Regional Waterway Management System
For Lee County, Phase 2

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Abbreviations

DGPS    Differential Global Positioning Systems
DOQQ    Digital Orthophoto Quarter Quadrangles
ESRI    Environmental Systems Research Institute, Inc.
FDEP    Florida Department of Environmental Protection
FMRI    Florida Marine Research Institute
FSG     Florida Sea Grant
GIS     Geographic Information System
ICW     Intracoastal Waterway
MLLW    Mean Lower Low Water
MOA     Memorandum of Agreement
NOAA    National Oceanic and Atmospheric Administration
PID     Parcel Identification Number
SFWMD   South Florida Water Management District
USACE   U.S. Army Corps of Engineers
USGS    U.S. Geological Survey
WCIND   West Coast Inland Navigation District
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Executive Summary

The Regional Waterway Management System for Lee County is a collaborative effort by the Lee County Division of Natural Resources, the West Coast Inland Navigation District, and the University of Florida Sea Grant Program. The Phase 2 report addresses the Pine Island Sound Basin and the region’s principal waterway management issue—balancing the phenomenal growth of its boating population with conservation and management of its estuarine resource. The project devises and uses methods that allow for the simultaneous use and protection of coastal waters, while still maintaining the economic vitality of coastal communities. This approach evaluates the human ecosystem (boat user) and waterway system (environment) jointly, concurrently, and spatially; and is consistent with municipal, county, Florida Department of Environmental Protection (FDEP), and WCIND goals of facilitating safe boating and reducing boating impacts on natural resources. The project’s design criteria are: (a) fit channel maintenance to boat draft needs; (b) minimize impacts on bay habitats; (c) prioritize and evaluate management alternatives on a regional scale; and (d) identify information products, for boaters and shore residents, which encourage environmental awareness by users of neighborhood waterways and boat access channels.

The Phase 2 region extends from the Charlotte County Line south to Sanibel Island, including Pine Island Sound, Matlacha Pass, San Carlos Bay, and the western Cape Coral canals accessed from Matlacha Pass. Information is presented in tables and maps for approximately 223 miles of navigable waterways, 7911 boats, 13,387 moorings, 4542 shore facilities, and 2005 boating-related signs. The report is based on regional (1:24,000) and large-scale (1:2400) mapping of water depth, boat and facility characteristics, signage, and habitat (sea grass, mangrove).

The waterway management needs of the Pine Island Sound Basin are uniquely defined by the geography of boat source areas ("trafficsheds"); there are waterways with many boats and areas with few boats. The relations of (1) concentrations of boats to access channel length and (2) boat draft to controlling channel depth determine the degree of boat accessibility and channel restrictions. An understanding of these relations is fundamental to developing and implementing rational waterway management policy.

The report provides a planning tool and decision options to stabilize channel conditions in order to avoid further deterioration of bay resources. A detailed, comparative analysis of water depth and boat draft relations provides a comprehensive overview of channel conditions and the geographic distribution and severity of waterway restrictions. The analysis delineates and quantifies, at a 0.5 ft resolution, levels of boat accessibility to the open bay, and the location and extent of channel depth restrictions.

1The term trafficshed is used to define an area that contains a concentration of boats that use a common channel, exclusive to the trafficshed, to gain access to secondary access channels and, ultimately, to deep, open water. Secondary access channels generally correspond to the “Minor Boating Channels” shown in A Boaters Guide to Lee County, published by the Lee County Environmental Services Division.
Two planning options are illustrated: (1) normal low tide conditions (2) and below normal (winter Cold Front) conditions. Data for a third option are presented: (3) adjusting waterway maintenance standards to the variable draft capability of restricted boats.

Estimated dredging requirements are provided for trafficsheds that contain waterway restrictions. The 20-foot wide improvement footprint used in the study conforms with the WCIND “surgical” approach to maintenance dredging adopted for regional waterway management in southwest Florida in order to minimize environmental impacts to bay resources.

