

# 2023 Annual Report

January 1, 2023 to December 31, 2023



Surface Water Improvement  
and Management Program



Cover photo: Rock Ponds Ecosystem Restoration

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## Purpose

This report provides a summary of the Southwest Florida Water Management District Surface Water Improvement and Management (SWIM) Program activities for the 2023 calendar year.

## Introduction

In 1987, the Florida Legislature enacted the Surface Water Improvement and Management Act (Sections 373.451-.4595, Florida Statutes). They recognized water quality in surface waterbodies throughout the state had degraded or were in danger of being degraded, and important functions once performed by associated natural systems were no longer being provided. The functions to be maintained or improved are identified in the SWIM Act and include providing aesthetic and recreational pleasure for the state's citizens; providing habitat for native plants and animals, including endangered and threatened species; providing safe drinking water for the state's growing population; and attracting visitors and accruing other economic benefits. The Act requires each water management district identify and maintain a priority list of waterbodies of regional or statewide significance and develop plans and programs for the improvement of those waterbodies. Waterbodies identified by the districts are approved by the state, including the addition of new waterbodies or the removal of existing ones.

The District's Governing Board and the FDEP are required to approve the list of SWIM Priority Waterbodies every five years. The last update in 2020 approved the current list of twelve Priority Waterbodies. No existing SWIM Priority Waterbodies were removed from the list, and no new waterbodies were added. Of the twelve SWIM Waterbodies, three are coastal estuaries (Tampa Bay, Sarasota Bay, Charlotte Harbor), five are first magnitude spring systems (Kings Bay/Crystal River, Rainbow River, Homosassa River, Chassahowitzka River, and Weeki Wachee River), and the remaining four are lake systems (Lake Panasoffkee, Lake Tarpon, Lake Thonotosassa, and the Winter Haven Chain of Lakes). Goals and objectives were developed for each waterbody and are used to guide programs and projects for maintaining or improving water quality, natural systems, and the other functions consistent with the SWIM Act. Essential to carrying out the SWIM Act is the cooperation between the District and local governments and agencies in developing and implementing effective SWIM Plans.

The work done by SWIM is highly recognized. Since 1987, SWIM Program projects and personnel have received a total of 65 awards. SWIM projects were recognized in at least 15 District-initiated broadcast and newspaper stories in 2023.

## Other District Programs

The District has a wide range of programs, initiatives, and actions that complement and enhance the objectives of the SWIM Act. The programs include planning, regulation, land acquisition, public education, and a cooperative funding program that provides the foundation for the District to accomplish its mission including the objectives of the SWIM Act. Regulating development and water use plays a key role in preserving water quality and habitat by ensuring that stormwater is properly treated, wetland impacts are minimized, and effects to the aquifer are monitored. Public education is a critical element because of the need for public support for these activities. And finally, the District's cooperative

funding program provides a significant incentive to local governments and others by funding activities that help protect and restore these waterbodies.

## Coastal Estuaries

There are three coastal estuaries in the SWIM Priority Waterbody list. Estuarine environments are a transitional zone from freshwater to saltwater. These fragile systems are dependent on the health of both the freshwater and coastal waters as this zone of interaction represents the base of the food chain and nursery habitat for both environmentally and economically important species. The SWIM coastal estuaries efforts are summarized below.

Estuary	Size (Square Miles)	Watershed (Square Miles)	Restoration /WQ Projects	Restored (Square Miles)	Treated (Square Miles)
<b>Tampa Bay</b>	373	2,200	124/107	11.5	132
<b>Sarasota Bay</b>	35	212	39/14	1.5	70
<b>Charlotte Harbor</b>	270	4,400	30/12	8.2	153

### Seagrass Mapping

During 2023, SWIM's Seagrass Mapping program solicited and selected a contractor for the 2024 mapping cycle and aerial imagery acquisition began in November 2023. As of 2022, finalized seagrass habitat maps for the Suncoast, which includes the estuaries of Tampa Bay, Sarasota Bay, Lemon Bay, and Charlotte Harbor were completed. In 2021, SWIM's Seagrass Mapping Program completed its most recent seagrass habitat maps for the Springs Coast region which includes the nearshore coastal waters from Waccasassa Bay south to Anclote River and the estuarine portions of the following SWIM Priority Waterbodies: Crystal River/Kings Bay, Homosassa River, Chassahowitzka River, and Weeki Wachee River. The Springs Coast is mapped every four years with the next map scheduled for 2024.

The SWIM Program maps seagrass habitat to "take the pulse" of these estuaries to help guide resource management actions and projects designed to maintain and improve the health of these priority waterbodies. Approximately 70% of the recreationally and commercially important species of fish, crabs, and shrimp in the Gulf of Mexico spend at least a portion of their lives in seagrass meadows. Seagrasses are a major source of food for both manatees and sea turtles, help maintain good water quality, and minimize impacts from storms and boat wakes. Because seagrasses are sensitive to water quality changes, impacts from red tide, hurricanes, and other episodic events, they make excellent barometers of overall estuarine health.

### Restoration Site Assessments

Following development of a methodology in 2020 and 92 sites assessed from 2020-2022, thirty-two (32) sites were completed during 2023, mostly in the southern counties. Brown and Caldwell were engaged to implement the assessment methodology developed by SWIM staff, which is an adaptation of the Uniform Mitigation Assessment Method (UMAM). Site information is available within an ArcGIS dashboard, the SWIM Restoration Geodatabase, and via reports compiled for cooperators. Results from these assessments will be used for CFI project metrics, contractual compliance, and project planning.

# Tampa Bay

## Background

Tampa Bay was declared an estuary of national significance in 1990 through its inclusion in the Environmental Protection Agency's National Estuary Program. Tampa Bay is Florida's largest open water estuary and includes portions of Hillsborough, Manatee, Pasco and Pinellas Counties. More than two million residents live in the Tampa Bay watershed. Three seaports are located along Tampa Bay's borders, including Port Tampa, Port St. Pete, and Seaport Manatee. Combined these ports generate more than \$21 billion to the local economy and supports over 110,000 jobs. The largest of these, the Port of Tampa, consistently ranks among the busiest ports in the nation.

Tampa Bay is also a focal point of the region's premier industry – tourism. The bay and surrounding barrier islands attract nearly 5 million visitors a year. Visitors and residents utilize the bay for sport fishing, boating, kayaking and wildlife observation. Tampa Bay provides critical nesting habitat to diverse colonies of wading, shorebird, and seabird species. In 2021 surveys by Audubon Florida, 26 species of wading and shorebirds with over 24,000 breeding pairs were documented in Tampa Bay. The U.S. Fish and Wildlife Service estimated an average of 50,000 pairs of nesting seabirds annually. One-sixth of the Gulf Coast population of Florida manatees seek refuge during winter near power plants bordering the bay; and more than 200 species of fish utilize the Tampa Bay estuary.

Since 1950, approximately 50 percent of the bay's natural shoreline has been lost to development. Most of the wetland loss occurred before 1970, prior to more stringent protection efforts. The combination of wetlands protection, wetland restoration projects, and improved water quality is responsible for recent increases in coverage estimates for these important fish and wildlife habitats.

## Tampa Bay National Estuary Program

The Tampa Bay National Estuary Program Interlocal Agreement established the Tampa Bay Estuary Program (TBEP) as an independent special district in 1998. The District partners with TBEP for their Annual Workplan to provide funding and participates in three main areas. First, the District's SWIM program carries out projects that will address water quality and habitat restoration within the bay. Second, the District has contributed funding to the TBEP since 1990 to carry out the administration and implementation of projects identified in the TBEP Comprehensive Conservation and Management Plan. Finally, the District provides staff to sit on the technical, management and policy (Governing Board Member) boards, the Nitrogen Management Consortium and the newly established Habitat Restoration Consortium, described below.

In August 2020, TBEP adopted the updated Habitat Master Plan (HMP) which establishes 2030 protection and restoration targets and longer term 2050 goals for critical habitats from the open waters of Tampa Bay to the headwaters and uplands of the Tampa Bay watershed. As described within the HMP, the Habitat Restoration Consortium (HRC) was established as a subcommittee of the TBEP Technical Advisory Committee (TAC) to provide a framework for coordinating habitat restoration activities throughout the Tampa Bay watershed. It consists of representatives from regulatory agencies; the private sector; and local, regional, state and federal land managers or restoration practitioners. The purpose of the HRC is to implement the HMP through encouraging the sharing of technical information, creation of new partnerships, watershed-level planning, identification of potential projects (and



potential funding sources), and reporting on annual progress toward managing Tampa Bay's habitats. The HRC may also review proposed projects for consistency with the TBEP Comprehensive Conservation and Management Plan (2017 Update) and the HMP. SWIM staff currently serve as a co-chair of the TBEP HRC.

### Tampa Bay Environmental Restoration Fund

The District cooperatively funds the Tampa Bay Environmental Restoration Fund (TBERF). TBERF was established to fund restoration, water quality, research and education initiatives in Tampa Bay. The following projects are currently being managed and funded through TBERF and status for 2023 is as follows: Mobbly Bayou completed 100% plans, Boyd Hill Freshwater Wetland Restoration project completed design & permit phase; Pinellas County Philippe Park Living Shoreline has Phase 2B and Phase 3 is underway; the District's Kracker Avenue is on hold pending additional permits; Hillsborough County's Lower Green Swamp Preserve Freshwater Wetland Hydrologic Restoration is complete; Eckerd College Living Shoreline has completed Phase 2 is delayed; Philippe Bay Stormwater Quality Improvements is delayed; Robinson Sportfish Emigration Tracking Phase 2 in progress; Atmospheric Nitrogen Deposition Impacts on WQ in TB Phase 3 is delayed; Shark Status and Trends completed Phase 2 Data Collection; Diamondback Terrapin Conservation Plan Phase 2 Data Collection in progress. Newman Branch Creek Living Shoreline Phase 1 Data Collection & 60% Design completed; Caulerpa-Seagrass Interactions in Tampa Bay Phase 1 Sampling Design & Collection completed; Perico Preserve Mangrove Habitat Restoration Phase 1 Restoration Pre-planning & Baseline Data completed; Biochar Pyroclinal Control Phase 1 Production & Characterization of Biochar completed; Philippe Park Seawall Habitat Enhancement Notice To Proceed (NTP) issued; MacDill Airforce Base Mangrove & Saltern Restoration NTP issued; and the District's Frog Creek Wetland Restoration is delayed. The TBERF FY24 agreement was executed in FY2023 and will advertise for grant applications in FY24.

### Seagrass

Seagrass acreages in Tampa Bay declined approximately 40 percent between 1950 and 1982. Much of this loss was due to indirect impacts associated with degraded water quality primarily resulting from nitrogen over-enrichment and related increases in algae concentration, causing light limitation to seagrass survival and growth. In 1980, all municipal wastewater treatment plants were required to provide Advanced Wastewater Treatment (AWT) for discharges directly to the bay and its tributaries. In addition to the significant reductions in nitrogen loadings from municipal wastewater treatment plants, stormwater regulations enacted in the 1980s also resulted in reduced nitrogen loads to the bay. Estimates for average annual total nitrogen loadings to Tampa Bay in 1976 are more than 2.5 times as high as current estimates.

In response to projects funded and managed by SWIM and other nutrient load reduction efforts, water quality has measurably improved in all segments of the bay over the past 30-plus years. However, recent water quality declines in Old Tampa Bay, and other bay segments, resulted in a 16% loss of mapped seagrass between 2018 and 2020. During the 2022 seagrass mapping cycle Tampa Bay experienced another 12% loss bringing the total seagrass acres for Tampa Bay to 30,137 acres. Despite these losses, seagrass acreage in Tampa Bay still remains well above 1982 totals.

## SWIM Plan

The kick-off meeting for the Tampa Bay SWIM Plan Update was held in February 2021 with Tampa Bay Estuary Program and the consultant. In 2021, water quality and natural systems issues and drivers were identified and water quality and habitat status and trends were summarized and presented at Technical Stakeholders meetings in 2021. Water Quality and Habitat action plans were presented at the Third and final Technical Stakeholders meeting in Spring 2022. A draft of the Tampa Bay SWIM plan was completed by the consultant when it was determined to delay completion of the draft plan to present and discuss the 2022 seagrass mapping results for Tampa Bay.

The draft SWIM plan was presented at a public workshop and the District's Environmental Advisory Committee in 2023. Following these meetings the final SWIM Plan update was presented to the District's Governing Board for approval to send to for agency and local government review pursuant to the requirement of 373.453 Florida Statutes. Several comments were received, and minor changes were incorporated as appropriate into the final Tampa Bay SWIM Plan update. The Governing Board approved the Tampa Bay SWIM Plan at its meeting in October 2023 and a copy of the plan may be found at [Tampa Bay | WaterMatters.org \(state.fl.us\)](https://www.watermatters.org/state/fl.us)

## SWIM Projects

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 124 restoration projects and 107 water quality projects for Tampa Bay, totaling over 7,300 acres of restored habitats and nearly 85,000 acres of treated watershed.

The following projects were either ongoing or completed in 2023:

**Anna Maria BMPs Phase M** – Water quality project in cooperation with City of Anna Maria to treat approximately 43 acres of stormwater runoff. Construction was completed in 2023.

**Bluff Restoration and Erosion Abatement** – Cooperatively funded study with the Town of Belleair to investigate the erosion of the bluff shoreline along Bayview Drive. During 2023, the data collection phase was ongoing.

**Boyd Hill Nature Preserve** – This natural system restoration project is in cooperation with St. Petersburg with the District as the lead. Bidding and contractor selection completed in 2023.

**Central Holmes Beach Basins 6 and 7** – Water quality project in cooperation with City of Holmes Beach to treat approximately 30 acres of stormwater runoff. The City completed design in 2023 for Phases F, G, and H and completed construction of Phase F.

**Delaney Creek Improvements** – Cooperatively funded project with Hillsborough County. Construction was ongoing for stormwater BMPs to treat 130 acres of highly urbanized watershed draining to Delaney Creek.

**Frog Creek Wetland Restoration at Terra Ceia** – A District Initiative for hydrologic and natural systems enhancement and restoration of approximately 100 acres of interconnected borrow pits located on the approximately 129-acre District owned Frog Creek Tract in Manatee County. Enhancements include the creation of littoral zones and the removal of exotic species. During 2023, draft 100% plans and specs were submitted while permitting was ongoing.



**Gully Branch Upland Restoration** – This District Initiative includes upland restoration for 444 acres. The Contractor prepared the area for seeding in 2023.

**Kracker Avenue Restoration** – This is a District lead natural system restoration project on a 23-acre former fish farm. The Contractor paused construction in 2023 to acquire permits.

**Lake Seminole Dredging Project** – Water quality project to reduce nitrogen by dredging the lake. Dredging material management enclosure ongoing in 2023.

**Little Manatee River Corridor: Area 8 Hydrologic Restoration** – This is a District Initiative to restore natural systems on about 1423 acres of District owned property on the Little Manatee River. Third party review completed in 2023.

**McIntosh Park Integrated Water Master Plan** – This project includes design, third-party review, permitting, and construction of a 100-acre treatment wetland that will accept at least 1.5mgd reclaimed water to improve water quality discharging to Blackwater Creek, the Hillsborough River, and Tampa Bay. Design and permitting continued in 2023.

**Mobbly Bayou Preserve Restoration** – The Mobbly Bayou Preserve is comprised of 396 acres located in the City of Oldsmar, at the extreme northern end of Upper Tampa Bay. The Preserve is co-managed by the City of Oldsmar and Pinellas County. This project focuses on restoration and enhancement of tidal creeks and tidal habitats by recontouring using a technique known as hydro-blasting to reduce the spoil mounds allowing new mangrove habitat to become established and restoring tidal movement and duration of tidal inundation. In 2023, design and permitting were completed.

**Nutrient Source Tracking** – Cooperatively funded study with Pinellas County to review existing data and conduct additional sampling to assess nutrient loading into the McKay Creek, Allen's Creek, and Curlew Creek watersheds. As of 2023, the final report was submitted and the project was completed.

**Philippe Bay Stormwater Quality Upgrades** – This cooperatively funded project with the Philippe Bay Neighborhood Association includes the construction of stormwater retrofits to improve water quality discharging to Safety Harbor from approximately 27 acres of urban residential watershed. In 2023 the cooperator continued to work towards completing the design.

**Roosevelt Creek Channel 5 Improvements** – Bid document completed in 2023 for the 12-acre natural systems restoration on Channel 5 in the Roosevelt Creek watershed.

**Southeast Riverside Water Quality Improvements** – The City of Palmetto is treating about 62 acres of stormwater runoff. Construction of the stormwater pond and associated structures was completed in 2023.

**Starkey M10 Stormwater Facility Quality Improvements** – This cooperative project with Marion County includes the construction of stormwater BMP retrofits to improve water quality discharging from 58 acres of residential watershed. Bid documents prepared in 2023.

**Study – Clearwater Harbor/St Joseph Sound Nitrogen Source Identification** – This is a cooperatively funded water quality project with Pinellas County aimed at identifying sources of nitrogen entering Clearwater Harbor and St. Joseph Sound and identifying potential future BMP targets. In 2023, data collection was ongoing.

**Weedon Island Tidal Marsh** – This cooperative project with Pinellas County involves design, permitting, and construction of a hydrologic restoration project in Weedon Island Preserve. The County has selected Sea and Shoreline as the contractor for this project in 2023. The contractor is expected to be approved by the Pinellas County Board of County Commissioners in early 2024.

