

SECTION 3: NATURAL AND CULTURAL RESOURCE MANAGEMENT

Resource management is focused at the natural community or ecosystem level, a holistic approach that provides benefits beyond those afforded by single-species management. Recent budget reductions have impacted resource management activities in the Preserve. Based on available staff and within existing and future budgetary constraints, the long-range goal is to maintain the current activities and level of service, including new restoration projects included in the existing Capital Improvement Program (CIP). This will be done with the help of volunteers and partnerships for research and monitoring projects.

Restoration

Weedon Island Preserve has been altered for years by many human impacts. The largest area of human impact is the network of mosquito ditches, which were dredged in the 1950's and 1960's. Consequently, salt marsh and salterns are rare. In addition to losing some of the natural estuarine diversity, the spoil ridges are conduits for establishment and encroachment of exotic invasive species.

Development (historic and recent) and roads also have impacted the area. Prior to County management, the public had access to the Preserve for unauthorized activities such as looting of cultural resources, trash dumping, and disposal of unwanted pets. All these uses impacted the Preserve.

Ecological restoration in the Preserve provides protection and enhancement of the natural communities. Restoration includes re-introduction of fire, establishment of regular burn regimes, mechanical vegetation reduction, and exotic vegetation control to improve and maintain natural habitats. Appropriate permits were obtained when required to minimize impacts to the adjacent natural resources. Some restoration projects were beyond the scope of County staff and equipment and therefore, private contractors were hired to complete these projects. Some of the areas were more severely impacted and required more extensive restoration, as detailed below.

Completed Restoration Projects (Figure 10)

Gateway Mitigation Habitat Restoration 2004 (~100 ac.)

This SWFWMD managed restoration project was funded through the Florida Department of Transportation (DOT) mitigation program. The site was primarily mosquito-ditched mangrove swamp with spoil mounds infested with Brazilian pepper and Australian-pine trees. The hydro-blast process, where water pressure is used to blast and redistribute sediments, was used in the northern portion of the mosquito ditch mound. The project restored approximately 45 ac. of salt marsh, 43 ac. of mangrove swamp, and 10 ac. of coastal uplands. The project also created open water habitats, through grading designed to improve tidal flushing.

Saltern Mitigation 2005 (~10 ac.)

This project provided wetland mitigation for impacts as a result of construction at Canterbury School in St. Petersburg, FL. The mounds created by dredged mosquito ditches were hydraulically washed to

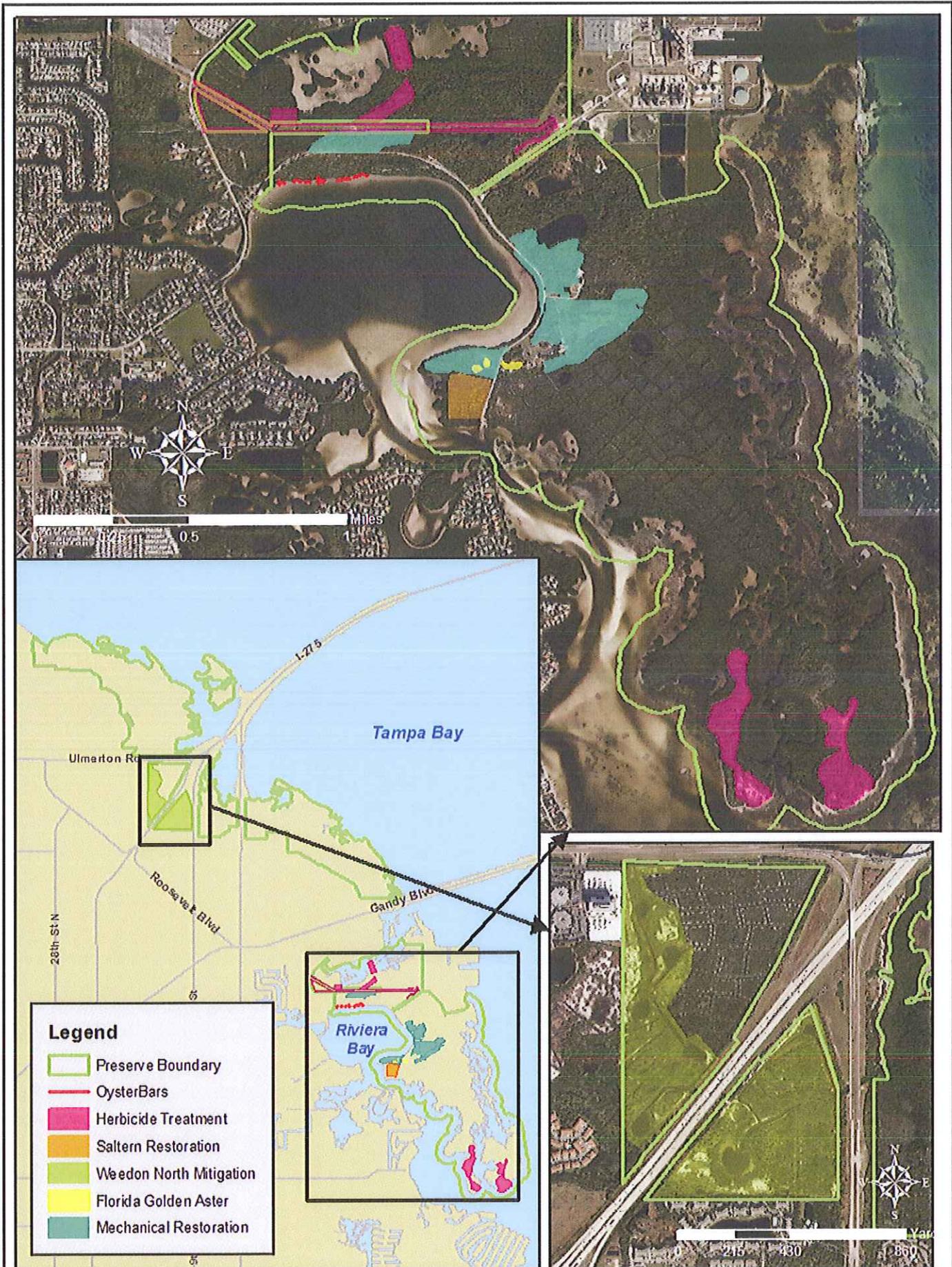


Figure 10. Restoration Map (2003 - 2010)

disperse the sediments evenly into the ditches. All exotic vegetation was removed from the mounds and surrounding areas. Five ac. were restored as saltern and 5 ac. remained as mangrove swamp.

Mechanical Vegetation Reduction (~64 ac.)

2008 – A contractor was hired to mechanically thin using a hydro-axe 38 ac. in 6 burn units (Units 1A, 2B, 2D, 2E, 3, and 7) to reduce small to medium oaks and vines. Five of the six units had been burned 1-3 years prior to being hydro-axed. The prescribed burns were patchy and required further reduction of the oaks and vines.

2009 – A contractor was hired to hydro-axe a 4-ac. burn unit (Unit 1F) and 11 ac. behind the Preserve residence. A prescribed burn was completed in Unit 1F but further reduction of the oaks and vines was required. The 11 ac. behind the residence was completed for fuel reduction.

2010 – A contractor was hired to hydro-axe a 14-ac. burn unit (Unit 2C) to reduce oaks and vines. A prescribed burn was completed previously in this unit, and required further reduction of the oaks and vines.

