which are completed and mailed back to the Natural Resources and Drainage Division for compilation on a monthly basis.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Michele Medani - Data Manager.

Other Project Partners: Volunteers include individuals from other Local and State Agencies.

Geographic Area: Polk County - County wide.

Expected Benefits and/or Drawbacks: Data obtained are summarized and included in the Division's Annual Lakes Report and are available to the public.

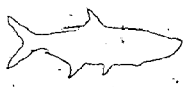
Project Timeline/Schedule: Project was initiated in 1984.

Status: In progress.

Resources/Funding
Available: Polk County Natural Resources & Drainage Division / $3,000 annually.
Needed:
Potential:

Reference Documents: Polk County Annual Lakes Report.

Comments: Mailing costs are currently being reduced by use of e-mail and fax to report rainfall data.



Polk County Ambient Surface Water Monitoring Program

Contact Person: Robert J. Kollinger, P.E.
Title: Water Resources Engineer
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FAX Number: (941) 534-7374
E-mail Address: Robertkollinger@Polk-County.Net

Quantifiable Objectives Addressed: WQ-1

Priority Actions Addressed: WQ-B, WQ-C, WQ-D

Project Description: Semi-annual monitoring (wet season/dry season) of water quality is conducted at 80 lakes (with public access) and selected creeks and streams within Polk County. Samples are analyzed to identify water quality trends to determine the health of the waterbody. Analytical results are forwarded to STORET for public access. Additional ambient monitoring work is being coordinated with the Florida Department of Environmental Protection, and the County will consider program modification to fill data gaps, where practical.

Strategy for Implementation: Samples are analyzed for nutrients, including total nitrogen, total phosphorus, total kjedahl nitrogen, and ammonia. General water quality parameters include dissolved oxygen, pH, turbidity and chlorophyll *a*.

Responsible Partner and Project Coordinator: Polk County Natural Resources - Water Resources Laboratory/ Hong Nguyen - Lab Manager

Other Project Partners: Lake Region Lakes Management District.

Geographic Area: Polk County, including the Peace River watershed.

Expected Benefits and/or Drawbacks: Continued update of the water quality database for the major surface waters within Polk County.

Project Timeline/Schedule: The Ambient Surface Water Monitoring Program began with routine lakes monitoring in the mid-1980s.

Status: This program remains in progress.

Resources/Funding
Available: Annual expenditures by Polk County estimated at $75,000.
Needed:
Potential:

Reference Documents: An Annual Lakes Report is produced by the Natural Resources and Drainage Division to summarize data results and identify water quality trends.

Comments:

Polk County Aquatic Weed Control Program

Contact Person: Mike Mahler
Title: Operations Manager
Agency/Organization: Polk County Natural Resources and Drainage Division
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Quantifiable Objectives Addressed: FW-4, HA-3

Priority Actions Addressed: FW-A, HA-F

Project Description: A State of Florida supported program for control of nuisance and exotic aquatic vegetation.

Strategy for Implementation: This program is implemented in accordance with the Cooperative Aquatic Plant Control Program as specified in Chapter 62 (C) - 54 of the Florida Administrative Code.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/Dean Jones - Aquatic Weed Control Manager.

Other Project Partners: Florida Department of Environmental Protection (DEP) - Bureau of Invasive Plant Management – Tallahassee, U.S.Army Corps of Engineers – Jacksonville.

Geographic Area: Polk County lakes (76 with public access) including portions of the upper Peace River watershed and selected streams and tributaries (with the exception of the Peace River south of Highway 60 which is maintained by the Southwest Florida Water Management District).

Expected Benefits and/or Drawbacks: Reduction of exotic and nuisance vegetation will allow for re-establishment of native species.

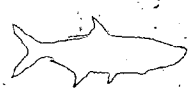
Project Timeline/Schedule: Project began in 1977 and has continued annually.

Status: In progress.

Resources/Funding
Available: FY 1998-99 - State Funds $2.8 million, County Funds $700,000.
Needed:
Potential:

Reference Documents: Department of Environmental Protection (DEP) Webpage, Institute of Food and Agriculture Sciences (IFAS) Webpage.

Comments:



Eagle Lake/Millsite Regional Drainage Project

Contact Person: Robert Wisemen, P.E.
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E-mail Address: Robbywisemen@Polk-County.Net

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4, FW-2

Priority Actions Addressed: HA-F, FW-A, FW-C

Project Description: Restore the hydrology and improve the drainage characteristics of the regional outfall system serving Eagle Lake and Lake Millsite to Lake Hancock.

Strategy for Implementation: Coordination with the Southwest Florida Water Management District (SWFWMD) staff for identification of areas needing immediate maintenance. Contract with an engineering consultant to complete a watershed assessment and for design and permitting of portions of the project area requiring Environmental Resources Permits. An electronic water level data collection/transmission station (SCADA) will be installed to monitor water elevations.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert Wisemen, P.E., Water Resources Manager

Other Project Partners: Southwest Florida Water Management District (SWFWMD) - Resource Projects Section - Brooksville

Geographic Area: Eagle Lake and Lake Millsite - Winter Haven, FL.

Expected Benefits and/or Drawbacks: Improved drainage within the urbanized portions of the watershed for flood control; establishment of a new level of base flow to Lake Hancock in the Upper Peace River system.

Project Timeline/Schedule: Field investigation for watershed assessment was initiated in 1998 with estimated completion in the year 2000.

Status: Project is in progress. Immediate maintenance of the conveyance from Lake Millsite was completed in 1997. A watershed evaluation was conducted to identify additional areas for drainage improvement and restoration of historic flows.

Resources/Funding
Available: Peace River Basin Board; Southwest Florida Water Management District (SWFWMD) & Polk County Cooperatively / $350,000: $ 29,000 - Immediate maintenance - completed 1998.
Phase I - $ 40,000 - Watershed investigation (data development).
Phase II - $200,000 - Floodplain study & evaluation of data.
Phase III - $ 80,000 - Watershed management plan.
Needed:
Potential:

Reference Documents:

Comments: BCI Engineering – Lakeland, has been contracted to conduct the field investigations, and survey and complete the watershed assessment.

Garden Grove Pines Stormwater Retrofit Project

Contact Person: Robert J. Kollinger, P.E.
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E-mail Address: Robertkollinger@Polk-County.Net

Quantifiable Objectives Addressed: WQ-6, FW-2

Priority Actions Addressed: WQ-B, WQ-D, WQ-E, WQ-N, FW-Q, FW-T

Project Description: Polk County is proposing a retrofit of an abandoned waste water treatment plant facility in the Garden Grove Pines Subdivision in order to reduce pollutant discharges to the Lake Florence outfall in Winter Haven.

Strategy for Implementation: An initial environmental assessment of the property will need to be conducted to determine if the site is suitable for a stormwater treatment facility. Engineering designs are to be prepared and submitted for permitting prior to initiation of construction. Monitoring the effectiveness of the treatment system would be conducted following completion of the project construction. The County will consider modification of the monitoring program to fill data gaps, where practical.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert J. Kollinger, P.E.

Other Project Partners: The County hopes to secure assistance for the project from the Southwest Florida Water Management District (SWFWMD) through cooperative funding provided by the Peace River Basin Board and the Florida Department of Environmental Protection (DEP) through Section 319 Grants from the Environmental Protection Agency (EPA).

Geographic Area: The Winter Haven area of the upper Peace River Basin.

Expected Benefits and/or Drawbacks: A net reduction in the peak flow rates and pollutant loads from storm events at the receiving water body.

Project Timeline/Schedule: The project will be proposed for 319 Grant funding in 1999 and for Peace River Basin Board Cooperative funding for FY 2000-2001.

Status: Project is currently under consideration for future implementation.

Resources/Funding
Available: None presently.
Needed: $350,000.
Potential: Southwest Florida Water Management District (SWFWMD) /Peace River Basin Board, Department of Environmental Protection (DEP) (Section 319-Environmental Protection Agency grant), and Polk County Board of County Commissioners (BoCC).

Reference Documents:

Comments: Polk County has completed a similar restoration project with the construction and operation of the Jan Phyl Stormwater Retrofit project which also involved conversion of an abandoned waste water treatment plant to treat stormwater.

Upper Peace River - Lake Hancock Advisory Group

Contact Person: Jeffrey F. Spence
Title: Natural Resources & Drainage Director
Agency/Organization: Polk County Natural Resources and Drainage Division
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Telephone Number: (941) 534-7377
FAX Number: (941) 534-7374
E-mail Address: Jeffspence@Polk-County.Net

Quantifiable Objectives Addressed: HA-3, HA-4, WQ-5

Priority Actions Addressed: HA-P, WQ-B, WQ-E, WQ-H, WQ-J, WQ-K, WQ-L

Project Description: Formation of a "Stake Holders Group" to discuss alternatives to improving the quality of water discharged to the Upper Peace River from Lake Hancock.

Strategy for Implementation: Participants from federal, state and local government have joined with citizens and representatives of environmental groups to assess potential projects for improvement of water quality. The Stake Holders Group is responsible for forming a consensus on a course of action while considering the issues of water quality, proposed land use changes and concerns over the use of the resources.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert J. Kollinger, P.E.

Other Project Partners: Representatives of the various governmental agencies concerned with water resources, fish and wildlife are encouraged to participate along with members of the public with special interest in the Peace River system.

Geographic Area: Central Polk County.

Expected Benefits and/or Drawbacks: Identification of potential projects for improvement of water quality and wildlife habitat.

Project Timeline/Schedule: Initial meeting was held on April 28, 1999.

Status: Ongoing.

Resources/Funding
Available: $1,000 for coordinating the initial meeting.
Needed: Support for project implementation.
Potential: Cooperative funding with the Southwest Florida Water Management District, Charlotte Harbor NEP, adjacent counties and water supply users of the Peace River.

Reference Documents: "Characterization of Reserves, Sediment, and Overburden for the Lake Hancock Mine and Reclamation Study", December 1986. Zellars-Williams Company - A Division of Jacobs Engineering. "Lake Hancock Restoration Plan", October 1991. Florida Fish and Wildlife Conservation Commission.

Comments: The primary challenge is in obtaining a consensus between the various users of the resource on what can be done to improve the quality of water discharged from Lake Hancock. The funding of any proposed projects will provide a challenge as well.

Jan Phyl Village Stormwater Retrofit Project

Contact Person: Robert J. Kollinger, P.E.
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FAX Number: (941) 534-7374
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Quantifiable Objectives Addressed: WQ-6, FW-2

Priority Actions Addressed: WQ-B, WQ-D, WQ-E, WQ-N, FW-T

Project Description: Polk County has completed a retrofit of an abandoned waste water treatment plant facility to reduce pollutant discharges from a 90-acre residential watershed to Lake Howard on the Winter Haven Chain-of-Lakes.

Strategy for Implementation: Following completion, treatment efficiencies are being evaluated by monitoring stormwater discharges upstream and downstream of the treatment facility. Polk County will consider modifying the monitoring program to fill data gaps, where practical.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert J. Kollinger, P.E.

Other Project Partners: Southwest Florida Water Management District (SWFWMD), through cooperative funding provided by the Peace River Basin Board, Florida Department of Environmental Protection (DEP) through Section 319 Grants from Environmental Protection Agency (EPA).