#### Outreach in 2023 – Volunteer Events, Presentations, and Education:

- The District sponsored the Florida Birding and Nature Festival where SWIM staff hosted a booth to educate participants about the program.
- The District sponsored the Pinellas County Florida Waters Stewardship Program, which educated participants about a variety of water-resources topics through seven three- hour class sessions.
- In Hillsborough County, nearly 14,000 sixth-grade students and 830 teachers and chaperones attended a three-day field trip program at Nature’s Classroom. The facility is located along the banks of the Hillsborough River in the District’s Lower Hillsborough Wilderness Preserve. Also, 160 students grades 4—7 attended Nature’s Classrooms water-resource summer camp. Nature’s Classroom hosted a week-long workshop focused on the Hillsborough River Watershed for 14 Hillsborough County School District educators. In addition, more than 220 fourth and fifth-grade students and 22 teachers and chaperones participated in a Freshwater Wetland Field Study program at Camp Bayou, where students learned about how the water cycle works in a watershed, the importance of biodiversity, how aquatic invertebrates indicate water quality and more.
- In Pinellas County, more than 5,000 fourth-grade students and more than 960 teachers and chaperones attended field trip programs at either the Boyd Hill Nature Preserve or the Brooker Creek Environmental Education Center at the Brooker Creek Preserve. Students experience one of these watersheds by learning about the flora and fauna as well as participating in water quality testing, dip netting and more.
- In Manatee County, about 1,200 fifth-grade students and 150 teachers and chaperones attended field trip programs led by Around the Bend Nature Tours at either Ken Thompson Park or Bay Preserve. Activities included water quality testing, dip netting, nature walks and more. Also, 19 students and two teachers participated in the Manasota Regional Envirothon competition, where students were tested on a variety of topics, including water resources.

## Sarasota Bay

### Background

Sarasota Bay was identified as an estuary of national significance in the Water Quality Act of 1987. The District was the initial local program sponsor and played a major role in shaping the restoration plan. Subsequent to approval of the Comprehensive Conservation and Management Plan (CCMP) in 1995, Sarasota Bay was added to the District's SWIM Priority List.

The Sarasota Bay restoration strategy focuses on improving juvenile fish habitat and restoring wetlands and seagrasses that were lost as a result of historic dredge and fill operations and pollution. Projects completed by the SWIM Program and other agencies have restored tidal and freshwater wetlands; created coastal upland habitats; and created bay bottom habitat.

### Sarasota Bay Estuary Program

The Sarasota Bay Estuary Program (SBEP) Comprehensive Management Plan Development and Implementation is a project to coordinate the partnership between the SBEP and the District. The District has assisted in the implementation of the SBEP since its inception in 1989. The District participates in three main areas. First, the District's SWIM program carries out projects that will address water quality and habitat restoration within the Harbor. Second, pursuant to the Interlocal Agreement, adopted in 2004, the District provides annual funding through the Annual Workplan Agreements with the SBEP to carry out the administration and implementation of projects identified in the SBEP Comprehensive Conservation and Management Plan. Finally, the District provides staff to sit on the technical, management and policy (Governing member) committees of the program.

### Seagrass

Seagrass acreages in Sarasota Bay have been declining since 2016. From 2020 to 2022 the bay lost more than 500 acres of seagrass, the greatest loss was in Sarasota Bay Proper. With this loss during the 2022 mapping cycle, Sarasota Bay reached a 15-year low of 9,962 acres; however, it is still well above the 1988 minimum of 8,712 acres. Field verification has proven that some areas are starting to recolonize but too sparse of coverage to be included during aerial imagery mapping. The next mapping cycle will be in 2024.

### SWIM Projects

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 39 restoration projects and 14 water quality projects for Sarasota Bay, totaling more than 900 acres of restored habitat and over 45,000 acres of treated watershed.

The following projects were either ongoing or completed in 2023:

**Bradenton Beach BMPs Avenues B and C** – Construction completed in 2023 to treat approximately 15 acres of urban stormwater discharging to Sarasota Bay.

**City of Sarasota Created Wetlands System** – City of Sarasota Created Wetlands System - This cooperative project with the City of Sarasota is for construction of an 18-acre wetland system that will treat runoff from 5800 acres urbanized of watershed. Construction began in 2022 and earthwork and planting were completed in summer 2023. A maintenance plan is being formulated between the City and Sarasota County.

**Sarasota Bay SWIM Plan Update** – This project is to update the Sarasota Bay SWIM plan. The process to secure a consultant to assist with development of the plan started in late 2023. The agreement is expected to be executed in early 2024.

**Sarasota County Denitrification Study** – This is a cooperatively funded project with Sarasota County assessing groundwater nutrient statuses and identifying areas with the greatest opportunity for groundwater nutrient reductions. In 2023, data collection was ongoing.

Outreach in 2023 – Volunteer Events, Presentations, and Education:

- In Sarasota County, nearly 880 fifth-grade students and 150 teachers and chaperones attended field trip programs led by Around the Bend Nature Tours to learn about Sarasota Bay at either

Ken Thompson Park or Bay Preserve. Activities included water quality testing, dip netting, nature walks and more. Also, 15 students and two teachers participated in the Manasota Regional Envirothon competition, where students were tested on a variety of topics, including water resources.

## Charlotte Harbor

### Background

Charlotte Harbor is a District SWIM Priority Waterbody and has also been declared an estuary of national significance through its inclusion in the U.S. Environmental Protection Agency's National Estuary Program (USEPA) in 1995. As a result of this designation, the Coastal and Heartland National Estuary Program (CHNEP) (formerly known as the Charlotte Harbor National Estuary Program) was established to assist the region in developing a comprehensive plan for the restoration and protection of Charlotte Harbor.

Charlotte Harbor is Florida's second largest open water estuary and is considered one of the most productive estuarine systems on the west coast of Florida. Because of its productivity, it has become a world-class destination for recreational fishing. Significant habitat losses within the harbor and its watershed have been documented and have been attributed to a variety of human activities. In the headwaters of the Peace and Myakka Rivers, large tracts of pine flatwoods, sandhill scrub, and other habitat types have been converted to agricultural land uses. In the Upper Peace River, much of the watershed has also been converted to phosphate mines. In the lower Peace and Myakka Rivers, once-large expanses of salt marsh and mangrove habitats have been drained and filled and replaced by residential housing in finger-fill canal communities. Charlotte Harbor is the home for more than forty species of animals listed by the state as either endangered, threatened, or of special concern.

### Coastal and Heartland National Estuary Program

Partners in the CHNEP include the Southwest Florida and South Florida Water Management Districts, USEPA, Florida Department of Environmental Protection, other state and federal agencies, and local governments from the watershed. The goals and strategies for the Harbor are identified in the Comprehensive Conservation and Management Plan (CCMP) for Charlotte Harbor which provides guidance to each entity on their contribution to restore the Harbor. The District participates in three main areas. First, the District's SWIM program carries out projects that will address water quality and habitat restoration within the Harbor. Second, the District has contributed annual funding through the Annual Workplan Agreements with the CHNEP since 1997 to carry out the administration and implementation of projects identified in the CHNEP Comprehensive Conservation and Management Plan. And finally, the District provides staff to sit on the technical, management and policy (Governing member) committees of the program. The District's annual budget includes funding support to the CHNEP and District staff salaries and travel to administer the project, which includes attending board meetings and other workshops and invoicing.

### Charlotte Harbor Flatwoods Initiative

The Charlotte Harbor Flatwoods Initiative (CHFI) is a multi-agency initiative lead by the South Florida Water Management District to restore flows, promote sheet flow enhancement, and restore wetland hydroperiods in Babcock Webb and Yucca Pens Wildlife Management Area (WMA); and improve the timing and magnitude of flows to tidal creeks west of Yucca Pens WMA. The FY2020 Cooperative Agreement with CHNEP included funds to support the CHFI through installation and maintenance of hydrologic monitoring stations (wells, rain gages and flow monitoring) and collection of data from these stations. During 2022, District funded data collection contributed to the development of a baseline hydrological model and scenarios were tested to determine the hydrological benefits of remedying artificial drainage from ATV trails on the Yucca Pens WMA as well as storing and routing excess water from Babcock Webb. District staff provided technical comment on modelling and associated reports to assist the CHNEP. Based on the modelling work, a project was initiated in 2023 by SFWMD and CHNEP to implement hydrological improvements on the Yucca Pens Unit. SFWMD staff provided input to the scoping of this project. SFWMD staff have also continued to provide general support to the initiative through participation in quarterly meetings and support for permitting of the Bond Farm reservoir.

### Coastal Charlotte Harbor Monitoring Network

The Coastal Charlotte Harbor Monitoring Network (CCHMN) is an ongoing project to monitor water quality in Charlotte Harbor. The purpose of the project is to establish long-term water quality monitoring stations in Charlotte Harbor and the estuarine areas of the Peace and Myakka Rivers. The CCHMN is a collaborative effort, which began in 2000, between the District, Charlotte County and the Florida Fish and Wildlife Conservation Commission (FWCC). Water clarity data and seagrass acreage have been collected since 2002 through the CCHMN and the District, respectively. Data collected through the CCHMN are essential for planning and management of habitat restoration and water quality improvement projects and providing data for comparison to water quality targets adopted by the CHNEP and the State. In August 2009, CHNEP adopted seagrass targets for each of the segments in Charlotte Harbor.

The CCHMN is implemented through the District's Annual Workplan Agreements with the CHNEP. Through a separate agreement with CHNEP, the FWCC is responsible for collection of samples at 30 randomly selected sites per month, in accordance with the CCHMN Standard Operating Procedures. CHNEP is responsible for coordinating with the County to ensure that the County continues funding laboratory analyses of all water quality parameters including nutrients, color and turbidity. CHNEP also is responsible for water quality data compilation, quality assurance/quality control, and submission of the data to the District. The District is responsible for the upload of the data to the Florida Department of Environmental Protection's (FDEP) database for water quality data.

### Seagrass

Seagrass acreage in Charlotte Harbor has been declining since 2016. From 2020 to 2022 the bay lost approximately 2% of grass or more than 300 acres. With this loss during the 2022 mapping cycle, Charlotte Harbor is at an all-time historic low of just over 14,000 acres. Some areas, such as the West Wall, had an increase in acres of patchy beds but lost acres of continuous beds. The greatest loss was along the northern section of the East Wall, where drift algae persists and attached algae continues to expand. The next mapping cycle will be in 2024.

## SWIM Projects

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 30 restoration projects, totaling more than 5,200 acres of restored coastal habitats. Since 2004, the District and its cooperators have completed 12 water quality improvement projects that are providing treatment for over 98,000 acres of watershed.

The following projects were either ongoing or completed in 2023:

**Boca Grande Area Drainage Improvements** – Cooperative funding project with the City of Punta Gorda to benefit approximately 50 acres of urbanized watershed. In 2023, the contract was executed and construction anticipated to start in 2024.

**Cape Haze Phase 3 Ecosystem Restoration** – The 3rd phase within the approximately 2,600-acre Coral Creek property, co-owned by the District and Florida Department of Environmental Protection (FDEP), includes the design and permitting of approximately 410 acres of coastal restoration. The project will create and enhance natural systems, including estuarine and freshwater wetlands and adjacent uplands. The 60% design and permitting submittals were completed in 2023.

**Crystal Lake Water Quality Improvement Study** – Cooperatively funded study with the City of Lakeland for water quality improvement opportunities in Crystal Lake. During 2023, the analysis and final report were completed.

**Deer Prairie Creek Preserve** – District initiated project to improve wetland quality in Deer Prairie Creek, a property co-owned by the District and Sarasota County. During 2023, a consultant was secured and updates to the previously permitted design were ongoing along with re-permitting.

**Dona Bay Surface Water Storage Facility** – This is a cooperatively funded project with Sarasota County and includes a third-party review and construction of a 380-acre surface water storage and treatment facility to improve water quality in Dona Bay. This facility is the second stage of the implementation plan for the Dona Bay Watershed Management Plan. Construction was completed in 2023.

**Lake Hancock Natural Systems Enhancements** – Cooperatively funded natural systems restoration project with Polk County will establish a minimum of 35 acres of planted native emergent/submerged aquatic vegetation in Lake Hancock. During 2023, emergent vegetation planting was completed.

**Lake June-in-Winter Catfish Creek BMPs** – The County is installing BMPs for treatment of approximately 2,760 acres of Catfish watershed. In 2023, design completed and bid documents prepared.

**Park Avenue Streetscape Improvements** – This is a cooperatively funded water quality project with the City of Lake Wales to implement stormwater BMP's including rain gardens. In 2023, construction was ongoing.

**Study: Lake Parker Restoration** – This is a cooperatively funded feasibility study with the City of Lakeland for a wetland swamp that discharges to Lake Parker. In 2023, data collection was completed.



**Study: Ridge to Rivers Feasibility** – This is a cooperatively funded feasibility study with Polk County assessing potential natural systems restoration opportunities in the southern portion of the county between the Lake Wales Ridge and Peace River. In 2023, data collection was ongoing.

**Study: Upper Peace River Feasibility** – This is a cooperatively funded feasibility study with Polk County assessing potential natural systems restoration opportunities along the upper Peace River corridor. In 2023, there was a kickoff meeting and the data collection plan was completed.

#### Outreach in 2023 – Volunteer Events, Presentations, and Education:

- In Charlotte County, more than 1,950 fourth-grade students and 60 teachers and chaperones attended field trip programs with the Charlotte Harbor Environmental Education Center at either Alligator Creek Preserve, the lower Peace River, Cedar Point Environmental Park or Lemon Bay. Students experience the Peace River watershed at one of these locations by learning about the wildlife, participating in water quality testing and more. Also led by the Charlotte Harbor Environmental Education center, more than 900 second grade students and 64 teachers and chaperones learned about Charlotte Harbor by participating in a one-hour seagrass wading field trip.
- In Hardee County, nearly 180 fifth-grade students and 13 teachers attended a field study program led by the Outdoor Classroom. During the field trip, students board a boat in Punta Gorda to study Charlotte Harbor.

## Spring Systems

It has been recognized in statute that the spring systems of the state are a public value as they “provide immeasurable natural, recreational, economic and inherent value” to the citizens of the state of Florida (F.S. 373.801). The quality of a spring is a function of aquifer health, and aquifer health is a function of springshed land-use. Primary protection of spring systems involves protection of the spring vent as well as the spring runs and associated shorelines. Secondary protection comes in the form of addressing intensive land-use within the springshed, particularly adjacent to the spring run and where high recharge soils occur. Many spring systems in Florida have experienced significant ecological shifts caused by both natural variability and human activities. To address these issues and recognizing that one entity alone cannot do it all, the District created a multi-stakeholder partnership called the Springs Coast Steering Committee (SCSC) in August 2014. The District formulates plans to address adverse issues with each of the five springs systems for the SCSC to consider and approve. This process assures that projects are focused on improvements to these spring systems. The main issues facing the springs systems include:

- Elevated Nitrate Concentrations
- Reduced Volume and Streamflow
- Reduced Water Clarity
- Altered Aquatic Vegetation Community
- Sea-level Rise (Crystal River/Kings Bay)
- Changing Salinity (Homosassa River)
- Sedimentation (Weeki Wachee River)

There are five spring-systems in the SWIM Priority Waterbody list. The SWIM efforts for these systems are summarized below.

Spring	Size	Watershed (Square Miles)	Springshed (Square Miles)	Total Restoration or Water Quality Projects
<b>Chassahowitzka River</b>	6 River Miles	91.7	168	2
<b>Crystal River/Kings Bay</b>	600 Acres	68.7	255	21
<b>Homosassa River</b>	8 River Miles	55.7	286	2
<b>Rainbow River</b>	6 River Miles	73.5	741	16
<b>Weeki Wachee River</b>	7.8 River Miles	38.1	277	2

### SWIM Plans

The SWIM Plans for all springs are divided into water quality, water quantity, and natural systems focus areas. Refinements to the quantifiable objectives in the Springs’ SWIM Plans were initiated in 2020. The Springs Coast Steering Committee approved refinements to these quantifiable objectives for Rainbow River in 2021, for the Crystal River/Kings Bay and Weeki Wachee River systems in 2022, and for the Chassahowitzka and Homosassa rivers in 2023. A virtual public meeting was held on October 18, 2023. District staff gave a presentation, and the public had an opportunity to provide comments and ask questions about the draft plan. A presentation was provided to the District’s Environmental Advisory Committee on October 10, 2023.

### Seagrass Mapping

For the Springs Coast region including the estuaries of Crystal Bay, Homosassa River, Chassahowitzka River, and Weeki Wachee River, the most recent seagrass maps were released in December 2021. These maps are created through photointerpretation of aerial imagery collected for the specific purpose of mapping seagrass and other submerged habitat. Unlike other areas in the state of Florida experiencing significant seagrass habitat loss, the Springs Coast region has remained remarkably stable. In 2016 there were 577,920 mapped acres of seagrass habitat. In 2020, the total was 586,512 acres, a slight (1.5%) increase over the four-year period. The next mapping cycle for Springs Coast is scheduled for 2024 with the aerial imagery acquisition beginning in November 2023.

### SAV and Water Quality Monitoring

Submerged aquatic vegetation (SAV) communities are significant contributors to ecosystem structure and function in spring systems and provide important ecosystem services including food and habitat for wildlife, nutrient cycling and removal, suspended particle filtration, sediment stabilization, and water clarity improvement. In recognition of the importance of SAV, the District assesses the status and trends of the SAV twice a year in each SWIM priority springs system. Water quality and other parameters, such as specific conductance, turbidity, flow velocity, tree canopy cover, and substrate type are also collected during sampling efforts. These parameters help to determine the causes of spatial distribution and changes over time of the SAV communities. This data is also used in support of monitoring the quantifiable objectives in the SWIM plans and the associated MFL reevaluations for each system.

Project Coast is a long-term continuous monitoring network that maintains situational awareness for the entire Spring Coast and reinforces the “Springshed to Sea” approach to managing natural resources in the Spring Coast region. These data are crucial to assessing the status and trends in surface water quality along the Springs Coast, home to the second largest sea grass area in the United States. These data are used in conjunction with the District's Springs Coast Seagrass Mapping project to investigate the effects of water quality on sea grass coverage and vice versa. Samples are collected at 60 stations quarterly to match the schedule currently employed for Quarterly Springs and Coastal Rivers sampling. Water quality analyses for this project are performed by the District Laboratory.

