

Clearwater Harbor and St. Joseph Sound Comprehensive Conservation and Management Plan: Task 3: Definition of Critical Issues



Prepared for:
Pinellas County
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Management



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FOREWORD

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INTRODUCTION

The development of a comprehensive conservation and management plan (CCMP) for the Clearwater Harbor/St. Joseph Sound area includes the identification of critical resources within the study area and the development of data analysis plans to establish management goals and targets for the proper stewardship of the areas valued natural resources. The objective of this technical memo is to define the critical resources within the study area, identify the natural and anthropogenic stressors on the resource, and identify the management issues related to proper stewardship of the resource. Also included as part of the tasks prior to initiation of the analytical phase of the project was the development of a data inventory spreadsheet, a bibliographic database of relevant literature and an archive of relevant geographic information (i.e., an ArcGIS geodatabase) which accompany this report as TAC internal working drafts which will be continually updated throughout the project.

The critical resource classes identified within the study area include:

- Water Quality – (e.g. circulation, pollutant loading, and ambient water chemistry)
- Emergent Wetlands – (e.g., bulrush, cattails, and other wetland communities)
- Riparian Vegetation – (e.g., Includes mangroves, cypress, and wax myrtle)
- Environmental Lands – (e.g., Parks, spoil islands, and preserves)
- Benthos – (e.g., sediments, hard bottoms, and benthic invertebrate communities)
- Seagrass – (includes at least 4 seagrass species found throughout the study area)
- Fish –(e.g., finfish of recreational and commercial importance, scallops, and stone crab)
- Birds – (e.g., colonial waterbirds and shorebirds)
- Charismatic megafauna – (e.g., manatee, dolphin, and sea turtles)

The remainder of this memo provides a summary for each of the critical resources defined above and identifies the stressors, and management issues of each resource. The Task 4a memo describes the data analysis plan for assessing the status of each critical resource. Once the resource status is ascertained, a management goal and target will be identified and management actions to achieve the targets will be explicitly identified as part of the comprehensive conservation and management plan.

Water Quality

Resource: Water quality is a primary determinant of conditions related to estuarine habitat availability and health. Water quality conditions play a role in light availability and thus the health and success of seagrass in the study area. Water quality also impacts the temporal and spatial extent of water column habitat availability for those organisms whose survival and reproductive strategies are dependent on specific water quality conditions (e.g., specific salinity ranges, dissolved oxygen requirements, water clarity, and phytoplankton production). Below is a list of the stressors and management issues related to the protection of water quality in the study area.

Natural and Anthropogenic Stressors:

- Impacts to circulation from natural or human activities - pass closings/openings, sediment transport, dredging
- Impacts to nutrient loadings from anthropogenic activities (fertilizer use, wastewater discharge) and resultant effects on estuarine water quality
- Impacts of nutrient loadings during extreme wet/dry periods, on circulation/flushing rates and resultant water quality
- Impacts to nutrient loadings from implementation of BMPs
- Impacts to water quality due to potential sea level change

Management Issues:

- How to identify areas where water quality and habitat targets are not met
- How to identify the reasons for water quality not meeting targets
- How to improve the water quality in these areas
- How to maintain and protect these improvements and protect those areas where water quality conditions are appropriate
- How to educate the public of the need and means for water quality improvements where necessary

Emergent Wetlands

Resource: Emergent wetlands throughout the Clearwater Harbor and St. Joseph Sound watersheds play an important role for wildlife and fish as well as water management and conservation. Many species of fish and wildlife depend on wetlands for breeding, nesting, and feeding, making wetlands one of the most productive habitats. Pollutants such as nitrogen and phosphorus, from fertilizer, manure, and municipal wastewater are filtered out as water flows through a wetland, thereby improving water quality. The effectiveness of this process can impact the water quality of receiving lakes and rivers in the Clearwater Harbor and St. Joseph Sound watersheds. Wetlands also provide flood protection and abatement for surrounding property. Below is a list of the

stressors and management issues related to the protection of emergent wetlands in the study area.