Geographic Area: The Winter Haven Chain-of-Lakes in the upper Peace River Basin.

Expected Benefits and/or Drawbacks: Control of local flooding as well as a net reduction in the peak flow rates and pollutant loads from storm events at the receiving water body.

Project Timeline/Schedule: The project was initiated in December 1996 with completion in January 1998.

Status: Project is complete with maintenance and monitoring being performed as required.

Resources/Funding
Available: Peace River Basin Board; Southwest Florida Water Management District (SWFWMD) - $100,000; Department of Environmental Protection (DEP) (319 Environmental Protection Agency Grant) - $85,315; Polk County - $189,450.
Needed:
Potential:

Reference Documents: "Innovative Retrofit of the Abandoned Jan-Phyl Wastewater Treatment Plant - Comprehensive Final Report", March 1998. Polk County; Polk County 1997 Annual Lake and Stream Report.

Comments: Related stormwater retrofit projects include the Inwood Alum Treatment System that was completed in 1994 and the Derby Avenue Wet Detention Pond which was completed in 1995 on the Winter Haven Chain-of-Lakes. Both projects were cooperatively funded through the Peace River Basin Board with additional funding being provided by the Florida Department of Environmental Protection (FDEP).

Lake Mariana Water Quality Improvements

Contact Person: Robert J. Kollinger, P.E.
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Quantifiable Objectives Addressed: WQ-3, WQ-6

Priority Actions Addressed: WQ-A, WQ-C, WQ-D, WQ-E, WQ-F, WQ-N, WQ-O

Project Description: Stormwater runoff monitoring and evaluation of available options for treatment of pollutant contributions to Lake Mariana. Surface and groundwater monitoring stations will be established to allow sampling of the water table to identify nutrient contributions from septic tanks.

Strategy for Implementation: Evaluation of treatment alternatives based on the results of current monitoring of stormwater discharges from various land uses on the south side of Lake Mariana. An evaluation of the data will be performed by consultant to determine if a cost effective option exists to construct a facility for the treatment of stormwater runoff in the southern watershed.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Jay Jarvis - Project Manager

Other Project Partners: Southwest Florida Water Management District (SWFWMD) - Cooperative Funding through Peace River Basin Board; Charlotte Harbor NEP - Grant for monitoring surface runoff and surficial aquifer.

Geographic Area: Polk County - Lake Mariana on the northern portion of the Winter Haven Chain-of-Lakes.

Expected Benefits and/or Drawbacks: Identification and construction of a stormwater treatment facility to reduce the pollutant loads to Lake Mariana.

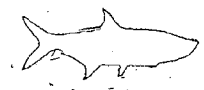
Project Timeline/Schedule: This is a multi-phase project for data collection and evaluation, land acquisition, and design of a treatment system. Polk County has entered into the monitoring phase and is collecting stormwater runoff data from three separate land use areas that discharge to Lake Mariana. Cooperative funding for data evaluation and feasibility determination has been requested from Southwest Florida Water Management District (SWFWMD) for FY 1999-2000. Additional funding will need to be obtained in FY 2001 for design and construction.

Status: Monitoring in progress. Water quality data will be published in a final report which will be available to the public.

Resources/Funding
Available: Phase I - $22,500 Southwest Florida Water Management District (SWFWMD)/ $22,500 Polk County (plus $46,200 in-ind services)/ $10,000 Charlotte Harbor NEP.
Needed: Phase II - $375,000 for Feasibility Determination & Land Acquisition (proposed cooperative funding between Polk County & SWFWMD/Peace River Basin Board).
Phase III - $350,000 for construction (based on results of feasibility determination).
Phase IV - $30,000 for evaluation of the effects of public education as a source control.
Potential: Phase II funding currently under review.

Reference Documents: "Lake Mariana Diagnostic Feasibility Study," 1996, Southwest Florida Water Management District (SWFWMD).

Comments:



Polk County Stormwater Management Program Implementation

Contact Person: Robert J. Kollinger, P.E.
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Quantifiable Objectives Addressed: WQ-1, WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-C, WQ-D, WQ-E, WQ-N, WQ-O

Project Description: A Stormwater Management Program was developed and implemented by Polk County in compliance with the National Pollutant Discharge Elimination System (NPDES) stormwater permit issued by the Environmental Protection Agency (EPA). The program provides for inspection and maintenance of stormwater facilities and identification and elimination of illicit discharges to the storm sewer system. Monitoring of stormwater runoff is performed to determine loading to receiving waters. Public education efforts are focused on reducing non-point sources of pollution and control of sediment deposition from erosion at construction sites.

Strategy for Implementation: The program is implemented in accordance with the schedule provided in the five year permit term. Polk County is currently monitoring the efficiencies of specific storm water retrofit projects, and is monitoring one ambient monitoring station for atmospheric deposition. The County will consider modifying the monitoring programs to fill data gaps, where practical.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert J. Kollinger, P.E.

Other Project Partners: Polk County is a Co-Permittee with the 17 cities within the county and the Florida Department of Transportation - District 1.

Geographic Area: Polk County - including the Peace River watershed.

Expected Benefits and/or Drawbacks: Reduction in pollutant loads to receiving waters.

Project Timeline/Schedule: Permit was effective March 1, 1996.

Status: Stormwater Management Program was implemented prior to the March 1, 1996 permit date.

Resources/Funding
Available: Funded by Polk County and the National Pollutant Discharge Elimination System (NPDES) Co-Permittees.
Needed:
Potential:

Reference Documents: National Pollutant Discharge Elimination System (NPDES) Stormwater Permit No. FLS 000015.

Comments:

Peace Creek Canal/Wahneta - Regional Drainage System Enhancement

Contact Person: Robert Wisemen, P.E.
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4, FW-2

Priority Actions Addressed: HA-F, HA-Q, FW-A, FW-C

Project Description: Restore hydrology and improve drainage of the regional system serving the Wahneta Farms Drainage District and the Peace Creek Canal.

Strategy for Implementation: Coordination with the Southwest Florida Water Management District (SWFWMD) staff for identification of areas needing immediate maintenance. Contract with an engineering consultant to complete a watershed assessment and for design and permitting of portions of the project area requiring Environmental Resources Permits. An electronic water level collection/transmission station (SCADA) will be installed to monitor water elevations.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert Wisemen, P.E., Water Resources Manager.

Other Project Partners: Southwest Florida Water Management District (SWFWMD) - Resource Projects Section – Brooksville.

Geographic Area: Peace Creek Canal - Winter Haven, FL.

Expected Benefits and/or Drawbacks: Improved drainage within the urbanized portions of the watershed for flood control with redevelopment of wetland areas for storage and treatment of stormwater runoff.

Project Timeline/Schedule: Field investigation for watershed assessment began February 1998 with estimated completion in 2001.

Status: Project in progress, initial field investigation complete and immediate maintenance performed. Design of alterations to the system are being prepared for permitting and construction.

Resources/Funding
Available: Cooperatively funded by Southwest Florida Water Management District (SWFWMD), (Peace River Basin Board) & Polk County - $1.875 million total.
$80,000 - Immediate maintenance.
Phase I - $120,000 for watershed evaluation,
Phase II - $175,000 for design and permitting; $1,000,000 for easement acquisition and continued maintenance.
Phase III - $500,000 for construction.
Needed:
Potential:

Reference Documents:

Comments: This project is proceeding under a contract with Parsons Engineering Science – Tampa; Walid Hatoum, P.E. - Project Coordinator.

Stormwater Videos For Public Education

Contact Person: **Robert J. Kollinger, P.E.**
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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B, WQ-N

Project Description: Provide access to recently developed educational videos and printed material on stormwater and floodplain management. Videos include:

1. *Stormwater - A Mixed Blessing* - 16 minutes;
2. *Floodplain Facts - A Buyers Guide* - 16 minutes; and
3. *A Developers Guide to Stormwater Management* - 17 minutes.

Strategy for Implementation: Videos were produced for use at schools and various public events (e.g. Earth Day) and have been distributed to local libraries within Polk County. Additionally, they will be shown on the local cable access channel following County Commission meetings.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage/ Robert J. Kollinger, P.E.

Other Project Partners: Southwest Florida Water Management District (SWFWMD)/Phoenix McKinney - Education Section, Lakes Education/ Action Drive (LE/AD).

Geographic Area: Polk County and central Florida.

Expected Benefits and/or Drawbacks: Inform the public of the effects of stormwater pollution on surface water and identify concerns over illicit discharges of material to the storm sewer system. Encourage a reduction in non-point sources of pollutants.

Project Timeline/Schedule: Video Project was completed in 1998 and supporting brochures were printed. The Videos are currently available by contacting the Natural Resources and Drainage Division of Polk County.

Status: On going implementation.

Resources/Funding
Available: Contacts for disseminating this information to the public is encouraged.
Needed:
Potential:

Reference Documents:

Comments:

Lake Parker/Saddle Creek - Regional Drainage Project

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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4, FW-2

Priority Actions Addressed: HA-F, FW-A, FW-C

Project Description: Restore hydrology and improve drainage of the regional system serving the Saddle Creek watershed from Lake Parker to Lake Hancock.

Strategy for Implementation: Coordination with the Southwest Florida Water Management District (SWFWMD) staff for identification of areas needing immediate maintenance. Contract with an engineering consultant to complete a watershed assessment and for design and permitting of portions of the project area requiring Environmental Resources Permits. An electronic water level data/transmission station (SCADA) will be installed to monitor water elevations.

Responsible Partner and Project Coordinator: Polk County Natural Resources and Drainage Division/ Robert Wisemen, P.E., Water Resources Manager.

Other Project Partners: Southwest Florida Water Management District (SWFWMD) - Resource Projects Section - Brooksville.

Geographic Area: Central Polk County.

Expected Benefits and/or Drawbacks: Improved drainage within the urbanized portions of the watershed for flood control with redevelopment of wetland areas for storage and treatment of stormwater runoff.

Project Timeline/Schedule: Board of County Commissioners approval was obtained in early 1999 to contract with Keith and Schnars, P.A., to perform the initial field surveys in preparation of the watershed analysis. Project timeline is four years with estimated completion in 2002.

Status: In progress.

Resources/Funding
Available: Cooperatively funded by Southwest Florida Water Management District (SWFWMD) and Polk County - $3 million total.

Phase I - $60,000 for watershed evaluation;
Phase II - $50,000 for surveying and watershed modeling;
Phase III - $2.09 million for design, permitting and construction; and
Phase IV - $800,000 for continued maintenance.

Needed: N/A.
Potential: N/A.

Reference Documents: "Lake Parker Diagnostic and Feasibility Study", 1993. Southwest Florida Water Management District (SWFWMD).

Comments: Proposed mining of Lake Hancock has been put on hold indefinitely. Reducing the current pollutant loads from the Saddle Creek watershed should aid in restoring lake water quality.

Environmental Landscape Management Education Program

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Quantifiable Objectives Addressed: WQ-6

Priority Actions Addressed: WQ-B, WQ-E, WQ-I, WQ-N

Project Description: On-going educational program to encourage adoption of environmentally sound landscape management practices by homeowners, landscapers, lawn maintenance service providers, and retail nurseries. Includes implementation of Florida Yards and Neighborhoods Program if adequate resources are budgeted.