### Septic to Sewer Conversions

In recognition of the importance of reducing nitrate concentrations in our springs, the District continues to work with local municipalities, including cities and counties, on multiple septic conversion projects through the Cooperative Funding Initiative and the FDEP Springs Funding Program. These projects are anticipated to improve water quality by reducing nutrient loads to the systems.

### Education and Outreach

An important aspect of springs management is education and outreach. The springs and rivers in our region have been growing in popularity, and there are concerns that increased visitor traffic has led to degradation of these resources. The District and its partners are educating the public about the recreational best management practices that will help protect these systems and reduce ecological impacts. Since activities within springsheds impact groundwater, and therefore, affect the water flowing from a spring, best management practices have been developed to inform the public on how they can also protect local springs from home. Increasing the public's awareness of the issues related to springs and encouraging good stewardship are critical to protecting our Outstanding Florida Springs.

## Chassahowitzka River

The Chassahowitzka River is a first-magnitude spring system and is designated by the state as an Outstanding Florida Water (OFW) and a SWIM Priority Waterbody. The Chassahowitzka River is a tidally influenced spring-fed river and associated estuary that originates from multiple spring vents and numerous spring-fed creeks that join the river as it flows towards the Gulf of Mexico in Citrus County. Aquatic plant life can be abundant in the upper river, and numerous wildlife, bird, and fish species are found in this coastal river. The Chassahowitzka River springshed, which contributes groundwater to the Chassahowitzka Springs, includes upland forests, urban areas, agricultural activities, and wetland forests. This springshed covers portions of Citrus and Hernando counties. The lower half of the Chassahowitzka River is part of the more than 31,000-acre Chassahowitzka National Wildlife Refuge. While the river's shoreline is mostly natural, the headsprings area contains a small marina with a public boat ramp. A nearby residential community is connected to the headsprings through a canal system.

In August 2017, the SCSC approved the Chassahowitzka River SWIM Plan. The Plan identifies four main issues facing the Chassahowitzka River: (1) Nitrate Enrichment, (2) Changing Salinity, (3) Potential Decrease in Historic Flows, and (4) Altered Aquatic Vegetation. The SWIM Plan also identifies several numeric targets or quantifiable objectives that represent long-term goals used to develop management actions and projects to help track success. Management actions and projects identified in the Chassahowitzka River SWIM Plan are divided into the three focus areas: (1) Water Quality, (2) Water Quantity, and (3) Natural Systems (Habitat). For Water Quality the priority management actions address septic tanks, urban & residential fertilizer use, and agricultural operations. For Water Quantity, priority management actions address conservation and minimum flows and levels. For Natural Systems, priority management actions address monitoring & research, and habitat conservation.

### SAV and Water Quality Monitoring

The District assesses the status and trends of submerged aquatic vegetation twice a year in the Chassahowitzka River. The most abundant species in the Chassahowitzka River include *Vallisneria americana* (eelgrass), *Najas guadalupensis* (southern naiad), *Zannichellia palustris* (horned pondweed), *Chaetomorpha spp.* (sea emerald), *Myriophyllum spicatum* (Eurasian milfoil), *Hydrilla verticillata* (water thyme), and filamentous algae. Some of the major drivers of spatial distribution and change over time in the Chassahowitzka River's SAV communities include salinity fluctuations and herbivory by animals including manatees.

The District's Coastal Rivers Water Quality Monitoring Network began in October of 2005 for monitoring surface water quality in the Chassahowitzka River. Five stations are sampled quarterly for a suite of water quality parameters including total nitrogen, total phosphorous, nitrate, phosphate, chlorophyll-a, turbidity, color, and clarity. This project represents the most consistent, long-term water quality dataset for the Chassahowitzka River.

The District's Springs Water Quality Monitoring Network has been sampling individual spring vents, at least quarterly, to monitor water quality in the Chassahowitzka Springs complex since 1993. This network is the primary source of data tracking nitrates and other potential pollutants in our springs.

## SWIM Projects

In January 2014, the Governing Board of the Southwest Florida Water Management District approved inclusion of the Chassahowitzka River as a SWIM Priority Waterbody. Summarizing 2014-2023, the SWIM Program and its cooperators have completed 1 restoration project, 1 water quality project, and 7 ecological studies for Chassahowitzka River.

The following projects were either ongoing or completed in 2023:

**Investigation of Iron Stimulation of Filamentous Algal Growth in Chassahowitzka River** – This ongoing study is to identify potential correlations between filamentous algae and iron in the Chassahowitzka River. The kickoff meeting and field work were completed during 2023.

Outreach in 2023 – Volunteer Events, Presentations, and Education:

- Publication of paper, which analyzed 20+ years of SAV data collected by the District in the Chassahowitzka River: Trowbridge, MC (2023). Indicators of salinization in spring-fed rivers using submerged aquatic vegetation. Florida Scientist. 86 (4). 489-500.
- Save Our Waters Week kayak tour led by Madison Trowbridge – 9/18/23
- Used social media to educate the public about the best practices to protect the Chassahowitzka River. The education campaign reached 1.3 million.
- Educational Q&A published by the Osprey Observer.
- Partnership with local campgrounds to distribute educational materials with best practices tips. More than 10,000 maps and other educational items were handed out to river visitors.

## Crystal River/Kings Bay

The Crystal River/Kings Bay complex is designated by the state as an Outstanding Florida Water (OFW) and a SWIM Priority Waterbody. Kings Bay is a spring-fed estuary with an average depth of 3-10 feet and forms the headwaters of the Crystal River. The Crystal River flows from southeast to northwest flowing to the Gulf of Mexico. Collectively, King Bay's numerous springs and countless seeps form the sixth largest spring system in Florida, by discharge. With over 70 documented springs and an average water temperature ranging between 66-76 degrees Fahrenheit, Kings Bay forms the largest natural warm water refuge for the Florida Manatee in the United States. In recent years, new record counts are a regular occurrence with over 500 manatees recorded during the winter months in Kings Bay. Crystal River/Kings Bay has become one of the largest tourist destinations for manatee viewing in the nation.

While the system is best known for manatees, it is also home to a rich diversity of other species. The Florida Fish and Wildlife Conservation Commission has observed 21 species of amphibians, 47 species of reptiles, 191 species of birds, and 22 species of mammals; including 26 state or federally protected species.

## SWIM Plan

In January 2016, the SCSC approved the Crystal River/Kings Bay SWIM Plan. The Plan identifies four main issues facing Crystal River/Kings Bay: (1) Sea-level Rise, (2) Reduced Water Clarity, (3) Altered Aquatic Vegetation Community, and (4) Elevated Nitrate Concentrations in the Springs. The SWIM Plan also

identifies several numeric targets or quantifiable objectives that represent long-term goals used to develop management actions and projects to help track success. Management actions and projects identified in the Crystal River/Kings Bay SWIM Plan are divided into the three focus areas: (1) Water Quality, (2) Water Quantity, and (3) Natural Systems (Habitat). For Water Quality the priority management actions address septic tanks, stormwater, and urban & residential fertilizer use. For Water Quantity, priority management actions address minimum flows and levels and water conservation. For Natural Systems, priority management actions address habitat restoration and habitat conservation.

#### SAV and Water Quality Monitoring

The District assesses the status and trends of submerged aquatic vegetation twice a year in Kings Bay. The most abundant species in the Kings Bay include *Vallisneria americana* (eelgrass), *Najas guadalupensis* (southern naiad), *Hydrilla verticillata* (water thyme), and filamentous algae. Some of the major drivers of spatial distribution and change over time in Kings Bay's SAV communities include competition from exotic invasive species, salinity fluctuations, and herbivory by animals including manatees.

Kings Bay water quality monitoring began in June of 2003. The monitoring consists of twelve bay-wide stations which are monitored on a quarterly basis to track water quality status and trends.

#### SWIM Projects

The first SWIM plan for Crystal River/Kings Bay was completed in 1989. Summarizing 1989-2023, the SWIM Program and its cooperators have completed 9 restoration projects, 12 water quality projects, and 21 ecological studies for Crystal River/Kings Bay.

The following projects were either ongoing or completed in 2023:

**Hunters Cove Sediment Removal** – This project included removal of sediment and detritus within portions of the Hunters Cove segment of Kings Bay. Construction began and was completed in 2023.

**Redfish Hole Restoration** – Design and construction of a hydrologic restoration project at Redfish Hole, a historically disturbed coastal site within Crystal River Preserve State Park. Design began in 2023.

**Three Sisters Canal Shoreline Stabilization** – This project is to design, permit and construct a stabilization project for canal shoreline surrounding the Three Sisters Springs Wildlife Refuge, co-owned by the District and the City. The USACOE permit was received and final design was completed in 2022. The Request for Bid was submitted in Fall 2022 to solicit a construction contractor for the project. Construction began in April 2023 and was completed by November 15, 2023.

#### Outreach in 2023 – Volunteer Events, Presentations, and Education:

- Follow the Water presentation by Madison Trowbridge – 4/20/23
- Madison Trowbridge featured on NRLI's Stakeholder Panel – 8/24/23
- Florida Section AWWA Region IV presentation by Madison Trowbridge – 10/27/23
- Provided support to the Save Our Waters Week organizers by producing educational materials.
- Produced a project video on the completion of the Three Sisters Springs Canal Shoreline Stabilization Project.



- Coordinated social media outreach with specific messaging about protecting springs. That social media reach was more than 500,000.
- Participated in the Florida Manatee Festival at Three Sisters Springs by hosting an educational booth.
- The District funded hands-on field trip programs where students learned first-hand about the importance of Crystal River/Kings Bay and local water resources while visiting the Citrus County Marine Science Station. The program reached nearly 1,080 fourth-grade students, 720 seventh-grade students, 520 high school students and 85 teachers. The District also provided funds to offset the cost of summer camp programming at the Marine Science Station that reached 58 middle school students and 29 high school students.

## Homosassa River

The Homosassa River is a first-magnitude tidal spring system and is designated by the state as an Outstanding Florida Water (OFW) and a SWIM Priority Waterbody. The Homosassa River is a slow-moving tidal river from the headsprings to the Gulf of Mexico at Homosassa Bay in Citrus County, Florida. The Homosassa River springshed, which contributes groundwater to the brackish Homosassa Springs, contains altered urbanized and agricultural lands, and natural forested uplands and wetlands. This springshed covers portions of Citrus and Hernando counties. The springs have been a tourist attraction since the early 1900s, when trains would stop to let rail passengers rest at the springs. The headsprings are located within the Homosassa Springs State Wildlife Park, which serves as a wildlife rehabilitation center for orphaned or injured manatees and other animals. Manatees, along with many freshwater and saltwater fish, can be seen year-round at the park's fishbowl observatory.

### SWIM Plan

In August 2017, the SCSC approved the Homosassa River SWIM Plan. The Plan identifies four main issues facing the Homosassa River: (1) Nitrate Enrichment, (2) Changing Salinity, (3) Potential Decrease in Historic Flows, and (4) Altered Aquatic Vegetation. The SWIM Plan also identifies several numeric targets or quantifiable objectives that represent long-term goals used to develop management actions and projects to help track success. Management actions and projects identified in the Homosassa River SWIM Plan are divided into the three focus areas: (1) Water Quality, (2) Water Quantity, and (3) Natural Systems (Habitat). For Water Quality the priority management actions address septic tanks, urban & residential fertilizer use, and agricultural operations. For Water Quantity, priority management actions address conservation and minimum flows and levels. For Natural Systems, priority management actions address monitoring & research, and habitat restoration.

### SAV and Water Quality Monitoring

The District assesses the status and trends of submerged aquatic vegetation twice a year in the Homosassa River. The most abundant species in the Homosassa River include *Vallisneria americana* (eelgrass), *Najas guadalupensis* (southern naiad), *Zannichellia palustris* (horned pondweed), *Chaetomorpha spp.* (sea emerald), and filamentous algae. Some of the major drivers of spatial distribution and change over time in the Homosassa River's SAV communities include salinity fluctuations, sediment accumulation, and herbivory by animals including manatees.

The District's Coastal Rivers Water Quality Monitoring Network began in October of 2005 for monitoring surface water quality in the Homosassa River. Five stations are sampled quarterly for a suite of water quality parameters including total nitrogen, total phosphorous, nitrate, phosphate, chlorophyll-a, turbidity, color, and clarity. This project represents the most consistent, long-term water quality dataset for the Homosassa River.

The District's Springs Water Quality Monitoring Network has been sampling individual spring vents, at least quarterly, to monitor water quality in the Homosassa Springs complex since 1993. This network is the primary source of data tracking nitrates and other potential pollutants in our springs.

### SWIM Projects

As of January 2014, the Governing Board of the Southwest Florida Water Management District approved inclusion of the Homosassa River as a SWIM Priority Waterbody. Summarizing 2014-2023, the SWIM Program and its cooperators have completed 1 restoration project, 1 water quality project, and 9 ecological studies for Homosassa River.

### Outreach in 2023 – Volunteer Events, Presentations, and Education:

- Presentation to the Homosassa River Alliance by Madison Trowbridge – 2/9/23
- Coordinated social media outreach with specific messaging about protecting springs. That social media reach was more than 500,000.

## Rainbow River

The Rainbow River is an important natural resource to the people of the state of Florida. From an ecological perspective, the river has an abundance of diverse plant communities providing excellent habitat for many species of fish and wildlife. Rainbow River's natural beauty makes the river an important recreational resource. Over 200,000 people visit the river annually to dive, swim, boat, and fish. Of the 33 first magnitude springs in the State of Florida, Rainbow Springs, forming the headwaters of the Rainbow River, is the fourth largest in terms of discharge. The Rainbow River discharges an average of 763 cubic feet per second (cfs), or 493 million gallons per day (mgd) into the Withlacoochee River, just upstream of Lake Rousseau. The Rainbow River, because of exceptional scenic beauty and its ecological significance, has been designated by the State to be an Outstanding Florida Water (OFW), an Aquatic Preserve, and a SWIM Priority Waterbody. Also, in 1972 Rainbow Springs was designated a National Natural Landmark by the National Park Service.

Overall, the Rainbow River is an ecologically healthy system. However, the river should not be thought of as being pristine. Past human activities over the last 150 years have significantly altered the character of the river, especially in the lower reaches. Most of the watershed remains largely rural, but parts of the watershed are rapidly losing their rural character. Land use immediately surrounding the Rainbow River has slowly transitioned from mining and agriculture to residential. Future residential and commercial development throughout the Rainbow River watershed is expected to increase and could compromise the status of the river and its many springs.

## SWIM Plan

In December 2015, the SCSC approved the Rainbow River SWIM Plan. The Plan identifies four main issues facing the Rainbow River: (1) Elevated Nitrate Concentrations, (2) Reduced Water Clarity in the Lower River, (3) Long-term Streamflow Reduction, and (4) Altered Aquatic Vegetation Community. The SWIM Plan also identifies several numeric targets or quantifiable objectives that represent long-term goals used to develop management actions and projects to help track success. Management actions and projects identified in the Rainbow River SWIM Plan are divided into the three focus areas: (1) Water Quality, (2) Water Quantity, and (3) Natural Systems (Habitat). For Water Quality the priority management actions address agricultural operations and septic tanks. For Water Quantity, priority management actions address water conservation and minimum flows and levels. For Natural Systems, priority management actions address invasive species management and recreation management.

## SAV and Water Quality Monitoring

The District assesses the status and trends of submerged aquatic vegetation twice a year in Rainbow River. The most abundant species in Rainbow River include *Sagittaria kurziana* (strap-leaf Sagittaria), *Vallisneria americana* (eelgrass), *Najas guadalupensis* (southern naiad), *Ludwigia repens* (primrose willow), *Hydrilla verticillata* (water thyme), and filamentous algae. Some of the major drivers of spatial distribution and change over time in the Rainbow River's SAV communities include competition from exotic invasive species and recreation and herbivory by animals including manatees.

The first SWIM plan for Rainbow River was completed in 1989. Summarizing 1989-2023, the SWIM Program and its cooperators have completed 1 restoration project, 15 water quality projects, and 14 ecological studies for Rainbow River.

The following projects were either ongoing or completed in 2023:

**Rainbow Springs 5th Replat Stormwater Retrofit** – This cooperative project with Marion County includes the construction of stormwater BMP retrofits to improve water quality. Construction was completed in 2023.

Outreach in 2023 – Volunteer Events, Presentations, and Education:

- Staff participation in Rainbow River cleanup event – 5/20/23
- Coordinated social media outreach with specific messaging about protecting springs. That social media reach was more than 500,000.

## Weeki Wachee River

The Weeki Wachee River is a first-magnitude spring system and is designated by the state as an Outstanding Florida Water (OFW) and a SWIM Priority Waterbody. The Weeki Wachee River flows from the headspring to the Gulf of Mexico at Bayport in Hernando County, Florida. Most of the river's spring flow comes from the main headspring; however, springs of Twin Dees, Salt, and Mud River contribute to the overall river discharge as well. The river is relatively narrow and stream-like in the upper portion, and gradually widens as it reaches the Gulf. The Weeki Wachee River springshed, which contributes groundwater to Weeki Wachee Springs, is comprised of urban areas, agricultural lands, and forested

uplands. This springshed covers portions of Hernando and Pasco counties. The headspring is home to Weeki Wachee Springs State Park, which features a water park and the famous underwater mermaid show.

### SWIM Plan

In March 2017, the SCSC approved the Weeki Wachee River SWIM Plan. The Plan identifies four main issues facing the Weeki Wachee River: (1) Nitrate Enrichment, (2) Potential decrease in historic flows, (3) Altered Aquatic Vegetation, and (4) Sedimentation. The SWIM Plan also identifies several numeric targets or quantifiable objectives that represent long-term goals used to develop management actions and projects to help track success.

Management actions and projects identified in the Weeki Wachee River SWIM Plan are divided into the three focus areas: (1) Water Quality, (2) Water Quantity, and (3) Natural Systems (Habitat). For Water Quality the priority management actions address septic tanks, urban & residential fertilizer use, and agricultural operations. For Water Quantity, priority management actions address conservation and alternative water supply. For Natural Systems, priority management actions address habitat conservation and recreation management.