Herbicide Treatment of Invasive Vegetation

2003 – A contractor was hired to herbicide Brazilian pepper, *Melaleuca* and Australian-pines on 30 ac. This project was funded 100% by the Sun Coast Invasive Exotic Plant Working Group.

2008 – A contractor was hired to herbicide Category I and II invasive plants on Ross and Googe Islands. Approximately 20 ac. of invasive vegetation were treated on Ross Island and approximately 24 ac. on Googe.

Oyster Bars

Tampa Bay Watch funded the construction of oyster shell bars along the shoreline of Riviera Bay in 2007 and 2011. This area was selected due to the erosion that was occurring at the shoreline. The work was completed by Tampa Bay Watch, County staff and volunteers. The oyster bars inhibit shoreline erosion and provide habitat for many species of fish and other important fauna in Riviera Bay.

Future Restoration Projects

Weedon Island Preserve has approximately 2610 ac. of tidal swamp, most of which are the result of man-made mosquito ditches. This hatched network of mosquito ditches created the spoil ridges that act as conduits for exotic vegetation, reduced the natural salt marsh and saltern communities and ultimately altered the hydrology and tidal flushing. A series of projects are planned to selectively fill ditches in these areas to restore natural salt marsh and saltern communities as well as improve hydrology and tidal flushing.

The protection of the natural and cultural resources has been and will continue to be a priority in managing the Preserve. Assessing the maps, communities and cultural resources, there should be no surplus of any portion of the Preserve. There have been no parcels immediately adjacent to the Preserve that are essential or available for purchase.

Feather Sound

This restoration project (Figure 10) is a cooperative effort of the Tampa Bay Estuary Program (TBEP), Southwest Florida Water Management District (SWFWMD) and Pinellas County. Funding for the project is from multiple sources that includes the County's CIP and grants from SWFWMD, USFWS and Pinellas County Environmental Fund/National Fish and Wildlife Foundation and TBEP. This project, scheduled to begin by the Spring of 2012, will fill a number of mosquito ditches to restore saltern communities and re-route a number of other mosquito ditches to reduce nutrient loading to Tampa Bay. The project will also involve extensive removal of exotic vegetation and the creation of approximately 10 ac. of saltern community.

Weedon Island South

We intend to selectively restore the mosquito-ditched tidal swamp areas to increase the saltern and salt marsh areas, restore hydrology and remove exotic vegetation. The United States Geological Survey (USGS) Tampa Bay Integrated Science Study which investigated the function of the ditches will be used to provide guidance in the restoration process. The existing canoe trail is non-navigable at low tides and dredging sections of the existing canoe trail will be considered as part of the restoration project. Design and implementation of this project will begin when CIP funding becomes available in the future. Additional funding sources will be necessary to help with project costs.

Opportunities for additional restoration projects will be considered if resources allow. Any additional projects considered will be prioritized based on benefits to natural resources and will be conducted in a manner consistent with this management plan.

Prescribed Burning

Fire is extremely important in the maintenance of upland Florida ecosystems. These natural communities have evolved to depend on fire. Each type community type burns at a specific frequency due to characteristics of various plant species and hydrologic conditions. Higher and drier communities with light, herbaceous fuels generally burn more frequently than do hydric areas with larger, heavier fuels.

The objectives of the burn program at the Preserve are to re-introduce fire and maintain a fire-frequency regime typical for the fire-adapted communities. These objectives are accomplished through partitioning the Preserve into burn units and implementing burns as appropriate for each unit.

Weedon Island Preserve has 19 burn units labeled W-1 through W-7 (Figure 11). Two new fire breaks were added in 2011. Units are delineated using existing roads, firebreaks and ecotones between communities. Firebreaks are maintained by PCR staff by disking periodically each year (Figure 11). Since 2002, 8 of the 19 units have been burned (60 ac.) (Table 3). All burns conducted in the unit are permitted through the Department of Agriculture and Consumer Services, Florida Forest Service (FFS).

Prescribed fires and mop-up of wildfires are conducted by County staff. The County established the Wildlands Fire Team in 1997 to handle the prescribed fires on County properties. Prescription preparation, planning, and scheduling of fires are done by PCR staffs.