Strategy for Implementation: Workshops are held for professionals as well as the general public. Newsletter is prepared and mailed monthly. Master Gardener Volunteers are trained and assist with outreach. Hire part-time Florida Yards and Neighborhoods Coordinator.

Responsible Partner and Project Coordinator: Polk County Cooperative Extension Service Nathan Williams, Extension Agent.

Other Project Partners: Polk County Board of County Commissioners, Institute of Food and Agricultural Science, University of Florida.

Geographic Area: Polk County.

Expected Benefits and/or Drawbacks: As homeowners, landscapers, lawn maintenance service providers, and retail nurseries increase awareness and understanding of potential environment impacts related to inefficient management practices, they will shift practices to adopt more efficient practices that in turn are more environmental friendly.

Project Timeline/Schedule: Year around educational program already in place and ongoing.

Status: Assuming funding and cooperative agreements between Board of County Commissioners and Institute of Food and Agriculture Sciences (IFAS) continue as is, this program should be on-going.

Resources/Funding
Available: Regular budget item Polk Board of County Commissioners and the Institute of Food and Agricultural Sciences (IFAS).
Needed:
Potential:

Reference Documents: Numerous fact sheets, circulars, and bulletins are available to supplement this program.

Comments:

Polk County Extension Water School

Contact Person: John Brenneman
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Quantifiable Objectives Addressed: HA-3, HA-4, WQ-1, WQ-3 WQ-4, WQ-5, WQ-6, WQ-7

Priority Actions Addressed: HA-A, HA-B, HA-C, HA-D, HA-H, WQ-I, WQ-N, WQ-E, WQ-B

Project Description: Hold a water policy and issues school for community leaders and decision makers to familiarize them with current issues and policies affecting water quality and quantity.

Strategy for Implementation: Extension will hold a multi-session school for current elected officials, agency employees, community leaders, and other interested citizens. Agencies such as the Southwest Florida Water Management District (SWFWMD), Florida Department of Environmental Protection (DEP), Charlotte Harbor National Estuary Program (NEP) and Department of Health.

Responsible Partner and Project Coordinator: Polk County Cooperative Extension Service, John Brenneman, Extension Agent.

Other Project Partners: Polk County Board of County Commissioners, Institute of Food and Agricultural Science, University of Florida, Southwest Florida Water Management District, Department of Environmental Protection, Charlotte Harbor NEP and the Department of Health.

Geographic Area: Polk County.

Expected Benefits and/or Drawbacks: Familiarize participants with policy and issues of concern will help them participate in develop of programs to address the issues. Informed citizens make the best decisions.

Project Timeline/Schedule: This project is expected to be conducted in the Spring of 2000. Timing is connected to election year so candidates for public office can be targeted.

Status: Planning underway.

Resources/Funding
Available:
Needed: Funding is needed for tour and development of recruitment brochure and postage.
Potential: May be opportunity for the Water Management District and other partners to collaborate.

Reference Documents: Printed and support materials are available through the Institute of Food and Agricultural Sciences, University of Florida.

Comments:

Lakewatch

Contact Person: John Brenneman
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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-6

Priority Actions Addressed: WQ-B, WQ-C

Project Description: Lakefront residents volunteer to monitor lake. Monthly observations are made of activities on the lake and within the surrounding watershed. Volunteers take secchi reading and collect water samples at three mid-lake stations. These samples are submitted to the laboratory at the University of Florida's Department of Fisheries and Aquatic Sciences for analysis of nitrogen, phosphorus, and chlorophyll *a*. Volunteers are trained in collection protocol and also receive data periodically. Educational program includes newsletters from the state office (quarterly) and locally (bimonthly). In addition, workshops are held to discuss data obtained, as well as other topics of interest.

Strategy for Implementation: This program is on-going and has current funding for training supplies for approximately forty lakes in Polk County. With more equipment and supplies the number of lakes on the program could increase considerably, as there are approximately 550 lakes in Polk County.

Responsible Partner and Project Coordinator: Florida LAKEWATCH (University of Florida, Department of Fisheries and Aquatic Sciences), and Polk County Cooperative Extension Service, John Brenneman, Extension Agent.

Other Project Partners: N/A.

Geographic Area: Polk County.

Expected Benefits and/or Drawbacks: Data will be gathered to provide a long term monthly profile of lake nutrient enrichment. Additionally, by participating in the program, volunteers will become informed of issues relating to lake management and water quality. Advantage of volunteer program is that it is not limited by public access availability.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Currently resources are available for approximately forty lakes.
Needed: To double to eighty lakes would require an additional $10,000.
Potential: Possible with Water Management District.

Reference Documents: Florida LAKEWATCH. 1998. Department of Fisheries and Aquatic Sciences, University of Florida, Institute of Food and Agricultural Sciences, University of Florida. Gainesville, Florida. Florida LAKEWATCH Data 1997, Department of Fisheries and Aquatic Sciences, University of Florida/ Institute of Food and Agricultural Sciences, University of Florida. Gainesville, Florida. Webpage: http://www.ifas.ufl.edu/~lakewatch/index.htm.

Comments:

Farm*A*Syst/Home*A*Syst

Contact Person: John Brenneman
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Quantifiable Objectives Addressed: WQ-3, WQ-6

Priority Actions Addressed: WQ-B, WQ-E, WQ-F, WQ-N

Project Description: Individuals (i.e. farmers & homeowners with wells and septic systems) are provided information (i.e. fact sheets and self-assessments) to assist them in carrying out an evaluation of risks to well-head, groundwater, and surface water from on-site management practices.

Strategy for Implementation: This program is a voluntary, confidential educational program available to any producer or homeowner interested in evaluating risks to water quality.

Responsible Partner and Project Coordinator: Polk County Cooperative Extension Service, John Brenneman, Extension Agent.

Other Project Partners: Department of Soil and Water Science, Institute of Food and Agricultural Sciences, and University of Florida.

Geographic Area: Polk County.

Expected Benefits and/or Drawbacks: Informed agricultural producers and/or homeowners will make changes in management practices to protect water quality.

Project Timeline/Schedule: Ongoing.

Status: Ongoing but participation is limited.

Resources/Funding
Available: The Institute of Food and Agricultural Sciences provide evaluation fact sheets and assessment forms.
Needed:
Potential:

Reference Documents: Web page, and fact sheets/assessment Forms (Farm*A*Syst) along with "Florida Home*A*Syst" manual.

Comments:

Continuous Surface Water Level Monitoring Using the Southwest Florida Water Management District's Supervisory Control and Data Acquisition (SCADA) System

Contact Person: Mark A. Hammond
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Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-B, HA-C

Project Description: Installation of automated data collection and radio transfer stations to monitor water levels of selected surface waters around the Southwest Florida Water Management District (SWFWMD).

Strategy for Implementation:

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Timothy J. De Foe, Director, Resource Data Department.

Other Project Partners: Polk County Natural Resources and Drainage Division.

Geographic Area: Throughout the entire 16-county Water Management Southwest Florida Water Management District (SWFWMD) Region, including the Charlotte Harbor National Estuary Program (NEP).

Expected Benefits and/or Drawbacks: To obtain real time water level information to assist in flood control.

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Southwest Florida Water Management District (SWFWMD) Governing Board and Basin Boards.
Needed:
Potential:

Reference Documents:

Comments: The Southwest Florida Water Management District (SWFWMD) does not currently have any programs geared to address incentives for composting toilets.

Southwest Florida Water Management District's Reuse Program

Contact Person: Gregg Jones
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E-mail Address: N/A.

Quantifiable Objectives Addressed: HA-1, HA-2

Priority Actions Addressed: HA-D, HA-E, WQ-P

Project Description: The Southwest Florida Water Management District (SWFWMD) has developed an effective reuse program which includes reuse goals, regulatory policies, and two funding assistance programs. Reuse goals, set forth in the District Water Management Plan, state that the District will encourage, assist in and, where appropriate, require the development and efficient use of alternative water sources such as reclaimed water. The District's regulatory policies require all water use permittees to utilize the lowest quality of water available for the proposed use. Reclaimed water may be considered a lower quality water and must be used if the water is available and is technically and economically feasible. Reclaimed water users are provided with a backup source through the issuance of a standby permit.

The District's funding assistance programs have allocated almost $170 million for reclaimed water projects. The Cooperative Funding Program, through its eight basin boards, will typically fund up to 50 percent of the cost of design and construction; pumping, storage, and transmission facilities; and reuse master plans of selected projects. The New Water Sources Initiative Program provides funding for alternative water supply projects. Eleven of the 18 New Water Sources Initiative projects utilize reclaimed wastewater or storm water. Together, the Cooperative Funding and New Water Sources Initiative projects will provide up to 215 million gallons per day (mgd) of additional reclaimed water supplies when completed. To date, 43 of the District's 48 local governments with wastewater facilities have developed or are designing reclaimed water systems (see District's "Annual Reuse Report" and "Reuse and Retrofit Report").

Strategy for Implementation: Ongoing programs. Additional State or Federal funding may be sought in implementing future large-scale basin-wide programs.

Responsible Partner and Project Coordinator: Local governments, public and private utilities, water use permittees.

Other Project Partners: Schools, developers, industry, Federal and State agencies.

Geographic Area: District-wide including the Charlotte Harbor NEP study area.

Expected Benefits and/or Drawbacks: Conservation and protection of water resources (all projects listed); reduction in groundwater reliance (reclaimed water projects, plumbing retrofit kits, irrigation rain sensor rebates, low flow toilet rebates, leak detection, xeriscape training); recharge of the aquifer (reclaimed water projects, reclaimed water aquifer storage and recovery [ASR] projects); enable more efficient utilization of reclaimed water, require advanced wastewater quality treatment, and eliminate the need for deep well disposal and wet weather discharge (reclaimed water ASR projects).

Project Time line/Schedule: Ongoing.

Status: Ongoing.

Resources/Funding
Available: Basin Boards and Governing Boards; local governments.
Needed:
Potential:

Reference Documents: Annual Reuse Report, Reuse and Retrofit Report.

Comments: The encouragement of the Manasota Basin Board to fund plumbing retrofit projects is a challenge.

Quality of Water Improvement Program (QWIP)

Contact Person: Greg McQuown
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E-mail Address: N/A

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3

Priority Actions Addressed: HA-G

Project Description: The Quality of Water Improvement Program (QWIP) was commended by the Southwest Florida Water Management District (SWFWMD) in 1974 to restore groundwater conditions altered by well drilling activities. The program coordinates well plugging between landowners, government agencies, and the industry to ensure detrimental wells are properly plugged according to statutes. The program address detrimental wells within the Southern Water Use Caution Area (SWUCA), Pinellas County, and portions of Pasco County and to date, has plugged approximately 2,411 wells, saving almost 300 million gallons per day (mgd) from waste and contamination. Locally, the program has plugged 233 wells in Charlotte County and 58 in DeSoto County. The program will continue to fund and coordinate the plugging of detrimental wells until all known detrimental wells are plugged, contingent upon funding (refer to the Artesian Well Plugging Annual Work Plan for list of wells plugged).