### SAV and Water Quality Monitoring

The District assesses the status and trends of submerged aquatic vegetation twice a year in the Weeki Wachee River. The most abundant species in the Weeki Wachee River include *Vallisneria americana* (eelgrass), *Najas guadalupensis* (southern naiad), *Hydrilla verticillata* (water thyme), and filamentous algae. Some of the major drivers of spatial distribution and change over time in the Weeki Wachee River's SAV communities include sedimentation and recreation.

The District's Coastal Rivers Water Quality Monitoring Network began monitoring surface water quality in the Weeki Wachee River in October 2005. Five stations are sampled quarterly for a suite of water quality parameters including total nitrogen, total phosphorous, nitrate, phosphate, chlorophyll-a, turbidity, color, and clarity. This project represents the most consistent, long-term water quality dataset for the Weeki Wachee River.

The District's Springs Water Quality Monitoring Network has been sampling individual spring vents, at least quarterly, to monitor water quality in the Weeki Wachee Springs complex since 1993. This network is the primary source of data tracking nitrates and other potential pollutants in our springs.

### SWIM Projects

As of January 2014, the Governing Board of the Southwest Florida Water Management District approved inclusion of the Weeki Wachee as a SWIM Priority Waterbody. Summarizing 2014-2023, the SWIM Program and its cooperators have completed 2 water quality projects and 8 ecological studies for Weeki Wachee.

The following projects were either ongoing or completed in 2023:

**Weeki Wachee River Restoration** – District led sediment removal to benefit the river's ecosystem. The District received funding from the state's General Appropriations Act for the evaluation, design, and permitting that were completed in 2019. Additional state funding was requested and approved in the 2020 legislative session for project implementation. Construction is ongoing.

**Weeki Wachee Sediment Management Structures** – District led design and permitting of natural sediment management structures, also known as submerged woody habitat arrays, at locations along the Weeki Wachee River to maintain sediment transport continuity and provide aquatic habitat. In 2023, design was ongoing.

**Weeki Wachee Springshed Nitrogen Removal Stormwater Retrofits** – This is a cooperatively funded project with Hernando County to retrofit existing urban drainage retention areas with denitrification cells. Construction of Phase 1 of the project was completed in 2023.

#### Outreach in 2023 – Volunteer Events, Presentations, and Education:

- Staff participation in Weeki Wachee River Restoration media day – 6/14/23
- WMNF interview with Madison Trowbridge – 3/7/23
- Used social media to promote best practices on the river. The educational campaign reached 1.1 million.
- Distributed nearly 5,000 educational materials to 27 businesses surrounding the Weeki Wachee River.
- Handed out a dozen educational kits to vocational rental along the Weeki Wachee River.
- Worked with media outlets to educate about protecting the Weeki Wachee River. Six media stories were published.

## Lake Systems

When a river, lake, estuary, or spring does not meet state water quality standards, the Florida Department of Environmental Protection (FDEP) determines a water quality restoration goal known as a Total Maximum Daily Load (TMDL) that will restore the waterbody so that it meets its standards. TMDLs address a specific impairment for a waterbody; therefore, a waterbody may have multiple TMDLs to address different pollutants.

Along with setting TMDLs, FDEP sets minimum water levels for lakes. Section 373.042(1), F.S. defines minimum flows and minimum water levels (MFLs) as the point at which further water withdrawals would be significantly harmful to the water resources or ecology of the area. As a part of fulfilling its mission and statutory responsibilities, the District establishes MFLs for priority waterbodies within our boundaries. MFLs are used both in planning for future water uses and in regulating water withdrawals. For waterbodies that are below their minimum flow, minimum level, or are projected to fall below their minimum flow or level within 20 years, the District is required to implement a recovery or prevention strategy to ensure the MFL is maintained over the long term.

There are four lake systems in the SWIM Priority Waterbody list

Lake	Surface Area (Acres)	Watershed (Square Miles)	Number of Restoration or Water Quality Projects	Number of Studies
Lake Panasoffkee	3,200	230	3	3
Lake Tarpon	2,534	57.5	8	6
Lake Thonotosassa	800	49.1	5	2
Winter Haven Chain of Lakes	7516 (Total)	32.5	13	5

### Lake Panasoffkee

Lake Panasoffkee, a SWIM Priority Waterbody and an Outstanding Florida Water (OFW), is the largest lake in Sumter County. Historically, the lake has supported a nationally renowned sport fishery, especially for red-ear sunfish. An estimate of angler expenditures on Lake Panasoffkee conducted in 1998 yielded a value of approximately \$2.0 million. This fishery, along with the natural resource values of the lake, makes Lake Panasoffkee important to the local and regional economy and the environment. The lake has a surface water area of approximately 3,200 acres. The lake is considered shallow with a maximum depth of approximately ten feet. Direct surface water inflows to Panasoffkee include Big Jones and Little Jones Creeks on the northern end and Shady Brook on the southern end. However, much of this surface water flow is attributed to spring discharges in the stream channels. Therefore, groundwater accounts for more than 40 percent of the lake's inflows. The only discharge from the lake is the Outlet River, which flows from the western shore of the lake to the Withlacoochee River.

Due to the substantial influence of groundwater on the lake, water quality in Lake Panasoffkee has been considered good since the initial Lake Panasoffkee SWIM Plan was drafted in 1989. The Trophic State Index (TSI) remained relatively unchanged since 1977.



While water quality in Lake Panasoffkee has been considered good, diagnostic studies completed by the SWIM Program in 1995 provided evidence that aesthetic and recreational uses of the lake had been impacted. Concerned for the health of Lake Panasoffkee, the Legislature passed Chapter 98-69, Laws of Florida, creating the Lake Panasoffkee Restoration Council (Council) within the District. The Council's November 25, 1998 Report to the Legislature identified sediment accumulation and encroachment of emergent vegetation as the primary issues threatening the lake.

That report, which established a Restoration Plan for Lake Panasoffkee, was incorporated into the April 2000 update of the Lake Panasoffkee SWIM Plan. The Restoration Plan consisted of a multi-step dredging project to improve fisheries habitat, restore the historic shoreline and facilitate navigation. The restoration project, which was completed in 2008, restored approximately 175 acres of historic fish bedding areas, restored the historic lake shoreline, increased open water area of the lake by 37%, and removed an approximated 8.3 million cubic yards of sediment.

Following the completion of the dredging in 2008, the District initiated a long-term monitoring program for Lake Panasoffkee. The District continues to track water quality and water clarity changes. Field parameters and water quality samples are collected at four stations on Lake Panasoffkee on a quarterly basis. The stations are located at the north, central, south, and outlet canal areas of the lake.

The District continues to monitor discharge through the Outlet River to ensure suitable outflow occurs. In addition, water quality data is collected on a bi-weekly basis to help promote optimal water quality conditions in Lake Panasoffkee and to assist operational decisions on the Wysong-Coogler Water Conservation Structure.

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 3 restoration projects and 3 ecological studies for Lake Panasoffkee for a total of approximately 1,744 acres of restored wetlands.

## Lake Tarpon

Lake Tarpon, an Outstanding Florida Water (OFW), is also a waterbody on the District's SWIM Priority List. Due to its reputation as a largemouth bass sport fishery, the lake was designated as a State Fish Management Area by a Special Resolution of the Pinellas County Board of County Commissioners in 1963. This sport fishery, along with historically good water quality and the existence of two regional County parks on its shore made Lake Tarpon a significant environmental, economic, and recreational resource in the Tampa Bay area. Lake Tarpon is the largest freshwater lake in the Tampa Bay area. The lake is relatively shallow with a mean depth of seven (7) feet. The major source of surface water inflow is through Brooker Creek, which enters the lake at its lower southeastern corner. The Lake Tarpon Outfall Canal and Structure serves as the only surface water outfall for the lake. This canal and structure operated and maintained by the District connects the southernmost end of the lake with Old Tampa Bay and is intended to provide flood control for the Lake Tarpon watershed.

The first indication of degraded water quality in Lake Tarpon was a blue-green algae bloom in 1987. Subsequently, the first Lake Tarpon SWIM Plan was prepared in 1989. This first SWIM Plan focused on diagnostic/feasibility studies to evaluate water quality in the lake and identify potential sources of nutrients. These conditions, along with Pinellas County's Growth Management Plan requirements, led

Pinellas County to develop the Lake Tarpon Watershed Management Plan. This Plan was incorporated into the Lake Tarpon SWIM Plan Update completed in 2001.

The 2001 Lake Tarpon SWIM Plan recognized declining water quality (specifically with regard to algae and nutrients) as the primary concern with the lake. Declining water quality can lead to the increase of undesirable blooms of algae, loss of more desirable rooted aquatic plants, and negative impacts to sport fish populations. The 2001 Lake Tarpon SWIM Plan identified strategies to improve and protect water quality, which were aimed at reducing internal and external sources of nutrients. Additionally, the 2001 SWIM Plan included projects to restore hydrology and habitat in the Brooker Creek watershed.

The Lake Tarpon SWIM Plan is being updated which began with a kick-off meeting held in January 2020 with Pinellas County. Then, two technical stakeholders' meetings were convened in 2020 to present results of water quality status and trends and the pollutant loading model. In early 2021, Pinellas County submitted a petition to FDEP to propose Site Specific Alternative Criteria in place of the Numeric Nutrient Criteria FDEP adopted for the Lake. The District has been coordinating with FDEP and the County to ensure that the SWIM plan supports data with regards to site specific criteria, prior to moving forward with a public meeting on the SWIM Plan. In September 2022, District and FDEP staff agreed to an indicator approach for the SWIM Plan update, using parameters such as chlorophyll-a and total nitrogen. A No-cost time extension amendment was approved in 2023 to allow the consultant to update the water quality status and trends and pollutant loading model and to complete the remaining tasks for the Lake Tarpon SWIM plan update. The public meeting for the draft SWIM plan is anticipated for Fall 2024.

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 4 restoration projects, 4 water quality projects, and 6 ecological studies for Lake Tarpon for a total of approximately 33 acres of restored habitats.

The following projects were either ongoing or completed in 2023:

**Beach Street Stormwater Improvements** – This cooperative project with the City of Port Richey includes the design, permitting and construction of stormwater improvement BMPs to treat runoff and improve water quality discharging to the Pithlachascotee River in New Port Richey. Project was on hold since May 2020 but recommenced in 2022. 100% design was completed in 2022.

**Lake Tarpon SWIM Plan Update** – In 2023, coordination with the county and FDEP continued as staff worked on the draft Lake Tarpon SWIM Plan. The final draft is anticipated to be completed in 2024.

## Lake Thonotosassa

Lake Thonotosassa is the largest natural lake in Hillsborough County. In recognition of the lake's regional significance, its highly impacted water quality, and the fact it discharges to a segment of the Hillsborough River which provides the municipal water supply for the City of Tampa, Lake Thonotosassa was designated a SWIM Priority Waterbody in 1988.

Development of a SWIM plan was initiated in 1989, and the initial plan was approved by the Florida Department of Environmental Regulation and adopted by the District in 1990. A second, more detailed

plan was completed and approved in 1996. The 1996 plan was updated and completed in February 2003.

During the late 1980's and early 1990's, pollutant loading to the lake consisted of approximately 60 percent non-point and 40 percent point source discharges. The strategy for improving water quality within the lake was to first focus on eliminating point source discharges within the watershed, then concentrate on non-point sources. Two major point source discharges were removed in the 1990's.

In 1992, a seafood packing plant that discharged to Baker Creek ceased operation. In 1997, the City of Plant City Wastewater Treatment Plant discharge was redirected away from the lake to the East Side Canal and some of the discharge was reused through the implementation of the City's reuse system, partially funded through the District's New Water Sources Initiative Program. During the latter half of the 1990's, the SWIM Program began working with several cooperators to implement stormwater improvement projects to treat non-point source pollution within the watershed.

One significant project completed in 1999 is the Lake Thonotosassa Marsh Restoration Project. This 51-acre marsh system is designed to treat inflow water from Baker Creek prior to its discharge into the lake. Other water quality improvement projects include the Plant City Pistol Range Stormwater Treatment Project and the three-phased Hillsborough County Baker/Pemberton Creek Erosion Control Project. Each of these projects addresses non-point source pollution entering Lake Thonotosassa. The SWIM Program implemented a study, completed in 2012, to refine the water and nutrient budgets for the lake and develop a linked watershed/waterbody model to evaluate and recommend Best Management Practices (BMPs) to best achieve the identified pollutant load reduction goals. The Lake Thonotosassa Nutrient Source Tracking Study was completed in 2016 and some structural and non-structural BMPs were proposed. Structural BMPs may be implemented with Hillsborough County during future cooperative funding cycles. As part of the Florida Department of Transportation Mitigation Program, a long-term nuisance vegetation management program continues to control nuisance exotic plants in the treatment marsh.

After the most recent assessments in 2014 verified the lake was impaired for nutrients, a Total Maximum Daily Loads (TMDLs) was developed by the Florida Department of Environmental Protection (FDEP) with participation of District staff. Following guidance from the U.S. Environmental Protection Agency, the TMDL for total nitrogen and total phosphorous was completed in 2019.

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 2 restoration projects, 3 water quality projects, and 2 ecological studies for Lake Thonotosassa for a total of approximately 101 acres of restored habitats.

## Winter Haven Chain of Lakes

The Winter Haven Chain of Lakes is comprised of 19 interconnected lakes located within and around the City of Winter Haven in north-central Polk County. The Chain consists of two “chains” of lakes – the Southern and Northern Chains. The watershed of the Chain of Lakes includes portions of the cities of Winter Haven, Lake Alfred, and Auburndale.

Water quality in the Chain of Lakes varies from lake to lake and between the northern and southern chains. Pollution sources present by 1949 included wastes from chemical fertilizer plants, citrus packing, citrus and vegetable canning, soft drink production, milk bottling, and untreated municipal waste. Considerable improvement occurred in the management of these industries by 1970. More recent improvements were the elimination of the City of Winter Haven's wastewater treatment plant discharge to Lake Conine in 1992; however, non-point sources such as urban stormwater pollution and septic tank seepage still need to be addressed for all lakes on the Chain.

An investigation of lake sediment cores from five lakes on the Chain was conducted to evaluate historical changes in water quality. Sediments dated to about 1860 indicated the lakes were historically in the mesotrophic to eutrophic range (slightly to moderately nutrient enriched) with a lack of blue green algae blooms during the summer.

In 2010, a study (Winter Haven Chain of Lakes Water Quality Management Plan, PBS&J) was completed that characterized water quality and prioritized restoration projects to address water quality issues in the Chain of Lakes. It was found that most of the lakes in the Chain are impaired for nutrients. Among the impaired lakes, five exhibit improving trends in water quality, while the remaining 14 exhibits declining or no trends in water quality.

Of the unimpaired lakes, three had declining trends in water quality and none had improving trends. Stormwater treatment projects have been implemented for seven lakes (Howard, May, Lulu, Hartridge, Jessie, Cannon, and Mariana) in the Chain to reduce nutrient loads to the lakes. Of these seven lakes, Lake Hartridge is the only lake not impaired due to high nutrient levels. Of the other six of the seven lakes with past projects, all but Cannon and Jessie exhibit improving trends in water quality.

While traditional stormwater treatment projects can successfully reduce external nitrogen and phosphorus loadings to the lakes, historic point and non-point source runoff and subsequent sediment accumulation in some lakes resulted in internal phosphorus loads that existing stormwater projects cannot treat.

Consequently, both traditional and non-traditional water quality management projects are proposed to address both external and internal phosphorus loading to the Chain of Lakes.

Summarizing 1989-2023, the SWIM Program and its cooperators have completed 12 water quality projects, 1 natural systems restoration project, and 5 ecological studies for Winter Haven Chain of Lakes.

The following projects were either ongoing or completed in 2023:

**Lake Lulu Watershed Protection** – Cooperatively funded feasibility study with Polk County to identify opportunities to improve water quality, provide flood protection, and restore natural systems in the Lake Lulu watershed. In 2023, the study and final report were completed.

**Winter Haven Ridge Implementation of Stormwater BMPs** – This cooperative project with the City of Winter Haven includes design, permitting, and construction of low impact design BMPs to treat approximately 4.5 acres of stormwater runoff in the Winter Haven Ridge area. In 2023, project is on approved revised schedule with construction anticipated for 2024.