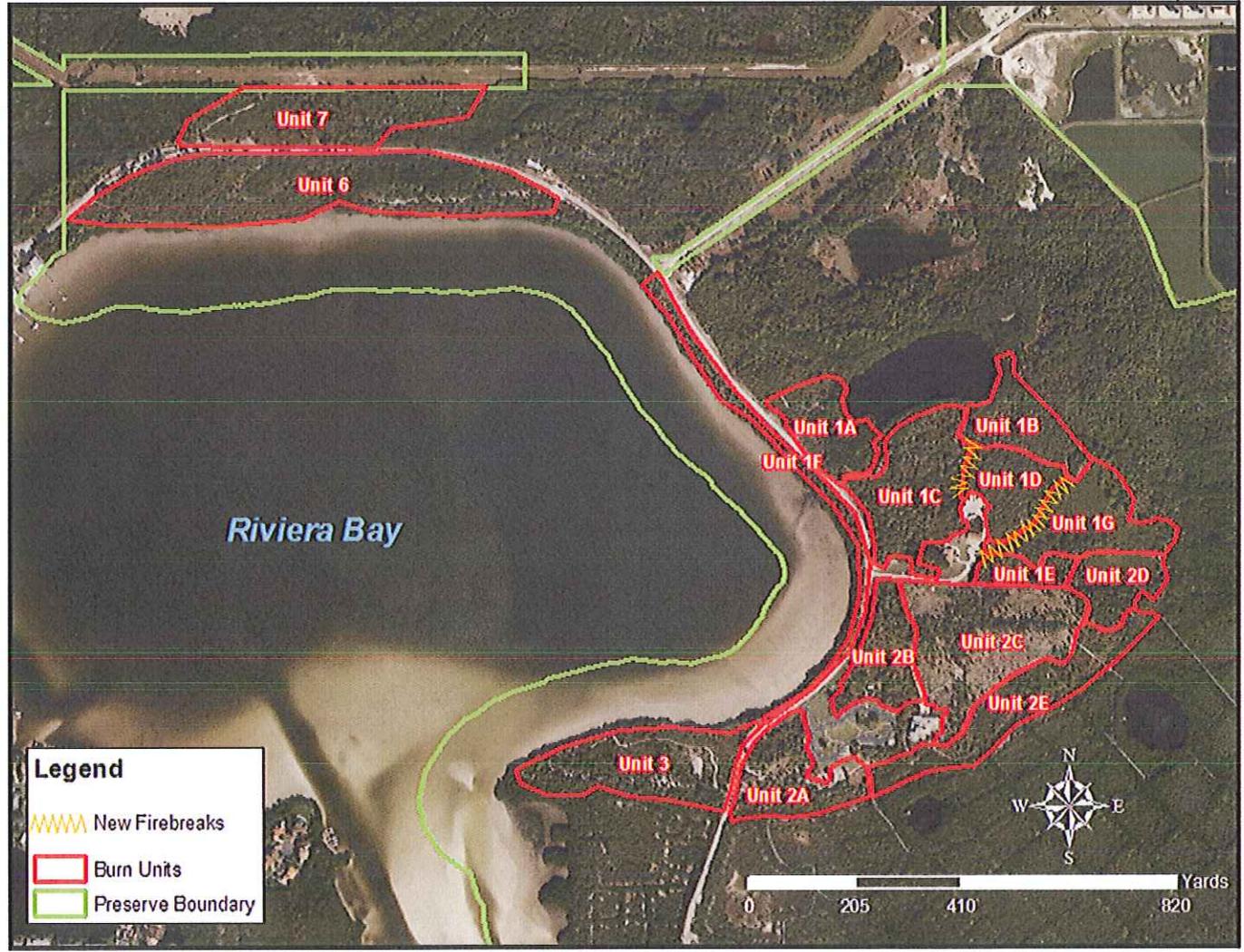
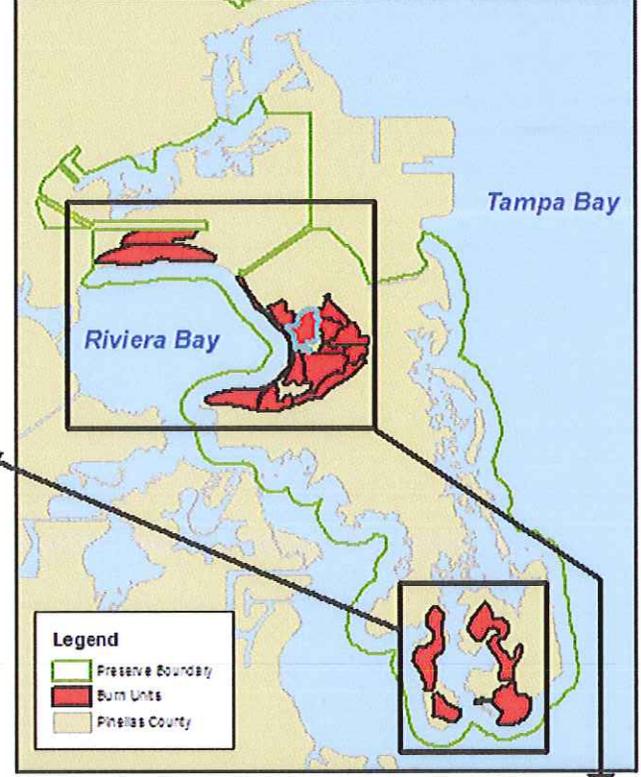
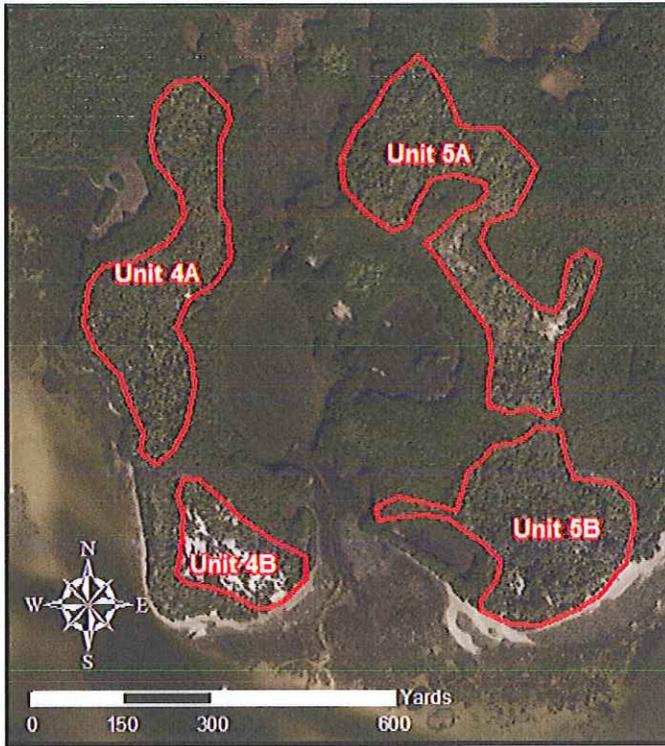


Figure 11. Prescribed Burn Units and New Firebreaks Map

Unit Name	Unit Acreage	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Unit 1A	5											
Unit 1B	5											
Unit 1C	10											
Unit 1D	5											
Unit 1E	2											
Unit 1F	4											
Unit 1G	7											
Unit 2A	7											
Unit 2B	4											
Unit 2C	14											
Unit 2D	4											
Unit 2E	8											
Unit 3	10											
Unit 4A	15											
Unit 4B	6											
Unit 5A	18											
Unit 5B	14											
Unit 6	20											
Unit 7	11											
Total Acreage	169	0	0	0	11	14	12	0	4	16	0	22

To support the prescribed burn program, PCR is equipped with two 300-gallon slide-on units, two 300-gallon brush trucks, 400-gallon water buffalo, 850-gallon modified old military M35, 50-gallon spray tank for an ATV utility cart, small Honda pumps for drafting out of surface water, drip torches, backpack sprayers, and miscellaneous hand tools.

Future Prescribed Burning

Prescribed burning will continue to be an important management tool in maintaining healthy natural communities on Weedon Island Preserve. Unit 3 is also a high priority and is planned for fire in the spring of 2012 as part of the Florida golden-aster monitoring project. This unit was previously burned in 2006. Fire will support the goal of the project to provide more open areas for seeds to disperse and germinate throughout the unit.

Opportunities for additional prescribed burns will be considered if additional resources become available and conditions allow. PCR plans to conduct prescribed fire in established burn units as presented in Table 4.

Unit Name	Unit Acreage	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Unit 1A	5			■								■
Unit 1B	5				■							■
Unit 1C	10		■								■	
Unit 1D	5	■								■		
Unit 1E	2				■							
Unit 1F	4								■			
Unit 1G	7	■										
Unit 2A	7		■								■	
Unit 2B	4				■							
Unit 2C	14								■			
Unit 2D	4					■						
Unit 2E	8					■						
Unit 3	10	■								■		
Unit 4A	15						■					
Unit 4B	6						■					
Unit 5A	18							■				
Unit 5B	14							■				
Unit 6	20			■								■
Unit 7	11								■			
Total Acreage	169	22	17	25	11	12	21	32	29	15	17	30

Species Inventories

In August 2002, Steven P. Christman was hired to conduct a floral and faunal inventory (Christman, 2003) and the 2005 floristic survey (Schmidt, 2005) formed the foundation for the most recent detailed inventories at the Preserve. These lists are kept up-to-date as Preserve staff identifies new species (Appendix 13). Currently, there are 283 verified floral species of which 237 are native to the area. Also verified are 14 mammal, 169 bird, and 41 invertebrate species.

Future Species Inventories

PCR staff will continue to identify new species as observed and update species lists. Taxon-specific inventories may also be conducted with volunteers and experienced partnering agencies and organizations.

Invasive Exotic Species Control

Exotic plants have an adverse impact on the structure and function of native plant and animal communities. Accordingly, exotic vegetation removal is an important and continuing process at the Preserve. Emphasis is placed on control of Category I and II species (Appendix 13), but other non-natives are also targeted.

Exotic vegetation treatment is conducted by PCR staff and through contracted labor. Contracted work is typically done for larger first-strike projects and for work done on the less accessible Ross and Gooch Islands. It is important that staff maintain each area after initial treatment is conducted so as to prevent re-infestation by exotic vegetation. Eight burn units, totaling 67 ac., are under maintenance control following larger first-strike projects (Figure 10). Mechanical removal, fire and herbicide application are all methods used to help control exotic vegetation in the Preserve. Proper chemical selection and application techniques are followed by licensed spray technicians to prevent damage to the surrounding environment.

Since they are detrimental to native the flora and fauna, exotic wildlife species are removed as encountered. Feral cats appear to be uncommon in the Preserve but, when found, they are trapped and taken to Pinellas County Animal Services.