Natural and Anthropogenic Stressors:

- Impacts due to dredge and fill for development and water supply (i.e. mining, agriculture, urban development adjacent to a wetland and within watersheds)
- Impacts due to altered flows and hydrology (i.e. construction of canals and other water control structures adjacent to a wetland and within watersheds)
- Impacts due to fragmentation of a wetland from a contiguous wetland complex
- Impacts due to point source and non-point source pollution
- Impacts due to climate change (i.e. sea level rise and greater severity of storm/flood events)

Management Issues:

- How to estimate recent and historical coverage
- How to measure the health of the system
- How to quantify impacts of anthropogenic (i.e. dredge and fill) stressors
- How to protect and/or restore wetland habitat
- How to measure success of restoration and/or protection
- How to educate the public about the value of protecting and/or restoring wetland habitat

Riparian Ecosystems

Resource: Riparian ecosystems through the Clearwater and St. Joseph Sound watersheds play an important role in providing habitat for many species of mammals, amphibians, reptiles, and resident birds, as well as breeding sites, wintering areas, and stopover habitats for migratory birds, stabilizing river and stream banks, and providing flood protection. Riparian ecosystems characterize the area between rivers, streams, or other bodies of water and upland ecosystems. Large fluxes of energy and material in these systems produce distinct vegetation and soil characteristics as well as a rich diversity of plant and animal species. The productivity of riparian ecosystems is a function of the ecological characteristics of the water body, often a river or stream that flows along and/or through it.

Riparian ecosystems are seasonally, semi-permanently, and permanently flooded wetlands. Bottomland hardwood forests are one of the systems that make up major expanses of riparian ecosystems in southeastern United States and occur in the Clearwater Harbor and St. Joseph Sound watersheds. Bottomland hardwood forests in the Clearwater Harbor watershed are frequent along the banks of Curlew Creek, Cedar Creek, Spring Branch, and Stevensons Creek and in the St. Joseph Sound watershed are frequent along the banks of the Anclote River and Bee Branch. Other riparian habitat,

such as mangrove swamps, is also found in the watersheds. Below is a list of the stressors and management issues related to the protection of riparian ecosystems in the study area.

Natural and Anthropogenic Stressors:

- Impacts due to filling and/or draining and clearing for development (i.e. mining, agriculture, urban development within watersheds)
- Impacts due to altered flows and/or hydroperiods (i.e. loss or degradation of adjacent water body)
- Impacts due to fragmentation of a riparian ecosystem from a contiguous wetland complex
- Impacts due to water quality and quantity of adjacent water body
- Impacts due to land use in adjacent upland
- Impacts due to climate change (i.e. sea level rise and greater severity of storm/flood events)

Management Issues:

- How to estimate recent and historical areal coverage
- How to measure health and function of the system
- How to identify impacts of anthropogenic (e.g. draining for agricultural use) stressors
- How to protect and/or restore riparian ecosystems
- How to measure success of restoration and/or protection
- How to educate the public about the value of protecting riparian ecosystems
- How to educate the public about the value of protecting and/or restoring water bodies adjacent to riparian systems

Environmental Lands

Resource: Environmental lands include publicly owned parks and preserves. Environmental lands are differentiated from recreational parks (e.g., ball fields) in that they provide for the protection and conservation of natural and cultural resources, while also allowing for public access to and enjoyment of said resources. Within the Clearwater Harbor and St. Joseph Sound watersheds there are several environmental lands parcels owned by the federal government, the State of Florida, and local governments. Other areas owned, leased, or managed by non-governmental organizations (NGOs) may also be considered to function as environmental lands. Pinellas County is unique in the State of Florida in that all submerged lands and tidal waters within the County boundaries are designated as an Aquatic Preserve pursuant to Chapter 258, Florida Statutes. The Pinellas County Aquatic Preserve includes approximately 350,000 acres of submerged lands, and a draft management plan for the Aquatic Preserve was adopted in 1987. Pinellas County also developed an Island

Management Plan in 2002. Below is a list of the stressors and management issues related to the protection of environmental lands in the study area.

Natural and Anthropogenic Stressors: Identify natural and anthropogenic stressors affecting the resource.

- Impacts due to dredge and fill for shoreline development
- Impacts due to dredging of ICW and various access channels
- Impacts due to adjacent urban development
- Impacts due to exotic species infestations
- Impacts due to propeller scarring
- Impacts due to trash dumping
- Impacts due to inappropriate pet usage
- Impacts due to inappropriate human recreational usage

Management Issues: Describe issues relevant to the management of the identified resource.