## Other Systems

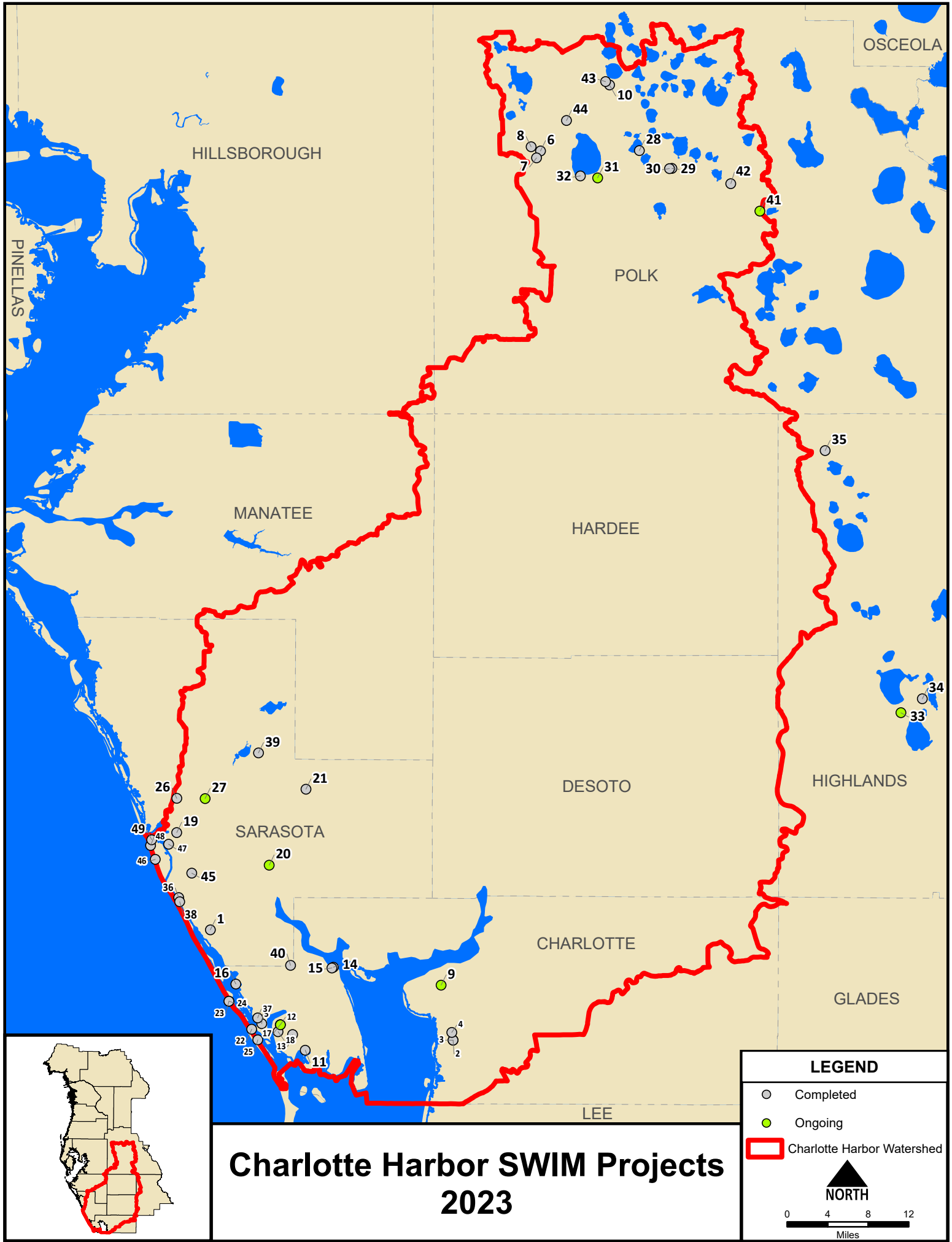
While some projects do not directly involve waterbodies identified as District Priority waterbodies in the Strategic Plan these projects were either selected based on the Governor’s Executive Order 19-12 that instructs the five water management districts to prioritize funding to focus on projects that will address harmful algal blooms and maximize nutrient reductions, involve natural systems restoration opportunities identified through the Cooperative Funding Initiative, or were deemed a priority by the District.

The following projects were either ongoing or completed in 2023:

**Pasture Reserve** – Cooperatively funded natural systems restoration project with Lake County for the design, permitting, and construction of restored uplands and wetlands, including cypress strands, marsh, mixed forested wetlands, and pine flatwoods, in the Green Swamp Area of Critical State Concern.

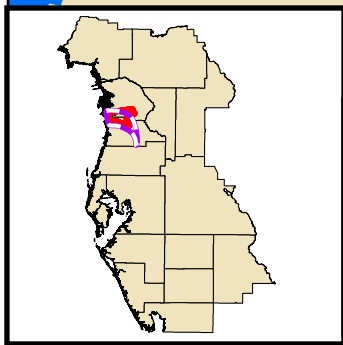
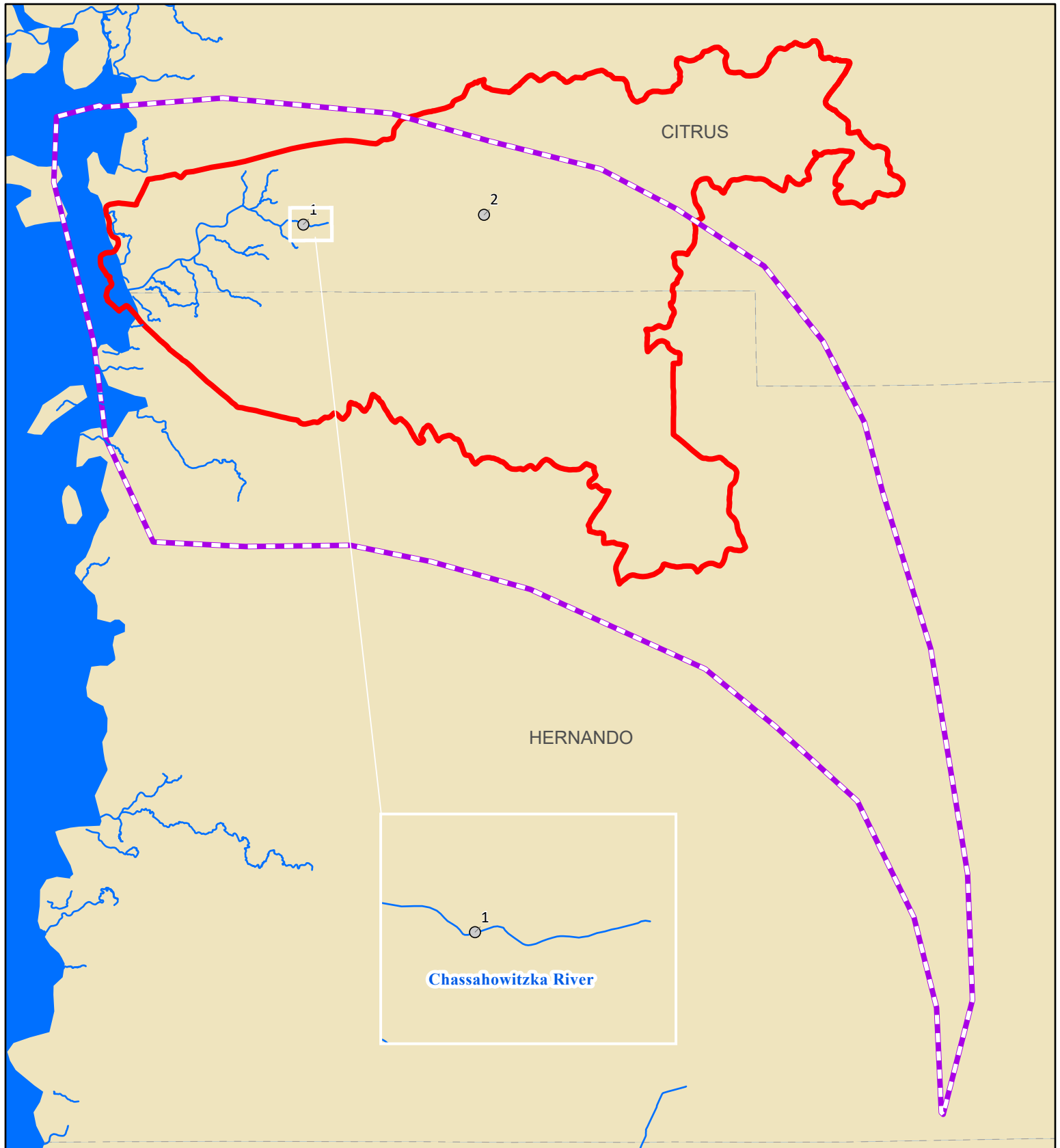
## Appendix A: Maps





## Charlotte Harbor Projects Legend

Map Number	Project Name	Status
1	Alligator Creek In-Stream Restoration	Completed
2	Alligator Creek Phase 1	Completed
3	Alligator Creek Phase 2	Completed
4	Alligator Creek Phase 3	Completed
5	Amberjack Slough	Completed
6	Banana Lake: Dredge Project	Completed
7	Banana Lake: Elizabeth Place Wetland Treatment System Phase II	Completed
8	Banana Lake: Stahl Canal Restoration	Completed
9	Boca Grande Area Drainage Improvements	Ongoing
10	Bridgers Avenue Drainage & Water Quality Project	Completed
11	Cape Haze Melaleuca Eradication	Completed
12	Cape Haze Phase 3 Ecosystem Restoration	Ongoing
13	Cape Haze Pioneer Trail	Completed
14	Cattle Dock Point Phases I	Completed
15	Cattle Dock Point Phases II	Completed
16	Cedar Point Restoration	Completed
17	Coral Creek Phase 1	Completed
18	Coral Creek Phase 2	Completed
19	Curry Creek Preserve Restoration	Completed
20	Deer Prairie Creek Preserve	Ongoing
21	Deer Prairie Slough	Completed
22	Don Pedro Phase I	Completed
23	Don Pedro Phase II	Completed
24	Don Pedro Phase III	Completed
25	Don Pedro Phase IV	Completed
26	Dona Bay Conveyance System	Completed
27	Dona Bay Surface Water Storage Facility	Ongoing
28	Eagle Lake Bingham Street Stormwater Retrofit	Completed
29	Lake Gwyn East Surface Water Restoration	Completed
30	Lake Gwyn Surface Water Restoration	Completed
31	Lake Hancock Natural Systems Enhancements	Ongoing
32	Lake Hancock Outfall Treatment Project	Completed
33	Lake June-in-Winter Catfish Creek BMPs	Ongoing
34	Lake McCoy BMPs	Completed
35	Lake Verona BMPs	Completed
36	Lemon Bay Ecosystem Restoration	Completed
37	Lemon Bay Habitat Restoration	Completed
38	Lemon Bay Site Enhancement	Completed
39	Myakka Island Ecosystem Restoration	Completed
40	Myakka State Forest Water Quality and Bank Stabilization	Completed
41	Park Avenue Streetscape Improvements	Ongoing
42	Peace Creek Canal Watershed Restoration	Completed
43	PK Avenue/Lake Lena Stormwater Improvements	Completed
44	Saddle Creek Audubon Tract Restoration	Completed
45	South Venice Waterway Restoration Project	Completed
46	Venice Beach Water Quality Project	Completed
47	Venice Hatchett Creek Stormwater Retrofit	Completed
48	Venice Outfall 1 and 2 Improvements	Completed
49	Venice/Laguna Drive Water Quality Improvement	Completed



Map Number	Project Name	Status
1	Chassahowitzka Spring Sediment Removal	Completed
2	Reclaimed Water - Sugarmill Woods Advanced Wastewater	Completed

# Chassahowitzka SWIM Projects

## 2023

Completed

Chassahowitzka River Springshed

Chassahowitzka Watershed

NORTH

0123

Miles

LEVY

MARION

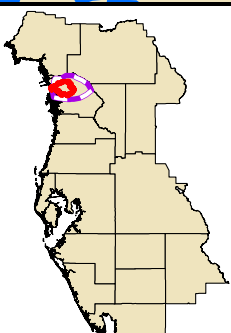
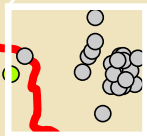
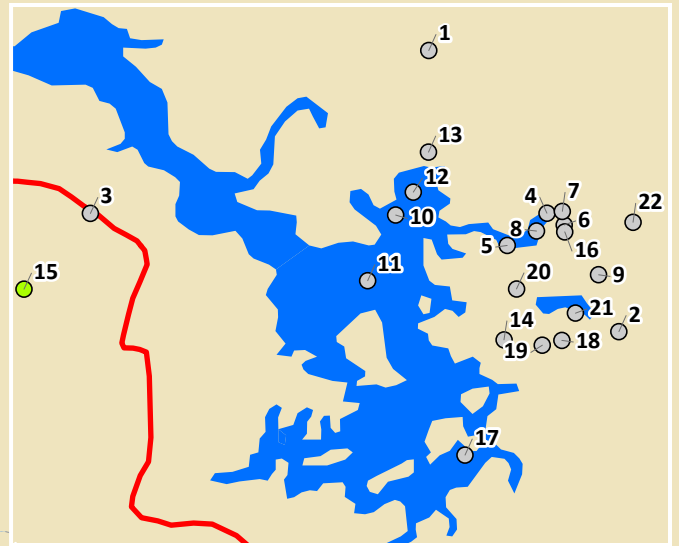
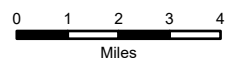
SUMTER

CITRUS

# Crystal River/Kings Bay SWIM Projects 2023

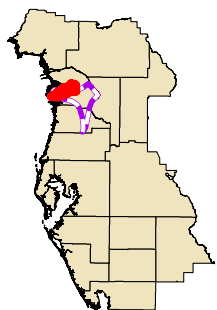
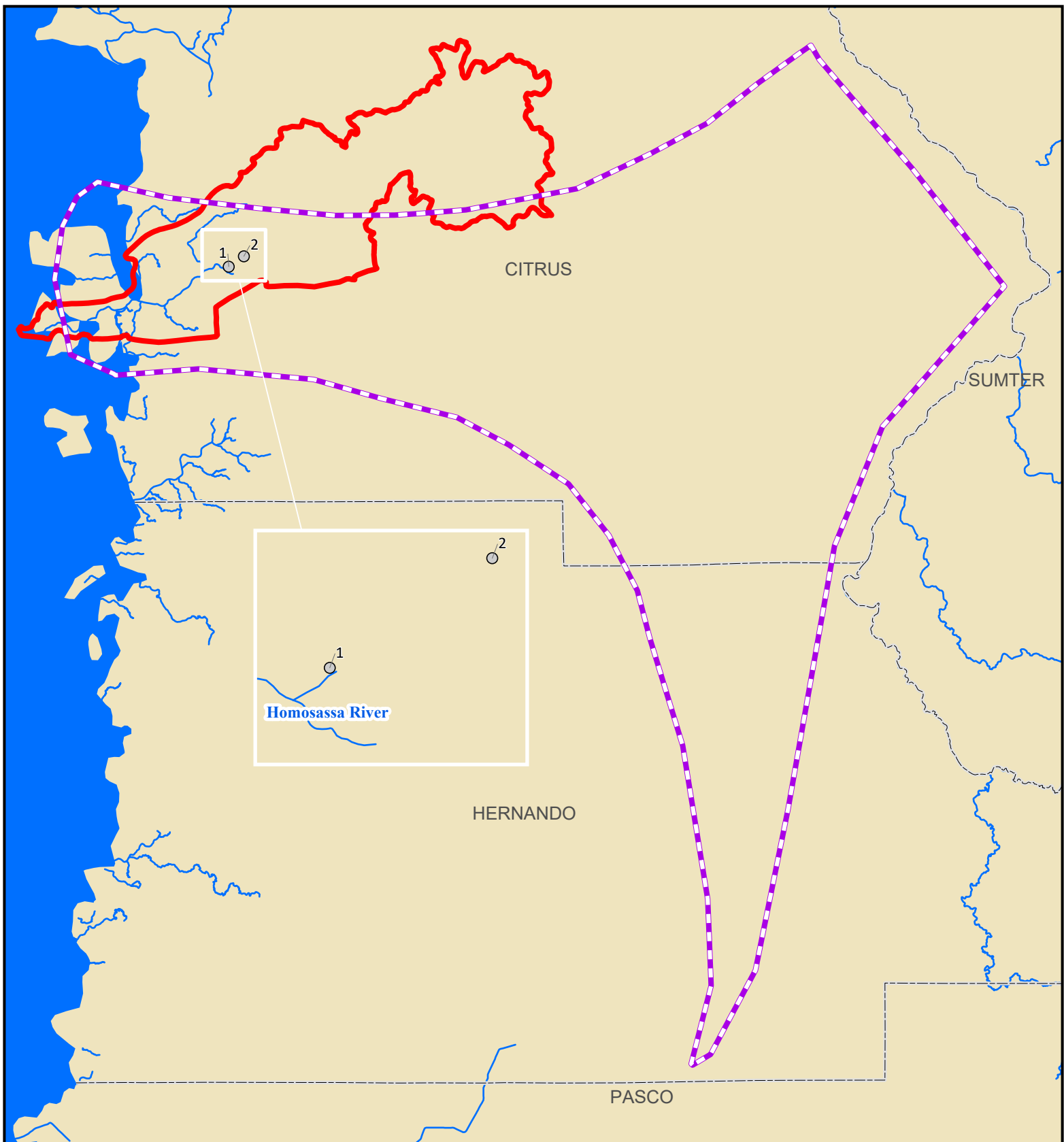
## LEGEND

- Completed
- Ongoing
- ▬ Crystal River Watershed
- ▬ Crystal River/Kings Bay Springshed



## Crystal River/Kings Bay Projects Legend

Map Number	Project Name	Status
<b>1</b>	City of Crystal River to Duke Energy Reclaimed Water Project	Completed
<b>2</b>	Crystal Center Stormwater Runoff Mitigation	Completed
<b>3</b>	Fort Island Trail Force Main Project	Completed
<b>4</b>	Hunter Springs Cove Living Shoreline	Completed
<b>5</b>	Hunter Springs Dredging Project	Completed
<b>6</b>	Hunter Springs Stormwater Modification	Completed
<b>7</b>	Hunter Springs Stormwater Treatment Pond Expansion	Completed
<b>8</b>	Hunters Cove Sediment Removal	Completed
<b>9</b>	Kings Bay Plaza Stormwater Runoff Management	Completed
<b>10</b>	Kings Bay Sediment Removal	Completed
<b>11</b>	Kings Bay Stormwater Projects	Completed
<b>12</b>	Lyngbya Removal and Revegetation Pilot Project	Completed
<b>13</b>	NW 6th Street Stormwater Treatment	Completed
<b>14</b>	Palm Island Stormwater Rehab	Completed
<b>15</b>	Redfish Hole Restoration	Ongoing
<b>16</b>	Springs Aquatic Vegetation Restoration: Hunters Cove/Kings Bay	Completed
<b>17</b>	Tarpon Hole Dredging Project	Completed
<b>18</b>	Three Sisters Bank Stabilization Project	Completed
<b>19</b>	Three Sisters Canal Shoreline Stabilization	Completed
<b>20</b>	Three Sisters Springs Sediment Removal Project	Completed
<b>21</b>	Three Sisters Springs Wetland Treatment Project	Completed
<b>22</b>	US 19 Stormwater Improvements	Completed