Future Invasive Exotic Species Control

The removal of exotic vegetation will remain a priority. Considerable resources have been allocated to exotic vegetation removal and maintenance in the Preserve. It is imperative that staff continue with the maintenance program. In fire-suppressed areas, access for exotic removal is limited. Following each prescribed burn the area will be surveyed to assess the need for additional herbicide treatment.

As the mosquito ditch restoration projects are completed, staff will begin maintenance treatment to prevent re-infestation by exotic vegetation. Restoration projects that have a re-vegetation component will require that only species that are documented in the Preserve be planted.

PCR staff will continue to monitor and remove exotic and nuisance animals from the Preserve as encountered. Opportunities for additional exotic vegetation removal projects will be considered if additional resources allow.

Monitoring

A number of monitoring projects have been conducted in the Preserve, typically completed with County staff and volunteers. The monitoring projects include:

- Exotic plant species monitoring. After an area is targeted for aggressive removal of exotic plants, periodic site visits are conducted to monitor the area's status and to re-treat any recruiting exotic species.
- Monitoring of other endangered and threatened species as detected in the Preserve.
- Pre-burn monitoring. Based on fuel loads and habitat structure, recommendations are developed for each burn unit annually.
- Post-burn monitoring. The characteristics of each burn are documented with attention to overall effectiveness, severity, and completeness of the burn.
- Water quality monitoring as described below.

Water Quality

Since 2003 the Pinellas County Department of Environment and Infrastructure's Watershed Management Division has collected water quality data in the waters surrounding the Preserve. This includes portions of Tampa Bay from Feather Sound south to the mouth of Riviera Bay and Riviera Bay. As part of the sample program design, these waters are divided into geographic areas or sampling strata designated as follows: E3 covers the area from the St. Petersburg-Clearwater Airport to the Howard Franklin Bridge; E4 from the Howard Franklin Bridge to the Gandy Bridge; E5 from the Gandy Bridge to the mouth of Riviera Bay; and RB from the mouth of Riviera Bay to the 83rd Avenue Bridge. Each stratum is visited 8 times per year and in each visit to a stratum, samples are collected at four randomly selected sample sites. Thus, each stratum has a total of 32 samples collected each year.

Water quality metrics collected include temperature, pH, dissolved oxygen (DO), conductivity, and salinity which are measured at the surface only for total water depth < 0.5-m., surface and bottom for total water depth < 1.0-m., and surface bottom and mid-depth for total water depth > 1.0-m. Water samples are collected at each sample site and analyzed for total Kjeldahl nitrogen, ammonia, nitrate-nitrite, total phosphorus, ortho-phosphorus, chlorophyll-a, chlorophyll-b, chlorophyll-c, phaeophytin, total suspended solids, and turbidity. Finally, measurements of light absorbance and transmission are taken including light absorbance, secchi disk depth, and transmissivity of 660 nm wavelength light.

The three water quality metrics that best describe water quality are bottom dissolved oxygen, chlorophyll-a, and transmissivity. These are briefly summarized.

There are several trends evident in water quality around the Preserve: a trend related to annual rainfall, a geographic trend, and a seasonal trend. Water quality in Tampa Bay is affected by rainfall received by watersheds surrounding the Bay. Rainfall in these watersheds reaches the Bay as nutrient-laden stormwater conveyed by streams, ditches, and canals. The more rainfall the greater the nutrient loads of nitrogen, phosphorus, and suspended sediments. The nitrogen and phosphorus are converted into phytoplankton biomass. So, it is instructive to look at rainfall patterns since 2003 (Figure 12). Rainfall is summed from October 1 – September 30 which is for successive dry and wet seasons. The average annual rainfall in Pinellas County for the past

century is about 51 in. For water years 2002-03 and 2003-04 rainfall totals exceeded this average and 2009-10 was slightly above the average. In all other years, rainfall totals were less than 51 in. including only 37 in. in water year 2006-07, a severe drought year.

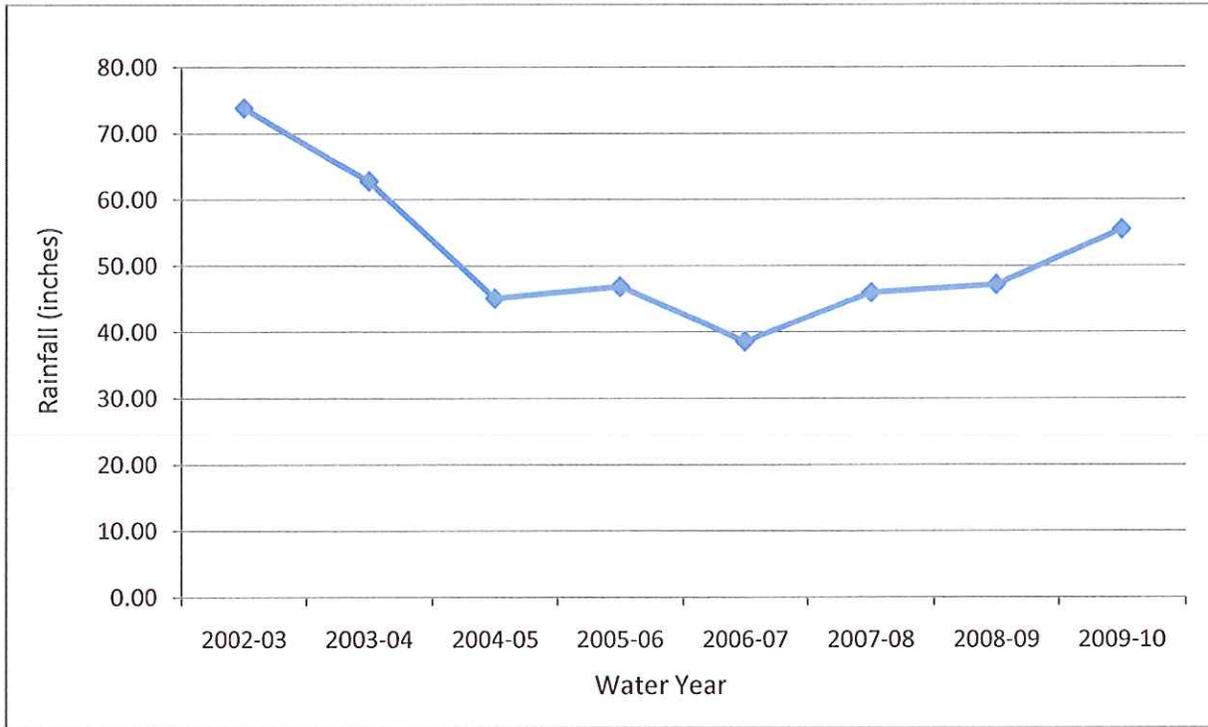


Figure: 12 Total Rainfall for each water year where each water year runs from October 1 to September 30.

Water quality patterns caused by inter-annual differences in rainfall are shown in Figure 13 for mean annual chlorophyll-a, and Figure 14 for mean annual transmissivity. In 2003, a year of very high rainfall, mean annual chlorophyll-a values were higher in all strata compared to other years. Increases in mean annual chlorophyll-a values seen only in stratum E3 may be due to *Pyrodinium bahamensis* blooms that have occurred in upper Old Tampa Bay the past several years and are probably not related to rainfall. A similar pattern related to rainfall is seen for transmissivity with lower mean annual transmissivity, indicating poor water quality in 2003 and 2004.