Strategy for Implementation: The Quality of Water Improvement Program (QWIP) procedure outlines the steps taken to participate in the well plugging reimbursement initiative offered by the Southwest Florida Water Management District (SWFWMD). To participate for up to 100% funding of a well plugging, owners must contact the QWIP for a well inspection and logging, a claim form will be forwarded to the owner with their maximum eligible reimbursement amount, relay this information to a licensed well driller and have their well plugged, forward the claim form and receipt to the Quality of Water Improvement Program (QWIP) and a check is returned usually within two weeks. The reimbursement program has increased cooperation from about 50 to about 250 wells per year. An inventory of all known and plugged wells is maintained in an annual report that is forwarded to the Department of Environmental Protection (DEP) annually.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Greg McQuown, Geohydrologic Data Section Manager.

Other Project Partners: The majority of wells addressed through the program are with individual property owners and are funded by the Southwest Florida Water Management District (SWFWMD) and their basins. Any well plugging costs in excess of program allowances are the responsibility of the landowner. The program has cooperatively funded and coordinated with local governments a few large scale well plugging projects. Also, wells located in coastal waters, canals, and rivers due to surface erosion are under the ownership of the Department of Environmental Protection (DEP). On several occasions, the program has cooperatively assisted this agency with funding well pluggings.

Geographic Area: The program is active where the ground-water aquifers are characterized as confined aquifers. This places program activity in the Southern Water Use Caution Area (SWUCA), North Tampa Bay, Pinellas County and parts of Pasco County.

Expected Benefits and/or Drawbacks: The program is restoring ground-water conditions to promote water supply conservation, water quality restorations and protection of surface water bodies from discharge of highly mineralized water from free flowing wells. The program has documented in the annual work plan of several "effectiveness measures" where water quality and water levels have been restored on a local level.

Project Time line/Schedule: The program began in 1974 as required by Florida statutes. It began with varying funding initiative from a 50/50 partnership between the Southwest Florida Water Management District (SWFWMD) and local governments and later changed to a 50/50 between SWFWMD and the landowner. In 1992, the SWFWMD authorized the program to implement a 50/50 partnership between the SWFWMD and its Basin Boards to promote landowner cooperation. This initiative increase the annual number of wells plugged from about 50 to 250 wells per year. This funding program is still in effect and will be proposed to continue until all known detrimental wells are plugged.

Status: The program and current funding initiative are in progress.

Resources/Funding
Available: Funding is offered for well plugging through the well plugging reimbursement initiative as a 50/50 funding source between the Southwest Florida Water Management District (SWFWMD) and local Basin Boards.
Needed: 50/50 funding from Basin Board and the SWFWMD; any overages are the responsibility of the landowner.
Potential: The program participates with other local governments and agencies, United States Fish and Wildlife Service (USFWS), Department of Environmental Protection, and counties, as the landowner to fund well pluggings.

Reference Documents: The annual Work plan is being placed on the Southwest Florida Water Management District (SWFWMD) webpage. The program produces its Quality of Water Improvement Program (QWIP) Annual Work Plan, which contains documents of studies and technical publications documenting the detrimental affects of Interaquifer Exchange and the positive impacts of plugging detrimental wells.

Comments: The Quality of Water Improvement Program (QWIP) is challenged with expanding its technical expertise to geophysically log all water use permitted (WUP) wells with an unknown well design for the permit file, to build a regional model of lithology and hydrology, and to collect water samples to include in the data base for a regional water quality model. The program is also available to conduct hydrologic investigations where water quality and water levels have been impacted possibly due to other local detrimental wells.

Management of Transportation Project Impacts

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Quantifiable Objectives Addressed: HA-3, WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, WQ-6

Priority Actions Addressed: HA-M, WQ-E

Project Description: New and future transportation projects are regulated via Chapter 373, Part IV, Florida Statutes. This regulatory authority, which is implemented through Chapter 40D-4, Florida Administrative Code, might require an Environmental Resource Permit (ERP).

Strategy for Implementation: An Environmental Resource Permit (ERP) is required when: 1) there is significant alteration of an existing surface water management system; 2) a new surface water management system is constructed; or 3) an existing system is abandoned. In order to receive an ERP, an applicant must demonstrate that their proposed project meets the "Conditions of Issuance," as delineated in 40D-4.301 and 40D-4.302.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Paul O'Neil, P.E., Director, Technical Services, Resource Regulation Division.

Other Project Partners: Department of Environmental Protection (DEP).

Geographic Area: Throughout the entire 16-county Southwest Florida Water Management District (SWFWMD) region, including the Charlotte Harbor National Estuary Program (NEP) boundaries.

Expected Benefits and/or Drawbacks:

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Southwest Florida Water Management District (SWFWMD) funded.
Needed:
Potential:

Reference Documents:

Comments:

Lake Hancock Water and Nutrient Budget and Lake Hancock Water Quality Improvement Project

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Quantifiable Objectives Addressed: HA-1, WQ-1, WQ-2, WQ-5

Priority Actions Addressed: HA-P, WQ-H, WQ-J, WQ-K, WQ-L

Project Description: The Peace River Basin Board approved funding in its FY 1998 budget for a Water and Nutrient Budget and Water Quality Improvement Project for Lake Hancock. Lake Hancock is located southeast of the City of Lakeland and north of the City of Bartow in Polk County. The lake was surveyed for the State in 1850 and is still publicly owned. At 4,553 acres, Lake Hancock is the largest lake associated with the Peace River, the third largest lake in Polk County, and the fourth largest in Florida. Lake Hancock has been recognized as having some of the poorest water quality in the State. The lake is considered to be eutrophic to hypereutrophic, characterized by persistent blue-green algae blooms, high nutrient concentrations and low dissolved oxygen levels in the water column, nearly 12,000 acre-feet (18 million cubic yards) of nutrient rich bottom sediments, and vegetation, fish, and wildlife populations indicative of eutrophic to hypereutrophic conditions. There has been a substantial amount of work done to assess the condition of Lake Hancock and to identify the issues that need attention culminating in a restoration strategy prepared for the lake in 1987.

The purpose of the project is to develop current water and nutrient budgets reflecting any changes in the watershed since the mid to late 1980s and identify, design and permit a project to improve the quality of water discharged from the lake into the Peace River to improve the water quality downstream from the lake and, where possible, improve the present undesirable vegetation, fish, and wildlife populations. The project is not presently anticipated to be a whole lake restoration project.

Strategy for Implementation: The Southwest Florida Water Management District (SWFWMD) has contracted with Environmental Research and Design, Inc. (ERD) to begin the development of the water and nutrient budget portion of the project. The intent of this effort is to update the existing budget that was prepared nearly 15 years ago, incorporate changes in the watersheds since then, and to evaluate in-lake nutrient loading from the sediments.

The information gathered from the updated water and nutrient budget will be used to select a water quality improvement project focusing, at this time, on improving the quality of water exiting the lake into the upper Peace River. The project is not presently anticipated to be a whole lake restoration effort. The specific technique for water quality improvement has not been predetermined and the consultant will make a recommendation as part of the scope of the project. There are several techniques for achieving the end result and most likely a combination of technologies may be proposed.

There has been some local interest in preparing a larger-scale whole lake restoration plan for Lake Hancock. The information obtained as part of this water and nutrient budget and water quality improvement project should be useful in the decision-making process for the lake restoration plan. The Southwest Florida Water Management District (SWFWMD) has assembled a small advisory committee to assist ERD with implementing the project and these same individuals will most likely be the core of any whole lake restoration evaluation effort. There is not a public consensus about the restoration goals and objectives for the lake and the public must be brought into the discussions early in the process. While the restoration plan could be prepared through close coordination with the existing agencies and interest groups around Lake Hancock, there is some discussion about seeking a legislatively backed restoration council.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Peace River Basin Board, Michael J. Perry, Senior Environmental Scientist, Project Manager.

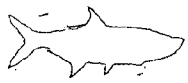
Other Project Partners: As the water quality improvement project becomes identified, the following entities could become involved in the implementation of the project: Florida Legislature; Florida Department of Environmental Protection (DEP); Florida Fish and Wildlife Conservation Commission; Imperial Polk County; IMC-Agrico Mining Company; commercial fishing interests; recreational fishing interests; environmental interest/activist groups; and Lakes Education/Action Drive.

Geographic Area: The project will focus on the Lake Hancock watershed. The water and nutrient budget portion of the project will focus on the areas draining to the lake and exiting the lake. The water quality improvement portion of the project is presently envisioned to improve the quality of the water exiting the lake. The present scope does not include evaluating the upper Peace River.

Expected Benefits and/or Drawbacks: The project will provide the most up-to-date water and nutrient budget for the lake that is the basis for making sound management and/or restoration decisions. The information gained will be utilized to select, design, and construct a project to improve the quality of water exiting the lake and entering the upper Peace River. Improvement to the quality of water leaving Lake Hancock will be expressed as lower levels of light-limiting algae in the upper reaches of the river, reducing the treatment costs to the Peace River/Manasota Regional Water Supply Authority, and a reduction of nutrient concentration in the water entering the estuary.

Potential drawbacks could result from utilizing a portion of the lake bottom for an in-lake marsh system due to the unavailability of publicly owned land around the lake. If a whole lake restoration project is proposed there may be several drawbacks including the increased turbidity in the lake and perhaps downstream if dredging is the chosen technique, perceived negative affect to the commercial fishing interests presently using the lake, and length of time the lake may be drawn down to facilitate restoration.

Project Timeline/Schedule: The water and nutrient budget and water quality improvement project is underway with the water and nutrient budget phase to be completed in late fall/winter 1999 or early 2000. The water quality improvement project phase will run as concurrently as possible with design, permitting to begin in late FY 1999 or early FY 2000 with construction proposed for late FY 2000 or early FY 2001.



Status: The Water and Nutrient Budget and Water Quality Improvement Project is in progress.

Resources/Funding

Available: The Peace River Basin Board and the State of Florida through the Surface Water Improvement and Management (SWIM) funding have shared to cost of the Water and Nutrient Budget and Water Quality Improvement Project to date. Funds for construction are proposed for Basin Board and SWIM funding for FY 2000.

Needed: Depending on the type of project selected, the proposed funding may not be sufficient and other funding sources will be pursued. If a whole lake restoration project is to be undertaken the cost will be very high and no funding sources have yet been identified.

Potential: Funding for a water quality improvement project for water exiting the lake could be available from the Peace River Basin Board and State SWIM funding. Funding for a larger scale whole lake restoration project will need to be a collaborative effort between the federal government, through the Charlotte Harbor National Estuary Program (NEP), the state legislature and/or appropriate state agencies, Polk County, perhaps the mining industry, and other federal, state and regional sources of funds as yet unidentified.

Reference Documents: The most current and complete reference document for the restoration of the lake would be: Zellars-Williams Company, 1987, Lake Hancock Restoration Study - Final Report, Prepared for the Florida Institute of Phosphate Research (FIPR), FIPR No. 86-04-034, Corps of Engineers (COE) Contract No. 087-045, FIPR-OFR-86-04-034, December 1987; other documents include the Request for Proposal and the contract documents for the Southwest Florida Water Management District's (SWFWMD's) Water and Nutrient Budget and Water Quality Improvement Project.