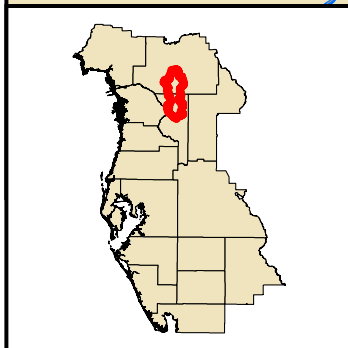
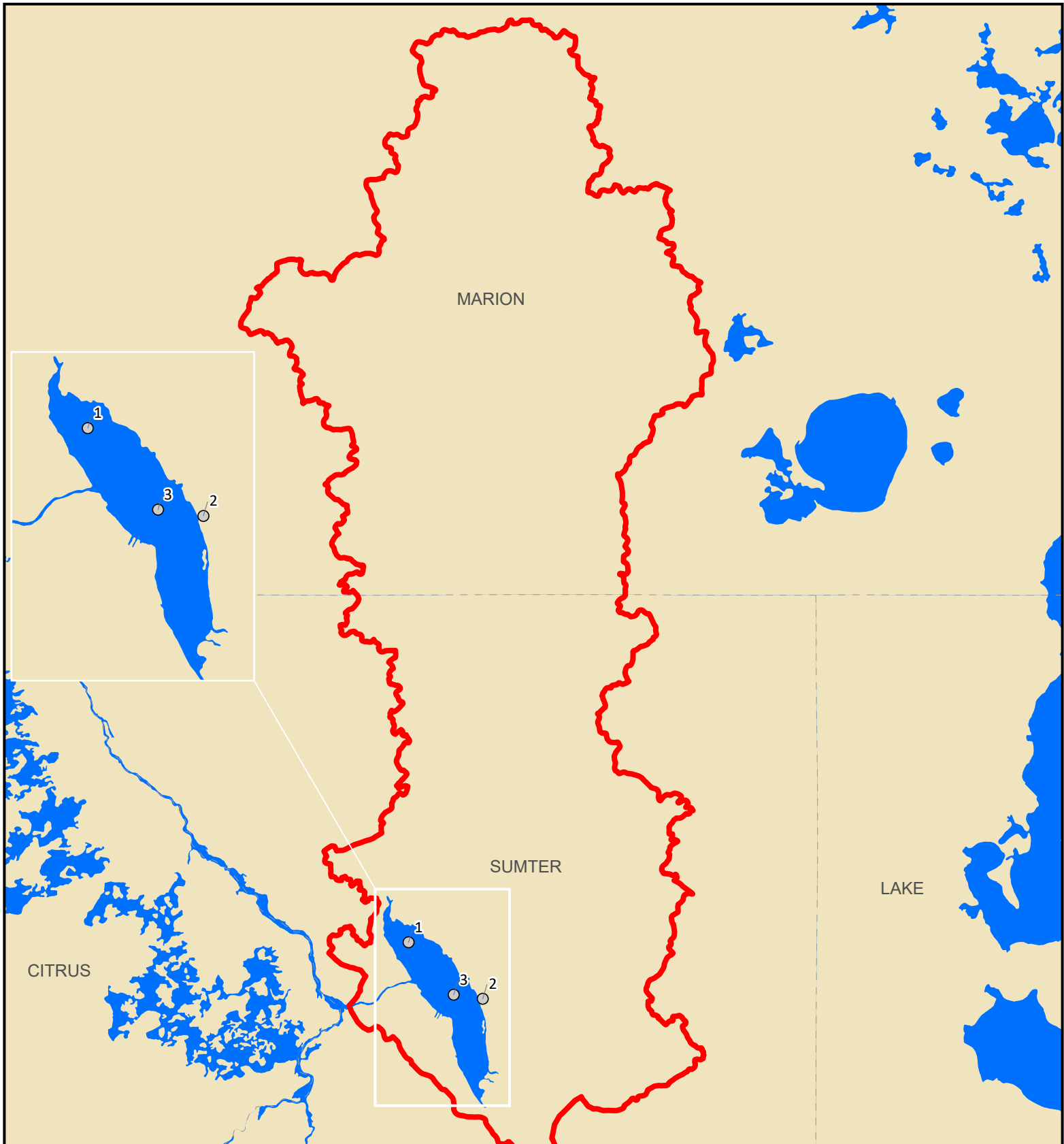
Map Number	Project Name	Status
1	Homosassa Floating Wetland Implementation	Completed
2	Homosassa Southfork Water Quality Improvement	Completed

## Homosassa River SWIM Projects 2023

### LEGEND

- Completed
- Homosassa River Springshed
- Homosassa River Watershed








Map Number	Project Name	Status
1	Biological Hydrilla Control	Completed
2	Coleman's Landing Pilot Dredging	Completed
3	Lake Panasoffkee Restoration Project	Completed

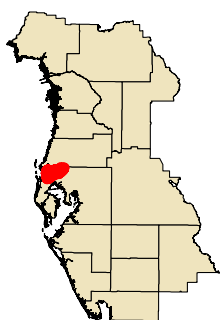
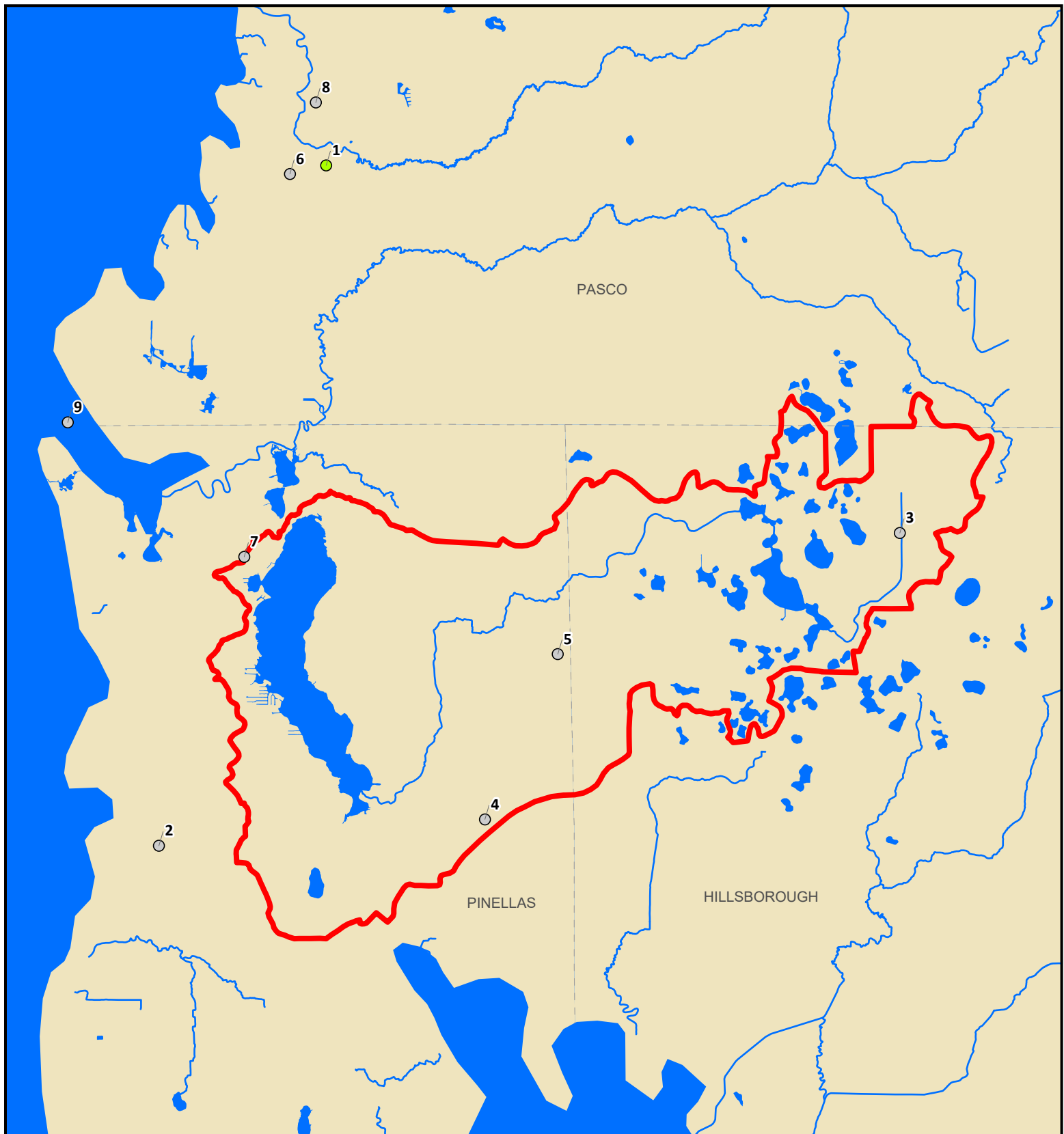
## Lake Panasoffkee SWIM Projects 2023

**LEGEND**

 Completed  
 Lake Panasoffkee Watershed

 NORTH  
 0 2 4 6  
 Miles





## Lake Tarpon SWIM Projects 2023

### LEGEND

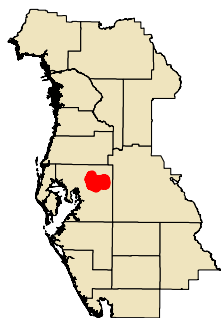
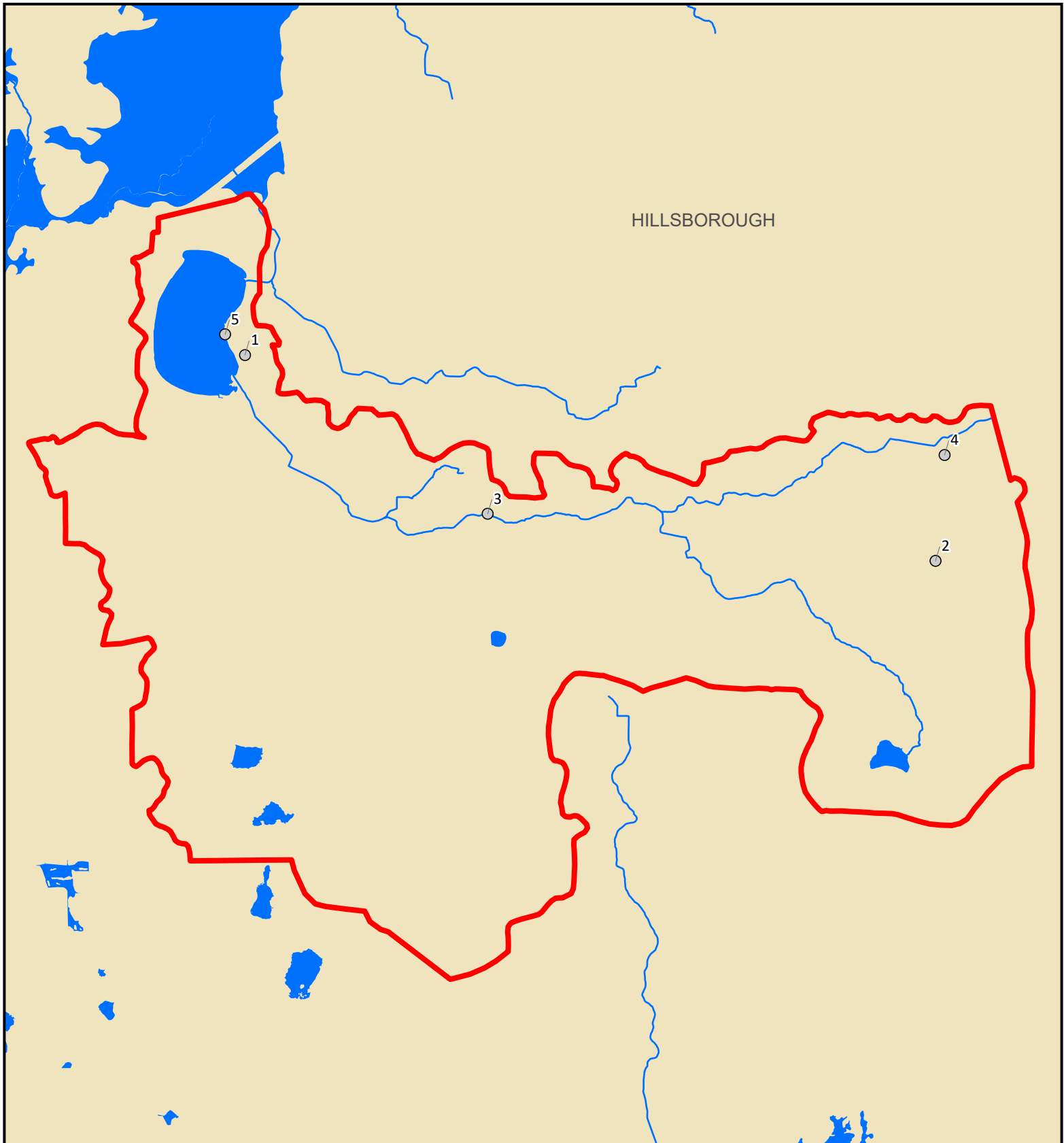
- Completed
- Ongoing
- Lake Tarpon Watershed



0 1 2 3  
Miles

## Lake Tarpon Projects Legend



Map Number	Project Name	Status
1	Beach Street Stormwater System Improvements	Ongoing
2	Bee Branch Improvements	Completed
3	Brooker Creek ELAPP Site Restoration	Completed
4	Brooker Creek Hydrologic Restoration on Channel "F"	Completed
5	Brooker Creek Hydrological Restoration on Channel "L"	Completed
6	Hemlock Drive Stormwater System Improvements	Completed
7	Lake Tarpon Area 6	Completed
8	Orange Lake Restoration	Completed
9	Pinellas Trail Natural Area Habitat Restoration	Completed

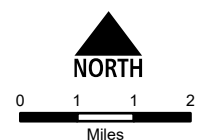


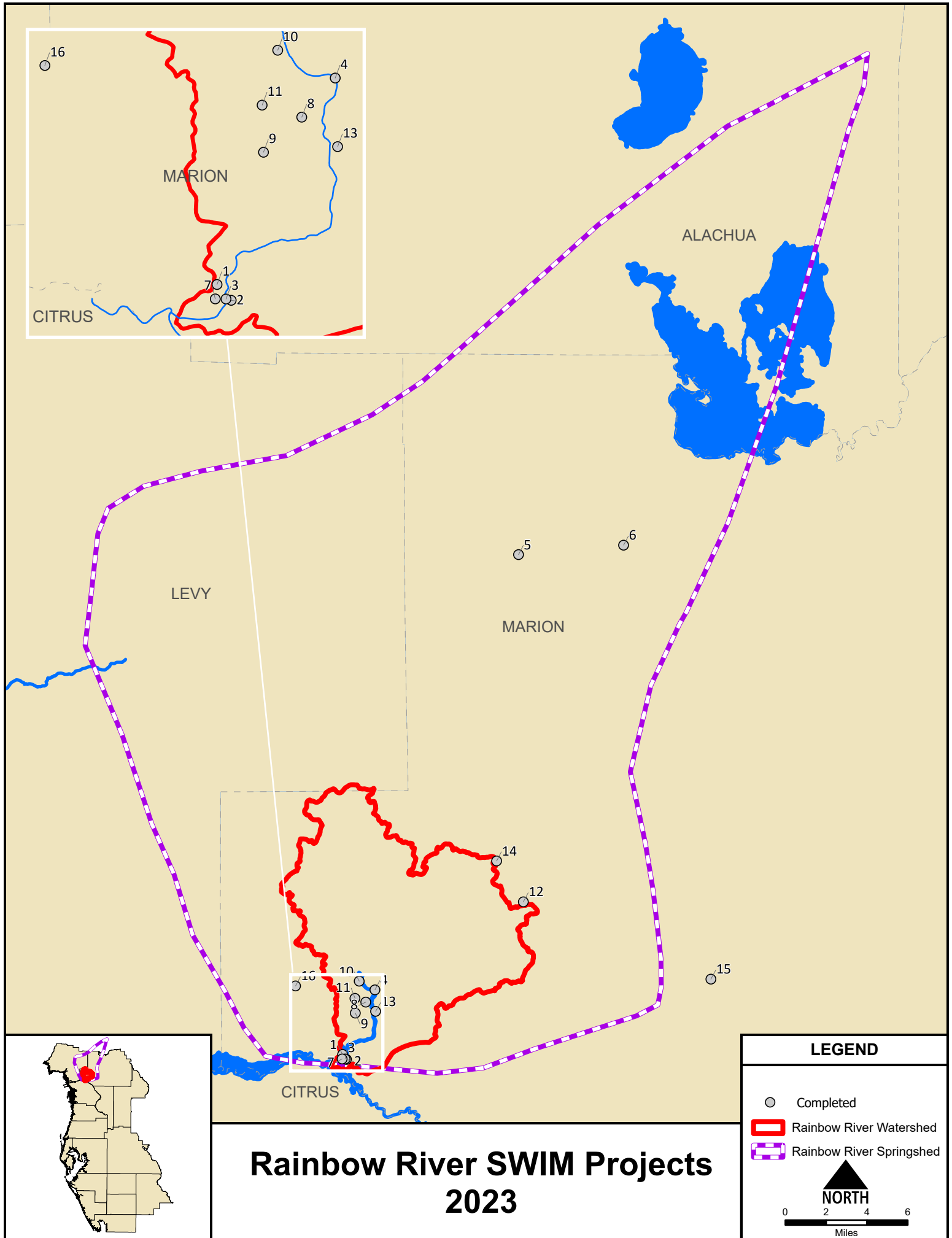
Map Number	Project Name	Status
1	Lake Thonotosassa Marsh Restoration	Completed
2	Lake Thonotosassa Source Tracking/Implementation	Completed
3	Pemberton/Baker Creek Erosion Management	Completed
4	Plant City Pistol Range-Westside Canal Stormwater Treatment	Completed
5	Submerged Aquatic Plant Revegetation	Completed