- How to estimate the existing boundaries and areal extents of environmental lands
- How to assess the environmental integrity of existing environmental lands
- How to quantify direct impacts (e.g., dredge and fill) and indirect impacts (e.g., adjacent urban development; water quality degradation) to existing environmental lands
- How to protect and/or restore habitat on environmental lands
- How to protect and support endangered and threatened species utilizing public lands
- How to identify the need for expanded or new environmental lands and buffer areas
- How to better use environmental lands to facilitate public education on conservation issues

Data Sources: The boundaries, facilities and usage of existing environmental lands are generally well documented in a variety of data sources including: Local government property appraiser databases; Southwest Florida Water Management District 2007 land use data; Pinellas County Aquatic Preserve Management Plan; Pinellas County Island Management Plan; Local government Comprehensive Plans; County Park plans; State Park plans, and the U.S. Coast Guard Intra-Coastal Waterway management plan.

Benthos

Resource: Benthic macroinvertebrates represent an important resource in estuaries such as St Joseph Sound and Clearwater Harbor. Benthic macroinvertebrates live in or on the

substrate and consist of aquatic insects, worms, snails, clams, and shrimp. Because the organisms live in or on the substrate, their distribution is obviously influenced by availability of suitable sediments. As a group, benthic macroinvertebrates are generally sedentary and are considered to be effective integrators of a variety of environmental factors. Unlike nekton, which are mobile organisms, most benthic invertebrates lack the ability to avoid large or rapid fluctuations in environmental conditions due to their sedentary nature.

Benthic macroinvertebrates play important biological and ecological roles in the aquatic environment. Benthic organisms process organic material as detritivores, suspension feeders, and deposit feeders, forming an essential link in the transfer of energy to secondary consumers including other benthic organisms, finfish, and avifauna. Benthic organisms serve as a food source to numerous commercially and recreationally important species such as Blue Crab, Stone Crab, Scallop, mullet, and Seatrout. Tubicolous and fossorial benthic invertebrates may also fulfill an important role in reworking sediments. In this role as bioturbators, they may bring sediments into contact with the water column thereby translocating nutrients and pollutants to the water column and oxygenating the sediments. Below is a list of the stressors and management issues related to the protection of benthos in the study area.

Natural and Anthropogenic Stressors:

- Sediment quality
- Water quality
- Contaminated sediments

Management Issues:

- How to estimate populations in study area
- How to protect and restore habitat
- How to inform public of the importance of benthic organisms

Hard Bottom Habitats

Resource: Hard bottom and attached macroalgal habitats include limestone outcroppings, artificial reefs, bridges, rip rap, and pilings and are found in the Clearwater Harbor and St. Joseph Sound. Hard bottom communities are important because they allow for a distinct assemblage of plants and animals in an area otherwise characterized by seagrass meadows and unvegetated, sandy bottoms. Organisms such as non-reef building corals, soft corals, and sponges can be associated with hard bottom habitat. Hard bottom communities provide at least seasonal habitat for more tropical species (i.e. angelfish) and year-round habitat for recreationally sought after species such as gray snapper (*Lutjanus griseus*). Below is a list of the stressors and management issues related to the protection of hard bottom habitats in the study area.

Natural and Anthropogenic Stressors:

- Impacts due to habitat degradation

- Impacts due to habitat destruction
- Impacts due to barrier island migration
- Impacts of disease
- Impacts due to red tide
- Impacts due to cold stress
- Impacts due to poor water quality
- Impacts due to climate change (i.e. sea level rise)

Management Issues:

- How to estimate areal extent of habitat
- How to quantify change in sedimentation and barrier island migration
- How to protect and restore lost habitat (i.e. use of artificial reef construction)
- How to inform public of impact of water quality on hard bottom and macroalgal habitats

Seagrass

Resource: Seagrass meadows are an important habitat for feeding and shelter for a large number of recreationally and commercially important species of finfish and shellfish. In addition, seagrass meadows serve as a direct food source for the West Indian Manatee (*Trichechus manatus*), the Green Sea Turtle (*Chelonia mydas*) and ecologically important invertebrates such as the variegated sea urchin, *Lytechinus variegatus*. Clearwater Harbor and St. Joseph Sound represent two different seagrass-containing regions; Clearwater Harbor has limited seagrass coverage mostly in the shallowest portions of the harbor, while St. Joseph Sound has extensive seagrass meadows that extend out significant distances away from the shoreline. Below is a list of the stressors and management issues related to the protection of seagrass in the study area.