Comments: There is not a public consensus about the restoration goals and objectives for the lake. While a restoration plan could be prepared through close coordination with the existing agencies and interest groups around Lake Hancock, there is some discussion about seeking a legislatively backed restoration council. The public must be included in this process and a measurable set of restoration goals must be established to allow for the selection of the most appropriate restoration technique.

Further Refinement of a Pollutant Load Reduction Goal for Charlotte Harbor

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Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3

Priority Actions Addressed: WQ-C, WQ-N

Project Description: In Charlotte Harbor, the development of a resource-based Pollutant Load Reduction Goals (PLRG) has been problematic. After examining the relationships between nitrogen loads and eutrophication indicators (i.e., chlorophyll *a* concentrations and Trophic State Index [TSI] values) through the use of both empirical and mechanistic modeling techniques, Pribble et al. (1997) found no direct relationship between nutrient loads and any indicators of eutrophication in Charlotte Harbor. The Southwest Florida Water Management District (SWFWMD) has contracted with faculty and staff from Louisiana State University (LSU) to conduct a study to try and reconstruct historic trends in hypoxia in the Charlotte Harbor, based on determining the status and trends in organic loading to bottom sediments.

Strategy for Implementation: The project is fully funded and currently underway.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD).

Other Project Partners: Louisiana State University.

Geographic Area: Upper Charlotte Harbor and the lower reaches of the Peace and Myakka Rivers.

Expected Benefits and/or Drawbacks: The project could develop a scientifically defensible resource-based pollutant load reduction goal.

Project Timeline/Schedule: The initial fieldwork was completed in summer 1998, and efforts to construct a date-sediment depth relationship are expected to be finalized in spring 1999.

Status: In progress.

Resources/Funding
Available:
Needed: Fully funded.
Potential: Not applicable.

Reference Documents: Report not completed.

Comments:

Ongoing Water Quality Monitoring Program in Charlotte Harbor

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E-mail Address: N/A

Quantifiable Objectives Addressed: WQ-1, WQ-2, WQ-3

Priority Actions Addressed: WQ-D

Project Description: In Charlotte Harbor, the development of a resource-based Pollutant Load Reducation Goals (PLRG) has been problematic. After examining the relationships between nitrogen loads and eutrophication indicators (i.e., chlorophyll *a* concentrations and Trophic State Index (TSI) values through the use of both empirical and mechanistic modeling techniques, Pribble et al. (1997) found no direct relationship between nutrient loads and any indicators of eutrophication in Charlotte Harbor. The Southwest Florida Water Management District (SWFWMD) has contracted with faculty and staff from Louisiana State University (LSU) to conduct a study to try and reconstruct historic trends in hypoxia in Charlotte Harbor, based on determining the status and trends in organic loading to bottom sediments. As part of an interim project, SWFWMD staff, assisted by staff of the Department of Environmental Protection (DEP), have been monitoring water quality at 13 locations in Charlotte Harbor and the lower reaches of the Peace and Myakka Rivers since 1993. Data are collected monthly, and include inorganic and organic species of both nitrogen and phosphorus, as well as chlorophyll levels.

Strategy for Implementation: The project is fully funded and currently underway.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD).

Other Project Partners: Department of Environmental Protection (DEP), Environmental Quality Laboratory, Charlotte Harbor Environmental Center (CHEC).

Geographic Area: Upper Charlotte Harbor and the lower reaches of the Peace and Myakka Rivers.

Expected Benefits and/or Drawbacks: The project is designed to aid in the development of a scientifically defensible resource-based pollutant load reduction goal.

Project Timeline/Schedule: The initial fieldwork was started in 1993. Monitoring is ongoing, and will continue until at least September 2000.

Status: In progress.
Resources/Funding
Available:
Needed: Fully funded.
Potential: Not applicable.

Reference Documents: Final Report not completed, however, data have been summarized in Morrison et al. (1998 - Charlotte Harbor Technical Conference Proceedings).

Comments: This interim monitoring project is funded. The comprehensive long-term monitoring program is expected to be developed by the Charlotte Harbor National Estuary Program (NEP) and the Southwest Florida Water Management District (SWFWMD) anticipates some involvement in implementation.

Estimates of Total Nitrogen, Total Phosphorus, and Total Suspended Solids Loadings To Charlotte Harbor, Florida

Contact Person: David A. Tomasko
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E-mail Address: N/A

Quantifiable Objectives Addressed: WQ-3

Priority Actions Addressed: WQ-O

Project Description: At least two pollutant loading models have been developed for Charlotte Harbor. The first effort (Hammett 1990) developed loading estimates based on measured flows and measured nutrient concentrations at various gage locations in the Peace and Myakka Rivers, and by extrapolating these relationships to those portions of the watershed that are ungaged. The second pollutant-loading model for Charlotte Harbor was produced by Coastal Environmental, Inc. (1995). This effort also estimated the contributions of atmospheric deposition in the Charlotte Harbor watershed to nitrogen, phosphorus, and total suspended solids loads. Overall, atmospheric deposition was approximately 19 percent of the 1992 nitrogen loads.

Strategy for Implementation: The project was completed in 1995.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD).

Other Project Partners: Coastal Environmental, Inc. (now Post, Buckley, Schuh & Jernigan, Inc.).

Geographic Area: Charlotte Harbor and its watershed.

Expected Benefits and/or Drawbacks: The project was designed to determine the relative pollution loads generated by septic tank systems, non-point sources, point sources, baseflow and atmospheric deposition.

Project Timeline/Schedule: The project was completed in 1995.

Status: Completed.

Resources/Funding
Available:
Needed: Fully funded.
Potential: Not applicable.

Reference Documents: Final Report available as: Coastal Environmental, Inc. 1995 b. Estimates of Total Nitrogen, Total Phosphorus, and Total Suspended Solid Loadings to Charlotte Harbor, Florida. Final Report to: Surface Water Improvement and Management (SWIM) Section, Southwest Florida Water Management District (SWFWMD), Tampa.

Comments:

Habitat Restoration, Including Projects on Don Pedro Island, Cape Haze Peninsula, Punta Gorda Isles, and the Alligator Creek Addition of the Charlotte Harbor Buffer Preserve

Contact Person:	**David A. Tomasko**
Title:	Senior Environmental Scientist
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E-mail Address:	N/A

Quantifiable Objectives Addressed: FW-2, FW-4

Priority Actions Addressed: FW-A, FW-B, FW-C

Project Description: The Southwest Florida Water Management District (SWFWMD) works with the state, local governments and other agencies to plan, design, and construct habitat restoration projects. For example, at Don Pedro Island, the SWFWMD and the Florida Parks Service have combined efforts to remove exotic vegetation from the entire barrier island portion of Don Pedro Island State Park and adjacent areas. At Cape Haze, the SWFWMD and Charlotte County have combined efforts to remove Melaleuca (*Melaleuca quinquenervia*) trees from approximately 160 acres of the peninsula. At Punta Gorda Isles, the SWFWMD combined efforts with the City of Punta Gorda and money from the Charlotte Harbor National Estuary Program (NEP) to remove exotic vegetation from one acre of disturbed wetlands and restore the historic tidal flow to approximately 20 acres of disturbed wetlands. At the Alligator Creek Addition of the Charlotte Harbor Buffer Preserve, the SWFWMD has entered into a Memorandum of Understanding with the Department of Environmental Protection (DEP) so that the SWFWMD will pay for consultant services to develop an overall master plan for the approximately 1,600-acre site, and design and obtain permits for two wetland restoration projects of approximately 10 acres each.

Strategy for Implementation: The specific projects mentioned are either completed (Punta Gorda) or underway. Additional projects may be identified in the Southwest Florida Water Management District's (SWFWMD's) Five-Year Plan updates, Surface Water Improvement and Management (SWIM) Plan updates, or through the Cooperative Funding Program.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD).

Other Project Partners: Florida Parks Service, Department of Environmental Protection (DEP) Aquatic Preserves, City of Punta Gorda, Charlotte Harbor Environmental Center (CHEC), Charlotte Harbor NEP, Charlotte County.

Geographic Area: Charlotte Harbor and its immediate watershed.

Expected Benefits and/or Drawbacks: These projects are designed to restore the hydrology and/or native plant cover for previously disturbed uplands and wetlands in the Charlotte Harbor watershed.

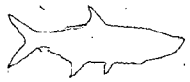
Project Timeline/Schedule: The specific projects mentioned are either completed (Punta Gorda) or underway. Additional projects may be identified in the Southwest Florida Water Management District's (SWFWMD's) Five-Year Plan updates, Surface Water Improvement and Management (SWIM) Plan updates, or through the Cooperative Funding Program.

Status: The specific projects mentioned are either completed (Punta Gorda) or underway. Additional projects may be identified in the Southwest Florida Water Management District's (SWFWMD's) Five-Year Plan updates, Surface Water Improvement and Management (SWIM) Plan updates, or through the Cooperative Funding Program.

Resources/Funding
Available:
Needed: Fully funded for all but the Alligator Creek Addition of the Charlotte Harbor Buffer Preserve.
Potential: Southwest Florida Water Management District's (SWFWMD's) Cooperative Funding Program, Surface Water Improvement and Management (SWIM) Funds.

Reference Documents: Not applicable.

Comments:



Ongoing Seagrass Mapping Efforts in Lemon Bay and Charlotte Harbor

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FAX Number: (813) 987-6747
E-mail Address: N/A

Quantifiable Objectives Addressed: FW-2, FW-3

Priority Actions Addressed: FW-M, FW-P, FW-R, FW-V

Project Description: Currently, the Southwest Florida Water Management District (SWFWMD) maps seagrass distribution in Tampa Bay, Sarasota Bay, Lemon Bay and Charlotte Harbor approximately every two years. Results from this project can be used to assist other agencies in preserving and improving seagrass and oyster bar communities.

Strategy for Implementation: This project is ongoing.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD) for tasks described in "Project Description", other agencies, notably the Department of Environmental Protection (DEP) for tasks described in "Priority Actions Addressed."

Other Project Partners: Department of Environmental Protection (DEP), various local governments.

Geographic Area: Charlotte Harbor and the lower reaches of the Peace and Myakka Rivers.

Expected Benefits and/or Drawbacks: Southwest Florida Water Management District (SWFWMD) projects can be used to inform other agencies on the status and/or trends in seagrass coverage and/or water quality.

Project Timeline/Schedule: This project is ongoing.

Status: This project is ongoing.

Resources/Funding
Available:
Needed: Fully funded.
Potential: Southwest Florida Water Management District's (SWFWMD's) Cooperative Funding Program.

Reference Documents: Not applicable.

Comments:

Site Identification/Land Acquisition

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Quantifiable Objectives Addressed: FW-1

Priority Actions Addressed: FW-S, FW-U

Project Description: The Southwest Florida Water Management District (SWFWMD) purchases lands through the Save Our Rivers (SOR) and Preservation 2000 (P-2000) programs. The SWFWMD Land Acquisition Program targets lands of regional significance for water management, water supply and the conservation and protection of water resources (see Southwest Florida Water Management District's [SWFWMD's] SOR/P-2000 Five-Year Plan).

Strategy for Implementation: Annually the Southwest Florida Water Management District (SWFWMD) Governing Board adopts its Save Our Rivers/Preservation 2000 Five-Year Plan, which, in essence, is its land acquisition plan. This plan identifies those properties which are authorized for acquisition, whether in fee simple or less-than-fee simple, and those properties which require a formal resource evaluation to determine if acquisition is warranted.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Ron Daniel, Land Acquisition Manager.