## Lake Thonotosassa SWIM Projects 2023

### LEGEND

-  Completed
-  Lake Thonotosassa Watershed





## Rainbow River Projects Legend

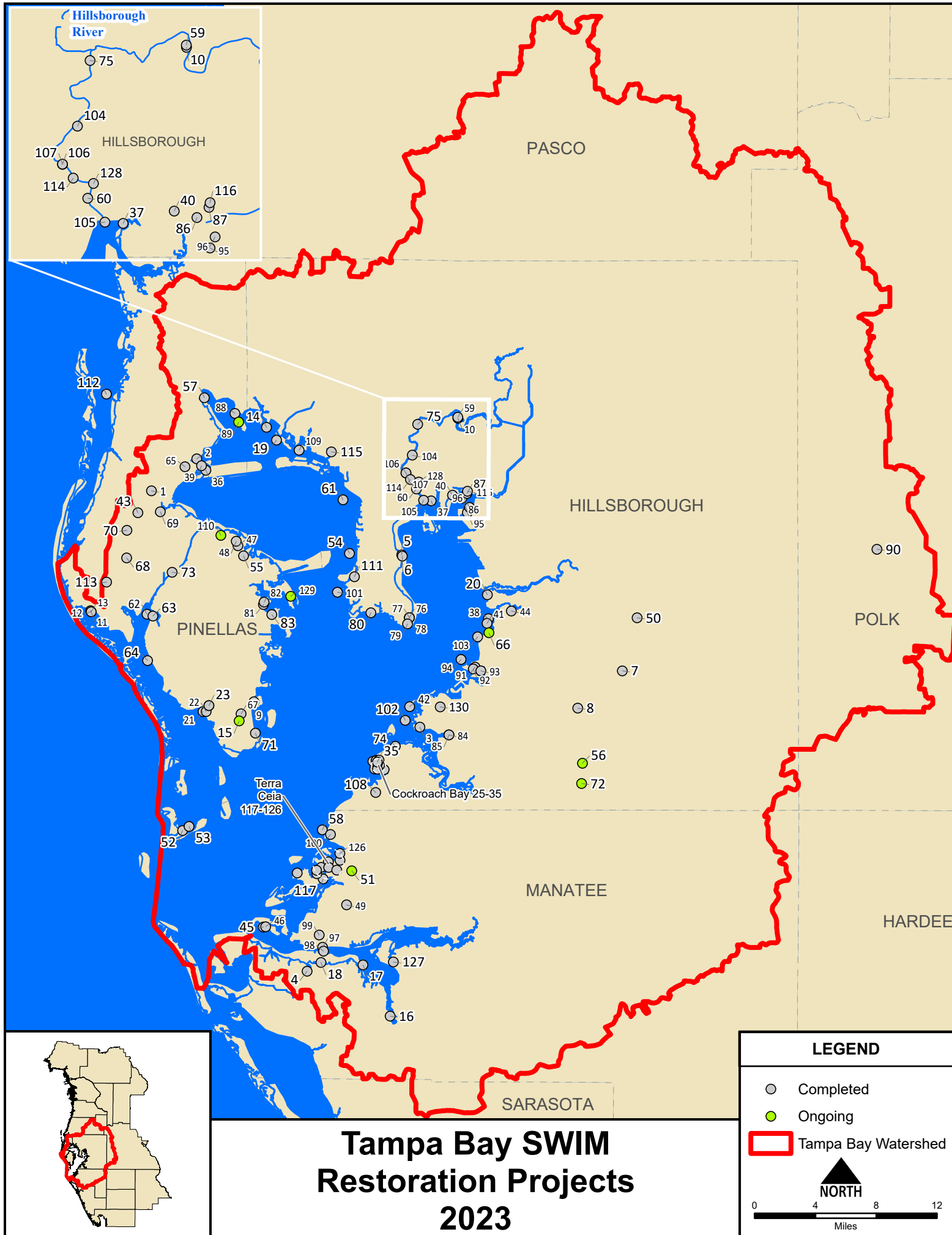
Map Number	Project Name	Status
<b>1</b>	Blue Cove Lake-Implementation of BMPs	Completed
<b>2</b>	Blue Run Park Stormwater Management Project	Completed
<b>3</b>	C.R. 484 Stormwater Outfall Retrofit	Completed
<b>4</b>	Devil's Elbow Revegetation	Completed
<b>5</b>	NW 119th Avenue Stormwater Retrofit	Completed
<b>6</b>	NW HWY 225 Stormwater Retrofit	Completed
<b>7</b>	Pennsylvania Ave. Stormwater Retrofit	Completed
<b>8</b>	Rainbow River Springshed Stormwater Retrofits	Completed
<b>9</b>	Rainbow Springs 5th Replat Stormwater Retrofit	Completed
<b>10</b>	Rainbow Springs County Club Estates Stormwater Retrofit	Completed
<b>11</b>	Rainbow Springs Innovative Stormwater Retrofit	Completed
<b>12</b>	Rolling Hills Stormwater Retrofit	Completed
<b>13</b>	Sa-Te-Ke Village Stormwater Retrofit	Completed
<b>14</b>	SW 16th and SW 14th Stormwater Retrofit	Completed
<b>15</b>	SW 85th Street & SW 40th Avenue-Implementation of BMPs	Completed
<b>16</b>	Village of Rainbow Springs Stormwater Retrofit	Completed



## Sarasota Bay Restoration Projects Legend

Map Number	Project Name	Status	Map Number	Project Name	Status
1	10th Street Outfall BMPs	Completed	31	Leffis Key	Completed
2	Bay Walk Creek	Completed	32	Neal Preserve	Completed
3	Bayfront Park	Completed	33	New College	Completed
4	Bayshore North-Artificial Reef	Completed	34	Nicholson Drainage Channel Stormwater Treatment Project	Completed
5	Bayshore South-Artificial Reef	Completed	35	North Lido Park	Completed
6	Blackburn Point Park Addition Restoration	Completed	36	Pelican Cove Stormwater Retrofit	Completed
7	Bowlees Creek Island	Completed	37	Perico Bayou Restoration	Completed
8	Bradenton Beach - 23rd Street North to 25th Street North BMPs	Completed	38	Perico Preserve	Completed
9	Bradenton Beach BMPs Avenues B and C	Completed	39	Phillippi Creek Barrier Removal and Restoration	Completed
10	Bradenton Beach Pier-Artificial Reef	Completed	40	Phillippi Creek In-Stream Restoration	Completed
11	Bradenton Beach Stormwater Retrofits	Completed	41	Quick Point Nature Preserve	Completed
12	Catfish Creek	Completed	42	Red Bug Slough Restoration	Completed
13	Catfish Creek Stormwater Facility	Completed	43	Robinson Preserve	Completed
14	Celery Fields Restoration	Completed	44	Robinson Preserve Phase 2	Completed
15	Central Holmes Beach Water Quality BMPs	Completed	45	Runaway Bay - Shoreline Restoration	Completed
16	City of Anna Maria - Implementation of BMPs	Completed	46	Sarasota Bay Habitat Restoration	Completed
17	City of Sarasota Created Wetlands System	Completed	47	Sister Keys	Completed
18	Coastal Basin Beach Road	Completed	48	South Creek Floodplain Restoration	Completed
19	Cortez AKA FISH Preserve Restoration	Completed	49	South Creek Phase I	Completed
20	Cortez Schoolhouse Restoration	Completed	50	South Lido Restoration	Completed
21	Crosley Estates Restoration	Completed	51	Spoil Islands Bird Colony	Completed
22	Durante Park	Completed	52	Ungarelli Preserve	Completed
23	Grassy Point	Completed			
24	GWIZ	Completed			
25	Herb Dolan Park Living Shoreline	Completed			
26	Hog Creek	Completed			
27	Holmes Beach Stormwater Improvements CIP	Completed			
28	Holmes Beach Stormwater Retrofits	Completed			
29	Hudson Bayou In-Stream Restoration and Water Quality Improvement	Completed			
30	Joan Durante Park	Completed			





## Tampa Bay Restoration Projects Legend

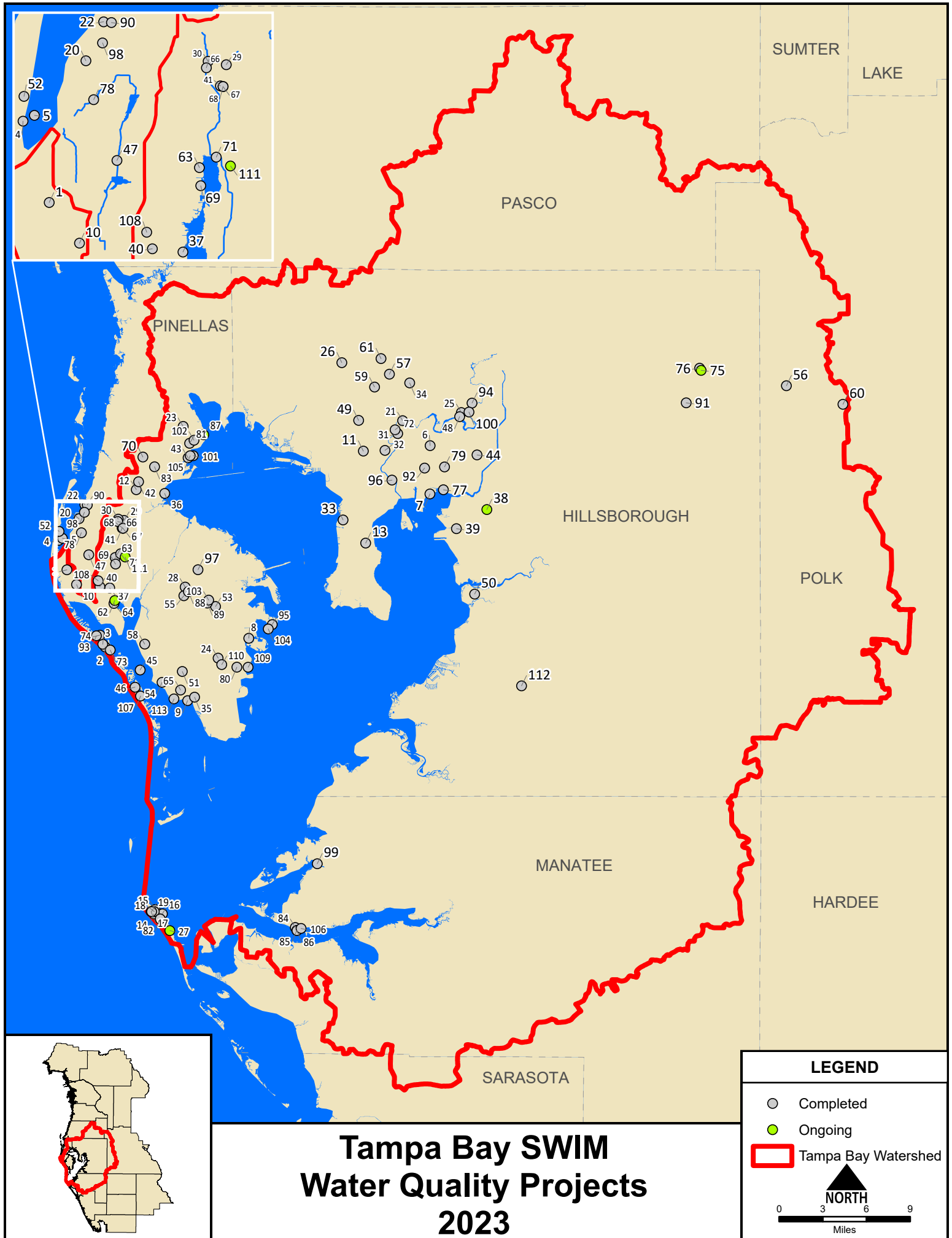
Map Number	Project Name	Status
1	Allen's Creek Red Maple Swamp Restoration	Completed
2	Alligator Lake	Completed
3	Bahia Beach Habitat Restoration	Completed
4	Ballard Restoration	Completed
5	Ballast Point Park Phase 1	Completed
6	Ballast Point Park Phase Seawall Enhancement	Completed
7	Balm Boyette Habitat Restoration	Completed
8	Balm Road Marsh	Completed
9	Bartlett Park	Completed
10	Blackwater Hammock Park Shoreline Restoration	Completed
11	Boca Ciega Phase 1	Completed
12	Boca Ciega Phase 2	Completed
13	Boca Ciega Phase 3	Completed
14	Bower Tract	Completed
15	Boyd Hill Nature Preserve	Ongoing
16	Braden River Phase 1	Completed
17	Braden River Phase 2	Completed
18	Bradenton Riverwalk Restoration	Completed
19	Cabbagehead Bayou	Completed
20	Cargill South	Completed
21	Clam Bayou Habitat Restoration Phase 1	Completed
22	Clam Bayou Phase 2a	Completed
23	Clam Bayou Phase 2b	Completed
24	Clam Bayou Phase 3	Completed
25	Cockroach Bay	Completed
26	Cockroach Bay Phase 1 Uplands	Completed
27	Cockroach Bay Phase 1A1	Completed
28	Cockroach Bay Phase 1A2	Completed
29	Cockroach Bay Phase 1B1	Completed
30	Cockroach Bay Phase 1B2	Completed
31	Cockroach Bay Phase 2 Uplands	Completed
32	Cockroach Bay Phase Braided Tidal Creek	Completed
33	Cockroach Bay Phase C	Completed
34	Cockroach Bay Phase Freshwater Wetlands	Completed
35	Cockroach Bay Saltwater	Completed
36	Cooper's Point	Completed
37	Cotanchobee Fort Brooke Park	Completed
38	Davis Tract	Completed
39	Del Oro	Completed
40	Desoto Park Addition Shoreline Restoration	Completed
41	Dug Creek	Completed

Map Number	Project Name	Status
42	E.G. Simmons Park Phase 1 & 2	Completed
43	Eagle Lake	Completed
44	Ekker Preserve	Completed
45	Emerson Point Phase 1	Completed
46	Emerson Point Phase 2	Completed
47	Feather Sound Phase 2	Completed
48	Feather Sound Tidal Wetland Restoration	Completed
49	FELTS Preservation Restoration	Completed
50	Fish Hawk Creek Preserve Habitat Restoration	Completed
51	Frog Creek Wetland Restoration	Ongoing
52	Ft. DeSoto Park Recirculation Phase 1	Completed
53	Ft. DeSoto Park Recirculation Phase 2	Completed
54	Gandy Park	Completed
55	Gateway Tract	Completed
56	Gully Branch Upland Restoration	Ongoing
57	Harbor Palms Park	Completed
58	Hendry Delta	Completed
59	Hillsborough River Water Quality Improvement	Completed
60	Hillsborough River West Bank Shoreline Restoration	Completed
61	Howard Franklin East	Completed
62	Joe's Creek 1	Completed
63	Joe's Creek School Site	Completed
64	Jungle Prada Park	Completed
65	Kapok Wetland/Floodplain Restoration	Completed
66	Kracker Avenue Restoration	Ongoing
67	Lake Maggiore Restoration	Completed
68	Lake Seminole Aquatic Life Enhancement	Completed
69	Lancaster Tract	Completed
70	Largo Central Park Wetland Enhancement	Completed
71	Little Bayou	Completed
72	Little Manatee River Corridor: Area 8 Hydrologic Restoration	Ongoing
73	Long/Cross Bayou	Completed
74	Lost River Preserve	Completed
75	Lowry Park	Completed
76	MacDill Air Force Base Phase 1A	Completed
77	MacDill Air Force Base Phase 1B	Completed
78	MacDill Air Force Base Phase 2	Completed
79	MacDill Air Force Base Phase 3	Completed
80	MacDill Air Force Base: Mangrove Restoration	Completed

## Tampa Bay Restoration Projects Legend

Map Number	Project Name	Status
81	Mangrove Bay Phase 1	Completed
82	Mangrove Bay Phase 2	Completed
83	Mangrove Bay Phase 3	Completed
84	Marsh Creek	Completed
85	Marsh Creek Phase 2	Completed
86	McKay Bay Dredge Hole Restoration	Completed
87	McKay Bay Nature Preserve	Completed
88	Mobbly Bay Habitat Restoration	Completed
89	Mobbly Bayou Preserve Restoration	Ongoing
90	Mulberry - NE 4th Ave Alafia Wetlands Restoration (REDI)	Completed
91	Newman Branch Phase 1	Completed
92	Newman Branch Phase 2	Completed
93	Newman Branch Phase 3	Completed
94	North Apollo Beach	Completed
95	Palm River Restoration Phase 1	Completed
96	Palm River Restoration Phase 2	Completed
97	Palmetto Estuary Habitat Restoration Phase 2A	Completed
98	Palmetto Estuary Phases 1 and 2	Completed
99	Palmetto MLK Park Low Impact Design and Wetland Restoration	Completed
100	Peanut Lake	Completed
101	Picnic Island	Completed
102	Polanis Park	Completed
103	Port Redwing/Schultz Preserve	Completed
104	Reed Property	Completed
105	Ribbon of Green	Completed
106	River Garden Phase 1	Completed
107	River Garden Shoreline Phase 2	Completed
108	Rock Ponds Phase 1 and 2	Completed
109	Rocky Creek Preserve Restoration	Completed
110	Roosevelt Creek Channel 5 Improvements	Ongoing
111	South Tampa Greenway/Tappan Site	Completed
112	Spoil Island Coop. Funding	Completed
113	St. Petersburg College Natural Park Habitat Restoration	Completed
114	Stewart Middle Magnet School	Completed
115	Sweetwater Creek	Completed
116	Tampa Shoreline Restoration Initiative	Completed
117	Terra Ceia Causeway	Completed