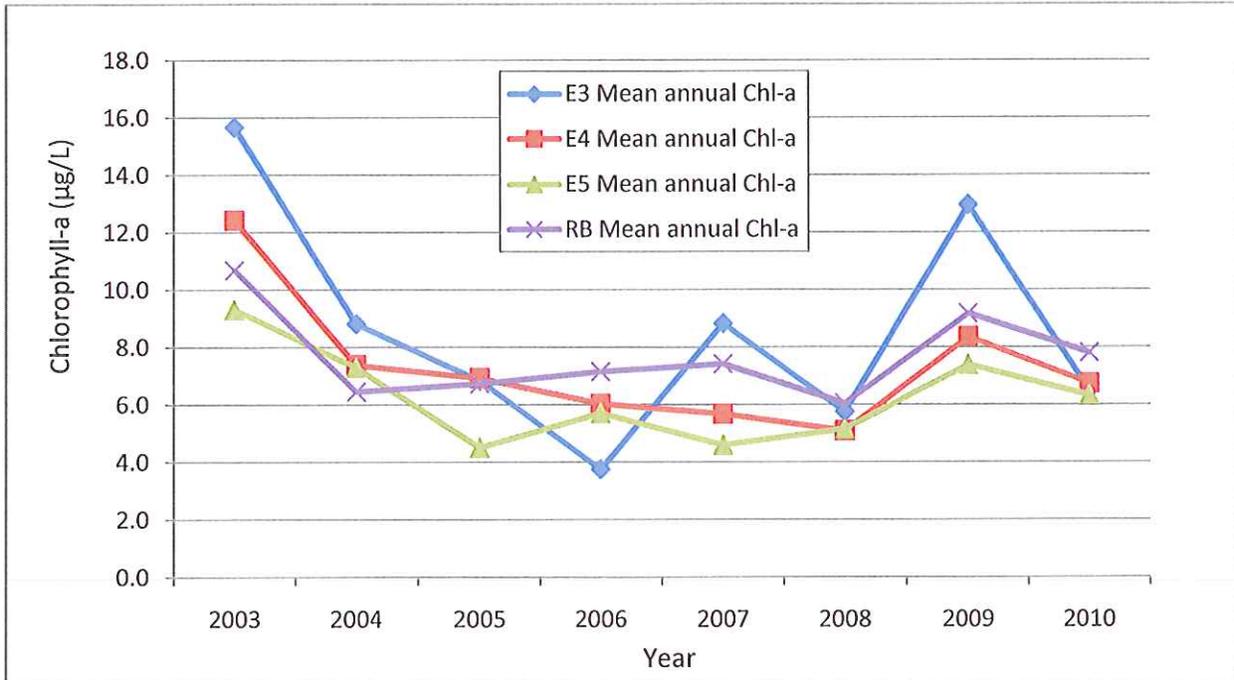


Figure 13: Mean annual chlorophyll-a in waters around Weedon Island Preserve.

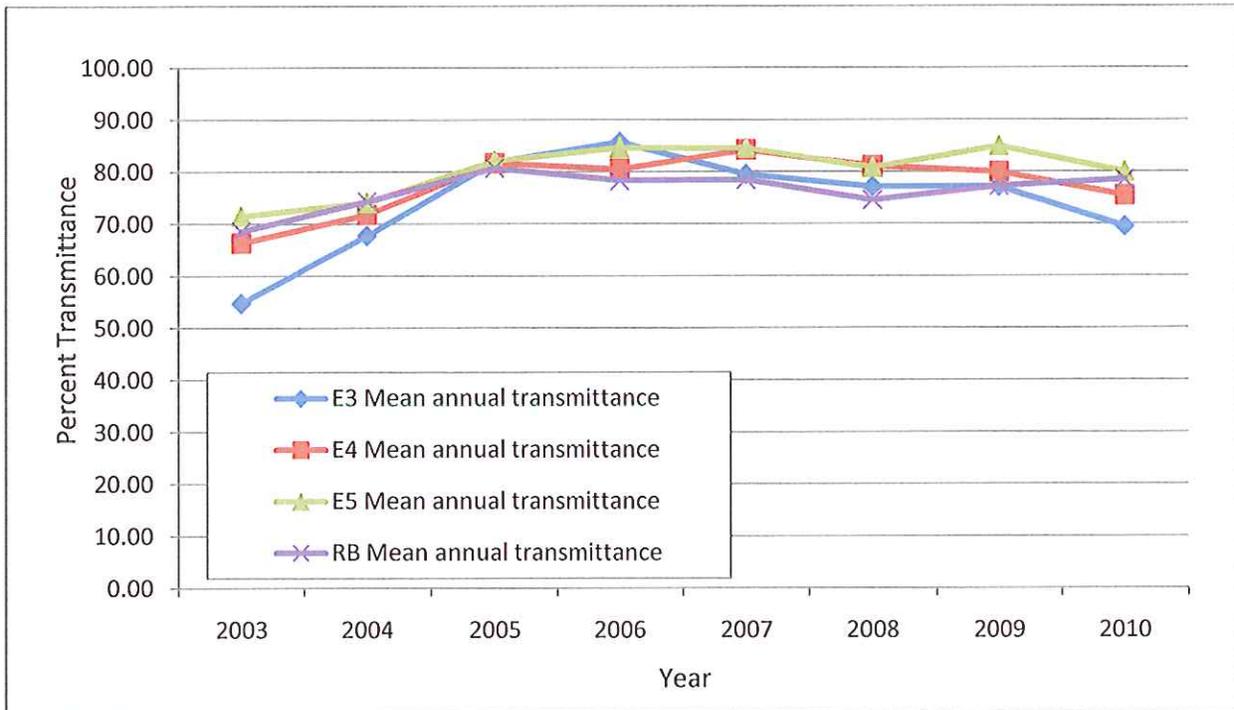


Figure 14: Mean annual transmissivity in waters around Weedon Island Preserve.

Geographic trends in water quality show water quality improves in Tampa Bay waters from the north to the south and is better in Tampa Bay water just outside of Riviera Bay compared to within Riviera Bay. This trend is seen for chlorophyll-a for most years and transmittance in the two high rainfall years, 2003 and 2004. In most years mean annual chlorophyll-a is higher (poorer water quality) in stratum E3 and lower (better water quality) in stratum E5. Also water

quality tends to be better in stratum E5, just outside the mouth of Riviera Bay with lower mean annual chlorophyll-a values and higher mean annual transmissivity values compared to stratum RB. Mean annual dissolved oxygen also tends to higher (better water quality) in stratum E5 compared to stratum RB.

Water quality is better in the dry season compared to the wet season in all strata. This trend is reflected in higher mean annual dissolved oxygen values (Figure 15) and mean annual transmissivity in all strata in the dry season and lower mean annual chlorophyll-a values in all strata in the dry season.