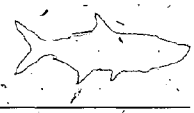
Other Project Partners: Department of Environmental Protection (DEP) and local governments.

Geographic Area: Throughout the entire 16-county water management Southwest Florida Water Management District (SWFWMD) region, including the Charlotte Harbor National Estuary Program (NEP) boundaries.

Expected Benefits and/or Drawbacks: The most obvious benefit of public acquisition of conservation lands is the preservation of large natural areas for future generations. In the case of the water management Southwest Florida Water Management District's (SWFWMD's), lands necessary for water supply protection, water quality and flood protection are also of primary benefit. Drawbacks include removing property from county tax rolls, thus potentially impacting a county's revenue stream.

Project Timeline/Schedule: The Southwest Florida Water Management District (SWFWMD) Land Acquisition Program began in the 1960s and will continue into the foreseeable future.

Status: In progress.



Resources/Funding
Available: Funding is currently available through the Water Management Lands Trust Fund and the Preservation 2000 Trust Fund.
Needed:
Potential: There is potential funding from local governments' environmentally sensitive land acquisition programs.

Reference Documents: Southwest Florida Water Management District's (SWFWMD's) Save Our Rivers / Preservation 2000 Five-Year Plan.

Comments:

1998 Minimum Flows And Levels (MFL) Priority List And Schedule

Contact Person: B. Terry Johnson
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Quantifiable Objectives Addressed: HA-1

Priority Actions Addressed: HA-A

Project Description: The minimum flows and levels (MFL) Priority List, approved by the District Governing Board on October 27, 1998, identifies the waterbodies and timing for establishment of minimum flows and levels for lakes, aquifers and flowing watercourses. This is a statutory charge to the District and is based on the importance of waters to the State or region, the existence of or potential for significant harm to the water resources or ecology of the State or region and includes those waters which are experiencing or may reasonably be expected to experience adverse impacts. The List is updated annually.

Strategy for Implementation: The priority list allows the District to anticipate the establishment of minimum flows and levels (MFLs) for the subject waterbodies (Myakka and Peace rivers, including Horse, Joshua and Shell creeks) so that data collection and analysis can be accomplished in a timely manner. This data is gathered by the District and others, including permittees where appropriate (e.g. the Peace River/Manasota Regional Water Supply Authority for the Peace River). The determination of the exact locations and methodologies to be used for each waterbody is a separate process from the development of the priority list, and is undertaken by District technical staff and consultants, with substantial input from affected parties.

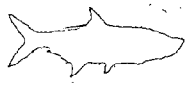
Responsible Partner and Project Coordinator: Southwest Florida Water Management District / Resource Conservation and Development Department. Contact: Gregg Jones, Director.

Other Project Partners: Permittees (where applicable); Florida Department of Environmental Protection.

Geographic Area: The Peace River and its associated tributaries are in the Peace River Basin, while the Myakka River is in the Myakka River Basin.

Expected Benefits and/or Drawbacks: Minimum flows and levels (MFLs) will provide appropriate criteria to prevent future overuse and allow for long-term planning of regional needs and sources, as well as maintaining and recharging surficial aquifers.

Project Timeline/Schedule: The Upper Peace River is scheduled for establishment by 2001, the Middle and Lower Peace River (including Shell, Horse and Joshua creeks) between 2002 and 2005, and the Myakka River is slated for establishment between 2011 and 2015.



Status: All noted waterbodies are planned on the minimum flows and levels (MFLs) Priority List and Schedule.

Resources/Funding
Available: Staff time and consultant funding regularly budgeted by the District for establishment.
Needed:
Potential: Permit conditions (where appropriate).

Reference Documents: Information on minimum flows and levels (MFLs) established to date (from technical reports and studies to monitoring data and District rules) are readily available. Caution should be used in attempting to project that the methodology used in one area (e.g. Northern Tampa Bay) will be applicable in other areas. Establishment of minimum flows and levels (MFLs) is highly specific to the waterbody being studied and established.

Comments: Experience to date has shown that the establishment of any minimum flows and levels (MFLs) is likely to be controversial in that it may affect at least the perception of the availability of water supply. One impact of this has been requests for peer review (now a standard feature for all waterbodies on the priority list) and administrative challenges which significantly slow the process and involve the same technical staff that would normally be moving on to the next scheduled waterbody.

Ongoing Efforts to Restore the Hydrology of the Upper Myakka River Watershed

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Quantifiable Objectives Addressed: HA-2, FW-2

Priority Actions Addressed: HA-C, HA-D, WQ-E, WQ-P

Project Description: In the Flatford Swamp and Upper Myakka River watershed, recently completed and ongoing efforts have focused on developing a response to the issue of excessive tree mortality. Irrigation water seeping off-site from agricultural land uses in the watershed are preventing the Flatford Swamp and other areas from drying out to the extent that historically occurred. In response, more than 2,500 acres of hardwood forest have experienced increased stress and/or mortality. Ongoing efforts are focused on: 1) monitoring streamflow and water quality in the major tributaries to the swamp; 2) updating the tree mortality estimates; and 3) determining the causes of tree mortality within the boundaries of Myakka River State Park. Additional efforts are focused on developing cooperative projects with area farmers to reduce the amount of off-site movement of irrigation water by increasing the efficiency of various agricultural practices.

Strategy for Implementation: Projects are presently funded, and currently underway.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD).

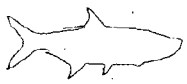
Other Project Partners: U.S. Geological Survey; Post, Buckley, Schuh & Jernigan, Inc.; and the University of South Florida

Geographic Area: Upper Myakka River watershed.

Expected Benefits and/or Drawbacks: These projects are designed to develop a scientifically-defensible flow reduction goal for responding to the problem of excessive tree mortality in the Upper Myakka River watershed.

Project Timeline/Schedule: Field work had been ongoing since December 1997. Water quality and quantity data acquisition efforts will be long-term efforts with periodic data summaries. Tree mortality acreage estimates are expected in early summer 1999. The tree mortality study in Myakka River State Park is expected in spring 2000.

Status: In progress.



Resources/Funding
Available:
Needed:
Potential Funding:

Reference Documents: "Tree mortality assessment of the Upper Myakka River watershed." 1998. Coastal Environmental, Inc. Final Report to: Southwest Florida Water Management District (SWFWMD), 2379 Broad Street, Brooksville, FL 34609.

Comments: Ongoing efforts include the Institute for Food and Agricultural Sciences, the Florida Farm Bureau, the Myakka River State Park, and the Florida Department of Agricultural and Consumer Services.

Communications Program

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FAX Number: (352) 754-6883
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, HA-4

Priority Actions Addressed: HA-I, HA-J, HA-K, WQ-B, FW-T

Project Description: The District's Communication Program includes in-school education, public education programs and initiatives, cooperative funding of education projects with local governments, overall supervision of the Speakers Bureau and Outreach activities, special events, public information, and media coordination.

Strategy for Implementation: *Water Resource Issues*: The District routinely works with both print and electronic media to develop and distribute via the media commentary related to water resource issues. A "Journalist's Guide the District" includes a set of issue papers that are updated annually. These papers are distributed to the public at special events, in response to query and through the District's Web site. Current issue oriented videos in production address issues related to prescribed burns and agricultural technologies links to water resource preservation. The District has a portable display for each of its Basins that explain the role of our Basin Boards along with some general information about the water resources within the basin.

Water Conservation: The District annually develops and airs conservation electronic public service announcements (PSAs) across the 16-county area it serves. This effort is supplemented by the distribution of print conservation materials at special events and the placement of print conservation PSAs in chamber guides, area maps, and other specialty publications. The District also is partnering with the University of Florida in this fiscal year to make water and energy conservation materials and training available to the public and to builders, developers and realtors through the University's "Build Green, Sell Green and Buy Green" workshops, which are offered through county extension services. The District has portable displays related to Xeriscape, which is a conservation and water protection landscaping technique that focuses on one of the major uses for potable water, outdoor irrigation.

Water Use: The District last year piloted a master water conservation curriculum and workshop to teach homeowners water conservation methods and techniques. Workshops will be offered in five locations within the District in this fiscal year, including one workshop in the Charlotte Harbor area. In future years, plans are underway to develop materials for at-home use and to place the curriculum on a distance learning Web site to increase availability. A non-District resource is the Home*A*Syst program from the University of Florida (IFAS), which guides homeowners on well systems through a water quality assessment and action program.

The District annually offers a public education community grant program to increase general public awareness about water resource issues, to include water quality. Through the program, community demonstration projects can and are developed. Additionally, the District partners with Charlotte Harbor Environmental Center (CHEC), county extension services and local organizations and associations throughout the Peace River Basin to provide water quality information to the public through the Florida Yards & Neighborhoods and environmental landscape management programs. A rack card related to the selection and use of fertilizers is nearing completion.

The District recently partnered with the Nature Conservancy program at Lake Wales Ridge to produce an ecosystem protection booklet. We also have portable displays related to the Florida Black Bear and the control and management of exotic species. A prescribed burn video is in production.

Responsible Partner and Project Coordinator: Sandra Haley, Manager, Communications Department.

Other Project Partners: National Estuary Program, Local Governments, Charlotte Harbor Environmental Center, State agencies, and others.

Geographic Area: Throughout the sixteen county water management district region including the National Estuary Program study area.

Expected Benefits and/or Drawbacks:

Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: Annual District appropriations.
Needed: Special projects.
Potential:

Reference Documents:

Comments:

Surface Water Improvement And Management (SWIM) Program

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E-mail Address: mark.hammond@swfwmd.state.fl.us

Quantifiable Objectives Addressed: HA-1, HA-2, HA-3, & HA-4

Priority Actions Addressed: HA-F, HA-Q

Project Description: In 1987, the Florida Legislature enacted the Surface Water Improvement and Management (SWIM) Act because they recognized that water quality in surface water bodies throughout the state had degraded or was in danger of being degraded. The SWIM Act identified important functions of the surface waters which included providing aesthetic and recreational pleasure for the state's citizens; habitat for native plants and animals; and safe drinking water for the state's growing population as well as attracting visitors and accruing other economic benefits. The District is required to develop plans and programs for the improvement of the SWIM priority water bodies. The SWIM plan will be updated following the completion of the *Comprehensive Conservation Management Plan* to reflect the long-term goals of the National Estuary Program.

Strategy for Implementation: Work with the National Estuary Program, local governments, State, and others to develop and implement projects to restore impacted areas of the watershed.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District (SWFWMD), Mark A. Hammond, Surface Water Improvement and Management (SWIM) Program Manager.

Other Project Partners: State, local governments, Charlotte Harbor NEP, and others.

Geographic Area: The National Estuary Program study area.

Expected Benefits and/or Drawbacks: Implementation of these projects should directly restore impacted areas in the watershed.

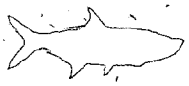
Project Timeline/Schedule: Ongoing.

Status: In progress.