Natural and Anthropogenic Stressors:

- Impacts due to dredge and fill for shoreline development
- Impacts due to dredging of ICW and various access channels
- Impacts due to burial under spoil islands
- Impacts due to propeller scarring
- Impacts (if any) due to potential changes in water quality (especially in Clearwater Harbor)
- Natural impacts due to intense grazing events

Management Issues:

- How to estimate recent and historical coverage
- How to quantify impacts of direct (i.e., dredge and fill) and indirect (i.e., water quality degradation) stressors
- How to protect and/or restore habitat

- How to educate the public so as to affect positive changes

Fisheries

Resource: Fisheries resources in St Joseph Sound and Clearwater Harbor provide important recreational and commercial economic value. Fisheries include commercial harvest of Blue Crab (*Callinectes sapidus*), Stone Crab (*Menippe mercenaria*) and mullet (*Mugil spp.*). Recreational harvest includes Scallop, Seatrout, Redfish, Snook, Grouper, and Shark. The study area is also an important nursery for juvenile species including the grouper/snapper complex which supports an important offshore commercial fishery. Below is a list of the stressors and management issues related to the protection of fisheries in the study area.

Natural and Anthropogenic Stressors:

- Impacts to nursery areas –(e.g., prop scarring of seagrasses, mangrove losses)
- Fishing pressure – fish mortality – (take and catch and release)
- Red tide events
- Cold stress
- Water quality

Management Issues: Describe issues relevant to the management of the identified resource

- How to estimate populations in study area
- How to estimate fishing pressures in study area
- How to protect habitat
- How to inform public of fishing impacts- (e.g., fishing line)
- How to encourage the recovery of scallops in the area

Birds

Resource: A unique assemblage of colonial waterbirds and shorebirds are resident or migratory through the Clearwater Harbor and St. Josephs Sound region of peninsular Florida. Approximately 30 species of waterbirds distributed among several taxonomic groups and species guilds use coastal habitats. At least 13 species are federally or state-listed as endangered, threatened, or as species of special concern and many birds that occur in the region are listed on regulatory or non-regulatory management lists. Below is a list of the stressors and management issues related to the protection of birds in the study area.

Natural and Anthropogenic Stressors:

- Extreme weather events – hurricanes, tropical storms, heavy rain, unusual cold weather during the nesting season.

- Predators – mammals, primarily raccoons, birds such as Fish Crows or Laughing Gulls, introduced reptiles such as iguanas.
- Disturbance from fishermen, boaters, or other persons recreating near nesting colonies, who approach too closely to nesting colonies or solitary nesting pairs that drive the adults off the nest, leaving the eggs or young chicks vulnerable to exposure or predation.
- Invasive exotic plants affecting availability of nesting substrate (some invasive exotics are actually very suitable nesting substrate, while other plants diminish nest site availability).
- Forage limitations – e.g., the winter 2010 cold weather resulted in widespread fish kills throughout coastal Florida.
- Other limiting factors to be discussed on a site-specific basis.

Management Issues:

- Suitable habitat availability – spatio-temporal habitat availability
- Predator (mammalian, avian, herptilian) population management
- Anthropogenic disturbance – recreational and commercial fishermen, boaters, kayakers, campers, swimmers, dogs.
- Forage availability – demersal estuarine fish, macroinvertebrates
- Epizootics
- Pollutants

Charismatic Megafauna

Resource: Dolphins, sea turtles and manatees are all federally protected species and are colloquially classified by this study as charismatic megafauna due to their common appeal among humans which tends to invoke a connection with nature and the marine environmental. These species are known to inhabit the St. Joseph Sound/Clearwater Harbor study area and have been successfully used to promote public awareness and conservation of natural resources. While there is limited data available for analysis, a characterization of these species, and natural and anthropogenic stressors and management issues will remain an important part of the comprehensive conservation and management plan. Below is a list of the stressors and management issues related to the protection of charismatic megafauna in the study area.

Natural and Anthropogenic Stressors:

- Red tide
- Cold weather events
- Food sources
- Habitat availability
- Interactions with humans

Management Issues:

- Protection of habitats - (e.g., beach habitat for turtle nesting, Seagrass habitat for foraging, etc.)

- Predation of turtle eggs
- Interactions with humans – (e.g., Prop scarring, entanglement)