The study results suggest that channel improvements should be prioritized according to those waterways and trafficsheds with the greatest need. The trafficsheds that contain the greatest numbers of restricted boats are Punta Rassa/Connie Mack Island, Bokeelia (west), Pine Island Creek, Bokeelia (east), Gault Island/Cherry Estates, Pine Island Cove/Flamingo Bay, Mattlach Isles/Cape Coral (northwest), Mattlach (northwest), Blind Pass, and Saint James City (south 1); they account for 75 percent of the boat access problems and 49 percent of the channel restrictions. Another 13 waterways [Roosevelt Channel, Sanibel/Tarpon Bay, South Seas Plantation, Eighth Avenue Canal, Burnt Store Marina, Saint James City (east), Sanibel/Point Ybel, Mattlach (southwest 2), Useppa (north), Saint James City (south 2), Manatee Bay, Dem ere Key, and Saint James City (south 3)] account for an additional 21 percent of the boat access problems and 16 percent of the channel restrictions. In some cases, such as Punta Rassa/Connie Mack Island, relatively short segments of channel restrictions impede relatively large numbers of boats: the high benefit-to-cost is an incentive to make channel improvements at these locations. Several secondary access channels\(^2\) serve two or more trafficsheds and are heavily used by boaters to transit the Phase 2 project area and to access open bay waters. The relatively heavy volume of boat traffic that traverses these arteries will assure them a high priority status when Lee County determines waterway management policy.

Lee County should consider implementing these recommendations under the Memorandum of Agreement (MOA) for Regional Waterway Systems Management (Appendix A). This MOA is designed to offer local governments and local waterfront community organizations a mechanism to effect regional waterway improvements within an ecosystem-wide, place-based management approach. The MOA provides an avenue for pursuing regional permit review and project applications. A comprehensive proposal for the Pine Island vicinity should be submitted to the FDEP for needed maintenance dredging, based on project results covering Lee County Phase 2 waterways.

Lee County and the WCIND have an investment in this Regional Waterway Management System. This system should be maintained and enhanced in order to respond to the county’s growing needs for rapid assessment and comprehensive geographic analysis of its bay water resources.

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\(^2\)Secondary channels generally correspond to the “Minor Boating Channels” shown on A Boaters Guide to Lee County, published by the Lee County Environmental Services Division.
The project's database should be updated periodically with countywide boat information. The WCIND has developed a preliminary plan based on revising the annual Vehicle/Vessel Registration Form. This plan, to incorporate information on boat type, draft, and location onto the form, offers a systematic updating method that should be pursued through the County Tax Collector's Office and the Division of Motor Vehicles.

The bathymetric surveys should be updated, as needed, to identify shoaling conditions of the waterways. The WCIND is collaborating, through Florida Sea Grant, with the National Oceanic and Atmospheric Administration (NOAA) Marine Chart Division in a program to redesign coastal charts for recreational waterway users. There are opportunities for Lee County to partner with this federal charting agency and thereby share survey information on a periodic basis.

The Regional Waterway Management System can be strengthened by linkage to the county's upland databases, which will facilitate response to more complex issues that transcend land-water boundaries. For example, sediment sources could be identified and their relative contribution to waterway shoaling quantified. This would allow for a more equitable distribution of maintenance dredging costs among agencies charged with waterway maintenance and those who contribute to shoaling.

The waterway inventory information in the project's Geographic Information System (GIS) database has value and application beyond the bay water planning and management results presented in this report. This information should be reformatted and provided to shorefront residents and boaters in the trafficsheds targeted for waterway improvements as waterway maps showing channel center-line depths, boat facilities, and natural resource conditions. (The WCIND and FSG have produced similar maps of anchorages.) This information can sensitize users to the environmental conditions of the waterways and provide a basis for encouraging stewardship and responsible boating practices.

The appropriate County department should be provided with the GIS equipment, software, and training to carry out waterway inventory and analysis, in order to respond to routine customer requests for information and technical services. The Florida Cooperative Extension Service and State University System should continue to provide institutional and professional support.

A measure of the success of the regional waterway management program is whether technical results are translated into meaningful benefits for local communities. A program that includes a strong boater education component will best address the diverse management needs of the Pine Island vicinity. The Lee County Marine Agent, a recently created extension education position that is jointly funded by Lee County and the University of Florida Sea Grant Program, is a timely resource for the dissemination of Project results at the local, community level. The Marine Agent can work with interested waterfront communities to help maintain their waterways. Assistance can be provided in the form of project data, technical support, workshops, and field site inspections. Networking the community with permitting agencies and contractors, in order to develop community-based strategies to restore and maintain their waterway
resources, will increase the effectiveness of the Marine Agent. Boaters, in this fashion, can play an active, critical role in determining whether to boat in a given area, what type of boating should occur, and what level of intervention is necessary.