Resources/Funding
Available: District basin boards, State Surface Water Improvement and Management (SWIM) Trust Fund, and local governments.
Needed:
Potential:

Reference Documents: District Priority List and Charlotte Harbor Surface Water Improvement and Management (SWIM) plan.

Comments:



Southern Water Use Caution Area (SWUCA)

Contact Person: B. Terry Johnson
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Quantifiable Objectives Addressed: HA-1, HA-2, HA-3

Priority Actions Addressed: HA-A, HA-C, HA-H

Project Description: The Southwest Florida Water Management District (SWFWMD) has begun anew the process of developing a management plan for the Southern Water Use Caution Area (SWUCA). This has included the creation of a "Conceptual Management Strategy" approved by the SWFWMD Governing Board for purposes of public input, and the creation of the Southern Water Use Caution Area (SWUCA) Working Group as the primary vehicle for affected party feedback and advice to this process. The main resource constraints in the Southern Water Use Caution Area (SWUCA) are saltwater intrusion in the Floridan Aquifer and lowered lake levels along the Highlands Ridge. All users, including agriculture, public supply, mining/industrial and recreation will need to assure high water use efficiency and possible use of alternative sources to groundwater.

Technical evaluations include investigating effects of lowered ground-water levels on seawater intrusion and lowered surficial aquifer levels (especially along the Highlands Ridge), and determining the regionality of the intermediate aquifer system. Goals for this effort include providing sound, technically defensible methodologies for establishing minimum levels in priority lakes by December 1999, establishing minimum levels for the Upper Floridan aquifer in the Southern Water Use Caution Area (SWUCA) by December 2001, and addressing the need for establishing minimum levels in the intermediate aquifer by December 2005.

Strategy for Implementation: Previous rulemaking for the Eastern Tampa Bay and Highlands Ridge Water Use Caution Area(s) (WUCAs) provide an existing regulatory framework until such time as the Southern Water Use Caution Area (SWUCA) Management Plan is completed. It is likely further rulemaking will occur after completion of the comprehensive management plan. Overall, the strategy can be characterized as attempting to balance regulation with water resource development and appropriate incentives so as to achieve sustainable supplies from the Floridan and all other sources. The result will be assurance of present and future water supplies for all reasonable and beneficial uses, including those for natural systems.

In October 1998, the Southwest Florida Water Management District (SWFWMD) initiated development of a water supply plan for three of the planning regions that either in whole or part comprise the Southern Water Use Caution Area Southern Water Use Caution Area (SWUCA). In addition, the SWFWMD formed a Work Group comprised of representatives of affected parties in the region.

The Work Group will provide external input to the District for development of the water management plan for the SWUCA. The water supply planning effort will include identification of projects to enhance water supply sources in the region and bring new sources of water online to satisfy future demands in the region. Projects to restore natural systems will also be investigated and developed. Regional declines in ground-water levels will be addressed for the Upper Floridan aquifer by December 2001. A recovery plan and prevention strategy to achieve minimum flows and levels adopted for the region will be incorporated into the water supply plan that will be revised once every five years.

Responsible Partner and Project Coordinator: Southwest Florida Water Management District, Richard S. Owen, Planning Director.

Other Project Partners: Permittees; Local Governments.

Geographic Area: The Southern Water Use Caution Area (SWUCA) encompasses about 5,100 square miles in the southern half of the Southwest Florida Water Management District (SWFWMD), and includes all or part of eight counties. This area overlays the southern ground water basin.

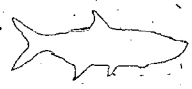
Expected Benefits and/or Drawbacks: Achievement of sustainable supplies from the Floridan Aquifer (by far the primary source of supply at present) will benefit all users, including the environment. Lake levels along the ridge will also benefit through the avoidance of significant drawdowns related to groundwater withdrawals.

Project Timeline/Schedule: The Southern Water Use Caution Area (SWUCA) Management Plan is expected to be brought to the Governing Board in about March 2000. Once adopted, this is likely to be followed by appropriate rulemaking as well as significant water resource development activities (over the next 10-20 years).

The water supply plan for the Southern Water Use Caution Area (SWUCA) was initiated in October 1998 and is targeted for completion in March 2000. Minimum levels in priority lakes in the region are targeted for completion by December 1999 and in the Upper Floridan aquifer are targeted for completion in December 2001.

Status: Existing Water Use Caution Area (WUCA) rules are in place now, the Conceptual Management Strategy is completed and the Southern Water Use Caution Area (SWUCA) Working Group is in progress. The eventual Management Plan can also be characterized as in progress.

Resources/Funding
Available: Staff time and consultant funding are budgeted by the District. Historically, a significant amount of investment has been made by the District and local cooperators in various types of water resource development projects. The Governing and Basin boards will continue this pattern.
Needed: Substantial funding will be needed over time to address continued water resource development.
Potential: Cooperative Funding, the New Water Sources Initiative (NWSI) and possibly State and federal funds will be leveraged to the maximum extent possible with local funds for water supplies.



Reference Documents:

Southern Water Use Caution Area Information Report; Southwest Florida Water Management District (SWFWMD), April 1998.

Southwest Florida Water Management District Water Supply Assessment, June 1998.

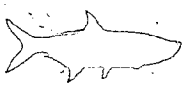
Southern Water Use Caution Area Information Report Conceptual Management Strategy; Southwest Florida Water Management District (SWFWMD), September 1998.

Comments: Continuing to expand the water supply "pie" will be a challenge, especially given the high degree of agricultural water use in the basin, but the District is committed to working with all user groups to achieve this. Development of alternative sources is the best means of protecting groundwater resources.

List of Acronyms

List of Acronyms

ABM	Agency for Bay Management (Estero Bay)
ACEE	Advisory Committee on Environmental Education
ACOE	Army Corps of Engineers
ADCP	Acoustic Doppler Current Profiler
AGWQMP	Agricultural Ground Water Quality Monitoring Program
AIRMoN	Atmospheric Integrated Research Monitoring Network
ASR	Aquifer Storage and Recovery
AWWA	American Water Works Association
BEST	Biomonitoring Environmental Status and Trends
BMP	Best Management Practice
BoCC	Board of County Commissioners
BOMP	Bureau of Mine Reclamation
BPA	Base Programs Analysis
BSLER	Bureau of Submerged Lands and Environmental Resources
CAC	Citizens' Advisory Committee
CARL	Conservation and Recreation Lands
CCMP	Comprehensive Conservation and Management Plan
CCU	Charlotte County Utilities
CDBG	Community Development Block Grant
CDM	Camp Dresser & McKee, Inc.
CES(a)	Center for Environmental Studies
CES(b)	Cooperative Extension Service
CFRPC	Central Florida Regional Planning Council
CHASBP	Charlotte Harbor Aquatic & State Buffer Preserves
CHEC	Charlotte Harbor Environmental Center
CHEVWQMN	Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
CLASAC	Conservation Lands Acquisition and Stewardship Committee
CMP	Clean Marina Program
COE	Army Corps of Engineers
CREW	Corkscrew Regional Ecosystem Watershed
CROW	Clinic for Rehabilitation of Wildlife
CRP	Conservation Reserve Program
CSO	Citizen Support Organization
CWA	Clean Water Act
CWM	Comprehensive Watershed Management



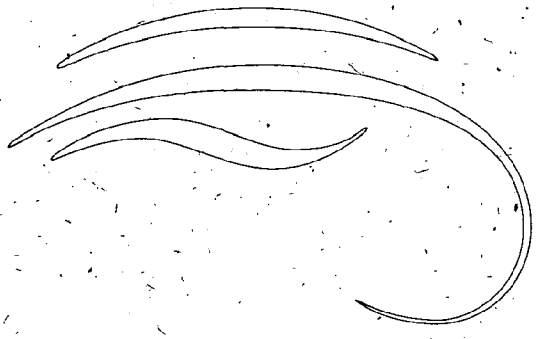
CWMP	Caloosahatchee Water Management Plan
CZMA	Coastal Zone Management Act
CZARA	Coastal Zone Act Reauthorization Amendments
DCA	Department of Community Affairs
DEP	Department of Environmental Protection
DO	Dissolved Oxygen
DOA	Department of Agriculture
DOC	Department of Commerce
DOD	Department of Defense
DOH	Department of Health
DOI	Department of the Interior
DOT	Department of Transportation
DRI	Development of Regional Impact
DRP	Division of Recreation & Parks
DW	Domestic Water
DWMP	District Water Management Plan
EAR	Evaluation and Appraisal Report
EBA&BP	Estero Bay Aquatic & Buffer Preserves
EBB	Estero Bay Buddies
ECARP	Environmental Service Conservation Acreage Reserve Program
ELMAC	Environmental Lands Management and Acquisition Committee
EM	Ecosystem Management
EMA	Ecosystem Management Area
EMAP	Environmental Monitoring and Assessment Program
EMC	Ecosystem Management Coordinator
EMWQAS	Ecosystem Management Water Quality Assessment Section
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know-Act
EQIP	Environmental Quality Incentives Program
ERD(a)	Environmental Research and Design, Inc.
ERD(b)	Environmental Resources Division
ERP	Environmental Resource Permitting
ESIP	Environmental Integration Services Program
ESQG	Exempt Small Quantity Generators
FAC	Florida Administrative Code
FACEE	Florida Advisory Committee on Environmental Education
FCHAP	Friends of the Charlotte Harbor Aquatic Preserves
FCT	Florida Communities Trust
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation

FEMA	Federal Emergency Management Agency
FFWCC	Florida Fish and Wildlife Conservation Commission
FGCU	Florida Gulf Coast University
FIP	Forestry Incentives Program
FIPR	Florida Institute of Phosphate Research
FIRM	Flood Insurance Rate Map
FL	Florida
FLUCCS	Florida Land Use/Cover Classification System
FMRI	Florida Marine Research Institute
FRDAP	Florida Recreation Development Assistance Program
FS	Florida Statutes
FW	Fish and Wildlife Habitat Loss
FY&N	Florida Yards & Neighborhoods Program
GCHEMA	Greater Charlotte Harbor Ecosystem Management Area
GDC	General Development Corporation
GFC	Florida Game and Fresh Water Fish Commission
GICIA	Gasparilla Island Conservation and Improvement Association
GIS	Geographic Information System
GPS	Global Positioning System
HA	Hydrologic Alterations
HUD	Department of Housing and Urban Development
IFAS	Institute of Food and Agricultural Sciences
IR	Infrared
ISTEA	Intermodal Surface Transportation Efficiency Act
IW	Industrial Water
IWRM	Integrated Water Resources Monitoring
LDR	Land Development Regulation
LE/AD	Lakes Education/Action Drive
LOS	Level of Service
LPA	Local Planning Agency
LRTP	Long Range Transportation Plan
LSU	Louisiana State University
LWC	Lower West Coast
M/WBE	Minority or Women Owned Business Enterprise
MFL	Minimum Flows and Levels
MGATV	Manatee Government Access Television
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MPRSA	Marine Protection, Research, and Sanctuaries Act