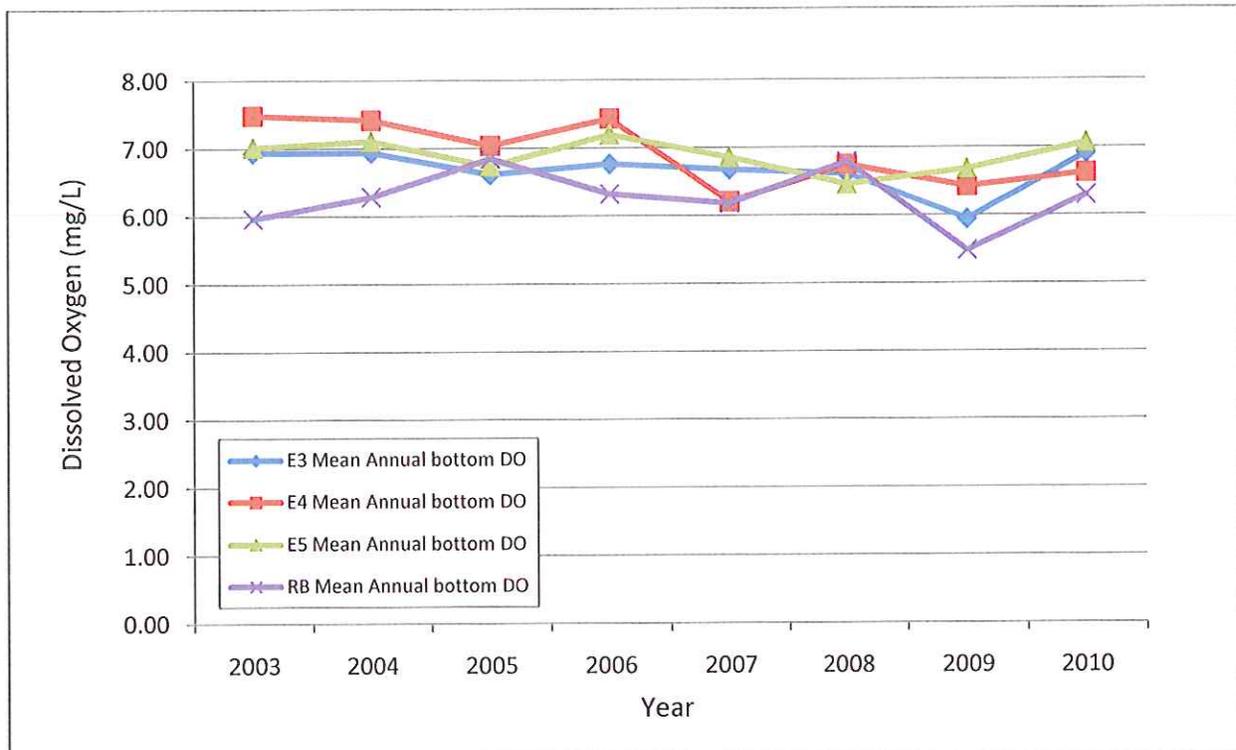


Figure 15: Mean annual bottom dissolved oxygen in waters around Weedon Island Preserve.

Future Monitoring Efforts

PCR staff and volunteers will continue to participate in bird counts. PCR staff will continue:

- Exotic plant species monitoring. After an area is targeted for aggressive removal of listed species, periodic site visits are conducted to monitor the area’s status.
- Pre-burn monitoring. Based on fuel loads and habitat structure, recommendations are developed for each burn unit annually.
- Post-burn monitoring. The characteristics of each burn are documented with attention to: overall effectiveness, severity of burn, completeness, etc.

DEI monitoring of water quality is scheduled to continue. The benefits of partnering with other agencies, institutions and volunteers have been realized at the Preserve. These partners can provide expertise and resources that allow surveys and monitoring to continue.

Research

Research projects have been conducted in partnership with other agencies and institutions to study natural and cultural resources. As noted previously, all research projects conducted in the Preserve require a site use agreement.

Preserving the Environment through Ecological Research

Preserving the Environment through Ecological Research (PEER), Inc. measured the effects of saltern restoration on vegetation and selected wildlife species following the 2005 saltern mitigation restoration project (PEER, 2006). The study found that wetland-dependent flora species, fish species densities, crabs and other macroinvertebrates were higher in saltern/mangrove habitat than in mangrove habitat.

United States Geological Survey

The Tampa Bay Integrated Science Study, conducted by USGS evaluated the mosquito ditches within the Preserve. From September 2003 through 2006, the USGS conducted fish sampling in 6 of the ditches, established a water quality and quantity site, and looked at sedimentation rates and composition. These studies evaluated the impacts of the mosquito ditches and the potential effects if removed. The results of this three year study will assist in implementation of parts of the management plan, which include restoration of mosquito ditches.

USGS was able to assess the hydro-leveling restoration technique used in Gateway Mitigation Habitat Restoration 2004 project. The study showed that spoil mounds must be lowered to the elevation of the surrounding wetland to eliminate exotic vegetation re-colonization (Smith 2007). In addition, distributing sediment more widely was shown to prevent burying of mangrove pneumatophores.

Bok-Tower Gardens

A contractor was hired to clear 0.5 ac. of palmetto and oaks in Unit 3 for site preparation for the introduction of the Florida golden-aster into the Preserve. In August 2010, staff and volunteers planted over 300 Florida golden-asters provided by Bok-Tower Gardens. The goal is to create a self-sustaining population in the Preserve. The site will be monitored intensively until 2013, and then occasionally thereafter.

Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute

The Fisheries-Independent Monitoring (FIM) program at the FWRI has conducted monthly stratified-random sampling in Tampa Bay since 1996. Sampling sites are randomly selected from all sites where a specific gear type could be set. Along with the stratified-random design, the FIM program uses a multi-gear sampling approach which collects many different species of fish and select macro-invertebrates and a wide size range of animals. The vast majority of the animals collected by the FIM program have been caught in the 21-m seine (offshore and

shoreline sets) samples. These animals tend to be species that attain small maximum sizes (<100-mm) or juvenile stages of larger-sized adult animals. Otter trawls collect animals that are similar in size to those collected by the 21-m seines. The 183-m purse seine and 183-m haul seine tend to collect larger juvenile, subadult and adult animals than any of the other gear types. In each sample, all fish and recreationally/commercially important invertebrates (pink shrimp, blue crabs, stone crabs, and scallops) are identified to the lowest practical taxonomic level, enumerated, and a random subsample of each species is measured.

In addition to stratified-random sampling, two grant-funded projects were conducted around the Preserve within the last 10 years. First, a 9.1-m seine was used to sample Grassy Creek and some of the associated outflows. Second, two dredge holes, one along the northwest side of the Gandy bridge and another near Big Island, were sampled with 6.1-m otter trawls and the surrounding flats were sampled with 21.3-m seines. All samples were processed following the same standardized protocols used in the FIM stratified-random sampling efforts.

The study area was defined as all one square nautical mile grids that contained a portion of the Weedon Island Preserve (Figure 16). All samples that were collected within these grids between 2000 and 2010 were included in the summary.

As part of this project, 6393 samples were collected around the Preserve from 2000 to 2010 (Appendix 14). One hundred and twenty four species and species groups, for which identification to species is not practical (*Brevoortia* spp., small *Eucinostomus* spp., *Menidia* spp., and *Oreochromis/Sarotherodon* species), have been collected in the study area (Appendix 14). Several of these species are of direct recreational and/or commercial importance, including *Callinectes sapidus* (blue crabs), *Centropomus undecimalis* (snook), *Cynoscion nebulosus* (spotted seatrout), *Farfantepenaeus duorarum* (pink shrimp), *Lutjanus griseus* (gray snapper), and *Mycteroperca microlepis* (gag). The most abundant fish species collected were *Leiostomus xanthurus* (spot) and *Anchoa mitchilli* (bay anchovy) with over 30,000 individuals collected for each. Many of these numerically abundant species (ex: *Anchoa mitchilli*, *Harengula jaguana*, and *Opisthonema oglinum*) are part of the forage base upon which the recreationally/commercially important species prey. *Palaemonetes pugio* (daggerblade grass shrimp) was the most abundant invertebrate collected (N=50,491) even though these grass shrimp were only enumerated in the Grassy Creek samples collected with the 9.1-m seine.