Map Number	Project Name	Status
118	Terra Ceia Huber Upland	Completed
119	Terra Ceia Isles Habitat Restoration	Completed
120	Terra Ceia Isles Upland Phase 1	Completed
121	Terra Ceia Isles Upland Phase 2	Completed
122	Terra Ceia Isles Upland Phase 3	Completed
123	Terra Ceia Isles Upland Phase 6	Completed
124	Terra Ceia Isles Uplands Phase 4	Completed
125	Terra Ceia Isles Uplands Phase 7	Completed
126	Terra Ceia Isles Wetlands Phase 1	Completed
127	Tom Bennett Park	Completed
128	Ulele Spring	Completed
129	Weedon Island Tidal Marsh	Ongoing
130	Wolf Branch Phases 1 and 2	Completed



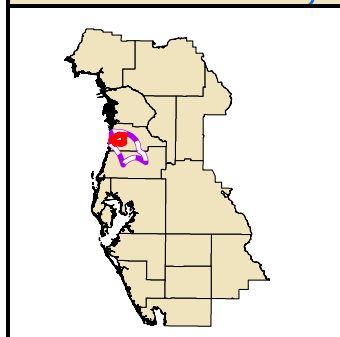
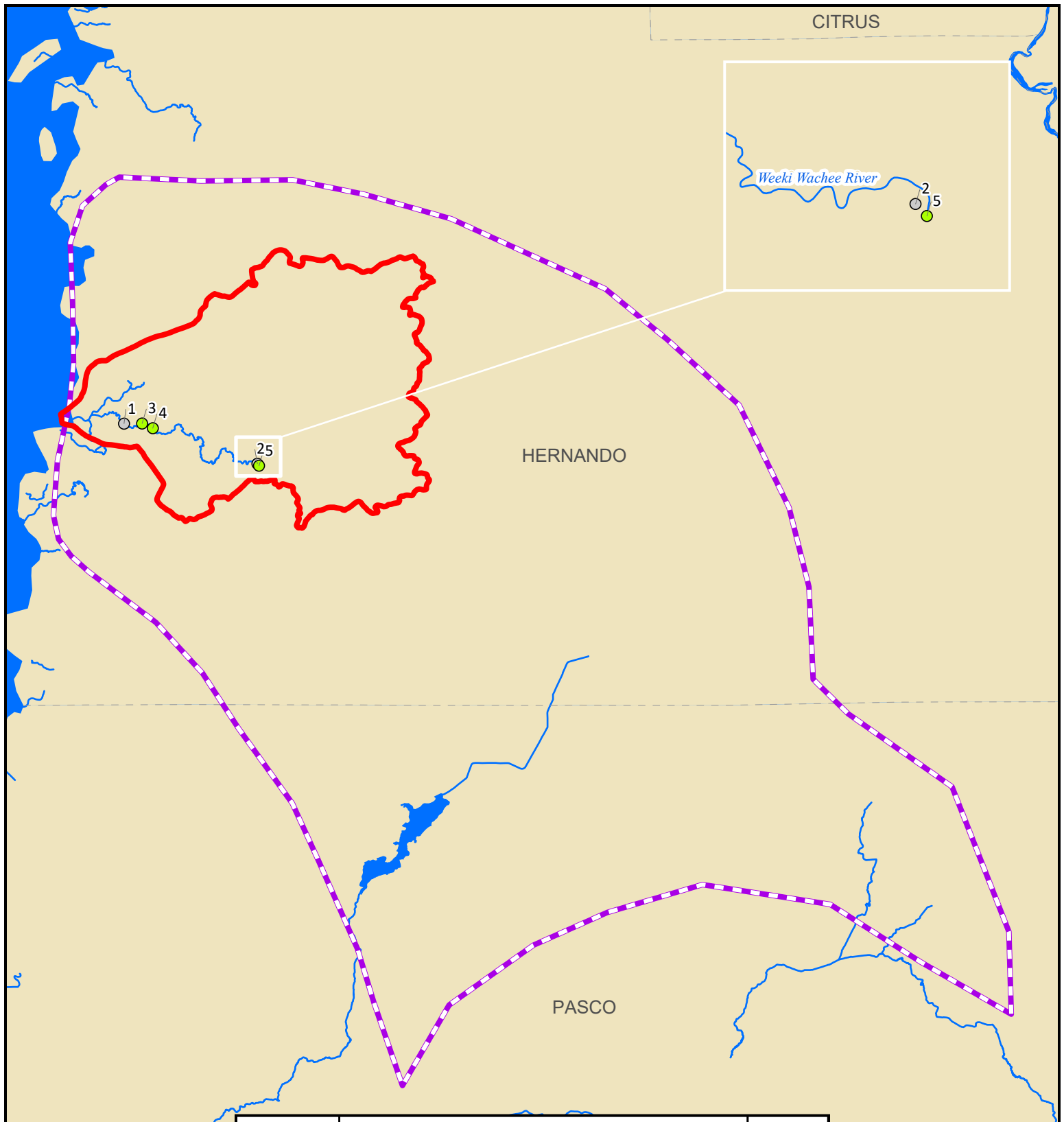
## Tampa Bay Water Quality Projects Legend

Map Number	Project Name	Status
1	102nd Avenue Pond Enhancement	Completed
2	137th Avenue Circle BMPs	Completed
3	141st Avenue Stormwater Retrofit	Completed
4	20th Ave Parkway Stormwater Improvements	Completed
5	20th Avenue Stormwater Improvements	Completed
6	30th Street and Hillsborough Ave. Stormwater Improvement	Completed
7	30th Street Baffle Box	Completed
8	34th Avenue NE Water Quality Improvements	Completed
9	49th Street Outfall Treatment	Completed
10	94th Avenue Stormwater Pond Enhancement	Completed
11	Al Lopez Park Stormwater Retrofit	Completed
12	Allen's Creek Improvements at Plumb Elementary	Completed
13	Alline Ave. Stormwater Improvement	Completed
14	Anna Maria BMPs Phase 3	Completed
15	Anna Maria BMPs Phase K	Completed
16	Anna Maria BMPs Phase L	Completed
17	Anna Maria BMPs Phase M	Completed
18	Anna Maria North Island BMPs	Completed
19	Anna Maria North Island BMPs Phases H and J	Completed
20	Basin SD-2 and SD-3 Improvements	Completed
21	Bath Club Concourse Stormwater Retrofit	Completed
22	Bayview Drive Drainage Improvements	Completed
23	Bishop Creek Streambank	Completed
24	Booker Lake Regional Stormwater Treatment Facility	Completed
25	Broadway Outfall Stormwater Retrofit	Completed
26	Brushy Creek Wetland Treatment	Completed
27	Central Holmes Beach Basins 6 and 7	Ongoing
28	Channel 1A2 Stormwater Quality Improvements	Completed
29	City of Largo Allen's Creek and McKay Creek Inlet Inserts	Completed
30	City of Largo CDS Unit	Completed
31	City of Tampa Stormwater Filtration Devices	Completed
32	City of Tampa Urban Lake Rescue: Edna	Completed
33	City of Tampa Urban Lake Rescue: Kipling	Completed
34	City of Tampa Urban Lake Rescue: Roberta	Completed
35	Clam Bayou Stormwater Pond	Completed
36	Clearwater Tropic Hills Drainage Improvements	Completed
37	Creation Pond Stormwater Enhancement	Completed
38	Delaney Creek Improvements	Ongoing
39	Delaney Creek Wetland Treatment	Completed

Map Number	Project Name	Status
40	Dogleg Pond Stormwater Enhancement	Completed
41	Downtown Largo Regional Stormwater Treatment Facility	Completed
42	Druid Road Stormwater Improvement Area	Completed
43	East Gate Drainage Improvements	Completed
44	East Lake Outfall Water Quality Improvement	Completed
45	East Treasure Island Causeway BMPs	Completed
46	Egan Park Best Management Practices	Completed
47	EMS Pond Stormwater Enhancement	Completed
48	FDOT 56th Street Outfall Stormwater Retrofit	Completed
49	FDOT North Dale Mabry Hwy Retrofit & Restoration	Completed
50	Gibson on the Bay	Completed
51	Gulfport-49th Street Drainage Improvements	Completed
52	Harbor Dr. & LaHacienda Dr. Stormwater Improvements	Completed
53	Haynsworth Tract Regional Stormwater Treatment Facility	Completed
54	Ibis Stormwater Pond Retrofit	Completed
55	Implementation of BMPs at England Brothers Park	Completed
56	Itchepackesassa Creek Regional Stormwater System	Completed
57	Jean Park Ponds/Cedar Lake Water Quality Improvement Study	Completed
58	Jungle Lake Enhancement Project	Completed
59	Lake Carrol Stormwater Retrofit	Completed
60	Lake Hunter BMP Project	Completed
61	Lake Magdalene BMPs	Completed
62	Lake Seminole Dredging Project	Ongoing
63	Lake Seminole Watershed Stormwater Pollution Reduction	Completed
64	Lake Seminole Weir Stage and Flow Device	Completed
65	Lake Tomlinson Restoration	Completed
66	Largo Highland Avenue Retrofit Project	Completed
67	Largo Regional Outfall Modification	Completed
68	Largo Regional Stormwater Treatment Facility	Completed
69	Largo ST Quality Retrofit - 101st St.	Completed
70	Logan Street Pond	Completed
71	Long Bayou - Lake Seminole Bypass Canal Treatment Facility	Completed
72	Lowry Park East & West	Completed

## Tampa Bay Water Quality Projects Legend

Map Number	Project Name	Status	Map Number	Project Name	Status
73	Madeira Beach - Boca Ciega Drive BMPs	Completed	108	St. Pete Junior College Stormwater Retrofit	Completed
74	Madeira Public Works Yard Stormwater Retrofit	Completed	109	St. Petersburg Pier Park	Completed
75	McIntosh Park Integrated Water Master Plan	Ongoing	110	St. Petersburg Public Works Storage Yard Stormwater Retrofit Project	Completed
76	McIntosh Park Stormwater Treatment Wetland	Completed	111	Starkey M10 Stormwater Facility Quality Improvements	Ongoing
77	McKay Bay - East Shore Commerce Park Parcel Stormwater Retrofit	Completed	112	Sumner Road Stormwater Management Improvement	Completed
78	McKay Creek Water Quality Improvements near Hickory Lane	Completed	113	Wood Ibis Park Stormwater Retrofit	Completed
79	Melbourne Pond Stormwater Retrofit	Completed			
80	Mirror Lake Stormwater Retrofit	Completed			
81	Mullet Creek Water Quality Improvement	Completed			
82	Northern Holmes Beach BMPs Basins 10 and 12	Completed			
83	Old Coachman (Channel H) Stormwater Retrofit	Completed			
84	Palmetto 5th Street LID	Completed			
85	Palmetto CRA Riverside Boat Ramp	Completed			
86	Palmetto Gateway LID	Completed			
87	Philippe Bay Stormwater Quality Upgrades	Ongoing			
88	Pinellas Park Implementation of BMPs Sawgrass Lake Watershed	Completed			
89	Pinellas Park Improvement of BMPs for Homeland Basin/Sawgrass	Completed			
90	Pinellas Road Stormwater BMPs	Completed			
91	Pistol Range Stormwater Retrofit	Completed			
92	Pond 56	Completed			
93	Rex Place Stormwater BMPs	Completed			
94	Riverhills Drive Outfall 1 & 2 Stormwater Retrofit	Completed			
95	Riviera Bay Snell Island Vaults	Completed			
96	Robles Park WQ and Natural Systems Improvement	Completed			
97	Roosevelt Stormwater Retrofit Project	Completed			
98	Rosery Road BMPs	Completed			
99	Rubonia Subdivision Stormwater Management Improvements	Completed			
100	S. Glen Arven Ave. Outfalls Stormwater Retrofit	Completed			
101	Safety Harbor Old Tampa Bay Water Quality and Drainage Improvements	Completed			
102	Safety Harbor Public Works Stormwater Retrofit	Completed			
103	Sawgrass Lake Restoration	Completed			
104	Shore Acres Stormwater Vaults	Completed			
105	South Green Springs Stormwater Retrofit	Completed			
106	Southeast Riverside Water Quality Improvements	Completed			
107	St. Pete Beach Public Works Facility Stormwater Retrofit Improvements	Completed			



Map Number	Project Name	Status
1	Rogers Park LID Implementation	Completed
2	Weeki Canoe Launch	Completed
3	Weeki Wachee River Restoration	Ongoing
4	Weeki Wachee Sediment Management Structures	Ongoing
5	Weeki Wachee Springshed Nitrogen Removal Stormwater Retrofits	Ongoing

## Weeki Wachee SWIM Projects 2023

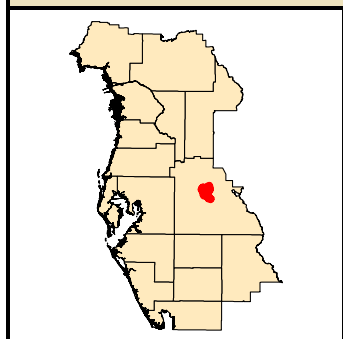
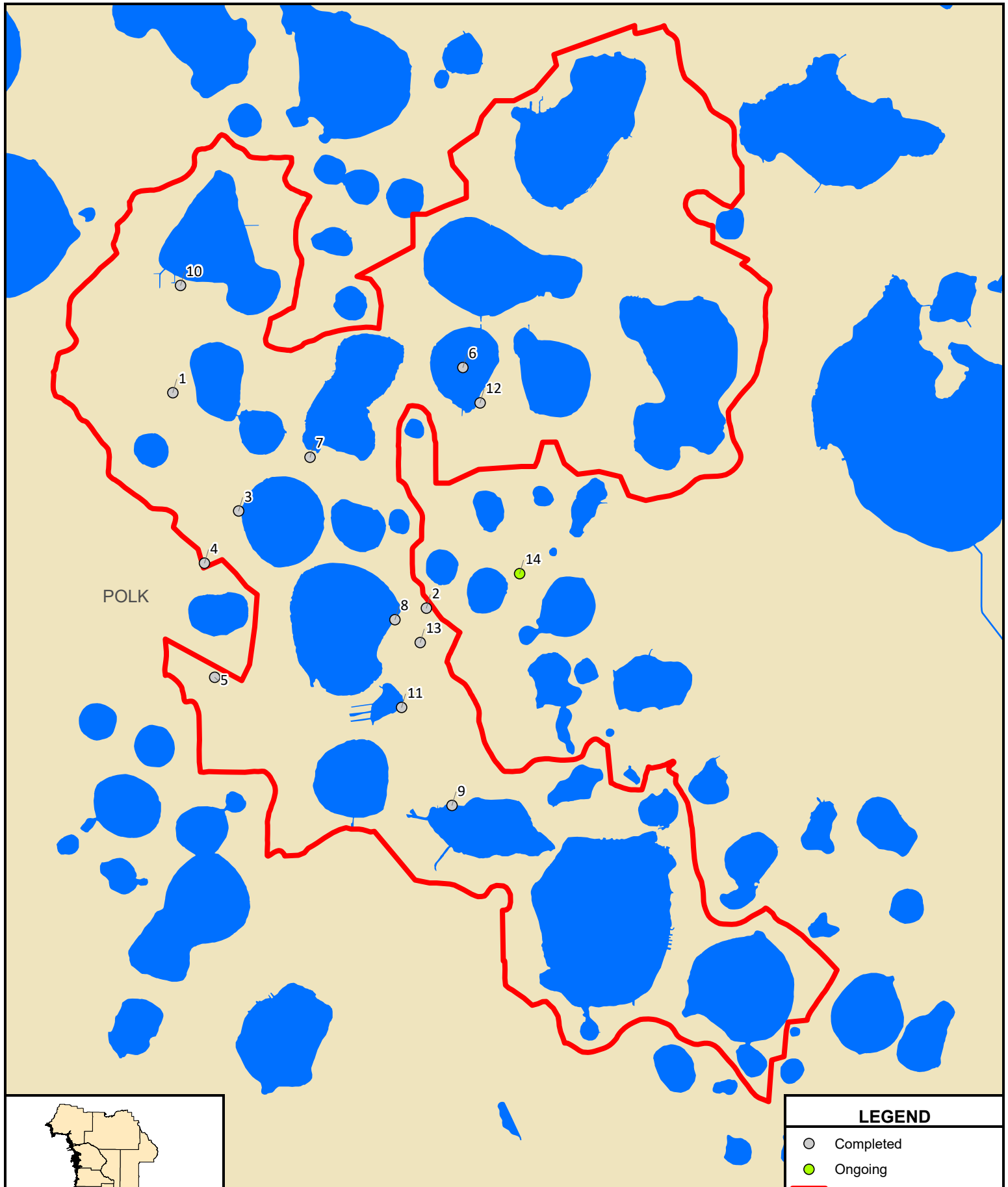
**LEGEND**

- Completed
- Ongoing
- Weeki Wachee Watershed
- Weeki Wachee Springshed

**NORTH**

0 1.5 3 4.5  
Miles





# Winter Haven SWIM Projects 2023

**LEGEND**

- Completed
- Ongoing
- ▭ Chain of Lakes Watershed

**NORTH**

0 1 1 2  
Miles

## Winter Haven Projects Legend

Map Number	Project Name	Status
<b>1</b>	Derby Ditch Retrofit	Completed
<b>2</b>	Downtown Winter Haven Stormwater Improvement	Completed
<b>3</b>	Inwood Ditch Alum Injection Project	Completed
<b>4</b>	Inwood Water Quality Stormwater Retrofit	Completed
<b>5</b>	Jan Phyl Stormwater Treatment Project	Completed
<b>6</b>	Lake Conine Whole Lake Alum Treatment	Completed
<b>7</b>	Lake Hartridge Stormwater Treatment Project	Completed
<b>8</b>	Lake Howard Alum Injection	Completed
<b>9</b>	Lake Lulu Stormwater Treatment Project	Completed
<b>10</b>	Lake Mariana: Construction of Wet Detention Pond	Completed
<b>11</b>	Lake May Stormwater Management Project	Completed
<b>12</b>	South Lake Conine Watershed Restoration	Completed
<b>13</b>	Winter Haven LIDs	Completed
<b>14</b>	Winter Haven Ridge Implementation of Stormwater BMPs	Ongoing