MS4	Municipal Separate Storm Sewer System
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSSW	Management and Storage of Surface Waters
MTC	Manufacturing Technology Center
NADP/NTN	National Atmospheric Deposition Program/ National Trends Network
NAWQA	National Water Quality Assessment Program
NBS	National Biological Service
NEP	National Estuary Program
NEPA	National Environmental Policy Act
NEXTEA	National Economic Crossroads Transportation Efficiency Act
NGVD	National Geodatic Vertical Datum
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NRPS	Natural Resources Planning Section
NWR	National Wildlife Refuge
OFW	Outstanding Florida Waters
OGT	Office of Greenways and Trails
P2	Pollution Prevention
P2000	Preservation 2000
P-2000	Preservation 2000
PA	Priority Action
PLRG	Pollution Load Reduction Goals
POTWS	Publicly Owned Treatment Works
PR/MRWSA	Peace River/Manasota Regional Water Supply Authority
PSA	Public Service Announcement
PSC	Public Service Commission
QO	Quantifiable Objective
QWIP	Quality of Water Improvement Program
RBNERR	Rookery Bay National Estuarine Research Reserve
RC&D	Resource Conservation and Development Program
RCRA	Resource Conservation and Recovery Act
RPC	Regional Planning Council
SARA	"Superfund" Amendments and Reauthorization Act
SCCF	Sanibel-Captiva Conservation Foundation
SD	South District, Florida Department of Environmental Protection
SDWA	Safe Drinking Water Act

SFWMD	South Florida Water Management District
SOR	Save Our Rivers
SRF	State Revolving Fund
SRPP	Strategic Regional Policy Plan
SWAMP	Surface Water Assessment and Monitoring Program
SWD	Southwest District, Florida Department of Environmental Protection
SWFRPC	Southwest Florida Regional Planning Council
SWFWMD	Southwest Florida Water Management District
SWIM	Surface Water Improvement and Management
SWMMP	Surface Water Management Master Plan
SWUCA	Southern Water Use Caution Area
SWUP	Stormwater Utility Program
TAC	Technical Advisory Committee
TBNEP	Tampa Bay NEP
TBRPC	Tampa Bay Regional Planning Council
TDS	Total Dissolved Solids
TEA21	Transportation Equity Act for the 21st Century
TIITF	The Board of Trustees of the Internal Improvement Trust Fund
TKN	Total Kjedahl Nitrogen
TMDL	Total Maximum Daily Load
TSI	Trophic State Index
TSS	Total Suspended Solids
UIC	Underground Injection Control
UEP	Utility Expansion Program
UPREPC	Upper Peace River Ecosystem Planning Committee
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
UST	Underground Storage Tank
VSR	Volunteer Scientific Research
WCIND	West Coast Inland Navigation District
WCS	Water Control Structure
WET	Water Efficient Toilet
WICP	Water Information Coordination Program
WMD	Water Management District
WQ	Water Quality Degradation
WRM	Wetlands Resource Management
WRP	Wetland Reserve Program
WUP	Water Use Permit
WWTP	Waste Water Treatment Plant

List of Acronyms



Glossary

GLOSSARY

algae – a group of small aquatic plants; occur as one-celled, filaments, or colonial; having no true root, stem or leaf; the base of the aquatic food chain.

algae bloom – a heavy growth of algae in a body of water; blooms commonly caused by high concentrations of nutrients in the water column.

anoxic – a condition of no oxygen in a water body.

anthropogenic – resulting from human activities.

aquifer – a water-storing underground rock formation.

atmospheric deposition – the transfer of pollutants and nutrients suspended in the air to the ground or open water; deposition commonly metals and compounds of nitrogen and sulfur.

beach re-nourishment – the process of pumping sand onto eroded beaches ; material for this process commonly taken from channels and off-shore resources.

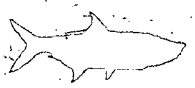
beneficiation – an industrial process to transform phosphate pebble (rock) into commercially marketable phosphate. The process is an energy intensive activity.

benthic – referring to the bottom of a body of water.

Best Management Practices (BMP) - A practice or combination of practices that provide the most effective and practicable means of controlling point and nonpoint pollutants at levels compatible with environmental quality goals.

Biochemical Oxygen Demand (BOD) - The quantity of oxygen demand present in a sample as measured by a specific test. A major objective of conventional wastewater treatment is to reduce the biochemical oxygen demand so that the oxygen content of the water body will not be significantly reduced. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

biodiversity - A network of composition, structure, and function of a given system that encompasses the natural biological wealth of organisms.



brackish – water with salinity common to estuaries; this condition has a salinity concentration between fresh and marine.

carnivore – flesh-eating organism.

coliform bacteria – a type of bacterium that in high concentrations indicates a polluted water body; this type occurs in animal feces.

deep-well injection – a process whereby a liquid, usually treated water or waste water, is pumped underground.

detritus – small particles of rock, sand, and/or dead organic and disintegrating vegetation.

dredge spoil – sand and/or mud removed from the bottom of a water body after dredging.

ecosystem – a system formed by the interaction of a community of organisms with their environment.

effluent – water released into the environment; commonly from waste water treatment processes or industrial processing.

epiphytes – refers to growing on the surface. Epiphytes are a general classification of algae commonly attached to seagrasses.

estuary – a semi-enclosed land and water interface where fresh water mixes with marine waters, allowing unique plants and animals to thrive; tidal mixing actions are common in an estuary.

eutrophic – a water quality condition typified by high productivity and nutrient inputs, with periods of oxygen deficiency from algae decomposition. This condition can be accelerated by pollution.

exotic species – a plant or animal species not native to an ecosystem.

fauna – animals of a region.

flora - plants of a region.

groundwater – water stored in underground sand rock formations; replenished from surface infiltration.

habitat - the specific place or environment where a particular plant or animal lives. An organisms habitat must provide all the basic requirements for life and should be free of harmful contaminants.

hypoxia – a condition of low dissolved oxygen in the water; hypoxia typically indicates less than or equal to two milligrams of oxygen per liter.

inlet – a short, narrow waterway connecting a bay or lagoon with the sea.

intertidal – the area of bay bottom that is alternately covered with water and then exposed due to the rise and fall of tide waters.

littoral drift – the parallel movement of suspended sand along the beach; drift caused by wave and tidal action.

mangrove – a salt-tolerant, sub-tropical tree found in estuarine and marine environments; mangrove leaves are an integral part of the food web.

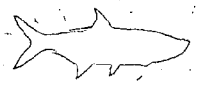
non-point source pollution – pollution from no specific source. This type of pollution is generally from surface, ground, or rain water coming in contact with contaminants on the land or air such as pesticides, herbicides, fertilizers, animal waste, gasoline, vehicle exhaust, power plant emissions, and liquid waste from failing household septic tank systems. This source of pollution is difficult to measure.

nutrients - any substance required by organisms for normal growth and maintenance. Mineral nutrients usually refer to inorganic substances derived from soil and water. Excessive amounts of nutrients, including nitrogen and phosphorus, may result in excessive growth of algae, leading to oxygen depletion and water quality degradation.

photosynthesis - the synthesis of organic matter from inorganic substrates using light as a source of energy.

plankton – passively floating or weakly motile microscopic plant and animal life; refers to various species of plants and animals at the base of the aquatic food chain.

point source pollution – pollution from a specific source such as a stormwater pipe, waste water plant discharge, or industrial discharge; easier to quantify this source.



red tide – characterized by an above average concentration of the toxic phytoplankton *Gymnodinium breve*; red tide causes fish and manatee mortality and shellfish contamination; process thought to be linked to high freshwater flows and nutrients into marine waters.

rookery – the breeding or nursery ground of birds or animals.

runoff – the portion of precipitation on the land that reaches a water body.

SAV – abbreviation for "submerged aquatic vegetation," including seagrasses and other emergent aquatic vegetation.

salinity – a measure of the dissolved salts in a water body, especially of sodium, magnesium, and potassium.

salt marsh – coastal ecosystems with communities of salt tolerant plants occupying intertidal zones that are at least occasionally inundated with salt water; refers to a type of marsh that exists at interface of land and marine waters.

saltern – a tidal area where sea water evaporates and salt concentrates.

saltwater intrusion – a process of high salinity groundwater moving inland and mixing with low salinity groundwater; intrusion commonly results from over pumping groundwater resources.

sea grass – extremely productive flowering marine plants found in estuaries and shallow open shelves off the coast; sea grass provides habitat for numerous fishes and invertebrates. Three common species exist in Florida (turtle grass, manatee grass, and shoal grass).

seawall – a wall or embankment constructed along a shore to reduce erosion from wave action; the structure greatly reduces tidal habitat.

septic tank system – a system of tanks and porous pipes in which waste water is treated by aerobic and anaerobic bacterial decomposition in the surrounding soil; septic systems are a common source of pollution to surface and groundwater if not functioning properly.

storm water runoff – water from rain, often carrying oils, trash, dissolved metals, and other pollutants. Storm water is a major source of pollution to rivers, lakes, and estuarine waters.

tide – periodic rising and falling of the oceans resulting from lunar and solar forces acting upon the rotating earth. Tide action strongly influences estuarine plants, animals, and bottom con-figuration,

tributary- a body of water that supplies a larger body of water.

trophic state – the nutritional status of a particular body of water. Nitrogen and phosphorus, the principal waterborne nutrients, commonly influence the trophic state.

turbidity – a measurement of water clarity; caused by a suspension of fine solids.

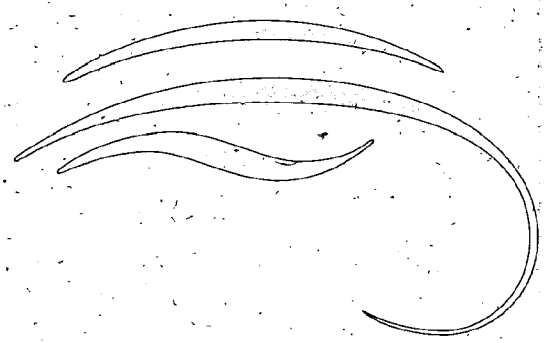
uplands – terrestrial areas above the influence of tide waters.

urbanization – the conversion of low density open spaces to high density human development such as houses or shopping malls; process decreases the volume of groundwater infiltration and increases storm water runoff.

watershed – a drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.

wetland – an ecosystem defined by unique plants, soils, and hydrology; plants in wetlands are adapted to tolerate wet conditions.

zooplankton – microscopic animals that float freely in water, graze on detritus particles, bacteria, and algae, and may be consumed by fish.



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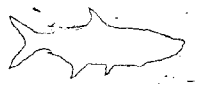

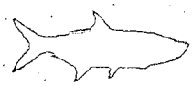

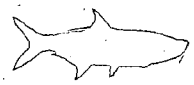

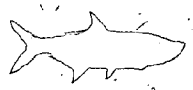

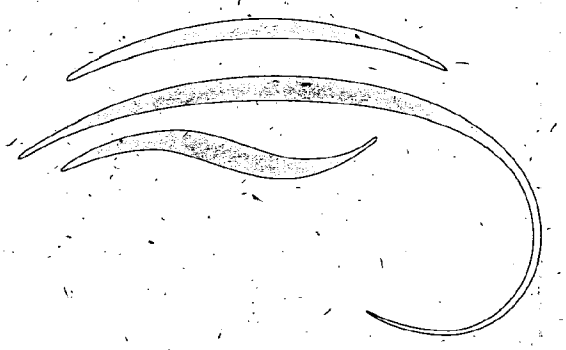

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