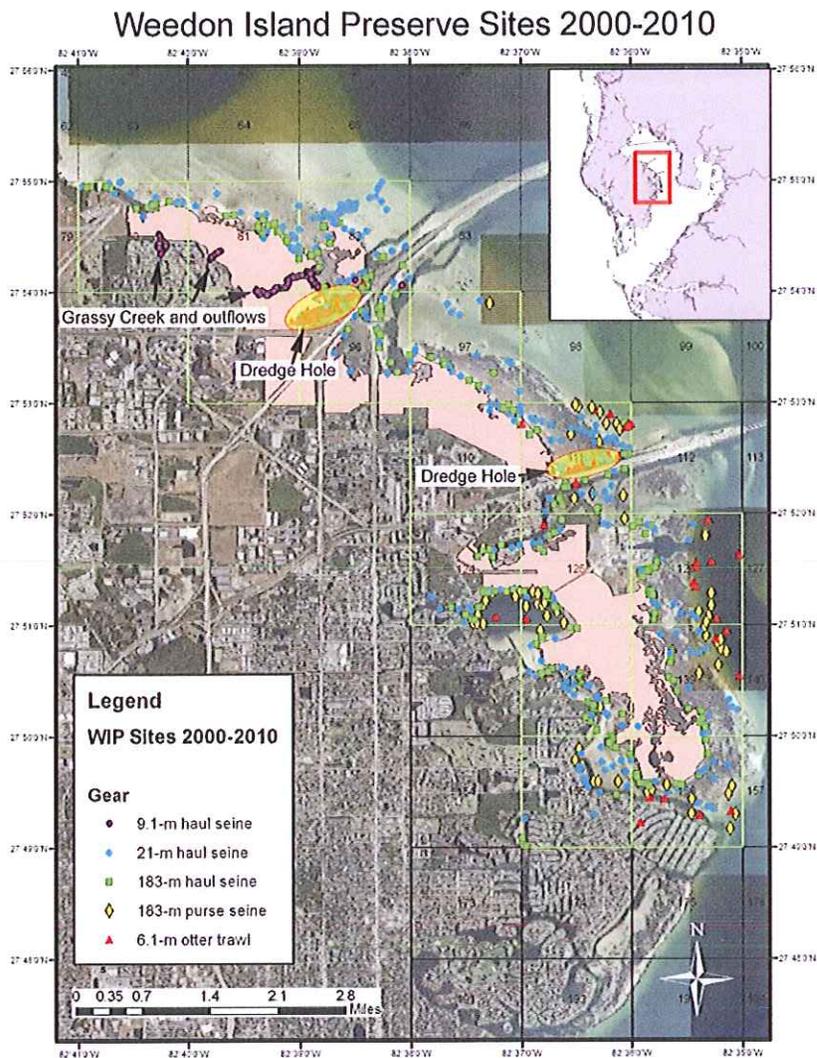


Figure 16. Map of the study area and sampling site locations around the Weedon Island Preserve from 2000-2010.

Future Research Needs

Research projects support informed resource management decisions. Such studies will be encouraged and supported to the fullest extent possible through partnerships with scientists from external agencies and institutions. PCR recognizes the need for additional research in the following areas:

- water quality and quantity of the freshwater spring and freshwater lake located on property managed for PEF
- regular monitoring of all taxonomic groups throughout the Preserve including imperiled species and their habitat based on site-specific population data
- historic vegetative mapping and comparison to existing vegetation communities
- archaeological research.

PCR will continue to permit and coordinate research conducted at the Preserve as part of the site use process (Appendix 12). Research partners provide expertise and resources that allow for detailed investigations beyond the scope of local government. Such partnerships, especially those that promote archaeological and applied ecological research, will continue.

Horticulture Operations

PCR Countywide Horticulture Operations are responsible for maintaining mowed areas and fire breaks in the Preserve. Crews mow approximately every 21 days during the peak of the growing season, and as needed out of season. New fire breaks and fire break maintenance is performed periodically as needed during the year. PCR protocol requires that prior to any mowing or cutting of fire breaks, crews clean equipment to limit introduction of exotics into the Preserve.

Future Horticulture Operations

PCR will continue to maintain mowed areas and fire breaks in the Preserve. Crews will mow approximately every 21 days during peak growing season and as needed out of season. Firebreaks will be disked as needed to maintain mineral surface barriers.

Cultural Resource Management

Since 2002 and throughout the past decade, numerous archaeological surveys and related studies have been conducted at the Preserve (Appendix 15). These were coordinated with the Division of Historical Resources (DHR) when required. Several of these projects were initiated by the construction requirements of the expansion of the PEF plant and fuel the conversion from oil to natural gas. Other surveys were initiated by grants and by educational programs at WIPCNHC.

In 2004, the County was awarded a grant from the DHR for a Comprehensive Cultural Resource Survey of the Preserve. This extensive survey conducted by the Department of Anthropology at the University of South Florida in Tampa, included an additional survey by the University of South Florida, Department of Geology on geomorphic studies of land change. In 2007, the County again was awarded a DHR grant for Survey and Mound Restoration in a public archaeology project at the northern part of Preserve.

In addition to these reports, additional surveys and research were conducted on PEF property. An on-going field excavation is held each spring at a shell midden site by University of South Florida, St. Petersburg.

An archaeological permit was issued to investigate a reported prehistoric dugout canoe located in the intertidal waters of the northern portion of the Preserve. Investigation and thorough documentation of this significant find took place in December 2007. The prehistoric canoe was measured at 12.17m, making it the longest dugout canoe discovered on record in the southeastern United States, and the only canoe found in an intertidal environment. Radiocarbon dating of

samples was conducted by Beta Analytic Laboratory. Two canoe samples yielded the 2 Sigma calibrated results of Cal A D 690 - 1010. The wood was identified as pine (*Pinus* sp). The decision to excavate the dugout canoe came after careful consideration and consultation with the State Archaeologist and State Historic Conservator. FOWI pledged \$30,000 to the project and local and state archaeological groups (Florida Public Archaeology Network West Central Region (FPAN), Central Gulf Coast Archaeological Society (CGCAS) and AWIARE joined in the effort and assumed responsibility for excavating and preserving the canoe. It was excavated in sections in March 2011 and placed in a specially prepared tank for preservation. The canoe ultimately will be displayed for public viewing at WIPCNHC (Appendix 15).

Future Cultural Resource Management

With the establishment of the AWIARE Research Station at Weedon Island, opportunities for new research at the Preserve and the region will be available to outside professional groups and universities. All permitting will be handled through PCR with input from AWIARE's professional board and in coordination with DHR.

Projects AWIARE is interested in pursuing include developing a GPS layer of all archaeological sites on the Preserve; working to update many of the listed Florida Master Site Files; and developing, conducting and documenting in coordination with Pinellas County a yearly program of site monitoring. Studies of shell materials will also be conducted in the next few years.

In addition, AWIARE will continue to expend time and expertise in the conservation of the Weedon Island dugout canoe excavated in 2011. The dugout canoe must remain in the conservation tank at least two more years through 2013, and it is monitored and documented 2-3 times each week. After preservation, the canoe will be prepared for interpretive display. Funding and professional advice will be sought from DHR for the interpretive display of this significant dugout canoe.

Security

Weedon Island Preserve is protected by a multi-faceted security program. First, land access to the Preserve is possible only by one road, which is equipped with an entrance station and gate. From 2005 to 2011, the entrance station was staffed 15 minutes before sunset to 6:00 AM by PEF security as part of their contract with the County. In late 2011 PEF installed a new remote security system and no longer provides security staff at the Preserve entrance station. From sunset to sunrise, entrance into the Preserve is monitored at FPE's security station. Cameras installed at the entrance station allow FPE staff to grant or deny access through remote control. This arrangement effectively restricts public use of the Preserve to regular hours of operation.

A second level of security is accomplished through a contract with PCSO to provide deputies assigned specifically to the County's environmental lands to enforce ordinances and laws. The contract provides for two deputies to patrol the preserves both by land and water. The deputies are

provided office space in the maintenance shop. This contract is renewed annually and is funded through part of PCR's annual operating budget.

A third level of security is provided by PCR Parks and Environmental Lands, South District program. Rangers patrol the Preserve a minimum of two times per day to provide safety and security of the trails, boardwalks, and facilities. They also provide assistance to visitors as needed and ensure compliance of Preserve rules and ordinances. Additional support is provided almost daily by the presence of volunteers, who report immediately to staff any concerns, such as missing signs or safety issues on the trail and boardwalks.

In 2009, security cameras were installed at the entrance station and the parking lots of the WIPCNHC and fishing pier. Video footage is provided to law enforcement officials in support of their criminal investigations.

All structures, office and residential, are equipped with smoke detectors and 10-lb. ABC type fire extinguishers. The facilities are inspected annually by the Pinellas County Fire Marshall and any deficiencies are corrected. Vehicles with keyed ignition systems are locked and the keys secured inside the maintenance shop building.

Fencing and signage also serve a vital role in resource protection. The landward (west) side of the southern part of the Preserve is fenced and posted to enforce trespassing laws and to protect against illegal activities such as dumping. The waterward extent of the Preserve is posted with signage that identifies regulatory zones for boaters (Figure 17). This was done to protect valuable sea grass beds and other aquatic natural resources.

The north part of the Preserve has approximately 3 mi. of fencing maintained by the Florida Department of Transportation along Interstate 275, Ulmerton Road and Dr. Martin Luther King Jr. Street North.

Future Security

PCR will continue to provide for security of the Preserve. Rangers will patrol the Preserve to provide safety and security of the trails, boardwalks, and facilities. Rangers also will provide assistance to visitors as needed. Volunteers will also continue to provide assistance to staff by reporting safety and security concerns.

PCSO will continue to be contracted, as funding allows, to provide security in the Preserve and to enforce rules, ordinances and laws. This will include enforcement of the existing regulatory zones (Figure 17) to protect the seagrass beds and other aquatic resources. PCSO will continue to notify PCR staff of missing or damaged signs. Inspections of the signs will continue approximately twice a year by PCR staff. Replacement of damaged or missing signs will continue to be completed by DEI Water and Navigation. For the purpose of increased resource protection, preserve safety and security, and emergency response establishment of a residence within the Preserve to house a PCSO deputy will be considered. This residence would be limited to an area already impacted such as the maintenance area of the Preserve and would be a

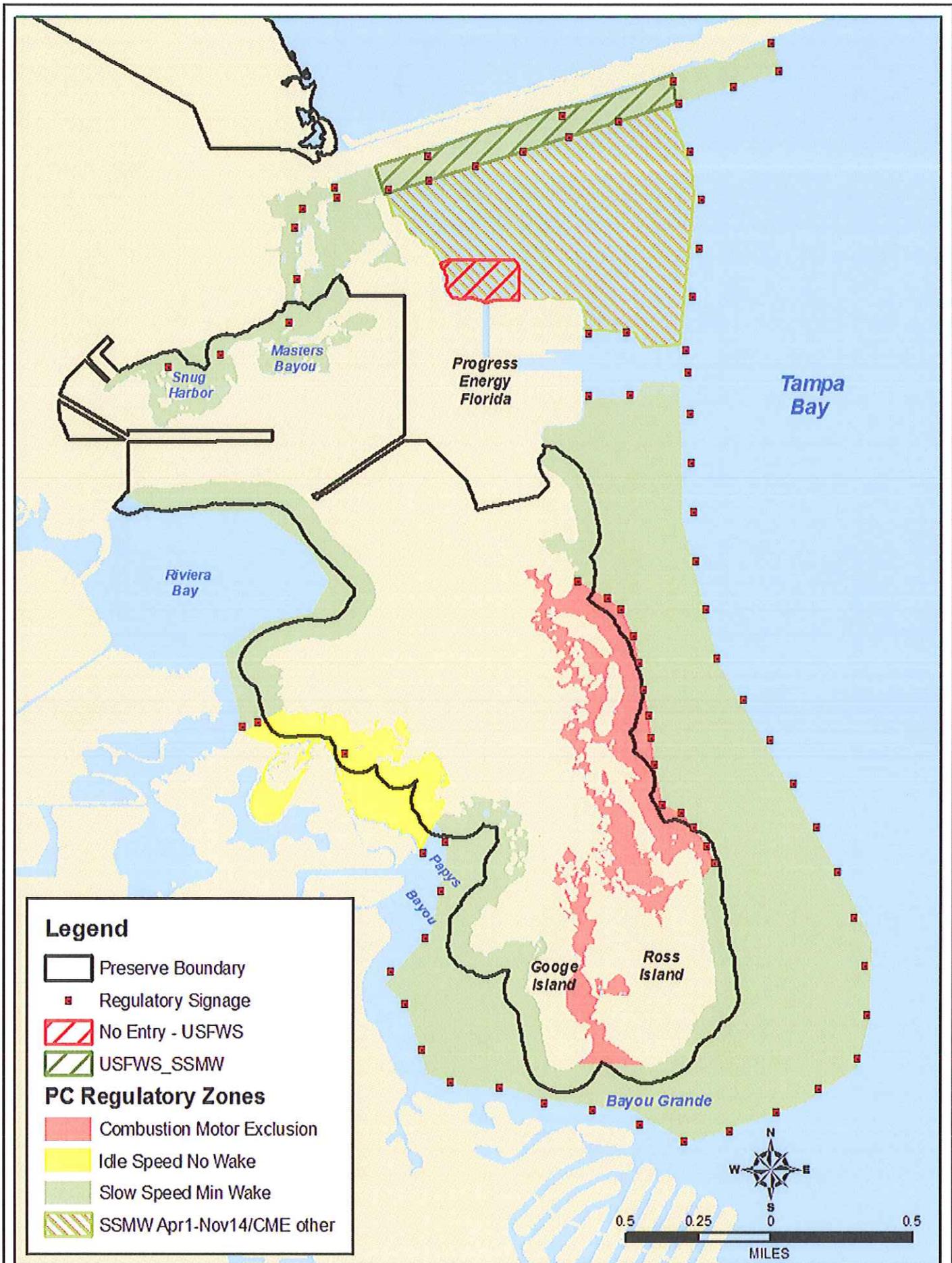


Figure 17. Aquatic Regulatory Zones Map

permanent, semi-permanent or mobile structure with connection to sanitary sewer. A resident deputy would provide for after hours coverage of the Preserve beyond the regularly staffed hours of operation. Residency would be subject to the County lease conditions under separate agreement and would be for space only, conveying no land owner rights.